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The return of industrial policy in the European Union: The political economy of state aid to 'Important Projects of Common European Interest'

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

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Abstract

Has industrial policy returned? Since the 2008 financial crash and subsequent economic crisis, frequent references have been made – in the academic literature, opinion pieces, policy reports, and news articles – to an apparent 'return' of industrial policy which challenges many of the ideas and rules of neoliberal globalisation. Focusing on the European Union (EU) as a relevant site for a theoretically informed analysis of industrial policy change, this thesis contributes to a better understanding of the nature, the causes, and the implications of this apparent 'return' of industrial policy. Drawing mostly on primary policy documents and original interview data, it makes three core claims: (1) in recent years, a novel supranational industrial policy complex has been emerging in the EU around the concept of 'important projects of common European interest'; (2) the former results from a longer, gradual process of observation, adaptation, and response to an evolving global economic context; (3) despite being explicitly linked to the 'common European interest', the emergence of this supranational industrial policy complex has been marked by unevenness, stratification, and contestation among EU member states. By unveiling and examining these developments, this thesis makes two main contributions to two different literatures. First, to the literature on the political economy of the EU, it puts forward a re-evaluation of the relationship between European integration and industrial policy practice: instead of just being regarded as a supranational constraint, the EU must be recognised as an actual, though internally stratified and contested, supranational platform for industrial policy too. Second, to the political economy literature on post-2008 continuity and change, it contributes robust evidence of recent industrial policy change that corroborates and expands upon other analyses documenting an ongoing shift away from neoliberal practices across a range of policy domains.

Declaration

I, the author, confirm that the thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means (www.sheffield.ac.uk/ssid/unfair-means). This work has not been previously presented for an award at this, or any other, university.

Acknowledgements

This thesis was written in a context marked by a prolonged pandemic, recurrent lockdowns and travel bans, the onset of a war, soaring energy and food prices, and, on a more personal level, a few painful moments of loss and grief. All of these adverse circumstances only aggravated some of the negative feelings of loneliness, purposelessness, and uncertainty which are, in any case, frequently experienced by doctoral researchers throughout their PhD journeys – negative feelings which, moreover, are so often, and so unfortunately, romanticised too. Definitely, I would have never been able to complete this journey had it not been for the exceptional guidance and generous support I received along the way from three brilliant supervisors: Matthew Bishop, Liam Stanley, and Scott Lavery. My first special acknowledgement goes directly to them.

Matthew Bishop was a tireless first supervisor, a role which he began to perform informally almost a year before my arrival in Sheffield when my initial research proposal (for what would have been a completely different PhD) first reached him. When I saw the detailed, insightful, and thoughtful feedback that Matt was willing to give to my research proposal and other application documents, I was immediately convinced that the University of Sheffield would be the right place for me to continue my postgraduate studies. During the almost four years that I spent under his formal supervision, Matt never let me doubt for one moment my own ability to carry out independent and original research. Liam Stanley gave this research more than would have been expected of a second supervisor. He kept challenging me to do my best work, forcing me to question the validity of the assumptions and the robustness of the arguments I made across several drafts of the thesis. Scott Lavery only joined the project later to cover for Liam during a limited period, but he left a significant imprint on the structure and the scope of the present thesis. Even after Liam resumed the role of second supervisor, Scott generously continued to offer valuable feedback on the work and suggestions for future research.

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Over the course of the PhD, I split most of my time between three different cities: Sheffield, Porto, and Cambridge. In Sheffield, I met a group of bright doctoral researchers whose enthusiasm and intellect shone through an otherwise dim set of office rooms. I was also lucky to have the opportunity to work at the Department as a Graduate Teaching Assistant in three undergraduate modules: 'Introduction to Global Political Economy' (POL119), 'The Political Economy of Global Capitalism' (POL217), and 'Development' (POL235). I would especially like to thank the students in those seminar groups for having made that teaching experience so rewarding. In July 2021 I presented a preliminary and partial version of this research at the Department's Annual Postgraduate Research Conference. I thank the organisers for this opportunity and the discussants for their feedback. Last but not least, I must thank Helen for her hospitality in Sheffield over the years. I am especially grateful to her for having hosted me again in her house once a week after I had already moved to Cambridge so that I could still travel to Sheffield to teach.

In the end, most of the words that compose the final draft of the thesis were not typed in Sheffield, but in Cambridge and, to a lesser extent, in Porto. I am really thankful for the patience and support of the family and friends I have in these cities. I thank them, especially, for having helped me take a few occasional breaks from the PhD to pursue other, non-academic interests as well. In this regard, I am particularly grateful to Ana – for the music, the books, the films, the food, the craft beer, and the many nights spent at home rewatching episodes of Mad Men and The Sopranos.

Finally, I would like to reiterate my unfaltering gratitude to Frederick Nixson. Fred was the most generous and inspiring dissertation supervisor I could have hoped for as an MSc student at the University of Manchester back in 2017. Unfortunately, we will never be able to finish writing that co-authored book chapter, nor will Fred ever read any part of this thesis. But I will always remember the time I spent under Fred's supervision in Manchester.

Table of contents

List of figures

List of tables

List of acronyms

DG	Directorate-General
DG CNECT	Directorate-General for Communications Networks, Content and Technology
DG COMP	Directorate-General for Competition
DG ENTR	Directorate-General for Enterprise and Industry
DG GROW	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
DG RTD	Directorate-General for Research and Innovation
EIB	European Investment Bank
ERT	European Round Table of Industrialists
EU	European Union
GDP	Gross domestic product
HLEG-KET	High-Level Expert Group on Key Enabling Technologies
IMF	International Monetary Fund
IPCEI	Important Project of Common European Interest
IPE	International Political Economy
KET	Key enabling technology
R&D	Research and development
R&D&I	Research and development and innovation
SME	Small and medium-sized enterprise
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
US	United States
WTO	World Trade Organization

1 Introduction

There is a very high chance that any reader who is interested in keeping abreast of the ways in which state intervention in the economy has been changing since the financial crash of 2008 has already come across at least a few references to the apparent 'return' (or 'revival' or 'rebirth') of a particular form of state intervention which goes by the name of 'industrial policy' (e.g., Rodrik 2010; The Economist 2010; Wade 2012; Andreoni 2015; UNCTAD 2018; Cherif and Hasanov 2019; Aiginger and Rodrik 2020). To be sure, statements about the apparent 'return' of industrial policy do not necessarily mean that this form of state intervention was ever truly and completely *gone* (on which, see, e.g., Graham 1992; Block 2008; Fine and Kyung-Sup 2012; Wade 2017). But they do suggest that there has been an important break or a significant degree of change in relation to past practice in this policy domain. Readers who are also familiar with the academic literature on the political economy of industrial policy are certainly aware of the tension between this form of state intervention, on the one hand, and the ideas, rules, and institutions which are most commonly associated with the period of neoliberal globalisation, on the other hand. Therefore, they will immediately be able to tell that to assert that 'industrial policy is back' is to allude to the appearance of cracks in the institutional edifice of neoliberal globalisation and to a shift away from neoliberal approaches to the role of the state in the economy. Through an in-depth empirical engagement with recent policy developments in the European Union (EU), the present thesis aims to contribute to a more substantive understanding of this apparent 'return' of industrial policy. In doing so, it shall also complement the work of other scholars who have, over the last few years, been mapping, interpreting, and assessing the ways in which economic policy practices have moved away from neoliberalism since 2008 across a wide range of geographical spaces, economic sectors, and policy domains.

Almost fifteen years after the collapse of the investment bank Lehman Brothers, political economists and other social scientists are still busy tracing the ripple effects of the financial crash and of the economic crises that followed, as well as making sense of how much has changed since that moment – in economic and political affairs alike, in different national contexts and globally too – and why. Many of the early analyses of this period of crisis emphasised the apparently limited extent of its effects and responses thereto. By and large, 2008 had been a 'status quo crisis' (Helleiner 2014). The dominant ideas, institutions, and practices of neoliberalism seemed to have survived the crisis 'strangely' unscathed

(Crouch 2011), and perhaps had become even stronger than they were before (Mirowski 2013). However, over the years, the thesis of an extremely 'resilient' neoliberalism (Schmidt and Thatcher 2013) has been gradually losing ground to an alternative view according to which the world economy and politics are, in many respects, fundamentally different from what they were in 2008, following a protracted period of global turbulence (Tooze 2018; Hunt and Stanley 2019).

The words Brexit and Trump, in particular, have become shorthand for some of the most significant and disruptive of these post-2008 politico-economic transformations – namely, the mounting 'backlash' against neoliberal globalisation 'from above' (Slobodian 2021) and 'from the right' (Bishop and Payne 2021), the proliferation of 'populist nationalist insurgencies' (Gamble 2021), and the 'return of national self-sufficiency' ambitions (Helleiner 2021). Other significant changes include the widespread adoption of unconventional policy tools, most notably quantitative easing in the realm of monetary policy (Green and Lavery 2018; Musthaq 2021), as well as the dawn of a new 'age of productive incoherence' in development finance which has given borrowing governments in developing countries more policy space to deviate from the standard neoliberal policy conditions which were usually attached to the loans from Washington-based international financial institutions such as the International Monetary Fund (IMF) or the World Bank (Grabel 2011, 2017; Babb 2013; Babb and Chorev 2016). All of these developments constitute important elements of the emerging 'post-neoliberal' (Davies and Gane 2021) hybrid forms of political economy which have increasingly come to characterise the post-2008 period.

Admittedly, the apparent return of industrial policy could, to a certain extent, be subsumed under the resurgence of nationalisms and the backlash against globalisation. But, overall, this would be to do it an analytical disservice. A cursory reading of the intellectual and practical history of industrial policy – from the writings of Alexander Hamilton and Friedrich List in the late 18th and early 19th centuries to the experiences of the export-oriented East Asian developmental states in the second half of the 20th century – would suffice to appreciate that industrial policy does not constitute a comprehensive nationalist alternative to globalisation. Instead, it represents a particular approach to managing the integration of the national territory into the world economy. The term 'industrial policy' refers to a range of *selective* state interventions in *industry* to promote the development of specific industrial sectors – surely, *inside* the domestic territory, but *not insulated* from global processes. This nuance prevents a simple association between industrial policy and nationalist insurgency against globalisation. But, for scholars of political economy, the former may be just as

interesting and as rich an object of study as the latter, not least because of how it evokes significant normative and theoretical distinctions among different traditions in the history of economic thought. The proposition that states should selectively intervene in markets so as to redirect resources from some sectors to others in defiance of the outcome that would have otherwise been produced by market competition alone is one at which liberal thinkers have consistently taken aim – from Adam Smith and David Ricardo in the 18th and 19th centuries to Friedrich Hayek and Milton Friedman in the 20th century and, indeed, the World Bank staff in the early 1990s when analysing the national development trajectories of East Asian developmental states over the previous decades (Page 1994; Wade 1996). Yet, this very same proposition is central to the alternative intellectual traditions of neomercantilism and developmentalism, both of which can be characterised by a strong advocacy of industrial policy practice as a means of achieving economic prosperity.

The selective forms of state intervention conveyed by the concept of industrial policy were thus at odds with the core tenets of economic liberalism (Johnson 1984; Campbell 1998) underpinning neoliberal globalisation and its attendant 'Washington Consensus' policy paradigm (Williamson 1990; Gore 2000; Babb 2013). Against this (neo)liberal background, even just using the expression 'industrial policy' was in poor taste for it would conjure up the image of an anachronistic era of capitalist development that belonged in the 1970s and whose state-directed inefficiencies and irrationalities should not be recalled with nostalgia (see, e.g., The Economist 2018). Indeed, this is why the authors of a 2019 IMF paper refer to the 'return' of industrial policy as 'the return of the policy that shall not be named' (Cherif and Hasanov 2019). However, it is important to also stress that (neo)liberal opposition to industrial policy did not only occur at the level of ideas and discourse. In a more tangible sense too, the ability of states to conduct industrial policy was effectively constrained – though, to be sure, never completely erased (Weiss 2005; Naqvi, Henow and Chang 2018) – by the creation of a set of rules and institutions which are typically associated with the rise of neoliberal globalisation and, particularly, with the concomitant consolidation of a disciplinary legal and institutional international framework of 'new constitutionalism' (Gill 1995, 1998). Typical examples of these restrictive rules and institutions are the international investment and trade rules of the World Trade Organization (WTO) (Chang 2003, 2011; Wade 2003) or the state aid rules of the EU (Buch-Hansen and Wigger 2010; Davies 2013; Copley and Moraitis 2021). It is precisely because of this tension between both the ideas and the rules of neoliberalism, on the one hand, and the practice of industrial policy, on the other, that the study of the apparent return of industrial policy can also offer an interesting vantage

point through which to engage with wider questions about the emerging 'post-neoliberal' forms of political economy of the post-crash world.

1.1 Approaching the apparent return of industrial policy

Industrial policy is back. But is it, really? And, if so, then what does it look like? Where does it come from? And where is it leading to? Arguably, despite all the references to this supposed return, recent developments in the narrow field of industrial policy have not attracted as much attention nor in-depth, careful analyses from scholars of political economy as other, perhaps more salient aspects of the post-2008 'post-neoliberalism', such as the nativist backlash against globalisation. Yet, this policy domain has not been entirely ignored either. So far, there have been two main approaches in the academic literature to the study of the apparent return of industrial policy and to tackling the questions just raised above. The first approach has been the study of industrial policy change in particular national contexts. Good examples of this approach are the work of Craig Berry (2016, 2020, 2021a) on the United Kingdom (UK) and that of Etienne Schneider (2022) on Germany. Informed by an understanding of the theoretical tension between neoliberalism and industrial policy, these works approach the question of the 'return' of industrial policy in these national polities through the lens of 'paradigm shifts' and offer rigorous and empirically rich accounts of continuity and change in this policy domain. However, there are necessarily a few analytical trade-offs. And the downside to this approach, therefore, is that detailed single-country case studies often come at the expense of identifying common themes and of appreciating the potentially synchronous and interactive character of many of these interventions across different spaces of the world economy.

A methodological counterpoint to this approach can be found in the emerging research agenda of 'new state capitalism' studies, pioneered by Ilias Alami, Adam Dixon, and colleagues (Alami and Dixon 2020a, 2021; Alami et al. 2022). Admittedly, the concept of '(new) state capitalism' deployed by these authors is more expansive than that of '(the return of) industrial policy'. As an object of inquiry, the former is meant to encompass *both* 'the development of muscular forms of statism', such as industrial policy but also national development strategies and other economic nationalist policy measures, *and* 'the multiplication of state-capital hybrids', which includes the institutional forms of sovereign wealth funds, state-owned enterprises, and policy or development banks (Alami and Dixon 2021: 7, 10). By putting economic geography and geopolitics at the centre of its analytical framework, the 'new state capitalism' research agenda emphasises the ineluctably 'combined'

and 'inter-referential' or 'relational' character of recent developments in industrial policy and other state capitalist practices. That is, from this perspective, the apparent return of industrial policy cannot be studied simply as the sum total of a series of national 'returns' which have independently happened to take place more or less at the same time as each other. On the contrary, it should be regarded as a total, global phenomenon whose determinants are, therefore, necessarily global too. For all its interdisciplinary theoretical sophistication, the downside to this approach, in turn, is that its holistic methodological ambitions might render empirical analysis intractable.

This thesis strives for a meso-level approach between these two methodological alternatives. Indeed, it can be argued that the approach to the study of the apparent return of industrial policy followed here constitutes a meso-level approach in a double sense. First, in the sense that it can be placed somewhere between the national scale of the 'paradigm shift' studies and the global scale of 'new state capitalism' studies. And, second, also in the sense that it attempts to produce delimited empirical analysis of concrete policy developments while still acknowledging the irreducibly global context within which any such policy developments necessarily take place. Hence, this thesis approaches the question of the 'return' of industrial policy neither in general, global terms nor within a single country alone, but instead by engaging with the meso-level case of the EU as a supranational but still delimited polity. Nevertheless, the choice of the EU as the relevant case study or site of analysis is not justified only on the grounds that it may represent a pragmatic compromise between being *supranational enough* that it can transcend the limitations of a single-country case study and being *delimited enough* that it can be subject to concrete empirical analysis. This choice is also informed by the understanding that, in light of several contributions to the academic literature, the EU stood out as a particularly *unlikely* place for any 'rebirth' of industrial policy to occur. This theoretical unlikelihood is rooted in the EU's institutionalised practice of state aid control and the neoliberalisation of its supranational economic governance, more broadly. In this regard, the EU not only offers a practical middle ground between the national scale and the global scale, but also constitutes, potentially, an unmatched site where the tension between (extant) neoliberalism and (emergent) industrial policy can be captured and tracked.

1.2 European integration, state aid control, and industrial policy practice

Whenever the EU is featured in discussions on industrial policy, it is typically as an example of a *supranational constraint* on national industrial policy practice. Political economists have often described the relationship between the two, therefore, as a conflictual one. And this conflict is attributed, first and foremost, to the competition rules of the European single market and the way in which these rules are enforced by the European Commission (see, e.g., Rosamond 2002, 2012b; Buch-Hansen and Wigger 2010, 2011; Clift 2013; Thatcher 2013). The importance of competition rules to European integration and supranational governance can hardly be overemphasised. They are part of the very essence of the EU as a politico-economic construct and an integrated supranational market. Competition policy was 'the first truly supranational policy' of the EU polity (McGowan and Wilks 1995: 142). And the core areas and principles that guide this competition policy have been enshrined in the legal infrastructure of European integration ever since the Treaty of Rome first established the European Economic Community among Belgium, France, West Germany, Italy, Luxembourg, and the Netherlands in 1957. EU competition policy spans across different areas, namely antitrust, cartels, mergers, and state aid. But it is in the area of state aid control that the tension between competition enforcement and industrial policy practice manifests itself more clearly.

Whereas the rules on antitrust, cartels, and mergers focus essentially on anticompetitive relationships that take place among firms, state aid rules govern the pecuniary relationships between firms, on the one hand, and member state governments, on the other. Yet, 'state aid' is not just another name for state subsidies. Instead, the concept of 'state aid' is defined, if somewhat implicitly, in Article 107, paragraph 1 of the Treaty on the Functioning of the European Union (TFEU) as any subsidy offered by a member state government or public authority to a firm or group of firms – whether in the form of a grant, a subsidised loan, a guaranteed, or a tax break – that simultaneously satisfies two additional conditions. First, to qualify as 'state aid', a subsidy needs to be *selective*, thus 'favouring certain undertakings or the production of certain goods'. Second, a subsidy only qualifies as 'state aid' insofar as it affects what would otherwise have been the outcomes of market competition – that is, if it 'distorts or threatens to distort competition' and 'affects trade between Member States' (see also European Commission 2016). It is precisely when these two additional conditions are considered that the overlap between state aid, as legal concept, and industrial policy, as a selective form of state intervention, becomes evident.

Hence, as a result of these conceptual overlaps, a degree of conflict or tension between the notions of state aid *control* and industrial policy *practice* can, in theory, be expected as well. However, in reality, this tension is much more nuanced. For, while the treaty provisions on state aid do stipulate that, as a general rule, state aid shall be deemed 'incompatible with the internal market' (TFEU Article 107(1)), they also accommodate a series of potential exceptions to this general rule – that is, cases in which certain state aid measures '*may be* considered to be compatible with the internal market' (TFEU Article 107(3), emphasis added). Ultimately, the extent to which these state aid measures are then actually considered 'compatible' or 'incompatible' depends, in turn, on the way the European Commission – and, particularly, the Directorate-General for Competition (DG COMP) which acts on its behalf in this policy domain – interprets and enforces state aid rules. Consequently, although membership of the EU formally subjects national governments' industrial policy practices to EU state aid rules, the extent to which these rules actually interfere with the ability of member states to conduct industrial policy also depends on how stringently or laxly these rules are interpreted and enforced.

In fact, the way that the treaty provisions on state aid have been enforced by the European Commission has changed over time even though those provisions have not. And this also helps to explain why, although state aid rules have existed since 1957, they are also frequently invoked by political economists as a typical example of the institutional footprint of neoliberalism closer to the end of the 20th century (e.g., Davies 2013; Nyberg 2017; Copley and Moraitis 2021). For the first thirty years, state aid control was only very laxly enforced and was very accommodative of the industrial policy practices of member states. From the mid-1980s onwards, however, state aid control was tightened in line with a broader neoliberal turn in European economic governance (Buch-Hansen and Wigger 2010, 2011; Kassim and Lyons 2013; Thatcher 2013; Aydin 2014; see also, e.g., Van Apeldoorn 2002; Bulmer and Joseph 2016; Ryner and Cafruny 2017). As in many other policy domains, the question of whether the neoliberalisation of EU state aid control was over was also raised following the 2008 crash and subsequent period of crisis and emergency bailouts (Clift 2013; Davies 2013). But here too the initial scholarly assessment was that the neoliberal approach to state aid control and competition enforcement had proved resilient and survived the crisis – in other words, there had been no 'paradigm shift' in this policy domain (Wigger and Buch-Hansen 2014).

From this perspective, the EU would seem a particularly unlikely place for any return of industrial policy to occur. But, for this very reason, it also constitutes an interesting case

study for a theoretically informed meso-level approach to the study of the apparent return of industrial policy. This thesis ventures into the domain of EU state aid control and sets out to look for evidence of a 'return' of industrial policy in an institutional field that, in light of the extant academic literature, could be expected to prevent it or, at least, to limit it. Hence, the research carried out for this thesis began with an exploratory empirical question – Can evidence of post-crisis change in industrial policy practice be found in the domain of EU state aid control? – and an auxiliary set of follow-up analytical questions – If so, what accounts for that change? And what are its main consequences and implications?

1.3 The emergence of a new supranational industrial policy complex

The short answer to the exploratory empirical question posed above is *yes* – evidence of change in industrial policy practice *can* be found in the domain of EU state aid control. Indeed, a central claim (and original concept) of this thesis is that a novel *supranational industrial policy complex* has been emerging in the EU – especially in the last five years, but as the outcome of a longer sequence of events and policy processes that can be traced back all the way to the immediate post-crash period. Although still incipient, the emergence of this supranational industrial policy complex also suggests an ongoing evolution in the relationship between the EU and the practice of industrial policy that needs to be acknowledged in the political economy literature: instead of being just understood as a *supranational constraint* on industrial policy, the EU must begin to be regarded as a *supranational platform* for industrial policy *too*. Arguably, if the former was often used as a typical example of the rules-based institutional framework of neoliberal globalisation, then the latter can serve as a useful illustration of, and an entry point into, the sorts of 'post-neoliberal' hybrid forms of political economy that have been germinating and proliferating throughout the post-2008 world.

Although it might have gone largely unnoticed by scholars and commentators at the time, the creation by the European Commission of a new state aid framework for 'Important Projects of Common European Interest' (henceforth, the IPCEI framework) in 2014 was definitely a landmark in this process of industrial policy change. The concept of 'important projects of common European interest' had existed in EU state aid rules since the 1957 Treaty of Rome as a potential exception to the general ban on state aid. But it had remained largely non-operational for more than fifty years of state aid control. The 2014 IPCEI framework offered a more precise definition of what kind of projects could qualify as 'important projects of common European interest' and stipulated the conditions under which state aid awarded to such projects could be deemed 'compatible' with the internal

market. With the creation of the IPCEI framework, the fifty-seven-year-old treaty clause was finally operational. And, as a result, the opportunities which were available to EU member states to engage in industrial policy under state aid rules were effectively widened. Shortly after, an unprecedented supranational industrial policy complex began to develop around this new IPCEI framework.

The term 'supranational industrial policy complex' is advanced in this thesis as shorthand for three distinct but interconnected sets of supranational industrial policy developments. The first development has been a growing collection of state aid projects approved by the European Commission under the IPCEI framework – henceforth, IPCEIs – in different industrial sectors. Following the introduction of the framework in 2014, IPCEIs were approved for the microelectronics sector in 2018, the electric-vehicle battery sector in 2019 and 2021, and the hydrogen sector in 2022. Combined, these four IPCEIs represent a gross investment volume of €42.7 billion, 31% of which is covered by state aid. Moreover, these figures are likely to keep growing in the coming years as more IPCEIs are already being prepared[1].

The second constitutive element of the supranational industrial policy complex is a widening range of so-called European industrial 'alliances' in different industrial sectors which offer EU member states and companies an institutional basis to negotiate and prepare IPCEIs or other policy measures – namely, the European Battery Alliance (launched in 2017), the Circular Plastics Alliance (2018), the European Raw Materials Alliance (2020), the European Clean Hydrogen Alliance (2020), the European Alliance for Industrial Data, Edge and Cloud (2021), the Alliance on Processors and Semiconductor Technologies (2021), the Alliance for Zero-Emission Aviation (2022), and the Renewable and Low-Carbon Fuels Value Chain Industrial Alliance (2022). The third and final piece of this new complex are supranational industrial policy committees – in particular, the 'Strategic Forum for Important Projects of Common European Interest' which, between 2018 and 2020, served as a forum where the European Commission staff, member state officials, and industry representatives discussed which industrial sectors should be considered supranational sectoral priorities warranting targeted industrial policy action.

[1] In fact, as the thesis was nearing submission, a fifth IPCEI – also for the hydrogen sector – was approved by the European Commission (2022c), thus raising the total gross volume of IPCEI investments to €54.9 billion (34% covered by state aid). Because the process of data collection and analysis for this research had already concluded when the approval of this project was publicly announced, this fifth IPCEI is not mentioned nor analysed in the empirical chapters of the thesis. However, it is acknowledged and discussed in the Conclusion (Chapter 8).

In sum, the research carried out for this thesis found substantial evidence of significant change in industrial policy practice by looking at the EU and recent developments in the domain of state aid control, in particular. Indeed, it even witnessed in real time many of the processes that, combined, make up the supranational industrial policy complex whose emergence this thesis unveils and chronicles. Thus, after having established with a sufficient degree of confidence that industrial policy change was indeed occurring, the research began to investigate the causes and the consequences of these developments. To do so, it peered into the political and bureaucratic lives of EU institutions, collecting primary documents and conducting interviews, while also remaining attentive to other developments in the global context within which these institutions operate, not least industrial policy interventions which could be taking place in other regions of the world economy around the same time.

Thus, a second core claim of this thesis is that, despite the position of industrial policy as an enduring point of contention between different schools of economic thought, the contemporary rise of industrial policy in the EU – embodied in the emerging supranational industrial policy complex – does not necessarily reflect a clear ideational shift as much as it reflects an ongoing process of practical adaptation and response to a changing global context. The analysis of policy documents and interview data does not reveal a definitive ideological position on the virtues and vices of selective state intervention that can be neatly associated with one school of thought or another. Among policy actors involved in these processes, there seems to be neither a committed embrace nor a wholesale rejection of either neoliberal ideas or neomercantilist and developmentalist ones. Instead, the rejuvenation of industrial policy action is more often regarded, by European Commission and member state officials alike, as a matter of practical necessity in the face of intensifying competition from other spaces in the world economy to attract investments in industrial sectors which are currently perceived to be of high economic value and, therefore, important sites of capital accumulation in their own right – most notably, the high-growth sectors of 'digital' and 'green' technologies.

Accordingly, rather than requiring a sudden swing in a perennial contest of economic ideas, the ongoing process of industrial policy change is better understood as the outcome of a longer, gradual process of observation, adaptation, and response to an evolving global competitive context which is indelibly marked, in space, by the economic rise of China and, in time, by the imperative of a shift towards a carbon-neutral economy in a matter of a few decades. Throughout this process, a perception of the risk of competitive underperformance was almost always present as was an alertness to what governments in other countries or

regions outside of the EU did to attract and nurture investments in high innovation and high growth sectors. Indeed, as the thesis will show as well, there are obvious overlaps between the sectoral priorities of the EU's emerging supranational industrial policy complex and those of synchronous industrial policy practices in other advanced capitalist economies. All of this, in turn, points to the strongly interactive and inter-referential character of industrial policy practice too, as emphasised in the 'new state capitalism' research agenda.

Finally, although the instances of industrial policy change which are tracked and traced here are still incipient, they are already leading to some visible tensions among EU member states. This observation informs the third core claim of the thesis. Although the supranational industrial policy complex continues to expand and to cement its position as an enduring feature of the EU institutional framework, the degree of participation of different member states in this supranational industrial policy practice has, so far, varied markedly. A few member states – namely, France, Germany, and Italy – have been clearly at the forefront of these developments – having participated in more projects and awarded more state aid to more firms. But, outside of this core, the rates of participation have generally been lower, though gradually increasing, and there is more ambivalence regarding the merits of these developments. Arguably, the continued reproduction of a supranational industrial policy practice hinges upon the possibility of agreeing on a 'common European interest' that may guide this practice and be intelligibly materialised in concrete 'important projects' targeting specific industrial sectors. At least to some extent, this agreement seems to have been possible so far. Otherwise, the number of IPCEIs, the number of member states financing IPCEIs with state aid, and the number of European industrial alliances would not have kept expanding as they indeed have.

Still, this thesis argues, two factors militate against the likelihood of an always peaceful determination and operationalisation of this 'common interest' – and, therefore, help to make sense of the ambivalence and contestation that supranational industrial policy practice has met from some member states. First, supranational industrial policy practice, however inclusive in its ambition and outlook, has arrived at a landscape which was already uneven across national lines. Because member states differ in terms of their industrial and fiscal capacities, the actual opportunities and most tangible benefits generated by this industrial policy change can also be expected to be unevenly distributed across EU member states, thus contributing to distributional conflicts between them. Second, the pluri-national nature of the EU polity implies that member states find themselves in a situation in which they are in competition to attract and hold investments not only with countries in other

regions of the world economy but also with each other. This means that the national governments of each EU member state have an incentive to make use of the new industrial policy opportunities which are made available to them – for example, by participating in IPCEIs – but they also have an incentive to attempt to undermine the ability of other member states to do the same. This is a fundamental but not necessarily fatal contradiction – as, to reiterate, the continued expansion of the supranational industrial policy complex shows. However, looking ahead, if the degree of national participation in IPCEIs remains stratified and is not offset by other means either, then these projects may begin to shape the industrial landscapes of the EU in ways that will further intensify tensions among member states – not only over who benefits the most from this novel supranational industrial policy practice, but also over the very meaning of, and the legitimacy of appeals to, the ideal of a 'common European interest' in an increasingly 'post-neoliberal' era.

With these three core claims and the empirical analysis that supports them, the thesis makes two main contributions to the literature. First, using the EU as a relevant and theoretically informed case study, it contributes clear and detailed evidence of recent and still ongoing industrial policy change which substantiates the otherwise thin perception that 'industrial policy is back' or that there has been a 'return' of industrial policy since the 2008 crash. This is an empirical contribution that corroborates and expands upon the burgeoning political economy literature documenting and making sense of post-crisis transformations away from neoliberalism and towards 'post-neoliberal' hybrids or a 'new state capitalism'. Arguably, because of how it was once regarded as a prominent site of post-crisis 'resilient liberalism' (Schmidt and Thatcher 2013) and even 'the epicentre of global neoliberalism' (Ryner and Cafruny 2017: 221), the EU stands out here as a relevant case study through which the nature and the direction of broader transformations away from neoliberalism may be gauged. Yet, besides using the EU as a case study for the literature on post-crisis change, this thesis also engages with the political economy of European integration and governance as an interesting object of study in its own right. Therefore, it also makes a specific contribution to the literature about the EU that sits at the intersection between political economy and EU studies. Namely, in developing and deploying the original concept of a 'supranational industrial policy complex', this thesis puts forward to the relevant literature a re-evaluation of the relationship between European integration and industrial policy practice: instead of being just a *supranational constraint* on industrial policy, the EU must begin to be recognised as a *supranational platform* for industrial policy *too* – even though, to be sure, this supranational platform is stratified along national lines and entangled in tensions and

conflicts among member states. Besides, by situating this process of industrial policy change in the EU firmly in the context of wider changes in the global economy (both in space and in time), this thesis supplements contemporary reflections about the structural nature and the historical evolution of the relationship between global capitalist processes and the internal dynamics of European integration and governance (see, e.g., Lavery and Schmid 2021).

1.4 The outline of the thesis

In addition to this Introduction and the Conclusion, this thesis is comprised of six substantive chapters. The latter may, in turn, be conveniently separated into two parts of three chapters each. The first part – Chapters 2 to 4 – deals with the core conceptual, theoretical, and methodological underpinnings of the research. Then, building upon these foundations, the three chapters of the second part cover different aspects of the empirical analysis of recent industrial policy change in the EU and develop in greater detail the core claims which have just been briefly anticipated above.

Chapter 2 opens the first part by clarifying and relating some of the central concepts used throughout the thesis – not least, the concept of 'industrial policy' itself. In fact, although this is a concept that can arouse strong emotions, its meaning is not always clear-cut. So, even as claims about the apparent return of industrial policy multiply, the truth is that the authors of those claims may not even agree on what exactly is that thing that is apparently returning in the first place. And this is why categorial statements such as 'industrial policy is back' can be as ubiquitous as they are hollow. So, the chapter asks: What is industrial policy? What makes a state intervention an example of industrial policy? And what is the place and significance of industrial policy in political economy scholarship? Answering these questions, the chapter articulates a deliberately narrow definition of 'industrial policy' as *selective* state intervention in *industry*. It then traces an intellectual genealogy of industrial policy, thus narrowly defined, as a central point of contention between different political economy traditions from the late 18th century to the early 21st century. In doing so, this chapter also offers an overview of broader concepts – such as (neo)liberalism, neomercantilism, and developmentalism – and of the theoretical arguments of different thinkers – such as Adam Smith and David Ricardo, Alexander Hamilton and Friedrich List, Friedrich Hayek and Milton Friedman, Mariana Mazzucato and Dani Rodrik – which are relevant for any theoretically informed discussion of industrial policy.

Chapter 3 outlines a theoretical framework to assist the empirical analysis of industrial policy practice and change. It is motivated by the following methodological

questions: How may the practice of industrial policy, and changes therein, be analysed and explained? How should we study the process in which industrial policy is formulated and implemented? The chapter argues that, while the agency of political actors and the openness of social events must be ontologically acknowledged and analytically accommodated, the empirical study of concrete instances of industrial policy cannot neglect the wider structural context in which the latter is formulated and implemented – that is, the context(s) in which state actors find themselves. So, the chapter begins by turning to the literature on state theory and borrowing three propositions to form the basis of a theoretical framework for the study of industrial policy: the competitive accumulation imperative, the legitimation imperative, and the relative autonomy of the state. It derives theoretical implications from each one of these propositions for the specific form of state intervention which industrial policy represents. Then, it combines these propositions and their implications with another two relevant elements for the analysis of industrial policy in space and in time, namely the inter-referentiality of industrial policy action (which can competitively multiply industrial policy interventions across different spaces of the world economy) and the unprecedented imperative of carbon neutrality (which created new high-growth industrial sectors, namely in 'green' technologies such as electric-vehicle batteries and hydrogen).

Chapter 4 introduces the EU, and the field of EU state aid control in particular, as an interesting site for a meso-level approach to the question of the apparent return of industrial policy. First, it addresses a descriptive question: How may the relationship between the EU and industrial policy be characterised? Drawing upon the academic literature and EU official documents and legislation, it adds more details to the preliminary sketch of this conflictual relationship already offered above – revisiting the origins of EU competition regulation and state aid control and tracing its historical evolution before and throughout the neoliberal era. Then, in turns to a methodological question: How may (possible instances of) change in this relationship be researched and explained? To answer this second question, the chapter adapts the theoretical framework outlined in Chapter 3 to the singular specificities of the EU and brings it into dialogue with more established approaches to the study of European integration and governance, such as intergovernmentalism and neo-Gramscianism. Finally, informed by these methodological reflections, the chapter details and justifies the methods used during the empirical research carried out for this thesis.

Then begins what may be regarded as the second part of the thesis – that is, the concrete empirical analysis of the nature, the causes, and the consequences of contemporary industrial policy change in the EU. Chapter 5 tells the story behind the creation of the novel

IPCEI state aid framework which preceded, and enabled, the emergence of the EU's new supranational industrial policy complex. Formally, this state aid framework was created by the European Commission in 2014 to clarify a treaty provision on state aid to 'important projects of common European interest' which already existed in EU state rules since 1957. However, looking beneath the surface, this chapter shows that this state aid framework was *not* just a neutral clarification of an already existing provision, that this was *not* the product of a single decision taken in 2014, and that the European Commission was *not* the only actor involved in the creation of this framework *nor* was the Commission always a unitary actor throughout the whole process. Instead, the 2014 IPCEI framework codified a particular understanding of what may constitute 'important projects of common European interest'. This understanding can be clearly traced back to discussions which were already taking place between 2009 and 2011 about investments in so-called 'key enabling technologies'. These discussions involved not only the Commission but member state officials and industry representatives too. And, throughout the process that eventually led to the creation of the IPCEI framework in 2014, there were consequential disagreements between DG COMP and other Directorates-General (DGs) of the Commission without whom this new state aid framework – and, by extension, the new opportunities for industrial policy practice that it opened up for EU member states – would not have been created. However, as the chapter also shows, these disagreements do not necessarily validate the depiction of DG COMP as a consistently neoliberal actor either for DG COMP officials express more nuanced views about what may constitute good forms of industrial policy which should be allowed (or even encouraged) within the EU.

Chapter 6 follows on chronologically from the previous chapter and tells the story of how a new supranational industrial policy practice took hold in the EU following the creation of the IPCEI state aid framework, thus giving rise an unprecedented and expanding, though still incipient, *supranational industrial policy complex*. It identifies and describes in detail the three main constitutive elements of this complex: an expanding collection of IPCEIs (that is, state aid projects prepared and approved under the IPCEI framework), the concomitant establishment of a series of so-called European industrial 'alliances', and the creation of supranational industrial policy committees such as the Strategic Forum for Important Projects of Common European Interest. It argues that these developments are better understood, not as the outcome of a deliberate rejection of neoliberal economic ideas, but as a practical response to a changing global competitive context. In addition, this chapter also analyses in detail what can be considered to have been so far the three main sectoral

priorities of the EU's supranational industrial policy practice (namely, microelectronics, electric-vehicle batteries, and hydrogen technologies), making sense of the selective allure of each one of these sectors, while also revealing the inter-referential overlaps between this set of priorities and those of synchronous industrial policy practices in other advanced capitalist economies outside of the EU.

Chapter 7 turns to the question of who benefits (the most) from these developments. It surveys the uneven industrial landscapes of the EU, maps the stratified geographies of national participation in IPCEIs, and examines ongoing controversies and tensions among different EU member states to reveal the national fractures that lie beneath this new supranational industrial policy practice. First, it argues that, owing to the differences that exist between member states in terms of their industrial and fiscal capacities, not all member states stand to benefit to the same degree from the industrial policy opportunities opened up by the creation of the IPCEI state aid framework. Then, it shows that, across member states, there have been varying degrees of participation in IPCEIs. Whereas France, Germany, and Italy have formed a stable geographical core for IPCEIs, other member states have expressed ambivalence about the merits of this supranational industrial policy practice because of how it may undermine their own competitive position vis-à-vis those larger economies. The chapter concludes by considering the potential impacts of this (stratified) supranational industrial policy practice on the future industrial landscapes of the EU and, more broadly, on the process of European integration too.

Finally, Chapter 8 concludes this thesis. First, it summarises the main arguments, identifies the core contributions to the literature, acknowledges the main limitations, and derives a few direct implications for future research. Then, it turns to a set of normative questions – If 'industrial policy is back', then how do we position ourselves in relation to it? When industrial policy practice is on the rise, how should one study and write about it? In grappling with these questions, the chapter makes a case for the development of a normative research praxis which, in dialogue with the literature on the politics of technology, may be capable of appreciating and analysing not only the progressive potential of contemporary industrial policy practice, but also its dangers, blind spots, and spaces of social struggle and political conflict.

2 The concept of industrial policy in the history of economic thought

What does the term 'industrial policy' refer to? Admittedly, as the perception of a contemporary return of industrial policy grows and so the term becomes more commonly and widely used in academic research and news reports alike, this question may seem trivial or redundant. However, a conceptual clarification is required since multiple definitions of this term actually coexist in the literature. So, when empirical statements are made about industrial policy, the very referent of the term may often change between those statements. And, if the concept is not explicitly clarified, these changes in its meaning may even go unnoticed. Therefore, seemingly contradictory claims about industrial policy are neither hard to find nor easy to dispel. This thesis has no aspirations to settle these conceptual disagreements once and for all, nor to revise past reports or analyses of industrial policy on the grounds that those were based on deficient understandings of the term. However, if it is to study the apparent 'return' of industrial policy through a rigorous empirical analysis of recent industrial policy change in the EU, then it must begin by explicitly specifying how this central concept (and object of study) is understood and how the definition used here can be positioned in relation to other definitions that may be found in the literature. For both methodological and theoretical reasons which are discussed in more detail below, this thesis adopts what can be considered a narrow definition of industrial policy. Namely, it defines industrial policy as selective state intervention in industry.

The other question animating this chapter is about the place of industrial policy in political economy scholarship. To answer this question, this chapter situates industrial policy (narrowly defined) in the history of economic ideas. As selective state intervention in industry, the concept of industrial policy evokes a long intellectual history of theoretical and normative disagreements between different schools of thought since, at least, the classical origins of political economy in the 18th century. An intellectual genealogy of industrial policy can be traced as a debate among successive generations of political economists of different persuasions. For the sake of brevity and simplicity, this chapter summarises this long intellectual history in three separate historical phases. The first phase is the debate that took place in the late 18th and early 19th centuries between classical economic liberalism, theoretically equipped with the principle of comparative advantage to justify openness to free trade, and neomercantilism, theoretically equipped with the infant industry argument to

justify selective state intervention in industry (that is, industrial policy, as the term is used in this thesis). The second historical phase consists of the reiteration of the classical debate with a few new nuances in the 20th century as classical economic liberalism and neomercantilism were respectively reinvented as neoliberalism, which advanced new epistemological objections to selective modalities of state intervention, and developmentalism, which looked to the role of state bureaucracies in the late industrialisation experiences of East Asian countries for inspiration on how industrial policy should be carried out in practice. Finally, the third historical phase covers the emergence of a new progressive approach to industrial policy in the 21st century which combines the developmentalist focus on the question of how to improve the bureaucratic practice of industrial policy with a more explicit emphasis on the politics of the direction of technological change. Besides serving to situate the concept in political economy scholarship more generally, the intellectual genealogy traced in this chapter also uncovers and engages with several concepts and themes which are essential to add theoretical depth to the empirical study of industrial policy in practice.

Thus, this chapter is organised as follows. The next section defines industrial policy as a selective modality of state intervention in industry, and compares this narrow definition to other, broader definitions which are often used too. Then, each of the three following sections covers one of the three historical phases of the intellectual genealogy of the concept of industrial policy (narrowly defined). Section 2.2 explores the debate between classical economic liberalism and neomercantilism, Section 2.3 turns to the debate between neoliberalism and developmentalism, and Section 2.4 focuses on the rise of a new progressive approach to industrial policy. Section 2.5 summarises and concludes.

2.1 Industrial policy as selective state intervention in industry

While there is a vast academic literature dedicated to the topic of industrial policy, the term itself has often proved difficult to define. Indeed, this has been a significant source of controversy among scholars (Chang 2011). And this controversy has also manifested itself in the proliferation of a variety of different definitions. For example, one survey of the literature identifies almost twenty variations of the concept (Warwick 2013: 16). Arguably, the coexistence of different definitions of industrial policy poses significant analytical challenges to its study as it undermines the necessary conceptual foundations for a clear and productive dialogue among scholars to take place. Yet, this section does not aspire to settle these controversies once and for all by offering the definitive and superior definition of

industrial policy. Instead, the more modest aim here is simply to clarify and justify the specific understanding of industrial policy that is adopted throughout this thesis.

Often, what underpins conceptual disagreements and multiple variations of the term is the question of how broad or how narrow the definition of industrial policy should ultimately be. For the sake of analytical precision, some authors (e.g., Chang 1996) explicitly reject what they regard as a proclivity to 'overload' the term, and instead express a preference for a narrow definition. Yet, other authors opt for broad definitions in the 'spirit of inclusiveness' (e.g., Warwick 2013: 16). At the risk of circumventing or downplaying recent developments that other scholars might have taken as evidence of the contemporary return of industrial policy, this thesis explicitly adopts a narrow definition of the term. More specifically, the definition adopted here is narrow in a double sense. First, it is narrow in the sense that it focuses on *industry* alone, as opposed to also encompassing agriculture or services. By definition, then, policies aimed at agriculture or services (such as financial services, social care, or tourism) do *not* constitute industrial policy. As such, they remain outside the scope of this thesis. This is not to suggest that agriculture, industry, and services operate in completely separate silos. Yet, when this thesis mentions industrial policy, it refers to policies specifically aimed at industry.

Second, in line with many other authors (e.g., Graham 1992; Chang 1996, 2011; Pack and Saggi 2006), the definition of industrial policy adopted here is narrow also in the sense is that it refers to *selective* state interventions only. That is, even within industry alone, industrial policy targets specific industrial sectors. This is sometimes also referred to as 'industrial targeting' (see, e.g., Krugman 1984). In this sense, a wide range of economic policy instruments, ranging from taxation and spending to regulation, may qualify as industrial policy insofar as they are deployed *selectively* to support the reproduction or development of specific industries. Owing to its selective character, industrial policy performs, however implicitly or indirectly, a redistributive function: selective state intervention redistributes resources away from non-targeted sectors and into targeted sectors (Tucker 2019). Ultimately then, when states engage in industrial policy, they act upon domestic industries unevenly and, thus, affect the direction of future industrial and technological development. As a selective modality of state intervention in industry, industrial policy elicits considerations about the composition and not just the volume of investment; the direction and not just the rate of economic growth; and the type and not just the number of the goods and services which are domestically produced. In sum, when this thesis refers to industrial policy, it refers to *selective* state interventions in *industry*.

This narrow definition of industrial policy is adopted for two reasons. The first reason is methodological. Broad definitions often run the risk of equating industrial policy with each and every policy decision that can be perceived to affect industry or, indeed, even the whole economy. Admittedly, almost any decision by governments or other political authorities regarding taxation, spending, public investment in infrastructure and services (such as in education and transport), interest rates, the enforcement of competition law and so on affects the economy, in general, and industry, in particular, somehow. But, if every measure in all of these domains necessarily qualified as industrial policy all of the time only by virtue of somehow affecting the economy or even industry alone, then only very few policy measures would not qualify as industrial policy at all. So broadly conceived, the concept can become at once empirically ubiquitous and analytically intractable.

A narrow definition typically avoids this methodological cul-de-sac by setting strict boundary conditions that remove from its analytical domain policy measures which have a general, as opposed to selective, scope – policies such as changes in headline corporate income tax rates, the provision of basic infrastructure and education, or public funding of basic scientific research. Admittedly, when broad definitions of industrial policy need to account for the selective character of some state interventions in industry, they can also do so if they take a second terminological step and further disaggregate the concept into two parts: on the one hand, *vertical* industrial policies which are selective and, on the other hand, *horizontal* industrial policies which do not target specific industrial sectors. As stated above, the aim of this section is not to rule out all other possible conceptual understandings of industrial policy. So, scholars that legitimately still prefer a *horizontal-plus-vertical* definition are only advised to imagine the word 'vertical' before every instance of the term 'industrial policy' hereafter.

Yet, there is also a second reason why such a narrow definition of industrial policy is adopted in this thesis. And, if the first reason was simply to pragmatically avoid the danger of conceptual overloading, the second reason is theoretically and historically informed. Arguably, the significance of industrial policy as an object of study in its own right for political economy scholarship becomes much clearer when both its relationship with *industry* (and concrete processes of industrialisation) and its distinctively *selective* character are emphasised. As a selective form of state intervention in industry, industrial policy evokes a long and rich history of economic ideas. Indeed, it can even serve as a vantage point through which foundational separations and divergences between different schools of economic thought can be identified and unpacked. The remaining sections of this chapter substantiate

this claim by tracing the intellectual genealogy of industrial policy across three historical phases.

2.2 Neomercantilism and classical economic liberalism

The intellectual origins of the concept of industrial policy as a selective form of state intervention in industry can be traced back to the theoretical and normative debates between classical economic liberalism and neomercantilism in the late 18th century and the early to mid-19th century. Most often, classical economic liberalism is associated with the writings of Adam Smith and David Ricardo, while neomercantilism is associated with the work of Friedrich List – but also Alexander Hamilton, who actually preceded him (Harlen 1999). These two schools of thought, along with Marxist political economy, are usually regarded as the classical foundations of (Western) political economy scholarship (Hobson 2013; Clift 2014; Helleiner 2020). Admittedly, the inclusion of neomercantilists within this trinity of classical political economy is not entirely uncontroversial among historians of economic thought. For example, Friedrich List's deliberate mischaracterisation of some of Adam Smith's positions has, for some scholars, rendered List a lesser figure in the long history of economic ideas (Watson 2012). Besides, Alexander Hamilton earned his reputation mostly as a statesman – by being the first US Secretary of the Treasury – rather than as a scholar. Even so, the relative sophistication of Hamilton's writings for a policymaker would still persuade Joseph Schumpeter to include a brief mention to him in his comprehensive volume on the history of economic thought as an example of '"applied economics" at its best' (1954: 193).

As political economists, Hamilton and List shared a question and an answer. First, they were primarily interested in understanding how their respective nations – the United States (US) and Germany, respectively – could try to catch up with the level of industrial development displayed by Britain at the time. Second, they answered that question with similar proposals for *selective* state interventions in industry – that is, industrial policy. And they did so while explicitly contrasting their own normative position with that of classical economic liberalism. The neomercantilism espoused by Alexander Hamilton and Friedrich List was neither liberal nor autarchic. Unlike classical economic liberals, they awarded the state more than a minimal role in economic affairs. Namely, the state was tasked with the responsibility of fostering and protecting the development of 'national productive powers' (List 1909 [1841]; Levi-Faur 1997a, 1997b). However, the comprehensive and indiscriminate protectionism advocated by earlier mercantilists was definitely to be avoided too (Levi-Faur

1997b; Harlen 1999). Instead of an inward-looking protectionism geared towards completely insulating all national industries from foreign competitors and achieving economic self-sufficiency, Hamilton and List argued for a *selective* and *temporary* form of protectionism, especially directed towards new, but promising industries. For them, this type of protectionism was crucial to promote national industrialisation and enhance the competitiveness of domestic industries in the world economy up to the point where they would be able to withstand foreign competition, without however having to repudiate the existence of international trade altogether nor their nations' participation therein (Levi-Faur 1997b; Harlen 1999; Helleiner 2002).

In making the case for the selective and provisional protection of certain domestic industries, Hamilton and List crafted what came to be known as the 'infant industry argument' and, thus, launched the modern debate on industrial policy (Andreoni and Chang 2019). The neomercantilist argument for targeted and temporary protectionism – or, in other words, for infant industry protection – is well captured in the three following passages of Alexander Hamilton's 1791 *Report on manufactures*:

> The spontaneous transition to new pursuits, in a community long habituated to different ones, may be expected to be attended with proportionably greater difficulty… these changes would be likely to be more tardy than might consist with the interest either of individuals or of the Society. In many cases they would not happen… To produce the desireable changes, as early as may be expedient, may therefore require the incitement and patronage of government. (Hamilton 1791)

> There are dispositions apt to be attracted by the mere novelty of an undertaking – but these are not always those best calculated to give it success. To this, it is of importance that the confidence of cautious sagacious capitalists both citizens and foreigners, should be excited. And to inspire this description of persons with confidence, it is essential, that they should be made to see in any project, which is new, and for that reason alone, if, for no other, precarious, the prospect of such a degree of countenance and support from government, as may be capable of overcoming the obstacles, inseperable from first experiments. (Hamilton 1791)

> The continuance of bounties on manufactures long established must almost always be of questionable policy… But in new undertakings, they are as justifiable, as they are oftentimes necessary. (Hamilton 1791)

As Hamilton puts it, 'the incitement and patronage of government', namely in the form of subsidies ('bounties'), are 'justifiable' and 'oftentimes necessary' to spur the development of 'new undertakings', although 'questionable' in the case of 'manufactures long established'. Put differently, the neomercantilist infant industry argument postulates that selective state intervention is necessary to change domestic productive structures. For, however desirable

this change, it is unlikely to occur spontaneously as a result of the uncoordinated actions of individuals going about their everyday business. The state is awarded a pivotal, though temporary, role in this process. The state's role consists in targeting and supporting a few promising industries before they reach maturity and become economically viable. Importantly, despite the selective nature of this mode of state intervention, the expectation underlying the infant industry argument is that the whole national economy, and not just the direct recipients of state support, benefits from the government's targeted actions. In *The national system of political economy*, Friedrich List makes this connection between selective protections and their widespread benefits:

> Neither is it at all necessary that all branches of industry should be protected in the same degree. Only the most important branches require special protection… If these main branches are suitably protected and developed, all other less important branches of manufacture will rise up around them under a less degree of protection. (List 1909 [1841]: 145)

The industrial policy agendas of Hamilton and List thus clearly and explicitly diverged from those of classical economic liberals who opposed the selective use of tariffs, export subsidies, and similar instruments on the grounds that these misdirected capital into unnatural and, therefore, inevitably less productive undertakings than those determined by undisturbed market allocation (Harlen 1999). Indeed, from a liberal perspective, state intervention can be considered especially harmful for national prosperity precisely when it is selective and impermanent, as prescribed by Hamilton and List. Although it was not written as a direct response to neomercantilists or their infant industry argument, the classical economic liberal counterargument to this kind of selective protectionism which disturbs the 'natural' allocation of capital among industrial sectors can be found clearly articulated in the following passage from Adam Smith's *Wealth of nations*:

> … every system which endeavours, either by extraordinary encouragements to draw towards a particular species of industry a greater share of the capital of the society than what would naturally go to it, or, by extraordinary restraints, to force from a particular species of industry some share of the capital which would otherwise be employed in it, is in reality subversive of the great purpose which it means to promote. It retards, instead of accelerating, the process of the society towards real wealth and greatness; and diminishes, instead of increasing, the real value of the annual produce of its land and labour. (Smith 1977 [1776]: Book IV, Chapter IX)

Thus, in direct opposition to Hamilton's argument cited above, according to Smith, any system of political economy which attempts to challenge the 'natural' order given by market forces necessarily 'retards, instead of accelerating, the process of society towards real wealth

and greatness'. For classical economic liberals, selective interventions generated an 'artificial incentive' for capital to migrate towards protected industries and away from those where the nation's comparative advantage in international trade naturally lied and where, therefore, its productive efforts would and should automatically concentrate (Hobson 2000: 69). If the infant industry argument was the defining feature of neomercantilism, its liberal counterpoint was precisely the principle of comparative advantage. This principle, which Ricardo, following Smith, developed to defend free trade among nations, is central to the intellectual and normative tradition of economic liberalism (Watson 2017). According to the principle of comparative advantage, instead of attempting to deliberately redirect capital towards specific industries through differential degrees of tariff protection or direct subsidies, states should accept their nations' naturally given comparative advantage. Provided all nations specialised on their natural comparative advantages, total output would be maximised. Accordingly, consumers from all nations benefit from international trade in the form of both greater output and lower prices.

Friedrich List disdained the liberal argument in favour of free trade as a disingenuous device used by British political economists to deliberately promote and defend the hegemonic position of Britain relative to less industrialised nations in the international trading system. For List, the British argument for free trade among nations concealed the protectionist 'ladder' through which Britain had climbed to a higher stage of economic development and denied other nations the opportunity of climbing up the same ladder:

> Any nation which by means of protective duties and restrictions on navigation has raised her manufacturing power and her navigation to such a degree of development that no other nation can sustain free competition with her, can do nothing wiser than to throw away these ladders of her greatness, to preach to other nations the benefits of free trade, and to declare in penitent tones that she has hitherto wandered in the paths of error, and has now for the first time succeeded in discovering the truth. (List 1909 [1841]: 295-6)

In contrast to classical economic liberals, List explicitly rejected that all nations would be better off by engaging in international trade according to their natural comparative advantages. For him, it was:

> an utter misconception of the nature of national economical conditions… that such nations can promote and further their civilisation, their prosperity, and especially their social progress, equally well by the exchange of agricultural products for manufactured goods, as by establishing a manufacturing power of their own. (List 1909 [1841]: 145)

Like the advocacy of infant industry protection, then, the neomercantilist opposition to the principle of comparative advantage was based on the premise that not all sectors were equally

conducive to generating national prosperity and progress. In the case of the example given by List in this passage, agricultural products are deemed inferior to manufactured goods. Industrialisation is vital to national prosperity. Therefore, in pursuing national prosperity, the state should not only support industry over agriculture but also discriminate in favour of 'the most important branches' of industry, temporarily, so as to enable them to develop beyond their infancy. Otherwise, these industrial sectors would fail to develop, while the 'natural' but less-promising agricultural sectors would absorb most of the nation's capital, making only a limited contribution towards the sustained growth of national prosperity and towards social progress.

The point made by List about the supposedly self-serving nature of British political economists' embrace of free trade also provides here an opportunity to clarify the conceptual distinction between neomercantilism and economic nationalism. Although these two concepts are often conflated and used interchangeably to refer to the same sort of quasi-protectionist economic policies, this section has consistently referred to Hamilton and List as neomercantilists, rather than economic nationalists, and avoided using the latter term when contrasting neomercantilism with classical economic liberalism. This has been a deliberate choice informed by the work of other political economy scholars who have warned that economic nationalism, as opposed to neomercantilism or indeed classical economic liberalism, is not necessarily associated with any specific policy programme (Crane 1998; Helleiner 2002, 2005; Pickel 2003; Harmes 2012). Economic nationalism, in this sense, can be more or less protectionist. It can even be autarchic, at one extreme, or completely liberal, at the other extreme. Ultimately, its concrete policy programme depends on which policies can, in a particular context, provide the best means to bolster the prosperity and power of a particular nation-state in the world economy (Helleiner 2002). In this regard, for List, the classical economic liberalism of British political economists was clearly no less nationalist than his own neomercantilism.

To summarise, the notion of industrial policy as a selective modality of state intervention in industry was present in all but name in the intellectual and normative debate between classical economic liberalism and neomercantilism between the 18th and the 19th centuries. Neomercantilists, most notably Alexander Hamilton and Friedrich List, outlined the case for industrial policy action in the shape of the infant industry argument. The modality of state intervention they advocated was selective and temporary and intended to generate wider economic benefits beyond the direct recipients of state support. This argument was developed in dialectical opposition to the liberal principle of comparative

advantage in international trade. For classical economic liberals, such as Adam Smith and David Ricardo, selective state interventions which attempted to redistribute capital across sectors were counterproductive because investments determined by market forces alone would naturally find their most productive employment. In this light, the narrow definition of industrial policy introduced in the previous section can be restated, in a slightly more theoretical fashion, as a selective modality of state intervention in industry which involves acting upon the sources and the direction of techno-industrial development, presumably in defiance of what would otherwise have been the outcomes of market competition.

In the intellectual genealogy of the concept of industrial policy, the debate between neomercantilism and classical economic liberalism in the 18th and 19th centuries was followed, in the 20th century, by the reinvention of neomercantilism as developmentalism and the reinvention of classical economic liberalism as neoliberalism. The fundamental disagreement between these two intellectual traditions over industrial policy remained, albeit with a few new theoretical and empirical nuances.

2.3 Developmentalism and neoliberalism

The classical ideas of Hamilton and List about selective state intervention and their critiques of economic liberalism have had a lasting influence on political economy scholarship and practice. The infant industry argument was the precursor to 'developmental' economic thought in the 20th century. The 'developmental' rubric is often used to qualify to separate (though similar) schools of thought. The first one is that associated with the founding figures of the new subdiscipline of development economics in the mid-20th century. Included in this strand of developmentalist thought are names such as Arthur Lewis, Celso Furtado, Hans Singer, or Raul Prebisch, among many others. What interested these development economists the most was the question of how nations which had gained independence from colonial rule could make the transition from agrarian to industrial societies in an uneven international context in which Western countries were already industrialised (Andreoni and Chang 2019).

The second school of thought that usually goes under the name of 'developmentalism' is that which started to emerge from the 1980s with the study of the rapid industrialisation of East Asian countries (Woo-Cumings 1999b; Pradella 2014; Andreoni and Chang 2019). The inaugural work in this strand of developmentalist thought was the political scientist Chalmers Johnson's 1982 book, *MITI and the Japanese miracle*, documenting and appraising the role of Japanese state bureaucracies in promoting national

industrial development (Johnson 1982). Johnson's book on Japan was then followed, during the 1980s and 1990s, by the work of other authors, namely Alice Amsden (1989), Ha-Joon Chang (1996), Linda Weiss (1995) or Robert Wade (1990), on the development experiences and the role of the state in Taiwan and South Korea. For the purposes of tracing an intellectual genealogy of the concept of industrial policy, this second strand of developmental thought is more relevant. First, because it explicitly made industrial policy its central concept. And second, because, in foregrounding the concept of industrial policy, this line of thought developed in clear opposition to neoliberal policy recommendations in the same way that neomercantilism developed in opposition to classical economic liberalism.

Thus, developmentalist scholarship – sometimes also referred to as neo-Listian political economy (Selwyn 2009) – combined the classical theoretical arguments of neomercantilism with new empirical support obtained from inductive analyses of the successful late industrialisation experiences of East Asian economies in the second half of the 20th century. The East Asian states, whose national programmes of techno-industrial development put the infant industry argument into practice, came to be known as 'developmental states' (Helleiner 2002; Thurbon 2016; Wylde 2016; Andreoni and Chang 2019). There is, however, a substantial degree of irony in this lineage of developmentalism and its turn to Asia for inspiration. Because Friedrich List himself was quite sceptical about the prospects for industrialisation in Asian nations. In fact, although he is often considered 'a champion of the third world' (Boianovsky 2013: 648) and a source of inspiration for a 'critically minded development theory' (Watson 2012: 460), List stated that his industrial policy prescriptions applied only to countries with 'temperate climates' and, conversely, were of no use to the countries of the 'torrid zone' (Boianovsky 2013; Hobson 2013). In hindsight, it is striking how one of the intellectual predecessors of the developmentalism with which East Asian economies became so closely associated (see, e.g., Woo-Cumings 1999a; Bello 2009) had nothing but a gloomy (and, indeed, offensive) prognosis for the entire region:

> Europe will sooner or later find herself under the necessity of taking the whole of Asia under her care and tutelage… In this utter chaos of countries and peoples there exists no single nationality which is either worthy or capable of maintenance and regeneration. Hence the entire dissolution of the Asiatic nationalities appears to be inevitable, and a regeneration of Asia only possible by means of an infusion of European vital power… (List 1909 [1841]: 336)

Yet, with this historiographical caveat in mind, developmentalism may be aptly understood as a 'political-economic philosophy' which renews the crux of the infant industry argument originally articulated by Hamilton and List (Thurbon 2016: 17). In the same vein as neomercantilism, developmentalism is neither liberal nor autarchic. Instead, it advocates

selective and provisional state intervention in 'strategic' industries in order to achieve the goals of industrial transformation, technological autonomy, and international competitiveness (Thurbon 2016). In this sense, developmentalists agree with Hamilton and List on both the desirable ends of national industrial development and the appropriate means of selective and temporary state interventions in industry.

The intellectual counterpoint to developmentalism can be found in neoliberalism, which is the 20th-century reinvention of classical economic liberalism (Stahl 2019). The concept of 'neoliberalism' is often a slippery one, inviting many disagreements among scholars over its appropriate definition and use (Brenner, Peck and Theodore 2010; Peck 2013; Bruff 2019). Still, there is a very significant degree of scholarly consensus about Friedrich Hayek and Milton Friedman being two of the foremost intellectual figures of neoliberalism as an ideology or a school of economic thought (Mirowski 2013; Davies 2014; Rodrigues 2018a; Bruff 2019). So, it seems reasonable to assume that the writings of Hayek and Friedman might serve as a good starting point for an engagement with neoliberal thought and, more specifically, with the position of neoliberal thinkers in relation to state intervention in the form of industrial policy.

The infant industry argument, in particular, was addressed by Milton Friedman and Rose Friedman (1980: 48) in their 1980 book, *Free to choose*. While they acknowledged that the infant industry argument was one of the few theoretical arguments for protectionism which 'in principle may have some validity', they concluded that, nonetheless, this argument was spurious because its practical implementation was inevitably flawed:

> The infant industry argument is a smoke screen. The so-called infants never grow up. Once imposed, tariffs are seldom eliminated. Moreover, the argument is seldom used on behalf of true unborn infants that might conceivably be born and survive if given temporary protection. They have no spokesmen. It is used to justify tariffs for rather aged infants that can mount political pressure. (Friedman and Friedman 1980: 49)

The practical difficulties associated with doing industrial policy play an important role in the neoliberal critique of industrial policy interventionism. For Milton and Rose Friedman, the beneficiaries of this selective and temporary protection would be those who 'can mount political pressure'. Because 'true unborn infants' of the kind that neomercantilists and developmentalists would want to support 'have no spokesmen' to make such demands of the state. So, in practice, 'the infant industry argument is a smoke screen'. Friedrich Hayek, for his part, expressed concerns that the views of List and other German scholars of the 19th and early 20th centuries legitimised and encouraged 'scientific planning' and the 'conscious organisation of industry' through the use of tariffs, subsidies, and other similar instruments

(Hayek 2001 [1944]: 21-22, 48). Hayek considered that such forms of intervention constituted a rather imprudent and inappropriate strategy for achieving national industrial development. For him, the state should not venture into any attempts at the 'conscious' coordination of industrial development because, in actual practice, it is not, and cannot possibly be, knowledgeable enough to do so. This argument is well captured in the following two passages:

> It is no exaggeration to say that if we had had to rely on conscious central planning for the growth of our industrial system, it would never have reached the degree of differentiation, complexity, and flexibility it has attained. Compared with this method of solving the economic problem by means of decentralisation plus automatic co-ordination, the more obvious method of central direction is incredibly clumsy, primitive, and limited in scope. (Hayek 2001 [1944]: 52)

> All that can be empirically verified is that societies making use of competition for this purpose realize this outcome to a greater extent than do others – a question which, it seems to me, the history of civilization answers emphatically in the affirmative. (Hayek 2002 [1968]: 10)

Hence, the neoliberal view, as articulated by Friedman and Hayek, is that the state should not try to act upon the sectoral sources of, or provide direction to, techno-industrial development. In other words, the state should not engage in industrial policy. This, however, does not mean that all other forms of state intervention in the economy are precluded too. As Hayek himself put it:

> The question whether the state should or should not "act" or "interfere" poses an altogether false alternative, and the term *laissez-faire* is a highly ambiguous and misleading description of the principles on which a liberal policy is based. Of course, every state must act and every action of the state interferes with something or other. (Hayek 2001 [1944]: 84, emphasis in the original).

The question, therefore, is not whether the state should intervene or not, but the modalities and the aims of state intervention. And both Friedman and Hayek envisaged an important role for the state in the creation and enforcement of competitive markets (Rodrigues 2018a, 2018b; Stahl 2019). So, instead of an entirely absent or a purely '*laissez-faire*' state, the neoliberal state is best characterised as a regulatory state enforcing market competition. Its main role should be to create and maintain the necessary rules-based framework for a competitive order to emerge (Hayek 2001 [1944]). Once the legal requirements for a competitive market order are in place, the state should delegate the task of providing direction to industrial development to the 'spontaneous forces' of market competition and their 'automatic' coordination mechanisms. This policy recommendation is based on the central epistemological premise that the state does not and cannot *know* what the best sectors

and right direction for industrial development are. Market competition is the only 'discovery procedure' (Hayek 2002 [1968]) through which such fundamental unknowns shall be organically revealed. Thus, policymakers and state bureaucrats who want to engage in industrial policy action are faced with an insurmountable practical problem: they do not and cannot know to which industries or technologies they should provide selective and temporary protection.

Combined, the passages of Milton and Rose Friedman and Friedrich Hayek transcribed above are illustrative of the two prongs of the standard neoliberal argument against selective state intervention. For neoliberals, the practice of industrial policy faces two crucial problems. These are the problem of *ignorance* and the problem of *capture*. While there is a connection between the two, these can be separated for analytical clarity. The problem of ignorance is that emphasised in the quote by Hayek: governments are ignorant about which sectors they should support or which direction they should imprint on techno-industrial development. They are not knowledgeable enough to act selectively. This fundamental ignorance, in turn, makes governments vulnerable to the problem of capture, which is the one identified in the quote by Milton and Rose Friedman. If necessarily ignorant governments decide to act selectively, in all likelihood this selective support will be channelled to particular interests with political connections, those with 'spokesmen' that can claim to be solving the problem of ignorance. In the end, industrial policy is captured by particular interests and does not deliver the wider societal impacts it promises. So, the argument goes, industrial policy is much more likely to encourage corruption and divert resources to socially wasteful activities such as lobbying and bribing than it is to inspire innovation, productivity growth, and techno-industrial development.

Instead of assuming them away, developmentalist scholars have often acknowledged the twin problems of ignorance and capture. In general, developmentalists agree that, notwithstanding the allure of the infant industry argument in abstract terms, practical problems may severely undermine the theoretical promises of industrial policy. Consequently, unlike their neomercantilist predecessors, developmentalists have placed a great emphasis on building an institutionalist and practice-oriented body of work on how to design and implement effective industrial policy interventions. Inspired by the bureaucratic practices of East Asian states, developmentalist scholars took it upon themselves to study and formalise practical solutions that address or at least mitigate the twin problems of ignorance and capture. At the centre of this practical turn have been the concepts of 'embedded autonomy' (Evans 1989, 1995) and 'governed interdependence' (Weiss 1995),

inductively derived from the study of the implementation of industrial policy by state bureaucracies in East Asian countries in the second half of the 20th century.

These concepts similarly combine two claims: *i)* that the 'embeddedness' of state bureaucrats among business elites allows them to elicit sufficient information to mitigate the problem of ignorance, while *ii)* their 'autonomy' as insulated, meritocratic bureaucracies enables them to avoid capture by particular business interests. These concepts, therefore, recognise but reconcile the inherent tension or trade-off between embeddedness and autonomy. When embeddedness is achieved at the expense of autonomy, it can result in 'rent-seeking'. Conversely, when autonomy is achieved at the expense of embeddedness, it can result in 'information gaps' (Weiss 1995: 604). So, from this perspective, the relative success of East Asian states in promoting domestic techno-industrial transformation through effective industrial policies is explained by their own systems of bureaucratic governance of industrial policy which allowed them to strike the right balance between embeddedness and autonomy. On the one hand, state bureaucrats in East Asian developmental states were sufficiently embedded to address the problem of ignorance: industrial policies were not 'imposed' by the state but developed through 'regular and extensive consultation and coordination with the private sector' (Weiss 1995: 594). On the other hand, these bureaucrats were sufficiently autonomous to address the problem of capture: the private beneficiaries of selective support were 'disciplined and monitored by the state' (Weiss 1995: 591).

Arguably, from a Hayekian perspective, the information which is produced and processed in the context of market competition cannot be discovered or apprehended otherwise. The total emergent knowledge is irreducible to the sum of that possessed by each market participant individually and, therefore, eludes individual cognition, regular consultations, and any methods of data collection and analysis. So, it is unlikely or indeed impossible that inductive findings from the experiences of East Asian states would persuade neoliberal critics that the problem of ignorance in industrial policy can in any way be solved. However, the key point here is that, as concepts such as 'embedded autonomy' and 'governed interdependence' show, developmentalist scholarship became primarily interested in the empirical study of the practice of industrial policy and in the question of how this could be improved to minimise policy failures, both of the 'rent-seeking' and the 'informational gap' kind. Thus, scholars of a developmental persuasion turned to the task of identifying best practices and formulating concrete policy recommendations for the design and implementation of industrial policies that could be replicated in other contexts beyond that of East Asian states in the second half of the 20th century. These have included a variety of

organisational and practical recommendations to facilitate coordination and informational exchange between state officials and private firms in deliberation councils, to ensure that the sectoral priorities and the goals of industrial policy are transparently communicated to citizens, to regularly report, monitor, and assess the effectiveness of state support, to impose discipline on the direct beneficiaries of state support through the definition of clear and enforceable performance standards, and to guarantee that state support is limited in time by built-in sunset clauses or similar arrangements (see, e.g., Rodrik 2004, 2008, 2014; Chang 2011; Warwick 2013; Warwick and Nolan 2014).

The comparison made in this section between developmentalism and neoliberalism, as the 20th century reinventions of neomercantilism and classical economic liberalism, has relied mostly on comparing the theoretical and normative arguments that each side has separately made which have the clearest implications for industrial policy. This is mostly a dialogue which is imagined in hindsight since the authors mentioned so far did not address each other directly but only implicitly. However, this imagined intellectual debate had a very concrete manifestation at the time of the preparation, publication, and fallout of the 1993 World Bank report on 'The East Asian miracle' (World Bank 1993). This report became emblematic of the divide between developmental and neoliberal approaches to economic development and industrialisation in developing countries. Although developmentalists saw in the historical trajectories of East Asian economies plenty of evidence of the active use of industrial policy and, therefore, a source of inspiration for similar selective state interventions elsewhere, in its report the World Bank only reluctantly acknowledged the existence of such interventions and, when it did, it still largely downplayed their effectiveness and their actual contribution to the process of techno-industrial transformation in these countries (Wade 1996). From the perspective of the World Bank, the main concern was that the selective interventionism of East Asian states would 'be used as an excuse to resist needed market-oriented reform' elsewhere, to quote the exact words of the lead economist in charge of the producing the report (Page 1994: 624).

Besides encapsulating the disagreement between developmentalism and neoliberalism, 'The East Asian miracle' report was also a testament to what was then the complicated relationship between the case for industrial policy and the mainstream framework of the discipline of economics (Wade 1996). Nowadays, however, economists such as Dani Rodrik and Justin Lin (2012) manage to combine developmentalist credentials with a high reputation in the circles of mainstream economics. The way they have framed the case for industrial policy in the language of 'market failures', such as information

externalities or investment coordination problems, has been pivotal to 'normalising' the idea of industrial policy among the mainstream of the discipline (Rodrik 2008). Insofar as the arguments in favour of selective state intervention can be reframed in the language of 'market failures', then they can also be reconciled with the mainstream frameworks of the discipline of economics (for another example, see Krugman 1984, 1993). Their reconciliation with neoliberalism, however, is much more difficult or effectively impossible, for the reasons identified above when discussing the positions of Milton Friedman and Friedrich Hayek.

To summarise, then, in the 20th century, the debate between neomercantilism and classical economic liberalism over industrial policy was revived with new nuances as a debate (although often only implicitly so) between developmentalism and neoliberalism. While the former places much more emphasis than the latter on treating techno-industrial development as an explicit goal that should be actively pursued, the main divergence between the two is not necessarily over the merits of techno-industrial development itself. Rather, the fundamental disagreement between them is over the modality of state intervention that can best serve it. The developmentalist approach ascribes an important role to selective and temporary protectionist measures – that is, industrial policy. It acknowledges, however, that this modality of state intervention requires carefully devising and implementing practical and organisational solutions of 'embedded autonomy' and 'governed interdependence' to address or mitigate the problems of ignorance and capture. The neoliberal approach, by contrast, rejects industrial policy interventions altogether, and recommends instead that the state focuses on enforcing a competitive market order. The problem of ignorance that plagues selective interventions is deemed insurmountable and, therefore, decisions over the sources and the direction of industrial development should be entirely delegated to the dynamic processes of market competition. The next section turns to the more recent rise of a new progressive approach to industrial policy which builds upon the developmentalist approach and has also developed in opposition to neoliberalism.

2.4 The new progressive agenda

In more recent years, a new progressive agenda for industrial policy has been emerging, especially in Western countries, in response to austerity, inequality, and the climate crisis. Broadly, this progressive view of industrial policy can be understood as an outgrowth of developmentalism. Like developmentalism, the new progressive view similarly emphasises the need to put in place institutional and practical solutions to mitigate the problem of capture that can result from the closer interaction between states and businesses in the

formulation and implementation of industrial policies. However, the two differ in how they approach the problem of ignorance. For developmentalists, the problem of ignorance was essentially something to be addressed *empirically*. Regular consultations between business representatives and state bureaucrats would generate the necessary information about the most promising sectoral sources of, and the most appropriate direction for, technological and industrial transformation to be supported by industrial policy. The new progressive view, in contrast, at least partly circumvents the problem of ignorance by shifting the discussion to an *ontological* level. That is, the selective targets of industrial policy are not to be discovered empirically, but instead informed *a priori* by a normative vision of what constitutes a socially desirable direction for technological and industrial development. Thus, the new progressive approach to industrial policy explicitly politicises technology and brings value judgements about the future direction of techno-industrial transformation to the fore.

For all its emphasis on the importance of technological and industrial transformation for national prosperity, developmentalism was not too concerned with the politics of technology. Instead, the primary focus of developmentalism, since its neomercantilist origins in the work of Alexander Hamilton and Friedrich List, had been on the predicament of late industrialisation and the best strategies for catching up with the most industrialised and technologically advanced nations. Yet, a growing wariness of this technological agnosticism can be observed even among some scholars who have been otherwise sympathetic to the industrial policy prescriptions of developmentalism. Notably, in the introductory paper to a 2020 special issue of the *Journal of Industry, Competition and Trade* on the 'rebirth of industrial policy', Karl Aiginger and Dani Rodrik (2020: 193) outline 'an agenda for the twenty-first century' and urge like-minded scholars to take a normative stance on the direction of technological development when writing about industrial policy. According to them:

> support of structural change and productivity growth can no longer serve as a policy goal without any consideration of the direction of technological change. In industrialized countries, the current bias of technical progress towards labor saving must be questioned, as it is neither natural nor conducive to a shift to lower, greener, and healthier growth. Steering technological change in a direction that is friendlier to environment and labor must be a key element of new industrial policies. In emerging economies, the question is whether industrial policy should copy leading economies or instead look for approaches better suited to the own countries' stages of development, as well as focus on new priorities such as supporting vulnerable groups, gender equality, reduced fossil energy use or the development of green technologies for new types of agriculture, housing, and transport. (Aiginger and Rodrik 2020: 193)

Some of these points have been reiterated by Rodrik in an opinion piece on 'reviving appropriate technology' (Rodrik 2022). In a very similar fashion, Antonio Andreoni and Ha-

Joon Chang, two scholars closely associated with the developmentalist tradition of industrial policy advocacy, have also recently argued that:

> structural change… requires much more than choosing from a pre-existing choice set. It requires formulating the choice set itself, namely, providing a vision for the future. And the state, as the central agent, can play an important role in providing such a vision. (Andreoni and Chang 2019: 143)

By far, however, the scholar who has done the most to develop and popularise this new progressive, vision-centred approach to industrial policy has been economist Mariana Mazzucato. Since the publication in 2011 of an early pamphlet version of her book 'The entrepreneurial state' (Mazzucato 2011, 2018a), Mazzucato has developed an intellectual and political project centred around two core aims. The first one has been the aim of empirically revealing 'the entrepreneurial state'. That is, empirically revealing the actual extent of the role that the state, especially in the US and in the UK, has historically played in enabling and promoting technological and industrial transformation. This 'entrepreneurial' role, Mazzucato points out, often goes unnoticed or is deliberately obscured by neoliberal ideology. And when the 'entrepreneurial' role of industrial policy is not visible, it is less likely to be publicly perceived as important. Therefore, it is more likely to being rolled back. Besides, the invisibility of its 'entrepreneurial' role of the state also puts the state in a position of weakness, making it less capable of claiming a direct financial return on the private investments it subsidises. In this situation, there is a mismatch between risks, which are socialised through industrial policy, and rewards, which remain private (Lazonick and Mazzucato 2013; Mazzucato 2018a). In revealing the hidden 'entrepreneurial state', Mazzucato seeks both to defend its public importance and to rectify the risk-reward mismatch.

In turn, the second core aim of Mazzucato's project has been to reclaim, strengthen, and repurpose the 'entrepreneurial state' to usher in a new 'mission economy' (Mazzucato 2021), where economic activity is infused with social purpose. In this 'mission economy', the industrial policies carried out by the state ought to be 'mission-oriented'. That is, for Mazzucato and her colleagues, the selectivity of industrial policy interventions should be informed by public 'missions' linked to 'societal challenges':

> through well-defined goals, or more specifically "missions", that are focused on solving important societal challenges, policymakers have the opportunity to determine the *direction* of growth by making strategic investments across many different sectors and nurturing new industrial landscapes, which the private sector can develop further… (Mazzucato, Kattel and Ryan-Collins 2020: 422, emphasis in the original)

Like the other examples of the new progressive view of industrial policy cited above, Mazzucato's mission-oriented approach to industrial policy involves, first, imagining a desirable future, and then, actively attempting to bring it about through targeted state action. It is, to quote, 'about deciding that a transformation must occur in society – and making it happen' (Mazzucato and Kattel 2020). The kernel of the new progressive approach to industrial policy, then, is that it foregrounds the possibility of politically deliberating on, as opposed to technocratically guessing, the right direction of techno-industrial change to be promoted. Accordingly, information obtained through regular consultations with businesses in a context of 'embedded autonomy' is no longer sufficient to guide industrial policy interventions. Instead, explicit political choices about the industries and technologies of the future need to be made by state actors.

By bringing new concepts such as 'appropriate technology', 'visions', 'missions', and 'societal challenges' into the framework, this new progressive strand seems intent on positioning itself as a deliberately less Sisyphean form of developmentalism in which techno-industrial transformation is not pursued for its own sake but because of how it contributes to wider societal goals – and only insofar as it does so. The new progressive approach also differs from the developmentalism that preceded it in its geographical reach. It is capable of speaking not only to developing countries in the Global South but also to the most advanced industrial economies in the Global North. Developmentalism, and neomercantilism before it too, were geographically associated with late industrialising nations and their attempts to catch up with more industrialised and technologically more advanced nations. They often only addressed audiences in the most advanced industrial economies of their time either to expose their liberalism as form of hypocrisy (List 1909 [1841]) or to demand that they stop 'kicking away the ladder' so that poorer countries may finally climb it too (Chang 2003). By contrast, because it reframes the argument for industrial policy in terms of 'societal challenges' more widely, the new progressive approach effectively universalises the recommendation for selective state intervention in industry in a way that neither developmentalism nor neomercantilism had done before.

Accordingly, the intellectual opponent of this new progressive approach is not so much a (neo)liberalism that is imposed from abroad as a neoliberal ideology which is internalised by state actors and that incapacitates them, including in advanced industrial economies. As Mazzucato (2021: Chapter 3) suggests, it is 'bad theory' that leads to 'bad practice'. And that 'bad theory' consists mostly of a set of deeply entrenched neoliberal 'myths' have contributed to discredit industrial policy as a self-defeating attempt by the

government to 'pick winners', whether those 'winners' be specific industries or technologies or firms. The expectation, therefore, is that, once these 'myths' are debunked, the 'entrepreneurial state' may emerge reinvigorated. Once equipped with an economic theory that empowers rather than incapacitates them, governments may effectively implement 'mission-oriented' industrial policies which, first, confidently set a desirable direction for future technological change, and then, realise that vision by 'picking' and working with 'the willing'. That is, those public organisations and 'purpose-driven businesses' which are willing to work with the government towards fulfilling the latter's missions (Mazzucato 2018b, 2021; Mazzucato and Kattel 2020).

Thus, underlying the new progressive, vision-centred, mission-oriented approach to industrial policy advocacy, especially as articulated in its most developed form in the work of Mariana Mazzucato, seems to be the implicit assumption that, as long as it is not held back by problematic economic ideas, the state can be regarded 'as an external, super-societal entity representing the "public" and "collective interest"', as political economist Lucia Pradella (2017: 66) puts it in her review of Mazzucato's *The entrepreneurial state*. Admittedly, Mazzucato and her colleagues still acknowledge that 'governments can and do become captured by particular interest groups which limit their ability to both establish missions and follow through on them' (Mazzucato, Kattel and Ryan-Collins 2020: 435). That is why they also stress the need to develop the administrative capacities of the state in a way that insulates bureaucracies from the direct influence of business interests, along the lines of the 'embedded autonomy' of East Asian developmental states. Thus, strengthening bureaucracies to adequately monitor and discipline the beneficiaries of targeted state support, as well as to claim a direct financial return to the state on the private investments it subsidises (Mazzucato 2016; Mazzucato, Kattel and Ryan-Collins 2020; Mazzucato and Kattel 2020). But, setting aside the anomalous influence of 'particular interest groups', their theory of the capitalist state rests on the assumption that the state ontologically precedes and always rules over markets. The relationship between states and markets is asymmetrical and clearly favourable to the state: states have the *power* to create, fix, and shape markets, while markets *depend* on states to exist and function. So, in the end, '[t]he capitalist economy will always be subordinate to the State and subject to its changes' (Mazzucato 2018a: 209).

This point warrants a brief detour from the intellectual genealogy of the concept of industrial policy traced in this chapter. For this conceptualisation of the state-market nexus where the state predominates is not exclusive to those working on, and advocating for, 'mission-oriented' industrial policies alone. On the contrary, it has been borrowed from a

specific interpretation of theoretical contribution of Karl Polanyi which is now well established among political economists more broadly and which is known as 'the mutual constitution thesis' (Copley and Moraitis 2021) or 'the marketcraft thesis' (Vogel 2018). Formulated as an explicit critique of dichotomous conceptualisations of the relationship between states and markets which presuppose that *more market* necessarily entails *less state* (and vice versa), the mutual constitution thesis is based on the observation that really existing markets are always underpinned by rules and infrastructures which, in turn, are actively developed and enforced by states. Starting from this observation, it draws attention to the possibility of *more market* begetting *more state* too, since the development of markets does not necessarily *replace* but instead *requires* state intervention (Clift and Woll 2012a; Vogel 2018).

The mutual constitution thesis has been extremely useful to transcend often unhelpful dichotomies between states and markets in political economy scholarship. It has also served to problematise the view that markets are natural phenomena which do not require any form of state intervention to emerge (Vogel 2018) – although, as noted above, this was not the view of (neo)liberals such as Hayek or Friedman either (see also Stahl 2019). However, in emphasising the economic role of the state in creating, fixing, and shaping markets, the mutual constitution thesis has also paved the way to some analyses of the state characterised by an undue degree of idealism and voluntarism. A logical leap is sometimes made from the observation that states have made and shaped markets in particular ways to the conclusion that the only thing preventing them from re-making and re-shaping markets in other and presumably better ways is 'bad theory' (Mazzucato 2018a) or the 'illusion' of their own powerlessness (Block 2018). If the study of the practice of industrial policy is to avoid this logical leap of idealism and voluntarism, an alternative theory of the capitalist state is required. This is an important analytical point which is addressed in much greater detail in the next chapter.

2.5 Concluding remarks

Some conceptual groundwork is required before actual instances and practices of industrial policy can be studied empirically. This chapter has laid this conceptual groundwork in two main ways. First, it has explicitly outlined how the concept of 'industrial policy' is understood and used throughout this thesis. As the perception of an ongoing resurgence of industrial policy grows, the term can become so commonly and widely used in academic publications and public discourse alike that its meaning may be taken for granted and spelling it out may seem to be a trivial or redundant exercise. However, as argued in this chapter, even a

superficial reading of the literature should be enough to appreciate that the concept is not univocal. Therefore, analyses and discussions of industrial policy can only benefit from the increased clarity of an explicit definition. In this thesis, a narrow definition of industrial policy is adopted. Industrial policy is understood specifically as a *selective* state intervention in *industry*. It is not a separate policy instrument nor just any decision by state authorities that somehow affects industry or the economy. Instead, it can involve a variety of policy instruments (such as subsidies, tariffs, taxation, regulation, etc.) provided these are deployed in a way that selectively targets and supports the reproduction or development of specific industrial sectors or technologies.

Admittedly, in adopting a narrow definition of industrial policy, this thesis potentially excludes from its analytical domain empirical developments that other scholars, working with broader definitions of the term, could perhaps identify and highlight as evidence of the contemporary return of industrial policy. And, to reiterate, the claim made in this chapter is not that narrower definitions of industrial policy are necessarily superior to, or more legitimate than, broader ones. However, what is clear – and will become even clearer in the empirical chapters of the thesis – is that the narrow definition adopted here does not define away industrial policy. This narrow definition is not so narrow that industrial policy may become a theoretical concept without an actual object. Nor does it conceal or downplay contemporary events to the point that it would entirely preclude the empirical analysis of actually existing industrial policy practice in the EU or anywhere else. On the contrary: rather than an impediment to concrete empirical analysis, a narrow definition will prove especially useful *both* to centre the analysis on concrete empirical manifestations of a resurgence of industrial policy in the EU *and* to make sense of their theoretical significance in the light of the extant academic literature. This is so because the definition of industrial policy adopted here is justified not only methodologically but also theoretically.

Hence, the second main contribution of this chapter is precisely that it situates industrial policy (narrowly defined) right at the centre of a long but periodically revisited and reinvented intellectual debate between different schools of economic thought about the appropriate role of the state in promoting technological and industrial development. The intellectual genealogy of the concept of industrial policy traced in this chapter cannot be considered exhaustive. However, it still introduces a range of concepts without which the empirical study of industrial policy practice would lack theoretical depth. A theoretically informed political economy approach to the study of industrial policy, in general, or to local manifestations of the apparent return of industrial policy, in particular, cannot lose sight of

the theoretical and normative antagonisms its practice arouses between classical economic liberalism and neoliberalism, on the one hand, and neomercantilism, developmentalism, and the new progressive approach to industrial policy, on the other.

Yet, this does not mean either that the study of industrial policy should be limited to applying these and related concepts alone. The task is not simply to characterise a particular state of affairs as '(neo)liberal' or 'neomercantilist' or 'developmentalist', thus confirming or disputing characterisations that might have been previously made by other scholars. While definitely important, that descriptive exercise is first and foremost a starting point: it identifies a puzzle in need of a solution. When it comes to the study of the contemporary resurgence of industrial policy and local manifestations thereof, the descriptive stage would involve claims such as 'this state of affairs was (characterised as) neoliberal, but now it is not'. The subsequent analytical step is to account for the actual transformation of that state of affairs in specific historical and geographical contexts, and to explore their potential implications and ramifications. This, in turn, cannot be done solely by relying on the history of economic ideas covered here. It requires a different theoretical basis. The next two chapters will, in different ways, contribute to building such a theoretical basis for the concrete empirical analysis of contemporary industrial policy change in the case of the EU.

3 The political economy of industrial policy practice: a theoretical framework

How may the practice of industrial policy, and changes therein, be analysed and explained? Actual instances and patterns of industrial policy practice, like any other modality of state intervention in the economy, can be explained at different levels of analysis. They can be explained, for example, in terms of the concrete and immediate actions of specific individual or collective actors. In the case of industrial policy, two types of actors would likely warrant special attention. The first would be state actors in positions of power who have their own particular ideas about the advantages and disadvantages of industrial policy action and who act intentionally in accordance with those ideas. The second would be business actors who have an interest in lobbying state actors for selective support to the industries or firms they represent. Industrial policy practice would, thus, be explained by the contingent interaction of these actors and their ideas, interests, or other motives. This level of analysis foregrounds the agency, the intentionality, and the will of political actors, as well as the openness of social events. All of these aspects are analytically valid and important. However, explanations that stop here neglect the wider structural context against which these actions and interactions take place. To overcome this limitation, this chapter outlines an original theoretical framework that situates industrial policy practice in structural context. Surely, the point is not to deny agency but to contextualise it more broadly. In so doing, the framework developed throughout this chapter offers both a conceptual language for empirical analysis and a theory-informed guide into the potential sources of change in industrial policy practice.

Yet, before industrial policy practice can be contextualised, the state too needs to be situated in its structural context. Thus, the chapter begins by turning to state theory to find the necessary theoretical resources to locate the state both in the global context of capitalist competition and in the domestic context from which it draws its legitimacy, while still acknowledging the possibility of situated agency (Section 3.1). Consequently, three propositions are borrowed from the literature on state theory to form the basis of the theoretical framework developed in this chapter. These are: *i)* the competitive accumulation imperative, *ii)* the legitimation imperative, and *iii)* the relative autonomy of the state. The theoretical implications of the first two of these three propositions for the practice of industrial policy as a specific modality of state intervention in the economy are explored in Section 3.2. It is argued that the imperatives of competitive accumulation and legitimation

can be linked to different industrial policy practices since each of them can be expected to compel state actors to prioritise different types of sectors to benefit from selective state support. In turn, Section 3.3 explores the theoretical implications of the third proposition, the relative autonomy of the state, for the practice of industrial policy. In particular, this section discusses the room that the relative autonomy of the state leaves for the (situated) agency of state actors and for the participation of business actors in industrial policy practices.

The two subsequent sections complement this theoretical discussion by considering two additional contextual factors that need to be taken into account in any framework whose aim is to analyse contemporary industrial policy practices. The first is the international inter-referentiality of industrial policy and the multiplier effects that a resurgence of industrial policy action in one country or region can stimulate in other countries and regions (Section 3.4). The second is the increasingly prominent issue of climate change and the ways in which the imperative of carbon neutrality – i.e., the necessity of reaching 'net zero emissions' by 2050 (Paterson 2021) – interacts with the imperatives of (competitive) accumulation and legitimation (Section 3.5). Finally, Section 3.6 summarises the key theoretical propositions advanced throughout the chapter and concludes by offering a visual representation of the theoretical framework in which all these propositions are integrated.

3.1 State theory: accumulation, legitimation, and relative autonomy

As pointed out at the end of the previous chapter, there seems to exist an elective affinity between the new progressive approach to industrial policy, especially as found in its most developed form in the work of Mariana Mazzucato, and a particular theory of the state as the entity with the power to create, fix, and shape markets and on which markets ultimately depend. In this theory, the state is awarded hyper-agency over markets: markets are constrained by the political authority of states, while states are hardly constrained by market dynamics. In other words, the economic policies adopted by states influence market outcomes much more than they are influenced by them. Accordingly, the adoption of specific economic policies by states can be largely explained in terms of the ideas held by policymakers – such as the self-defeating 'illusion' that policymakers entertain about their own powerlessness (Block 2018) or their pathological commitment to 'bad theory' (Mazzucato 2021) – or, alternatively, by moments of capture in which states with weak administrative capacities fall prey to particular business interests that tilt economic policies to their side. Accounts of this sort are not necessarily wrong by definition. However, they

lack a systematic attempt to situate the state *qua* capitalist state in its structural context. And, by failing to do so, they also fail to appreciate, for example, how the dynamic logic of capitalist markets 'imposes itself back upon states', thus constraining states' ability to completely subordinate markets to their ideological preferences (Copley and Moraitis 2021: 491). That is, they downplay the ways in which market dynamics influence economic policies.

Hence, for the purposes of analysing and explaining concrete instances and patterns of industrial policy practice, an alternative theory of state is required. More specifically, what is required is a theory that places the state in its structural context – the context against which economic policies, including industrial policies, are formulated and adopted. To be clear, the point of outlining an alternative theory of the state is not to rule out the possibility of agency altogether, but to *situate* that agency in the structural context it faces and, by extension, the structural forces with which it interacts. The need to take this into account is something that scholars contributing to the literature on state theory, especially (neo-)Marxian political economists, have not only acknowledged but also strongly emphasised for a long time (see, e.g., Block 1977; see also Hay 2006; Lavery 2019: 52-55). Thus, this section turns to this body of literature and borrows from it three propositions on which a theoretical framework for the analysis of industrial policy practice can be built. In brief, these can be summarised as: *i)* the accumulation imperative, *ii)* the legitimation imperative, and *iii)* the relative autonomy of the state. The remainder of this section unpacks each one of these three key propositions in turn. Before proceeding, however, it is worth pointing out that, although these propositions are often associated with (neo-)Marxian state theory, they are nonetheless completely separable from central elements of Marxian economics, such as the labour theory of value or the immiseration thesis (for a critique of which, see, e.g., Schumpeter 2011 [1947]: Part I), as well as from historical prognoses about the eventual demise of capitalism, which are beyond the scope of this thesis.

So, the first proposition that this thesis borrows from the literature on state theory is that states are structurally compelled to secure the necessary conditions of profitability for continued capital accumulation to occur domestically – or, for short, that states are faced with an *accumulation* imperative. This proposition rests on the premise that the existence and reproduction of the national state is financially dependent on the reproduction of domestic economic activity. More specifically, the tax base from which the state may collect fiscal revenues to finance itself and its policies increases with the economic value that is generated by domestic productive activity. However, in a capitalist economy, the level of economic activity and the economic value that it generates depend on *private* investment decisions

which are made on the basis of *individual* profitability considerations. The capitalist state cannot force private investments, but only induce them – namely, by acting upon the conditions that may affect their profitability. So, in order to finance and thus reproduce itself, the capitalist state can be expected to act in ways that seek to secure the profitability conditions that are required to encourage and facilitate private investments (Block 1977; Farnsworth 2004).

However, it is inadequate to conceive of the relationship between one state and one national economy in isolation. Instead, the national state needs to be placed in an economic context which is global. When that global context is considered, it becomes clear that each national state exists alongside other national states. And the respective national economies from where each of them draws the necessary resources for its own reproduction are linked too through trade, investment, and finance. Exchange rates between all the different national currencies are provisionally established and revised in international monetary systems, thus rendering every national economy and the commodities produced therein globally commensurable. Under these conditions, the economic viability of the activities of each individual firm, regardless of its location, is not determined only nationally but globally, with the world market setting the standards for viable economic activity (Copley 2021; Copley and Moraitis 2021). For each national state, the standards that the world market sets in terms of price, productivity, and profitability are experienced as an external competitive pressure. Failure to observe them may mean that domestically produced commodities are too expensive to be competitive in the world market or that the profitability of investments made in that national territory is lower than that which can be obtained in other spaces of the world economy. And, this, in turn, may translate into capital flight, growing trade deficits, and/or more restricted access to international financial markets, eventually precipitating currency and/or debt crises that undermine the ability of the national state to finance itself (Bonefeld 2014; Copley 2021; Copley and Moraitis 2021).

This observation about the global competitive context faced by each national state individually strengthens the accumulation imperative proposition. Given that states are 'nationally fixed' and capital is 'globally mobile' (Bonefeld 2014: 159), national states find themselves in a situation where they must compete with each other in order to avoid the risk of currency and/or debt crises. They must 'continually augment the competitiveness of their territory' (Copley 2021: 24) to ensure they are able to attract and keep (globally mobile) capital within their national borders (Holloway 1996). So, the premise and the proposition outlined above can be rephrased in this light. It may be argued that the existence and reproduction of

each national state in the international system is contingent upon the reproduction of domestic economic activity which is viable according to the price, productivity, and profitability standards that are dynamically and interactively set in the world market. In this situation, the economic value generated by domestic economic activity from which the state may collect tax revenues is not only dependent on private investment decisions, but also determined in relation to those global standards. This can be expected to generate a tendency for states to act in ways that seek to secure *internationally competitive* conditions of profitability for the continued accumulation of *globally mobile capital* to occur domestically. In this light, the accumulation imperative may perhaps be more aptly renamed as the *competitive accumulation* imperative.

The second proposition, the *legitimation* imperative, is that states are also structurally compelled to secure domestic popular support for their actions (Lavery 2019). The legitimation imperative may actually reinforce the competitive accumulation imperative. For example, as argued above, the state's failure to secure the conditions for continued capital accumulation domestically may lead to currency and/or debt crises. If those crises severely affect the livelihoods of a significant portion of the population, then public support for the state's actions can be expected to decline too (Block 1977). Conversely, the achievement of growing levels of economic activity, especially when they also result in the creation of additional jobs, may similarly contribute to the public legitimation of the state's actions. In such cases, the competitive accumulation imperative and the legitimation imperative go well together and reinforce each other. However, in many other occasions, these two imperatives may actually contradict each other and push the state in opposite directions (Paterson 2010; Lavery 2019). This is most obviously the case when the global viability of national economic activity is sought by cheapening and disciplining labour, either through changes in labour law or through the rollback of public services and public welfare programmes. It can also be the case when national economic viability is sought conspicuously at the expense of environmental protection. In such cases, to mitigate popular opposition and avoid social unrest, the national state is compelled to implement 'palliative measures' (Copley 2021; Copley and Moraitis 2021), even though these might be contrary to, and further undermine, national economic viability as determined by the standards of the world market and, thus, the competitive accumulation imperative.

The two structural imperatives of competitive accumulation and legitimation faced by the state can be identified when it is simultaneously situated in global capitalist relations of production and exchange and in its national basis of popular support. Crucially,

acknowledging this structural context precludes the adoption of an excessively voluntaristic conceptualisation of the state, according to which the state is a free-floating, if sometimes misguided, actor. However, rectifying voluntarism should not entail succumbing to the opposite danger of structural determinism. The structural imperatives of competitive accumulation and legitimation can only generate tendencies for the state to act in particular ways. The question of how each state actually acts in each particular situation remains an open and empirical one. This is not only an epistemological point, but an ontological one, especially. Even if it were possible to use a barometer to precisely measure the pressure exerted on the state by the competitive accumulation imperative and that exerted by the legitimation imperative in a specific moment in time, the actual course of action followed by the state would not be simply given by the combined result of those two pressures. In the theory of the state outlined here, the possibility of agency is not ruled out, it is only situated in its structural context.

Admittedly, the very notion that states themselves can possess agency is necessarily a rhetorical simplification of a more complicated ontological question. States, as well as their multiple administrative and policymaking sub-units (for example, the government, specific government departments, specific bureaucratic agencies within the state, etc.), can be regarded as social entities, as the category is defined and employed by Tony Lawson (2019). Following Lawson's definition, social entities are, in abstract terms, constituted both by a set of different individual parts and an internal relational structure according to which these different individual parts are organised together to form a whole. Because of the constitutive role of their internal organisation, social entities cannot simply be reduced to the sum of their constitutive individual parts. Importantly, however, social entities only 'act through their parts acting' (Lawson 2019: 110).

The example of an orchestra, briefly used by Lawson, may be illustrative (see also Elder-Vass 2017). For a large and diverse group of musicians to form an orchestra, it needs to be organised and coordinated in specific ways – not least, they all need to be in the same room at the same time, positioned in the appropriate sections associated with each family of instruments, and playing the same musical composition. Thus, an orchestra is more than the sum of the individual musicians that comprise it. And yet, an orchestra can only produce a sound through the actions of those musicians (Lawson 2019). Returning to the question of the agency of the state, this means that while states (and their sub-units) cannot be reduced to the individuals that occupy positions in their internal organisation (e.g., individual bureaucrats, individual politicians, etc.), it is only *through* the coordinated actions of those

individuals so positioned and organised within them that states can be said to act. In this sense, to talk of the (situated) agency of the state is really to talk of the (structurally constrained) ability of those individuals positioned and coordinated inside the state (which, in addition to bureaucrats and politicians, can variably be referred to as state actors, state managers, policymakers, etc.) to act consciously and intentionally – that is, motivated by their own beliefs, desires, perceptions, etc. – upon the structural context.

The last of the three propositions covered in this section, the *relative autonomy* of the state, captures and gives theoretical expression to this analytical balancing act of acknowledging both the structural context of state action and the situated but nonetheless irreducible agency of state actors. The proposition of the relative autonomy of the state is based on the dual observation that *i)* the state interacts with and depends on the wider social context that surrounds it, but still *ii)* there is a legal separation between the state as a social entity in its own right and the other non-state entities and individuals that comprise the social realm. This legal separation awards the individuals positioned within the state (and its sub-units) formal autonomy from the structural context within which they operate (Jessop 2002, 2008; Buch-Hansen and Wigger 2011; Lavery 2019), including the (competitive) accumulation and legitimation imperatives outlined above. For, to paraphrase Hubert Buch-Hansen and Angela Wigger (2011: 25), in practice '[n]on-state actors can provide ideational input into policy processes, but they rarely get to design the rules' themselves. In the end, policy decisions are the prerogative of state actors exclusively. So, unless the exercise of agency is precluded by ontological assumption, the possibility that state actors behave in ways that defy what the competitive accumulation and/or the legitimation imperatives would compel them to do at any specific moment in time needs to be analytically accommodated. As does the structurally derived implication that such patterns of behaviour necessarily carry risks for the financial viability and/or the popular legitimacy of their own actions. Hence the *relative*, as opposed to absolute, autonomy of state actors.

To summarise, this section has outlined a basic conceptualisation of the capitalist state that seeks to avoid excessive voluntarism but also structural determinism in the empirical analysis of state action. It is based on three propositions borrowed from the literature on state theory: the (competitive) accumulation imperative, the legitimation imperative, and the relative autonomy of the state. This is a conceptualisation of the state in which the agency of state actors is clearly acknowledged but also situated in the global context of capital accumulation and the domestic context of popular legitimation. The next section explores what this conceptualisation of the state means more specifically for the analysis of

a particular form of state intervention, namely selective state intervention in industry – or, for short, industrial policy.

3.2 Industrial policy in the context of accumulation and legitimation

If the state is structurally subject to the imperatives of competitive accumulation and legitimation (although not entirely reducible to them), then the practice of industrial policy needs to be understood accordingly. States can be expected to use industrial policy when that helps them facilitate accumulation and/or secure legitimation. When the state gives a subsidy – which is a traditional example of an industrial policy instrument – to a firm or a group of firms in a specific industrial sector, it improves their individual conditions of profitability. Subsidies may render financially viable private investments which were previously unviable, and thus enable their direct recipients to make investments which they would not otherwise be interested in making. Subsidies can also be used to attract investments to particular territories by making them more profitable than they would be somewhere else (for example, in another country), thus steering capital flows into the territory where the subsidy is made available. Furthermore, directed subsidies may be used to gain popular support from, or temporarily appease, certain constituencies. So far, this is straightforward but, admittedly, also too generic. The conditions under which this may occur need to be theorised to some degree. Arguably, there is a missing link between the *selective* nature of industrial policy interventions (and their immediate *individual* effects), on the one hand, and the *general* nature of the imperatives of competitive accumulation and legitimation, on the other.

Put differently, there is still an analytical gap between the general propositions of state theory outlined in the previous section and the selective nature of industrial policy as a specific modality of state intervention. Namely, the ways in which the individual/sectoral acquires general qualities for the purposes of accumulation or legitimation need to be theorised too. Otherwise, the analysis of actual instances of industrial policy practice would remain theoretically disconnected from the wider structural context within which states (and, by extension, state actors) operate. Hence, this section bridges this gap by conceptualising industrial policy practice *within* the structural context of the imperatives of competitive accumulation and legitimation, and by showing how each of these imperatives compels state actors to selectively support sectors with different characteristics.

To reiterate, selective state intervention in industry can, in principle, serve both accumulation and legitimation ends. However, not every sector serves both ends equally well. Each imperative can be expected to generate a tendency for state actors to prioritise and

direct state support to different sectors. In the case of the competitive accumulation imperative, this can be conceptualised by returning to the example of the subsidy given above. When the state gives a selective subsidy to a particular business, it immediately improves the latter's individual conditions of profitability. But under what conditions can this selective support and the corresponding immediate individual benefit it generates be specifically linked to the competitive accumulation imperative faced by state actors? The capitalist state is structurally faced with this imperative because its reproduction hinges on the taxation of value added by domestic economic activity as a whole in a global context of capitalist relations of production and exchange. And while this compels the state to ensure conditions of profitability for private investments in general, it clearly does not require that the state intervene with surgical precision to make the activities of each and every business in each and every sector individually profitable at all times. So, in order to establish a theoretical relationship between industrial policy and the competitive accumulation imperative, it is necessary to accommodate theoretically the possibility that, for one reason or another, certain individual industrial sectors may, at different points in time, appear more important than others for the purposes of competitive accumulation – and, therefore, more attractive to selective state support.

In this regard, three possibilities can be conceived. The first possibility is that in which particular sectors stand out for their potential to make a significant direct contribution to increase domestic value added on a sustained basis. The sectors in which this potential is greater are often designated as being of 'high value' or of high value added (Reinert 1995). Typically, these are typically characterised by greater innovativeness, displaying a relatively high intensity of research and development (R&D) activities, a high potential for market growth, and significant economies of scale (Reinert 1995, 2020; Pérez 2001). These are sectors where neither has market growth already been exhausted nor has the economic value they generate been eroded by intensified competition among different producers – predicaments which are typically associated with more mature and declining sectors. Therefore, they constitute important sites of capital accumulation in their own right at a particular moment in time. In this light, state actors may feel compelled to use industrial policy as a way to selectively attract and develop these sectors at a relatively early stage by global standards, thus capturing and benefiting domestically from their most dynamic periods of capital accumulation and sustained periods of value generation before they reach maturity and eventually start to decline.

Not only is the manifestation of these 'high-value' characteristics in a particular sector likely to be momentary, but also the specific sectors that exhibit these characteristics are likely to change over time. For instance, when Friedrich List was writing *The national system of political economy* (1909 [1841]: 145), those characteristics could perhaps be associated with 'cotton, woollen, and linen manufactories', but today they are more likely to be associated with sectors such as 'intelligent robotics' (Thurbon and Weiss 2021), which did not even exist at the time of List's writings. So, 'high-value' industries can be regarded as a sort of relatively infant industries of their own specific historical time by global standards – not in the neomercantilist sense of the infant industry argument, according to which these industries would fail to develop domestically without selective state intervention (although the competitive accumulation imperative *does* make it likely that their development will benefit from state intervention in one way or another), nor in some purely scientific or technological sense of being 'frontier industries' (Thurbon and Weiss 2021), but rather in the economic sense that there still are significant opportunities for technical innovations, market growth potential, and economies of scale ahead of them. Thus, to state actors faced with the competitive accumulation imperative, such (historically specific) 'high-value' industrial sectors appear charged with an inherent allure, which, in turn, makes them prime candidates for selective state support.

A second, though not mutually exclusive, possibility is that certain sectors may stand out to policymakers, first and foremost, for their potential to make an important indirect contribution to the total value added that is generated domestically by upgrading the value added of other, already existing sectors or stimulating the creation of new sectors entirely. This value-enabling potential is conveyed by the concepts of 'linkage effects' and 'general purpose technologies'. In the literature on economic development and industrial policy, the concept of 'linkages' and 'linkage effects' is mostly associated with the work of the economist Albert Hirschman (1958). The concept is based on the simple observation that one industry's output often is another industry's input. Any given sector is related through backward linkages to those other sectors that supply the inputs it requires and, provided it does not only sell final consumers goods, also through forward linkages to those other sectors which, in turn, use its outputs as their inputs. From this simple observation, however, follows the possibility that the development of a single sector may, by itself, produce dynamic, systemic effects. Namely, it may 'induce attempts to supply through domestic production the inputs needed in that activity' and 'to utilize its outputs as inputs in some new activities' (Hirschman 1958: 100). A similar effect is induced by the industries that produce 'general purpose

technologies' (Lipsey, Carlaw and Bekar 2005). These are defined as technologies which are characterised by having a wide variety of uses and, accordingly, a great potential to spill over and 'create opportunities for profitable investments' in other sectors and technologies as well, thus generating a ripple effect across the whole economy (2005: 98).

Finally, there is a third possibility. Although industrial policy is typically a forward-looking modality of intervention whose effects are expected to manifest in the long term, it can also appear to policymakers as the ideal tool to respond to localised emergencies that threaten to have widespread consequences across the domestic economy. For, besides the dynamic 'linkage effects' that a sector with multiple and strong linkages to other sectors may induce, there are also static, although similarly systemic, implications which result from these patterns of cross-sectoral interdependencies. The number and the strength of the economic linkages of one sector to other sectors that comprise the domestic economy endows that one sector, and the firms operating therein, with a certain degree of *leverage* over the state. In such cases, that sector can be said to acquire *infrastructural* characteristics. If, for some reason, that sector experiences difficulties, policymakers are compelled to lend it selective and temporary support in order to avoid systemic disruptions to supply chains that would affect vast segments of the domestic economy, potentially threatening to cause an economic crisis. The automotive industry is often portrayed as a typical example of an industrial sector which, owing to its multiple and strong backward and forward linkages with a range of other sectors (including chemicals, construction, electronics, oil, and steel, among others), often appears as a prime candidate for emergency state support (Paterson 2000, 2007; Mattioli et al. 2020).

The concept of 'leverage', conveying a form of immanent power which operates from the individual or sectoral level onto the general or systemic level, is employed by political economist Martijn Konings (2018a, 2018b) to make sense of the puzzle of state-backed bank bailouts in the aftermath of the 2008 financial crisis which 'provoked an extraordinary degree of anger' but, at the same time, still appeared as 'entirely necessary' (2018b: 206), thus reflecting 'an absence of meaningful choice' (2018a: 30). The immanent logic of leverage is that when a given social entity (which, for Konings, is the banking system in general and large banks in particular but, for the purposes of industrial policy, can be an individual industrial sector or an individual industrial firm) becomes 'a critical hub of connections' (2018b: 206), namely through the static input-output effects of its economic linkages which enable but also threaten value generation elsewhere, it 'insinuates [itself] into the way others comprehend their own conditions of reproduction' (2018a: 16). Hence, state actors are

structurally compelled to give selective support to sectors or firms that emerge as central nodes in dense networks of domestic economic relationships.

But it is not only states that become directly invested in the reproduction of these 'critical hubs of connections'. Other sectors and businesses find themselves invested in their reproduction too. Thus, these economic linkages also leverage certain patterns of agency from business representatives. Namely, they enable, and increase the likelihood of, active exercises of coalition-building among firms in other sectors whose own reproduction is dependent on the reproduction of the sectors and firms with which they are linked. Consequently, the reproduction of the sectors with multiple and strong linkages becomes a shared interest of those other sectors which generate value by supplying them inputs or utilising their outputs. A business alliance can, thus, be formed on the basis of this common interest, and this may, in turn, act as a platform through which the general importance of an individual sector is more directly and vocally expressed to policymakers, thus further bolstering that individual sector's claim to selective state support. So, not only do these infrastructural sectors appear to policymakers as structurally important, they are also more likely to be able to enlist a broad constituency of other businesses to actively lobby state actors on their behalf.

Whereas the competitive accumulation imperative impels state actors to ponder which sectors might be sufficiently high-value and/or value-enabling (or, in an emergency, infrastructural) to be worth supporting selectively, the legitimation imperative elicits a different range of considerations. It impels policymakers to identify sectors which need to be selectively supported in order to achieve specific social objectives which are not reducible to value generation or capital accumulation and whose attainment is politically important to ensure the continued popular legitimation of incumbent state actors. Within this category may be placed interventions more akin to those advocated by the new progressive approach to industrial policy with its explicit focus on using selective state intervention to address societal challenges (see Chapter 2). This can involve, for example, selectively supporting the development of the necessary research and manufacturing capacities in the pharmaceutical sector to produce accessible medicines and, thereby, improve public health outcomes (Mazzucato 2021: Chapter 5). A different example of the use of industrial policy for legitimation ends would be that of giving support to failing sectors or firms to safeguard jobs otherwise threatened by imminent bankruptcy of globally unviable domestic businesses (Moraitis 2020; Copley and Moraitis 2021). The legitimation imperative may equally compel state actors to use industrial policy to mitigate intra-national regional disparities by

discriminating in favour of industrial sectors or firms based in poorer regions, something which is usually associated with the agenda of 'levelling up' and the concept of 'left behind places' (Berry 2021b; Martin, Sunley and Gardiner 2021; Tomaney and Pike 2021).

Hence, to situate the practice of industrial policy in its structural context is to appreciate how the imperatives of competitive accumulation and legitimation compel state actors to use industrial policy differently and produce tendencies for selective state support to be awarded to different types of sectors. In general, the competitive accumulation imperative will compel state actors to prioritise sectors which are high-value and/or value-enabling for selective state support, whereas the legitimation imperative will compel state actors to use industrial policy when that enables them to accomplish other social objectives, protect social welfare, or mitigate social inequities. However, whether (relatively autonomous) policymakers will *actually* use industrial policy to achieve either of these ends in any specific occasion remains necessarily an open question that can only be addressed empirically.

3.3 Relative autonomy, ideas, and the participation of business actors

The impact of the structural forces (namely, the imperatives of competitive accumulation and legitimation) on the conduct of policymakers is always mediated by the legal and operational autonomy they enjoy and by their own ability to act consciously and with intentionality (i.e., deploying agency) within that institutional context of relative autonomy. This means that while reducing the decisions of state actors to ideological 'illusions' or a belief in 'bad theory' is arguably to venture too far into a voluntaristic and idealist conception of the state, placing industrial policy in structural context does not rule out the possibility that state actors – *qua* conscious and intentional agents acting in a position of relative autonomy – might decide against the use of industrial policy on ideological grounds (see, e.g., Johnson 1984; Graham 1992; Campbell 1998; Hopewell 2017). After all, as shown in Chapter 2, the very notion of industrial policy evokes a long debate in the history of economic ideas over the merits of selective modalities of state intervention. So, state actors may have, and act upon, their own ideas about the merits of state intervention in the form industrial policy too. However, there is no reason to assume that these ideas will be always stable, entirely coherent, or very strong (Clift 2020). Neither is there any reason to assume that state actors are merely the intellectual 'slaves' of Friedrich List or Friedrich Hayek or some other theorist, despite John Maynard Keynes's famous dictum about economic ideas, 'practical men', and 'defunct economists' (Keynes 2018 [1936]: 340).

Similarly, to situate industrial policy in context – and, more specifically, in the context of the competitive accumulation imperative – is not to deny agency to concrete business representatives nor the possibility that they may attempt to interact directly with state actors. On the contrary, it is to understand the conditions under which this agency is enabled and exercised. For example, as mentioned above, a situation where close economic linkages exist creates favourable conditions to leverage the creation of *ad hoc* alliances centred on a shared interest in the reproduction of those linkages. Businesses across a range of sectors whose ability to generate value may at some point be compromised by developments which are peculiar to one sector may decide to come together to actively lobby state actors to give selective support that one sector. In addition to these *ad hoc* business alliances, business interest associations also exist as more stable institutional forms that serve to collectively represent the interests of certain sectors or groups of sectors (Van Apeldoorn 2000; Farnsworth 2004). These direct agential attempts by business representatives to affect the decisions of state actors can be considered 'subsidiary' causal mechanisms since they are grounded in a structural context (of competitive accumulation and legitimation) on which their chances of success necessarily depend (Block 1977: 14; see also Woll 2019). Moreover, in the same way that it partially separates state actors from the structural pressure exerted by the imperatives of competitive accumulation and legitimation, the relative – legal and operational – autonomy of the state also shields state actors from the lobbying offensives of particular business coalitions (Jessop 2002). So, the actual success of the latter is never a foregone conclusion.

Yet, in the case of industrial policy, a form of interaction between state actors and business representatives which assumes special importance is the direct participation of business representatives in specialised policy committees which may provide input into, as well as feedback on, industrial policy decisions. Indeed, as shown in Chapter 2, developmentalist scholars placed significant emphasis on the ability of state bureaucrats to embed themselves within business communities, while preserving their operational autonomy to discipline the direct recipients of state support, as a way to mitigate the problem of ignorance they faced when picking the most promising sectors to benefit from selective state support. The task of identifying, as early as possible, sectors with high-value and/or value-enabling properties involves a substantial and irreducible degree of uncertainty (Levy, Miura and Park 2006; Yeung 2016; Thurbon and Weiss 2021). Therefore, the use of industrial policy for the purposes of satisfying the competitive accumulation imperative always includes an inescapable element of speculation.

Against this background of uncertainty, specialised policy committees where state actors and business representatives meet emerge as potentially mutually beneficial institutional devices. The benefit of these committees to state actors is that there they may gather information about the business prospects of different industries and technologies to inform their industrial policy decisions. In return, business representatives get the chance to directly participate in the policy process and, therein, act as spokespeople for the development of those industries and technologies which might interest them the most, while simultaneously shielding themselves from some of the uncertainty they too would face in case they had to invest in their development alone. It is important to emphasise here that the existence of these specialised policy committees does not contradict the proposition about the relative autonomy of the state. While business representatives with a seat in these specialised policy committees do get an opportunity to contribute with their own ideas to the definition of a selective choice set of industrial policy priorities, the authority to legally enforce any set of priorities and to operationally translate it into concrete industrial policy measures that offer selective state support to this or that sector still lies with state actors.

The mutual benefits that industrial policy committees bring to state actors and business representatives alike can be expected to give rise to a correlation: industrial policy measures taken by state actors are likely to be accompanied by the creation of specialised policy committees where individual businesses or business groups are directly represented. When such a correlation is observed empirically, it might be tempting to immediately establish a causal relationship as well: concrete industrial policy measures (that benefit this or that sector) would be the effect and the direct participation of (this or that sector's) business representatives in specialised policy committees would be the cause. To be sure, the direct participation of business representatives in policy committees can indeed be *causal* in the sense that actual outcomes would presumably be different in its absence. However, to be consistent with the conceptualisation of the capitalist state elaborated in this chapter, an analysis of these events would require *both* tracing the moments of agency that connect them *and* situating them in their structural context, not least the competitive accumulation imperative which compels state actors to chase and prioritise high-value and/or value-enabling sectors (and, thus, set up specialised policy committees with business representatives in the first place). From this perspective, specialised policy committees are functional, but not structural, to industrial policy measures.

To summarise, the last two sections have explored the implications of the three state theory propositions that had been previously outlined – namely, the competitive

accumulation imperative, the legitimation imperative, and the relative autonomy of the state – to the specific case of state intervention in the form of industrial policy. It has been argued that each of the structural imperatives faced by state actors pushes them to use industrial policy differently and to prioritise different types of sectors for selective state support. On the one hand, the imperative of competitive accumulation generates a tendency for state actors to prioritise sectors which display high-value and/or value-enabling characteristics. On the other hand, the imperative of legitimation compels state actors to use industrial policy to prioritise sectors which can fulfil broader social objectives, contribute to protect social welfare (namely as a source of employment and income), or mitigate social inequities (such as regional imbalances). The actual effects of these tendencies are, however, always mediated by the relative autonomy of the state and the (situated, but irreducible) agency of state actors, which may or may not have their own ideas about the merits of selective modalities of state intervention. Besides, it has been shown how business representatives may also attempt to actively influence industrial policy decisions, either through the formation of *ad hoc* business alliances centred around a particular node of a dense network of economic linkages or through direct participation in specialised policy committees that state actors may set up in order to mitigate the uncertainty that necessarily pervades the exercise of identifying high-value and/or value-enabling sectors. This set of propositions outlines a basic theoretical framework for an approach to the empirical study of industrial policy practice that can avoid the two opposite extremes of empiricist voluntarism and structural determinism. The next two sections complement this theoretical framework by exploring, in turn, two additional dimensions which are fundamental to make sense of the contemporary context of industrial policy practice. These are: the inter-referentiality of industrial policy action and the carbon neutrality imperative.

3.4 Inter-referentiality and multiplier effects

Drawing on state theory, one of the core propositions of this chapter so far has been that the capitalist state needs to be placed against the domestic context of popular support on which its political legitimacy rests but also the global context of capitalist relations of production and exchange on which its financial viability depends. This latter *global* dimension, which is captured by the imperative of competitive accumulation, implies that the decisions of national state actors cannot be understood in terms of domestic factors and developments alone. Instead, there is a dynamic interaction between the decisions of national policymakers and events which may happen elsewhere in the global economy – not least because, as argued

above, the viability of domestic economic activity is measured in relation to price, productivity, and profitability standards which emerge in the world market. Yet, something which has not been explicitly specified so far is that among these events which take place elsewhere in the global economy, one may include the policy decisions made by other national states. Once this is recognised, it becomes clear that the decisions of state actors in one country are not entirely independent of the decisions made by state actors in another country.

In the specific case of state action in the modality of industrial policy, this means that the decisions by national state actors to provide this much selective state support to this or that sector are often in some way related to industrial policy decisions made by the national authorities of other countries. Besides, an increase in industrial policy activity in one country or region can itself be expected to stimulate some sort of response in the form of industrial policy activity in another country or region. Therefore, the reinvigoration of industrial policy in any one particular place may be the local, interactive response to a reinvigoration of industrial policy elsewhere. This theoretical proposition carries with it a clear methodological implication too: the study of concrete instances of industrial policy practice in one particular national jurisdiction cannot completely ignore synchronous industrial policy practices in other national jurisdictions. The latter form part of the global structural context on which the former needs to be situated. Indeed, if anything, this methodological implication only becomes more relevant against the background of an apparent return of industrial policy across different spaces of the world economy.

The global 'inter-referentiality' of state action, not least when it comes to industrial policy action, is central to the recent work of Ilias Alami, Adam D. Dixon, and colleagues on 'the new state capitalism' (Alami and Dixon 2021; Alami et al. 2022). As noted in the Introduction (Chapter 1), the empirical notion of 'the new state capitalism' employed by these scholars has many affinities and overlaps with that of a return of industrial policy, although it is a more expansive concept: it encompasses *both* the resurgence of 'muscular forms of statism', such as industrial policy, *and* the proliferation of 'state-capital hybrids', such as sovereign wealth funds, state-owned enterprises, and state-owned promotional banks (Alami and Dixon 2021: 7). For this group of scholars, 'the new state capitalism' must be understood as 'a relational phenomenon' that exhibits an endogenous 'multiplier effect' (Alami and Dixon 2021: 22; Alami et al. 2022: 12). By this they mean that there is a tendency for state capitalism to beget state capitalism. Hence, even though the geographical diffusion of state capitalist practices cannot be treated as an automatic or deterministic sequence of

events that completely bypasses the agency of domestic actors, the development of state capitalist practices in one space of the world economy has the potential for 'producing further expansion in state prerogatives' elsewhere (2021: 22).

While the empirical focus of these scholars is on the broader category of 'the new state capitalism', a similar reasoning may be applied to the more circumscribed sub-case of resurgent industrial policy practice. More specifically, two main types of multiplier effects can be anticipated. First, the reinvigoration of industrial policy in one country or region may be transmitted to other countries or regions through the competitive accumulation imperative, amplifying its signal and spurring direct inter-state rivalry and confrontation. This roughly corresponds to what Alami and Dixon (2021: 22) call the multiplier effect of 'competitive emulation'. Second, the experience of industrial policy in certain countries, if perceived as having been particularly successful (for example, that of East Asian developmental states), may inspire state actors elsewhere to copy and adopt similar practices domestically (see, e.g., Fourie 2014; Behuria 2018). This, in turn, corresponds to what Alami and Dixon (2021: 22) call the multiplier effect of 'mimetic behaviour'. Thus, to reiterate, situating concrete industrial policy practices in their structural context also entails acknowledging the inter-referentiality of industrial policy action across different spaces of the world economy and, accordingly, the multiplier effects this can generate as the actions of one state have the potential to stimulate (competitively) and/or inspire (mimetically) the actions of another.

3.5 Climate change and the carbon neutrality imperative

Besides the inter-referentiality of industrial policy action, a theoretical framework for the analysis of contemporary industrial policy practices must necessarily accommodate the increasingly salient issue of climate change too. The growing severity of the ecological consequences of climate change has shone an intense light on the ecological conditions required for socio-economic reproduction, as well as the negative impact that a mode of socio-economic reproduction which is heavily reliant on burning fossil fuels has on those ecological conditions. Accordingly, the question of what to do about the rising concentration of greenhouse gases (such as carbon dioxide and methane) in the Earth's atmosphere has become a central, inescapable topic in contemporary politics and an increasingly important locus of state action in recent years (Fraser 2021). And state intervention in the form of industrial policy has not remained immune to these wider shifts towards 'greener' politics.

Indeed, the notion of 'green industrial policy' has been gaining prominence in both academic and policymaking circles (Rodrik 2014; Allan, Lewis and Oatley 2021; Meckling 2021).

The context of climate politics, especially since the Paris Agreement, which was adopted in 2015, has been increasingly marked by the urgent need to achieve carbon neutrality globally by the middle of the 21st century (Paterson 2021). This international treaty enshrined the objective of keeping the average increase in global temperature between 1.5 ºC and 2 ºC relative to historical pre-industrial levels so as to avoid the most damaging effects of climate change, which are expected to be triggered above these tipping points. Effectively, keeping global warming below 2 ºC entails bringing the atmospheric concentration of greenhouse gases to a definitive halt. And this requires that each state gradually but consistently reduces their annual greenhouse gas emissions and ultimately reaches and remains at net zero annual emissions from around 2050 onwards. So, as the world approaches the year 2050, state actors around the globe are increasingly subject to a new structural, though diffuse, imperative which they had never faced before: the carbon neutrality imperative.

Admittedly, in contrast to the competitive accumulation and the legitimation imperatives, this new carbon neutrality imperative is much more diffuse because the decisions that contribute to cause climate change and the harmful consequences that result from it are not localised in the same space. Thus, collective action problems often plague international coordination efforts to tackle climate change. For example, signatory states' nationally determined contributions with regard to planned reductions of greenhouse gas emissions have been consistently found to fall short of the reduction rates effectively required to fulfil the objective of the Paris Agreement (Hickel and Kallis 2020; Intergovernmental Panel on Climate Change 2022). Furthermore, the fragility of carbon neutrality imperative was eloquently revealed by the withdrawal of the US from the Paris Agreement decided by the Trump Administration, even though this was later reversed following the election of President Joe Biden. So, rather than the direct and isolated expression of a legal text, the effects of the carbon neutrality imperative for state action, in general, and industrial policy, in particular, are better understood in conjunction with the imperatives of competitive accumulation and legitimation (see also Paterson 2010).

The term 'green industrial policy' is typically used to designate a subtype of industrial policy that specifically supports the development of 'green technologies' (Rodrik 2014; Allan, Lewis and Oatley 2021). That is, 'green industrial policy' involves the provision of selective state support to the domestic development of technologies whose deployment is expected

to contribute to the decarbonisation of the economy and society. These include technologies which can replace the use of fossil fuels in domains such as mobility or heavy industry, thus reducing emissions directly, as well as technologies which do not replace fossil fuel use directly but that capture and store emissions resulting from their use (on which, see, e.g., Hickel and Kallis 2020). The widespread dissemination of these green technologies is, therefore, essential to render economic sectors and social practices which currently still require fossil fuel use compatible with the imperative of carbon neutrality. In the absence of green technologies, either those economic sectors and associated social practices would have to be abandoned altogether to achieve carbon neutrality or the latter objective would have to be sacrificed in order to preserve the former sectors and practices.

Hence, the adoption of 'green industrial policy' by state actors may be understood as the result of the interaction between the carbon neutrality and the competitive accumulation imperatives. The more carbon neutrality becomes accepted as a global objective, the more it can be argued that green technologies start to display high-value and value-enabling characteristics, thus standing out as sectors that policymakers are compelled to prioritise to address the imperative of competitive accumulation. First, since the attainment of carbon neutrality globally requires that these technologies be adopted everywhere around the world in just a few decades, the growth potential of the global market for relatively nascent green technologies is very significant. Second, specific green technologies might be essential to ensure the continued reproduction of already existing domestic industries in a context of carbon neutrality. Because of these linkages, supporting the development of green technologies is, to policymakers, also a way of enabling continued value generation in those other domestic industries by allowing them to upgrade their processes and product to meet the requirements of decarbonisation. Moreover, as argued before, in addition to attracting the selective gaze of policymakers, these economic linkages may also prompt business representatives from these industries to mobilise in support of selective state interventions that support the development of the green technologies they require.

Whereas the interaction between the carbon neutrality and the competitive accumulation imperatives can be expected to compel state actors to prioritise certain sectors (namely, green technologies) for industrial policy action, the interaction between the carbon neutrality and the legitimation imperatives can, on the other hand, be expected to also discourage state actors from giving selective state support to certain sectors whose development is seen as inimical to the objective of carbon neutrality, such as the oil and gas sector. There is a growing link between carbon neutrality and legitimation. This is well

illustrated by the recent multiplication of social movements and the growth of political activism related to the climate and ecology, more broadly – from multiple Green New Deal platforms to Climate Justice movements to the Fridays for Future school strikes to Extinction Rebellion, in addition to *ad hoc* anti-pipeline protests and fossil fuel divestment campaigns (Pettifor 2020; Strauch, Dordi and Carter 2020; Fraser 2021; Malm 2021; Paterson 2021). As the average global temperature continues to rise and extreme weather events become even more frequent, the interaction between carbon neutrality and legitimation can be expected to become even stronger too, thus raising the legitimacy costs of industrial policy practices that are perceived go against the objective of carbon neutrality.

3.6 Concluding remarks

This chapter has outlined an original theoretical framework that helps to situate industrial policy practice. This framework offers both a conceptual language for analysis and theoretically informed guide into the potential sources of change in industrial policy action. It does not in any way deny the agency of specific state actors or business actors nor the openness of social events, but it contextualises that agency by acknowledging a range of contextual factors that may influence, though never pre-determine, industrial policy practice.

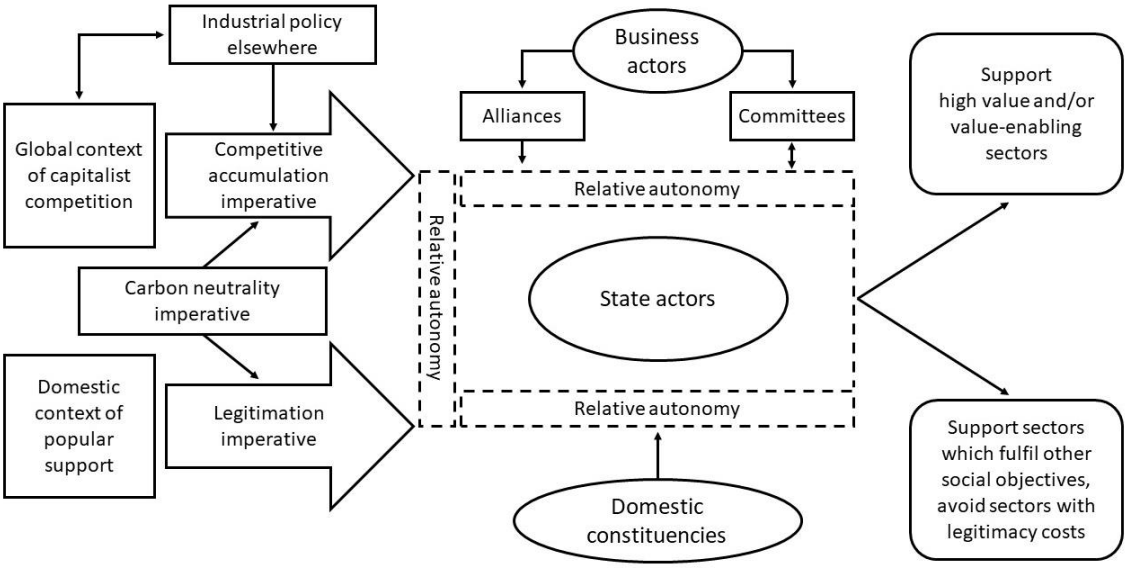
To recapitulate, the starting point in the development of this theoretical framework was placing the state simultaneously in the global context of capitalist competition and the domestic context of popular support. This, in turn, enabled the identification of two structural imperatives that act upon the capitalist state. On the one hand, the competitive accumulation imperative, which generates a tendency for states actors to adopt measures that may to secure internationally competitive conditions of profitability for the continued accumulation of globally mobile capital to occur domestically. On the other hand, the legitimation imperative, which generates a tendency for state actors to adopt measures that may help them secure domestic popular support. While these imperatives act as structural forces, their actual effects are always mediated by the relative autonomy of the state, which allows state actors some degree of situated agency. So, these imperatives do not determine how state actors ultimately behave, although they influence the expected benefits and costs associated with different courses of action.

This is the basic structural context against which the practice of industrial policy by states takes place too. Industrial policy can be used by state actors to address the imperatives of competitive accumulation and legitimation. However, each of these imperatives can be associated with different industrial policy practices since each of them can be expected to

compel state actors to prioritise different types of sectors to benefit from selective state support. While the competitive accumulation imperative will compel state actors to prioritise sectors with high-value and/or value-enabling characteristics, the legitimation imperative will compel state actors to direct selective state support to sectors which may be failing or unviable by world market standards but whose reproduction, nonetheless, serves to fulfil other social objectives, contribute to protect social welfare, or mitigate social inequities. However, to situate industrial policy practice in the structural context of competitive accumulation and legitimation does not rule out the capacity of relatively autonomous state actors to act consciously and intentionally on the basis of their own economic ideas. This means, for example, that state actors may indeed, in specific occasions, decide against industrial policy action on ideological grounds too. Furthermore, business actors can also be expected to attempt to influence concrete instances of industrial policy practice, either through the formation of *ad hoc* business alliances centred around specific sectors or through direct participation in industrial policy committees set up by state actors to speculatively identify sectors with the greatest high-value and/or value-enabling potential.

Importantly, however, this structural context is not static, but dynamic – and, therefore, so too is the practice of industrial policy. It is dynamic because, first, the sectors that may exhibit high-value and/or value-enabling characteristics change over time through successive waves of technological innovation and competition. Second, there is inter-referentiality, and thus potential multiplier effects, among the industrial policy practices of different spaces of the world economy. The reinvigoration of industrial policy in one space has the potential to spur (competitively) and/or inspire (mimetically) industrial policy in another. Synchronous practices of industrial policy adopted elsewhere are, therefore, part of the global context against which industrial policy decisions are made by domestic state actors. Finally, new events and developments may arise and, in conjunction with the imperatives of competitive accumulation and legitimation, compel state actors to pursue new courses of action, namely new industrial policy practices which prioritise certain sectors and eschew others. The most prominent example of a development of this kind is climate change and the associated imperative of carbon neutrality, enshrined in the 2015 Paris Agreement, which reinforces the position of green technologies as sectoral priorities for industrial policy practice. In sum, dynamic changes in contextual factors induce changes in the practice of industrial policy as well, whether in intensity or in terms of its sectoral priorities.

Figure 1. Theorising industrial policy practice



To conclude, the theoretical framework which has been outlined throughout this chapter is schematically represented in Figure 1. In order to develop this framework, which is expected to help clarify and explain instances of industrial policy practice and change, this chapter has been mostly dedicated to the tasks of identifying, exploring, and combining a series of theoretical propositions. Therefore, the discussion has remained relatively abstract so far. However, because this thesis is specifically concerned with the empirical study of recent industrial policy change in the EU, this theoretical framework must now be adapted to the specificities of this concrete pluri-national case. This is the main task of the following chapter.

4 Industrial policy practice and state aid control in the EU

When political economists write about industrial policy and the EU, the latter appears, first and foremost, as an example of a supranational constraint on the former. This is mostly owing to the competition rules of the EU single market and, more specifically, the control of state aid by the European Commission which sets legal limits on what and how much individual member states can do to selectively support the development of specific industries with direct subsidies. In effect, the ability of each national government to respond to changes in the global context of capitalist competition or in the domestic context of popular support with industrial policy measures is conditioned by their membership of the EU. So, insofar as a tension exists, theoretically, between industrial policy practice and state aid control, there has also been a tension, historically, between industrial policy and European integration. This makes the EU – and the institutional domain of EU state aid control, in particular – an especially relevant site where to study the apparent return of industrial policy.

Building upon the theoretical framework developed in the previous chapter, this chapter lays the theoretical and methodological groundwork for the empirical study of industrial policy change in the EU. It is organised as follows. The next section outlines the conventional understanding of the conflictual relationship between European integration and industrial policy that can be found in the literature on the political economy of the EU and unpacks this understanding with a clarification of the legal concept of 'state aid' and brief historical overview of developments in this domain. Section 4.2 traces the links between this understanding of the EU as a supranational constraint on industrial policy and descriptions of the EU as an entirely and coherently neoliberal entity and, in problematising the latter notion, justifies the narrow empirical focus on the delimited institutional field of EU state aid control. Then, Section 4.3 adapts the theoretical framework developed in Chapter 3 to the concrete analysis of industrial policy change via change in EU state aid control by bringing it into dialogue with more established approaches to the study of European integration and its unique intricacies. In so doing, it clarifies the political economy approach to the study of the EU followed in this thesis. Section 4.4 derives a series of methodological implications from the preceding section's theoretical elaborations and reflects on the practical aspects of data collection for empirical research. Section 4.5 concludes.

4.1 The EU as a supranational constraint on industrial policy

How may the relationship between the EU and industrial policy be characterised? Political economists often describe the relationship between European integration and industrial policy as a conflictual one. And this conflict is attributed, first and foremost, to the competition rules of the European single market and to link between these rules (or, perhaps, the way in which they are enforced by the European Commission) and neoliberal policy recommendations (see, e.g., Rosamond 2002, 2012b; Buch-Hansen and Wigger 2010, 2011; Clift 2013; Thatcher 2013). Thus, when the EU is featured in discussions on industrial policy, it is typically as an example of a *supranational constraint* on national industrial policy practice.

Karl Aiginger and Dani Rodrik refer to a 'tension' between industrial policy and competition policy in the EU – these two policies, they claim, 'are often in tension or viewed as such' (2020: 190, 192). Ben Clift (2013) argues that the practice of state aid control in the EU reflects a 'clash of capitalisms' in which the European Commission's neoliberal inclination, which prioritises the enforcement of market competition above other considerations, has emerged victorious over neomercantilist alternatives and their attendant emphasis on creating spaces for the industrial policy interventionism. Linda Nyberg (2017: 19) contends that the enforcement of state aid control by the European Commission is meant to turn EU member states into 'neoliberal subjects that will act in ways that do not distort competition'. Indeed, even outside of the geographically delimited study of the political economy of European integration and governance, EU state aid control is regularly invoked by scholars of political economy as a typical example of the international laws and institutions of neoliberal globalisation which have limited the room for manoeuvre available to national governments to implement discretionary economic policies (see, e.g., Davies 2013; Copley and Moraitis 2021) – what Stephen Gill (1995, 1998) has famously dubbed 'new constitutionalism'.

In this light, therefore, the EU would seem a particularly unlikely place for any return of industrial policy to occur for the EU appears in the literature as a *supranational constraint* on industrial policy *through* (a neoliberal approach to the enforcement of) state aid control. Yet, to unpack this claim about the nature of the relationship between the EU and industrial policy, it is important to clarify the meaning of certain key concepts, such as 'state aid', and the history of state aid control and competition regulation in the process of European integration.

The supranational regulation of competition has been a central feature of European integration from the very beginning (McGowan and Wilks 1995). The two are historically

intertwined, and both can be traced back to the same legal texts. Namely, the 1951 Treaty of Paris which established the European Coal and Steel Community and, especially, the 1957 Treaty of Rome which then gave rise to the European Economic Community. In fact, the legal prohibition of state aid on which the control of state aid by the European Commission is based and which can nowadays be found in Article 107(1) of the TFEU has been present in EU treaties since the 1957 Treaty of Rome, where it could be found as Article 92(1). This article states that:

> Save as otherwise provided in the Treaties, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market.

Importantly, unlike the concept of 'industrial policy', whose definition is a methodological prerogative and responsibility of the researcher, the term 'state aid' has, within the EU, a legal definition from which the researcher cannot escape – even though the latter is not completely immune to ambiguity either (European Commission 2016). In this regard, state aid and industrial policy are imperfect synonyms. On the one hand, state aid is not circumscribed to industry. State subsidies attributed to banks, for example, also count as state aid. On the other hand, industrial policy may also involve selective regulatory interventions, whereas state aid is strictly fiscal. Nonetheless, there are also clear and very important overlaps between the concept of industrial policy, especially in the narrow definition adopted in this thesis (see Section 2.1), and the legal concept of state aid. Namely, to qualify as state aid, a state subsidy – whether in the form of a grant, a subsidised loan, a guarantee, or a tax break – needs to be selective ('favouring certain undertakings or the production of certain goods') and to affect what would otherwise have been the outcomes of market competition ('which distorts or threatens to distort competition', 'in so far as it affects trade between Member States').

Admittedly, given these overlaps between the concepts of state aid and industrial policy, some degree of tension or contradiction can, already by definition, be expected to exist between the notion of state aid *control* and that of industrial policy *practice*. In any case, however, the two are not necessarily incompatible nor mutually exclusive – not least because, while paragraph 1 of Article 107, cited above, bans the provision of state aid which might 'distort competition' and 'affect trade', paragraphs 2 and 3 of the same Article immediately identify a series of possible exemptions from the general prohibition (see also Davies 2013; Thatcher 2013). Admittedly, some of these exceptions have little to do with industrial policy

– for example, 'aid having a social character, granted to individual consumers' or 'aid to make good the damage caused by natural disasters or exceptional occurrences'. But, in other cases, the link is much stronger. For example, 'aid to facilitate the development of certain economic activities or of certain economic areas' may be considered exempted from the general prohibition provided 'such aid does not adversely affect trading conditions to an extent contrary to the common interest' (TFEU Article 107(3) (c)). So, even in strictly legal terms, these possible exemptions, inscribed on state aid rules since the 1957 Treaty of Rome, already allowed member states some latitude to continue to adopt industrial policy measures and disburse aid.

Thus, neither the conflictual relationship between European integration and industrial policy practice nor the affinity between state aid control and neoliberal ideology are presented in the literature as wholly congenital. Instead, they are presented as something that developed and became more pronounced over time – especially from the 1980s onwards, in tandem with advent and consolidation of neoliberal globalisation, more broadly. The historical evolution of EU competition policy and state aid control, and especially their neoliberalisation from the 1980s, have been documented by several scholars, although the most comprehensive political economy analysis of these historical transformations in EU competition has been offered by Hubert Buch-Hansen and Angela Wigger (2010, 2011; see also Wigger 2008; Wigger and Buch-Hansen 2012, 2014). Surveying more than fifty years of EU competition policy, Buch-Hansen and Wigger identify a clear discontinuity between how competition policy had been enforced in the first three decades of European integration and how it came to be enforced from the mid-1980s onwards. They argue that it was only after the 1980s that a neoliberal discourse finally began to dominate this policy domain with the rise to prominence of a new vision privileging 'competition only', above all other economic and social considerations.

According to the historical reading found in the literature, the neoliberalisation of EU competition policy marked the end of a three-decade period during which competition law was only laxly enforced by the European Commission and largely subordinated to the industrial policy agendas of EU member states. During that initial period, the link between EU competition policy and neoliberal ideas about the merits of market competition and the dangers of industrial policy was not so self-evident. On the contrary, the European Commission had been generally tolerant of anti-competitive practices and 'cautious in exercising its extensive powers over member state aid' (Aydin 2014: 141). It 'was very reluctant to interfere with national industrial policies', 'largely ignore[d] the aid granted', and,

therefore, left state aid control 'virtually unenforced' in practice (Buch-Hansen and Wigger 2011: 67-69). So, for the first three decades of European integration, competition policy and state aid control did not impose a very significant constraint on member states' ability to implement industrial policy measures and their connection with neoliberalism was tenuous (Thatcher 2013). This only began to change with the deepening of the European integration project following the 1986 Single European Act which aimed to create a truly 'single market' among European nations (Smith 2005; Buch-Hansen and Wigger 2010, 2011; Thatcher 2013; Aydin 2014).

Even though it did not involve a drastic revision of the original competition and state aid rules which had already been enshrined in supranational law since the Treaty of Rome, the neoliberalisation of EU competition policy represented a shift in how existing rules came to be enforced. From the mid-1980s onwards, the European Commission – or, more specifically, DG COMP (also known as DG Competition), which is the unit responsible for handling EU competition policy inside the European Commission – became increasingly active in the enforcement of competition rules, especially in relation to the prosecution of cartels and the elimination of state aid (Buch-Hansen and Wigger 2010, 2011). In regard to state aid control, DG COMP began to enforce more systematically the obligation that member states notify it before implementing any policy measures that involve the provision of state aid. The planned subsidies could only be disbursed after receiving the approval from DG COMP, which would assess their potential effects on competition and trade among member states. And any aid which would be given without having received this prior approval would be deemed illegal and would have to be recovered from the beneficiary firms (Buch-Hansen and Wigger 2011; Kassim and Lyons 2013; Aydin 2014). Gradually, DG COMP also began to specify in greater detail, through the publication of 'frameworks', the conditions under which certain aid measures would actually qualify for the possible exemptions already contemplated in state aid rules, thus reducing the room for discretionary readings of those exemptions (Blauberger 2009; Doleys 2013; Wigger and Buch-Hansen 2012).

So, as the control of state aid was tightened by the 'neoliberal hardliners' that staffed and led DG COMP (Buch-Hansen and Wigger 2010; 2011: 94; Wigger and Buch-Hansen 2014: 121), the practice of industrial policy by national governments became increasingly 'marginalized or excluded as illegitimate' (Thatcher 2013: 179) or, at best, began to require a higher degree of 'creative compliance' to circumvent this supranational constraint (Lindstrom 2021). Overall, the neoliberalisation of EU state aid control is shown to have

coincided with a gradual decline in the amount of state aid provided by EU member states in percentage of gross domestic product (GDP), from around 2% or 3% in the 1980s to 1% in the 1990s and just 0.5% in the mid-2000s (Aydin 2014; Wigger and Buch-Hansen 2014).

Admittedly, not all scholars who write about EU state aid control would similarly characterise this institutional domain as a neoliberal one or as a purely constraining factor. This applies especially outside of political economy circles, among political scientists and EU law scholars. For example, besides not using the terms 'liberal' or 'neoliberal' at all, Michael Blauberger (2009) argues that through the complex combination of a general ban on state aid, a series of potential exemptions from that ban contemplated by the treaty clauses, and a collection of state aid frameworks which specify under which conditions certain aid measures may or may not qualify for one of those exemptions, EU state aid control certainly does impose limits on state aid but also projects a positive vision of what may constitute 'good' state aid (that is, subsidies which, by observing the stipulations of the state aid frameworks, qualify for an exemption from the ban) – though a likely counterargument from scholars who emphasise the neoliberalisation of state aid control since the mid-1980s would be that the stipulations of those frameworks are so restrictive that, in practice, very few aid measures may actually fit within the boundaries of that positive vision (see, e.g., Buch-Hansen and Wigger 2011). So, on the one hand, and to be clear, the diagnosis of a neoliberal(ised) and very restrictive EU state aid control is not unanimous among all scholars (see also Medve-Bálint and Šćepanović 2020). However, on the other hand, and to reiterate, the claim that through a(n increasingly) neoliberal approach to the enforcement of state aid control the EU has come to constitute a supranational constraint on industrial policy practice is, as shown throughout this section, still very well established in the literature, especially among political economists who are interested in the study of the EU and of 'new constitutionalism' and neoliberal globalisation too.

4.2 European integration, neoliberalisation, and counterexamples

Claims about the neoliberalisation of state aid control and competition from the mid-1980s are not isolated assessments. On the contrary, they echo a vast body of literature about the wider trajectory of neoliberalisation of the whole supranational economic governance framework and policy orientation of the European integration project since the mid-1980s (Van Apeldoorn 2000; Sandbeck and Schneider 2014; Ryner and Cafruny 2017; Van Apeldoorn and Horn 2018). Other developments often associated in the literature with this neoliberalisation process are the centralisation of monetary policy decisions in a new

independent monetary authority, the European Central Bank, and the definition of a new set of fiscal rules that limited the budgetary space available to national government to pursue expansionary fiscal policies (Gill 1998; Sandbeck and Schneider 2014; Ryner and Cafruny 2017; Van Apeldoorn and Horn 2018), the continued removal of barriers to competition and sectoral liberalisation, namely in infrastructure and services (Hay 2012), and, on the external front, attempts to reduce regulatory and other nontariff barriers to competition beyond the geographical boundaries of the European single market through the negotiation of bilateral free trade agreements with non-EU countries (Siles-Brügge 2011, 2014).

Moreover, while the onset of the euro crisis in the early 2010s might have exposed the flawed institutional design of the European monetary union and its consequent vulnerabilities (De Grauwe 2013; Flassbeck and Lapavitsas 2015), the crisis response at the EU level was broadly in line with these pre-existing neoliberalisation trends, thus only consolidating them even further in the framework of supranational economic governance. The European Commission and EU member states mainly responded to the crisis by drawing on a neoliberal policy repertoire of fiscal discipline and labour cost deflation. This was particular evident in the case of those member states (namely, Cyprus, Greece, Ireland, and Portugal) that implemented country-specific austerity programmes as part of the bailout packages they negotiated with the 'troika' – that is, the European Commission, the European Central Bank, and the IMF (Parker and Tsarouhas 2018). However, this sort of crisis response was not circumscribed to these countries alone. There was a wider turn to fiscal austerity which was reflected in the tightening of existing fiscal rules in the EU. A significant moment in this regard was the agreement of the 2012 Fiscal Compact, an intergovernmental treaty signed by most EU member states which established a new legally-binding balanced budget rule and foresaw the introduction of automatic correction mechanisms which should be triggered in case national governments failed to comply with that rule (Bulmer and Joseph 2016; Bruff and Wöhl 2016). And while fiscal discipline became the standard response to fiscal imbalances, an agenda of 'internal devaluation', consisting of wage repression and labour market reforms with the aim of deflating unit labour costs, became the standard response to the macroeconomic imbalances experienced by member states (Wigger 2019a, 2019b).

In this light, the neoliberalisation of EU competition policy and state aid control that has placed a constraint on industrial policy practice appears as one element of a wider neoliberal turn in the process of European integration – though, arguably, an important one to apprehend the wider turn given the absolute centrality of the concept of competition to

neoliberal thought. In fact, from this stylised account of three decades of European integration from the mid-1980s to the mid-2010s, it 'might be tempting' to conclude that the EU has morphed into a fully coherent neoliberal project (Bulmer and Joseph 2016: 735). However, this is not entirely the case. Indeed, one does not need to dig very deep to find counterexamples which sit uncomfortably with the depiction of a fully neoliberal(ising) EU and which pose a challenge to the overall descriptive neatness of such claims. For example, as some scholars note, the provision of subsidies to farmers under the Common Agricultural Policy represents an obvious protectionist deviation from neoliberal principles of market competition and free trade (Grant 2012; Rosamond 2012b; Bulmer and Joseph 2016). Similarly, the infrastructure financing and promotional banking activities of the European Investment Bank (EIB) constitute another important counterexample to the proposition of a wholly neoliberal approach to supranational economic governance in the EU (Griffith-Jones and Tyson 2013; Mertens and Thiemann 2019).

Surely, if the EU cannot be reduced to an entirely coherent neoliberal project, then it may be argued that the neoliberalisation of EU competition and state aid control need not have posed such a significant constraint on industrial policy practice in the EU provided this had been offset by the concomitant development of new mechanisms for supranational industrial policy. In this scenario, rather than having simply been supranationally constrained, industrial policy practice would have been transferred to a supranational level and become a site of 'supranational economic patriotism' (Clift and Woll 2012a, 2012b; Clift 2019), involving 'liberalization within the EU for the sake of protection towards the outside' (2012a: 309). That is, the tightening of state aid control would have been combined with the development of supranational forms of industrial policy practice. According to some scholars, this is an hypothetical scenario that never really materialised – the practice of industrial policy remained a national competence subject to a supranational constraint (see, e.g., Rosamond 2012b; Clift 2013). Still, it must be acknowledged that, although they might not necessarily display the strong sectoral selectivity that defines industrial policy interventions, there have indeed been some compensatory mechanisms at the supranational level for the constraints imposed on member states by EU state aid control. Among these compensatory mechanisms are precisely some of the lending activities of the EIB – which, besides financing regional infrastructure projects, also makes loans to industrial firms for private investment projects (Griffith-Jones and Tyson 2013; Mertens and Thiemann 2019),

as well as the EU's own supranational R&D programmes, which usually comprise around 7% or 8% of the EU budget[2].

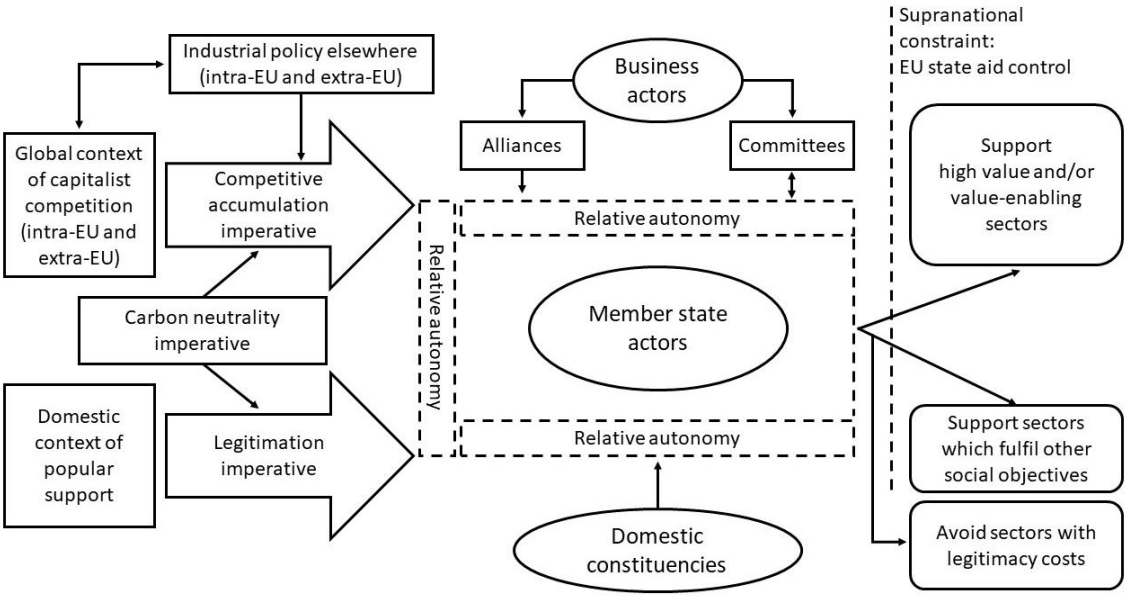
These are important, and typically overlooked, caveats to an oversimplified reading of the neoliberalisation of the European integration process and to definitive statements about the impossibility of a supranational industrial policy practice in the EU. Moreover, these caveats only make a narrow empirical focus on the institutional domain of EU state aid control even more suited for an exploratory investigation of the return of industrial policy in the EU – for it is in this domain, and not in general across all supranational policy domains, that claims about the conflictual relationship between European integration and industrial policy practice have always been most compelling (though, admittedly, not unanimous either). And, therefore, it is in this domain that evidence of a return of industrial policy would be especially puzzling and challenging to those claims. In other words, if evidence of a return of industrial policy could be found in the domain of EU state aid control, this finding would be particularly strong – since it would apply only *a fortiori* across other supranational policy domains where claims about that conflict may never have been as persuasive. Therefore, this evidence would clearly demand from the literature on the political economy of the EU a re-evaluation of the relationship between European integration and industrial policy.

4.3 The political economy of industrial policy and state aid control

The theoretical framework outlined in the previous chapter aimed to situate the practice of industrial policy by state actors in a broader context of competitive accumulation and domestic legitimation. However, it did not make any reference to the existence of supranational constraints on the agency of domestic state actors. So, in order to be applied to the concrete case of EU member states (that is, at the *member* state level), that theoretical framework would need to better reflect this specific institutional setting of EU state aid control and the attendant constraints it imposes on industrial policy. Thus, a slightly modified framework is schematically represented in Figure 2.

[2] https://ec.europa.eu/info/strategy/eu-budget_en (accessed: 27 October 2022).

Figure 2. Theorising industrial policy practice at the EU member state level



When moving from an abstract nation-state (as was the case in Chapter 3) to the much more specific case of an *EU member state*, two aspects merit special emphasis. And these are reflected in Figure 2. First, it should be noted that the competitive pressures each member state experiences can emanate from both outside the EU (i.e., 'extra-EU') and other member states (i.e., 'intra-EU'). Second, the supranational constraint on national action needs to be acknowledged. Admittedly, there are no constraints on state actors' ability to *avoid* supporting sectors with legitimacy costs. So, visually, this legitimation-derived course of action needs to be separated from the prioritisation of sectors that fulfil other social objectives and moved away from the line signalling the constraint. But, otherwise, the ability of each member state's relatively autonomous state actors to respond to competitive or legitimation pressures with industrial policy measures is supranationally constrained by (a neoliberal approach to the enforcement of) EU state aid control. Crucially, because of the possible exemptions contemplated in the treaty clauses on state aid control, industrial policy measures are not completely ruled out from the outset – hence, the dashed, as opposed to solid, line representing the supranational constraint. Yet, to be implemented, they need to secure a favourable assessment from DG COMP about whether they can qualify for one of those exemptions and, thus, can be considered compatible with the preservation of competition and trade within the EU single market. Faced with this supranational constraint, member states may, in theory, respond in a variety of ways. They may more or less reluctantly accept the limits it places on their industrial policy activities, but they may also adopt strategies of 'creative compliance' (Lindstrom 2021) or, more fundamentally, mobilise to change the way

DG COMP enforces EU competition policy so that this constraint is effectively relaxed (Smith 2005).

Although it is crucial to acknowledge that the practice of industrial policy by EU member states is marked by the presence of a supranational constraint, the possibility of change, however incremental or partial, should not be entirely excluded either. In the same way that the neoliberalisation of state aid control occurred only over time, a shift away from neoliberalisation is also a historical possibility. For instance, in the immediate aftermath of the 2008 financial crisis, the enforcement of state aid control was relaxed. The European Commission allowed member states to offer emergency subsidies, first, to bail out banks and, later, to keep non-financial firms afloat too (Davies 2013; Kassim and Lyons 2013; Wigger and Buch-Hansen 2014). This sparked some speculation regarding whether that crisis had effectively marked the end of the neoliberal era, at least in the field of state aid control. On the one hand, Ben Clift (2013) entertained the possibility that the post-crisis emergency bailouts could herald a turning point in the 'clash of capitalisms' that underpins the political economy of state aid control. The 'tolerant attitude' displayed by the Commission in that situation signalled '[t]he retreat of neo-liberal ebullience' inside that institution and could pave the way for some sort of reinvigoration of industrial policy in the EU (2013: 107, 115). On the other hand, Angela Wigger and Hubert Buch-Hansen (2012; 2014: 114) dismissed the 'apparent leniency' of the European Commission in relation to post-crisis emergency subsidies as a mere momentary blip in an otherwise unaffected trajectory of neoliberalisation in EU state aid control and competition policy. Arguably, while there is no reason why moments of economic crisis in whatever scale or shape should be expected to automatically lead to policy change, neither may neoliberal(ising) continuity always be regarded as a foregone conclusion. Yet, it is important to develop a theoretical grasp of how this kind of change may occur in the domain of state aid control.

Without a doubt, this is a complex task. If the study of change in national industrial policy practice in any given country would already require, as outlined in Chapter 3, appreciating context as well as agency, structural imperatives as well as relative autonomy, and policy ideas as well as interactions among different actors, then shifting the level of analysis to the EU more widely entails, in addition to all of this, also acknowledging the distinctive features of this supranational polity. The EU is not a single, unified state nor a federation. But it is not simply an international organisation or forum either. On the one hand, the EU consists of a large and heterogenous group of sovereign nation-states. But, on the other hand, it also features a unique set of supranational institutions with legal authority

over a range of policy areas. So, to study industrial policy change via change in the domain of EU state aid control, the theoretical framework developed in Chapter 3 and revisited in the previous section, needs to be brought into dialogue with more established theoretical approaches to the study of internal developments in the EU and the specificities of European integration – namely, intergovernmentalism, neofunctionalism, and neo-Gramscian political economy – so it can be coherently scaled up to the EU level.

The EU has not only been the object of study across many disciplines of the social sciences, but also warranted the development of a dedicated, multidisciplinary field of EU studies (Rosamond 2007; Lavery and Schmid 2021). On the whole, the two standard approaches to the study of the EU and the process of European integration have been intergovernmentalism and neofunctionalism. These two approaches disagree over the level at which the drivers of integration and change within the EU should be located. For intergovernmentalists (see, e.g., Moravcsik 1993), it is within each member state's domestic setting that preferences regarding the scale and scope of integration to be pursued are formed. These domestic preferences, in turn, inform the stance adopted by the respective national government in intergovernmental negotiations. And, ultimately, the actual form of integration at any point in time results from these negotiations and only depends on the relative bargaining power of each state therein. So, within the theoretical framework of intergovernmentalism, European integration is solely the product of decisions made by national governments in accordance with domestic preferences. In contrast, for neofunctionalists, the integration process can '[take] on a life of its own' above and beyond the net effect of aggregate domestic preferences (George 2004: 108). The drive towards integration is, in this case, often attributed to a self-reinforcing logic – a spillover effect which spreads from one policy area to another as each stage of partial integration creates functional pressures and incentives to take integration further (Rosamond 2005; Bulmer and Joseph 2016). In addition, neofunctionalist scholarship also tends to highlight the consequential role of actors other than member states' governments in shaping integration and political developments in the EU. Thus, the main actor in many of these neofunctionalist accounts is the European Commission – often acting in coalition with other subnational or transnational (networks of) actors too (George 2004; Diez and Wiener 2009).

Still, both intergovernmentalism and neofunctionalism can be characterised by a similarly narrow focus, first, on the 'internal dynamics' of the EU exclusively (Lavery and Schmid 2021) and, second, on the institutional and legal 'form' assumed by European integration (Van Apeldoorn 2000; Van Apeldoorn and Horn 2018). The narrow focus on

internal dynamics implies that the evolving global context against which developments in the EU take place is often ignored and its causal relevance downplayed (Lavery and Schmid 2021), while the narrow focus on the institutional and legal forms of European integration implies that its politico-economic 'content' or policy orientation is overlooked (Van Apeldoorn 2000; Van Apeldoorn and Horn 2018) and, by extension, that changes in this regard are unlikely to be deemed empirical puzzles worthy of investigation. In this light, neither intergovernmentalism not neofunctionalism seem to offer an adequate EU-scale complement to the theoretical framework outlined in Chapter 3, given how the latter seeks to situate industrial policy practice also in the global context of capitalist competition – which is something that, by definition, transcends the boundaries of the EU. Furthermore, this thesis is motivated by an appreciation of the tension between the apparent return of industrial policy and neoliberalism as well as an interest in investigating the possibility of a return of industrial policy in an institutional field that, in the light of the literature, could be expected to prevent or, at least, limit it – and this clearly presupposes an awareness of, and emphasis on, the politico-economic 'content' of the EU as well.

An alternative to this doubly narrow focus of the traditional canon of EU studies and integration theory can be found in political economy. In contrast to intergovernmentalism and neofunctionalism, political economy approaches to the study of the EU can be generically characterised by an interest in capturing and analysing shifts in the policy orientation of the EU as a supranational site of economic policy-making and by an explicit attempt to 'uncover the deep connections between' these internal shifts and wider transformations in global capitalism (Van Apeldoorn 2000, 2002; Buch-Hansen and Wigger 2011; Ryner and Cafruny 2017; Van Apeldoorn and Horn 2018: 5; Lavery and Schmid 2021). So, in this regard, there is a much closer alignment between political economy perspectives and the generic theoretical framework for the analysis of industrial policy developed in Chapter 3. However, there are also some differences that result from the fact that the dominant political economy approach to the study of the EU is associated with neo-Gramscian International Political Economy (IPE), whereas this thesis used state theory as the starting point to build its own theoretical framework. To clarify the approach adopted here, it is worth signposting these differences.

Broadly, in neo-Gramscian IPE, policy change is conceptualised as the historical outcome of a struggle between different social forces or classes. Each of these social forces is equipped with a rival political project or discourse from which rival policy recommendations can be derived. This is not, however, social struggle devoid of social

agents. In order to be actively present in the struggle and, thus, have some degree of influence over changes in policy orientation, each of these social forces or classes needs to be represented by a concrete actor or coalition of actors. Thus, applying a neo-Gramscian IPE lens to the study of the EU, usually involves outlining a series of rival discourses with links to rival political economy traditions and alternative implications for policy practice in different domains. These can be, for example, a 'neoliberal discourse', a 'neomercantilist discourse', and a 'social-democratic' or 'centre-left discourse' (see, e.g., Van Apeldoorn 2000, 2002; Buch-Hansen and Wigger 2010, 2011). Then, it also involves identifying the concrete actors who, in representation of underlying social forces, act as the advocates of these rival discourses – and this can be, for example, trans-European business elite networks or trans-European business interest associations which, formally representing the managers of transnational corporations operating across the EU as a unified class, act as advocates of a neoliberal discourse to promote the neoliberalisation of different aspects of policy-making at the EU level or, perhaps, a neomercantilist discourse to promote the adoption of more protectionist measures (again, see, e.g., Van Apeldoorn 2000, 2002; Buch-Hansen and Wigger 2010, 2011).

A first limitation of this approach, therefore, is that it often presupposes a high degree of ideological and discursive coherence so that different actors, both individual and collective, can be intelligibly classified on the basis of the political project to which they subscribe. In order for policy change to be the result of an active contest between rival political projects, the commitment of each participating actor to a given political project needs to be both consistent and stable. Relevant actors are expected to espouse either a neoliberal project or a neomercantilist project or a centre-left project. For this reason, approaches founded on neo-Gramscian IPE are less accommodative of the possibility that actors may more pragmatically or opportunistically combine different ideational elements from alternative projects since the result would presumably not constitute a coherent political project in its own right. By contrast, the political economy approach followed in this thesis deliberately attempts to avoid the strong requirement of ideological coherence around particular rival projects or discourses. This also applies when discussing the ideas held by state actors, which need not always cohere into a fully delineated or stable political project. For, as already argued when outlining the basic elements for a theoretical framework in Chapter 3, appreciating the policy ideas of state actors – and, indeed, of other actors as well – should not require treating those actors as the intellectual 'slaves' of any 'defunct economist' (see also Best 2020; Clift 2020).

Another shortcoming of approaches to the study of the EU founded on neo-Gramscian IPE which is often highlighted in the literature is their tendency to downplay the national dimension of European integration – that is, the tendency to downplay the extent to which political developments within the EU are also shaped by the active role of national governments, by changes that take place in their respective national contexts, and by inter-member state relations (Bulmer and Joseph 2016; Ryner and Cafruny 2017). Instead, neo-Gramscian accounts of policy continuity and change in the EU usually place a much greater emphasis on the interactions that take place at the supranational level between transnational actors and the European Commission. However, this may be an empirical result which follows from their greater analytical interest in the supranational dimension and deliberate decision to investigate it than any commitment to an ontological assumption or theoretical proposition that prevents neo-Gramscian scholars from appreciating the role of member states and national developments altogether. For example, Buch-Hansen and Wigger (2010) largely attribute the neoliberalisation of EU competition policy from the mid-1980s to a 'public-private alliance' formed between, on the one hand, the European Commission's DG COMP and, on the other hand, trans-European business interest associations, such as the European Round Table of Industrialists (ERT) and Business Europe (previously known as the *Union des Industries de la Communauté Européenne* [UNICE]). But the role of national governments is not something that they reject from the outset. On the contrary, they explicitly claim that '[t]he relation between states and supranational institutions' and 'the famous supranationalist-intergovernmentalist dichotomy' is a question that 'can only be answered empirically' (Buch-Hansen and Wigger 2011: 25). The political economy approach to the study of the EU followed in this thesis agrees that this a question that only be solved empirically on a case-by-case basis rather than assumed way or settled theoretically once and for all. Although empirical research on the EU may face practical trade-offs in terms of focus, ideally the acknowledgement of the role of supranational and transnational actors in shaping developments in the EU should not have to come at the expense of recognising the role of national governments too.

Arguably, a major downside of potentially overemphasising the supranational level of analysis is that this may prevent a fuller appreciation of the socioeconomic differences that exist between member states and, accordingly, of the inter-member state distributional tensions and conflicts to which shifts in the orientation of the EU in different policy domains may give rise. As illustrated in Figure 2 above, state actors in each member state can be conceptualised as being faced with structural imperatives of competitive accumulation and

legitimation. But this shared predicament should not be conflated with homogeneity of national experiences and situations. In addition to the differences which necessarily exist across member states regarding the respective domestic contexts from which national state actors must seek popular support, socioeconomic heterogeneity among them means that different member states are also differently integrated into, and thus unevenly affected by, changes in the global context of capitalist competition.

Besides, from the perspective of each member state, developments that take place in other member states – including, for example, an intensification of industrial policy action – form part of the global competitive context they face individually. That is, EU member states find themselves in competition not only with non-EU nation-states, but also with each other (Strange 1998). This condition of intra-EU competition alone, not to mention the possibility of ideological disagreements as well, already suggests that even though all EU member states are in some degree constrained in their national industrial policy practices by EU state aid control, changes to EU state aid control can still be source of disagreement and contestation among member states. For, insofar as EU countries differ in terms of their fiscal capacity or their productive structures, it is likely that the opportunities for industrial policy practice which would be opened up by a relaxation of state aid control would also be unevenly distributed across member states. Therefore, changes in EU state aid control are not devoid of potential intra-EU redistributive consequences and, therefore, should not be assumed to be immune to distributional tensions and conflicts along national lines either.

Admittedly, at least as long as they fall short of a more fundamental revision of EU treaties or require the adoption of supporting legislation, changes in the way state aid control is conducted are not something which national governments can negotiate among themselves nor something that is subject to a vote among member states in the Council of the EU. Instead, the enforcement of state aid control is, first and foremost, a formal competence and responsibility of the European Commission. However, from a political economy perspective, it would be inadequate to regard the legal and operational autonomy that the Commission enjoys in this domain as a form of absolute autonomy. For that would be to conceptualise the European Commission as an actor that exists in total isolation, removed from any social context. And, manifestly, the Commission does not operate in isolation. Therefore, its autonomy can only be regarded as *relative*. Ultimately, the position of the European Commission as a 'governing agent' of the EU (Rosamond 2012a: 55; 2012b: 334) is contingent upon the delegated authority it obtains from member states and even the very reproduction of the EU as an integrated polity – whose apparent irreversibility was

emphatically disproved by the departure of the UK. So, even in domains where it enjoys significant legal and operational autonomy, the Commission cannot overwhelmingly nor persistently ignore the preferences and concerns of national governments, not least as regards the constraints that its enforcement of state aid control might place on national governments' ability to respond to the imperatives of competitive accumulation and legitimation each of them faces.

Within the European Commission, DG COMP is the administrative unit in charge of enforcing state aid control. It does so on behalf of the Commission as a whole and under the leadership of the Commissioner for Competition. The main activities of DG COMP in relation to state aid control include *i)* assessing member states' planned aid measures prior to their implementation, *ii)* investigating possible cases of infringement of the rules and proposing remedial action, such as the recovery of aid which it finds to be illegal, and *iii)* drafting state aid 'frameworks' or 'guidelines' which specify under which conditions certain aid measures may be considered to fall within the scope of the exemptions contemplated in Article 107 of the TFEU. However, even at a strictly legal and operational level, DG COMP does not have full control over the enforcement of state aid control. First, because DG COMP cannot issue formal decisions. Ultimately, its assessments, the conclusions of its investigations, and its state aid 'frameworks' need to be agreed on and adopted at the level of the College of Commissioners where all 27 Commissioners have a seat. Second, because, even after they are adopted by the Commission, the rulings on specific cases may be appealed to the Court of Justice of the EU, where they can be annulled.

The distribution of responsibilities between DG COMP, which carries out the day-to-day work of state aid control, and the College of Commissioners which formally adopts decisions in the name of the European Commission are a reminder that, even in well delimited areas of EU policy, the European Commission is a plural actor. The multiple DGs which constitute the bureaucratic infrastructure of the Commission have different competences and areas of responsibility and report to different Commissioners. Yet, despite this internal division of labour, some issues may be relevant to more than one DG. Industrial policy is definitely a case in point. It is relevant to DG COMP and the Commissioner for Competition because of its overlap with the concept of state aid. But it can also be relevant, for example, to the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs[3] (DG GROW) or the Directorate-General for Research and Innovation (DG RTD) and the respective Commissioners to which these DGs report. Therefore, the possibility of

[3] Small and medium-sized enterprises (SMEs).

consequential disagreements within the Commission between different DGs or Commissioners over such issues also needs to be analytically accommodated rather than assumed away.

So, to recapitulate, the study of industrial policy change via change in EU state aid control demands that the theoretical framework outlined in Chapter 3 be combined with an appreciation of the specificities of this institutional field. Only then can the analysis be shifted from an abstract nation-state to the concrete and pluri-national EU. From the outset, there are two dimensions that need to be considered: the national dimension (or, perhaps more appropriately, dimensions) and the supranational dimension. Neither of these dimensions should be deemed reducible to the other. As regards the national dimension(s), and in order to preserve the foundational theoretical framework founded in state theory, the starting point must be the proposition that, within each EU member state, state actors are faced with structural imperatives of competitive accumulation and legitimation, which may nowadays be more or less entangled with the relatively novel imperative of carbon neutrality too (see Figure 2). To the extent that EU state aid control places a constraint on their ability to use industrial policy to respond to these structural imperatives, national governments may be expected to be compelled to oppose this constraint. However, heterogeneity and competitive pressures among member states can also be expected to generate disagreements and distributional tensions about whether and how state aid control might be relaxed. Moreover, while the interactions among member states inside take place against a common extra-EU context, each member state experiences this context, and any changes therein, differently.

In the supranational dimension, the European Commission needs to be identified as a crucial actor. It enjoys operational and legal autonomy over the enforcement of state aid control, including the publication of state aid frameworks that specify under which conditions certain aid measures can be considered to qualify for the exemptions to state aid prohibition contemplated in the TFEU. Still, the autonomy of the European Commission is not absolute but only relative. It cannot completely nor persistently ignore member states' preferences and concerns, not least those that stem from the structural imperatives of competitive accumulation and legitimation. Furthermore, while DG COMP is the unit more directly in charge of enforcing state aid control, other units may also have a stake in the topic of industrial policy. Therefore, the European Commission itself can become a site of disagreement between different units over the appropriate course of action. Finally, in addition to the Commission (and its different units), another set of relevant actors in the supranational dimension are trans-European business interest associations, such as ERT or

Business Europe, which, as neo-Gramscian approaches have consistently demonstrated, are proactive participants in policy discussions at the EU level.

4.4 Methodological implications and sources of data

To reiterate, this thesis ventures into the domain of EU state aid control and sets out to look for evidence of a 'return' of industrial policy in an institutional field that, in light of the extant academic literature, could be expected to prevent it or, at least, to limit it. Hence, the research carried out for this thesis began with an exploratory empirical question – Can evidence of post-crisis change in industrial policy practice be found in the domain of EU state aid control? After having established with a sufficient degree of confidence that industrial policy change was indeed occurring, the research began to investigate the causes and the consequences of this change. To do so, it peered into the political and bureaucratic lives of EU institutions, collecting primary documents and conducting interviews, while also remaining attentive to other developments in the global context within which these institutions operate, not least industrial policy interventions which could be taking place in other regions of the world economy around the same time.

A series of methodological implications for the concrete analysis of industrial policy practice follow directly from the theoretical framework first outlined in Chapter 3 and then adapted and re-scaled in Section 4.3. At a structural level, the study of change in industrial policy practice should involve *i)* identifying and examining the type of sectoral priorities which have been attracting selective state support, *ii)* finding traces of their connection to the underlying structural imperatives faced by state actors, and *iii)* documenting relevant changes in context which may have affected the ways and the intensity with which those imperatives manifest themselves – including, for example, synchronous industrial policy activity elsewhere. Furthermore, since change in industrial policy practice cannot occur without the exercise of agency either, its study should equally involve identifying active and relevant participants in industrial policy processes. These may include both state and non-state actors (namely, business actors and other constituencies), and, especially in the case of the EU, both national actors (such as national governments) and supranational or transnational actors (for example, the European Commission and trans-European business interest associations). In turn, incorporating these actors' agency into the process of change would entail capturing their views (including their policy ideas), while appreciating variation and diversity in those views – for example, between member states and the European Commission, but also across member states and between different DGs of the European

Commission – and, finally, reconstructing the events in which consequential interactions might have taken place between them.

First, to find evidence of recent industrial policy change in the domain of EU state aid control and, then, to capture both the structural and agential elements of this change, the empirical research conducted for this thesis has relied on data collected from two main types of sources: textual documents and semi-structured (elite and expert) interviews. Methodologically, these two types of sources presuppose a different degree and form of involvement of the researcher in the generation of the data that can be collected from them. The production of the textual documents generally precedes the moment of their collection. Therefore, although the data they contain is amenable to different thematical choices, interpretations, and uses by the researcher (Prior 2016), it is nonetheless produced independently of the researcher (Silverman 2013). This is not the case with interview data. While similarly amenable to different thematical choices, interpretations, and uses, interview data is characterised by the peculiarity that its production and collection occur simultaneously and are inextricable from each other. In contrast to data recorded in textual documents, interview data is interactively co-produced in an unique conversation that takes place between the researcher, as interviewer, and the interviewees (Brinkmann and Kvale 2015; Holstein and Gubrium 2016; Miller and Glassner 2016). Because of their differences, the strategic combination of these two types of sources may serve not only for triangulation purposes but also to yield complementary findings. For example, the quantity and the degree of granularity of the data found in some textual documents would prove impossible to replicate in the context of a single conversation between an interviewer and an interviewee. On the other hand, well targeted interviews can offer an unrivalled opportunity to probe and expand upon the more 'official' views and 'sanitised' accounts of events which are frequently found in policy documents. In particular, interviews can provide the researcher with an entry point into the hidden processes and moments of agency which lie behind the production of those policy documents, including possible disagreements among different participants which could otherwise remain concealed by an outward appearance of internal unity around a single official text.

The majority of the textual documents collected and analysed for this thesis can be classified as EU-scale policy documents. The latter included a variety of documents published by the European Commission, ranging from those which often enjoy a lot of visibility – such as communications, press releases, reports, and speeches by the Commissioners – to other documents which, although publicly available, tend to receive far

less public attention – namely, official texts of Commission decisions on specific state aid cases, meeting minutes of relevant expert groups set up by the Commission, and Commission staff working documents (especially those which chronicle in detail the internal processes of reviewing state aid frameworks). Other EU-scale policy documents collected and analysed for this research included texts which represented the views of member states' national governments. For example, conclusions adopted by the Council, responses sent by member states to public consultations held by the Commission (namely, on the review of state aid frameworks), and relevant open letters written by groups of member states on topics related to industrial policy and competition policy. Finally, policy statements and position papers released by other relevant stakeholders, not least trans-European business interest associations, can also be included in the category of EU-scale policy documents. The analysis of these EU-scale policy documents was complemented by the analysis of other textual documents, such as recent news reports, policy documents of extra-EU national governments (for example, those outlining their own synchronous industrial policy initiatives), and a few academic articles. These were mostly used to provide additional information on relevant changes in the wider context in which the developments reflected and discussed in EU-scale policy documents took place.

One of the limitations associated with studying these developments in almost real time was that the official text of some of the decisions made by the Commission on recent state aid cases of interest had not yet been made publicly available at the time of research. To cleanse these official documents of any confidential business information, there is usually a lag between the announcement of the decision, which is made in a press conference and through a press release, and the publication of the official text of the decision. However, this lag can be long and unpredictable as well. For example, it took one year for the text of a decision on a relevant state aid case which had been made in December 2018 to be made publicly available. And the public version of a decision made on another relevant state aid case in December 2019 was only released in July 2022 – over two and a half years later. For the purposes of the present thesis, this limitation was mitigated by the consideration of alternative sources of data, namely related and already available documents (e.g., the respective press releases from the European Commission which precede the publication of the official decision and summarise its key points) as well as interviews carried out with individuals who were either directly involved in, or at least familiar with, these processes and decisions (e.g., DG COMP officials).

I conducted two rounds of interviews at different stages of the research process. The first round took place during a two-week fieldwork trip to Brussels (8 – 22 February 2020) where most interviews were carried out in person. At the time, the plan was to return to Brussels for another two weeks in May 2020 to conduct a second round of interviews. This plan, however, was severely disrupted by the rapid spread of COVID-19 and by the lockdowns and international travel restrictions that ensued. In addition to making fieldwork impossible, the COVID-19 pandemic also caused delays in the policy developments I was tracking in real time. So, instead of booking online interviews in May 2020, I decided to put interviews on hold for the time being and focus on other aspects of the research, namely collecting and analysing textual documents and conducting further literature review. This decision was motivated by two main reasons. First, it was unclear at the time whether or at least in what form the ongoing industrial policy change in the EU would outlive the pandemic. Second, the pandemic had such a sudden and dramatic effect on personal lives that I felt I should give participants time to adjust to these changes before approaching them for an interview. Therefore, I only resumed interviews over the summer of 2021. And, during this second round, interviews were conducted online exclusively.

Across both rounds, interviews followed a semi-structured format. That is, on the one hand, for each interview there would be an interview guide, prepared in advanced, consisting of a short list of open-ended questions to structure the interview around the topics which I expected to be the most relevant to discuss with that interviewee. These topics – and, therefore, the structuring interview guide – would change depending on the interviewee. For example, the guide for an interview with a DG COMP official would include questions about the internal functioning of DG COMP that the guide for an interview with a member state representative would not. The interview guides were also modified over time to accommodate the need to triangulate data collected from earlier interviews and from textual sources. On the other hand, during the interview itself, interviewees were allowed to explore other themes they felt were not being covered. And, in turn, I would also ask them impromptu follow-up and probing questions.

Interviews were carried out with a twofold aim: *i)* peering into the 'hidden abode' and the internal life of the contemporary industrial policy change in the EU and *ii)* adding greater nuance to the characterisation of the views of different stakeholders and on how they positioned themselves in relation to ongoing developments. To this end, interview guides included two main types of questions: *i)* questions about concrete policy developments, the context in which they were or had been taking place, and the main actors and procedures

involved in them and *ii)* questions about policy ideas, such as the interviewee's opinion on the relative merits of industrial policy practice and competition enforcement as well as the tensions between these two. This second type of questions was meant both to capture the views of the individuals participating in those interviews and to contribute to convey a more general sense of the (uniform or varied) views or positionings which could be attributed to the collective actor they represented, insofar as this could be corroborated by other interviews or textual sources.

To capture as clear a picture as possible of the actual policy processes which lie behind the shift in the relationship between industrial policy and the EU, most interviewees were selected on the basis of their proximity to the policy processes of interest. Some of these interviewees, especially those holding relevant positions within the European Commission (for example, in DG COMP or in DG GROW), were identified using the official directory of the European Union, the 'EU Who is who' website[4]. Another useful resource for identifying potential interviewees, especially those representing member states in these processes, were the lists of participants found in some meeting minutes, although these lists only included the names of participants, never their contacts. In addition to elite interviews with those more closely involved with the policy processes of interest, I also conducted a few expert interviews with external observers who were following these developments and had written about them – for example, in the specialised press or in the publications series of Brussels-based think tanks dedicated to EU affairs. However, the data generated in these expert interviews was mostly used for the purposes of contextualisation or corroboration, and not to make any specific claims about internal processes or to externally attribute certain intentions or motivations to those actually involved in those processes.

All in all, I carried out a total of 21 interviews with 23 interviewees, after having sent by email 49 direct personal interview requests and one request to the contact person of a relevant Commission expert group asking for my invitation for an interview to be extended to all participants in that expert group (namely, the 'Strategic Forum for Important Projects of Common European Interest'). Thus, the final numbers of interviews and interviewees reflect the perceived saturation in the data generated from the interviews but also more practical challenges regarding the identification and recruitment of additional participants in a time-constrained research project. The full list of interviews can be found in Table 1.

[4] https://op.europa.eu/en/web/who-is-who (accessed: 31 May 2022).

Table 1. List of interviews

#	Interviewee(s)	Date	Location
1	European think tank economist	12 February 2020	Online
2	Journalist	12 February 2020	Brussels
3	DG GROW official	13 February 2020	Brussels
4	European Commission staff I European Commission staff II	14 February 2020	Brussels
5	DG COMP official I	14 February 2020	Brussels
6	DG COMP official II	17 February 2020	Brussels
7	DG COMP official III	18 February 2020	Brussels
8	Johan Bjerkem, think tank researcher	19 February 2020	Brussels
9	Business Europe staff	19 February 2020	Brussels
10	Czech official	20 February 2020	Brussels
11	Guido Nelissen, representative of industriAll	20 February 2020	Brussels
12	European Commission staff III	24 February 2020	Online
	///		
13	Strategic Forum member	28 July 2021	Online
14	European Commission official	9 August 2021	Online
15	Representative from small member state	30 August 2021	Online
16	Member of Sherpa Group	30 August 2021	Online
17	Former DG COMP official	7 September 2021	Online
18	Irish official	16 September 2021	Online
19	German official I German official II	17 September 2021	Online
20	Phedon Nicolaides, Professor of European Economic Law, University of Maastricht	29 September 2021	Online
21	French official	29 October 2021	Online

All interviewees were offered the possibility of choosing anonymous aliases that would disclose just enough descriptive information about the roles for which they were being interviewed without revealing their actual names. Alternatively, interviewees could opt out of anonymity and choose to be referred to by their own names. Still, most interviews decided to pick an anonymous alias (20 out of 23). Offering anonymity to interviewees in this way

helped me ensure that interviewees were comfortable about participating in the research and, especially, about having their own words directly quoted throughout the thesis (although, there were a few exceptions – see below). Often, I would indicate to the interviewee one or two possible aliases depending on their job or the role for which they were being interviewed (e.g., 'Representative of organisation A', 'Member state B official', 'DG C official', 'Member of expert group D', etc.). The final decision, however, was always made by the interviewee. And their approaches varied. For example, although most member state representatives agreed to be classified according to nationality (Interviews 10, 18, 19, and 21), there was one member state representative who preferred to anonymise nationality as well and, instead, classify their member state as a 'small member state' (Interview 15). Furthermore, in the case of Commission officials, some agreed to be identified by their respective DG, whereas others preferred not to specify the DG they worked for inside the Commission. When the same generic alias was picked more than once, I numbered them following the chronological order of the interviews (e.g., 'DG COMP official I', 'DG COMP official II', 'DG COMP official III'). Otherwise, I remained faithful to the exact formulation of the interviewee's choice of alias even when this introduced some unnecessary discontinuities. For example, after 'European Commission staff III' (Interview 12), there is no 'European Commission staff IV', although there is a 'European Commission official' (Interview 14). This discontinuity results simply from different interviewees having chosen different terms to refer to themselves. It does not reflect any substantive difference that absolutely warranted a distinction between the term 'staff' and the term 'official'.

As a rule, interviews were recorded using a voice recorder so that their audio content could then be transcribed verbatim for analysis and direct quotation in the thesis. There were only two exceptions to this rule. In one interview I was informed at the beginning that I would not be given permission to use a voice recorder, but only to take notes. On another occasion, even though I had been given permission to use a voice recorder, it seemed likely that the quality of the recording would be compromised by the noisy setting in which that interview was taking place (a café outside of the interviewee's workplace). So, I decided not to record that interview either and only take notes, instead. The other 19 interviews, however, were recorded and then transcribed. There were also two occasions (one of which was the one just mentioned above in which I was not given permission to use a voice recorder) in which the interviewees agreed to be interviewed and to be included in the list of interviews but explicitly objected to any of the material collected during the interview being either directly quoted or even only indirectly mentioned at any point in the thesis. So, none of the

data generated in either of those two interviews is featured in this thesis. Yet, those interviews still contributed to this research, though in more intangible ways, such as by making me more aware of the relevance of certain topics which I then went on to investigate further in subsequent interviews or in textual documents.

4.5 Concluding remarks

This chapter has laid the theoretical and methodological groundwork for an empirical engagement with industrial policy change in EU and, particularly, in the domain of EU state aid control. A review of the political economy literature on EU competition policy offers a brief overview of the history of state aid control in European integration. Although a tension exists, theoretically, between the notions of industrial policy practice and state aid control, the more specific, actually existing tension between these two in the EU is not entirely congenital, but rather something which can be historically situated from the mid-1980s onwards, with the neoliberalisation of state aid control and, indeed, the EU's supranational economic governance, more broadly. The historical neoliberalisation of state aid control has reduced the space for national industrial policies. On this basis, the literature on the political economy of the EU typically portrays the relationship between European integration and industrial policy as a conflictual one: through (a neoliberal approach to the enforcement of) state aid control, the EU appears as a *supranational constraint* on national industrial policy practice. Furthermore, this claim is sometimes combined with a subsidiary one according to which no compensatory mechanisms for this constraint have ever been developed at the supranational level. This second claim may resonate with descriptions of the EU as an entirely and coherently neoliberal entity. But, as argued above, this claim is much more difficult to sustain empirically for, although they might not always exhibit the clear sectoral selectivity that defines industrial policy interventions, some of the lending operations of the EIB and the supranational R&D programmes of the EU budget do, to a greater or lesser extent, compensate for the constraints imposed by state aid control on national industrial policy action. In this light, the delimited institutional domain of EU state aid control stands out as particularly interesting for the study of the apparent return of industrial policy and the tension between the latter and neoliberal ideas, practices, and rules. This is the domain where evidence of a return of industrial policy would be more puzzling, interesting, and consequential for the extant literature.

Thus, in order to develop a political economy approach to the empirical analysis of industrial policy change in the domain of EU state aid control, this chapter has combined

the basic theoretical framework founded already outlined in Chapter 3 with a critical engagement with established approaches to the study of European integration and political developments within the EU, namely intergovernmentalism, neofunctionalism, and neo-Gramscian IPE. Simply put, the main conclusions from this theoretical dialogue were that a political economy analysis of industrial policy change in EU state aid control must *i)* acknowledge the evolving global context against which policy developments in the EU necessarily take place – and, therefore, seek to always situate the latter in the former, *ii)* acknowledge the national dimension(s) of policy developments in the EU – and, thus, be accommodative of the role played by national governments and the significance of inter-member state distributional tensions and conflicts, and *iii)* acknowledge the supranational dimension of policy developments in the EU – and, therefore, be accommodative of the role of supranational and transnational actors such as the European Commission (itself a site of potential disagreement between different DGs) and trans-European business interest associations. It is from this theoretical and methodological standpoint that this thesis now delves into the domain of EU state aid control in search for evidence of a return of industrial policy in an institutional field that, in light of the extant academic literature, could be expected to prevent it or, at least, to limit it.

5 Inventing a new state aid framework, enabling new industrial policy practices

It might have gone largely unnoticed by scholars and commentators at the time. But, in hindsight, the creation by the European Commission of an entirely novel state aid framework dedicated to 'Important Projects of Common European Interest' (henceforth, the IPCEI framework) in 2014 really stands out if one delves into the domain of EU state aid control in search of evidence of a recent return or reinvigoration of industrial policy. The concept of 'important projects of common European interest' had existed in EU state aid rules since the 1957 Treaty of Rome as a potential exception to the general ban on state aid. But it had remained largely non-operational for more than fifty years of state aid control. The 2014 IPCEI framework offered a more precise definition of what kind of projects could qualify as 'important projects of common European interest' and stipulated the conditions under which state aid awarded to such projects could be deemed 'compatible' with the internal market. With the creation of the IPCEI framework, the fifty-seven-year-old treaty clause was finally operational, enabling new industrial policy practices and paving the way for the subsequent emergence of a supranational industrial policy complex.

Thus, this chapter tells, in detail, the story behind the creation of the IPCEI state aid framework in 2014, which was a pivotal moment in an ongoing process of industrial policy change in the EU. A concern with maintaining competitiveness in a context of global competition with other regions for mobile techno-industrial investments is central to, and present throughout, this story. But the institutional process which led to the creation of the IPCEI framework was also punctuated with consequential moments of agency. Indeed, this framework codified a particular understanding of what may constitute an 'important project of common European interest' – namely, a large and technologically innovative industrial project comprising both an R&D stage and an industrial deployment stage – which, in turn, may be clearly traced back to discussions which were already taking place between 2009 and 2011 about investments in so-called 'key enabling technologies', involving different DGs of the European Commission as well as member state officials and industry representatives.

This chapter is organised as follows. Section 5.1 begins by clarifying what state aid 'frameworks' are. Then, Section 5.2 offers an overview of the 2014 IPCEI framework and explains how the novelties it has introduced into the domain of state aid control have expanded the available opportunities for EU member states to engage in industrial policy

action. It also emphasises how the IPCEI framework differs from other state aid frameworks in that it has preceded – and, therefore, has contributed to create – the object that it regulates. The two following sections contextualise and trace the institutional process behind the creation of this novel framework. Section 5.3 focuses on events that were initially external to the process of drafting the frameworks but whose imprint is clearly visible in the 2014 IPCEI framework, while Section 5.4 delves into the internal process of drafting the framework to appreciate the role of other actors besides DG COMP in the creation of this framework. Drawing on original interview data, Section 5.5 elucidates the perspective of DG COMP officials on these developments and on the merits of industrial policy in general. Finally, Section 5.6 concludes this first empirical chapter by summarising the discussion and highlighting the key analytical points that can be extracted from it.

5.1 The role of frameworks in state aid control

Before the IPCEI framework and the process behind its creation can be unpacked and understood, the very concept of a state aid 'framework' should be clarified in greater detail. As already mentioned in the brief historical overview of EU state aid control in Chapter 4, the wording of EU state aid rules, as enshrined in EU treaties since the 1957 Treaty of Rome, has remained virtually untouched for more than six decades of European integration and the occasional revisions of the intergovernmental treaties which underpin it. But the enforcement of these rules has changed significantly over time. For while EU treaties prohibit state aid as a rule, they also immediately outline a list of effective or at least potential exemptions from that general rule. Because, for the most part, these exemptions are only vaguely defined, EU treaties actually offer, *ab initio*, a series of 'normative vacuums' in state aid control (Davies 2013: 44) which never completely precluded the practice of industrial policy by member states.

Consider, for example, 'aid to promote the economic development of areas where the standard of living is abnormally low or where there is serious underemployment' (TFEU 107(3) (a)), or 'aid to promote the execution of an important project of common European interest or to remedy a serious disturbance in the economy of a Member State' (TFEU 107(3) (b)), or even 'aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest' (TFEU 107(3) (c)). According to Article 107(3) of the TFEU, all these forms of aid 'may be' considered to be exempted from the general prohibition of state aid. And yet, there is a double ambiguity at play here. First, the wording

of the clauses sufficiently vague to accommodate a variety of conflicting interpretations as to what constitutes 'certain economic activities', an 'important project', or the 'common interest', etc. Second, even their status as exemptions is itself precarious since these are not straightforwardly exempted but only potentially (i.e., *'may be'*) exempted – and, moreover, the conditions upon which the effective realisation of this potential depends are not specified either. This foundational ambiguity entails that it is not at the level of the rules enshrined in the treaties that change in state aid control takes place, but rather at the level of how the European Commission (and, more specifically, DG COMP) enforces and interprets these rules.

Consequently, it is against this background of foundational ambiguity and at the level of interpretation that the state aid 'frameworks' or 'guidelines' that the European Commission produces and periodically revises need to be understood. State aid frameworks are an interpretative tool at the disposal of the European Commission to enforce state aid control and, indeed, to bring about change therein too. Broadly, these frameworks specify under which conditions certain kinds of aid may qualify for the potential (and vaguely defined) exemptions contemplated in the treaties. Namely, they specify under what treaty clause that aid can be deemed permissible (for example, does it qualify as 107(3) (a), 107(3) (b), or 107(3) (c)?), what types of investment can be subsidised, what percentage of those investments can be covered by public funds, at what point public financing has to stop, or what additional provisions must be put in place to ensure that the subsidy does not to significantly undermine competitive conditions within the European common market. The first framework of this kind was introduced in 1971 and focused exclusively on the textiles and clothing industry. It was then followed by the regional aid guidelines in 1972, the environmental aid guidelines in 1975, and the R&D guidelines in 1986, among others (Blauberger 2009).

These frameworks have been regularly revised and updated over the years in successive rounds of 'state aid reform', such as the 'State Aid Action Plan' in the second half of the 2000s (Commission of the European Communities 2005) or the 'State Aid Modernisation' in the first half of the 2010s (European Commission 2012). In producing these frameworks, the European Commission tightened state aid control and reduced the room for manoeuvre for member states to justify their own industrial policy practices with discretionary readings of the potential exemptions found in EU treaties. Therefore, the creation and development of these state aid frameworks went hand in hand with the neoliberal turn in state aid control reported in the political economy literature. Ultimately,

the evolution of these frameworks over time reflects what types of aid and the conditions under which those types of aid are, as some (e.g., Buch-Hansen and Wigger 2011) would probably say, *tolerated* or, as others (e.g., Blauberger 2009) would perhaps prefer, *encouraged* by the European Commission. Through changes in these frameworks (whether in the form of new frameworks or the revision of existing ones), EU state aid control as an institutionalised policy practice can change over time as well, even in the absence of any changes to its underlying treaty provisions. By extension, the creation or review of these frameworks can add or remove opportunities for EU member states to engage in industrial policy practice.

Therefore, rather than a neutral or anodyne clarification of the rules from a strictly legal point of view, the creation and revision of these state aid frameworks constitute politically consequential events. And, although they have not usually attracted the attention of the political economy scholarship, the actual processes of reform behind the drafting and re-drafting of these state aid frameworks reaffirm their eminently political character too. This applies to long-established state aid frameworks, such as those for research and development and innovation (R&D&I), the environment and energy, and regional development, as well as to the most recently created IPCEI framework.

5.2 The novelty of the 2014 IPCEI state aid framework

Besides being entirely novel and unprecedented, what is also significant about the IPCEI framework in particular is that its creation, unlike that of other state aid frameworks, has clearly *preceded* the object that it regulates. For example, the R&D&I framework did not invent R&D&I activities nor subsidies thereto. Those already existed well before the framework was introduced. The framework, in turn, only specified under which conditions subsidies to investments in R&D&I activities could qualify for the possible exemption contemplated in Article 107(3) (c) – and, conversely, under which conditions it should be deemed unlawful. This is different in the case of the IPCEI framework because neither 'important projects of common European interest' nor the practice of attributing state subsidies to said projects effectively existed before the framework was introduced. Although they had always been present as a latent possibility in Article 107(3) (b), for almost sixty years of competition regulation and state aid control in the EU they just remained 'dormant'[5].

It was only in June 2014 that the IPCEI framework was first introduced into EU state aid control with a communication from the European Commission which established

[5] European Commission official (Interview 14).

the 'Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest' (European Commission 2014c). This new framework was a product of the periodic review of state aid frameworks which took place in the first half of the 2010s under the State Aid Modernisation reform, even though its creation had not been explicitly anticipated by the Commission at the beginning of process in May 2012 (European Commission 2012). On the whole, the IPCEI framework published in 2014 broadly defined 'important projects of common European interest' as those which, in any economic sector, showed the potential to make a significant contribution to 'the Union's objectives', not least with regard to the 'competitiveness of the Union, sustainable growth, addressing societal challenges or value creation across the Union' (2014c: paragraphs 14 and 15). Furthermore, the framework specified that such projects 'must normally involve more than one Member State' and that their 'benefits must not be confined to the financing Member States, but extend to a wide part of the Union' as well (European Commission 2014c: paragraph 16).

In more concrete and practical terms, the IPCEI framework introduced the notion that 'important projects of common European interest' could be large and technologically innovative investment projects comprised of two main stages to which EU member states could provide public financing: first, an R&D&I stage and, crucially, a subsequent stage of 'industrial deployment' to 'allow for the development of a new product or service with high research and innovation content and/or the deployment of a fundamentally innovative production process' (2014c: paragraphs 21 and 22). In this regard, the creation of the IPCEI framework effectively expanded the opportunities for member states' industrial policy practice beyond what was already contemplated in other state aid frameworks in two main ways. First, in relation to the R&D&I framework in particular, it expanded the list of costs of a project that were eligible to be covered by state aid. Namely, the new framework also stipulated the possibility of aid being granted to activities which lay beyond the earlier stages of R&D&I alone and can be found closer to the production and commercialisation stages of new products and services with the explicit reference made to the 'industrial deployment' stage. Second, in contrast to most state aid frameworks in general, it did not impose maximum ceilings for the amount of aid which could be awarded as a percentage of a project's eligible costs. Instead, it stipulated that state aid would be allowed to cover up to 100% of the eligible costs of a project, at least insofar as that aid intensity was deemed necessary to overcome the 'funding gap' faced by the private firms which made investment on that project commercially unviable for them on an individual level.

In sum, the introduction of the IPCEI framework into EU state aid control effectively resulted in a tangible expansion of the possibilities for the practice of industrial policy by EU member states beyond what was already contemplated in other frameworks in terms of both the eligible costs (which now included costs incurred in the 'industrial deployment' stage too) and the aid intensity rates (which now could cover up to 100% of the eligible costs). Still, one aspect in which the IPCEI framework clearly did not differ from those other frameworks was that any aid measures falling within the scope of this framework would still need to go through the standard procedure of prior assessment and approval that all large aid measures need to go through regardless of the framework under which they are being considered. So, under the new IPCEI framework too, before any aid could be awarded from the financing member states to the participating firms, the expected benefits of the project, the necessity and proportionality of the aid in relation to the 'funding gap', and its potential effects on competition within the EU internal market would still have to secure a favourable assessment from DG COMP and, subsequently, the official approval from the European Commission.

Therefore, as also specified in the 2014 IPCEI framework, for each aid measure submitted to the Commission by member states for approval under this framework, DG COMP would 'carry out a balancing test to assess whether the expected positive effects outweigh the possible negative effects' (European Commission 2014c: paragraph 26). This 'balancing test' is the standard methodology of analysis used be DG COMP to assess the 'compatibility' of aid measures with state aid rules and, thus, the preservation of trade and competition within the EU internal market. The reference to positive effects *outweighing* negative effects is perhaps misleading to the extent that it suggests that both the expected benefits of the project and its impacts on competition are quantitatively measured, aggregated, and converted into the same unit of measurement so that the balancing test can arrive at an exact arithmetical conclusion regarding the net positive effect of a given measure (see, e.g., Commission of the European Communities 2009c). In practice, this is not how the balancing test takes place, for not all effects can be quantified or made commensurable. Instead, the balancing test involves the assessment (often qualitative and not just quantitative) and ponderation of the different expected effects of a given aid measure to determine whether the same expected benefits can be achieved with an alternative aid measure that entails fewer effects on market competition[6]. This can happen if, in the alternative aid measure (for the same expected benefits), the amount of aid is smaller or the

[6] Phedon Nicolaides, Professor of European Economic Law, University of Maastricht (Interview 20).

design of the measure itself includes mitigating measures that the beneficiary firms would need to observe or put in place in return for receiving the aid (e.g., the requirement that some of the research results produced during the R&D&I stage of the project be openly disseminated in conferences or through publications (see, e.g., Commission of the European Communities 2009c: 21-22; European Commission 2018d: 96)).

This 'balancing test' demands that extensive information about planned aid measures be collected, shared, and processed among DG COMP, financing member states, and participating firms. For example, according to the 2014 IPCEI framework, member states which intend to have an aid measure approved under this framework are asked to 'provide the Commission with… a comprehensive description of the counterfactual scenario which corresponds to the situation where no aid is awarded' against which the additional benefits resulting from the fact that aid is awarded can be evaluated (European Commission 2014c: paragraph 29). Besides, the financing member states and the participating firms are required to provide the Commission with sufficient financial information for it to be able to determine whether the aid is *necessary* for the project to be taken forward (in the sense that the net present value of the project, in the absence of aid, would be negative and, thus, private firms would face a 'funding gap' for that project) and *proportional* (in the sense that the amount of aid awarded does not exceed what would be necessary to overcome that 'funding gap' and, thus, make the project 'sufficiently profitable') (2014c: paragraphs 30 and 31). And, finally, in order to assess the potential negative effects of the aid measure in terms of 'undue distortions of competition', the 2014 IPCEI framework puts DG COMP in charge of analysing foreseeable impacts 'in the product markets concerned, including up- or downstream markets', as well as on 'the risk of overcapacity' and 'the risk of market foreclosure and dominance' (2014c: paragraphs 42 and 43). So, although the 2014 IPCEI framework did indeed create new opportunities for the practice of industrial policy by EU member states (as regards both eligible costs and aid intensity), aid attributed under the IPCEI framework, like that attributed under any other state aid framework, still needs to be assessed on a case-by-case basis by DG COMP and formally approved by the European Commission before it can be disbursed.

After this overview of the 2014 IPCEI framework, its differences and overlaps with other state aid frameworks, and, therefore, the specific opportunities its introduction into EU state aid control opened up for industrial policy by EU member states, the story behind the creation of this unprecedented framework can begin to be traced and made sense of over the course of the next few sections. Admittedly, because the treaty clause which underlies

this framework is not new, it could in some way be possible to argue that 'the IPCEI was not invented in 2014. It… was already there in the treaties'[7], as a DG GROW official put it in one interview. Yet, as the next sections will show, far from being an automatic or unmediated process which only revealed or clarified what 'was already there' since the 1957 Treaty of Rome, the transposition from treaty clause (TFEU 107(3) (b)) to state aid framework was actually the result of a contingent and interactive process whereby the meaning of 'important projects of common European interest' came to be defined in a particular way rather than other. So, why and how was this hitherto 'dormant'[8] possibility finally turned into a state aid framework in its own right in 2014, then? What was the context, what were the institutional processes, and who were the key actors that influenced, enabled, and participated in the drafting of the framework which expanded opportunities for industrial policy within the EU in novel and unprecedented ways?

5.3 Competitiveness, 'key enabling technologies', and the 'valley of death'

Although the creation of the IPCEI framework was not explicitly part of the review agenda of the State Aid Modernisation reform that began officially in 2012 (European Commission 2012), it was not a spontaneous event taking place in 2014 alone either. On the contrary, early traces of what came to be the IPCEI framework, with its dual emphasis on R&D&I and industrial deployment, could already be found in discussions that were taking shape at the EU level in the aftermath of the 2008-09 financial and economic crisis. However unintendedly at first, ongoing concerns with maintaining global competitiveness at both the level of EU member states and the level of the European Commission were foundational to the process that eventually led to the creation of the IPCEI state aid framework. Five years before the introduction of this framework, when EU member states' representatives met in May 2009 under the Competitiveness Council configuration of the Council of the EU, European economies had just recently experienced one of their worst quarters in terms of economic activity, with price-adjusted GDP falling by more than 5% in the first quarter of 2009 when compared to what had been recorded in the first quarter of 2008[9]. Unsurprisingly, the meeting was marked by 'the need to continue to react promptly to the present economic

[7] DG GROW official (Interview 3).
[8] European Commission official (Interview 14).
[9] Own calculations, using Eurostat data.

recession' (Council of the European Union 2009: 1), but it was not dominated solely by a short-term focus on economic crisis management.

The written conclusions of this meeting express a concern with continually 'preserving and enhancing the competitiveness of European industry and improving the conditions for investment in Europe' in order to avoid what is referred to as a 'production leakage' – that is, the offshoring of industrial investments, facilities, and production to non-EU regions of the world economy (2009: 4). Furthermore, the Competitiveness Council stressed the importance of maintaining 'strong R&D investments in high-tech industries in Europe' and, in this regard, anticipated an initiative by the Commission 'to develop a pro-active policy for enabling high-tech industries' (2009: 5). However, the written conclusions make no direct references to the need to adapt EU state aid control to these competitiveness challenges, let alone to the need to create a new state aid framework specifically for 'important projects of common European interest'. On the contrary, it is stated that state aid rules and competition rules are to be respected in full and 'should be seen as an integral part of a successful, forward-looking industrial policy' rather than a hindrance to it (2009: 5).

The European Commission's initiative on 'enabling high-tech industries' mentioned in the written conclusions of the meeting of the Competitiveness Council arrived in September of the same year with a communication with the title, 'Preparing for our future: Developing a common strategy for key enabling technologies in the EU'. The first paragraph of this document anticipates a scenario of imminent industrial transformations brought about by the development and use of what it calls 'key enabling technologies' (henceforth, KETs) and, accordingly, the concomitant emergence of the imperative for different nations and regions to strive to master these critical technologies of the future in order to secure a leading, or at least a more advantageous, position in the coming industrial transformations:

> The shape and potential of industries worldwide will be transformed over the next 5 to 10 years. New goods and services will be created. A significant part of the goods and services that will be available in the market in 2020 are as yet unknown, but the main driving force behind their development will be the deployment of key enabling technologies… Those nations and regions mastering these technologies will be at the forefront of managing the shift to a low carbon, knowledge-based economy, which is a precondition for ensuring welfare, prosperity and security of its citizens. Hence the deployment of KETs in the EU is not only of strategic importance but is indispensible [sic]. (Commission of the European Communities 2009b)

Hence was born the concept of KETs, which were more specifically defined as being those technologies which are:

> knowledge intensive and associated with high R&D intensity, rapid innovation cycles, high capital expenditure and highly-skilled employment. They enable process, goods and service innovation throughout the economy and are of systemic relevance. They are multidisciplinary, cutting across many technology areas with a trend towards convergence and integration. KETs can assist technology leaders in other fields to capitalise on their research efforts. (Commission of the European Communities 2009b)

So, in other words, and to use terms introduced and discussed in Chapter 3, what the European Commission suggested in this communication was that certain technologies – namely, those which are 'key' and 'enabling' – deserved special attention from policymakers owing to their innate high value characteristics ('knowledge intensive', 'high R&D intensity', 'rapid innovation cycles', 'high capital expenditure', 'highly-skilled employment') and systemic value-enabling characteristics ('enable process, goods and service innovation throughout the economy'). In so doing, the Commission began to outline the case for new industrial policy practices that selectively prioritised and lent public support (at least, at the early stages of R&D activities) to the development and dissemination of these technologies within the EU. But, before that, the two main practical goals of this communication were to identify which technologies could more accurately be classified as KETs in the first place and to produce a common European list of KETs, especially since the public authorities of a few member states – most notably, France (in 2006), Germany (in 2006), and the UK (in 2008) – had already started to devise similar lists at the national level by then (Commission of the European Communities 2009a, 2009b).

Ultimately, the Commission awarded the title of KET to five different technological sectors: *i)* advanced materials, *ii)* biotechnology, *iii)* micro- and nano-electronics, *iv)* nanotechnology, and *v)* photonics. In addition, a reference was also made to the importance of 'advanced manufacturing systems' to robotically assemble complex manufactured goods. But these were not classified as a sixth KET in their own right. Besides, in this 2009 communication, the Commission made a few generic references to how state aid could be used to support the development of KETs and to stimulate R&D&I investments, in general, and showed some receptiveness to 'assess whether amendments are necessary' to the R&D&I state aid framework in the light of the new emphasis placed on KETs (2009b). However, like the Competitiveness Council conclusions that preceded it, the Commission's communication still did not include any reference to the need or the intention of creating a new framework that would allow member states to provide public financing to 'important projects of common European interest' at both the R&D&I and the subsequent industrial deployment stages.

In hindsight, the contribution of this communication to the eventual creation of the IPCEI framework would be mostly an indirect one. In the last section of the communication, by way of conclusion, the European Commission suggested setting up a high-level expert group on KETs, comprised of 'industrial and academic experts' from EU member states, equipped with a mandate to contribute to better define a common European strategy for KETs and to substantiate that strategy with more specific policy recommendations (Commission of the European Communities 2009b: 25). In the contingent and accidental institutional process which led to the introduction of the IPCEI framework into EU state aid control in 2014 and the operationalisation of the concept of 'important projects of common European interest' for the purposes of supranational industrial policy practice, the creation of this high-level expert group would turn out to be a pivotal moment.

The 'High-Level Expert Group on Key Enabling Technologies' (henceforth, HLEG-KET) was, thus, formed in July 2010 under the aegis of the Commissioner for Industry and Entrepreneurship, Antonio Tajani, the Commissioner for the Digital Agenda, Neelie Kroes (who had just recently left the position of Commissioner for Competition, which she occupied between 2004 and early 2010), and the Commissioner for Research, Innovation and Science, Máire Geoghegan-Quinn. The Directorate-General for Enterprise and Industry (DG ENTR) – which has, in the meantime, been converted into DG GROW – was the responsible unit, within the European Commission, for providing secretarial and logistical support to the HLEG-KET. The latter included both a board where discussions took place and a sherpa group to which technical and administrative work was delegated. The member states' governments and other organisations represented in the Board are identified and classified in Table 2.

According to the Commission's 2009 communication, the HLEG-KET was meant to include both 'industrial experts' and 'academic experts'. But, in practice, the number of industrial firms and business interest associations far outweighed that of research and scientific organisations, although both the president of the board and the chair of the sherpa group were individuals representing the French Atomic Energy Commission. In particular, individually appointed industrial firms stood out as the most represented type of organisation in both the board and the sherpa group (High-Level Expert Group on Key Enabling Technologies 2011: 45-46). Besides, only three member states' governments were represented in the HLEG-KET, namely those of France, Germany, and the UK. Perhaps not coincidentally, these were the same member states whose previous attempts to define, at a national level, a list of priority technology sectors had been highlighted by the Commission

as a motivation for coming up with a common list of KETs at the European level (Commission of the European Communities 2009a, 2009b). The role of the HLEG-KET would be to formulate a common, authoritative opinion about the (industrial or other) policies that the EU, as a whole, and its member states should implement to support the development of KETs – and, thereby, continually preserve and enhance the global competitiveness of European industry.

After holding a series of meetings and workshops over the course of one year, the HLEG-KET published its final report in June 2011. This report substantially expanded on some of the core claims of the 2009 Commission communication and staff working document regarding the importance of KETs, the global competitive race over these technologies, and the challenges and opportunities faced by the EU in nurturing their development within its territory. It reiterated the central role of KETs as both the drivers of 'sustainable, smart and inclusive growth' and the sources of new solutions to 'grand societal challenges' (High-Level Expert Group on Key Enabling Technologies 2011: 10). And promoted 'advanced manufacturing systems' to the status of a sixth KET in its own right, alongside the other five which had already been singled out by the European Commission two years before. Furthermore, the report emphasised that the EU was facing the external threat of 'growing and overwhelming global competition from both developed and emerging economies in particular in North America and East Asia'. And, against this background, alerted that, even though so far 'the EU remains resilient, in a position of relative strength', it must nonetheless 'reinforce and rapidly develop its KETs industry to compete for the future' (2011: 4).

Table 2. Membership of the board of the HLEG-KET

Type	Member state / Organisation	Department / Sector
Government	France	Ministry for Economy, Industry and Employment (General Director)
	Germany	Federal Ministry of Economic (Secretary of State)
	UK	Minister of State for Universities and Science
Business interest association	European Association of Craft, Small and Medium-Sized Enterprises	Horizontal
	European Photovoltaic Industry Association	Energy, solar panels and cells
	European Semiconductor Industry Association	Electronics
Industrial firm	ARKEMA	Chemicals, advanced materials
	Bayer	Pharmaceuticals, life sciences
	Cube Optics	Tech hardware, electronics
	Infineon Technologies	Electronics
	Intel Ireland	Electronics
	Nicolas-Correa	Machine tools
	QinetiQ	Defence
	Rolls Royce	Aerospace, defence
	SAFT	Batteries
	Shell	Oil and gas
	SOITEC	Semiconductor materials
	STMicroelectronics	Electronics
	Süd-Chemie	Chemicals
	THYIA Tehnologije	Information and communication technologies
	Umicore	Materials

Other public	European Investment Fund	Public financial institution (EU)
	French Atomic Energy Commission	Public research organisation (France)
	Vattenfall	Energy – state-owned enterprise (Sweden)
	VTT Technical Research Centre	Public research organisation (Finland)
Other private	European Society for Biomaterials	Scientific society (non profit)
	Fraunhofer-Gesellschaft	Private research organisation (Germany)
	The Netherlands Organisation for Applied Scientific Research (TNO)	Private research organisation (Netherlands)

Source: High-Level Expert Group on Key Enabling Technologies (2011: 45).

Besides boosting some of the main ideas which were already present in the European Commission's 2009 communication, the report of the HLEG-KET introduced a new concept to diagnose the weaknesses of the EU in developing KETs. In essence, the central message of the report was that the EU has difficulties crossing the *'valley of death'* between, at one end, the scientific knowledge generated through R&D activities and, at the other end, the later transformation of this knowledge into marketable products which afford commercial opportunities to businesses. Among the reasons for this difficulty in crossing the 'valley of death', the report decried a 'lack of political support' to KETs, inadequate regulatory frameworks, and insufficient access to large-scale finance to fund investment projects – especially past the earlier stages of R&D (High-Level Expert Group on Key Enabling Technologies 2011: 24). Moreover, the report claimed that the EU was failing to react to the competitive pressure exerted by industrial policy practices that were simultaneously taking place elsewhere in the world economy – '[i]n many competitor countries, generous incentives are available to support investment projects, which are often negotiated on a case-by-case basis, and which the EU has been unable to match' (2011: 18). And this claim is illustrated with a few examples, across the different KETs industries, of public subsidies offered by the governments of the US, Russia, and China to industrial firms, including 'European companies', to build their manufacturing facilities in these countries rather than in the EU.

Accordingly, in its policy recommendations' section, the report suggested regulatory reforms as well as an expansion and re-orientation of public funding, at both the EU and member state level, towards more applied, as opposed to basic, forms of technological

research and product development, following the example of the EU's main 'competitors' in North America and East Asia. With regard to state aid control, in particular, the report suggested that the interpretation and enforcement of EU state aid rules be adapted to the specific needs of KETs. This should include, for example, generalising the possibility for EU member states to match the higher subsidies offered by the governments of non-EU countries, raising notification thresholds to exempt a greater number of subsidies from the ex-ante scrutiny of DG COMP's 'balancing test', and simplifying notification procedures, on the grounds that '[a] fast decision-making process is necessary to raise Europe's attractiveness for manufacturing investments' (High-Level Expert Group on Key Enabling Technologies 2011: 36). Particularly relevant for the purposes of the reconstruction of events carried out here, however, is that it was also this 2011 report which, in its policy recommendations, entertained the dormant possibility contained within Article 107(3) (b) and the notion of 'important projects of common European interest' as a means of allowing state subsidies to be awarded, beyond the R&D stage, to large industrial investments in KETs industries taking place inside the EU[10]. To quote directly from the report:

> The EU should consider how to use the rules of Article 107 (3)b TFEU to support large scale open-access technology development, testing and demonstration facilities, including pilot lines and demonstrators in KETs where these would make a significant contribution to strengthening EU competitiveness…
>
> Article 107 (3)b of the TFEU permits "aid to promote the execution of an important project of common European interest or to remedy a serious disturbance in the economy of a Member State". This article allows projects to be funded outside EU programmes and financial limits in exceptional circumstances. However, projects funded via this mechanism are still subject to WTO [World Trade Organisation] disciplines and could be made the subject of a WTO dispute. Projects also need political agreement amongst Member States. Therefore, this mechanism needs to be used sparingly, although it could be a means of supporting key projects that will build technology capability or help to create new markets for products and services. For example, this could be a mechanism that could fund large scale demonstrators of new manufacturing technologies (e.g. pilot lines) or KET-based applications that would prove these technologies can be deployed on a large scale and thus create lead markets for these in the EU. (High-Level Expert Group on Key Enabling Technologies 2011: 36)

It is here, in these associations between Article 107(3) (b) of the TFEU and the public funding of particular types of techno-industrial projects (such as 'large scale demonstrators of new manufacturing technologies') that the 2014 IPCEI framework, with its explicit

[10] DG GROW official (Interview 3).

emphasis on large, technologically innovative projects encompassing both R&D&I and industrial deployment activities, starts to take shape. There was a gradual and contingent process from generic concerns with global competitive pressures to the development of KETs being an important part of the necessary response to those pressures, to the 'valley of death' representing the main obstacle to the development of KETs, and finally to state aid to (particular kinds of) 'important projects of common European interest' being a way of overcoming the 'valley of death' and of keeping pace with synchronous industrial policy efforts taking place outside of the EU. This process involved the direct participation of (some) member states, the European Commission, and other stakeholders represented in the HLEG-KET. It cannot be simply attributed to the initiative or the intentional behaviour of a single actor.

Admittedly, however, this was just one recommendation in one report written by one expert group. It was not binding in any way and perhaps could have been simply ignored. After all, the European Commission does enjoy formal and operational autonomy as far as the design of state aid frameworks goes. The fact that this idea outlived the mandate of the HLEG-KET and eventually left a visible imprint on EU state aid control requires, in turn, paying closer attention to a subsequent institutional process – namely, the review of existing state aid framework in the context of the State Aid Modernisation reform – and to the different actors that participated therein.

5.4 Review, consultations, and the need for a separate framework

A close reading of the European Commission's staff working documents that track and describe the review of state aid frameworks carried out in the first half of 2010s under the State Aid Modernisation reform shows that the 2014 IPCEI framework emerged as an outgrowth of the review of the R&D&I framework which was taking place then. The version of the framework which was then under review, the 2006 R&D&I framework, already contained a brief reference to the possibility of aid granted to certain R&D&I projects being considered under Article 107(3) (b) of the TFEU (i.e., as 'aid to promote the execution of an important project of common European interest'), in addition to the more commonly used Article 107(3) (c) ('aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest') (Commission of the European Communities 2006). However, the conditions under which state aid to R&D&I activities could be considered eligible for the former treaty clause were not in any way as clear and detailed as those under

which it could be considered eligible for the latter. Besides, for the whole lifetime of that R&D&I framework (2006-2013), the exemption for state funding of R&D&I projects under Article 107(3) (b) was never invoked by any member state or group of member states (European Commission 2014a). So, the 2006 R&D&I framework remained firmly anchored on TFEU 107(3) (c) rather than 107(3) (b). Yet, when the time came for that R&D&I framework to be reviewed under the State Aid Modernisation reform, this previously underdeveloped and never utilised section of the 2006 R&D&I framework became so important in internal discussions as to be developed into its own independent framework from 2014 onwards. To be sure, while a similar brief reference to 'important projects of common European interest' and Article 107(3) (b) also existed in the 2008 environmental protection guidelines (Commission of the European Communities 2008), it did not attract as much attention during the review of the guidelines as it did during the review of the R&D&I framework (European Commission 2014b).

In contrast to what later would be inscribed in the 2014 IPCEI framework, the section on Article 107(3) (b) in the 2006 R&D&I framework did not make any explicit reference to costs with industrial deployment, in addition to those with R&D&I activities, being eligible for state aid nor to the possibility of state aid covering up to 100% of those eligible costs. However, this issue became more salient in the course of the review of the R&D&I framework and, by extension, the need for a separate framework also became increasingly apparent. This happened in two stages. Initially, during the first round of public consultations which DG COMP held with stakeholders (between 20 November 2011 and 24 February 2012). But especially, during the subsequent inter-service consultations held between DG COMP and the other Commission DGs (between 15 July and 1 August 2013) (European Commission 2014a).

In the first public consultations, the need for specific guidance on the conditions under which state aid could be awarded to 'important projects of common European interest' was raised by 'a number of stakeholders' – and 'mostly' industry representatives as opposed to member states' representatives (European Commission 2014a: 9). But, more generally, many stakeholders pointed out that the stipulations of the R&D&I framework, especially when it came to 'aid for demonstration and pilot projects', were too restrictive and did not 'take into account the particularities of breakthrough technologies that address societal challenges and usually require a high degree of collaboration' and, therefore, suggested that a change in this regard was required, specifically 'to counter the decline in the industrial deployment of cutting-edge innovations in the EU' (2014a: 10).

Yet, responses from stakeholders to public consultations are not legally binding. So, when, following this first round of public consultations, DG COMP began to revise the text of the R&D&I framework, its original intention was still to have only a brief section for Article 107(3) (b) in the revised R&D&I framework, rather than creating a whole separate IPCEI framework[11]. This only changed as a result of inter-service consultations in which the other Commission DGs were given the chance to express their opinion on the DG COMP's draft proposal for the new R&D&I framework. Inter-service consultations are an important moment in the institutional process of reviewing state aid frameworks because, although DG COMP is ultimately the responsible unit for drafting and reviewing state aid frameworks, according to the rules of procedure of the Commission, DG COMP's proposals need to secure a favourable vote from all the others DGs for whom the content of those frameworks can be considered to be relevant[12]. DG COMP's initial proposal received three negative opinions. And, significantly, these were issued by DGs with a strong stake in these topics, namely DG ENTR, the Directorate-General for Communications Networks, Content and Technology (DG CNECT), and DG RTD. For these three DGs, among other things, 'changes to the rules on aid for IPCEI were crucial, in particular with a view to clarify the compatibility criteria, and thereby make the provisions more operational, as well as *to explicitly include close-to-the-market activities*' (European Commission 2014a: 11, emphasis added). Hence, by linking 'important projects of common European interest' to 'close-to-the-market activities', DG ENTR, DG CNECT, and DG RTD effectively brought into the internal discussions surrounding the review process the suggestion which had first been made two years before in the report of the HLEG-KET. In fact, the active role of these other DGs and the importance of the topic of key enabling technologies for the creation of the 2014 IPCEI framework is also confirmed by a DG COMP official in one interview:

> It's in the context of the various evaluations that we encountered some suggestions that there might be an issue and a need to provide more horizontal guidance. In that period as well, there was quite a lot of concern from the colleagues, well, in then DG Enterprise and also in DG RTD about was called the Key Enabling Technologies, that those were not really captured by the traditional Research and Development Framework and so that you would need some guidance on how to go about this type of projects under, well, [Article] 107(3) (b) – so, the IPCEI communication. And so, from that, in fact then it was decided that, yes, it might be useful to just take what we already have in the research and development rules and what we have in the energy and environmental rules and try to make it more abstract.[13]

[11] DG COMP official I (Interview 5).
[12] Personal correspondence with DG COMP State Aid Registry (emailed dated 8 July 2021).
[13] DG COMP official I (Interview 5).

Following discussions with these three DGs, DG COMP began to work on the draft of a dedicated IPCEI framework that would specifically cater to the needs of KETs and, thus, accommodate the possibility of awarding state aid to also cover the costs associated with 'close-to-the-market activities'. Hence was born the first draft of the 2014 IPCEI framework, with an explicit reference to a 'productive investment' stage – that would, in the final version, be renamed 'industrial deployment' – and to aid intensities of up to 100%, provided this was found, in the 'balancing test' to be both necessary and proportional in relation to the 'funding gap' faced by private firms (European Commission 2014d: 6).

The draft IPCEI framework was then released for public consultation in early 2014 (European Commission 2014a: 12). This public consultation was less participated in than that for the revised R&D&I framework, for example. But the publication of the draft IPCEI framework still elicited feedback from a few member states as well as other stakeholders, such as industry representatives. Among the latter, SEMI Europe, a transnational association representing the interests of the micro- and nano-electronics industry, was particularly emphatic about their support for the new state aid framework, which, it claimed, should be adopted 'as soon as possible'. In particular, SEMI Europe's answer to the consultation reaffirmed the potential of the novel possibilities contained in the draft IPCEI framework to overcome the 'valley of death' and to match 'the incentives offered in other regions', of which 'SEMI Europe and its members [had] provided evidence':

> Micro- and nano-electronics manufacturing is a global industry and European companies have to be present and compete on many different regional markets. SEMI Europe and its members have provided evidence to EU and Member State representatives of the incentives offered in other regions to attract investment in semiconductor and related industries manufacturing.
>
> In the past European funding programs and state aid rules have provided significant support for research and development, but little was done to help take innovative ideas to market and stimulate manufacturing in Europe. In order to remain competitive on the global market, Europe needs to adapt its policies and rules to attract investment in manufacturing. (SEMI Europe 2014: 1)

To be sure, the links between the micro- and nano-electronics industry and the processes surrounding the creation and implementation of the IPCEI framework did neither begin nor end with this enthusiastic response (and public reaffirmation of their lobbying efforts). In fact, micro- and nano-electronics had already been nominated as a KET by the European Commission in 2009. Besides, several firms and another sector-specific business interest association (in this case, the European Semiconductor Industry Association) had been represented among the membership of the HLEG-KET between 2010 and 2011. And, as

shall be discussed in more detail in the next two chapters, this would also become the first industry to receive targeted support under the IPCEI framework, thus inaugurating a new era of industrial policy at the supranational level in the EU.

Only five member states sent written feedback to the public consultation on the draft IPCEI framework: Denmark, France, Germany, the Netherlands, and Sweden. Generally, they welcomed the new framework and the new industrial policy opportunities it would enable (European Commission 2014a; Federal Government of Germany 2014; Government of France 2014; Government of the Netherlands 2014; Ministry of Enterprise 2014; Ministry of Growth and Business of Denmark 2014). However, they also expressed some doubts about technical aspects of the 'balancing test' and about how these could ultimately undermine the very industrial policy opportunities which the new framework was expected to create. For example, the answer of the French authorities emphasised the additional administrative costs that companies applying for aid under the IPCEI framework would have to incur in order to gather and process the necessary data to comply with all the technical requirements of the 'balancing test' (Government of France 2014). The German authorities, in turn, pointed out that the more innovative a particular project was, the more difficult it would be to define a 'counterfactual scenario'. And warned that the consequence of these technical requirements could be that innovation would not be supported and, therefore, would not take place at all (Federal Government of Germany 2014). Similarly, in their reply to the consultation, the Swedish authorities argued that the definition of a 'counterfactual scenario' for projects with a strong component of technological innovation, as those which were expected to be covered by the IPCEI framework, was 'often a utopia' and suggested that DG COMP downplay such technical requirements and, instead, be more accepting of the possibility of failures (Ministry of Enterprise 2014). In response, DG COMP would fine tune some of informational and technical aspects related to the 'balancing test' – for example, by clarifying that a 'counterfactual scenario may consist in the absence of an alternative project' (European Commission 2014c: paragraph 29). But the framework would not go through any significant modifications as a result of the public consultations. All in all, there are few substantive differences between the draft published in January 2014 and the official version published in June 2014.

5.5 The perspective of DG COMP

This detailed investigation of the hidden bureaucratic life of the review processes of state aid frameworks reveals the consequential involvement of actors other than DG COMP in the

creation of the IPCEI framework, not least other units inside the European Commission. For example, the intervention of DG ENTR, DG RTD and DG CNECT turned out to be crucial to ensure that what was only a policy recommendation in the 2011 report of the HLEG-KET would by 2014 become a new state aid framework. Yet, despite the crucial participation of these other DGs in the institutional process and the fact that the initial suggestion for a more active of Article 107(3) (b) to be tied to the possibility of extending public funding to 'close-to-the-market' or 'industrial deployment' activities came from the HLEG-KET, this does not necessarily mean that DG COMP should be portrayed as a loser in this process who had no option but to reluctantly accept creating new opportunities for member states to engage in industrial policy interventions.

Admittedly, as shown in Chapter 4, many accounts of neoliberalisation and neoliberal continuity in the domain of EU competition policy, including state aid control, depict DG COMP as a consistently neoliberal actor who is committed to the practical implementation of neoliberal beliefs, prioritising the enforcement of market competition above all other considerations in their actions (i.e., in drafting state aid frameworks and in assessing individual state aid measures submitted under those frameworks). From this perspective, DG COMP would have to be a loser in this process, indeed. However, here is a risk that this becomes a taken-for-granted assumption and an unhelpful oversimplification. In fact, interviews carried out with DG COMP officials suggest that, instead of a single-minded focus in insulating market outcomes from the influence of industrial policy (in the form of state aid), they hold more nuanced views about the pros and cons of state subsidies and about what practices may constitute or encourage 'good forms' of industrial policy within the EU (this finding resonates with the analysis of Blauberger 2009). And the IPCEI framework is seen and justified in this light too.

For example, DG COMP's original intention not to create a separate IPCEI framework in the process of reviewing the R&D&I framework need not necessarily reflect an ideological suspicion of industrial policy. In one interview, a DG COMP official justified it with more practical concerns regarding a relative dearth of case practice and accumulated experience regarding the application of Article 107(3) (b) upon which to build this new framework: 'COMP is traditionally a bit more reluctant, unless we have a certain case practice to build our rules upon'[14]. In contrast to other more common exemptions contemplated in the TFEU, the clearing of state aid on the grounds that the beneficiary project constituted an 'important project of common European interest' was almost unprecedented. Historically,

[14] DG COMP official I (Interview 5).

the exemption in Article 107(3) (b) had been used very few times and, therefore, the case practice on its application was quite limited. In the domain of transport infrastructure, it had been used for the financing of the Belgian TGV in 1996, the channel tunnel rail link in 2001, and the planning of the Fehmarn Belt tunnel between Denmark and Germany in 2009; whereas, for the support of R&D activities, it had been used to approve the provision of state aid by France to a few projects in microelectronics between 2001 and 2003 in the context of the MEDEA+ programme which was part of the intergovernmental Eureka network (European Commission 2001; 2014a: 24, footnotes 111 and 112).

Practical and legal concerns aside, in another interview, a former DG COMP official[15] stressed that allowing national governments to award more state aid was 'fine' and that there could be a 'good economic argument' for state subsidies, namely when these address 'market failures'. For example, when subsidies are used to compensate first movers for the technological spill-overs or other positive externalities that their investments can generate, thus encouraging investments in innovation and avoiding a situation in which firms invest in innovation less than they otherwise would because they cannot appropriate all of the economic benefits of their investments (for a similar argument in support of industrial policy action, see Rodrik 2004; and, for a critique of its neoclassical foundations, see Andreoni and Chang 2019). In addition, according to the same former DG COMP official, the IPCEI framework is a 'good' or even 'fantastic' tool. And, as a rule, it should be used to support the development of 'an ecosystem of smaller European firms' rather than to subsidise the investments and operations of the very largest companies:

> The point is you want really to make sure that this is a momentum for good investments, no? And if it is the giants that we already have, they have already exploited economies of scale, they cannot become even more efficient, right?, because they have already reached that scale. So, I don't think that subsidising the big firms is a great thing, in general, there maybe be exceptions. So, I really would like this instrument to allow an ecosystem of smaller European firms to come out. If we can do that, that's a great success.[16]

So, clearly, there is no outright rejection of industrial policy, but an acknowledgement that certain forms of industrial policy can indeed be good – while other forms are arguably not as good. For example, in the quote just cited above, an industrial policy practice of supporting very large industrial firms to become 'European champions' is argued to be, in general, inferior to one focused on developing industrial 'ecosystems'. This view is shared by another DG COMP official, who argued that the 'beauty of IPCEI' resides in the fact that it not only

[15] Former DG COMP official (Interview 17).
[16] Former DG COMP official (Interview 17).

creates a platform for cooperation among member states to scale up industrial policy – 'and that's really the main difference between the IPCEI approach and everything that has happened before'[17] –, but also one that may serve as an alternative to the option of supporting 'European champions' and approving 'mega-mergers', focusing, instead, on supporting 'technological breakthroughs':

> … we [DG COMP] were of course not the only ones in the Commission to realise that, if member states want to, you know, reach a certain size in the kinds of projects that they want to do, then they will have to pool resources. So, we realised it, GROW realised it, Research [DG RTD] realised it – and especially in a situation where the EU budget itself always only takes us so far.[18]

> So, you know, the IPCEI logic in terms of why do we allow them [member states] to pool their resources is, one, they couldn't do it alone; two, the fact of allowing them, but also, if you also want, forcing them to pool their resources in the way in which this has to be done under an IPCEI – and, as you very well know, there is a point when funding under the IPCEI stops, namely after the first industrial deployment. And this is very important for us. Because this is not about, you know, subsidising the production of, whatever, mass productions – this is very much about contributing, on the one hand, to breakthrough technology and, on the other hand, then making sure that, to the extent possible, this breakthrough technology and the research results found in this context are also disseminated, shared – including with regions in the EU that may be, let's say, less technologically-advanced, and so on and so forth.[19]

> I've been a staunch defender of this approach, already more than ten years ago. Simply because it makes a difference. It makes a difference whether member state A puts state money primarily into the objective of fighting member state B, which is what they have done for the first sixty-whatever years of the EU – or whether they start to realise that this is actually a waste of everybody's money, a waste of resources, and therefore let's try and do something together because, like that, we can get the scale – without needing to mega-merge and create whatever horrible Moloch that will then basically just, you know, monopolise the market and stifle innovation. And that for me is the beauty of IPCEI.[20]

Again, there is an appreciation that some forms of industrial policy are justified and virtuous – though not all: supporting 'technological breakthroughs' up to the 'first industrial deployment' represents a better form of industrial policy that subsiding the operational costs of regular business activity or supporting the growth of certain firms to become large 'European champions'. On top of that, the IPCEI framework also stands out as a particularly good form of industrial policy because it has the potential to project an EU-wide 'supranational economic patriotism' (Clift and Woll 2012a, 2012b) that transcends national

[17] DG COMP official III (Interview 7).
[18] DG COMP official III (Interview 7).
[19] DG COMP official III (Interview 7).
[20] DG COMP official III (Interview 7).

divisions. And this resonates with the European Commission, including DG COMP, because it helps to consolidate the supranational European polity of which the European Commission is 'an aspiring governing agent' (Rosamond 2012b: 334).

Another DG COMP official summarised the reasons why industrial policy under the IPCEI framework could be considered 'a good form of industrial policy' along the same lines:

> I mean, clearly, I think, there is political impetus from the whole Commission – the entire Commission, including our Commissioner [Commissioner for Competition, Margrethe Vestager] – for IPCEIs to work. Because there is a clear recognition that it's a good form of industrial policy. Good because, indeed, we have several member states working together – so it's not purely national-based, but there's already a European dimension. Because there are those spillovers that I mentioned earlier [which, according to the IPCEI framework, must extend beyond the beneficiary companies and the financing member states], and because, at least for R&D&I, there is a very ambitious level required – because, actually, the Communication stresses that only fundamentally innovative projects can be funded. So, all these combined makes, let's say, IPCEIs a good industrial policy, I would say – or a less bad industrial policy, however you want to put it [laughs]. And clearly DG COMP is part of that. This being said, we have a crucial work to carry out to avoid that there is unnecessary aid to projects which don't fit the requirements or disproportionate aid. So, we have to make sure that, indeed, every single individual participant in an IPCEI is up to the standards and the requirements of the Communication – and on that we have also a very clear mandate from our Commissioner to be strict.[21]

Thus, equally important for DG COMP officials is the fact that the IPCEI framework does not represent a suspension of state aid control but is still subject to the standard 'balancing test' in which DG COMP can assess the necessity and proportionality of the aid, weigh the expected benefits against the expected costs and, on that basis, propose modifications to member states of their aid measures. This can involve, for example, requesting that beneficiary firms disclose some of the results of the research carried out in the course of the aided project or requesting that the volume of aid is subject to a 'claw-back clause' so that in case the actual revenues from the aided project turn out to exceed projected revenues, some of that surplus profit is returned to the financing member state and the 'proportionality' of the aid is ensured *ex-post*[22]. Arguably, in intervening in the design of aid measures in this way, DG COMP also acts like a sort of industrial policy agency. Because of the technical and informational requirements of the 'balancing test', DG COMP staff argue, the IPCEI framework, even though it may have expanded opportunities for member states to engage in industrial policy, 'is not a free lunch' (DG Competition Case Team 2020: 11) nor a 'blank

[21] DG COMP official II (Interview 6).
[22] DG COMP official II (Interview 6).

cheque'[23]. For it is still subject to a 'demanding State Aid assessment' (DG Competition Case Team 2020: 11). As one DG COMP official put it:

> I mean, it still remains an instrument where there is actually real control… it's still state aid control – and still quite serious state aid control.[24]

And, therefore, to quote another DG COMP official:

> This is not rubberstamping classical industrial policy of the 19th century, yeah? This is a different ball game.[25]

In sum, what these responses show is that, while DG COMP officials clearly do not embrace all kinds of industrial policy action in the same way, they nonetheless hold nuanced views on what may constitute good forms of industrial policy (and how that is reflected in the provisions of the IPCEI framework). And these nuanced views cannot be satisfactorily put into a wholly neoliberal or 'competition only' (Buch-Hansen and Wigger 2011) pigeonhole without stretching the latter categories too far to be of any analytical use. Instead, it must be acknowledged that there is some ideological latitude and pragmatism from DG COMP officials in relation to the possibility for industrial policy practice inside the EU – they are not intellectual 'slaves' to any neoliberal thinker. For this reason, it would also be inadequate to completely demote DG COMP to the role of a reluctant loser in the institutional process which led to the creation of the IPCEI state aid framework in 2014.

5.6 Concluding remarks

The creation of the IPCEI state aid framework in 2014 operationalised a treaty clause which had been 'dormant' for fifty-seven years of EU state aid control and, in doing so, enabled new industrial policy practices among EU member states and paved the way for the eventual emergence of a new supranational industrial policy complex. This chapter has delved into the often-overlooked internal bureaucratic life of the review processes of state aid frameworks to reconstruct the events that eventually led to the creation of this framework. In summary, this a story of how a particular understanding of the concept of 'important projects of common European interest' – that is, large and technologically sophisticated projects which encompass both R&D&I and industrial deployment activities – was codified into the domain of state aid control following discussions that were taking place at the supranational level about the need for the EU to attract investments in so-called 'key enabling

[23] DG COMP official I (Interview 5).
[24] DG COMP official I (Interview 5).
[25] DG COMP official III (Interview 7).

technologies' and, by extension, to create new financial support instruments that would allow it to overcome the 'valley of death' and keep pace with the industrial policy practices underway in other regions of the world economy – most notably, in the US and in East Asia. In this story were featured both national and supranational, and both public and private actors.

A few key points are worth emphasising in this concluding section. To start, it is relatively easy to find traces of the competitive accumulation imperative throughout this process. The threat of global competition for mobile capital and developments in industrial policy elsewhere are constantly in the background. This is expressed, for example, in the references made by member states in the Competitiveness Council to the necessity of 'improving the conditions for investment in Europe' to avoid a 'production leakage' to other parts of the world economy (Council of the European Union 2009), but also in the frequent comparisons which are made between the public subsidies which are available in the EU vis-à-vis other regions – for example, throughout the 2011 report of the HLEG-KET or in SEMI Europe's answer to the public consultation on the IPCEI framework in early 2014.

Admittedly, the EU's perennial concerns with competitiveness are well documented in the literature, though often associated with neoliberalisation processes, not least in the domain of competition policy (Rosamond 2002; Smith 2005; Wigger 2008, 2019a; see also Krugman 1994; Hay 2012). Here, however, is an example of how the nexus between the two – concerns with competitiveness, on the one hand, and neoliberalisation, on the other – is not inexorable. And that the former can also inform decisions that at least sometimes go in a different direction to that of continued neoliberalisation in every aspect of EU policymaking. In this case, particularly important was the emphasis placed on identifying so-called 'key enabling technologies' – which, in turn, corroborates the hypothesis, outlined in Chapter 3, that sectors which are perceived to be endowed with certain 'high value' and 'value-enabling' qualities may more easily become the foci of selective state interventions.

Another point which is worth highlighting is that while DG COMP is the unit to which the European Commission delegates most of the tasks which have to do with state aid control, including drafting and revising state aid framework that specify how certain types of aid may qualify for one or more of the exemptions contemplated in the TFEU, it does not do this entirely alone nor autonomously. Instead, the practice of drafting and revising state aid frameworks is negotiated with a range of other actors – especially, other DGs which have to issue a positive opinion on DG COMP's intentions before any new draft frameworks can be taken to public consultations or appreciated by the College of Commissioners. And,

as the institutional process behind the IPCEI framework shows, the involvement of other DGs (in this case, DG ENTR, DG RTD, and DG CNECT) is not just a formality, but something that can have real effects on the content of the frameworks and, hence, on what opportunities for industrial policy are ultimately available to member states. Besides, the internal drafting and review process takes place in a wider context from which it is not completely insulated. So, wider developments and concerns can also permeate into the state aid frameworks which are internally prepared. Formal and operational autonomy is always *relative*, never absolute, and hence is always open to external stimuli, pressures, and novel ideational inputs. Particularly, without the concern with 'production leakage', without the creation of the HLEG-KET (in which participated some member states and multiple representatives of businesses and other public and private organisations), and without an appreciation of what other regions were doing to attract mobile investments in KETs, it is unlikely that the IPCEI framework would have turned out exactly the way it did and that 'important projects of common European interest' would have come to be defined exactly in the way they were in the end.

Finally, there is a risk that portraying DG COMP as a consistently neoliberal actor may conceal more than it reveals in the analysis of continuity and change in EU state aid control. Interview data suggests that DG COMP officials have more nuanced views about what may or may not constitute good forms of industrial policy which should be allowed (or even encouraged) within the EU. This applies even more so in the case of the industrial policy opportunities opened up by the IPCEI framework because of the supranational economic patriotism, as opposed to economic nationalism, to which it appeals and which it can contribute to reify – and which the European Commission can aspire to govern. In addition, it was also clear from the interviews that DG COMP officials regard their own 'balancing test' analysis as a way of ensuring that industrial policy measures are well designed, namely in what concerns the necessity and proportionality of the aid and the conditionalities which are attached to it and which beneficiary firms must observe. In fact, the 'balancing test' provides so many opportunities for DG COMP to intervene in the design of policy measures that the demarcation between competition authority and industrial policy agency can become blurred.

Having clarified the novelty of the 2014 IPCEI framework and traced the process behind its creation, the next two chapters show how this state aid framework has been deployed as an instrument for a new supranational industrial policy practice, around which a wider supranational industrial policy complex has been developing.

6 Towards a supranational industrial policy complex

The creation of the IPCEI framework in 2014 breathed new life into what had remained a largely underused and overlooked clause of state aid rules since it was first inscribed in the 1957 Treaty of Rome. Admittedly, the creation of the IPCEI framework was relatively discreet. It did not attract a lot of attention from either academia or the media. It went mostly under the radar as yet another anodyne, routine bureaucratic procedure of the many that every day take place in Brussels. However, as this chapter will show, in the eight years since its creation, the concept of 'important projects of common European interest' has gained considerable currency and the provision of state aid to such projects has become a central element of an emerging – still incipient, yet nonetheless unprecedented – *supranational industrial policy complex* in the EU. This chapter documents the gradual development of this complex and argues that this development is better understood as a practical response to changing global competitive conditions as opposed to the outcome of a wholesale and conscious rejection of (neo)liberal economic policy ideas. Through this supranational industrial policy complex, the EU has been attempting to strengthen its competitive position in relation to other regions of the world in sectors which, because of their links to the digital and the green transitions of the economy and society, currently display particularly high value and value-enabling characteristics. This complex is therefore the localised manifestation of wider dynamics and an interactive response thereto.

This chapter is organised as follows. Section 6.1 identifies and outlines the three components of the emerging supranational industrial policy complex in the EU: state aid awarded under the IPCEI framework, European industrial 'alliances', and a dedicated industrial policy committee. Section 6.2 investigates the main driving forces behind the development of this complex. This investigation is complemented across the following three sections by a more detailed analysis of the factors behind the attractiveness, for industrial policymakers, of the three industrial sectors which have so far warranted IPCEIs – that is, microelectronics, batteries, and hydrogen technologies. Section 6.6 concludes.

6.1 New supranational industrial policy practices

Before 2014, the concept of 'important projects of common European interest', as well as the possibility of giving state aid to such projects, could be found in the treaty clauses on

state aid control but remained virtually non-existent in practice. This began to change after the creation of the IPCEI framework – slowly in the first few years, but then more rapidly. Less than a decade after being awarded its own separate state aid framework, the concept of 'important projects of common European interest' is no longer just a vague legal possibility contained in Article 107 (3)(b) of the TFEU. Instead, it increasingly stands for an emerging and unprecedented, though still incipient, *supranational industrial policy complex* in the EU. Three main types of elements comprise this supranational industrial policy complex: *i)* concrete 'Important Projects of Common European Interest' (henceforth, IPCEIs – i.e., the projects, not the concept) in specific sectors, *ii)* a widening range of so-called European industrial 'alliances' in different sectors (which offer EU member states and companies an institutional basis to negotiate and prepare IPCEIs or other industrial policy measures), and *iii)* supranational industrial policy committee(s) (that is, spaces where supranational sectoral priorities and possible industrial policy measures are discussed).

The first component of this complex are the concrete IPCEIs for which state aid has been approved by the European Commission under the new framework – that is, state aid which is meant to cover the costs of private investments in large and technologically innovative industrial projects at both the stages of R&D&I and of the first industrial deployment of new technologies. At the time of writing (August 2022), there have been approved four IPCEI state aid cases. The first was on microelectronics. It was approved in 2018. So, it took four years for the first state aid case to be approved under the IPCEI framework, even though the preparatory work for this project began in 2016 (European Commission 2018d). The project was subsequently revisited and expanded in 2021. It involves around €1.9 billion of state aid (from five member states) to subsidise an expected additional private investment of €6.5 billion (European Commission 2018e, 2021f). This was followed in 2019 by an IPCEI on batteries, with €3.2 billion of approved aid (from seven member states) for an expected additional private investment of €5 billion (European Commission 2019b). A second IPCEI on batteries followed in 2021, with €2.9 billion of aid (from twelve member states) and €9 billion of private investment (European Commission 2021e). Finally, an IPCEI state aid case on hydrogen technologies was approved in 2022, involving €5.4 billion of aid (from fifteen member states) and an expected additional private investment of €8.8 billion (European Commission 2022d). The varying degrees of participation of different EU member states in IPCEIs are analysed and discussed in detail in Chapter 7. The point for now, however, is that after the framework opened up

opportunities for supranational industrial policy in EU state aid control, IPCEIs have become a new site of supranational industrial policy practice.

Together, these four techno-industrial projects in three specific industrial sectors (microelectronics, batteries, and hydrogen technologies) have been awarded a total of €13.4 billion of state aid for an expected additional private investment of €29.3 billion. So, all in all, the stock of approved IPCEIs stands at €42.7 billion, with state aid corresponding to 31% of the total sum. Arguably, this still represents a modest value when compared to the size of the EU economy. For reference, investment flows in the EU amount to almost €3 trillion a year – according to Eurostat data[26], EU27 gross fixed capital formation stood at €2859.4 billion in 2018 and €3111.1 billion in 2019. However, it is still significant that this development has taken place in the course of only four years (since the first project) or eight years (since the introduction of the framework), especially considering that the reference to 'important projects of common European interest' in Article 107 (3)(b) of the TFEU had been neglected for almost sixty years of European integration and state aid control. Furthermore, the stock of IPCEI investments only seems likely to continue to grow in the coming years. As a German official put it, the current situation can be best described as 'very dynamic'[27]. In fact, although they have not been approved yet, a second (and presumably much larger) IPCEI on microelectronics and an IPCEI on cloud infrastructure and services have already been publicly announced and are reported to be in preparation (German Federal Ministry for Economic Affairs and Energy 2021; German Federal Ministry for Economic Affairs and Climate Action 2021a, 2021b; European Commission 2021c). Besides, brief references have already been made to the possibility of developing similar projects on pharmaceutical research and manufacturing (European Commission 2021b; POLITICO 2021b) and on critical raw materials (European Parliament 2021) as well.

In addition to those already approved, imminent, or possible IPCEIs, another component of the supranational industrial policy complex is a range of new European industrial 'alliances'. These alliances, set up by the European Commission – more precisely, by DG GROW, constitute a new institutional form of supranational collaboration among those member states, industrial firms (including 'foreign companies'[28]), and research institutes which have a shared interest in the development of specific industrial sectors or technologies. Here too the process has been dynamic and accelerating. The first of this kind was the European Battery Alliance. It was launched in 2017, paving the way for the first

[26] https://ec.europa.eu/eurostat/en/ (accessed: 16 August 2022).
[27] German official I (Interview 19).
[28] European Commission official (Interview 14).

IPCEI on batteries two years later (European Commission 2017b, 2019b), which was prepared and organised under its aegis[29]. After that, a series of similar industrial alliances followed in different areas of interest: namely, the Circular Plastics Alliance (launched in 2018), the European Raw Materials Alliance (2020), the European Clean Hydrogen Alliance (2020), the European Alliance for Industrial Data, Edge and Cloud (2021), the Alliance on Processors and Semiconductor Technologies (2021), the Alliance for Zero-Emission Aviation (2022), and the Renewable and Low-Carbon Fuels Value Chain Industrial Alliance (2022)[30]. Thus, a total of eight alliances were forged between 2017 and 2022 – six of which were between 2020 and 2022 alone as this institutional process picked up pace.

Like the projects for which state aid is approved under the IPCEI framework, these new European industrial alliances are an integral part of the EU's emerging supranational industrial policy complex. Indeed, according to a European Commission official, 'there is a lot of appetite for industrial alliances' and for carrying on with the 'new type of interaction with the industry' which they represent[31]. Moreover, although an IPCEI does not need to be accompanied by the establishment of an industrial alliance nor does an industrial alliance necessarily demand an IPCEI, there are clear overlaps between their sectoral priorities and often a functional link between them. For example, the European Battery Alliance was set up in 2017 and two IPCEIs on batteries were approved in quick succession in 2019 and 2021. Similarly, the European Clean Hydrogen Alliance was set up in 2020 and a Hydrogen IPCEI was approved in 2022. In addition, both the European Alliance for Industrial Data, Edge and Cloud and the Alliance on Processors and Semiconductor Technologies were set up in the same year that a first IPCEI on cloud infrastructure and services and a second one on microelectronics were publicly announced. Thus, these alliances appear in the emerging supranational industrial policy complex as the sectoral chambers where sector-specific policy measures – not least, new IPCEIs – are discussed and coordinated.

Finally, the third piece of this complex are supranational industrial policy committee(s). One expert group performed this role between 2018 and 2020: the 'Strategic Forum for Important Projects of Common European Interest' (henceforth, the Strategic Forum, for short). This was also set up by the European Commission and was a place where industrial policy measures can be discussed and coordinated. However, unlike the industrial alliances, it was not associated with one specific sector alone. Instead, it served to discuss

[29] DG COMP official II (Interview 6).

[30] For an up-to-date list of European industrial alliances, see: https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances_en (accessed: 16 August 2022).

[31] European Commission (Interview 14).

which sectors should be prioritised for industrial policy action in the first place – to formulate the choice set guiding selective interventions. The recommendation for establishing the Strategic Forum came from DG GROW[32]. And it was first announced by the European Commission in 2017 as a means to better exploit the industrial policy possibilities which had been opened up by the introduction of the IPCEI framework three years before:

> To ensure a highly competitive manufacturing sector in Europe, a successful strategy must build on Europe's strengths and assets in strategic value chains in new technologies and make these more robust. This often requires joint, well-coordinated efforts and investments by public authorities and industries from several Member States. The Commission's Communication concerning Important Projects of Common European Interest (IPCEI) is designed for such strategic projects. Examples of value chains of strategic importance for Europe include energy storage as well as electronic chips. Where used by Member States, they can play a vital role in promoting policies and actions in key areas for economic growth. To achieve a more proactive approach with Member States and industry with regard to Important Projects of Common European Interest, the Commission will establish a strategic forum involving key stakeholders to identify key value chains and investment projects and monitor progress achieved. (European Commission 2017a: 12)

The European Commission put this intention into practice and formally decided 'to set up a group of experts in the field of strategic value chains and investment projects' in early 2018 with a two-year mandate, after which the expert group would expire (European Commission 2018b). EU bodies, member states, and 'key stakeholders' would have a seat in this new Strategic Forum. And its main tasks would be to *i)* identify 'strategic value chains' for European industry, *ii)* suggest and help prepare and coordinate potential IPCEIs in these strategic value chains, and *iii)* recommend other policy measures (beyond IPCEI state aid) as well. The Strategic Forum's 'key stakeholders' were appointed by DG GROW on the basis of a call for the expression of interest targeted at both individual experts 'appointed in a personal capacity' and 'organisations representing the interests of academia and research, finance, industry and SMEs, and employees and workers' (European Commission 2018a). According to the text of the call, applicants should 'bring high-level expertise' to the Strategic Forum. The main requirement was that applicants must have 'proven and relevant competence and a minimum of 10 years' experience' in domains such as 'advanced technologies', 'industrial value chains and industrial base in Europe' or investments and public subsidies in 'first industrial production' (European Commission 2018a). On the basis of this call, seventeen organisations (see Table 3) and three experts appointed on an

[32] DG GROW official (Interview 3).

individual basis were invited to join representatives of EU bodies and member states in the Strategic Forum[33].

Table 3. Organisational members of the Strategic Forum

Type	Name	Sector	Geography
Business interest association	BusinessEurope	Horizontal	Europe
	CECIMO (European Association of the Machine Tool Industries and related Manufacturing Technologies)	Machine tools	Europe
	CEFIC (European Chemical Industry Council)	Chemicals	Europe
	CEMBUREAU (The European Cement Association)	Cement	Europe
	CEPI (Confederation of European Paper Industries)	Paper	Europe
	Confindustria (*Confederazione Generale dell'Industria Italiana*)	Horizontal	Italy
	EUROFER (The European Steel Association)	Steel	Europe
	France Industrie	Horizontal	France
	Hydrogen Europe	Hydrogen and Fuel Cells	Europe
	ZVEI (*Zentralverband Elektrotechnik- und Elektronikindustrie*)	Electrical and electronics	Germany
Industrial firm	Epiroc	Mining, infrastructure, and natural resources	Sweden
	Umicore	Materials technology and recycling	Belgium
Other	ASTER	Public-private regional consortium	Italy (Emilia-Romagna)
	CEA (The French Alternative Energies and Atomic Energy Commission)	Public research organisation	France
	IMEC (*Interuniversitair Micro-Electronica Centrum*)	Private research organisation	Belgium

[33] Register of Commission expert groups and other similar entities: 'Strategic Forum for Important Projects of Common European Interest (IPCEI) (E03583)': https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=3583 (accessed: 14 October 2021).

	NEFI (Network of European Financial Institutions for SMEs)	Association of public financial institutions	Europe
	VTT (Technical Research Centre of Finland)	Public research organisation	Finland

Source: Register of Commission expert groups and other similar entities[34]; EU Transparency Register[35].

From the information summarised in Table 3, it is clear that, notwithstanding the wide and inclusive scope of call for applicants, industry interests were by far those most represented among the organisational membership of the Strategic Forum. Out of a total of seventeen organisational members, ten were business interest associations – most of them with a pan-European geographical reach, but three of them national. In addition to these ten business interest associations, two individual industrial firms, with headquarters in European countries but transnational operations, also had a seat at the Strategic Forum. The remaining five members were a public-private regional consortium for innovation and technology transfer, two public research organisations, one private research organisation, and an association of public financial institutions from different EU member states.

Notably, although 'employees and workers' were explicitly mentioned in the call, ultimately no organisation representing their interests was included in the membership of the Strategic Forum. Admittedly, IPCEIs and 'strategic value chains' might not have been one of the most pressing issues facing worker's representatives across the EU at the time, but it was not entirely off their radars either. For example, industriAll, a European federation of trade unions, had previously shown interest in this topic by submitting a written answer to the public consultation on the IPCEI state aid framework in early 2014 (IndustriAll 2014). Their decision not to apply to participate in the Strategic Forum in 2018 was, according to an interviewee, at least partly motivated by the perception that the Strategic Forum would strictly engage in 'technical' and 'scientific work'[36]. And yet, while the call's emphasis on 'high-level expertise' might have discouraged industriAll (and perhaps other organisations) from participating in the Strategic Forum, it did not necessarily award individual experts or research organisations more than a secondary role in the meetings of the Strategic Forum. In fact, as corroborated by several interviewees, the effective list of organisational members,

[34] Register of Commission expert groups and other similar entities: 'Strategic Forum for Important Projects of Common European Interest (IPCEI) (E03583)': https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=3583 (accessed: 14 October 2021).

[35] https://ec.europa.eu/transparencyregister/ (accessed: 14 October 2021).

[36] Guido Nelissen, representative of industriAll (Interview 11).

as experienced in the meetings of the Strategic Forum, may almost be reduced to industry representatives alone:

> I mean, of course, that's how it is presented, that is how the call was made. But, I think, in practical terms, it is really more about two or three groups: one is civil power and the second is business, really… Because, if you take the logic of how the IPCEIs are chosen, it is basically the industry telling you "we think there is an opportunity to create a new value chain through the IPCEIs – or strengthening an existing one"; civil servants, that includes member states and the Commission, think "yeah, that's a good idea"… So, to me, it's more like two groups, really.[37]

> Well, I very much agree with that statement. That's how I experienced it as well… It's a few years back, but I honestly can't really remember the other groups, other than industry and member state authorities playing any role in the discussions. So, yes, I would very much agree with the statement.[38]

> Actually, I would agree with that. In fact, it wasn't apparent to me that there were experts or research organisations on the Forum. Because, as I said to you earlier, it seemed to me to be very much – I don't want to say "dominated" by industry bodies, but certainly they were very significant participants in the process and with member states. And, actually, I think, looking back at it now, I think participation by experts and research organisations would have been welcomed. Because I think sometimes the Forum tended to be too dominated, as I've sort of been hinting at, by industry bodies.[39]

> Basically, there were only two experts… The initial idea of the European Commission was that experts take at least one third of this Board, but in practice it happened that there were two experts and a lot of lobbyists.[40]

> Well, I mean, the stage was dominated by business and by the member states because this is the nature of IPCEIs and we were looking for something that could be quickly turned into action. But if you look at the recommendations of the Forum, there was also a role, for example, for research organisations to contribute to them quite significantly. But we were looking for something really practical, and really trying to say, "what are the sort of key conditions for the whole thing to take off now – not in five years' time, not in ten years' time". We are not talking about coordination of research activities.[41]

Besides member state representatives (whose heterogenous views on the Strategic Forum are discussed in Chapter 7), organisational members, and individual experts, regular attendees to the Strategic Forum meetings included a representative of the EIB and representatives of different European Commission services, especially DG GROW, which was responsible for organising and coordinating the activities of the Strategic Forum, but also DG COMP, DG

[37] Czech official (Interview 10).
[38] Representative from small member state (Interview 15).
[39] Irish official (Interview 18).
[40] Strategic Forum member (Interview 13).
[41] European Commission official (Interview 14).

CNECT, and DG RTD. Acting on behalf of the European Commission, DG GROW understood its role in the Strategic Forum to be that of facilitating cooperation among member states and industry representatives for the development of a supranational industrial policy practice in the EU:

> … what we are doing is simply facilitating, really, a kind of bottom-up cooperation. So, it's not the Commission choosing certain priority areas. But actually, really industry and member states together identifying priority areas for joint cooperation.[42]

> I mean, we discovered, as the Commission, the power of being a sort of facilitator. If we put everybody around the table, all of a sudden people started talking to each other. And they were saying "oh you're doing this and I'm doing that, so maybe we could do something together".[43]

Over the course of its two-year mandate, the Strategic Forum defined a list of six 'strategic value chains' – namely, 'Clean, connected and autonomous vehicles', 'Smart health', 'Low CO_2 emissions industry', 'Hydrogen technologies and systems', 'Industrial Internet of Things', and 'Cybersecurity' –, published a report with policy recommendations for each of those value chains (see Strategic Forum for Important Projects of Common European Interest 2019), and served as a space for member states' representatives, industry representatives, and the European Commission to discuss the experience with ongoing IPCEIs (namely, the IPCEI on microelectronics and the first IPCEI on batteries)[44] and to begin the preparation of the IPCEI on hydrogen technologies[45], which would be approved in 2022. So, although the formal mandate of the Strategic Forum expired, its impact on the new supranational industrial policy practice is still being felt.

After the closure of the Strategic Forum, the European Commission set up in 2021 another forum, the Industrial Forum, similarly comprised of representatives of EU bodies, member states, and a range of stakeholders. However, instead of performing the role of an industrial policy committee – that is, that of deliberating which sectors are the priority sectors that must be supported through selective interventions –, the Industrial Forum has mostly served as a sort of cross-sectoral chamber where different economic sectors (not only in industry, but in agriculture and in services too) may share their concerns through their

[42] DG GROW official (Interview 3).

[43] European Commission official (Interview 14).

[44] DG COMP official I (Interview 5); Meeting minutes and other documents retrieved from European Commission – Register of Commission Expert Groups and Other Similar Entities: Strategic Forum for Important Projects of Common European Interest (IPCEI) (E03583): https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=3583 (accessed: 14 October 2021).

[45] European Commission official (Interview 14); German official I (Interview 19).

respective business interest associations and where the European Commission can share information about policy developments in different areas[46]. Therefore, the Strategic Forum has so far been the only industrial policy committee in the emerging supranational industrial policy complex. But, because of its ongoing impact, it should still be regarded as an important component of the latter.

6.2 Ideational shift or practical necessity in the face of competition?

A gross investment volume of €42.7 billion across four IPCEIs, 31% of which is covered by state aid. At least another two IPCEIs in preparation. Eight European industrial alliances. And a dedicated industrial policy committee. A supranational form of industrial policy has been on the rise in the EU since the creation of the IPCEI state aid framework in 2014. To explain this development through an emphasis on the economic ideas held by policymakers alone would entail tracing a shift from more neoliberal ideas to less neoliberal ideas – namely, neomercantilist or developmentalist ideas about the merits of selective state intervention. Yet, interview data shows that the idea that states should engage in industrial policy interventions is not entirely unproblematic, even among the actors who are more closely involved in these processes. Views on the merits and perils of industrial policy are mixed. Hence, instead of signalling a full embrace of industrial policy and ideational shift between the two sides of the debate of economic ideas (as reviewed in Chapter 2), the renewal of industrial policy practice is often justified as a practical necessity in the face of strong global competition – or, in other words, a pragmatic response to the imperative of competitive accumulation.

For example, when asked about the standard (neo)liberal criticism of industrial policy as a harmful form of state intervention which consists in bureaucratically supplanting the market mechanism and making administrative judgements about what should be considered strategic and selectively protected instead of allowing production costs and consumer preferences to be expressed through market competition, a French official replies that such a criticism 'makes perfect *theoretical* sense' but 'maybe less *practical* sense' because it would put the EU in a vulnerable competitive position in relation to other regions of the world economy:

[46] Irish official (Interview 18); German official I (Interview 19); Meeting minutes and other documents retrieved from European Commission – Register of Commission Expert Groups and Other Similar Entities: Commission expert group "Industrial Forum" (E03743): https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=3743 (accessed: 16 August 2022).

> I fully understand the criticism. I think it is fair enough. And it makes really good theoretical and economic sense to have those criticisms. So, in many ways I share them and it could lead to work only on the framework conditions and to then have a *laissez-faire* approach … But that would place Europe in a situation where it's the only economic bloc doing that while the rest of the world is taking a different approach. So, I think it makes perfect theoretical sense and maybe less practical sense.[47]

> … clearly there are companies which are supported by their state [in non-EU countries where state aid rules do not apply]. And what is it like for companies in Europe to compete with them? And how do we make sure that it's a fair competition?[48]

When asked the same question, a German official also agrees that the liberal criticism of industrial policy does have 'a very valid point' as does the 'the liberal, more Nordic sense of economic policy'. But also adds two important caveats – one theoretical and one practical. The first is that the specific merit of using IPCEIs as industrial policy instruments – as opposed to the 'active industrial policy' of 'the 80s or 70s' – resides in this remaining a well-delimited type of industrial policy which, under the IPCEI state aid framework, must be circumscribed to supporting the initial development of novel and highly innovative technologies – 'a kind of industrial policy' which economists such as '[Dani] Rodrik and others' have shown 'to be paying off in the long term'. The second caveat, however, is more pragmatic again: the use of IPCEIs as industrial policy instruments is a response to 'global competition settings' where the US and China are 'giving huge funding to new technologies':

> I can, first of all, see the point. It's a very valid point. So, I'm one the economists in the team and, of course, and also our ministry and our minister and the policy line would be more, let's say, if you would put it, in the liberal, more Nordic sense of economic policy. So, the IPCEI instrument is, well, sort of, leading to distortions in that sense that, you know, free markets should deliver themselves the breakthrough technologies and survive or function without the funding by government. Well, we would argue that, as I said in the beginning, that it's not like it used to be in the 80s or 70s, which made industrial policy so unpopular – that is "active industrial policy". That's why we call it now the very critically different "activating industrial policy". And the IPCEI instrument is, I think, an answer to also global competitive – or global competition settings where the US is, through their Department of Defense and through NASA and, you know, through some official departments giving huge funding to new technologies. The same for China – holds even truer much more. So, I think it is due to the strong prerequisites of the IPCEI communication – considering market failure, considering the highly innovative character of technologies – you know, that this [inaudible] … that it actually makes sense for the government to play a role in these very forward-looking projects. And I've also been attending some – I think, and this is, you know, probably you've been following this as well, I mean, it's subject to a lot of scrutiny at the moment from the economic scientific

[47] French official (Interview 21).
[48] French official (Interview 21).

> community. And I've been to some conferences – also at the LSE with Mr Rodrik and others making the case for exactly this kind of industrial policy to be paying off in the long term.[49]

In turn, a Czech official replied that 'it would be easy to just simply criticise the IPCEIs for being selective or whatever', while, in truth, 'the global competition is fierce and is fast'. In other words, the practical necessity of using industrial policy to respond to 'global competitors' outweighs any purely theoretical liberal criticism of the notion of selective state intervention:

> So, it would be easy to just simply criticise the IPCEIs for being selective or whatever, but that, I think, is not the full picture… the global competition is fierce and is fast. The EU, because it is a democratic institution, of course, takes longer on the decision-making process – unlike some of our global competitors where somebody just, you know, snaps a finger and things go.[50]

And, for a European Commission official, even though the creation of a group such as the Strategic Forum to engage in 'longer-term planning' may have some undertones of the 'Chinese capitalist model', any associations between IPCEIs or the Strategic Forum and protectionism are, nevertheless, 'a bit strange'. Rather than being protectionist or statist, these initiatives are about 'join[ing] forces in an open way' to support European industry, 'which normally has a difficulty of competing against big American companies or competing against the Chinese who are subsidised by the government', while remaining 'an open, liberal economy' and 'one of the major champions of globalisation'[51]:

So, analysing the quotes transcribed above, it is difficult to grasp an assertive rejection of (neo)liberal precepts or a committed embrace of an alternative intellectual tradition. Instead, with the exception of the German official's reference to market failures and the work of economists such as Rodrik, these answers mostly emphasise the *practical*, as opposed to ideational or ideological, determinants of industrial policy action. And, in particular, the *competitive* pressures behind it, especially those emanating from the industrial policy efforts of the US and Chinese governments. Put differently, industrial policy emerges as a practical response to the need to continually advance or defend the competitive position of the EU in the global market relative to other countries and regions which are themselves using industrial policy to advance or defend their own competitive positions in the global market too – even if industrial policy as an idea is not completely unproblematic. This practical and competitive dimension suggests that the emergence of this supranational industrial policy

[49] German official I (Interview 19).
[50] Czech official (Interview 10).
[51] European Commission official (Interview 14).

complex should not be interpreted as a sign of a clear ideational shift from neoliberalism to some sort of neo-mercantilism or developmentalism. Instead, the quotes transcribed above generally point to the need to analytically situate the emergence of this supranational industrial policy complex in an evolving context of global competition which has become strongly marked by the economic rise of China and the consequent development of a more 'decentred' world economy characterised by a growing politico-economic rivalry between the US and China as well (Alami and Dixon 2020b; Arboleda 2020; Lavery and Schmid 2021; Van Apeldoorn and De Graaff 2022).

In addition, owing to the potential inter-referentiality and multiplier effects of industrial policy practice (as outlined in Chapter 3), these institutional and policy developments in the EU cannot be decoupled from wider movements towards the reinvigoration of industrial policy and cognate 'muscular forms' of state intervention in different parts of the world economy – that is, what Alami and Dixon (2021) refer to as the 'new state capitalism'. Clearly, among EU actors, 'there is an awareness of what other global competitors are doing and how much money they put in developing new technology'[52]. And this awareness feeds into industrial policy practice – including at the level of the choice of the sectoral priorities. Indeed, once situated in a broader context, it becomes clear many of the sectoral priorities of these industrial policy efforts are in no way peculiar to the EU. On the contrary, there are many resemblances between the techno-industrial priorities which are found at the core of the EU's renewed supranational industrial policy complex and those prioritised by other, non-EU countries in their own synchronous industrial policy efforts.

In the EU, as noted, approved IPCEIs have so far focused on microelectronics, batteries, and hydrogen technologies. On the other side of the Atlantic, the Biden Administration's executive order and subsequent report on 'America's supply chains' also identified microelectronics ('semiconductor manufacturing and advanced packaging') and batteries ('high-capacity batteries, including electric-vehicle batteries') as two of the four key supply chains for the US economy (The White House 2021a, 2021b). Moreover, the other two 'supply chains' considered particularly important for the US economy where 'critical minerals', for which an industrial alliance has already been set up in the EU, and pharmaceuticals, for which the possibility of an IPCEI has already been mentioned. Besides, despite not being included among the four 'America's supply chains', hydrogen technologies cannot be said to be entirely absent from US industrial policy either as they feature alongside other energy technologies such as batteries, carbon capture, and nuclear in the US

[52] German official I (Interview 19).

Department of Energy's share of the 2021 Bipartisan Infrastructure Deal (US Department of Energy 2021).

Japan's 2021 Green Growth Strategy features batteries, hydrogen, and semiconductors as priority areas for industrial policy action, among a comprehensive list of fourteen 'industrial fields'. Indeed, in this document, the Japan government also claims to having been the first in the world to publish a hydrogen strategy when it published its Basic Hydrogen Strategy in 2017 (Ministry of Economy 2021a). In addition, the Japanese government published in 2021 a strategy announcing special industrial policy measures geared towards semiconductors and data centres and clouds (Ministry of Economy 2021b) – which, as mentioned in the previous section, are precisely the two sectors for which future IPCEIs, currently in preparation, have already been publicly announced. Pledges to continue and even increase the ongoing industrial policy efforts to support developments in batteries, hydrogen, and semiconductors also figure prominently in South Korea's Ministry of Trade, Industry, and Energy 2022 work plan (South Korean Ministry of Trade 2021). And, indeed, these three techno-industrial sectors have also been extensively supported by many of China's industrial policies (Fuller 2019; VerWey 2019; Yeung 2019; Li, Shi and Phoumin 2022), which the 'America's supply chains' report describes as especially 'aggressive' (The White House 2021a: 11). Besides, the governments of Canada and the UK have also published national strategies on hydrogen. Canada's Hydrogen Strategy, published in 2020, aspires to turn Canada into 'a world-leading supplier of hydrogen technologies (Government of Canada 2020: VIII). Similarly, the UK's Hydrogen Strategy, published in 2021, believes that the UK 'is well positioned to be a world leader in low carbon hydrogen production and use' (HM Government 2021: 12).

Hence, rather than being European idiosyncrasies, the three sectors which have so far warranted the approval of an IPCEI – microelectronics, batteries, and hydrogen technologies – clearly have been attracting the selective gaze of industrial policymakers in many other parts of the world economy as well. To make sense of their allure, the next three sections examine in closer detail the political economy of each of the three sectoral priorities of the EU's emerging supranational industrial policy complex.

6.3 The political economy of microelectronics

The selective emphasis on microelectronics – or semiconductors (here, for the sake of simplicity, I use the two terms interchangeably) – tells a story of how the competitive accumulation imperative has been operating both through and underneath the digitalisation

of the economy and society. In hindsight, microelectronics has been a constant presence in the chronology of events covered in this thesis. Almost a decade before becoming the first sector to warrant an IPCEI in 2018, 'micro- and nanoelectronics, including semiconductors' had already been identified as a 'key enabling technology' by the European Commission in 2009 (Commission of the European Communities 2009b). Their status as a key enabling technology was also confirmed in the subsequent report of the High-Level Expert Group on Key Enabling Technologies (2011). And, in 2013, the European Commission published 'A European strategy for micro- and nanoelectronic components and systems', which stated that the latter were 'essential for growth and jobs in the European Union' and, thus, warranted 'a strategy to strengthen the competitiveness and growth capacity of the micro- and nanoelectronics industry in Europe' (European Commission 2013: 2). The EU's share of global production had been declining from 15% in the 1990s to just below 10% in 2011 as manufacturing shifted to Asia (European Commission 2013; Electronic Leaders Group 2014).

Microelectronics attracted the attention of policymakers because they displayed both high value and value-enabling characteristics. First, not only did they already 'underpin a significant part of the worldwide economy', but the prospects of continued digitalisation of products and services into the future strongly suggested that the market for this sector would continue to expand (European Commission 2013: 3). Second, this was a very innovative industry, constantly producing 'smaller and faster' electronic components (European Commission 2013, 2018e). And, third, the dense linkages of this industry, whose products can be found 'in almost all electronic devices we use every day – be it your phone, computer, washing machine, or your car' and underpin '[e]very connected device, every modern machine, all our digital services' (European Commission 2018e), made it a most promising source of ripple effects throughout the economy, enabling the process of value generation elsewhere through digitalisation. Indeed, the financing member states of the 2018 IPCEI on microelectronics went so far as to claim that '[t]he versatility of microelectronics components makes this technology *indispensable* for *every* downstream market and across *all* industrial sectors' (European Commission 2018d: 6, emphasis added). New technological developments in microelectronics are expected to induce productivity gains in virtually all other sectors, namely by enabling the adoption of data-intensive automation systems (e.g., the 'Internet of Things', robotics), as well as create opportunities for profitable investments in new areas, such as in autonomous vehicles and other 'smart' consumer goods and services

(Electronic Leaders Group 2014; European Commission 2018d; Strategic Forum for Important Projects of Common European Interest 2019).

Besides endowing it with an immanent allure, the sector's dense linkages imply there is a vast network of businesses which are invested in this sector's continued reproduction. This economic network offers, *in potentia*, a broad political constituency for measures that support the expansion and development of the semiconductors industry. Particularly in moments of crisis, the receding tide can reveal this political constituency in what would otherwise pass as a network of arm's-length market transactions. This was clearly the case with the onset of a 'global chip shortage' in 2020-21. Political constituencies emerged out of existing economic networks and business groups mobilised in favour of state support to the semiconductors industry so that production could be expanded. The president of the European Automobile Manufacturers' Association, Oliver Zipse (who is also the chairman of the board of management at BMW), wrote a letter to Commissioner Thierry Breton to 'reiterate [the association's] strong support for a concerted European initiative to enhance the EU's future semiconductor manufacturing capability' (European Automobile Manufacturers' Association 2021). Similarly, in the US, the Semiconductor Industry Association was joined by 'a broad coalition' of sixteen other sectoral or cross-sectoral business interest groups in signing a letter which urged President Joe Biden to 'reinvigorate semiconductor manufacturing in the United States and increase semiconductor research' (Semiconductor Industry Association (SIA) 2021).

Inter-state competition in the microelectronics sector manifests itself in industrial policy efforts to attract and hold mobile investments. This can be seen expressly reflected in the text of the European Commission's decision on the 2018 IPCEI on microelectronics. According to the financing member states, some of the industrial firms applying to benefit from state aid under the IPCEI framework had 'brought forward certain deliberations of relocation of their activities outside the EU due to, for example, some offers they allegedly received from third countries or due to lower operational costs in those third countries locations, where they already operate certain production facilities' (European Commission 2018d: 88). The threat of relocation and investment withdrawal demanded industrial policy action. Indeed, owing to the global scope and mobility of the microelectronics industry, similarities among the industrial policy efforts of different countries and regions of the world economy do not necessarily stop at the level of identifying this sector as a priority only, but sometimes extend all the way down to the very same firms benefiting from selective support across these different jurisdictions.

For example, there are a few overlaps among the firms that comprise the business constituencies for EU and US industrial policies in relation to semiconductor manufacturing and research. In the US, these industrial policies, most notably the CHIPS for America Act, a bipartisan legislative package offering government subsidies to underwrite the costs of investments in the design and production of semiconductors within US borders, received public support from the Semiconductors in America Coalition (SIAC), an ad hoc alliance of businesses in the semiconductor industry and supply chain, in a letter written to US Congressional leaders on 28 July 2021. In that letter, SIAC 'urge[d] Congress to support funding for incentives for semiconductor manufacturing and increased semiconductor research'. The letter stressed that additional government support was imperative '[b]ecause U.S. leadership in this critical technology is at risk in the face of global competition and investment by our competitors' and claimed that this support would, in turn, contribute to 'promote economic growth, enhance U.S. technology leadership, strengthen national security, and make our supply chains more resilient' (Semiconductors in America Coalition (SIAC) 2021). The letter's long list of 63 signatories, which reads like a veritable who's who of the whole electronics supply chain, includes tech giants such as Amazon Web Services, Apple, Google, or Microsoft. It also includes four industrial firms which, in the EU, are among the aid beneficiaries of the first Microelectronics IPCEI, namely GlobalFoundries, Infineon, NXP, and Soitec (European Commission 2018d, 2021f).

Furthermore, Intel, another of the signatories of SIAC's letter to the US Congress, has also been circling the preparations for a second Microelectronics IPCEI in the EU. The case of Intel is particularly interesting as an illustration of the family resemblances across the industrial policies on both sides of the Atlantic. On the European side, Intel executives meet with EU leaders such as French President Emmanuel Macron, Italian prime minister Mario Draghi, and European Commissioner for Internal Market Thierry Breton to discuss a portfolio of investments in semiconductor production facilities across different EU member states in exchange for public financial support, potentially as part of a second IPCEI on microelectronics (Financial Times 2021a; POLITICO 2021c; Reuters 2021a). On the US side, Intel executives claim to be 'leading the efforts to restore U.S. semiconductor manufacturing leadership' as they announce investments in new production facilities in Ohio, whose 'scope and pace… will depend heavily on funding from the CHIPS Act' (Intel 2022). The same company positions itself to benefit from the renewed industrial policies efforts on both sides as each side attempts to increase domestic manufacturing capacity. Companies with transnational operations can be found partaking in the industrial policies of different

countries and regions, all the while promising them 'autonomy', 'leadership', 'security', or 'sovereignty' in return.

6.4 The political economy of batteries

Alongside microelectronics, batteries now clearly stand out as another one of the main technological priorities of the EU's emerging supranational industrial policy complex. They motivated the creation of the first European industrial alliance in 2017 and gave rise to two IPCEIs which were approved in quick succession in December 2019 and January 2021. However, unlike microelectronics, high-capacity batteries were not explicitly regarded as a technological priority at the early stages of the process that eventually culminated in the creation of the IPCEI state aid framework. They were not recognised as a 'key enabling technology' in either the Commission's 2009 communication or the High-Level Expert Group's 2011 report (Commission of the European Communities 2009b; High-Level Expert Group on Key Enabling Technologies 2011). This, clearly, did not prevent them from being labelled as one a few years later at the launch of the European Battery Alliance by the then Commission Vice-President for Energy Union Maroš Šefčovic (European Commission 2017b). The conceptual boundaries delimiting 'key enabling technologies' are malleable, so the term is susceptible to rhetorical appropriations. Yet, the fact that microelectronics has consistently been referred to as a 'key enabling technology' over time while batteries have not also hints at a more substantive difference between the two. Whereas the former is generally recognised as a focal point in a very dense web of sectoral linkages through which it can produce a ripple effect, in the case of the latter there is one connection that clearly predominates over the others – namely, the connection it has with the automotive industry. In this regard, the opening statement of the European Commission's webpage on the European Battery Alliance is interesting because it speeds right through this tension when it describes batteries as 'a key enabling technology, essential to the automotive sector's competitiveness'[53].

To be sure, high-capacity batteries can have other important applications besides powering electric vehicles. Most notably, they can be used as stationary energy storage systems in the electricity grid. Still, however important it may be, the projected market size for batteries for this type of application is dwarfed by that for electric vehicles (European Commission 2019a; International Energy Agency 2021; The White House 2021a). The allure

[53] https://ec.europa.eu/growth/industry/strategy/industrial-alliances/european-battery-alliance_en (accessed: 16 February 2022).

of high-capacity batteries as an industrial policy priority is, therefore, largely derived from the extant economic significance of the automotive industry as the latter gradually adjusts to the imperative of carbon neutrality. Even before the recent pivot of industrial policy to the development of batteries for electric vehicles, political economists had observed how historically the economic centrality of the automotive industry has interacted with its political power in self-reinforcing ways, thus often granting car firms access to state resources, whether directly or indirectly. Matthew Paterson (2000: 260; 2007), for example, has argued that the automotive industry, in its current dimension, cannot be understood as the product of 'capitalist enterprise' alone. Instead, it owes a lot of its development to state support awarded in a context of inter-state competition in which the automotive industry was 'seen ubiquitously as a key industry in ensuring continued accumulation'. Likewise, examining what they call 'the political economy of car dependence', Mattioli et al. (2020: 4) conclude that this industry's 'sheer scale and economic significance', its 'strong economic linkages to other sectors', and the high degree of industrial concentration which results from 'large economies of scale' bolster 'the industry's political clout' and make it a prime candidate for state support from governments which find themselves dependent 'on the jobs, growth, and state revenues it provides', as well as vulnerable to the threat of relocation and investment withdrawal.

One can find significant overlaps between this analysis and the way the automotive industry is portrayed within EU policymaking circles. In the Strategic Forum's 2019 report on 'strategic value chains', the automotive industry is deemed 'crucial for the prosperity of the EU' (Strategic Forum for Important Projects of Common European Interest 2019: 24), an expression that the report openly borrows from DG GROW's webpage dedicated to the automotive industry[54]. Although the report and the webpage do not always seem to agree on the exact numbers, they nonetheless agree on what makes the automotive industry so 'crucial': its size, measured both in terms of employment and contribution to GDP, and the 'important multiplier effect on the economy' it has by stimulating upstream and downstream industries. It does not come as a surprise, then, that following the 2008 financial crash, the automotive industry stood out as 'one of the main beneficiaries' of emergency state aid measures (European Commission 2011: Box 7). The two recent IPCEIs are, nonetheless, quite different from emergency support given to crisis-hit car manufacturers. In fact, despite the presence of a few major car brands (such as BMW, Fiat Chrysler Automobiles, or Tesla), most of the direct aid beneficiaries in these two projects are not car manufacturers themselves (more details on the participating firms in each IPCEI are provided in Chapter 7).

[54] https://ec.europa.eu/growth/sectors/automotive-industry_en (accessed: 17 February 2022).

Interestingly, in October 2018 – so, halfway between the creation of the European Battery Alliance and the approval of the first IPCEI on batteries, the European Commission published a memo which ruled out, in all but name, the possibility of a (neo)liberal approach to the development and manufacturing of high-capacity batteries. The memo asked the question 'Why does the EU need to produce batteries instead of importing them?', and confidently answered that 'public investment in developing the battery industry is a no-brainer' (European Commission 2018c). This conclusion was supported by two main arguments. One of them was explicitly about the automotive industry. Namely, the imperative of ensuring the continued 'global competitiveness' of the EU's automotive industry in light of its structural importance to the EU economy. As the memo put it, 'the car industry needs batteries to stay globally competitive and a globally competitive car industry is very important for the EU'.

The other argument, while not directly about the competitiveness of the EU-based car manufacturers, also evoked the close links between that industry and the battery industry. The argument was that, looking ahead, the demand for batteries 'is expected to surge' and these 'will represent a high proportion of the value added in the car of the future', so the EU should strive 'to retain as much of the value creation in Europe as possible'. At its core, this is an argument about what should be the relative position of the EU in the future of the global battery industry. And the choice presented in the memo is between 'taking the lead in this sector', which 'can be a major source of jobs, economic growth and investment', or remaining reliant on batteries 'from foreign, mainly Asian suppliers', a situation which 'puts the EU at a competitive disadvantage'. A similar argument was reiterated by a European Commission official in an interview:

> Well, if you think about batteries and you think about IPCEI, at the moment the whole thing started, we were falling behind the Chinese quite significantly. So, either you accept it, and you say "okay, we are [behind?], not a single company can catch up". So that means that in the future automobile market, I don't know, 20-30% of the value of the electric car will be taken by the Asian batteries and we would be squeezed out of it, meaning losing jobs, etc. etc. etc. "Should we do something about it or not?". The answer was "yes, let's try to do something about it, because this is important, it is a huge sector that is growing, it is strategic for the EU economy – without putting any barriers [to international trade or foreign investment]".[55]

Similarly, a 2019 report by the European Commission reaffirms that the production of batteries within the EU is necessary to 'prevent a technological dependence on [its]

[55] European Commission official (Interview 14).

competitors and capitalise on the job, growth and investment potential of batteries' (European Commission 2019a: 2). This economic potential is inextricably linked to prospective developments in the market for electric vehicles. According to sources cited in the report, the number of electric vehicles on the road, globally, is expected to grow from 4 million in 2018 to up to 900 million by 2040, with batteries estimated to account for 40% of the value of an electric car (European Commission 2019a).

In sum, what these arguments show is that the prioritisation of batteries in the EU's supranational industrial policy efforts rests on a twofold recognition of the linkages between high-capacity batteries and the automotive industry. On the one hand, the production of batteries in the EU is meant to secure the supply of an input which is required for the reproduction of a 'globally competitive' automotive industry in the EU. In this case, batteries are selected for their value-enabling properties. In the end, however, as one interviewee pointed out, there is no guarantee that every EU-based car manufacturer will decide to procure batteries produced in the EU[56]. Nonetheless, provided it increases the global supply of batteries (and, in that process, possibly lowers their price too), EU-based car manufacturers still stand to benefit, however indirectly, from the expansion and multiplication of battery factories endorsed by industrial policy in the EU. On the other hand, regardless of its direct or indirect impact on the competitiveness of EU-based car manufacturers, the production of batteries in the EU is regarded as an opportunity to capture a share in a global market which is expected to grow dramatically as the automotive industry adapts to the requirements of decarbonisation worldwide. Hence, while deriving its allure from its linkages with the automotive industry, the battery industry is simultaneously perceived as a significant site of capital accumulation itself, thus inviting inter-state competition for a greater relative share of the value it will likely generate in the future. In this case, batteries are selected for their high value properties.

Like in microelectronics, in the battery sector there are also examples of industrial firms whose transnational investments and operations leave a trail of family resemblances across different geographies. According to a European Commission official, the EU's supranational industrial policy efforts in this area are not meant to exclude 'foreign companies that invest in the EU'[57]. Indeed, the US auto manufacturer Tesla stood out as one the beneficiaries of German state aid in the second Battery IPCEI (European Commission 2021e), as the company prepared to open its Berlin 'Gigafactory', the first European node in

[56] Guido Nelissen, representative of industriAll (Interview 11).
[57] European Commission official (Interview 14).

the company's transnational operations, which already included other 'Gigafactories' in Nevada, New York, and Shangai. However, subsequent delays in the opening of its 'Gigafactory' in Berlin led Tesla to move some of the investments in battery technologies which were planned for the Berlin plant to other locations. Consequently, the company's investments in Germany could no longer qualify as the 'first industrial deployment' of those battery technologies, as required by the IPCEI framework, and the company had to forfeit the corresponding IPCEI subsidy (Financial Times 2021b). A situation which further underscores the transnational mobility of these investments.

Another telling example is that of SK Innovation. When this South Korean conglomerate announced the opening of its third battery plant in Hungary, the investment was celebrated by the European Battery Alliance as a clear sign of 'Europe's position as the global hotspot for the battery industry' (InnoEnergy 2021), something for which the European Battery Alliance took credit. Although, unlike Tesla's investment in Germany, SK Innovation's investment in Hungary was never directly part of either the first or the second Battery IPCEI, it still benefited from state aid awarded by the Hungarian authorities, and approved by DG COMP, under the regional aid guidelines (European Commission 2021d, 2022b). In addition to its South Korean and Hungarian facilities, SK Innovation also operates battery facilities in China, where it is expanding its presence (electrive.com 2021b), and in the US, where the possibility of the company withdrawing its investments following an unfavourable decision on an intellectual property rights dispute became an important political topic in early 2021 (CNBC 2021; POLITICO 2021a; Reuters 2021b). The industrial policies of China, the EU, South Korea, and the US have all, in one way or another, prioritised the technological development and manufacturing of high-capacity batteries within their borders. And a transnational firm like SK Innovation can be found operating across all of these jurisdictions and on the receiving end of all these industrial policy efforts.

6.5 The political economy of hydrogen

Hydrogen technologies were the third sector to receive selective state support under the IPCEI state aid framework. Like batteries, they had not been explicitly considered a key enabling technology at the outset of this process, either by the European Commission (Commission of the European Communities 2009b) or the High-Level Expert Group (High-Level Expert Group on Key Enabling Technologies 2011). But, again like batteries, hydrogen technologies' initial absence from this formal nomenclature did not prevent them from ten years later being designated as a 'new key enabling technology' in the press release of the

German government which, in December 2020, announced the imminent launch of an IPCEI on hydrogen technologies (German Federal Ministry for Economic Affairs and Climate Action 2020). In contrast to both microelectronics and batteries, hydrogen technologies also have the peculiarity of being the first project for which preparatory talks and expressions of interest took place within the institutional framework of the Strategic Forum. For someone who served as a sherpa to the Strategic Forum, there is little doubt that hydrogen is 'really' a 'critical technology' in the context of climate change[58]. The reasons for this can be traced along a dense web of linkages in which hydrogen is expected to serve as a central hub in a decarbonised economy – or, as often put, a 'hydrogen economy' (Cefic 2019; Strategic Forum for Important Projects of Common European Interest 2019; European Commission 2020).

In July 2020, five months after the final meeting of the Strategic Forum, the European Commission published 'A hydrogen strategy for a climate-neutral Europe' (European Commission 2020). With this communication, the Commission formally launched the European Clean Hydrogen Alliance, whose main tasks would be 'to identify and build up a clear pipeline of viable investment projects' and to 'facilitate cooperation in a range of large investment projects, including IPCEI projects, along the hydrogen value chain' (European Commission 2020: 8). The communication alluded to hydrogen's 'many possible applications across industry, transport, power and buildings sectors' (2020: 1) – an immanent web of linkages which is yet to be fully actualised. The main applications mentioned in the communication include the incorporation of hydrogen as a substitute for fossil fuels in hard-to-electrify processes in the steel and chemical industries, the use of hydrogen in means of transport which are also considered hard to electrify (such as heavy-duty road vehicles, some rail networks, shipping, and aviation), and the use of hydrogen for energy storage. The mirror image of all these downstream linkages along which hydrogen flows as a critical input because of the carbon neutrality imperative is an untapped global market for hydrogen and hydrogen technologies. In this regard, the European Commission's communication noted that the EU 'is highly competitive in clean hydrogen technologies manufacturing and is well positioned to benefit from a global development of clean hydrogen as an energy carrier'. Ultimately, 'the emergence of a hydrogen value chain' in the EU 'could employ up to 1 million people, directly or indirectly' (2020: 2). In sum, hydrogen is perceived as both a critical input required for the continued reproduction of, and value generation in, some industries in the face of the carbon neutrality imperative (e.g., chemicals, steel) and, owing to these linkages, a growing

[58] Member of the Sherpa Group (Interview 16).

global market in which the EU should competitively position itself to capture a share of its value.

In contrast to high-capacity batteries, hydrogen is potentially linked to a wider array of downstream applications than electric vehicles alone. Yet, unlike microelectronics, which is overwhelmingly defined in terms of its downstream effects (namely, the digitalisation of all other sectors), when it comes to hydrogen, the upstream linkages are also very relevant – and, politically, much more divisive than its downstream linkages, in turn creating legitimation challenges to industrial policy efforts which target hydrogen. This is because hydrogen comes in different colours, each denoting a different production method using different inputs. Currently, most hydrogen (around 96%) is produced using fossil fuels – either natural gas or coal. These are respectively called 'grey hydrogen' and 'brown hydrogen' (Howarth and Jacobson 2021). And neither can serve to meet the imperative of carbon neutrality. However, much more relevant in these recent industrial policy initiatives targeting hydrogen are the two other colours in the hydrogen palette: blue and green. Although the European Commission does not use this colour classification scheme, both 'blue' and 'green' hydrogen are included in its strategy. In essence, 'blue hydrogen' refers to hydrogen which is still produced from fossil fuels but in combination with (highly controversial) technologies of carbon dioxide capture and storage to mitigate the emissions involved in its production. Alternatively, 'green hydrogen' is that which is produced through the electrolysis of water using electricity which has itself been generated through renewable sources (Howarth and Jacobson 2021). Hence, a crucial difference between these two colours of hydrogen lies precisely in their different upstream linkages: although both promise to meet the imperative of carbon neutrality, 'blue hydrogen' is still closely entangled with the fossil fuel industry, whereas 'green hydrogen' is not.

This is where hydrogen becomes a source of greater disagreement and contestation and where it faces legitimation problems. For example, in December 2020, at the end of Germany's presidency of the Council of the EU, twenty-one EU member states plus Norway signed a 'Manifesto for the development of a European "Hydrogen Technologies and Systems" value chain' in preparation of a future IPCEI (German Federal Ministry for Economic Affairs and Climate Action 2020). Yet, five signatories – namely, Austria, Denmark, Luxembourg, Portugal, and Spain – published a separate joint letter clarifying their position. In that letter, the five governments stressed that an IPCEI on hydrogen 'should exclusively refer to hydrogen from renewable energy sources', since, for them, this was 'the only long-term sustainable solution to achieve climate neutrality by 2050' (Gewessler et al.

2020). Besides leading to disagreements among member states, hydrogen-related industrial policy initiatives in the EU have also attracted significant criticism from anti-corporate lobbying campaign groups owing to the link between 'blue hydrogen' and the fossil fuel industry (see, e.g., Balanyá et al. 2020; European Network of Corporate Observatories and The Fossil Free Politics Campaign 2021). For these groups, state support for the development of hydrogen technologies and systems is, first and foremost, a way of 'greenwashing' state support to the fossil fuel industry. Conversely, business interest associations representing, upstream, oil and gas producers (IOGP 2020a, 2020b), and, downstream, the chemical industry (Cefic 2019) and the steel industry (EUROFER 2020) have requested that EU policymakers adopt a 'technology-neutral' approach to hydrogen production in which 'green hydrogen' does not take precedence over 'blue hydrogen'. For oil and gas producers, 'technological neutrality' allows them to participate in the burgeoning hydrogen market while avoiding stranded assets in gas production. In turn, for hydrogen consumers in the chemical and the steel industries, 'technology neutrality' is a way of ensuring that the hydrogen they use (or will use) as an input in their industrial processes can be as cheap as possible.

Evidence of the dense web of linkages-turned-constituencies sustaining the prioritisation of hydrogen can be found in the membership of Hydrogen Europe, the business interest association described as 'the most influential player in the hydrogen policy debate' by anti-corporate lobbying campaign groups (Balanyá et al. 2020: 9). Hydrogen Europe was one of the business associations represented in the Strategic Forum (see Table 3), and a very active one in its meetings. This association's growing membership is currently at 332 members, of which 272 are categorised as 'industry corporate' members, including very large companies such as Air Liquide, Airbus, Alstom, ArcelorMittal, BMW, Bosch, BP, E.ON, General Electric, Iberdrola, Michelin, Shell, Siemens, Solvay, Thyssenkrupp, TotalEnergies, Toyota, Umicore, or Volvo, among others[59]. Underpinned by the (potentially) dense linkages of hydrogen as a technology – both downstream and upstream, Hydrogen Europe emerges as a truly cross-sectoral business interest association.

6.6 Concluding remarks

'Important projects of common European interest' have existed, *de jure*, in EU state aid rules ever since the Treaty of Rome. But, *de facto*, these have only become an instrument of

[59] https://hydrogeneurope.eu/members-locations/ (accessed: 22 February 2022).

industrial policy practice following the introduction of the IPCEI state aid framework in 2014. Eight years after the introduction of the framework, the expression 'important projects of common European interest' is as alive as it has ever been in the history of European integration and IPCEIs – the projects, not just the expression – have become a central instrument of an emerging supranational industrial policy complex, comprised of four approved projects (totalling a gross investment volume of €42.7 billion, of which 31% is covered by state aid) in three industrial sectors (microelectronics, batteries, and hydrogen technologies), at least another two projects in preparation, eight European industrial 'alliances', and a dedicated industrial policy committee (the Strategic Forum, which operated between 2018 and 2020). As opposed to signalling a wholesale ideational shift away from neoliberalism and towards neo-mercantilism or developmentalism, this emerging supranational industrial policy complex appears as the localised manifestation of broader dynamics – most notably, the 'decentring' of the world economy with the rise of China (Lavery and Schmid 2021) and the 'contemporary advent of state capitalism' (Alami and Dixon 2021) – as well as an ongoing, interactive practical response thereto.

Accordingly, two strong themes dominate the sectoral priorities revealed across the three components of this supranational industrial policy complex: a *digital* theme and a *green* theme. Indeed, with few exceptions, the sectors or technologies which have been selectively prioritised can be linked to notion of a digital transformation or a green transformation of the economy and society. This applies to IPCEIs – both approved and in preparation – as well as to the 'strategic value chains' prioritised by the Strategic Forum and many of the European industrial alliances. Yet, neither the renewal of industrial policy nor the choice of these specific technologies is peculiar to the EU. A brief overview of the industrial policies of other advanced capitalist economies shows there are strong family resemblances among their technological priorities. The similarities are such that, sometimes, the same (transnational) firms can be found weaponising, partaking in, or positioning themselves to benefit from, the industrial policies efforts of different countries and regions.

More specifically, with IPCEIs on microelectronics, batteries, and hydrogen technologies, the EU is attempting to strengthen its competitive position in a global race to capture as much as value as possible form burgeoning global markets for the products of these high value sectors. In addition, the development of these industries is expected to also enable value generation through their linkages. Innovation in microelectronics is expected to induce productivity gains, not least in the services sector (Moraitis 2021), and create new investment opportunities by enabling further digitalisation and interconnectivity. Batteries

are closely intertwined with the reproduction of the automotive industry in the face of the carbon neutrality imperative. And hydrogen technologies are linked to the adaptation of a wide range of industrial sectors to the imperative of carbon neutrality too, downstream – most notably, steel, chemicals, and long-haul transportation – and, especially in the case of 'blue hydrogen', upstream – the fossil fuel industry. These linkages have not only been perceived by EU policymakers as economically important and worth supporting through industrial policy action but have also served as a basis for the mobilisation of wider business constituencies in favour of the provision of state support to these specific sectors.

In sum, there is clear evidence of continued industrial policy change in the EU since the introduction of the IPCEI state aid framework in 2014 enabled new industrial policy practices among EU member states. A new supranational industrial policy complex, centred around the newly operationalised notion of 'important projects of common European interest, has been emerging as a result of a gradual process of observation, adaptation, and response to an evolving global competitive context. But what does its emergence mean for European integration and intra-EU dynamics? Which member states stand to benefit the most from these developments inside the EU? These are the questions to which the next chapter turns.

7 The national geographies of the 'common european interest'

How truly 'European' are these new supranational industrial policy practices? Or, indeed, how truly 'European' could they possibly be given the EU's irreducibly pluri-national and heterogenous constitution? Which EU member states stand to benefit the most from them? And, ultimately, what does this mean for European integration and intra-EU dynamics? What can the experience with state aid to IPCEIs so far teach us in this regard? In addressing these questions, this chapter surveys the uneven industrial landscapes of the EU, maps the stratified geographies of national participation in IPCEIs, and examines ongoing controversies and tensions among different EU member states to reveal the national fractures that lie beneath this new supranational industrial policy practice.

The creation of the IPCEI state aid framework in 2014 expanded the opportunities for industrial policy action which are available to EU member states. Yet, as anticipated in Chapter 4, owing to the socioeconomic differences that exist among EU member states, changes to EU state aid control – such as the introduction of any new state aid framework – are unlikely to be neutral. Instead, they are bound to benefit some member states more than others. Accordingly, this chapter shows that, in the particular case of the IPCEI framework, the uneven industrial landscapes of the EU imply that access and, thus, the potential benefits of this framework are also likely to be unevenly distributed across the EU. Indeed, national participation in IPCEIs has, so far, been characterised by a significant degree of stratification: there are significant differences between the total number of IPCEIs in which different member states have participated as well as the volume of state aid that they have awarded to these projects and the number of firms to whom they have awarded it. So, the actual direct and tangible benefits of this novel supranational industrial policy practice have so far been unevenly distributed among member states. Against this background of unevenness and stratification, there are clear signs of ongoing contestation among EU member states over the merits of IPCEIs, primarily linked to concerns about how stratified participation in these projects, leveraging unequal industrial and fiscal capacities, may disproportionately bolster the competitive position of some EU countries vis-à-vis others.

The chapter is structured as follows. Section 7.1 begins by surveying the uneven industrial landscapes of the EU using different techno-industrial indicators. Then, Section 7.2 looks inside all four IPCEIs approved so far, as well as some IPCEIs which are

currently under preparation, and notes that, while the geographical reach of IPCEIs has been gradually and steadily expanding from project to project, participation in IPCEIs is still strongly stratified and centred around a clear and stable core of three member states – namely, France, Germany, and Italy. The following sections explore national tensions, concerns, and contestation over IPCEIs and the framework itself – first, inside the Strategic Forum for Important Projects of Common European Interest (Section 7.3) and, then, outside of it too (Section 7.4). Finally, Section 7.5 concludes with a summary and with some implications of these ongoing developments for the future of European integration and intra-EU dynamics.

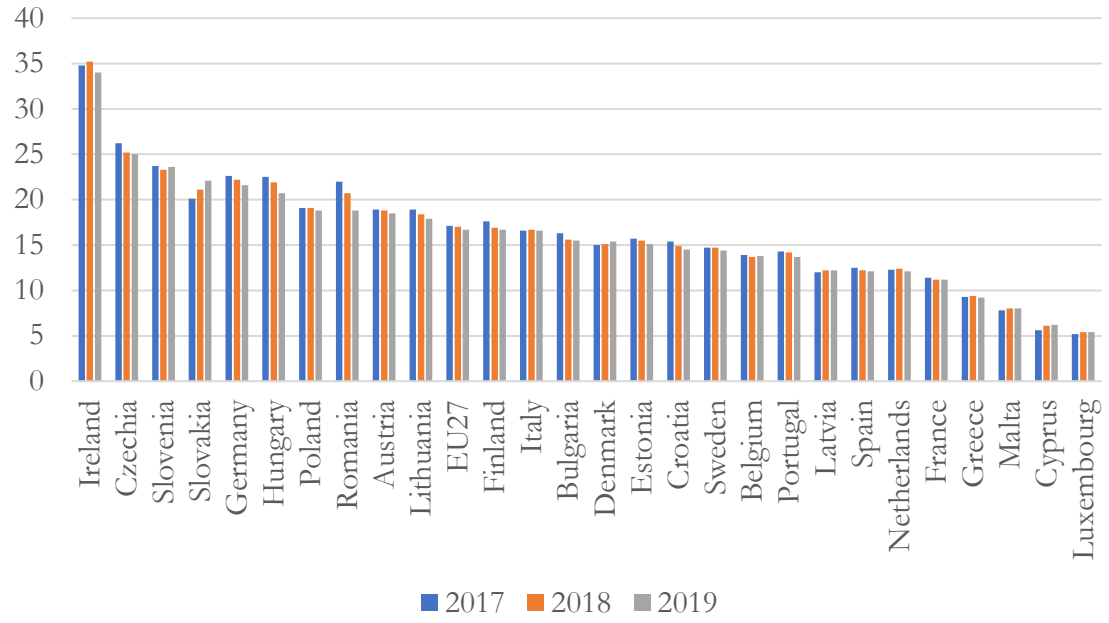
7.1 The uneven industrial landscapes of the EU

As documented in Chapter 5, the IPCEI framework was largely an offshoot of ongoing discussions at the EU level about 'key enabling technologies' and the need to develop new public financing instruments to attract private investments in these technologies across the 'valley of death' between the early research stage and the final commercialisation stage. Accordingly, the meaning of 'important projects of common European interest' came to be associated with large and technologically innovative industrial projects, encompassing both R&D&I and first industrial deployment activities. The introduction of the IPCEI framework opened up new opportunities for EU member states to engage in industrial policy interventionism. Yet, insofar as industrial landscapes are not completely even and homogenous across EU member states, these opportunities are also likely *not* to be evenly and homogenously distributed across all EU member states. The emphasis on large and technologically innovative industrial projects will be more attuned to the characteristics of some national productive structures than others as three characteristics stand out as particularly important in this understanding of 'important projects of common European interest': the degree of industrialisation, the degree of innovativeness, and fiscal capacity.

The degree of industrialisation of a national economy can be measured either in terms of the relative contribution of the manufacturing sector to value added or to employment. The share of manufacturing in total domestic value added differs considerably across EU member states (see Figure 3). The EU27 average is close to 17%. But it can be as high as almost 35% of total gross value added in Ireland (so, roughly twice the EU27 average), 25% in Czechia, and between 20% and 25% in Slovenia, Slovakia, Germany, and Hungary. Conversely, it can be as low as 5% of total gross value added in Luxembourg, 6% in Malta, 9% in Greece, 11% in France, and 12% in the Netherlands, Spain, and Latvia. Significant

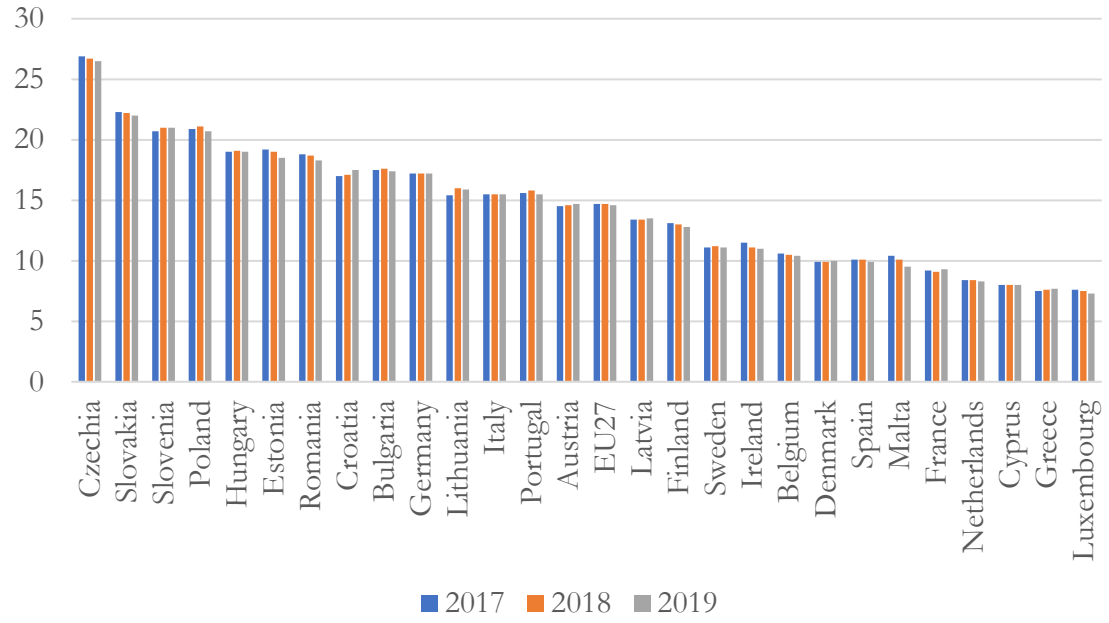
differences also exist among EU member states as regards the share of manufacturing in total domestic employment (see Figure 4). The EU27 average is close to 15%. But it is higher than 20% in Czechia, Slovakia, Slovenia, and Poland and lower than 10% in Luxembourg, Greece, Cyprus, the Netherlands, and France.

Figure 3. Manufacturing share of total gross value added (%), EU27, 2017-2019



Source: Eurostat.

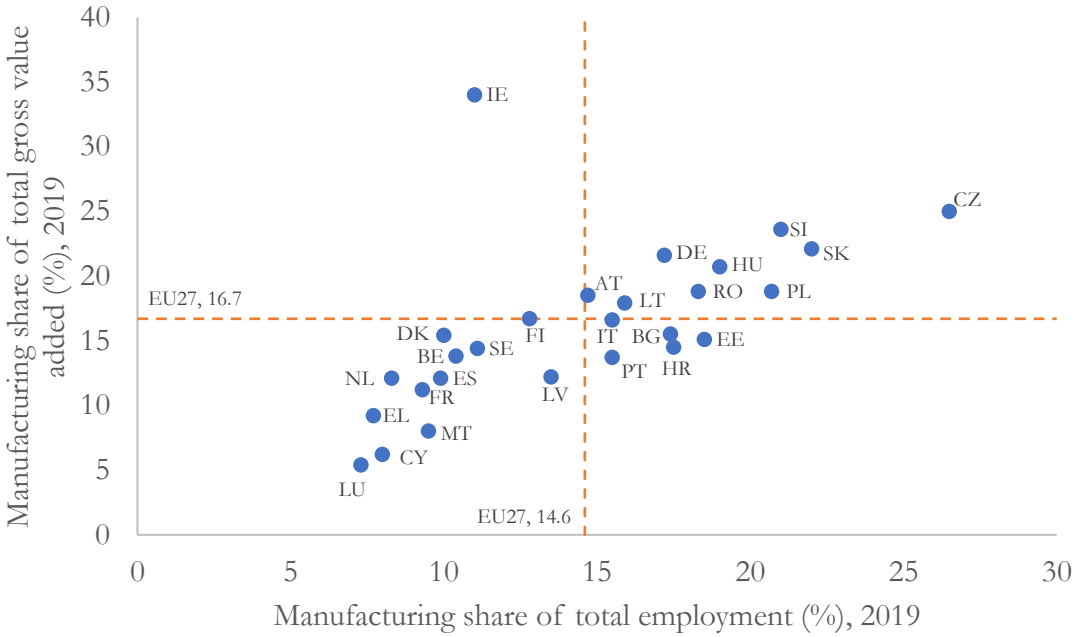
Figure 4. Manufacturing share of total employment (%), EU27, 2017-2019



Source: Eurostat.

In Figure 5, the shares of the manufacturing sector in total gross value added and in total employment for a single year (2019) are plotted on the same graph. Ireland stands out as a clear outlier, with the value-added share of manufacturing being three times the employment share. In total, then, there are 9 member states in which the share of manufacturing exceeds the EU27 average in both value added and employment: Austria, Czechia, Germany, Hungary, Latvia, Poland, Romania, Slovakia, Slovenia. These can be regarded as the most industrialised countries in the EU. Closely behind is Italy, which only falls outside of this group because its manufacturing share of value added is 0.1 percentage points below the EU27 average. This snapshot chimes with accounts of the concentration of EU manufacturing in what has been called the 'Central European manufacturing core' (Stehrer and Stöllinger 2015), encompassing Germany and Austria, as well the four countries of the Visegrád Group – that is, Czechia, Hungary, Poland, and Slovakia – which, through continued inward foreign direct investment flows have become heavily integrated into the value chains of German manufacturing lead firms, especially in the automotive and the electronics industries (Stehrer and Stöllinger 2015; Bohle 2018).

Figure 5. Manufacturing share of gross value added and employment (%), EU27, 2019

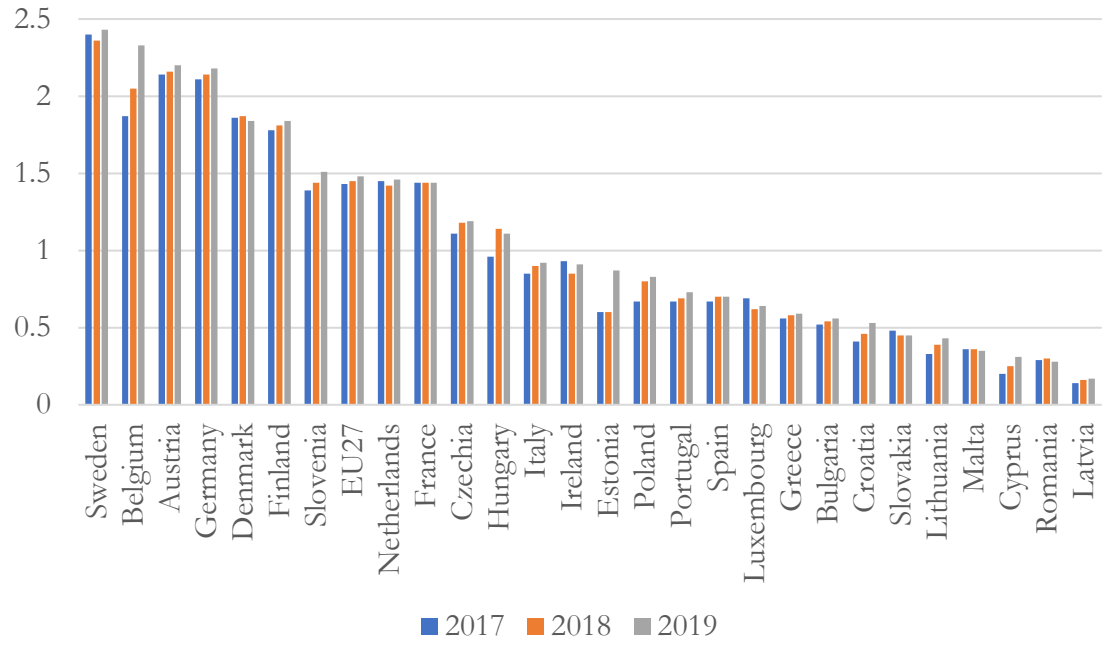


Source: Eurostat.

Country codes: Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE).

Besides the relative degree of industrialisation, another aspect that needs to be taken into consideration is the degree of innovativeness of each country's productive structure. For the IPCEI framework is not geared to any kind of industrial project but only the R&D&I and first industrial deployments stages of highly innovative projects. A possible indicator of this degree of business innovativeness is the gross expenditure on R&D performed by the business enterprise sector (regardless of the source of funds – i.e., whether these are subsidised or not) as a percentage of GDP. This indicator gives a measure of how far the firms operating in a given country engage in R&D activities. As shown in Figure 6, there are also considerable differences among EU member states when it comes to the degree of innovativeness of domestic businesses. The EU27 average is close to 1.5% of GDP. Sweden, Belgium, Austria, and Germany can be found clearly above the average (more than 2% of GDP), followed by Denmark and Finland (around 1.8% of GDP). At the other end of the distribution are Latvia, Romania, Cyprus, Malta, Lithuania, and Slovakia, in all of which R&D performed by the business enterprise sector represents less than 0.5% of GDP. Importantly, three of these countries – namely, Lithuania, Romania, and Slovakia – were included above among the most industrialised EU member states. This shows how the degree of industrialisation and the degree of innovativeness are not necessarily correlated. The latter will depend on the more specific sectors and activities which predominate in the domestic productive structure. A relative specialisation of domestic industrial firms on the unskilled segments of the value of chains of mature industries will not be conducive to very high R&D intensities of business activity.

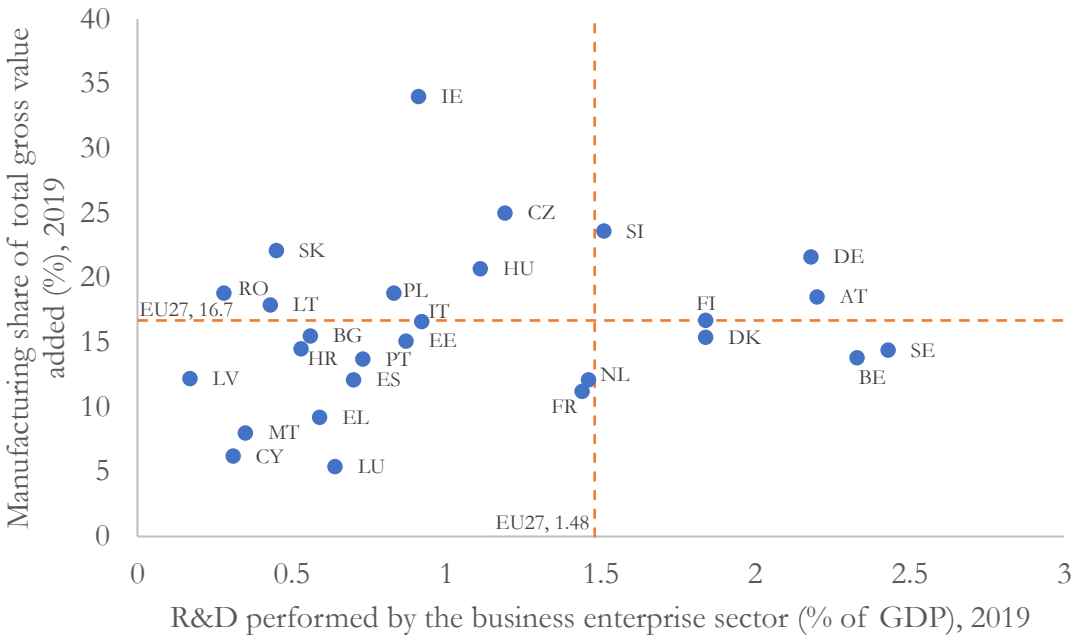
Figure 6. R&D performed by the business enterprise sector (gross expenditure as % of GDP), EU27, 2017-2019



Source: Eurostat.

Hence, to identify the member states whose productive structures combine both characteristics (that is, high degrees of industrialisation coupled with high degrees of innovativeness), Figure 7 plots the manufacturing share of gross value added and the R&D performed by the business enterprise sector (as a percentage of GDP) on the same graph for the year 2019. The closer a member state is to the top right corner of the figure, the more it fulfils these two conditions. There are different rungs here. First are Austria and Germany, both of which are clearly above the EU27 average on both dimensions. Second are Finland and Slovenia, which are clearly above the average on one of the dimensions but are only narrowly above the average on the other (in fact, when it comes to the share of manufacturing, the value for Finland and EU27 in 2019 is the same: 16.7%). Then, there is a third group of countries which are clearly above the average in terms of innovativeness and are not very far from the average in terms of industrialisation: Belgium, Denmark, and Sweden. By contrast, furthest from fulfilling any of these two conditions are Cyprus, Greece, Latvia, Luxembourg, and Malta.

Figure 7. Manufacturing share of total gross value added (%) and R&D performed by the business enterprise sector (% of GDP), EU27, 2019

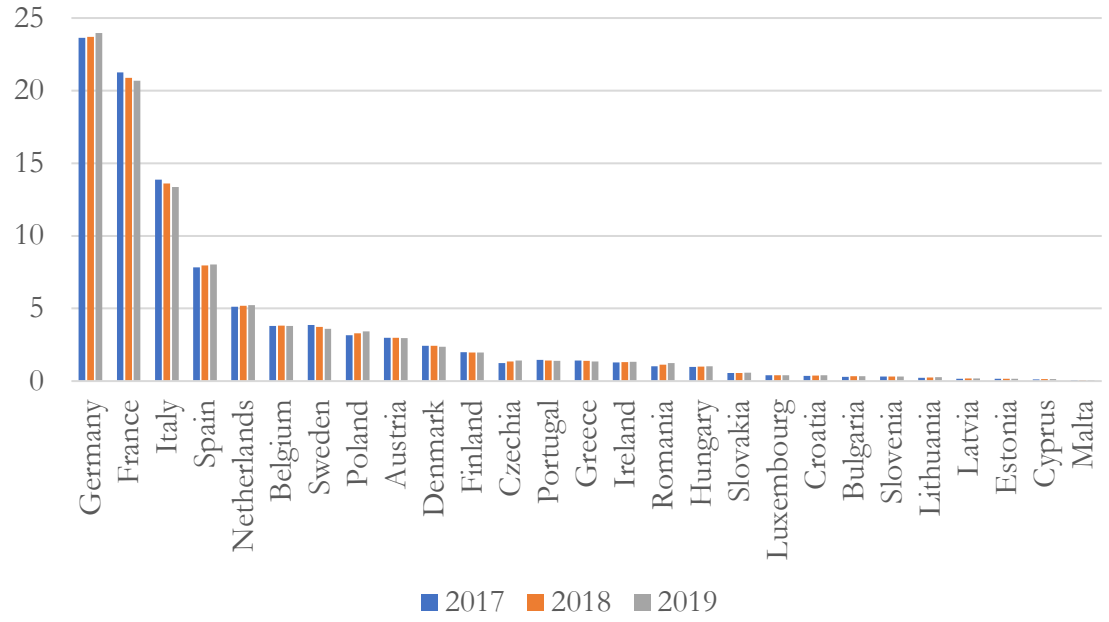


Source: Eurostat.

Country codes: Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE).

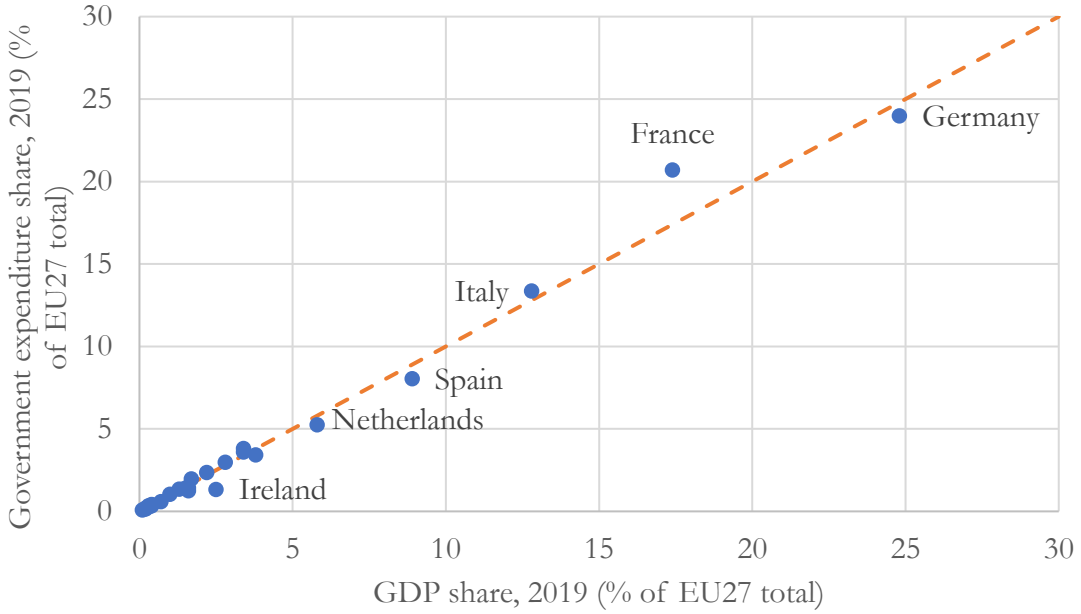
Finally, if 'important projects of common European interest' can be broadly defined as *large* and technologically innovative industrial projects, then a third dimension to consider is the fiscal capacity of each member state to support projects of a significant size. The overall levels of government spending differ widely among member states. Three member states alone – Germany, France, and Italy – account for almost 60% of all general government expenditure in the EU (see Figure 8). Unsurprisingly, these differences in fiscal capacity reflect the differences in economic size between member states. As Figure 9 shows, a given member state's share of EU27 GDP is usually a good proxy of its share in EU27 government spending, although different national approaches to fiscal policy mean that there can still be a few discrepancies between the two indicators. For example, France's share in government spending exceeds its GDP share by 3 percentage points, while Ireland's share in government spending is almost half of its GDP share.

Figure 8. General government expenditure (% of EU27 sum total), EU27, 2017-2019



Source: Eurostat.

Figure 9. Government expenditure share and GDP share, EU27, 2019



Source: Eurostat.

That differences in fiscal capacity may significantly – and even disproportionately – affect a given member state's government ability to exploit the opportunities opened up by changes in EU state aid control was eloquently demonstrated in the immediate aftermath of the outbreak of the COVID-19 pandemic. A temporary framework was introduced by the

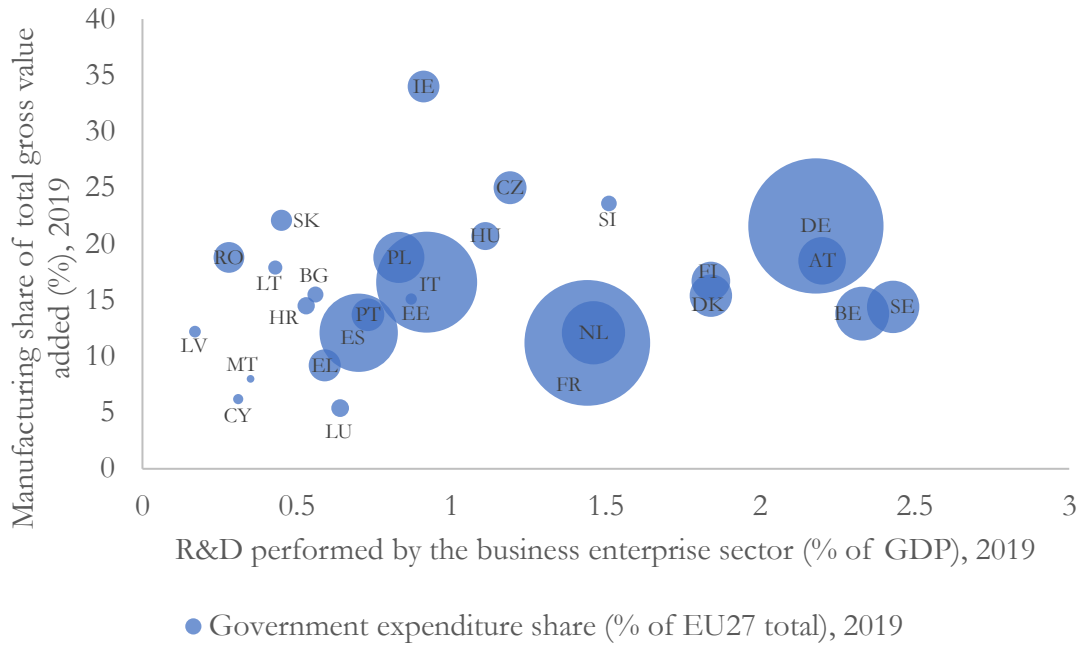
European Commission to enable a fast fiscal response from member states to the deteriorating economic situation, but this increased leeway to provide state aid was not equally exploited by all member states (de Pablo and Buendía 2020). For example, while Germany accounts for around 25% of EU27 GDP and 19% of its total population[60], the emergency state aid measures it adopted in the first months of the pandemic represented nearly 50% of the value of the measures adopted by all 27 member states. Indeed, the emergency measures of the three largest economies alone (Germany, France, and Italy) made up almost 80% of total emergency support adopted in the form of state aid (The Economist 2020) – a value which is also well in excess of their already significant 60% share in total EU27 government spending.

Thus, a topographical view of the uneven industrial landscapes of the EU can be obtained if, in addition to the manufacturing and business R&D coordinates (already plotted in Figure 7), the size of each national bubble is rendered proportional to the government spending share of each member state in the EU27 total (see Figure 10). The closer to the top right corner of the graph and the larger the size of its bubble, the better the fit between the concept of 'important projects of common European interest' *qua* large and technologically innovative industrial projects and the domestic productive structures of that member state – and, therefore, the more that member state can be expected, *prima facie*, to benefit from the industrial policy opportunities opened up by the introduction of the IPCEI framework. When the fiscal capacity dimension is added in, the opportunities this framework offers to Slovenia are revised downwards, whereas the positions of Italy and especially France are bolstered up, and the position of Germany becomes unmatched.

Owing to these differences among EU member states as regards their relative degrees of industrialisation and innovativeness as well as fiscal capacity, potential asymmetries can be expected when it comes to using the IPCEI framework as a basis for providing state aid. And, for this reason too, potential tensions among national governments can be anticipated over this state aid framework and the new industrial policy opportunities it creates. The actual asymmetries and tensions which have developed around the IPCEI framework and its use are explored in greater detail in the following sections of this chapter.

[60] Source: Eurostat.

Figure 10. Manufacturing share of value added, business R&D, and government expenditure, EU27, 2019



Source: Eurostat.

Country codes: Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE).

7.2 The stratified geographies of IPCEI

The first project to be developed and approved under the IPCEI framework was the IPCEI on microelectronics (henceforth, Microelectronics IPCEI). The project was approved by DG COMP in December 2018, but the preparatory work had begun two years before with a pre-notification in October 2016 by the four interested member states: Germany, which led the process and acted as the coordinator for the whole project[61], France, Italy, and the UK (European Commission 2018d). The project included twenty-seven participants across these four member states. Two participants were research organisations (namely, the electronics and information technology lab of the French Alternative Energies and Atomic Energy Commission in France and the *Fondazione Bruno Kessler* in Italy) and, owing to the non-commercial nature of their activities, the funds that these two participants received did not qualify as state aid (European Commission 2018d). So, in total there were twenty-five industrial firms which qualified as state aid recipients in this project. Germany gave state aid

[61] German official I (Interview 19).

to sixteen firms, France to six, the UK to four, and Italy to only one. Two firms received aid from more than one member state, namely ST-Microelectronics (both from France and Italy) and X-FAB (both from France and Germany) (see Table 4). As regards the volume of state aid, €820 million would come from Germany, €524 million from Italy, €355 million from France, and €48 million from the UK. Although initially only these four member states were involved in the project, in 2021 Austria would also join the project by pledging an additional €146.5 million in state aid to three beneficiaries: one firm which was already part of the project since 2018 as a recipient of German aid (Infineon) and two industrial firms which would be joining the project for the first time (AT&S and NXP Semiconductors) (European Commission 2021f).

Table 4. Microelectronics IPCEI: aid recipients and financing member states

Participating firm/consortium	Financing member state
3-D Micromac	Germany
AMTC	Germany
AP&S International	Germany
AT&S	Austria
AZUR Space Solar Power	Germany
Bosch	Germany
Carl Zeiss	Germany
Cologne Chip	Germany
CorTec	Germany
Elmos Semiconductors	Germany
Globalfoundries	Germany
ICS	UK
Infineon	Austria, Germany
IQE	UK
MURATA	France
Newport Wafer Fab	UK
NXP Semiconductors	Austria
OSRAM	Germany
Racyics	Germany
SEMIKRON	Germany
Sofradir	France
Soitec	France
SPTS Technologies	UK
ST Microelectronics	France, Italy
TDK-Micronas	Germany
ULIS	France
X-FAB	France, Germany

Source: European Commission (2018d, 2018e, 2021f).

After a first experience with microelectronics, the IPCEI framework was used on two projects related to batteries. These two projects were developed under the aegis of the European Battery Alliance[62], whose launch by the European Commission in 2017 had already signalled the intention of nurturing the development of 'a full value chain of batteries in Europe' and, therefore, 'help [European] industries remain or become world leaders in innovation, digitisation and decarbonisation' (European Commission 2017b). The first Battery IPCEI project was approved in December 2019 (European Commission 2019b). Instead of only four member states, this project encompassed seven member states. In addition to Germany, France, and Italy, which had already financed the Microelectronics IPCEI, the first Battery IPCEI was also subsidised by Belgium, Finland, Poland, and Sweden. In this project, France acted as the project coordinator among the financing member states[63] and seventeen industrial firms (or consortia thereof) participated in the project as recipients of aid, four of which received aid from more than one member state: ACC (Germany and France), BASF (Germany and Finland), Solvay (Belgium, France, and Italy), and Umicore (Belgium, Germany, and Poland) (see Table 5). A total of €3180 million of state aid was approved for this project. Germany would distribute €1250 million across five beneficiaries, France would distribute €960 million across two beneficiaries, Italy would distribute €570 million across five beneficiaries, Poland would distribute €240 million across three beneficiaries, Belgium would distribute €80 million across three beneficiaries, Sweden would give €50 million to one beneficiary, and Finland would distribute €30 million across four beneficiaries (European Commission 2019b).

[62] DG COMP official II (Interview 6).

[63] EU state aid register: https://ec.europa.eu/competition/state_aid/register/ (accessed: 1 August 2022).

Table 5. First Battery IPCEI: aid recipients and financing member states

Participating firm/constortium	Financing member state
ACC	France, Germany
BASF	Finland, Germany
BMW	Germany
Elemental	Poland
Endurance	Italy
Enel X	Italy
Eneris	Poland
FAAM	Italy
Fortum	Finland
Kaitek	Italy
Keliber	Finland
Nanocyl	Belgium
SEEL	Sweden
Solvay	Belgium, France, Italy
Terrafame	Finland
Umicore	Belgium, Germany, Poland
VARTA	Germany

Source: European Commission (2019b).

The second Battery IPCEI was approved just over one year later, in January 2021, with the participation of twelve member states: the seven countries of the first Battery IPCEI plus Austria, Croatia, Greece, Slovakia, and Spain (European Commission 2021e). Germany acted as the project coordinator, as it had already done for the Microelectronics IPCEI[64]. This time, forty-two industrial firms (or consortia thereof) would receive close to €2900 million of state aid. However, for this second battery project, the European Commission's press release did not disclose how much each member state had contributed to the total state aid approved. Only the number of aid recipients was broken down by member state: Italy would give aid to twelve participants, Germany to eleven, Austria to six, Finland and Slovakia to three each, Belgium, France, and Spain to two participants each, and Croatia, Greece, Poland, and Sweden to only one participant each (European Commission 2021e). Three participants received funding from more than one member state: Manz (Germany and Italy), Northvolt (Germany and Sweden), and SGL Carbon (Germany and Poland) (see Table 6).

[64] EU state aid register: https://ec.europa.eu/competition/state_aid/register/ (accessed: 1 August 2022).

Table 6. Second Battery IPCEI: aid recipients and financing member states

Participating firm/consortium	Financing member state
ACIS	Germany
Alumina Systems	Germany
Arkema	France
AVL	Austria
BMW	Germany
Borealis	Austria
Cellforce Group	Germany
ElringKlinger	Germany
Endurance	Italy
Enel X	Italy
Energo Aqua	Slovakia
Engitec	Italy
FCA	Italy
Ferroglobe	Spain
FIAMM	Italy
Fluorsid	Italy
Fortum	Finland
FPT Industrial	Italy
Green Energy Storage	Italy
Hydrometal	Belgium
InoBat Auto	Slovakia
Italmatch Chemicals	Italy
Keliber	Finland
Liofit	Germany
Little Electric Cars	Spain
Manz	Germany, Italy
Miba eMobility	Austria
Midac	Italy
Northvolt	Germany, Sweden
Prayon	Belgium
Rimac Automobili	Croatia
Rosendahl Nextrom	Austria
SGL Carbon	Germany, Poland
Skeleton Technologies	Germany
Solvay	Italy
Sunlight Systems	Greece
Tesla	Germany
Tokai Carbon Group	France
Valmet Automotive	Finland
VARTA Micro Innovation	Austria
Voltlabor	Austria
ZTS Vav	Slovakia

Source: European Commission (2021e).

Table 7. Hydrogen IPCEI: aid recipients and financing member states

Participating firm/consortium	Financing member state
1s1 Energy	Portugal
Advent	Greece
Alstom	France, Italy
Ansaldo	Italy
Arkema	France
AVL	Austria
Bosch	Austria, Germany
BT&T Composites	Greece
Christof Industries	Austria
Cummins	Belgium
Daimler Truck	Germany
De Nora	Italy
EKPO	Germany
Elcogen	Estonia
Elogen	France
Enel	Italy
Faurecia	France
Fincantieri	Italy
Genvia	France
H2B2	Spain
HYVIA	France
Iveco	Czechia, Italy, Spain
John Cockerill	Belgium, France
McPhy	France
NAFTA	Slovakia
Nedstack	Netherlands
Neste	Finland
Nordex	Spain
Ørsted	Denmark
Plastic Omnium	Austria, France
Sener	Spain
Stargate	Estonia
Sunfire	Germany
Symbio	France
Synthos	Poland

Source: European Commission (2022d).

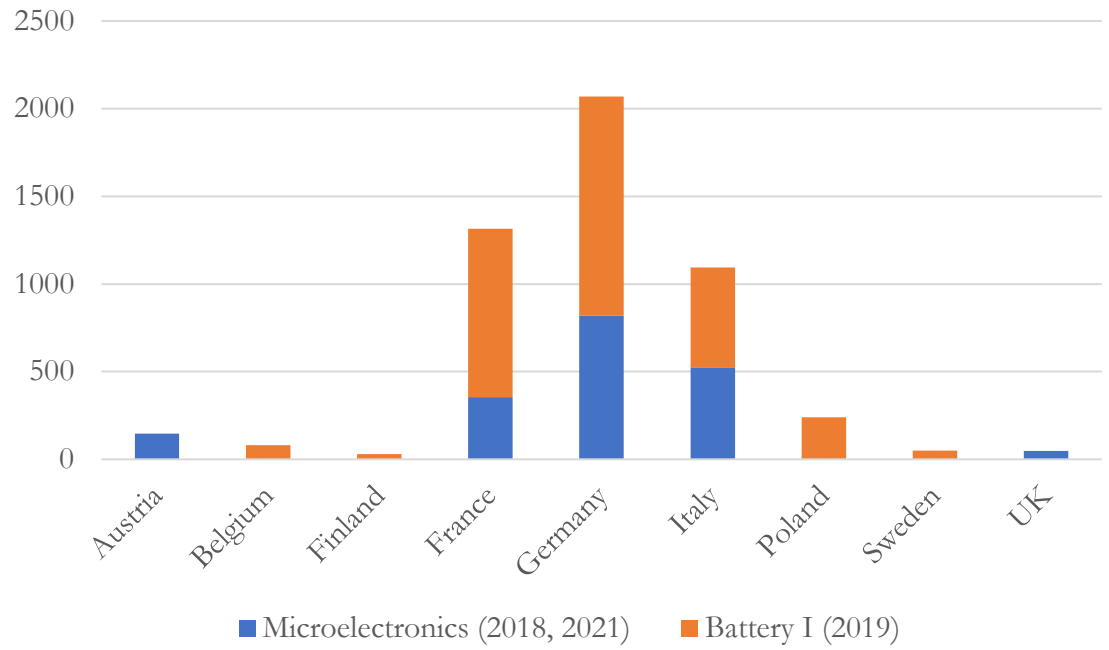
As noted previously, the fourth – and, at the time of writing (August 2022), last – project to be approved under the IPCEI framework was the Hydrogen IPCEI, publicly announced for the first time in December 2020 at the end of the German presidency of the Council of the EU (German Federal Ministry for Economic Affairs and Climate Action 2020), but only finally approved in July 2022 (European Commission 2022d). This gathered fifteen EU member states – Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany,

Greece, Italy, Netherlands, Poland, Portugal, Slovakia, and Spain – and thirty-five aid recipients. Like the press release for the second Battery IPCEI, the European Commission's press release announcing the Hydrogen IPCEI did not clarify how much each financing member state contributed to the total € 5.4 billion of state aid approved for this project. Only the number of aid recipients by member state was disclosed. France awarded aid to ten participants, Italy to six, Austria, Germany, and Spain to four each, Belgium, Estonia, and Greece to two each, and Czechia, Denmark, Finland, the Netherlands, Poland, Portugal, and Slovakia to one each. Five participants received aid from more than one member state: Alstom (France and Italy), Bosch (Austria and Germany), Iveco (Czechia, Italy, and Spain), John Cockerill (Belgium and France), and Plastic Omnium (Austria and France) (see Table 7).

Admittedly, with only four projects approved so far, the actual experience with the IPCEI state aid framework remains quite limited. However, two empirical trends can already be tentatively identified. The first trend is that the geography of IPCEI has been spreading steadily. Whereas only France, Germany, Italy, and the UK (or 'the Big 4', as German official put it[65]) embarked on the inaugural Microelectronics IPCEI (2018, before Austria joined the project too in 2021), the number of participating member states grew to seven in the first Battery IPCEI (2019), twelve in the second Battery IPCEI (2021), and fifteen in the Hydrogen IPCEI (2022). The second empirical trend is that, although spreading steadily, this geography of IPCEI has so far been marked by the existence of a clear and stable core of financing member states. Only Germany, France, and Italy have participated in all four IPCEIs so far. Germany and France have also taken on the role of project coordinators among the financing member states in these projects. Austria, Belgium, Finland, and Poland have participated in three projects each. Greece, Slovakia, Spain, and Sweden have participated in two projects each. Croatia, Czechia, Denmark, Estonia, the Netherlands, Portugal, and the UK have participated in one project each. And there are ten EU member states which have not yet participated in a single IPCEI: Bulgaria, Cyprus, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Romania, and Slovenia.

[65] German official I (Interview 19).

Figure 11. IPCEI state aid volume by financing EU member state (€ million)



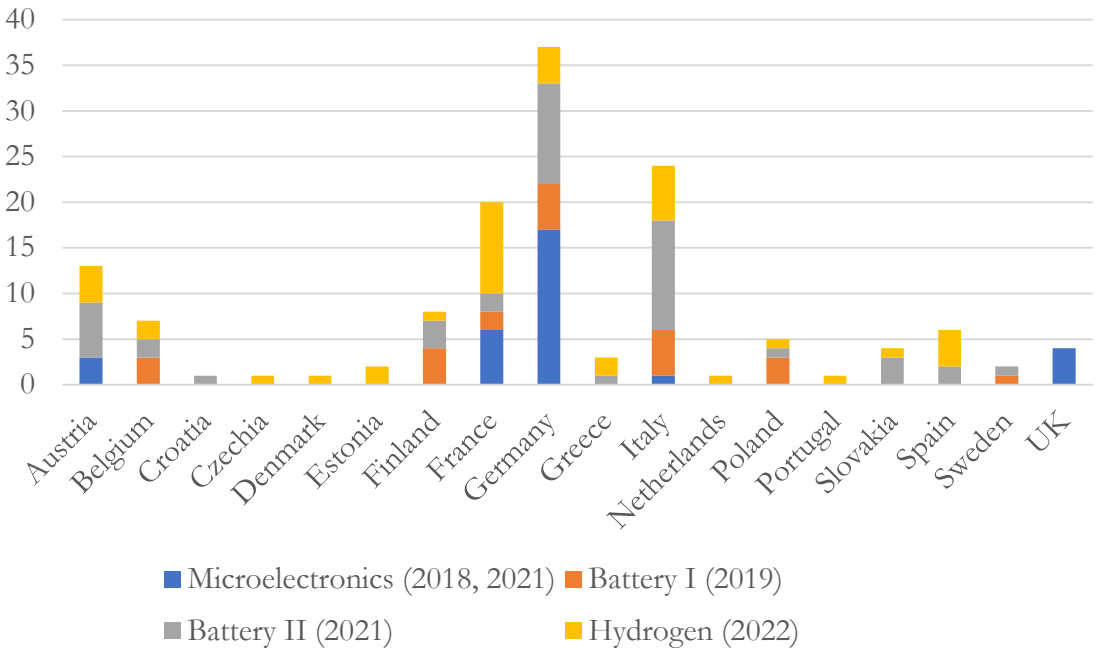
Source: European Commission (2018e, 2019b, 2021f).
Note: Unlike the press releases for the Microelectronics IPCEI and the first Batteries IPCEI (European Commission 2018e, 2019b, 2021f), the press releases for the second Batteries IPCEI and the Hydrogen IPCEI (European Commission 2021e, 2022d) did not disclose how the total aid volume was split between the multiple financing member states. So, it is only possible to compare IPCEI state aid volumes by financing member state for the first two IPCEI state aid cases.

Germany, France, and Italy stand out not only because they are the only EU member states that have participated in all four projects so far, but also because, overall, they have contributed with more state aid (Figure 11) to a larger number of companies (Figure 12). In the first two IPCEIs, Germany, France, and Italy accounted for almost 90% of the total volume of state aid approved (Germany: 41%, France: 26%, Italy: 22%) – a share which is clearly above their shares in both EU27 government spending (60%) and EU27 GDP (58%). These three countries' IPCEI aid shares are now presumably lower owing to the growing number of financing member states in the second Battery IPCEI and the Hydrogen IPCEI. However, since the European Commission stopped disclosing the aid volume breakdown by member state after the first Battery IPCEI, this cannot be verified. Besides, out of a total 121 participating firms over the four IPCEIs, thirty-seven received state aid from Germany (31% of the total), twenty-four from Italy (20%), and twenty from France (17%). By contrast, Croatia, Czechia, Denmark, the Netherlands, and Portugal have only awarded funding to one firm each, for example.

So, although the IPCEI framework is explicitly centred around the notion of the 'common European interest', actually existing IPCEIs have not yet fully transcended the national differences which exist among EU member states. Instead, as a former DG COMP official put it, the practical deployment of this industrial policy instrument becomes 'a reflection of the division of power of the member states':

> In principle, you can have a fantastic European tool, like IPCEI. In practice, it is a reflection of the division of power of the member states. So, you would have France, Italy, Germany accepting to contribute to this project of common European interest as long as there is a German, French and Italian firm involved in it. And this is suboptimal… But you do have a tendency of replicating the political strength of the states also in the interest they have in such big projects.[66]

Figure 12. Number of IPCEI state aid recipients by financing EU member state



Source: European Commission (2018e, 2019b, 2021e, 2021f, 2022d).

Importantly, both these trends regarding the geographies of IPCEI – that is, steadily spreading but still centred around a clear and stable core of financing member states – seem to be confirmed by the forthcoming projects which are currently being prepared. The status of the IPCEI state aid framework as a tool for a renewed European industrial policy was given a significant push during the German presidency of the Council of the EU in the second half of 2020. Besides the Hydrogen IPCEI, two other projects were announced at the end of the German presidency. One of them was an IPCEI on 'Cloud infrastructure and

[66] Former DG COMP official (Interview 17).

services' to support the digitisation of EU industries and public administrations. The project is jointly coordinated by Germany and France and is expected to also include Italy, along with another nine EU member states: Belgium, Czechia, Hungary, Latvia, Luxembourg, the Netherlands, Poland, Slovenia, and Spain (German Federal Ministry for Economic Affairs and Energy 2021). A second Microelectronics IPCEI was also announced to follow up on the first one approved in 2018 and expanded in 2021 with the participation of Austria (German Federal Ministry for Economic Affairs and Climate Action 2021b). This follow-up project also seems likely to dwarf the geographical reach of the first Microelectronics IPCEI as Germany and another nineteen EU member states are reported to have already pre-notified the European Commission of their intention to join this project (German Federal Ministry for Economic Affairs and Climate Action 2021a; European Commission 2021c). In addition, there have also been some talks of a possible IPCEI on pharmaceutical research and manufacturing – again led by France and Germany (European Commission 2021b; POLITICO 2021b).

To sum up, after four projects, it can be argued that the geographies of IPCEI have been expanding steadily but remain centred around a clear and stable core comprised of Germany (4 projects, 37 participating firms), Italy (4 projects, 24 firms), and France (4 projects, 20 firms). Then, around this clear and stable core, one may find a series of concentric circles along which the other EU member states can be distributed according to their distance to the core. For example, closer to the core are Austria (3 projects, 13 participating firms), Finland (3 projects, 8 firms), Belgium (3 projects, 7 firms), Poland (3 projects, 5 firms), and Spain (2 projects, 6 firms). In the furthest concentric circle are those ten member states which have not yet awarded any state aid under the IPCEI framework. Arguably, there are also some overlaps between this representation of the actual geographies of IPCEI and the topographical view of the uneven industrial landscapes of the EU offered in the previous section. In particular, the Germany's leadership is not surprising nor is the relatively high participation of Austria, Finland, or Belgium in IPCEIs so far (see Figure 10). As the next two sections reveal, this asymmetrical or stratified participation in IPCEIs is entangled with conflicts between EU member states over how and when this state aid framework should be used – and, ultimately, how the 'common European interest' which it invokes should be determined politically in a pluri-national setting.

7.3 Who gets to determine the 'common European interest'?

Tensions among member states over the IPCEI state aid framework and associated industrial policy practices began to emerge in the meetings of the 'Strategic Forum for Important Projects of Common European Interest' (henceforth, for short, the Strategic Forum), which had been set up by DG GROW to foster supranational industrial policy initiatives. For starters, attendance of the Strategic Forum meetings was uneven across member states. Fifteen member states attended all six meetings of the Strategic Forum (Belgium, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Portugal, Spain, and Sweden) and another four member states only missed one meeting each (Austria, Czechia, Greece, and Luxembourg). However, there were six member states which were absent from at least half of the meetings (Bulgaria, Cyprus, Malta, Romania, Slovakia, and Slovenia), and two of them did not attend any meeting at all (Cyprus and Slovakia) over the course of the two-year mandate of the Strategic Forum. And the political question of who gets to determine what constitutes the 'common European interest' and how permeated the contentious process through which the members of the Strategic Forum – that is, member states' representatives, organisational members, and individual experts – decided on the final list of six 'strategic value chains' (Strategic Forum for Important Projects of Common European Interest 2019). Far from being merely a disconnected and inconsequential episode of bureaucratic life in Brussels, this process was contested in a way that is revealing of the underlying tensions and socioeconomic differences along national lines which militate against the tentative form of 'supranational economic patriotism' (Clift and Woll 2012a) which the IPCEI state aid framework embodies and projects.

The selection process spanned the first three meetings of the Strategic Forum. An initial long list of 37 value chains was progressively narrowed down until members voted on the final six ('Clean, connected and autonomous vehicles', 'Smart health', 'Low CO_2 emissions industry', 'Hydrogen technologies and systems', 'Industrial Internet of Things', and 'Cybersecurity'). Admittedly, besides the direct participation and voting rights of the members of the Strategic Forum in the meetings, the prioritisation process also involved some external technical input which DG GROW outsourced to the Fraunhofer, a German conglomerate of research institutions, and PricewaterhouseCoopers Netherlands[67]. The

[67] Meeting minutes and other documents retrieved from European Commission – Register of Commission Expert Groups and Other Similar Entities: Strategic Forum for Important Projects of Common European Interest (IPCEI) (E03583): https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=3583 (accessed: 14 October 2021).

Fraunhofer was hired to prepare 'analytical papers' for the Strategic Forum's discussions, thus saving Commission services that workload[68]. But members of the Strategic Forum also conducted their own research and presented it at the meetings. PricewaterhouseCoopers Netherlands, in turn, developed a method for the prioritisation of value chains, consisting of a series of quantitative and qualitative indicators and thresholds. This method was validated and used by the members of the Strategic Forum but only after being revised to accommodate a greater weighting to the member's in-meeting vote in the final result, not least because there was an acknowledgement of the limited availability and reliability of quantitative data to identify strategic value chains. So, ultimately, the choice of the six strategic value chains depended more on the result of the vote of the members of the Strategic Forum than on any technical input from the Fraunhofer or PricewaterhouseCoopers.

The voting procedure was designed by DG GROW. Each member of the Strategic Forum – regardless of whether they were member state representatives, organisational members, or experts appointed on an individual basis – had the same number of votes and was asked to distribute them across the value chains of their preference. A German official recalls the procedure as being amusingly evocative of the Eurovision Song Contest[69]. However, the views of member states' representatives on the merits of this voting system varied. Some of them, including representatives from Czechia, Denmark, Spain, and Sweden, saw the fact that industry representatives were allowed to vote and that each industry member held the same number of votes as each member state as especially problematic. Representatives from Czechia, Denmark, and Sweden, in particular, expressed this concern in meetings of the Strategic Forum, suggesting that the vote should occur instead at the level of the Council of the EU where industry representatives would not have a say and where any decisions regarding strategic value chains and important projects of common European interest would be subject to a majority vote among member states[70][71][72]. Recalling the discussions that took place around the voting procedure, an Irish official shares similar concerns:

[68] European Commission official (Interview 14).

[69] German official I (Interview 19).

[70] Meeting minutes and other documents retrieved from European Commission – Register of Commission Expert Groups and Other Similar Entities: Strategic Forum for Important Projects of Common European Interest (IPCEI) (E03583): https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=3583 (accessed: 14 October 2021).

[71] Czech official (Interview 10).

[72] Representative from small member state (Interview 15).

> So, I do think it was important to hear the industry voice. But it seems to me that it's quite unusual that – here we were making a decision on what strategic, particular value chains would be prioritised by the EU and, by extension, member states… It seems to me, it's just not a decision that is appropriate for industry bodies to have a vote on… The voting was – I mean, I remember a number of member states expressing, kind of, surprise. The process maybe lacked transparency… I had some, at the time, misgivings about how the voting process was managed and the outcome.[73]

Not every member state representative had similar misgivings about giving industry members a vote on the decision. According to a French official, 'fully' involving industry members was not only appropriate but 'a key part of the decision process'[74]. And, according to a German official, the experience of the Strategic Forum was very much 'what member states were looking for' in order to make good use of the IPCEI instrument and the concerns expressed by other member state representatives in relation to the voting mechanism were largely unwarranted:

> Well, yeah, I told you – it was funny. And I remember the panicking between the member states about the power of the votes for industry… Would I criticise it? Well, it would be too hard to judge. I found the Strategic Forum organisers very credible. So, I had the feeling they really worked hard on finding a voting mechanism. I think they might have overdone it. Were businesses too powerful? Well, I wouldn't call it powerful. Maybe it led to an unbalanced outcome but, in the end, I mean, if you see it from nowadays looking back, nothing happened that wouldn't have had sustainable support.[75]

Admittedly, the Strategic Forum did not have the legal authority to initiate nor approve any concrete IPCEIs. The decision to launch a new IPCEI is incumbent on the member states who might have an interest in that project. And, because this is a state aid framework, projects can only be implemented after being approved by DG COMP. Yet, as shown in the previous section, the extant empirical record of IPCEIs suggests that what, in theory, could be the necessary 'sustainable support' for a project to get off the ground is not entirely separable, in practice, from the actual support of France, Germany, and Italy for that specific project. So, alongside some member states' preoccupation with the 'transparency' of the voting process, one can find a deeper anxiety that the outcome of the vote in the Strategic Forum would serve to legitimise future IPCEIs to the disproportionate benefit of the domestic industrial sectors of the largest member states which have the greatest fiscal capacity to subsidise such large industrial projects:

[73] Irish official (Interview 18).
[74] French official (Interview 21).
[75] German official I (Interview 19).

> … we did quite a bit of work along with especially Spanish and Czech partners, we wrote a non-paper on the governance of IPCEIs that should be transparent, that it should be open to smaller countries and smaller companies. And these are obviously a reaction to some of the risks we saw in this work being, you know, a game for the stronger economies, bigger economies, bigger companies. And then, we saw this risk of skewing the competition to the disadvantage of smaller companies and smaller economies. And we had quite a bit of trouble with the governance of these IPCEIs and how things were selected in the Strategic Forum… So, our point was to ensure transparency in this process and to ensure openness in this process to make sure that countries with smaller state budgets, to be honest, and made up of mostly smaller companies… would actually have a chance to be part of these projects and also have a chance to have a say in which projects should be chosen at the European level and which projects should not be chosen.[76]

Hence, the internal heterogeneity and the uneven industrial landscapes of the EU manifest themselves in the controversy over the bureaucratic rules of procedure of the Strategic Forum too. The quote cited above suggests that, to this interviewee (who wished to be identified as a representative from a *small* member state), the problem with the voting method adopted by the Strategic Forum was not only that it allowed industry members to vote alongside member states but especially that, precisely in doing so, it went against the best interests of 'countries with smaller state budgets… and made up of mostly smaller companies'. In a similar vein, according to an Irish official, it was the geo-economic condition of being a 'small open economy' which demanded that Ireland approached the Strategic Forum with 'a degree of scepticism' – that is, being a 'constructive' and 'active participant' in the meetings but, still, 'in the mode of asking questions, push back, maybe, against some of the positions of the larger member states or some member states'[77].

To be clear, within the Strategic Forum, the voting system developed by DG GROW attributed to each member state the same number of votes, regardless of the size of their domestic economies or their fiscal capacities, although it could perhaps be argued that the economic geographies of France, Germany, and Italy were better represented among the *organisational* membership of the Strategic Forum. For instance, the only three national business interest association with a seat in the Strategic Forum came precisely from France (France Industrie), Germany (ZVEI – *Zentralverband Elektrotechnik- und Elektronikindustrie*), and Italy (Confindustria). Moreover, it would be wrong to presume that simply because the remaining business interest associations had a 'European' rather than national scope, the industries they represented were evenly distributed across the EU. On the contrary, the heterogeneity and unevenness of the industrial landscapes of the EU also affects the

[76] Representative from small member state (Interview 15).
[77] Irish official (Interview 18).

composition of these business interest associations and the geographies of the interests they are more likely to represent. For example, only twelve EU27 member states are represented in the membership of CECIMO (European Association of the Machine Tool Industries and related Manufacturing Technologies), alongside three non-EU27 members (Turkey, Switzerland, and the UK). And, even among the countries which are represented within this business interest association, production in Germany alone accounts for 43.8% of total production, followed by Italy with 23.2% (CECIMO 2021: 2).

However, the crucial point is that, if decisions on the 'strategic value chains' or industrial sectors which warranted an 'important project of common European interest' were subject to a vote at the Council of the EU as some of the member states represented in the Strategic Forum suggested, they would require the agreement of at least fifteen member states representing at least 65% of the EU population (in the standard voting method of qualified majority). This would significantly broaden the base of support required for an IPCEI to take off and, in turn, effectively give smaller member states a greater say over, as well as a greater chance of vetoing, the use of the IPCEI state aid framework as a supranational industrial policy instrument. Far from being merely anecdotal, this episode of contestation within the Strategic Forum about who should have the right to vote on IPCEIs showcases how the political determination of the 'common European interest' and its materialisation in concrete techno-industrial projects is complicated by the pluri-national nature of the EU polity.

7.4 The delicate balance of supranational industrial policy practice

National tensions over IPCEIs outlived the two-year mandate of the Strategic Forum. Indeed, if anything, as the status of the IPCEI state aid framework as a tool of industrial policy was strengthened at the end of the German presidency of the Council of the EU in 2020, intra-EU tensions in relation to IPCEIs intensified too. While previously it was mostly confined to the rooms where the meetings of the Strategic Forum took place, the contestation over IPCEIs became public with the release of a position document on the use of the IPCEI framework which had been signed by eleven EU member states – namely, Czechia, Denmark, Finland, Ireland, Latvia, Lithuania, Poland, the Netherlands, Slovakia, Spain, and Sweden. In this document, it was argued that the 'proliferation' of IPCEIs did not serve the interests of member states with fewer 'financial and human resources' and that, as a result, instead of promoting the common European interest, the more frequent use of this framework could lead to 'widening economic disparities' within the EU:

> It is therefore imperative that IPCEIs, by their nature very large and to a large extent funded by state aid, are not overused at the risk of disproportionately harming competition in the Single Market or undermining already effective markets. There is a risk that a proliferation of IPCEIs will lead to a less dynamic and less competitive economy in the EU. Also, not all Member States have the same financial or human resources to participate in an IPCEI, especially in light of the COVID-19 pandemic. This brings along the risk of further widening the economic disparities between Member States, creating unequal access to IPCEI initiatives as well as increasing national debt levels. (Government Offices of Sweden 2021a)

The interesting paradox here is that the critical stance adopted by these member states in relation to the 'proliferation' of IPCEIs occurs in tandem with the growing participation in IPCEIs by many of them (as shown in Section 7.2). For, while it is true that Ireland, Latvia, and Lithuania have not yet participated in any IPCEI, Finland and Poland have participated in three out of the four IPCEIs approved so far. So, outside of the core formed by France, Germany, and Italy, there is some *ambivalence* regarding the merits of the IPCEI state aid framework and its deployment as an instrument of supranational industrial policy in the EU. This ambivalence manifests itself in a dual strategy of *participation and contestation*. On the one hand, ambivalent member states monitor the launch of new IPCEIs and join those specific projects which resonate with their domestic industrial landscape and which, therefore, are more likely to generate suitable investment opportunities[78] – thus, the geographies of IPCEI keep spreading beyond the core. On the other hand, they display a defensive scepticism about the IPCEI state aid framework and the renewal of industrial policy that it enables because of how it may undermine their own competitive position vis-à-vis core countries – for the fiscal capacity to fully exploit the industrial policy opportunities opened up by the IPCEI state aid framework is greater at the core than around it[79].

These tensions among member states also manifested themselves in their answers to the public consultation that the European Commission held in 2021 on a revised version of the IPCEI state aid framework. Whereas the public consultation on the 2014 draft framework had attracted the attention of only a handful of member states (see Chapter 5), in 2021 a total of eighteen national governments of EU member states responded to the consultation. One of the few notable changes in DG COMP's new draft when compared to the original 2014 text was precisely the introduction of a new condition regarding the minimum geographical reach required for a given project to qualify as an 'important project

[78] Czech official (Interview 10); Strategic Forum member (Interview 13); Representative from small member state (Interview 15).

[79] Czech official (Interview 10); Representative from small member state (Interview 15); Irish official (Interview 18).

of common European interest' and, thus, to be eligible for state aid under the IPCEI framework. In the new draft it was stipulated that, '[u]nless a smaller number is justified by the nature of the project, an IPCEI 'must ordinarily involve *at least four* Member States' (European Commission 2021a: paragraph 16, emphasis added), whereas previously the condition was only that it 'must normally involve *more than one* Member State' (European Commission 2014c: paragraph 16, emphasis added). The tightening of this criterion – from 'normally… more than one' to 'ordinarily… at least four' financing member states – already signals an attempt by the European Commission to avoid an excessive concentration of IPCEI state aid in a very small number of member states, even though it still sets the bar low enough so that no IPCEI approved before this alteration would have been prevented from qualifying as an 'important project of common European interest' because of it. Indeed, even the very first IPCEI, the Microelectronics IPCEI, would have fulfilled this new condition. It began with France, Germany, Italy, and the UK in 2018. And when the UK left the EU, Austria joined this IPCEI.

Still, the introduction of this new condition elicited different responses from national authorities which, again, express enduring national conflicts over the definition of this 'common European interest'. For example, the national authorities of Germany and Italy expressed the concern that this new requirement may act as an additional hindrance to the establishment and fast approval of IPCEIs (Federal Government of Germany 2021; Government of Italy 2021). On the other hand, the national authorities of Belgium and Ireland welcomed this change, although the former also noted that the involvement of a greater number of member states would not, on its own, prevent imbalances in the use of the IPCEI instrument insofar as significant differences persisted among the volumes of state aid provided by each member state (Department of Enterprise 2021; Government of Belgium 2021). The Polish authorities did not agree with raising the minimum number of financing member states necessary for an IPCEI and suggested instead that 'projects from less developed regions' be 'assessed more favourably' to ensure a greater balance in the distribution of the benefits of the IPCEI framework across member states (Government of Poland 2021). Yet, the national authorities of Denmark and Sweden argued that the minimum number of financing member states should, ideally, be even higher than four (Government Offices of Sweden 2021b; Ministry of Industry 2021). In fact, the Swedish authorities even suggested the possibility of smaller member states initiating legal action against IPCEIs if these failed to 'encompass a substantial part of the Member States'.

These persistent disagreements – and even potential legal conflicts – among EU member states over the IPCEI state aid framework raise questions about the compatibility between industrial policy and supranational economic integration as well as the possibility of shifting industrial policy interventions from the national to the supranational level in such a context. These questions are not new. In an essay first published in 1939 under the title 'The economic conditions of interstate federalism', the Austrian neoliberal economist Friedrich Hayek argued that economic integration among national states would result in a decline of the degree of state intervention in economic affairs – particularly, the kind of *selective* state intervention geared towards supporting 'individual industries' and 'particular groups of producers' (Hayek 1948: 259). For not only would economic integration deprive national states of some of the policy instruments on which they previously relied, but the greater heterogeneity of the supranational economic area would also make it much more difficult to reach an agreement at the supranational level on a set of selective state interventions than within each relatively more homogenous national unit. Therefore, in an economically integrated area, what the national states would no longer be able to do would never be fully compensated for at the supranational level either. Irrespective of the economic ideas held by state actors, economic integration would create a tendency for a more (neo)liberal approach to economic policy, with fewer selective interventions.

Admittedly, the kind of policy instruments that Hayek refers to in this essay are essentially tariffs and marketing boards. Writing eighteen years before the Treaty of Rome, Hayek did not anticipate that this 'one single market' (1948: 258) would also include, within its institutional infrastructure, a legal system of state aid control that would constrain each national state's ability to offer targeted subsidies too. However, his general argument about how economic integration is likely to limit national industrial policy more than it is to enable supranational industrial policy still resonates with the contemporary tensions and difficulties surrounding IPCEIs. The tension between the 'common European interest' which the IPCEI state aid framework invokes and the pluri-national composition of the EU keeps manifesting itself in a series of dilemma or trade-offs – for example, between the administrative manageability of a given project and the number of member states which are included therein or between the need to respond to industrial policy actions that take place outside of the EU and the need to ensure that this response does not fragment the EU or contribute to aggravate economic disparities among its member states. The status of the IPCEI state aid framework as a truly 'European' industrial policy instrument hinges upon a

delicate balance of national differences and a constant negotiation of these different trade-offs.

Still, contestation over IPCEIs is not just a product of the socioeconomic heterogeneity of an economically integrated area. While heterogeneity may indeed complicate political deliberations on what ultimately constitutes the 'common European interest', contestation over IPCEIs cannot be dissociated either from the eminently competitive nature of the relations which are established among capitalist states. As anticipated in the theoretical discussion in Chapter 4, EU member states, faced with the imperative of competitive accumulation, find themselves in competition for capital – not only with other regions of the world economy, but also with each other. The implications of this situation for supranational industrial policy practices such as IPCEIs are contradictory. On the one hand, for the national governments of each individual EU member state, responding to the imperative of competitive accumulation creates an incentive to make use of the industrial policy opportunities which are available to them to attract and hold capital – for example, by participating in IPCEIs. But, on the other hand, it also creates an incentive to undermine the ability of other member states to do the same – for example, by contesting the 'proliferation' of IPCEIs. The acknowledgement of this dual predicament and its implications helps to make sense of the empirical pattern of participation and contestation identified above.

7.5 Concluding remarks

The IPCEI state aid framework seems to attempt to reconcile the reinvigoration of industrial policy with European integration and the single market. With the introduction of this framework in 2014, a more active and expansive industrial policy, which may attract and support private investments in large and technologically innovative industrial projects and which may respond to similar industrial policy practices projects taking place in other regions of the world economy, is deemed compatible with state aid rules *provided* state support is directed towards 'important projects of common European interest'. However, the pluri-national nature of the EU polity and socioeconomic differences among the member states complicate the determination of this 'common European interest' and its materialisation in specific 'important projects'. Ultimately, while the tension between European integration and industrial policy is relaxed, new tensions and controversies arise elsewhere.

For starters, the IPCEI state aid framework arrives at an industrial landscape which is uneven. There are considerable differences among EU member states as regards their relative degree of industrialisation, the R&D intensity of domestic business activity, and each

national government's fiscal capacity. Therefore, the industrial policy opportunities opened up by the introduction of the IPCEI framework are also unevenly distributed across member states. And, hence, even though the IPCEI state aid framework stipulates that these projects' 'benefits must not be confined to the financing Member States, but extend to a wide part of the Union' (European Commission 2014c, 2021a), arguably, member states with a larger industrial base, more innovative firms, and greater fiscal capacity seem more likely to meet the requirements of the IPCEI framework and, by extension, more likely to participate in, and derive direct and more tangible benefits from, IPCEIs. In this regard, because of how it combines high degrees of industrialisation and innovativeness with significant fiscal capacity too, Germany clearly stands out as the member state which is most likely to make use of, and directly benefit from, the IPCEI framework.

This does not mean, however, that the benefits of IPCEIs will be circumscribed to Germany. In fact, because of Germany's position in the 'Central European manufacturing core' (Stehrer and Stöllinger 2015) and particularly its trade and investment links with the countries of the Visegrád Group (Bohle 2018), investment flows facilitated by IPCEI state aid are likely to spill over to the latter countries too even when they are not directly involved in these IPCEIs as financing member states. One example of this dynamic are the foreign direct investments for the construction of battery production facilities in Hungary, already mentioned in Chapter 6. Although Hungary has not joined either the first or the second Battery IPCEIs as a financing member state, it has recently attracted (not least, with state aid awarded under the regional aid guidelines) investments from large South Korean battery manufacturers such as Samsung and SK Innovation that supply batteries to automotive manufacturers such as the German BMW and Volkswagen, as well as the Italian Fiat and the Swedish Volvo (European Commission 2019c, 2021d; Reuters 2019; electrive.com 2021a)[80]. In other words, the countries of the Visegrád Group can potentially be free riders in IPCEIs, deriving indirect benefits through subsequent foreign direct investment flows without contributing any public funding to the project. Conversely, the EU member states whose productive structures are not as strongly integrated into the supply chains of the 'Central European manufacturing core' will be less likely to derive tangible benefits from Germany-centred IPCEIs unless they participate in these IPCEIs as financing member states too.

Furthermore, the actual experience with the practical deployment of the IPCEI state aid framework as a supranational industrial policy instrument so far shows that the

[80] See also: https://www.samsungsdi.com/automotive-battery/partnership.html (accessed: 8 August 2022).

participation of member states has been strongly stratified. Although the geographical reach of IPCEIs has been expanding gradually and steadily from only four financing member states in the first IPCEI in 2018 to fifteen in the fourth IPCEI in 2022, there is a clear and stable core, formed by Germany, France, and Italy, at the centre of the geographies of IPCEI. Leveraging their greater fiscal capacity, these three member states have participated in all projects thus far and have awarded more aid to more firms than all other member states together. For this reason, many of the other EU member states have expressed ambivalence regarding the use of the IPCEI framework as supranational industrial policy instrument. This ambivalence manifests itself through a dual strategy of contestation (against the 'proliferation' of IPCEIs) and participation (in new IPCEIs, whose number of financing member states continues to grow).

Both the stratified geographies of actual IPCEIs and the political contestation that surrounds the use of this state aid framework reflect the contradiction between, on the one hand, the 'common European interest' which the IPCEI state aid framework invokes and, on the other hand, the pluri-national and heterogenous nature of the EU. The imperative of competitive accumulation puts each member state, individually, in a situation in which they are exposed to competition from outside of the EU but also in competition with other member states. Moreover, owing to the socioeconomic differences that exist among member states, each of them also experiences these competitive pressures differently. It is unlikely that this foundational contradiction of European integration and governance can be completely overcome. However, it need not be fatal for supranational industrial policy practice, in general, or IPCEIs, in particular. At the present moment, growing participation with contestation seems to be the more likely scenario for IPCEIs in the near future – as, indeed, the preliminary information which is available about a second and much larger Microelectronics IPCEI suggests. It remains to be seen how much this growing participation may contribute to flatten the stratified geographies of IPCEI over time. If it fails to do so, then the question becomes how far and in what ways IPCEIs will transform – directly *and* indirectly – the industrial landscapes of the EU and how much these transformations will, in turn, reshape national tensions among member states over the deployment of the IPCEI state aid framework but also over the very meaning of, and the legitimacy of appeals to, the ideal of a 'common European interest'.

8 Conclusion

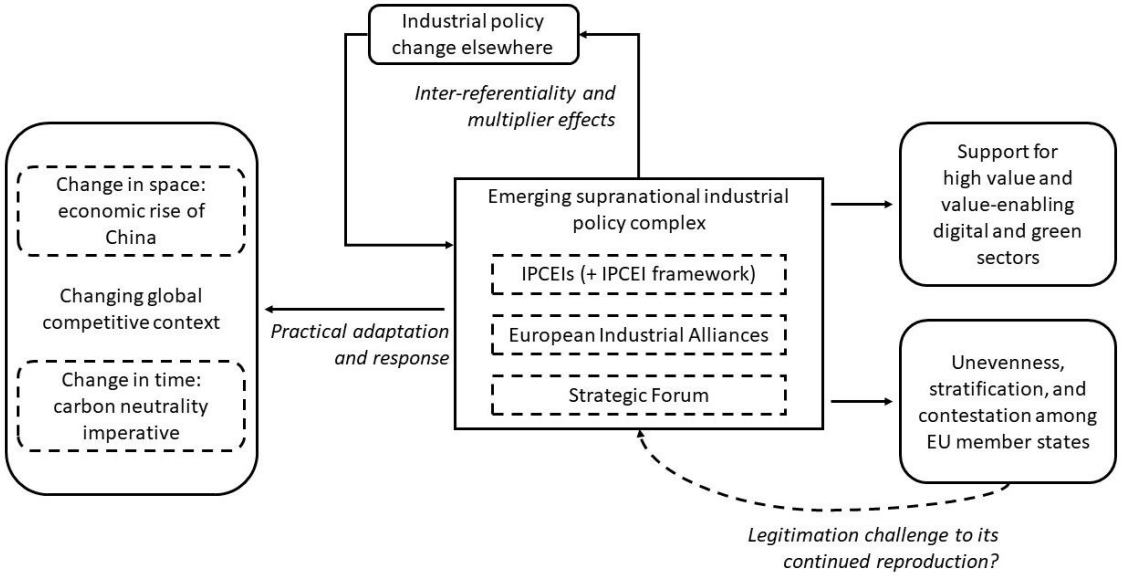
The main aim behind this thesis was to move beyond the vague perception that 'industrial policy is back' and to contribute to a better understanding of the apparent return of industrial policy as one of the features of the 'post-neoliberal' hybrid forms of political economy of the post-2008 world. This was done by focusing on the EU as a relevant site for a theoretically informed meso-level approach to the analysis of industrial policy change. Counterintuitively but intentionally, the research for this thesis set out to look for tangible evidence of the apparent return of industrial policy in the institutional field of EU state aid control. Indeed, the first stage of empirical research was prompted by an exploratory question – Can evidence of post-crisis change in industrial policy practice be found in the domain of EU state aid control? Then, by pulling the thread of changes in this domain that might have otherwise gone unnoticed (namely, the introduction by the European Commission of a new state aid framework that created new opportunities for EU member states to carry out industrial policy interventions), the thesis gradually unveiled and examined the emergence of a novel supranational industrial policy complex – locating its structural undercurrents, tracing its constitutive bureaucratic and political processes, identifying its key actors, and revealing its internal asymmetries and conflicts. The purpose of this closing chapter is to summarise the core claims and the main contributions of the thesis, acknowledge its most relevant limitations, and offer a final reflection on the task of studying and writing about industrial policy when this form of state intervention is on the rise.

8.1 The core claims of the thesis: a reprise and an update

Overall, this thesis makes three core claims which, in turn, are supported, expanded, and qualified by a few ancillary points. These are schematically illustrated below in Figure 13 and can be briefly summarised as follows. First, throughout the post-2008 period, and particularly in the last five years, a novel and unprecedented *supranational industrial policy complex* has been emerging in the EU. This expression is advanced here to designate a dynamic amalgam of formally distinct but deeply interconnected sets of supranational industrial policy developments and practices. These include, most tangibly, a series of supranational industrial policy interventions centred around IPCEIs, which have been prepared under the aegis of a state aid framework which was only introduced into EU state aid rules in 2014, as well as a

growing range of so-called European industrial 'alliances' in different industrial sectors and the establishment of *ad hoc* supranational industrial policy committees, namely the 'Strategic Forum for Important Projects of Common European Interest', which was active between 2018 and 2020.

Figure 13. Unveiling and examining the supranational industrial policy complex



The second core claim (or set of claims) made in this thesis, especially in Chapters 5 and 6, deals with the drivers of change and the underlying causes of these institutional and practical developments. The central argument, in this respect, is that recent industrial policy change in the EU – embodied in the emerging supranational industrial policy complex – is the dynamic outcome of a longer, gradual process of practical observation, adaptation, and response to a changing global competitive context. The two main vectors of change in the global context within which policy developments in the EU take place have been, spatially, the rise of China in the world economy, which intensified inter-state competition for mobile capital flows in high value-generating industrial sectors, and, temporally, the epochal imperative of carbon neutrality, which repositioned 'green' technologies, in particular, as high value-generating industrial sectors of the present and, consequently, as sites of capital accumulation and inter-state competition in their own right too. In response to these changes, the EU's emerging supranational industrial policy complex has been channelling targeted support for the domestic developments of 'digital' and 'green' industrial sectors, such as microelectronics, electric-vehicle batteries, and hydrogen technologies. Far from

being idiosyncratic themes which are peculiar to industrial policy developments in the EU alone, there are strong overlaps and clear signs of competitive inter-referentiality and multiplier effects between the sectoral priorities of the EU's emerging supranational industrial policy complex and those of synchronous industrial policy interventions in other advanced capitalist economies.

Thus, at a structural level, the story of the recent emergence of the EU's novel supranational industrial policy complex is a familiar story of evolving responses to concurrently evolving global competitive pressures. And, therefore, it is, to a large extent, a story about the most recent empirical manifestation – in historically novel ways and circumstances – of the underlying and perennial imperative of competitive accumulation which capitalist states face by virtue of the *inter-national* fragmentation, within the inter-state system, of otherwise *global* processes of capitalist production and exchange. However, as shown throughout the empirical chapters of the thesis, this is a story that is also punctuated by several consequential moments of agency exercised by a variety of actors in EU politics – whether that is the staff of the European Commission (or, indeed, of different units inside of the Commission), member state officials at different levels, industry representatives or other stakeholders of industrial policy with a temporary seat in *ad hoc* 'expert groups'. In the absence of some of these moments of agency, subsequent events and policy processes could have unfolded differently too.

Finally, the third core claim made in this thesis, especially in Chapter 7, is that, despite being ostensibly centred on the notion of the 'common European interest', these new supranational industrial practices have also been marked by unevenness, stratification, and contestation among EU member states. Admittedly, this claim requires some unpacking. For starters, the *unevenness* of the industrial and fiscal landscapes of the EU, whose national factures long predate recent developments, suggest that, *a priori*, the opportunities for, and potential benefits of, national participation in supranational industrial policy practices are already unevenly distributed among member states. Moreover, as detailed in Chapter 7, national participation in IPCEIs has, so far, been characterised by a significant degree of *stratification*: there are important differences between the total number of IPCEIs in which different member states have participated as well as the volume of state aid that they have awarded to these projects and the number of firms to whom they have awarded it. So, effectively too, the most direct and tangible benefits of this supranational industrial policy practice have so far been unevenly distributed among member states.

Unless it is flattened by widening participation or offset by some other means (e.g., redistributive transfers, developments in other policy or institutional domains), this stratification might contribute to aggravate the already-existing unevenness of the industrial and fiscal landscapes of the EU and, consequently, generate new tensions between member states. The latter, in turn, may potentially pose a significant legitimation challenge to these novel supranational industrial policy practices, to the emerging supranational industrial policy complex, to the current and future legitimacy and credibility of appeals to the 'common European interest', and ultimately even to the social purpose of European integration and governance as a whole. In fact, there is clear evidence of ongoing *contestation* among EU member states over the merits of IPCEIs, primarily linked to concerns about how stratified participation in these projects, leveraging unequal industrial and fiscal capacities, may disproportionately bolster the competitive position of some EU countries (namely, those that have so far comprised the stable core of IPCEI – that is, France, Germany, and Italy) vis-à-vis others. Arguably, that EU member states find themselves in competition for mobile capital not only with non-EU states but also with each other is a foundational contradiction of supranational industrial policy practice. Nonetheless, it has not yet proved fatal to the continued reproduction of the supranational industrial policy complex, which continues to grow steadily despite the concomitant contestation.

In fact, the ongoing dynamism of these developments is such that, as the thesis was nearing submission, the European Commission (2022c) announced that it had approved a second IPCEI for the hydrogen sector, just two months after the announcement of the first. In total, this was the fifth project to be approved under the IPCEI state aid framework. Combining €5.2 billion of state aid from thirteen financing member states with an additional private investment of €7 billion, it raised the cumulative gross volume of IPCEI investments to €54.9 billion (34% of which in the form of state aid). This project did not expand the geographical coverage of IPCEI since all of its thirteen financing member states had already been involved in at least one other IPCEI. Indeed, the configuration of financing member states involved in this second Hydrogen IPCEI does not differ very significantly from the first one. Sweden, which had not participated in the former project, joined this subsequent one. On the other hand, Czechia, Estonia, and Germany, which had participated previously, did not award state aid to this second project. Notably, this was the first time, after five IPCEIs, that Germany was not featured in the list of financing member states.

Because the process of data collection and analysis for this research had already concluded when the approval of this project was publicly announced (21 September 2022),

this fifth IPCEI was not mentioned nor analysed in the empirical chapters of the thesis. However, this novel empirical fact must be acknowledged and emphasised here, particularly since one of the empirical claims made in Chapter 7 was that the stratified geographies of IPCEI were dominated by a stable core comprised of France, Germany, and Italy. The position of these three countries in this stable core reflected the fact that, up until then, they *i)* had been the only four countries which had participated in all of the first four IPCEIs and also that, according to publicly available data, they *ii)* had awarded a greater volume of state aid to *iii)* a greater number of participating firms across these projects. The first of these three propositions, at least, does not hold true anymore. Formally, following the approval of this fifth IPCEI, France and Italy have become the only EU countries to have participated in all five projects so far. By contrast, Germany has participated in four IPCEIs – as many as Austria, Belgium, Finland, or Poland. On the one hand, this new development clearly underscores the ongoing dynamism of supranational industrial policy practice in the EU – and, in that sense, it is testimony to the relevance and permanence of the processes of industrial policy change at the EU level which were revealed, traced, and analysed throughout the thesis. On the other hand, against such a dynamic background, a few of the empirical claims made in the thesis must necessarily be regarded as provisional, particularly those in Chapter 7 regarding the stratified geographies of participation in IPCEI.

In any case, the significance of the absence of Germany from this fifth IPCEI should not be exaggerated. First of all, even though Germany has now *only* been involved in as many IPCEIs as Austria, Belgium, Finland, or Poland, the extent of their involvement in each of those projects is not necessarily the same. The stratified geographies of IPCEI are not just about the number of projects in which each member state is involved, but also about the varying degrees of involvement of each member state in those projects (namely, the volume of state aid that it contributes to the project and the number of firms it subsidises). For example, across the four projects in which they have been involved so far, Austria has awarded aid to a total of fifteen firms, Belgium and Finland to ten each, and Poland to six. By contrast, Germany alone has awarded aid to thirty-seven firms. Moreover, there may also be significant differences in the total volume of IPCEI state aid disbursed by each of these countries across the four projects to which they have contributed funding. Admittedly, as observed in Chapter 7, the European Commission only disclosed information about how much of the total state aid for an IPCEI came from each financing member state in the first two IPCEIs (that is, the Microelectronics IPCEI in 2018 and the first Battery IPCEI in 2019). Therefore, it is not possible to measure these countries' relative degrees of involvement in

IPCEIs by adding up and comparing the total volume of aid they have disbursed in all four projects[81]. However, an illustrative example can be sought in that first Battery IPCEI for which disaggregated data was still made available and in which, with the exception of Austria, these countries participated. The evidence of stratification *among* financing member states *within* that one project alone is clear: the €80 million disbursed by Belgium, the €30 million disbursed by Finland, and the €240 million disbursed by Poland pale in comparison to the €1250 million disbursed by Germany (European Commission 2019b). Moreover, these figures remain disproportionate even after differences in population size are factored in – whereas the total national populations of Belgium, Finland, and Poland were equivalent to 14%, 7%, and 46% of that of Germany in 2019[82], their state aid contribution to the first Battery IPCEI only amounted to 6%, 2%, and 19% of German aid to that project, respectively.

Furthermore, these two Hydrogen IPCEIs were approved in very quick succession – only two months apart from each other – but negotiated and prepared over a much longer period – they were only finally approved almost two years after the launch of an IPCEI on hydrogen was publicly announced, not least, by the German government at the end of Germany's presidency of the Council of the EU (German Federal Ministry for Economic Affairs and Climate Action 2020). So, it is reasonable to presume that the separation between these two IPCEIs may be more formal than substantive. Moreover, in an interview I conducted for this research in September 2021 (that is, one year before the official approval of the second Hydrogen IPCEI), a German official told me that the forthcoming IPCEI on hydrogen, which was in preparation at the time, had to be 'cut up' for administrative reasons because it integrated 'too many projects'[83]. Accordingly, the two Hydrogen IPCEIs can be safely regarded as two different parts of the same larger state aid project. While the first part focuses more on generation technologies and downstream applications in the mobility sectors, the second part focuses more on infrastructure and downstream applications in heavy industries. Together, they involve a total of sixteen financing member states,

[81] On 7 October 2021 I sent an email to the State Aid Registry of DG COMP noting that the nondisclosure of the disaggregated IPCEI state aid figures for the second Battery IPCEI (approved in January 2021) represented a break with the practice established in the previous two IPCEIs (Microelectronics in 2018 and Battery I in 2019) and requesting, for the purposes of this research, the disaggregated state aid figures for that second Battery IPCEI too. Although DG COMP formally acknowledged the receipt of my email on 8 October 2021, I never received an actual answer to my request. The reluctance to disclose these figures not only undermines the public transparency of IPCEIs, but also hinders empirical research on these policy developments and invites suspicion of a deliberate attempt to conceal the stratified national geographies of the 'common European interest'.

[82] Own calculations, using Eurostat data.

[83] German official I (Interview 19).

€10.6 billion of state aid, and an additional expected private investment of €15.8 billion (European Commission 2022d, 2022c).

Besides, less than two weeks after announcing the second Hydrogen IPCEI, the European Commission formally approved an individual state aid measure by Germany, totalling €1 billion, to the steel production company Salzgitter for the decarbonisation of the latter's production processes through the application of hydrogen. According to the Commission's press release, even though in the end it was decided that 'given its characteristics and objectives, [this measure] was better suited for assessment under the Guidelines on State aid for climate, environmental protection and energy' than under the IPCEI framework, the industrial project which it supports had been identified and prepared precisely in the context of the process 'which resulted in the two approved IPCEIs' on hydrogen technologies and systems, which this project was originally supposed to integrated as well (European Commission 2022a).

In light of the above, the formal absence of Germany from the second Hydrogen IPCEI is probably not as substantive as it might seem at first sight. Thus, although the empirical claims made in Chapter 7 of this thesis about the stratified geographies of national participation in IPCEIs must remain provisional and subject to revision in the future, it is still way too early to declare these geographies completely flat.

8.2 Contributions to the literature

This thesis speaks to a few different audiences. First, because of how it positions itself conceptually, theoretically, and methodologically, it speaks to a generalist political economy audience and, especially, to a few specialised subgroups therein. One of these specialised subgroups is composed by those scholars of political economy who are interested, first and foremost, in questions regarding the role of the state in the economy or, even more narrowly still, in the practice of industrial policy as a specific form of state intervention. Another subgroup of political economists to whom this thesis might be of interest is that formed by those who, from a variety of angles, have been mapping and making sense of the ways in which economy and politics have changed since the 2008 financial crash. Furthermore, owing to its strong empirical focus on the EU, this thesis also speaks to audiences in EU studies who are interested in the study of the EU as a *sui generis* political entity or space. In particular, the empirical analysis and many of the empirical claims made throughout this thesis may be relevant to those who are especially interested in the delimited domains of EU competition policy and state aid control or in gaining insight into the bureaucratic backrooms where many

so many supranational policy processes unfold through the interactions between Brussels-based EU institutions (such as the European Commission), member state officials, and other stakeholders.

Because it speaks to different audiences, this thesis also makes different contributions to different literatures. The first contribution is providing clear and detailed evidence of ongoing change in industrial policy practice to substantiate the otherwise often vague perception that 'industrial policy is back' or that there has been a 'return' of industrial policy over the last decade or so. This constitutes, first and foremost, an empirical contribution that, though a meso-level and theoretically informed case study of the EU, corroborates and expands upon other recent political economy analyses of post-crisis change away from the neoliberal economic policy paradigm in different national settings (see, e.g., Craig 2015; Berry 2016, 2020, 2021b; Schneider 2022; Van Apeldoorn and De Graaff 2022) and towards the concomitant development of new 'post-neoliberal' hybrid forms of political economy (see, e.g., Green and Lavery 2018; Hunt and Stanley 2019; Davies and Gane 2021; Gamble 2021; Slobodian 2021) and the rise of a new era of 'state capitalism' in which states, through a variety of policy and institutional instruments, assume a growing role in managing economic and financial affairs (see, e.g., Alami and Dixon 2020b; Alami and Dixon 2020a, 2021; Alami et al. 2022). Furthermore, by using the EU as a case study, this thesis has also demonstrated how an empirical focus on this supranational polity – not least because of how it was regarded, after the crisis, as an example of 'resilient liberalism' (Schmidt and Thatcher 2013) and 'the epicentre of global neoliberalism' (Ryner and Cafruny 2017: 221) – can help capture and grasp the nature and the direction of broader changes in the world economy and in patterns of state intervention beyond neoliberal policy practice.

However, the EU does not appear in this thesis in a purely instrumental fashion – that is, just as an entry point into wider phenomena of interest. On the contrary, the research for this thesis was always underpinned by the understanding that the political economy of the EU constitutes a topic that deserves to be studied in its own right. Therefore, this thesis also makes a distinctive contribution to the literature on the EU that sits at the intersection between political economy and EU studies. It develops and deploys the original concept of a 'supranational industrial policy complex' to designate a series of interrelated supranational industrial policy practices which have simultaneously been taking off in the EU but which, by and large, have still been flying under the radar of the relevant academic literature (however, for an example of a partial engagement with these EU-level developments, through a case study of recent industrial policy change in Germany, see Schneider 2022).

Accordingly, this thesis puts forward to the relevant literature a re-evaluation of the relationship between European integration and industrial policy practice. Instead of being just a *supranational constraint* on industrial policy – as commonly portrayed in the literature (see, e.g., Rosamond 2002; Smith 2005; Buch-Hansen and Wigger 2010, 2011; Clift 2013; Thatcher 2013; Aydin 2014), this thesis demonstrates that the EU must begin to be recognised as an actual, though internally stratified and contested, *supranational platform* for industrial policy *too* (for earlier post-crisis discussions of this possibility, see, e.g., Clift and Woll 2012a, 2012b; Rosamond 2012b). This corroborates and complements concomitant empirical accounts of recent changes away from neoliberalism in other EU policy domains, such as trade policy (e.g., Jacobs et al. 2022; Schmitz and Seidl 2022). Moreover, by firmly situating internal policy developments of the EU in the domain of industrial policy in the context of wider transformations in the global economy (both in space and in time), the empirical story told in this thesis supplements contemporary reflections about the structural nature and the historical evolution of the relationship between global capitalist processes and the internal dynamics of European integration and governance, including moments of convergence and cooperation but also divergence and conflict among EU member states (see, e.g., Lavery and Schmid 2021).

Finally, the thesis also engages with, and thus has implications for, wider theoretical debates. A first theoretical implication can be derived for the long-standing debate in political analysis about the role of ideas – and, more specifically, economic ideas – in policymaking decisions and processes (see, e.g., Hall 1993; Campbell 1998; Blyth 2002; Schmidt 2008; Hay 2011; Widmaier 2016). At an ontological level, the theoretical approach followed in this thesis, as outlined in Chapters 3 and 4, was accommodative of the proposition that (economic) ideas, as a resource and a guide at the disposal of conscious and intentional agents, do, or at least may, matter in politics. What does *not* necessarily follow from this position of ontological openness to the role of ideas, however, is the proposition that the ideas which actually matter are faithfully transcribed from economic textbooks or from the classic manuscripts of 'defunct economists' (Keynes 2018 [1936]: 340). So, in contrast to John Maynard Keynes's famous dictum, the theoretical framework adopted for this thesis also accommodated the possibility that policymakers might actually be 'practical [people]' who borrow and combine different ideas without fully committing to a single ideological tradition or school of economic thought and who respond pragmatically, as opposed to ideologically, to new events and developments. Indeed, at the later empirical stage, the research found little evidence of strong or definitive ideological positions being held by the

actors involved in these policy processes, whether in favour or against neoliberalism or any alternative other school of thought. Therefore, the reasons for the recent rise in industrial policy practice could not be convincingly attributed to a swing in the contest of economic ideas. In making this empirical claim, this thesis clearly does *not* intend to rule out or downplay the role of economic ideas in policy processes. Yet, it joins other recent additions to the literature which have emphasised the messy 'practical life of ideas' in policy processes (Best 2020), as well as the possibility of policymakers combining and drawing upon a 'pragmatic amalgam' of economic ideas rather than subscribing to a fully-fledged 'paradigm' (Clift 2020).

The second theoretical implication of this thesis lies in its adaptation of core propositions of state theory to the specificities of industrial policy as a *selective* form of state intervention. On the one hand, as remarked at the end of Chapter 2, recent interventions into the industrial policy debate, especially those that can be associated with a new progressive approach to industrial policy advocacy, seem largely impervious to the need for a conceptualisation of the capitalist state that goes beyond a focus on the 'good' or 'bad' ideas that policymakers hold or the quality of the institutional organisation and practices of state bureaucracies (see, e.g., Aiginger and Rodrik 2020; Mazzucato, Kattel and Ryan-Collins 2020; Mazzucato and Kattel 2020; Mazzucato 2021). On the other hand, the emphasis that the literature on state theory places on *general* imperatives and on the necessary conditions for capital accumulation to occur *in general* imply that it is not perfectly suited to grasp the distinctively *selective*, as opposed to general, nature of industrial policy interventions. Hence, this thesis bridges the gap between, simply put, an industrial policy debate that is not hugely interested in state theory and a state theory debate that is not hugely interested in industrial policy (again, for a recent exception, see Schneider 2022). It does so by exploring the conditions under which specific industrial sectors (that is, the selective element) may acquire general importance for the purposes of competitive accumulation or legitimation. In so doing, the thesis also combines different arguments and concepts scattered across the literature to articulate the notion of 'high value' and 'value-enabling' sectoral characteristics as the missing links between *selective* interventions and competitive accumulation *in general*.

So, to briefly recapitulate, this thesis makes a few different contributions to a few different literatures. First, it contributes evidence of recent industrial policy change to the political economy literature on post-crisis transformations, 'post-neoliberal' hybrids, and 'new state capitalism', using the EU as a relevant and theoretically informed case study. Second, it makes a more specific contribution to the EU studies literature about recent and

significant changes in European integration and governance and the evolving relationship between the EU and industrial policy practice. Finally, it also has two theoretical implications for more perennial academic debates in political economy – one to qualify the role of economic ideas in policy processes and another one to bridge the gap between the study of industrial policy and the development of state theory.

8.3 Main limitations of the thesis and suggestions for future research

Like any other research output, this thesis is not without its own fair share of limitations. A first and most obvious limitation is that probably this thesis is, in some respects, slightly premature. Some of the events that it covers are very recent. Some of the processes that it traces are still unfolding. Therefore, they are not very amenable to conclusive assessments or definitive statements yet. Instead, they may only be partially captured and provisionally analysed. In part, this is an inevitable predicament of all research projects which have an empirical focus on contemporary events. The approval of a second Hydrogen IPCEI as this thesis was already nearing submission and after the process of data collection and analysis had already concluded is testimony to the difficulties and perils of doing empirical research in real time. But, for research projects of this type which were conducted in the last few years, this limitation was further exacerbated by the outbreak of COVID-19.

At least during its initial phase, the COVID-19 pandemic severely disrupted the relative stability and continued normalcy on which real-time empirical research relies. Moreover, with good reason, the multipronged public policy response to this massive and unexpected health crisis took precedence over many other ongoing policy processes around the world, including in the EU. When I was in Brussels to carry out a first round of face-to-face interviews in February 2020, just weeks before COVID-19 was declared a pandemic by the World Health Organization, discussions about a forthcoming IPCEI on hydrogen were already ongoing. The topic came up a few times in different interviews. Yet, the first Hydrogen IPCEI would only be approved in July 2022 – almost two and a half years later. Premature research can also have redeeming features, however. In carefully approaching these processes at such an early stage and investigating them in detail, this thesis has collected, treated, and summarised an abundance of data from original interviews and primary documents which could have been permanently lost otherwise. So, hopefully, when the time to write the definitive history of the EU's supranational industrial policy complex or of the apparent return of industrial policy finally arrives, the early material recorded and organised in this thesis may prove to be a useful resource for that endeavour.

The recent case of the German state aid measure which began as part of an IPCEI on hydrogen but was then approved separately under the climate, environmental, and energy guidelines also highlights another potential limitation of the approach followed in this thesis going forward. It is clear that the novelty introduced by the IPCEI state aid framework into state aid rules in 2014 was instrumental in enabling the emergence of an unprecedented set of supranational industrial policy practices in the EU thereafter. But, if the negotiation processes behind IPCEIs begin to result not only in large integrated projects involving multiple member states (that is, IPCEIs) but also in a series of seemingly individual state aid measures which are adopted by different member states under different state aid frameworks though more or less at the same time, then a close focus on projects approved under the IPCEI framework alone will become increasingly unsuited to track and analyse the reproduction and development of these novel supranational industrial policy practices. On the other hand, to continually monitor and appraise the relevance of every state aid case that is daily added to the European Commission's online state aid register – large and small, from every member state, and under every state aid framework – is a very strenuous and time-consuming task. Thus, if IPCEIs – that is, integrated state aid projects approved under the IPCEI state aid framework – ever lose their centrality in the EU's emerging supranational industrial policy complex, then finding a new method for gauging the development of the latter will necessarily require an appreciation of practical trade-offs too.

Finally, a third main limitation of this thesis is that it has little to contribute to our understanding of recent industrial policy change at the EU member-state level unless this change has been linked to the participation of those member state in specific IPCEIs. This is a conscious limitation given that it is an unavoidable by-product of the meso-level approach to the apparent return of industrial policy – between the national level and the global level – that this thesis deliberately adopted from the outset. And, clearly, it would have been impossible to cover all these levels within the scope of this research project alone. However, as the recent case (mentioned in Chapters 6 in 7) of subsidised foreign investments in battery production facilities in Hungary shows, there can be ongoing and subtle interactions between the kind of supranational-level industrial policy change that IPCEIs represent and national-level developments in the industrial policy practices of EU countries that do not participate in IPCEIs but still use individual state aid measures (approved, for example, under the regional state aid guidelines) to attract investments in the same industrial sectors for which there are ongoing IPCEIs. Again, as cautioned above, to continually monitor and appraise the relevance of every individual state aid case in the European

Commission's state aid register for all twenty-seven EU member states is strenuous and time-consuming and probably only within the reach of a very large-scale collaborative research project. But tracing these developments and interactions by, first, focusing on relatively homogenous regional subgroups of member states and, then, comparing them (on the comparative political economy of European capitalist diversity, see, e.g., Bohle 2018; Johnston and Regan 2018) might be a good place to start this broader and more complex exercise of analysing the varieties of industrial policy change across EU member states.

8.4 Coda: how to study industrial policy today

The research that was conducted for this thesis engaged empirically with the apparent return of industrial policy through a theoretically informed, meso-level case study of recent industrial policy change in the EU. However, as it began to find evidence of change and to make sense these ongoing developments, new epistemic and normative questions began to sprout in the background – If 'industrial policy is back', how may scholars of political economy position themselves in relation to it? How should they study and write about industrial policy when the latter is on the rise? Indeed, how should they study and write about industrial policy as it rises *today*?

As observed in Chapter 2, we are also currently witnessing the emergence and consolidation of a new progressive agenda for industrial policy, spearheaded by the work of economist Mariana Mazzucato and her colleagues, which builds upon the developmentalist tradition (and its emphasis on finding institutional and practical solutions to concrete policy problems) but adds to it a much greater emphasis on the question of the political 'visions' or societal 'missions' that should guide selective state interventions. This new progressive agenda might not be underpinned by a strong interest in developing a robust theory of the state, but it does have an answer to the sorts of practical questions raised above. Whether implicitly or explicitly, the answer is that political economists of the present should appreciate the progressive potential of industrial policy and contribute to realise it – first, by developing solutions to the practical problems of state capture which may thwart that potential and, second, by outlining 'visions' and 'missions' towards which that potential might be steered. Policy ideas are the output, policymakers are the target audience.

Admittedly, this is a valid answer on its own terms and, at the very least, an extremely useful place to start any discussion about these sorts of questions. It should be emphasised, however, that to give that same answer here would partially contradict the theoretical framework adopted throughout the thesis. Within a framework in which policy decisions

cannot be solely attributed to the ideas held by state actors but need to be understood in the light of the structural imperatives these actors face as well, such a strong research focus on, and normative commitment to, generating policy ideas and practical recommendations for an audience of policymakers do not seem completely warranted. Instead, a normative research praxis which would be more consistent with this theoretical framework would consist of similarly appreciating the promise of industrial policy practice, to be sure, but also highlighting its dangers and revealing its blind spots, as well as being mindful of the competitive accumulation and legitimation contexts within which industrial policy is practised and, by extension, being alert to the spaces from where social pressure for more progressive or less progressive forms of industrial policy might come from.

In the current context, appreciating the promise of industrial policy practice means, for example, appreciating that the ongoing disbursements of state subsidies in the EU and elsewhere in an inter-referential process of inter-state competitive outbidding are likely to contribute to a faster development of better technologies – namely, the development of microchips for interconnected electronic devices, batteries for electric vehicles and energy storage, and electrolysers for 'green' hydrogen production which are more efficient than those that exist and are used today. And this, in turn, could potentially lead to subsequent beneficial developments such as greater automation and digitalisation of industrial processes, new and convenient digital services, more affordable electric vehicles for consumers, and more affordable 'green' hydrogen for the mobility sector and for heavy industries which are hard to electrify. This is all part of the progressive potential of ongoing industrial policy action.

The potential dangers of industrial policy practice which are most often recognised in the literature – by its critics and advocates alike – are those that stem from the problems of state ignorance and state capture discussed in Chapter 2. Indeed, the whole new progressive research praxis mentioned above can be regarded as a response to these twin problems: a focus on 'visions' and 'missions' to circumvent the problem of ignorance and a focus on practical recommendations to mitigate the problem of capture. What is not so often – if at all – recognised in the industrial policy debate is that there may also be specific dangers associated with the development of particular technologies which, by extension, also become dangers, or at least blind spots, of the industrial policy interventions that selectively support the development of those technologies. While the concepts of 'visions' and 'missions' promise to politicise more explicitly the direction of technological change and, therefore, the

selectivity of industrial policy interventions, this promise still remains largely unfulfilled in the literature on industrial policy.

The development of a normative research praxis capable of acknowledging the dangers and blind spots of industrial policy *beyond* the problems of capture and ignorance alone may benefit from a greater engagement with the literature on the politics of technology (e.g., Winner 1980; Feenberg 2002, 2017; Lawson 2017; Hornborg 2019, 2021; Arboleda 2020). In the case of digital technologies, this may involve recognising that, despite their multiple benefits, the digitalisation processes which are indirectly supported by an industrial policy practice that directly supports the development of the microelectronics industry can also be linked to the rise of new, unsavoury forms of monitoring and disciplining workers' performance – or, for short, the rise of 'digital Taylorism' (Cole, Radice and Umney 2020; Altenried 2022) – and to the proliferation of especially precarious microwork arrangements in the 'hidden abode of automation' (Jones 2021: 7). In the case of 'green' technologies, this involves, for example, acknowledging that the scaling up of electric-vehicle battery production, which has been a priority of contemporary industrial policy in the EU and elsewhere, entails a massive concomitant expansion of mining activities to extract the metals which are necessary for the production of batteries. The International Energy Agency (2021) estimates that, by 2040, the demand for lithium, which is a crucial component of electric-vehicle batteries, may grow by a factor of forty-two relative to 2020 levels. This dramatic expansion of mining activities may pose new risks to biodiversity and to the livelihoods of local communities (Sonter et al. 2020; Luckeneder et al. 2021).

However, the point of acknowledging these dangers is not just to compile a comprehensive list of the pros and cons of each technological possibility. Rather, the ultimate analytical point is to illuminate the spaces where social struggle and political conflict over these technologies is occurring or is most likely to occur. And this matters because such political conflicts will not only affect how those technologies are developed and used, but also shape the context in which industrial policy is practised. For example, as recent developments regarding lithium prospection in Portugal and Serbia show (EURACTIV 2022; The Guardian 2022), the future availability of lithium for electric-vehicle batteries will not simply be given by the size of existing deposits. It will also be determined politically by the interplay between the competitive accumulation imperative, the effective mobilisation of local communities harnessing the legitimation imperative, and the environmental risk assessments carried out by expert agencies (see also Riofrancos 2022). Therefore, industrial policy interventions directed at battery production will also be shaped by these conflicts –

both in scale (e.g., a greater or smaller number of subsidised production facilities) and in content (e.g., a stronger or weaker emphasis on the recyclability of the batteries to be produced in those facilities).

These conflicts and the events through which they manifest themselves are not just background noise. On the contrary, they are constitutive of the political economy of industrial policy practice – they shape the social context in which industrial policy interventions are formulated and implemented by state actors. Therefore, political economists can neither evade them nor assume them away, especially when industrial policy is on the rise. Those studying industrial policy today must begin to foreground these conflicts in their analyses and to position themselves in relation to them.

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