FACULTEIT POLITIEKE EN SOCIALE WETENSCHAPPEN

# A 'COMMON' INTEREST?

## EU MEMBER STATES' MOTIVES FOR FUNDING IMPORTANT PROJECTS OF COMMON EUROPEAN INTEREST

Word count: 9,949 (excl. preface, abstract, tables, bibliography, notes and appendices)
Format: journal article ('wetenschappelijk artikel')

Ruben De La Cruz
Student number: 02004916

Promotor: Prof. Dr Ferdi De Ville

A dissertation submitted to Ghent University in partial fulfilment of the requirements for the degree of Master of Science in EU-Studies

Academic year: 2023 – 2024

UNIVERSITEIT GENT

# PREFACE

Over the course of the past four years, I have had the privilege of studying the most intriguing academic discipline – Political Science. The first three bachelor years culminated with a bachelor's dissertation. Similarly, this final master year should culminate with – or just "end with", if this thesis were to be of low quality – a master's dissertation. I have, however, decided not to write my thesis in the more common format of a dissertation, but instead opted for a journal article. Before the Esteemed Reader jumps to the conclusion that I took the easy way out by opting for a format with a lower required word count, I ask them to postpone their judgment for five lines. Should the Esteemed Reader choose to yield five lines of their time, I will gratefully make use of them to justify this choice. Thereafter, the Esteemed Reader of course has every right to come to their own conclusion.

The justification for opting for the journal article format – and not choosing the more common format of a dissertation – is twofold. First, as Marilyn Monroe[1] is believed to have said: "Being normal is boring!" Second, after already having written my bachelor's thesis in the dissertation format, I wanted to try something else and acquire this new writing skill. This desire was further strengthened after I applied for a predoctoral fellowship of the Flemish Scientific Research Fund (FWO).

As my experience as a political science student comes to an end, I would like to express my gratitude to the people who supported me – and keep supporting me – on this journey. A warm, honest, and sincere "thank you" to…

… Prof. Dr Ferdi De Ville, for providing his Guidance – yes, capital *G* – while I wrote my bachelor's and master's theses, and supporting me in my FWO application – with hopefully more to come.

… Prof. Dr Tim Haesebrouck, for supporting me in my FWO application, and enduring my presence as his intern at the Ghent Institute for International and European Studies.

… Opa and Oma, for providing the philosophical foundations of my political science education, providing the apple sauce supporting the final stretch of this thesis, and "working".

… Mama and Papa, for comfortably enduring my procrastination – although I dare to say that you will sleep better now that I have submitted.

… Luz, for bringing joy to the (dinner) table, providing much needed distraction.

… Lou-Wilson, for sharing moments of general goofiness and – at last – embarking on an exciting journey together.

Ruben De La Cruz

Sint-Niklaas, August 2024

[1] Although it had never occurred to me that she coined this phrase, a highly convincing GoodReads webpage persuaded me in believing so.

# ABSTRACT

***English:*** The European Union's (EU) recent industrial policy turn has sparked both scholarly and policy debates. Scholars have extensively covered the origins of this paradigmatic shift, and stress its tensions with competition policy as industrial policies are funded by state aid – distorting the level playing field. However, current literature is yet to identify the political interests driving the abovementioned tensions. The use of industrial policy instruments is also underresearched. This article addresses this double research gap by analyzing the politics of Important Projects of Common European Interest (IPCEIs) in this industrial-competition policy nexus. This major industrial policy tool is financed by state aid exempted from normal state aid regulations. Interestingly, some member states participate in more IPCEIs than others – thus providing their firms with more state aid. This begs the question: *Which interests prompt EU member states to provide IPCEI state aid?* Drawing on existing state aid and geoeconomics literature, a novel theoretical framework with political-economic and geopolitical explanatory conditions is constructed. This framework is tested with fuzzy-set qualitative comparative analysis, operationalizing these conditions using quantitative data for all 27 member states' participation in the Hy2Tech project. The results confirm concerns on industrial policy-induced distortions of the level playing field. The EU's three biggest economies provide IPCEI aid *purely* because of political-economic interests. Moreover, among other participating member states, economies with a high per capita income are driven by geopolitical interests and (political-economic) interests of their businesses, whereas this is not the case for economies with a low per capita income.

***Nederlands:*** Het nieuw industrieel beleid van de Europese Unie (EU) is voorwerp van academische én beleidsdebatten. Bestaand onderzoek focust op de oorzaken achter deze beleidsomslag en benadrukt de spanning met het competitiebeleid. Industrieel beleid wordt namelijk gefinancierd door staatssteun, wat het gelijk speelveld op de interne markt bedreigt. De politieke belangen achter deze spanningen blijven echter onderbelicht, evenals het gebruik van deze instrumenten. Dit artikel vult deze kennishiaten op door de belangen achter het gebruik van *Important Projects of Common European Interest* (IPCEI) te analyseren. Dit instrument van industrieel beleid wordt gefinancierd door staatssteun die niet onder reguliere staatssteunregels valt. Het valt op dat bepaalde lidstaten vaker participeren in IPCEI dan andere, waardoor bedrijven in die lidstaten meer staatssteun ontvangen. Dit artikel stelt daarom de vraag: *Op basis van welke belangen keren EU-lidstaten staatssteun uit voor IPCEI?* Gebruikmakend van onderzoek naar staatssteun en geo-economie wordt een verklarend theoretisch kader opgesteld, bestaande uit politiek-economische en geopolitieke determinanten. Deze worden voor alle 27 EU-lidstaten geoperationaliseerd aan de hand van kwantitatieve data. Het theoretisch kader wordt getest door de participatie van de lidstaten in de *Hy2Tech*-IPCEI te onderzoeken via *fuzzy-set qualitative comparative analysis*. De resultaten bevestigen dat IPCEI-staatssteun een marktverstorend effect heeft. De drie lidstaten met de grootste economie keren enkel IPCEI-staatssteun uit vanuit politiek-economische belangen. Voor de andere deelnemende lidstaten geldt dat welvarende landen (met een hoog bbp per capita) in IPCEI-projecten stappen omwille van geopolitieke belangen én de (politiek-economische) belangen voor hun bedrijven. Bij minder welvarende landen is dat niet het geval.

# 1 INTRODUCTION

"We will build a future in Europe . . . be it chips, batteries, solar panels, or hydrogen, we want the EU to remain an industrial leader", declared Thierry Breton, European Commissioner for the Internal Market Breton, 2023). Recent geoeconomic changes on the world stage have prompted the European Union (EU) to make a paradigmatic industrial policy turn to increase the bloc's strategic autonomy in the green and digital twin transition, developing breakthrough technologies such as microelectronics, batteries and hydrogen applications (see e.g. Abels & Bieling, 2023; Di Carlo & Schmitz, 2023; McNamara, 2023; Herranz-Surralles, forthcoming, p. 1; Meunier & Nicolaïdis, 2019, p. 107). However, this "significant shift" is mostly financed through the relaxation of competition regulations, as major funding is provided by state aid coming from individual member states. Hence, scholars warn for potential distorting effects on the level playing field (McNamara, 2023, p. 2377; see also Eisl, 2022*b*, pp. 5-7; Wigger, 2023). Concerns about these tensions in the industrial-competition policy nexus are also widely echoed among firms and policymakers, with Competition Commissioner Vestager (2023) showing that 80 percent of state aid approved in 2022 under the Temporary Crisis Framework was provided by Germany and France alone (Vestager, 2023) – prompting member states' leaders to state that this "looks a bit like a game of the deepest pockets" (Gayet & Riffaud, 2022). While a lot is known about the abovementioned origins of industrial policy (see e.g. Di Carlo & Schmitz, 2023; Meunier & Mickus, 2020; Seidl & Schmitz, 2023; Schneider, 2023), we do not know *how* the EU pursues it using its industrial policy instruments. Second, although there is scholarly consensus on the increasing pressure industrial policy puts on competition policy by relaxing competition regulations (see e.g. Bulfone, 2023; Gräf & Schmalz, forthcoming; Poitiers & Weil, 2022; Wigger, 2023), existing accounts have ignored the interests and motivations behind these pressures. The current literature is thus characterized by a double research gap.

A "major policy tool" through which the EU pursues this industrial policy is Important Projects of Common European Interest (IPCEIs) (McNamara, 2023, p. 2379). These "large and ambitious cross-border projects by multiple Member States" center around developing breakthrough technologies and infrastructure on hydrogen, batteries, microelectronics, and cloud and communication technologies (DG COMP, 2023, p. 1). Interestingly, existing research shows that member states differ significantly in their participation in IPCEIs – without offering explanations for these significant differences. (Eisl, 2022*a*, 2022*b*; see also Poitiers & Weil, 2022). This implies that firms in participating member states profit from the nearly €37.2 billion in total IPCEI state aid, while their rivals in neighboring countries do not – leading to significant potential distortion of the level playing field (European Commission, n.d.*b*.). As current literature fails to provide an explanation for these large differences in potential market-distorting state aid, this raises the question: *Which interests prompt EU member states to provide state aid for Important Projects of Common European Interest?*

Studying this research question addresses the double research gap in the current literature. First, it provides an account on how the bloc pursues its industrial policy, by analyzing IPCEIs (an industrial policy tool). Second, it puts interests at the heart of the tension between industrial and competition policy, by showing which interests lead to IPCEI state aid. In addition, it also provides input for the scholarly debates regarding the determinants of state aid (Alves et al., 2021; Biondi & Righini, 2015;

Poulou et al., 2023; Schito, 2021*a*, 2021*b*), and industrial policy's impact on European integration (see Christiansen, 2020; Eisl, 2022*a*; Lavery & Schmid, 2021; McNamara, 2023; Seidl & Schmitz, 2023).

To answer the research question, a novel theoretical framework consisting of geopolitical and political-economic drivers will be constructed, building on existing literature on geoeconomics and state aid respectively. A fuzzy-set qualitative comparative analysis (fsQCA) will indicate which of these interests drive all 27 member states' (non-)participation in the Hy2Tech IPCEI.

This article is further structured as follows. Section 2 summarizes the state-of-the-art, introducing the EU's competition and industrial policy, and Important Projects of Common European Interest. In doing so, it underscores gaps in the current literature, out of which the research question is derived. Section 3 presents the theoretical framework of possible explanatory conditions behind member states' decisions to provide IPCEI state aid. To test this framework, section 4 develops a research design using fsQCA. It also justifies the case selection and operationalizes the conditions of the theoretical framework. The analysis and results are presented in section 5. Section 6 concludes, elaborating on the implications of the results for diverse strands of literature, and offering possible avenues for further research.

# 2 LITERATURE REVIEW

This section first describes the EU's established competition policy and the scholarly debate around its ordo- and neoliberal underpinnings. Second, it portrays the bloc's emerging industrial policy, and the (global) geoeconomics and (internal) EU-politics behind this "paradigmatic shift" (Schneider, 2023, p. 254). Subsequently, the current literature on the tension between the two policy fields is summarized. The third part demonstrates how researching IPCEIs contributes to understanding this industrial-competition policy nexus. The existing literature on IPCEIs is then outlined, out of which the research question is eventually derived (part 4).

## 2.1 The EU's established competition policy

### *2.1.1 EU competition policy and its ordoliberal foundation*

EU competition law regulates (horizontal) relations between firms, as well as (vertical) state-firm relations (see Table 1). *Horizontal regulations* include antitrust rules regarding restrictive practices, such as horizontal price-fixing by cartels, and abuse of dominance by firms with a dominant market position[2] (DG COMP, n.d.*b*; Wilks, 2015, pp. 146-155). It also involves merger control, preventing mergers and acquisitions that may lead to a firm obtaining a dominant market position[3] (DG COMP, n.d.*c*). *Vertical regulations* govern the liberalization of utilities and state aid. EU member states are only allowed to provide limited amounts of state aid, as gives the benefitted firms an unfair advantage over their competitors (DG COMP, n.d.*d*). Besides state aid, other forms of state-to-firm assistance are also covered by this regulation, such as tax breaks, preferential purchasing, and loans or loan guarantees

[2] A classic example is the Google Shopping case. In 2017, the Commission fined Google €2.42 billion for consistently placing its Google Shopping results above other comparison shopping results in its Google search engine (European Commission, 2017).
[3] For example, in 2016 DG COMP only approved of ABInbev's acquisition of SABMiller, which both were the two largest brewers at the time, given that the former sold all of the latter's businesses in the EU (European Commission, 2016).

(Poulou et al., 2023, p. 361; Wilks, 2015, pp. 146-155). While these vertical regulations are an important part of the EU's competition policy, existing literature has overlooked it due to its focus on horizontal anti-competitive agreements (Wilks, 2015, p. 146). This article aims to bridge this gap by studying the drivers of state aid in the industrial-competition policy nexus.

***Table 1. EU competition law regulations***

| **Horizontal relations** *(firm-firm)* | **Vertical relations** *(state-firm)* |
|---|---|
| Antitrust – restrictive practices (art. 101 TFEU)<br>Antitrust – abuse of dominance (art. 102 TFEU)<br>Merger control (Council Regulation 139/2004) | State aid (arts. 107-108 TFEU)<br>Liberalization of utilities (arts. 37, 105 TFEU) |

*Source*: Author, based on Wilks (2015, pp. 146-155).

Competition policy is arguably one of the EU's most supranationalized policy fields. It is predominantly enforced by the Commission's Directorate-General for Competition (DG COMP), which possesses far-reaching powers (Buch-Hansen & Wigger, 2011, p. 3; Wilks, 2015, p. 141). Scholars view this technocratic oversight by unelected DG COMP officials, rather than elected politicians, is a key signifier of the ordoliberal foundation of EU competition policy (Biebricher, 2017, p. 113; see also Bartle & Wilks, 2002). Developing an understanding of ordoliberalism is therefore imperative in order to analyze the EU's competition policy – and its tension with industrial policy.[4]

The main goal of the Freiburg School of ordoliberalism is ensuring a perfectly competitive environment (Biebricher 2017, p. 105; see also Amable 2017, p. 21; Giocoli, 2009). However, this competitive environment does not emerge naturally and thus has to be cultivated by the state (Gerber, 1998, pp. 245-246). At the same time, ordoliberals do not trust elected officials with this task, as they can be easily swayed by interest groups who then use the state apparatus to their advantage. The ordoliberal solution to this problem is implementing an *economic constitution* for competition rules, which constrains the government (Biebricher, 2017, pp. 107-110; Giocoli, 2009, pp. 769-770; Wigger, 2017, p. 164). This ensures enforcement of competition rules by a strong state apparatus, while also limiting the government's discretion over economic policy – thus rendering political interference with the economic system impossible.

This depoliticization of the economy is further strengthened by discursive and institutional tools, which are clearly present in the EU's discourse and governing of competition policy. The former refers to the portrayal of neoclassical economic theories as the only scientific view on how to organize the economy (Buch-Hansen & Wigger, 2011, p. 2). The EU has embraced this ordoliberal rhetoric, as it states that "competition policy encourages companies to offer consumers goods and services on the most favorable terms. It encourages efficiency and innovation and reduces prices" (DG COMP, n.d.*a*).[5] The latter consists of tasking a technocratic, independent institution with enforcing the economic constitution, insulated from democratic influence (Biebricher, 2017, pp. 107-110; Giocoli, 2009, p. 770; Wigger, 2017, p. 164). Indeed, Wilks (2015, p. 141) notes that DG COMP is "relatively free from control from the Council and the Parliament" (Wilks, 2015, p. 157). Moreover, as Table 1 demonstrates, competition law is firmly anchored in the Treaty on the Functioning of the European Union. One could

[4] The standard account on ordoliberalism is Gerber (1998, ch. 7). For a more recent analysis, see Biebricher et al. (2022).
[5] The Commission also emphasizes this in policy documents (see e.g. European Commission, 1994, p. 14).

therefore conclude that "competition policy has become . . . an 'economic constitution' for Europe" (Wilks, 2015, p. 141).

### *2.1.2 Critiquing the ordo- and neoliberal competition policy*

The described narrative on the ordoliberal underpinnings of the EU's competition policy has stimulated interesting scholarly critiques, centering around two main issues (see Table 2). A first strand of literature questions the influence of the ordoliberal school of thought on EU competition policy (Bartalevich, 2016; Biebricher, 2017; Giocoli, 2009; Schneider, 2023; Wigger, 2017). It is commonly believed that the German ordoliberal competition policy was reproduced at the EU level (see e.g. Wilks & McGowan, 1996). However, Wigger (2017, pp. 163, 175-176) points out that existing research has not been able to find evidence for this claim. EU competition policy was not enforced until the neoliberal turn in the late 1970s. Indeed, literature on New Constitutionalism confirms that it was the neoliberal shift that established the economic architecture of EU competition policy (Schneider, 2023, p. 249). Contrary to mainstream accounts, these scholars therefore argue that EU competition policy is not ordoliberal, but neoliberal in nature (Bartalevich, 2015; Biebricher, 2017; Schneider, 2023, p. 249).

***Table 2. Current critiques on ordoliberalism in EU competition policy***

| **Influence of ordoliberalism on policy** | **Substantial critiques on ordoliberalist nature of competition policy** | |
|---|---|---|
| | *Depoliticizing economy* | *Constraining economic policy discretion* |
| Bartalevich (2016)<br>Biebricher (2017)<br>Giocoli (2009)<br>Schneider (2023)<br>Wigger (2017) | Buch-Hansen and Wigger (2011)<br>Budzinski (2007)<br>Wigger and Nölke (2007) | Buch-Hansen and Wigger (2010)<br>Bieling and Brand (2015)<br>Clift (2013)<br>Doleys (2013)<br>Lianos, 2019<br>Ryner and Cafruny (2017)<br>Schneider (2023)<br>Townley (2009)<br>van Apeldoorn (2002)<br>Wigger (2007) |

*Source*: Author.

Regardless of the scholarly debate on the ordoliberal versus neoliberal foundations, a second strand of literature critiques the current EU competition policy. Some scholars focus on the depoliticized nature of competition policy (Buch-Hansen & Wigger, 2011; Budzinski, 2007; Wigger & Nölke, 2007). Budzinski (2007) takes an economic approach, as he critiques the "more-economic approach" (p. 295) in which neoclassical economics is portrayed as the only possible scientific basis to organize competition policy. Other research critiques stem from political science, using different theoretical perspectives, concretely critical political economy (Buch-Hansen & Wigger, 2011), and the Varieties of Capitalism-approach (Wigger & Nölke, 2007). These approaches emphasize the "profoundly political" nature of competition policy, while noting that "competition regulation still suffers from a chronic lack of attention from political scientists" (Buch-Hansen & Wigger, 2011, pp. 4, 6). This article aims to remedy this shortcoming, by studying power and interests at the heart of the industrial-competition policy nexus.

Current literature also studies how the EU's ordo-/neoliberal competition policy constrains member states' discretion over economic policies (Bieling and Brand, 2015; Buch-Hansen & Wigger, 2010; Clift, 2013; Doleys, 2013; Lianos, 2019; Ryner and Cafruny, 2017; Schneider, 2023; Townley, 2009; van Apeldoorn, 2002; Wigger, 2007). This is mostly studied using neo-Gramscian approaches, such as neo-

Gramscian international political economy (Ryner & Cafruny, 2017; van Apeldoorn, 2002) and New Constitutionalism (Bieling & Brand, 2015; Schneider, 2023). The ordo-/neoliberal economic constitution constrained the discretionary economic policy choices of member states, by, among other things, a rougher enforcement of competition policy against member states, in particular regarding state aid law (Schneider, 2023, pp. 249-250). As a result, the policy space for industrial policies was strongly restricted – which is also attracted significant scholarly attention (see e.g. Buch-Hansen & Wigger, 2010; Bulfone, 2023; Clift, 2013; Cini & McGowan, 2009, p. 166; Doleys, 2013; Lianos, 2019; Pianta et al., 2020). To conclude, current literature clearly showcases how competition policy restricts industrial policy. However, this is only one aspect of the tension in the industrial-competition policy nexus, as the EU's emerging industrial policy also increasingly pressures competition policy.

## 2.2 The EU's industrial policy: the new kid on the block

In recent years, the EU's industrial policy has increasingly come to the forefront of EU politics, as demonstrated by new policy instruments and legislation (see below). It is aimed at creating and protecting so-called "European champions" among firms (Di Carlo & Schmitz, 2023; Gräf & Schmalz, forthcoming; Johnston & Huggins, 2023; Lavery, 2024; McNamara, 2023; Schneider, 2023). By supporting certain enterprises in strategic industries – enabling them to take on global competitors – the EU reduces its dependence on other states in global value chains, thus protecting the bloc's strategic autonomy (Eisl, 2022*b*, p. 3; De Decker, 2023; Gräf & Schmalz, forthcoming; Jansen & Devroe, 2022; McNamara, 2023, p. 2; see also Farrell & Newman, 2019; Moraes & Wigell, 2022). Scholars widely regard this industrial policy turn as a "significant shift" (McNamara, 2023, p. 2377; see also Falkner et al., 2024; Schneider, 2023, p. 254; Seidl & Schmitz, 2023). First, it constitutes a shift from competition policy's market-*creation* – the EU creates the conditions for firms to compete freely – to market-*direction* by the government (Seidl & Schmitz, 2023; van Apeldoorn & de Graaff, 2022, p. 309). This implies a shift from a *horizontal* (firm-firm) to a *vertical* (state-firm) policy approach (Gräf & Schmalz, forthcoming; Landesmann & Stöllinger, 2020; Schneider, 2023, p. 254). Second, it reconfigures the EU's political authority (McNamara, 2023). Indeed, contrary to the government's politically neutral role in market-creation, market-direction requires explicit political choices (see also Seidl & Schmitz, 2023, p. 2151).

The EU's industrial policy turn has stimulated interesting scholarly work, focusing on four fields of study. First, current research has mostly focused on describing the origins of the emergence of EU industrial policy (see e.g. Di Carlo & Schmitz, 2023; Meunier & Mickus, 2020; Seidl & Schmitz, 2023; Schneider, 2023). Second, the impact of this paradigmatic shift in relation to European integration is also being studied (see Christiansen, 2020; Eisl, 2022*a*; Lavery & Schmid, 2021; McNamara, 2023; Seidl & Schmitz, 2023). Third, existing literature also maps different policy measures, consistently highlighting the tensions between industrial and competition policy (see e.g. Bauerle Danzman & Meunier, 2024; Di Carlo & Schmitz, 2023; Gräf & Schmalz, forthcoming; Lopes-Valença, forthcoming; McNamara, 2023; Poitiers & Weil, 2022). The next sections provide an overview of the current research on these three topics.

### *2.2.1 Global and internal origins: driving European integration?*

Existing research provides extensive accounts for the drivers of this interesting policy turn (see Table 3). Scholars point to global geoeconomics, as well as internal EU-politics. First, *geoeconomics* encompasses developments in both global geopolitics and global economics. In line with an emerging

literature on geoeconomics, these determinants are combined, as "there is a strong economic dimension to this geostrategic competition" (Seidl & Schmitz, 2023, p. 2151). Geoeconomics capture the increasing interweaving of economic policy on the one hand, and foreign and security policy on the other hand (Lavery & Schmid, 2021, p. 1330; see also Baracuhy, 2018; Meunier & Mickus, 2020). Regarding *global geopolitics*, multiple scholars point out the role industrial policy plays in the EU's quest for Open Strategic Autonomy (OSA) (Miró, 2022; see also Schneider, 2023). Indeed, industrial policy tools are employed to reduce its dependence on other states in global value chains, thereby safeguarding its technological sovereignty (Abels & Bieling, 2023; Eisl, 2022*b*, p. 3; De Decker, 2023; Jansen & Devroe, 2022; see also Farrell & Newman, 2019; Moraes & Wigell, 2022). Current literature also points out that this has become increasingly important following the geopolitical green technological race in the energy transition (Allan et al., 2021; Herranz-Surralles, forthcoming, p. 1; Meunier & Nicolaïdis, 2019, p. 107). In this regard, IPCEIs are frequently mentioned as "useful tools" in "the quest for . . . 'strategic autonomy'" (Szczepański, 2020, p. 2). They play a crucial role for the EU, as demonstrated by the European Parliamentary Research Service (Evroux, 2022, p. 9; Szczepański, 2020, p. 2) and policy papers (Eisl, 2022*a*, p. 2; Eisl, 2022*b*, p. 3).

***Table 3. Drivers of the EU's industrial policy turn***

| **EU Industrial policy** | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Geoeconomics*** | | | | ***Internal EU-politics*** | | | |
| *Global geopolitics* | | *Global economics* | | *Ideational politics* | *Coalitional politics* | | |
| OSA | Green technological race | Twin transition | Countering rival policies | | Inter-governmental | Neo-Gramscian | Neo-functionalist |

*Source*: Author.

Regarding *global economics*, scholars argue that industrial policy was created to remedy market failure in the green and digital transitions (Jansen & Devroe, 2020, p. 120; Seidl & Schmitz, 2023). As the EU can not afford to fall behind in this twin transition and market forces fail to deliver, the EU has decided to employ public investments via its industrial policy (Di Carlo & Schmitz, 2023; Eisl, 2022*b*; McNamara, 2023). In addition, it also plays an important role in countering industrial policies from other states (e.g. the US Inflation Reduction Act) (De Decker, 2023; see also Chazan et al., 2023). Although these geoeconomic evolutions came into being gradually, current literature points to two major catalysts: the Covid-19 pandemic (Meunier & Mickus, 2020; Szczepański, 2020, p. 8; see also Meunier & Matthijs, 2023) and Russia's full-scale invasion of Ukraine (Herranz-Surralles, forthcoming, p. 23; Meunier & Matthijs, 2023).

Second, scholars stress the importance of internal EU-politics in the bloc's industrial policy turn. In this regard, both ideational (Di Carlo & Schmitz, 2023; Seidl & Schmitz, 2023) and coalitional politics (Bora & Schramm, forthcoming; Di Carlo & Schmitz, 2023; Jansen & Devroe, 2022; Meunier & Mickus, 2020; Pianta et al., 2020; Schneider, 2023; Seidl & Schmitz, 2023) are highlighted. From a neofunctionalist perspective, Di Carlo and Schmitz (2023) stress the role of the Commission as a policy entrepreneur, using *ideational politics* to unite a diverse coalition under the industrial policy flag. This brings us to the *coalitional politics*. The abovementioned literature agrees on the importance of Franco-German alignment on industrial policy. However, scholars differ on the causes of this alignment. Intergovernmental accounts (Bora & Schramm, forthcoming) point to the aligning interests of the bloc's two biggest economies, as the industrial policy debate erupted after the proposed merger

between (German) Siemens and (French) Alstom. This is partly echoed by neo-Gramscian approaches (Schneider, 2023). On the other hand, neofunctionalist approaches stress that this policy turn was led by a cultivated spillover by the Commission (Bora & Schramm, forthcoming; Di Carlo & Schmitz, 2023; Meunier & Mickus, 2020).

A smaller strand of literature examines how the emergence of this new policy field might lead to further European integration (Christiansen, 2020; Eisl, 2022*a*; Lavery & Schmid, 2021; McNamara, 2023; Seidl & Schmitz, 2023). These scholars argue that the bloc's determination to become more autonomous during the decentring of US-led globalization (Lavery & Schmid, 2021), and the fear of technologically and economically falling behind (Seidl & Schmitz, 2023) necessitate further integration (Christiansen, 2020). Current research suggests that the direction of industrial policy at the EU-level is categorically different from the past, in which those forms of market-direction usually happened at the member state-level (Di Carlo & Schmitz, 2023; McNamara, 2023; see also Eisl, 2022*a*, p. 1)

### *2.2.2 Industrial policy tools: fragmenting the common market?*

In addition to researching its drivers and its relation to European integration, current literature on EU industrial policy also maps the legislation and policy instruments used. The former encompasses, among others, the EU's Net-Zero Industry Act, European Chips Act and Critical Raw Materials Act (Breton, 2023). While describing the latter, scholars frequently mention the bloc's Foreign Direct Investment Screening Regulation, International Procurement Instrument, Foreign Subsidies Regulation, Anti-Coercion Instrument, Carbon Border Adjustment Mechanism, and general outbound investment screening (Bauerle Danzman & Meunier, 2024, pp. 7-10; Gräf & Schmalz, forthcoming; Seidl & Schmitz, 2023). Most notably, IPCEIs are widely recognized as a "major policy tool" (McNamara, 2023, p. 2379; see also Bulfone, 2023; Eisl, 2022*a*, 2022*b*; Di Carlo & Schmitz, 2023; Gräf & Schmalz, forthcoming; Lopes-Valença, forthcoming; Traversa & Sabbadini, 2022). However, the "mapping" of these instruments remains descriptive, as how "industrial policy plays out on the ground" is yet to be researched (Seidl & Schmitz, 2023, p. 2168). Hence, this article aims to provide a novel analysis of an industrial policy instruments, namely IPCEIs.

As mentioned above, the industrial-competition policy nexus is characterized by tensions between the two policies, as competition policy restricts member states' discretion over industrial policies. In addition, current literature also widely agrees that industrial policy pressures competition policy (see Abels & Bieling, 2023, p. 524; Di Carlo & Schmitz, 2023; Eisl, 2022a, p. 2; Eisl, 2022b, p. 2; Jansen & Devroe, 2022; Miró, 2022, p. 320; Poitiers & Weil, 2022, 26 november; Schito, 2021; Schneider, 2023, p. 250; Wilks, 2015, p. 145). As industrial policy involves market-direction – often financed by state aid – scholars warn this can cause fragmentation of the common market (Di Carlo & Schmitz, 2023; Eisl, 2022*b*, pp. 5-7; Pianta et al., 2020; Redeker, 2021; Wigger, 2023). After all, larger and richer member states have more resources to provide their firms with state aid. This way, their firms gain an uneven advantage. As mentioned, these concerns are widely echoed among policymakers (see e.g. Gayet & Riffaud, 2022; Vestager, 2023).

Concluding, current literature on EU industrial policy fails to provide a scientific *analysis* of its subject. It *describes* the origins of this significant policy turn and *maps* the new industrial policy instruments, while *mentioning* the tensions these new policy tools cause in the industrial-competition policy nexus. However, existing research does not *analyze* how these industrial policy tools are used (Bulfone, 2023;

Di Carlo & Schmitz, 2023), or how this tension manifests itself in the implementation of the new industrial policy instruments. The scientific literature is thus characterized by a double research gap. First, while we know why the EU is embracing assertive industrial policy, we do not know *how* it is exactly pursuing this. Second, while scholars identify tensions between industrial and competition policy, current literature fails to address the political motivations behind them. This article aims to compensate for this double gap by *analyzing* the politics behind IPCEIs, an instrument well-suited to study how "industrial policy plays out on the ground" (Seidl & Schmitz, 2023, p. 2168) and examine which political interests motivate IPCEI state aid – thus revealing member states' interests in the industrial-competition policy nexus.

## 2.3 IPCEIs in the industrial-competition policy nexus

Important Projects of Common European Interest are "large and ambitious cross-border projects by multiple Member States aimed at overcoming important market or systemic failures"(DG COMP, 2023, p. 1). IPCEIs center around the research, development and innovation (R&D&I), and first-market deployment of breakthrough technologies and infrastructure in strategically important sectors (Abels & Bieling, 2023, p. 524; European Commission, 2021, p. 1; Lopes-Valença, forthcoming, p. 5; Strategic Forum for IPCEIs, 2019). In the same vein, they also contribute to the EU's green and digital transitions (Eisl, 2022*a*; European Commission, 2021, p. 1). At present, ten IPCEIs have been approved for microelectronics, batteries, hydrogen, and cloud and communication technologies (European Commission, n.d.*b*.). As the (financial) risks for developing such breakthrough technologies outweigh the capacities of one firm or member state, IPCEIs pool knowledge, expertise and financial resources from all over the EU (European Commission, n.d.*a*). IPCEIs are funded through national state aid of the participating member states[6], under an exception of the EU's competition rules[7]. IPCEIs thus have a dual nature: their aim is to strengthen the EU's position in the global economy through *collaboration* among member states, but the means to achieve that are through potentially market-distorting *national* state aid.

It is clear that researching IPCEIs is essential to address the double research gap in existing literature. With regard to the first research gap, as a "major [industrial] policy tool" that signifies a significant shift in EU market-direction, IPCEIs are well-suited to complement existing research on the EU's industrial policy instruments (McNamara, 2023, p. 2379). The importance of IPCEIs is also evidenced by the high amounts of state aid the projects received. The first eight (of ten) IPCEIs received €35 billion in state aid, unlocking an additional €55 billion in private investments (Lopes-Valença, forthcoming, pp. 1-2). Second, as these projects are funded by state aid exempted from normal state aid rules, IPCEIs are exemplary in capturing the risk of state aid-funded industrial policy fragmenting the common market (Lopes-Valença, forthcoming, p. 1; McNamara, 2023, p. 2379; Eisl, 2022*a*, 2022*b*; Poitiers & Weil, 2022). Existing descriptive accounts indeed demonstrate that EU member states differ significantly in their participation in IPCEIs (Eisl 2022*a*, 2022*b*; see also Poitiers & Weil, 2022). This implies that firms in non-participating member states do not profit from state aid, risking

[6] As member states participating in IPCEIs are expected to provide IPCEI state aid, both are used interchangeably in this article.

[7] Following a General Block Exemption Regulation, IPCEI state aid was deemed compatible with the internal market (Communication 2014/C 188/02 from the Commission of June 20, 2014 — 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, *OJ* C188, June 20, 2014, pp. 4-12).

fragmentation of the single market – which some policymakers even call an intra-European 'subsidy war' (Haeck, 2023). In sum, IPCEIs provide an excellent way to understand how industrial policy may lead to distortion of competition in the EU: some member states participate in IPCEIs more often – and thus provide more state aid – than others.

Although IPCEIs are often mentioned in the industrial-competition policy nexus (see above), current literature remains descriptive, leaving a lot of scientific questions on IPCEIs unanswered. After all, current contributions on IPCEI are mostly policy papers (or non-papers), mapping granted IPCEI state aid (Eisl, 2022*a*, 2022*b*) and recommending how to improve the IPCEI policy (Eisl, 2022*a*, 2022*b*; Poitiers & Weil, 2022; Swedish Ministry of Climate and Enterprises, 2021; Szczepański, 2020, p. 8). Regarding the latter, recommendations center around (1) involving more member states, especially Mediterranean, and Central- and Eastern-European countries; (2) providing more transparent and equal financing; and (3) improving the governance around IPCEIs. Political science scholars have only depicted the emergence of this policy instrument (Lopes-Valença, forthcoming, p. 2), or studied specific IPCEIs in depth (see Johnston & Huggins, 2023 on microelectronics; Machado et al., 2022 on hydrogen). Contributions that did examine IPCEIs as a whole, only analyzed them as part of a broader research project on the relationship between China's geoeconomic stance and the EU's industrial policy (see Babic & Dixon, 2022; Gräf & Schmalz, forthcoming; Hanemann & Huotari, 2018). A notable exception is Lopes-Valença (forthcoming), who concluded that IPCEIs have a limited or detrimental effect on the convergence between the bloc's core and periphery.

## 2.4 Research question

EU member states differ significantly in their participation in IPCEIs and the amount of IPCEI state aid they provide (see Eisl, 2022*a*, 2022*b*; Lopes-Valença, forthcoming). However, current literature fails to provide an explanation for these large differences in potential market-distorting state aid.[8] Hence, this article fills this gap by examining member states' drivers behind IPCEI state aid, guided by the following research question: *Which interests prompt EU member states provide state aid for Important Projects of Common European Interest?*

In doing so, this article addresses a double gap in existing literature on the industrial-competition policy nexus. First, it *explains* how the EU pursues its industrial policy, by showcasing which interests drive IPCEI participation – thus going further than providing *descriptive* accounts of the EU's industrial policy turn (see e.g. Di Carlo & Schmitz, 2023; Meunier & Mickus, 2020; Seidl & Schmitz, 2023; Schneider, 2023), or its instruments (see e.g. Bauerle Danzman & Meunier, 2024; Di Carlo & Schmitz, 2023; Gräf & Schmalz, forthcoming; Lopes-Valença, forthcoming; McNamara, 2023; Poitiers & Weil, 2022). Second, this contribution provides insight into which way the industrial-competition policy balance tilts – thus going further than merely stressing the pressures between the two fields (see e.g. Bulfone, 2023; Di Carlo & Schmitz, 2023; Gräf & Schmalz, forthcoming; Poitiers & Weil, 2022; Schneider, 2023, p. 250; Wigger, 2023).

Concretely, this will be examined by creating a new theoretical framework, consisting of both possible geopolitical, and classic political-economic drivers for IPCEI state aid. If member states participate in

[8] Although Lopes-Valença (forthcoming) elaborates further on the differing amount of state aid, this contribution only examines the differences between the EU's core and periphery – and not the differences between all member states.

IPCEIs on the basis of classic political-economic advantages, this points to interests on gaining an advantage on competitors – thus aiming for market-distorting potential. On the other hand, participation on geopolitical grounds evidences that those concerns are unjustified.

Additionally, this article contributes to existing research on the determinants of state aid (Alves et al., 2021; Biondi & Righini, 2015; Poulou et al., 2023; Schito, 2021a, 2021b). Furthermore, it remedies political science scholars' lack of attention for vertical competition policy measures, by putting politics at the heart of studying competition policy (Buch-Hansen & Wigger, 2011, p. 4; van Druenen, 2022, p. 553; Wilks, 2015, p. 146). Analyzing member states' drivers of providing IPCEI state aid also contributes to the ongoing debate about industrial policy's impact on European integration (Christiansen, 2020; Eisl, 2022a; Lavery & Schmid, 2021; McNamara, 2023; Seidl & Schmitz, 2023).

The present article is also methodologically innovative, as existing state aid literature is dominated by quantitative large-N studies (see e.g. Alves et al., 2021; Poulou et al., 2023; Boateng et al., 2020; Hongli & Vitenu-Sackey, 2020; Tunali & Fidrmuc, 2015). Answering to multiple calls for comparative research (van Druenen, 2022, p. 570; Zohlnhöfer et al., 2018, p. 22), this research will be carried out using qualitative comparative analysis. This comparative middle-N approach fills a methodological gap between between quantitative and qualitative approaches, as it is capable of analyzing a fairly large number of cases, while respecting the complexity of each case (Ragin, 1987, pp. 83-85). Concluding, this research also has significant societal relevance. This is illustrated by ongoing political debates about state aid distorting the level playing field (see e.g. Breton, 2023; Vestager, 2023; Swedish Ministry of Climate and Enterprises, 2021) and concerns of government leaders about state aid being "a game of the deepest pockets" (Gayet & Riffaud, 2022; see also Haeck, 2023). Moreover, firms and policy officials are increasingly developing interest in IPCEIs (Eisl, 2022*a*, p. 4).

# 3 THEORETICAL FRAMEWORK

To uncover the drivers of IPCEI state aid and determine which interests prompt member states to participate in such a project, a novel theoretical framework is developed (see Table 4). Mirroring the different origins of EU industrial policy, it consists of EU-internal political-economic determinants, as well as global geopolitical drivers (see section 2.1.1). In developing this framework, the political-economic determinants were derived from an established body of literature on state aid (e.g. Crössmann & Mause, 2014; Fuentes & Pipkin, 2016; Gràcia et al., 2023; Juhász et al., 2022; Lindstrom, 2021; Nicolini et al., 2016; Schito, 2021*a*, 2021*b*). Geoeconomics literature inspired the geopolitical determinants (e.g. De Decker, 2023; Lavery & Schmid, 2021). Building on these strands of literature, hypotheses regarding the impact of each condition were formulated.

***Table 4. Theoretical framework: possible determinants of IPCEI state aid***

| **Political-Economic** *(EU-internal)* | **Geopolitical** *(Global)* |
|---|---|
| 1. Strong business demands<br>2. High civil society pressure<br>3. High fiscal capacity of member state<br>4. Conservative ideology<br>5. Federal system | 6. High threat from Russia<br>7. High energy dependence on Russia<br>8. High defense expenditure |

*Source*: Author.

## 3.1 Political-economic determinants

Current state aid literature proves that *strong business demands* positively impact a member states' decision to provide state aid (Nicolini et al., 2016; Schito, 2021*a*; van Druenen, 2022). A common explanation is that a significant domestic presence of companies in the targeted sectors implies a high level of importance to the national economy. Therefore, the theoretical hypothesis is as follows:

**Hypothesis 1:** Strong business demands in a member state lead to IPCEI state aid.

*High civil society pressure* may also constitute an explanation for to IPCEI participation. As IPCEIs often contribute to the green transition, pressure groups may compel businesses and member states to engage in this industrial policy instrument (Fuentes & Pipkin, 2016, p. 158). Therefore, the theoretical hypothesis is as follows:

**Hypothesis 2:** High civil society pressure in a member state leads to IPCEI state aid.

There is a consensus among state aid scholars that *high fiscal capacity of a member state* enables a member state to provide state aid (Crössmann & Mause, 2014; Eisl, 2022*a*, 2022*b*; Gràcia et al., 2023; Juhász et al., 2022; Poitiers & Weil, 2022. Moreover, industrial policy interventions have been linked to states with a higher per capita income. Therefore, the theoretical hypothesis is as follows:

**Hypothesis 3:** High fiscal capacity of a member state leads to IPCEI state aid.

State aid scholars do not agree on the impact of a *conservative ideology*. Intuitively, one might expect governments with state-interventionist ideological preferences to provide more state aid (Hoffman, 2016; Lindstrom, 2021). However, there is debate regarding the significance of this causal condition (see e.g. Hoffman 2016; Schito, 2021b). Moreover, the direction of influence is also heavily disputed. Some expect left-leaning governments to support state aid from a Keynesian viewpoint, while others assume that conservative governments will use state aid to favor their business constituency (Crössmann & Mause, 2014; Nicolini et al., 2016). In this analysis, the hypothesis will follow mainstream accounts, thus rendering it as follows:

**Hypothesis 4:** Having a government with a conservative ideology leads to *absence* of IPCEI state aid by the member state.

Nicolini et al. (2016) argue that states in a *federal system* provide more state aid. However, this is subject to scholarly debate, as Franchino and Mainenti (2016, p. 430) conclude that regional fiscal autonomy has no impact when accounting for district magnitude. As the latter's findings are conditional, this research follows the former's theoretical hypothesis:

**Hypothesis 5:** A federal system leads to IPCEI state aid by the member state.

## 3.2 Geopolitical determinants

The geopolitical conditions were refined to match the scope of the examined IPCEI. The project under study (Hy2Tech) focusses on the infrastructure surrounding the production of hydrogen and its initial storage (European Commission, n.d.*c*). Given hydrogen's potential to replace oil and gas, these conditions were strongly angled on the member state-Russia relationship. After all, these commodities – until recently – accounted for the majority of EU imports from Russia (Eurostat, 2024*d*, Fig. 8 in supplementary file). Moreover, the geoeconomics literature argues that de-risking from Russia is a major driver of EU industrial policy, especially regarding energy dependence (Lavery & Schmid, 2021, p. 1331; Seidl & Schmitz, 2023).

According to geoeconomic literature, Russia weaponizes EU member states' dependence on Russian energy, giving them a motive to pursue industrial policies (De Decker, 2023; Lavery & Schmid, 2021, p. 1331; Seidl & Schmitz, 2023). Based on this analysis, both a general and an energy-specific driver for member state IPCEI participation are generated:

**Hypothesis 6:** High threat from Russia leads to IPCEI state aid by the member state.

**Hypothesis 7:** High energy dependence on Russia leads to IPCEI state aid by the member state.

Amid the geoeconomic conflicts between the US, China and Russia, the EU wants to retain its autonomy (Schneider, 2023, p. 250). IPCEIs are a tool in achieving this strategic autonomy (Eisl, 2022*a*, p. 2; Eisl, 2022*b*, p. 3; Evroux, 2022, p. 9). Another key way of achieving this objective, is by reducing reliance on NATO and increasing defense expenditure. Therefore, the latter is used as a variable proxying the willingness of the member state to spend government funds on IPCEIs. The theoretical hypothesis is as follows:

**Hypothesis 8:** High defense expenditure by a member state lead to IPCEI state aid.

The following section introduces a research design to test this theoretical framework, using fuzzy-set qualitative comparative analysis. First, this methodological approach will be explained. The second part justifies the case selection of all EU member states in Hy2Tech. Finally, the aforementioned conditions and the outcome (provided state aid in the Hy2Tech IPCEI)are operationalized.

# 4 RESEARCH DESIGN

## 4.1 Methodological approach

As existing research points out, the amount of IPCEI state aid provided differs greatly among member states (Eisl, 2022*a*, 2022*b*; Lopes-Valença, forthcoming). This poses the question: Why do some member states provide ICPEI state aid, while others do not? QCA is well-suited to explain this kind of divergence puzzle, where the studied phenomenon (the outcome) occurs in some cases but not in others (Mello, 2021, pp. 1-2; see also Ragin, 1987). Furthermore, this research method is capable of unraveling a complex form of causal relations, known as multiple conjunctural causation. *Conjunctural causation* implies that the outcome (i.e. IPCEI state aid) are usually caused by combinations of conditions (explanatory factors). *Multiple causation* indicates that different combinations can produce the same outcome. Drawing on the introduced theoretical framework, member states' IPCEI state aid can most likely be explained by such a complex interplay between political-economic and geopolitical factors. For example, high energy dependence on Russia can prompt a member state to participate in an IPCEI, but only if it has enough fiscal capacity to provide state aid (conjunctural causation). At the same time, there may be multiple causal pathways that explain the decision to participate (multiple causation). Besides the combination of high energy dependence on Russia and high fiscal capacity, the combination of high civil society pressure and a state-interventionist ideology may also lead to IPCEI state aid from a member state.

The use of QCA, a comparative research method, is also methodologically innovative. As state aid literature is dominated by quantitative studies (see e.g. Alves et al., 2021; Poulou et al., 2023; Boateng et al., 2020; Hongli & Vitenu-Sackey, 2020; Tunali & Fidrmuc, 2015), the present article answers to multiple calls for comparative research (van Druenen, 2022, p. 570; Zohlnhöfer et al., 2018, p. 22). Moreover, as a middle-N research method, QCA fills a methodological gap between quantitative and

qualitative research methods (Ragin, 1987, pp. 83-85). It allows to examine the participation of all 27 member states, while respecting the specifics of each of them.

To date, scholars have developed multiple approaches to QCA, such as crisp-set QCA (see Rihoux & De Meur, 2009), fuzzy-set QCA (zie Ragin, 2000), multi-value QCA (see Haesebrouck, 2016), and two-step QCA (see Haesebrouck, 2019). Varying to a large extent, the aforementioned conditions and the outcome are not categorical variables. For example, the amount of IPCEI state aid provided is not categorically *absent*, *low*, *medium*, or *high*, but can statistically vary from zero to an infinite amount, the degree to which a member state's government system is federal can also vary significantly, etc. Therefore, the fuzzy-set version of QCA will be employed, which operationalizes the outcome and every condition into fuzzy membership scores. These vary from 0 to 1, depending on the extent to which the condition or outcome is present in a given case. The qualitative status of a case depends on its positions towards the 0.5-anchor, which indicates whether a condition/outcome is either more present (> 0.5) or more absent (< 0.5). The assignment of fuzzy membership scores to the cases on the outcome and the conditions is known as calibration.

## 4.2 Case selection

The EU has, to this date, already approved ten IPCEIs (European Commission, n.d.*b*). Therefore, studying all 27 member states' reasons for (not) providing IPCEI state aid in these 10 projects would result in analyzing 270 cases. For reasons of feasibility, the present article will consequently examine member states' motives for providing IPCEI state aid in one project, namely the first IPCEI on hydrogen (Hy2Tech). Hy2Tech's goal to create the infrastructure to produce hydrogen fuels, which have the capacity to replace fossil fuels (European Commission, n.d.*c*). This choice was based on data availability and the total amount of provided IPCEI state aid. First, due to data availability regarding disaggregated IPCEI state aid and statistics in Eurostat, needed for the operationalization of the conditions and the outcome, five projects commissioned in 2023 and 2024 could not be analyzed (see Lopes-Valença, forthcoming, p. 7). Second, out of the five remaining IPCEIs, Hy2Tech was selected because it entailed the most approved state aid (European Commission, n.d.*b*). It therefore constitutes the largest potential market-distorting effects, thus most accurately capturing the tensions in the industrial-competition policy nexus. Concluding, all 27 member states' Hy2Tech state aid – or the lack thereof – will be examined.

## 4.3 Operationalization and calibration

As mentioned, fsQCA operationalizes the outcome and conditions into fuzzy membership scores for each case, varying from 0 to 1, representing the degree to which the outcome/condition is present. This calibration can either done using qualitative data, based on categorical differences between the cases, or using the direct calibration method, using quantitative data. In this last case, raw data is fitted between three qualitative anchors for the fuzzy membership scores (0, 0.5, 1). Both methods are based on theoretical or empirical knowledge. Hereafter, the member states' fuzzy scores for *high threat from Russia* will be calibrated qualitatively, the other conditions and the outcome will be calibrated quantitatively.

*Hy2Tech participation* (the outcome; abbreviated as Part) is operationalized and calibrated in Appendix 1. In accordance with the state-of-the-art on IPCEI state aid, it is operationalized as the

participation depth ratio (Lopes-Valença, forthcoming, pp. 6-8). To this extent, each member states' (*i*) share of the total (*EU*) *Hy2Tech* state aid is compared to the member states' share (i) of the EU GDP:

$$participation\ depth\ ratio_i = \frac{\frac{Hy2Tech\ state\ aid_i}{Hy2Tech\ state\ aid_{EU}}}{\frac{GDP_i}{GDP_{EU}}}$$

Comparing the share of provided state aid to each member states' share of GDP sheds light on how substantial a member states' contribution is. After all, using absolute numbers would favor large member states with big economies, which would disrupt the analysis. Data on the Hy2Tech state aid was obtained from the decision letter approving each participating member states' aid (European Commission, 2022, pp. 81-84). As this decision was finalized in 2022, all other measures will be operationalized using data from 2021, reflecting each member states' position before their decision to participate in Hy2Tech was finalized. Therefore, GDP data from 2021 was used (Eurostat, 2023). Using the direct calibration method, member states' fuzzy scores are calibrated using 0, 0.5, and 2 for the 0-, 0.5- and 1-anchor point respectively. Cases with a participation dept ratio between 0 and 0.5 are thus calibrated as not participating, because their provided state aid is minimal compared to their economic capabilities: their share in Hy2Tech state aid is less than half their share in EU GDP. Member states with a participation depth ratio exceeding 2 are calibrated as fully participating (fuzzy score = 1), as their share in Hy2Tech state aid is twice their share in EU GDP.

*Strong business demands* (abbr. *Business*) is operationalized as company density in Hy2Tech sectors (see Appendix 2). This is in line with current literature, as it reflects the level of importance of a sector to the national economy (van Druenen, 2022). Hy2Tech focusses on the technology surrounding the production and initial storage of hydrogen (European Commission, n.d.*c*). According to the Commission's Directorate-General for Financial Stability, Financial Services and Capital Markets Union (n.d.), this corresponds to sectors regarding the manufacture of fabricated metal products, except machinery and equipment (C25), electrical equipment (C27), and machinery and equipment not elsewhere classified (C28). Therefore, strong business pressure is operationalized as the mean of the 2021 share in employment of these three sectors vis-à-vis the total employment in manufacturing (see Eurostat, 2024*a*). This proxies the company density of C25 and C27-28 sectors in the manufacturing industry. Aiming for maximal variation around the median value, the 0-, 0.5- and 1-anchor points for the quantitative calibration are 0 percent, 8 percent, and 12 percent respectively.

*High civil society pressure* (abbr. CivSoc) is operationalized in Appendix 3. It draws on the 2021 data of V-Dem's Civil Society Participation Index (Coppedge et al., 2024; Pemstein et al., 2024). This index varies between 0-1, enabling it to be directly used as fuzzy membership scores. However, as EU member states have significantly high scores compared to the rest of the world, this would leave little variation between the cases, disrupting the analysis (see Rihoux & De Meur, 2009). Therefore, the 0-, 0.5- and 1-anchor points for the quantitative calibration are 0.5; 0.75; and 1 respectively. This brings about more variation in the membership scores, accounting for the existing differences in civil society participation *within* the EU.

*High fiscal capacity of a member state* (abbr. FiscCap) is operationalized as using the member states' per capita GDP (see Appendix 4). After all, scholars found evidence that industrial policy interventions are correlated with high economic development and a high per capita income (Crössmann & Mause, 2014; Juhász et al., 2022). Moreover, more common operationalizations using member states' debt

ratio gave improbable results. Aiming for maximal variation around the median value, the 0-, 0.5- and 1-anchor points for the quantitative calibration are 0; 33,000; and 60,000 EUR/capita respectively. The data for 2021 were obtained through Eurostat (2024*b*).

*Conservative ideology* (abbr. Ideol) is calibrated in Appendix 5. Using data from ParlGov (Döring et al., 2023), the government ideology will be calculated will be by summing the ideological position (*ip*) of each party (*i*, for all *n* parties), weighted by its share in seats (*s*) of the total government seats (*gs*):

$$\sum_{i=1}^{n} \frac{s_i ip_i}{gs}$$

The ideological position of a party is based on its score on a left-right dimension.[9] This measure is created based on the governing cabinet as of September 14, 2021, as this was the day after the last participating state notified its state aid to the Commission (European Commission, 2022, p. 2). This operationalization results in a weighted left-right indicator on the policy preferences on the government, theoretically varying between 0 (left) and 10 (right). However, because the cases only show a variation between 2 and 8, these are used for the 0- and 1-anchor points in the quantitative calibration. Instead of placing the 0.5-anchor point right down the middle (at 5), it is placed at 5.5: in order to not-join IPCEIs, it is assumed that a government must have strong anti-state intervention policy preferences.

*Federal system* (abbr. Fed) is operationalized in Appendix 6. The extent to which a member states' government system is federal, is captured by the Regional Authority Index (RAI) (Hooghe et al., 2016; Shair-Rosenfeld et al., 2020). Data for 2018 is used, as this existing database only provides information up to 2018. RAI is designed to vary between 0 (not federal) and 30 (federal) (Hooghe et al., 2021, p. 6). Employing the direct calibration method, these are used as the 0- and 1-anchor points respectively. The 0.5-anchor point is set at 20, because strong federal entities are required in order to provide IPCEI state aid.

*High threat from Russia* (abbr. Threat) is calibrated qualitatively[10] (see Appendix 7). It is operationalized as geographic proximity to Russia, building on an existing literature that emphasizes that geographical proximity matters in international politics (see e.g. Gleditsch & Ward, 2001; Portela, 2005). The calibration builds on six-value QCA, in which cases are awarded one of six fuzzy scores, corresponding to the qualitative category it belongs to. In this article, the fuzzy scores for *high threat from Russia* are awarded as described in Table 5.

***Table 5. Qualitative characteristics for the calibration of* high threat from Russia**

| Category | Fuzzy score |
|---|---|
| Land and sea border | 1 |
| Sea border only | 0.8 |
| Neighbor of Ukraine | 0.6 |
| Neighbor of a country neighboring Russia (over land) | 0.4 |

[9] Döring et al. (2023) also provide a more specific indicator on a party's preference for state intervention versus free market powers. However, using this measure gave improbable results, therefore the broader left-right indicator was used.

[10] Existing literature offers more accurate operationalizations by using minimal distance measures (see Gleditsch & Ward, 2001). However, these requires running certain software packages in R, which is a skill I do not possess.

| | |
|---|---|
| Neighbor of a country neighboring Russia (over sea) | 0.2 |
| No neighbors | 0 |

*Source*: Author.

*Notes:* A sea border is defined as the case and Russia both bordering the same sea (i.e. the Baltic Sea and the Black Sea). The Russian exclave of Kaliningrad is taken into account.

*High energy dependence on Russia* (abbr. RusEDep) is calibrated in Appendix 8. According to Eurostat (2024*d*, Fig. 8 in supplementary file), in 2023 the EU's most imported goods from Russia were still oil and natural gas (SITC codes 333-334 and 343 respectively). This condition is therefore based on those products. As data on natural gas (343) and crude oil (333) is not available for al member states due to reasons of confidentiality, energy dependence on Russia will be operationalized using 2021 data on non-crude oil (see Eurostat, 2024*e*). This dependence will for each member state (*i*) be calculated by comparing its import of non-crude oil from Russia to its total import of non-crude oil from outside the EU:

$$dependence\ on\ Russian\ NonCrude\ oil_i = \frac{import\ of\ Russian\ NonCrude\ oil_i}{total\ import\ of\ NonCrude\ oil\ extraEU_i}$$

The result is a percentage, indicating the case's energy dependence on Russian non-crude oil. This will be translated into fuzzy scores, using 0 percent, 50 percent, and 100 percent as the 0-, 0.5- and 1-anchor points respectively.

*High defense expenditure* (abbr. DefExp) is calibrated in Appendix 9. In line with common practice, member states' defense expenditure is displayed as a percentage of their GDP. Again, the direct calibration method is used, with the 0-, 0.5- and 1-anchor points set at 0 percent, 2 percent (NATO's defense spending target) and 3 percent respectively. The top mark is set at 3 percent, as this is just above the highest scoring case (Greece, 2.8 percent). For this operationalization, data on the member states' 2021 defense expenditures was obtained from Eurostat (2024*c*).

Table 6 provides an overview of member states' fuzzy scores on the conditions and the outcome. This shows that the outcome is present in 10 out of 27 cases: Estonia, Greece, France, Finland, Italy, Austria, the Slovak Republic, Denmark, Germany, and Portugal. This is in line with standards of good practice, as Rihoux and De Meur (2009) note that the outcome should be present in at least one-third of the examined cases. The following section analyzes this table of fuzzy membership scores by creating the truth table, out of which the parsimonious solution will be derived. Consequently, interpreting this solution will point out which combinations of conditions lead to IPCEI participation, thus answering the research question. Thereafter, the concluding section will summarize the main findings and elaborate on the wider implications for the literature on the industrial-competition policy nexus. Possible avenues for further research will also be suggested.

*Table 6. Fuzzy data*

| *Case* | | Part[a] | Business[b] | CivSoc[c] | FiscCap[d] | Ideol[e] | Fed[f] | Threat[g] | RusEDep[h] | DefExp[i] |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Austria*** | ***(AT)*** | **0.69** | 0.88 | 0.84 | 0.80 | 0.49 | 0.71 | 0.20 | 0.95 | 0.11 |
| ***Belgium*** | ***(BE)*** | **0.14** | 0.34 | 0.91 | 0.77 | 0.36 | 0.98 | 0.20 | 0.25 | 0.16 |
| ***Bulgaria*** | ***(BG)*** | **0.05** | 0.44 | 0.65 | 0.11 | 0.69 | 0.06 | 0.80 | 0.92 | 0.35 |
| ***Croatia*** | ***(HR)*** | **0.05** | 0.43 | 0.35 | 0.16 | 0.71 | 0.17 | 0.00 | 0.58 | 0.18 |
| ***Cyprus*** | ***(CY)*** | **0.05** | 0.41 | 0.79 | 0.38 | 0.89 | 0.05 | 0.00 | 0.05 | 0.43 |
| ***Czech Republic*** | ***(CZ)*** | **0.23** | 0.91 | 0.67 | 0.30 | 0.51 | 0.24 | 0.40 | 0.05 | 0.18 |
| ***Denmark*** | ***(DK)*** | **0.60** | 0.88 | 0.94 | 0.95 | 0.28 | 0.13 | 0.80 | 0.36 | 0.23 |
| ***Estonia*** | ***(EE)*** | **1.00** | 0.43 | 0.87 | 0.30 | 0.61 | 0.05 | 1.00 | 0.89 | 0.57 |
| ***Finland*** | ***(FI)*** | **0.90** | 0.91 | 0.93 | 0.80 | 0.33 | 0.13 | 1.00 | 0.94 | 0.23 |
| ***France*** | ***(FR)*** | **0.97** | 0.36 | 0.87 | 0.61 | 0.64 | 0.64 | 0.20 | 0.30 | 0.43 |
| ***Germany*** | ***(DE)*** | **0.55** | 0.93 | 0.94 | 0.76 | 0.47 | 1.00 | 0.80 | 0.67 | 0.21 |
| ***Greece*** | ***(GR)*** | **1.00** | 0.34 | 0.72 | 0.19 | 0.70 | 0.16 | 0.20 | 0.63 | 0.92 |
| ***Hungary*** | ***(HU)*** | **0.05** | 0.64 | 0.09 | 0.17 | 0.68 | 0.14 | 0.60 | 0.32 | 0.21 |
| ***Ireland*** | ***(IE)*** | **0.05** | 0.22 | 0.93 | 1.00 | 0.53 | 0.21 | 0.00 | 0.10 | 0.06 |
| ***Italy*** | ***(IT)*** | **0.90** | 0.88 | 0.86 | 0.45 | 0.38 | 0.85 | 0.00 | 0.26 | 0.29 |
| ***Latvia*** | ***(LV)*** | **0.05** | 0.28 | 0.79 | 0.20 | 0.84 | 0.08 | 1.00 | 0.86 | 0.77 |
| ***Lithuania*** | ***(LT)*** | **0.05** | 0.21 | 0.65 | 0.24 | 0.76 | 0.06 | 1.00 | 0.93 | 0.43 |
| ***Luxembourg*** | ***(LU)*** | **0.05** | 0.62 | 0.93 | 1.00 | 0.35 | 0.05 | 0.20 | 0.05 | 0.10 |
| ***Malta*** | ***(MT)*** | **0.05** | 0.20 | 0.72 | 0.42 | 0.33 | 0.05 | 0.00 | 0.06 | 0.11 |
| ***Netherlands*** | ***(NL)*** | **0.08** | 0.78 | 0.83 | 0.88 | 0.62 | 0.41 | 0.20 | 0.20 | 0.26 |
| ***Poland*** | ***(PL)*** | **0.08** | 0.46 | 0.10 | 0.16 | 0.81 | 0.21 | 1.00 | 0.94 | 0.35 |
| ***Portugal*** | ***(PT)*** | **0.55** | 0.36 | 0.77 | 0.25 | 0.31 | 0.17 | 0.00 | 0.56 | 0.14 |
| ***Romania*** | ***(RO)*** | **0.05** | 0.29 | 0.53 | 0.14 | 0.59 | 0.18 | 0.80 | 0.90 | 0.46 |
| ***Slovak Republic*** | ***(SK)*** | **0.69** | 0.89 | 0.62 | 0.21 | 0.77 | 0.16 | 0.60 | 0.06 | 0.26 |
| ***Slovenia*** | ***(SI)*** | **0.05** | 0.93 | 0.65 | 0.32 | 0.63 | 0.70 | 0.00 | 0.15 | 0.23 |
| ***Spain*** | ***(ES)*** | **0.14** | 0.42 | 0.86 | 0.34 | 0.26 | 0.99 | 0.00 | 0.59 | 0.18 |
| ***Sweden*** | ***(SE)*** | **0.05** | 0.81 | 0.92 | 0.89 | 0.25 | 0.23 | 1.00 | 0.21 | 0.26 |

*Notes:* (a) *Hy2Tech participation* (outcome), see Appendix 1; (b) *strong business demands*, see Appendix 2; (c) *high civil society pressure*, see Appendix 3; (d) *high fiscal capacity of the member state*, see Appendix 4; (e) *conservative ideology*, see Appendix 5; (f) *federal system*, see Appendix 6; (g) *high threat from Russia*, see Appendix 7; (h) *high energy dependence on Russia*, see Appendix 8; (i) *high defense expenditure*, see Appendix 9.

# 5 ANALYSIS AND RESULTS

## 5.1 Truth table and parsimonious solution

Table 7 presents the truth table for the presence[11] of the outcome (i.e. Hy2Tech participation). Rows in which no case has a fuzzy membership score of more than 0.5 are logical remainders and are omitted from the truth table. For other rows, the presence or absence of the outcome is determined based on their consistency scores. The consistency in each row "indicates the extent to which a combination of condition *consistently* leads to" the outcome (Haesebrouck & van Immerseel, 2020, p. 12). Literature on QCA advises to ideally only categorize the outcome present in rows with a consistency higher than 0.75 (Schneider & Wagemann, 2012, p. 279), with 0.7 being the lower boundary. In line with that common standard, the consistency cut-off point is placed at 0.71. The truth table contains only two contradictory cases (Denmark and Estonia). These are cases which the analysis can not explain, as their outcome is different than the truth table portrays: both are coded as not participating (0), although the two member states have contributed significant IPCEI state aid. Interpreting the results will provide an explanation for these contradictory cases (see below).

***Table 7. Truth table Part***

| Business | FiscCap | Ideol | Fed | RusEDep | DefExp | Threat | CivSoc | *Consistency* | Part | Cases |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | *0.7975* | **1** | IT |
| 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | *0.7939* | **1** | DE |
| 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | *0.7863* | **1** | SK |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | *0.7805* | **1** | GR |
| 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | *0.7741* | **1** | AT |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | *0.7632* | **1** | FI |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | *0.7306* | **1** | PT |
| 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | *0.7157* | **1** | FR |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | *0.6603* | **0** | ES |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | *0.6354* | **0** | MT |
| 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | *0.6301* | **0** | HU |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | *0.6168* | **0** | BE |
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | *0.6119* | **0** | SE, **DK** |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | *0.5601* | **0** | CY |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | *0.5345* | **0** | LU |
| 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | *0.5332* | **0** | CZ, SI |
| 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | *0.5285* | **0** | HR |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | *0.5073* | **0** | NL |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | *0.4943* | **0** | IE |
| 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | *0.4853* | **0** | **EE,** LV |
| 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | *0.4575* | **0** | RO, LT, BG |
| 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | *0.3714* | **0** | PL |

*Notes:* Contradictory cases in bold. *Part* = Hy2Tech participation; *Business* = strong business pressure; *Fisccap* = high fiscal capacity of the member state; *Ideol* = conservative ideology; *Fed* = federal system; *RusEDep* = high energy dependence on Russia; *DefExp* = high defense expenditure; *Threat* = high threat from Russia; *CivSoc* = high civil society pressure.

[11] Appendix 10 provides the truth table for the absence of the outcome.

The next step is the minimization of the truth table by applying Boolean algebra. This produces the parsimonious, complex, and intermediate solution, which show which combinations of conditions lead to the outcome. The present article focusses on the first, as it is the only solution that only includes conditions which have proven to be causally relevant in producing the outcome (Baumgartner, 2015, p. 854). The parsimonious solution containing combinations of conditions that lead to Hy2Tech participation is presented in Table 8.[12]

***Table 8. Parsimonious solution Part***

| | Combination | Coverage | | Consistency | Cases |
|---|---|---|---|---|---|
| | | *Raw* | *Unique* | | |
| 1. | Business*Fed | 0.4956 | 0.0515 | 0.6828 | DE, IT |
| 2. | Ideol*Fed | 0.4441 | 0.0307 | 0.7219 | FR |
| 3. | ~Fed*RusEDep*~Threat*CivSoc | 0.3059 | 0.0526 | 0.75 | PT, GR |
| 4. | Business*RusEDep | 0.5885 | 0.0712 | 0.6253 | FI, AT |
| 5. | Business*Ideol*Threat*CivSoc | 0.3936 | 0.0482 | 0.6685 | SK |
| | **Total solution** | 0.8191 | | 0.6368 | |

*Notes:* Denmark and Estonia are not mentioned, as they are contradictory cases that are not explained by this analysis. [~] indicates the absence of the condition; [*] indicates that conditions are present/absent at the same time. Raw (unique) coverage indicates which share of cases is (only) explained by this combination. *Part* = Hy2Tech participation; *Business* = strong business pressure; *Fisccap* = high fiscal capacity of the member state; *Ideol* = conservative ideology; *Fed* = federal system; *RusEDep* = high energy dependence on Russia; *DefExp* = high defense expenditure; *Threat* = high threat from Russia; *CivSoc* = high civil society pressure.

## 5.2 Interpretation

The parsimonious solution clearly indicates which conditions prompt EU member states to provide IPCEI state aid, thereby showing which interests drive IPCEI participation. Table 8 shows that both the political-economic and geopolitical schools of thought outlined in the theoretical framework are proven to be theoretically relevant. Neither strand of literature can fully explain member states' decision to participate in IPCEIs alone. Overall, IPCEI state aid is thus driven by political-economic, as well as geopolitical interests. Concretely, a member state will provide IPCEI state aid if:

1. business demands are strong and the government mode is a federal system; or
2. government ideology is conservative and the government mode is a federal system; or
3. the government mode is a unitary system, the member state is highly dependent on Russian energy, threat from Russia is low, and civil society pressure is high; or
4. business demands are strong and the member state is highly dependent on Russian energy; or
5. business demands are strong, government ideology is conservative, threat from Russia is high, and civil society pressure is high.

Although IPCEI state aid is driven by both "kinds" of interests on the EU level, a clearer distinction can be made on the member state level. Whereas less prosperous economies' participation is both political-economically and geopolitically driven, bigger and more prosperous economies are (purely) driven by political-economic interests. Indeed, the parsimonious solution clearly shows the following:

[12] Again, the parsimonious solution for the absence of the outcome are also provided (see Appendix 11).

- the EU's three biggest economies (Germany, Italy and France) participate *purely* based on political-economic interests (see combinations 1 and 2);
- within the group that is partly driven by its high dependence on Russian energy (a geopolitical motivation), clear distinctions can be made. The northern, more prosperous[13] member states also face high business pressure, a political-economic driver (see combination 4). Their decision to participate could therefore not be a direct consequence of their geopolitical exposure, but a reaction to the pressures from firms, who face high energy prices and energy insecurity. Meanwhile, southern member states with less prosperous economies participate based on other motives (see combination 3);
- Slovakia constitutes an interesting "in between"-position as a neighbor of Ukraine and a large potential in its manufacturing industry.

With regard to the research question – drawing on these insights – we can conclude that how EU member states pursue industrial policy, and which way the industrial-competition policy balance tilts is highly dependent on the member states' economic position. This supports existing concerns about industrial policy fragmenting the internal market (see e.g. Di Carlo & Schmitz, 2023; Eisl, 2022*b*, pp. 5-7; Pianta et al., 2020; Redeker, 2021; Wigger, 2023). As Lopes-Valença (forthcoming) notes, IPCEIs could be detrimental for the bloc's economic convergence.

Although this analysis explains more than 80 percent[14] of member states' IPCEI state aid, it does not account for the participation of Denmark and Estonia. These member states share the same characteristics as Sweden and Latvia respectively, which did not participate. Regarding Denmark and Sweden, a possible explanation builds on Hy2Tech's goal to create the infrastructure to produce hydrogen fuels, which have the capacity to replace fossil fuels (European Commission, n.d.*c*). Comparing Denmark and Sweden, the former's need for this alternative fuel is much bigger than the latter's. Indeed, in 2021, the share of oil and gas in Denmark's energy consumption amounted to 53 percent (Our World in Data, 2024*a*, 2024*b*). At the same time, those two energy sources only accounted for 25 percent of Sweden's total energy consumption – less than half of Denmark's. Estonia's participation vis-à-vis Latvia's non-participation can be clarified using literature on the economic reforms in former Soviet states, after the dissolution of the Soviet Union. Staehr (2017) repeatedly stresses Estonia's position as a "frontrunner" (pp. 506, 508) among the Baltic states, that "spearheaded" (p. 504) these reforms. Participating in innovative IPCEI projects, a novel economic policy tool, might well be another example of Estonia's forwardness. In addition, Estonia 2021 debt ratio was less than half of Latvia's, providing it with the fiscal capacity to give IPCEI state aid (see Eurotat, 2024*b*).

The present analysis also provides some results that contradict theoretical expectations, which deserve further scholarly attention. First, the impact of a conservative government (*Ideol*) leads to IPCEI participation, where one would expect that would be the product of a left-leaning, more state-interventionist oriented ideology. This suggests that not state-market preferences, but other elements in political parties' ideology influence the decision to provide IPCEI state aid. For example, conservative parties might be more "hawkish" regarding geopolitical threats, prompting them to more

[13] The per capita income of Finland and Austria is two to three times as big as that of Portugal and Greece (Eurostat, 2024*b*).
[14] The parsimonious solution's coverage is 0.8191 (see Table 8).

quickly seek refuge in industrial policy tools than "dovish" progressive parties. Second, the role of a federal system (*fed*) in IPCEI participation is contested. In two out of five combinations, its impact contradicts theoretical expectations. Third, the absence of threat positively impacted Portugal's and Greece's decision to participate, whereas existing literature would suggest otherwise. Further research should investigate the possibility that member states already view high dependence on Russian energy as a major threat, thus neutralizing the impact of the dedicated threat condition.

# 6 CONCLUSION

The EU's "paradigmatic shift" to industrial policy has stimulated interesting scholarly work (Schneider, 2023, p. 254). However, current literature is characterized by a double research gap. First, while we know why the EU is embracing assertive industrial policy, we do not know *how* it is exactly pursuing this. Second, while scholars identify tensions between in the industrial-competition policy nexus (see e.g. Eisl, 2022*b*; Poitiers & Weil, 2022), current literature fails to address the political motivations behind them. The present article addressed this double gap by studying member states' interests behind IPCEI state aid. As an industrial policy tool funded by relaxation of competition regulations, it is well-suited to examine tensions in industrial-competition policy nexus (see e.g. Lopes-Valença, forthcoming, p. 1; McNamara, 2023, p. 2379). In the same vein, existing literature points out that member states differ significantly in their participation in IPCEIs and the amount of state aid provided (Eisl, 2022*a*, 2022*b*; Lopes-Valença, forthcoming). Therefore, the following research question was examined: *Which interests prompt EU member states to provide state aid for Important Projects of Common European Interest?* Understanding member states' motivations driving IPCEI state aid advances our understanding of *how* the bloc approaches this industrial policy instrument (first gap) and what causes the tensions in the industrial-competition policy nexus (second gap). Drawing on a novel integrated framework of political-economic and geopolitical conditions, member states' interests behind participating in the Hy2Tech IPCEI were uncovered by performing a fuzzy-set QCA.

Answering the research question, this analysis revealed state funding for IPCEIs by the *EU as a whole* is driven by both political-economic and geopolitical interests. However, motivations differ significantly *within the bloc*. Indeed, the EU's three biggest economies provide IPCEI state aid *purely* based on political-economic interests. This is – to a lesser extent – also true for northern member states with a high per capita income, as they are driven by their high dependency on Russian energy (geopolitical) and strong business pressures (political-economic) . Meanwhile, southern member states with a lower per capita income are also driven by this high dependency on Russian energy, but not by strong business pressures.

This evidence sheds light on the four outlined scholarly debates. First, the evidence on differing interests supports existing concerns about industrial policy fragmenting the internal market (see e.g. Di Carlo & Schmitz, 2023; Eisl, 2022*b*, pp. 5-7; Lopes-Valença, forthcoming; Pianta et al., 2020; Redeker, 2021; Wigger, 2023). Second, while IPCEIs may lead to *political* European integration, contributing to the Europeanization of industrial policy (see e.g. Eisl, 2022*a*; McNamara, 2023; Seidl & Schmitz, 2023), they are detrimental to *economic* European integration and convergence (see Lopes-Valença, forthcoming). Third, the present article partly remedies the lack of attention political science scholars hitherto had for competition regulation (Buch-Hansen & Wigger, 2011, p. 4), by putting political interests at the heart of state aid analysis. Fourth, it also contributes to scholarly debates in the

literature on the determinants of state aid (Alves et al., 2021; Biondi & Righini, 2015; Poulou et al., 2023; Schito, 2021*a*, 2021*b*). More specifically, as the impact of government ideology and government systems on state aid contradicts theoretical expectations, these results should be further examined.

Concluding, other avenues for further research could also be explored – some stemming from the limitations of this study. First, the participation of Estonia and Denmark can not be explained by the present analysis. Further research could therefore focus on these interesting cases. Second, besides government ideology and government systems, the impact of high threat from Russia also contradicts theoretical expectations. New contributions using this condition could explore a different operationalization, for example using a minimal distance measure (see Gledtisch & Ward, 2001), or a different conceptualization than geographical proximity. Third, the causal mechanisms behind member states' participation should still be refined further. While QCA can point out the conditions leading to IPCEI state aid, it is not able to shed light on the interplay between these conditions. This comparative analysis should therefore be complemented by a method that can probe the causal mechanisms, such as process tracing (Beach & Rohlfing, 2018, p. 5). Fourth, while all IPCEIs share common characteristics, the projects in different value chains also have their own specificalities. Further research should therefore further examine the interests driving state aid in all these "major policy tool[s]" (McNamara, 2023, p. 2379). Finally, the interests driving (the use of) other industrial policy instruments should also be researched, in order to further enhance our understanding of how the EU pursues its industrial policy.

# BIBLIOGRAPHY


Abels, J., & Bieling, H.-J. (2023). Infrastructures of globalisation. Shifts in global order and Europe's strategic choices. *Competition & Change, 27*(3-4), 516-533. doi:10.1177/10245294221130119

Allan, B., Lewis, J. I., & Oatley, T. (2021). Green Industrial Policy and the Global Transformation of Climate Politics. *Global Environmental Politics, 21*(4), 1-19. doi:10.1162/glep_a_00640

Alves, A. M., Brousseau, E., & Yeung, T. Y.-C. (2021). The dynamics of institution building: State aids, the European Commission, and the Court of Justice of the European Union. *Journal of Comparative Economics, 49*(3), 836-859. doi:https://doi.org/10.1016/j.jce.2021.02.001

Amable, B. (2017). Dirigisme and modernism vs ordoliberalism. In J. Hien & C. Joerges (Eds.), *Ordoliberalism, Law and the rule of economics* (pp. 13-22). Bloomsbury Publishing.

Babić, M., & Dixon, A. D. (2022). Is the China effect real? Ideational Change and the political contestation of Chinese state-led investment in Europe. *The Chinese Journal of International Politics, 15*(2), 111-139.

Baracuhy, B. (2018). Geo-economics as a dimension of grand strategy: Notes on the concept and its evolution. In M. Wigell, S. Scholvin, & M. Aaltola (Eds.), *Geo-economics and power politics in the 21st Century* (pp. 14-27). Routledge.

Bartalevich, D. (2016). The influence of the Chicago School on the commission's guidelines, notices and block exemption regulations in EU competition policy. *Journal of Common Market Studies, 54*(2), 267-283.

Bauerle Danzman, S., & Meunier, S. (2024). The EU's Geoeconomic Turn: From Policy Laggard to Institutional Innovator. *Journal of Common Market Studies, 62*(4), 1097-1115. doi:https://doi.org/10.1111/jcms.13599

Baumgartner, M. (2015). Parsimony and causality. *Quality & Quantity, 49*(2), 839-856.

Beach, D., & Rohlfing, I. (2018). Integrating Cross-case Analyses and Process Tracing in Set-Theoretic Research: Strategies and Parameters of Debate. *Sociological Methods & Research, 47*(1), 3-36. doi:10.1177/0049124115613780

Biebricher, T. (2017). Ordoliberalism as a Variety of Neoliberalism. In J. Hien & C. Joerges (Eds.), *Ordoliberalism, Law and the Rule of Economics* (pp. 103-114). Hart Publishing.

Biebricher, T., Nedergaard, P., & Bonefeld, W. (Eds.) (2022). *The Oxford Handbook of Ordoliberalism*. Oxford University Press.

Bieling, H.-J., & Brand, U. (2015). Competitiveness or Emancipation? Rethinking regulation and (counter-) hegemony in times of capitalist crisis. In R. Albritton, D. Badeen, & R. Westra (Eds.), *The Future of Capitalism After the Financial Crisis* (pp. 184-204). Routledge.

Biondi, A., & Righini, E. (2015). An Evolutionary Theory of EU State Aid Control. In D. Chalmers & A. Arnull (Eds.), *The Oxford Handbook of European Union Law*. Oxford University Press.

Boateng, E., Agbola, F. W., & Mahmood, A. (2021). Foreign aid volatility and economic growth in Sub-Saharan Africa: Does institutional quality matter? *Economic Modelling, 96*, 111-127.

Bora, S. I., & Schramm, L. (forthcoming). Intergovernmentalism in a supranational field: France, Germany, and EU competition policy reform. *West European Politics*, 1-29. doi:10.1080/01402382.2024.2355812

Breton, T. (2023). *A Europe that protects, transforms and projects: industrial policy the European way.* Speech at the Bruegel Annual Meeting, September 6, 2023, Brussels.

Buch-Hansen, H., & Wigger, A. (2010). Revisiting 50 years of market-making: The neoliberal transformation of European competition policy. *Review of International Political Economy, 17*(1), 20-44.

Buch-Hansen, H., & Wigger, A. (2011). *The Politics of European Competition Regulation. A Critical Political Economy Perspective*. Routledge.

Budzinski, O. (2007). Monoculture versus diversity in competition economics. *Cambridge Journal of Economics, 32*(2), 295-324. doi:10.1093/cje/bem031

Bulfone, F. (2023). Industrial policy and comparative political economy: a literature review and research agenda. *Competition & Change, 27*(1), 22-43.

Chazan, G., Fleming, S., & Inagaki, K. (2023). A global subsidy war? Keeping up with the Americans. *Financial Times*. Retrieved from https://www.ft.com/content/4bc03d4b-6984-4b24-935d-6181253ee1e0.

Christiansen, T. (2020). The EU's New Normal: Consolidating European Integration in an Era of Populism and Geo-Economics. *Journal of Common Market Studies, 58*(Supplemental Issue), 13-27.

Cini, M., & McGowan, L. (2009). *Competition Policy in the European Union* (2nd ed.). Palgrave Macmillan.

Clift, B. (2013). Economic patriotism, the clash of capitalisms, and state aid in the European Union. *Journal of Industry, Competition and Trade, 13*(1), 101-117.

Coppedge, M., Gerring, J., Knutsen, C. H., Lindberg, S. I., Teorell, J., Altman, D., . . . Ziblatt, D. (2024). *V-Dem* (Country-Year/Country-Date; Dataset v14) [Dataset]. Varieties of Democracy (V-Dem) Project.

Crössmann, K., & Mause, K. (2015). Rail subsidisation in the European Union: An issue beyond left and right? *Comparative European Politics, 13*(4), 471-492. doi:10.1057/cep.2014.2

De Decker, V. (2023). Charting Belgium's Economic Security. A Complex Country in a Complex World. *Egmont Papers* (124).

Di Carlo, D., & Schmitz, L. (2023). Europe first? The rise of EU industrial policy promoting and protecting the single market. *Journal of European Public Policy*, *30*(10), 1-34.

Directorate-General for Competition. (2023). *DG COMP Code of good practices for a transparent, inclusive, faster design and assessment of IPCEIs*. Brussels: European Commission.

Directorate-General for Competition. (n.d.*a*). *Competition Policy*. Retrieved from https://competition-policy.ec.europa.eu/index_en.

Directorate-General for Competition. (n.d.*b*). *Antitrust and Cartels*. Retrieved from https://competition-policy.ec.europa.eu/antitrust-and-cartels_en.

Directorate-General for Competition. (n.d.*c*). *Mergers*. Retrieved from https://competition-policy.ec.europa.eu/mergers_en?prefLang=nl.

Directorate-General for Competition. (n.d.*d*). *State aid*. Retrieved from https://competition-policy.ec.europa.eu/state-aid_en.

Directorate-General for Financial Stability, Financial Services and Capital Markets Union. (n.d.). *Manufacture of equipment for the production and use of hydrogen.* Retrieved from https://ec.europa.eu/sustainable-finance-taxonomy/activities/activity/267/view.

Doleys, T. J. (2013). Managing the dilemma of discretion: the European commission and the development of EU state aid policy. *Journal of Industry, Competition and Trade, 13*, 23-38.

Döring, H., Quaas, A., Hesse, M., & Manow, P. (2023). *Parliaments and governments database: Information on parties, elections and cabinets in established democracies* (development version; November 4, 2023) [Dataset]. ParlGov.

Eisl, A. (2022*a*). EU industrial policy in the making. From ad hoc exercises to key instrument: how to make IPCEIs fit for the long run. *Jacques Delors Institute Policy Papers* (286).

Eisl, A. (2022*b*). Important Projects of Common European Interest (IPCEIs) as a New Form of Differentiation. An Analysis of Their Challenges for the European Single Market. *EU IDEA Policy Papers* (18).

European Commission. (1994). *Growth, Competitiveness, Employment. The challenges and ways forward into the 21st century. White paper*. Luxembourg: Publications Office of the European Union.

European Commission. (2016). Mergers: *Commission approves AB InBev's acquisition of SABMiller, subject to conditions.* Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/IP_16_1900.

European Commission. (2017). *Antitrust: Commission fines Google €2.42 billion for abusing dominance as search engine by giving illegal advantage to own comparison shopping service - Factsheet.* Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_1785.

European Commission. (2021). *State aid: Commission adopts revised State aid rules on Important Projects of Common European Interest.* IP/21/6245 [Press release]. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/IP_21_6245.

European Commission. (2022). *Important Project of Common European Interest on Hydrogen Technology (Hy2Tech*). C(2022) 5158 final. Letter to member states participating in Hy2Tech. Brussels: European Commission.

European Commission. (n.d.*a*). *Important Projects of Common European Interest (IPCEI).* Retrieved from https://competition-policy.ec.europa.eu/state-aid/legislation/modernisation/ipcei_en.

European Commission. (n.d.*b*). *Approved integrated Important Projects of Common European Interest (IPCEI).* Retrieved from https://competition-policy.ec.europa.eu/state-aid/ipcei/approved-ipceis_en.

European Commission. (n.d.*c*). *Approved IPCEIs in the Hydrogen value chain.* Retrieved from https://competition-policy.ec.europa.eu/state-aid/ipcei/approved-ipceis/hydrogen-value-chain_en.

Eurostat. (2023). *GDP and main components (output, expenditure and income)* (nama_10_gdp; version December 20, 2023) [Dataset]. Eurostat.

Eurostat. (2024*a*). *Enterprises by detailed NACE Rev.2 activity and special aggregates* (sbs_owv_act; version March 22, 2024) [Dataset]. Eurostat.

Eurostat. (2024*b*). *Main GDP aggregates per* capita (nama_10_pc; version July 20, 2024) [Dataset]. Eurostat.

Eurostat. (2024*c*). *General government expenditure by function (COFOG)* (gov_10a_exp; version July 22, 2024) [Dataset]. Eurostat.

Eurostat. (2024*d*). *EU trade with Russia - latest developments*. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_trade_with_Russia_-_latest_developments.

Eurostat. (2024*e*). *EU trade since 1999 by SITC* (ds-018995; version July 23, 2024) [Dataset]. Eurostat.

Evroux, C. (2022). *Important projects of common European interest: State of play.* PE 729.402. Brussels: European Parliamentary Research Service.

Falkner, G., Heidebrecht, S., Obendiek, A., & Seidl, T. (Eds.) (2024). Digital sovereignty - Rhetoric and reality. *Journal of European Public Policy, 31*. doi:10.1080/13501763.2024.2358984

Farrell, H., & Newman, A. L. (2019). Weaponized interdependence: How global economic networks shape state coercion. *International Security, 44*(1), 42-79.

Franchino, F., & Mainenti, M. (2016). The electoral foundations to noncompliance: addressing the puzzle of unlawful state aid in the European Union. *Journal of Public Policy, 36*(3), 407-436. doi:10.1017/S0143814X15000343

Fuentes, A., & Pipkin, S. (2016). Self-discovery in the dark: the demand side of industrial policy in Latin America. *Review of International Political Economy, 23*(1), 153-183. doi:10.1080/09692290.2015.1104374

Gayet, A.-S., & Riffaud, A. (2022). Belgian PM calls for coordinated EU response to IRA, energy crisis. *Politico.* Retrieved from https://www.euractiv.com/section/politics/news/belgian-pm-calls-for-coordinated-eu-response-to-ira-energy-crisis/.

Gerber, D. J. (1998). *Law and competition in twentieth century Europe: protecting Prometheus*. Oxford University Press.

Giocoli, N. (2009). Competition versus property rights: American antitrust law, the Freiburg School, and the early years of European competition policy. *Journal of Competition Law and Economics, 5*(4), 747-786.

Gleditsch, K. S., & Ward, M. D. (2001). Measuring Space: A Minimum-Distance Database and Applications to International Studies. *Journal of Peace Research, 38*(6), 739-758. doi:10.1177/0022343301038006006

Gràcia, N., Lunneryd, I., & Papaefthymiou, A. (2023). The race towards a more sustainable future: is current State aid policy fit for purpose? *Competition Law & Policy Debate, 8*(2), 92-100.

Gräf, H., & Schmalz, S. (forthcoming). Avoiding the China shock: How Chinese state-backed internationalization drives changes in European economic governance. *Competition & Change*. doi:10.1177/10245294231207990

Haeck, P. (2023). Belgium calls out Europe's 'subsidy war'. *Politico*. Retrieved from https://www.politico.eu/article/belgium-eu-presidency-industry-subsidy-manufacturing/.

Haesebrouck, T. (2016). The added value of multi-value qualitative comparative analysis. *Forum Qualitative Sozialforschung = Forum Qualitative Social Research*, *17*(1).

Haesebrouck, T. (2019). An alternative update of the two-step QCA procedure. *Quality & Quantity*, *53*, 2765–2780.

Haesebrouck, T., & van Immerseel, A. (2020). When does politics stop at the water's edge? A QCA of parliamentary consensus on military deployment decisions. *European Political Science Review, 12*(3), 371-390. doi:10.1017/S1755773920000223

Hanemann, T., & Huotari, M. (2018). EU-China FDI: Working towards reciprocity in investment relations. *MERICS Papers on China, 3*, 2004-2020.

Herranz-Surralles, A. (forthcoming). The EU Energy Transition in a Geopoliticizing World. *Geopolitics*, 1-31. doi:10.1080/14650045.2023.2283489

Hofmann, H. (2016). State aid review in a multi-level system: motivations for aid, why control it, and the evolution of state aid law in the EU. In H. Hofmann & C. Micheau (Eds.), *State aid law of the European union.* (pp. 3-11). Oxford University Press.

Hongli, J., & Vitenu-Sackey, P. A. (2020). Assessment of the effectiveness of foreign aid on the development of Africa. *International Journal of Finance & Economics, 28*(1), 79-92.

Hooghe, E., Marks, G., Schakel, A. H., Niedzwiecki, S., Chapman-Osterkatz, S., & Shair-Rosenfeld, S. (2021). *Regional authority index (RAI)* (country-1; v.3) [Dataset]. European University Institute.

Hooghe, L., Marks, G., Schakel, A. H., Chapman-Osterkatz, S., Niedzwiecki, S., & Shair-Rosenfeld, S. (2016). *Measuring Regional Authority*. Oxford University Press.

Jansen, P., & Devroe, W. (2022). Industrial policy, competition policy and strategic autonomy. In J.-C. Defraigne, J. Wouters, E. Traversa, & D. Zurstrassen (Eds.), *EU Industrial Policy in the Multipolar Economy* (pp. 80-121). Edward Elgar Publishing.

Johnston, A., & Huggins, R. (2023). Europe's semiconductor industry at a crossroads: Industrial policy and regional clusters. *European Urban and Regional Studies, 30*(3), 207-213. doi:10.1177/09697764231165199

Juhász, R., Lane, N., Oehlsen, E., & Pérez, V. C. (2022). The Who, What, When, and How of Industrial Policy: A Text-Based Approach. *STEG Working Paper, 50*. Retrieved from https://steg.cepr.org/publications/who-what-when-and-how-industrial-policy-text-based-approach.

Landesmann, M. A., & Stöllinger, R. (2020). The European Union's Industrial Policy. In A. Oqubay, C. Cramer, H.-J. Chang, & R. Kozul-Wright (Eds.), *The Oxford Handbook of Industrial Policy* (pp. 0). Oxford University Press.

Lavery, S. (2024). Rebuilding the fortress? Europe in a changing world economy. *Review of International Political Economy*, *31*(1), 1-24.

Lavery, S., & Schmid, D. (2021). European Integration and the New Global Disorder. *JCMS: Journal of Common Market Studies, 59*(5), 1322-1338. doi:https://doi.org/10.1111/jcms.13184

Lianos, I. (2019). The Future of Competition Policy in Europe. Some reflections on the interaction between industrial policy and competition law. *Centre for Law, Economics and Society Policy Paper Series, 2019*(1).

Lindstrom, N. (2021). Aiding the state: administrative capacity and creative compliance with European state aid rules in new member states. *Journal of European Public Policy, 28*(11), 1789-1806. doi:10.1080/13501763.2020.1791935

Lopes-Valença, H. (forthcoming). EU Industrial Policy and Convergent Development in EU Peripheries: An Assessment of the 'Important Project of Common European Interest' (IPCEI) Template. *Journal of Common Market Studies*. doi:https://doi.org/10.1111/jcms.13664

Machado, J. T. M., Flynn, B., & Williamson, I. (2022). The national shaping of Europe's emerging hydrogen strategies: Cooperative or competitive hydrogen Politics? *Competition and Regulation in Network Industries, 23*(1), 77-96. doi:10.1177/17835917221082935

Matthijs, M., & Meunier, S. (2023). Europe's Geoeconomic Revolution. How the EU Learned to Wield Its Real Power. *Foreign Affairs, 2023*(September/October). Retrieved from https://www.foreignaffairs.com/europe/european-union-geoeconomic-revolution.

McGowan, L. (2005). Europeanization unleashed and rebounding: assessing the modernization of EU cartel policy. *Journal of European Public Policy, 12*(6), 986-1004.

McNamara, K. R. (2023). Transforming Europe? The EU's industrial policy and geopolitical turn. *Journal of European Public Policy*, *31*(9), 1-26. doi:10.1080/13501763.2023.2230247

Mello, P. A. (2021). *Qualitative Comparative Analysis. An Introducion to Research Design and Application*. Georgetown University Press.

Meunier, S., & Mickus, J. (2020). Sizing up the competition: explaining reform of European Union competition policy in the Covid-19 era. *Journal of European Integration, 42*(8), 1077-1094. doi:10.1080/07036337.2020.1852232

Meunier, S., & Nicolaidis, K. (2019). The Geopoliticization of European Trade and Investment Policy. *Journal of Common Market Studies, 57*(S1), 103-113. doi:https://doi.org/10.1111/jcms.12932

Miró, J. (2022). Responding to the global disorder: the EU's quest for open strategic autonomy. *Global Society, 37*(3), 315-335. doi:10.1080/13600826.2022.2110042

Nicolini, M., Scarpa, C., & Valbonesi, P. (2016). Determinants of state aid to firms: the case of the European automotive industry. *Industrial and Corporate Change, 26*(3), 399-420. doi:10.1093/icc/dtw023

Our World in Data. (2024*a*). *Share of primary energy consumption that comes from oil – Using the substitution method* [Dataset]. Energy Institute. Retrieved from https://ourworldindata.org/energy/country/denmark?country=DNK~SWE#what-sources-does-the-country-get-its-energy-from.

Our World in Data. (2024*b*). *Share of primary energy consumption that comes from gas – Using the substitution method* [Dataset]. Energy Institute. Retrieved from: https://ourworldindata.org/energy/country/denmark?country=DNK~SWE#what-sources-does-the-country-get-its-energy-from.

Pemstein, D., Marquardt, K. L., Tzelgov, E., Wang, Y.-t., Medzihorsky, J., Krusell, J., . . . von Römer, J. (2024). The V-Dem Measurement Model: Latent Variable Analysis for Cross-National and Cross-Temporal Expert-Coded Data (9th ed.). *V-Dem Working Paper, 21*. University of Gothenburg: Varieties of Democracy Institute.

Pianta, M., Lucchese, M., & Nascia, L. (2020). The policy space for a novel industrial policy in Europe. *Industrial and Corporate Change, 29*(3), 779-795. doi:10.1093/icc/dtz075

Poitiers, N., & Weil, P. (2022). Opaque and ill-defined: the problems with Europe's IPCEI subsidy framework. *Bruegel.* Retrieved from https://www.bruegel.org/blog-post/opaque-and-ill-defined-problems-europes-ipcei-subsidy-framework.

Poulou, N., Polemis, M. L., & Oikonomou, A. (2023). The impact of state aid on economic growth: fresh evidence from a panel of 27 EU countries. *European Competition Journal, 19*(3), 359-379. doi:10.1080/17441056.2023.2200615

Ragin, C. C. (1987). *The comparative method: moving beyond qualitative and quantitative strategies*. University of California Press.

Rihoux, B., & De Meur, G. (2009). Crisp-set qualitative comparative analysis (csQCA). In C. C. Ragin & B. Rihoux (Eds.), *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques* (Vol. 51, pp. 33-68). SAGE Publications.

Ryner, M., & Cafruny, A. (2017). *The European Union and Global Capitalism*. Palgrave Macmillan.

Schito, M. (2021*a*). The politics of State aid in the European Union: explaining variation in aid allocation among Member States. *Journal of Public Policy, 41*(2), 277-306. doi:10.1017/S0143814X2000001X

Schito, M. (2021*b*). A Sectoral Approach to the Politics of State Aid in the European Union: an Analysis of the European Automotive Industry. *Journal of Industry, Competition and Trade, 21*(1), 1-31. doi:10.1007/s10842-020-00348-y

Schmitz, L., & Seidl, T. (2023). As open as possible, as autonomous as necessary: Understanding the rise of open strategic autonomy in EU trade policy. *Journal of Common Market Studies, 61*(3), 834-852.

Schneider, E. (2023). Germany's Industrial strategy 2030, EU competition policy and the Crisis of New Constitutionalism. (Geo-)political economy of a contested paradigm shift. *New Political Economy, 28*(2), 241-258. doi:10.1080/13563467.2022.2091535

Seidl, T., & Schmitz, L. (2023). Moving on to not fall behind? Technological sovereignty and the 'geo-dirigiste' turn in EU industrial policy. *Journal of European Public Policy*, *31*(8), 1-28. doi:10.1080/13501763.2023.2248204

Shair-Rosenfeld, S., Schakel, A. H., Niedzwiecki, S., Marks, G., Hooghe, L., & Chapman-Osterkatz, S. (2020). Language difference and regional authority. *Regional and Federal Studies*. doi:https://doi.org/10.1080/13597566.2020.1831476

Staehr, K. (2017). The Choice of Reforms and Economic System in the Baltic States. *Comparative Economic Studies, 59*(4), 498-519. doi:10.1057/s41294-017-0037-1

Strategic Forum for Important Projects of Common European Interest. (2019). *Strengthening Strategic Value Chains for a future-ready EU Industry*. Brussels: European Commission.

Swedish Ministry of Climate and Enterprises. (2021). *Smart and selective use of the IPCEI instrument. Joint non-paper by the Czech Republic, Denmark, Finland, Ireland, Latvia, Lithuania, Poland, the Netherlands, Slovakia, Spain and Sweden.* Retrieved from https://www.government.se/articles/2021/09/smart-and-selective-use-of-the-ipcei-instrument/.

Szczepański, M. (2020). *Important projects of common European interest. Boosting EU strategic value chains.* PE 659.341. Brussels: European Parliamentary Research Service.

Townley, C. (2009). *Article 81 EC and public policy*. Bloomsbury Publishing.

Traversa, E., & Sabbadini, P. M. (2022). Industrial policy and EU state aid rules. In J.-C. Defraigne, J. Wouters, E. Traversa, & D. Zurstrassen (Eds.), *EU Industrial Policy in the Multipolar Economy* (pp. 45-79). Edward Elgar Publishing.

Tunali, Ç. B., & Fidrmuc, J. (2015). State Aid Policy in the European Union. *Journal of Common Market Studies, 53*(5), 1143-1162. doi:https://doi.org/10.1111/jcms.12247

van Apeldoorn, B. (2002). *Transnational Capitalism and the struggle Over European Integration*. Routledge.

van Apeldoorn, B., & de Graaff, N. (2022). The state in global capitalism before and after the Covid-19 crisis. *Contemporary Politics, 28*(3), 306-327. doi:10.1080/13569775.2021.2022337

van Druenen, R. (2022). Permission to bail out EU's national flag carriers? Technocratic and political determinants of commission approval of state aid to national airlines in difficulties in the pre-COVID era. *Journal of Public Policy, 42*(3), 553-572. doi:https://doi.org/10.1017/S0143814X22000010

Vestager, M. (2023). Letter to EU finance ministers. Retrieved from https://www.politico.eu/wp-content/uploads/2023/01/16/Letter_EVP_Vestager_to_Ministers_Economic_and_Financial_Affairs_Council_Competitiveness_Council_aressv398731.pdf.

Wax, E., & Ahmatovic, S. (2024). Italy's 5Star Movement asks to join Left group in European Parliament. *Politico*. Retrieved from https://www.politico.eu/article/italy-5star-movement-party-asks-to-join-left-group-in-european-parliament-giuseppe-conte/.

Weiss, L., & Thurbon, E. (2021). Developmental State or Economic Statecraft? Where, Why and How the Difference Matters. *New Political Economy, 26*(3), 472-489. doi:10.1080/13563467.2020.1766431

Wigger, A. (2007). Towards a market-based approach: The privatization and micro-economization of EU antitrust law enforcement. In H. Overbeek, B. van Apeldoorn, & A. Nölke (Eds.), *The transnational politics of corporate governance regulation* (pp. 98-118). Routledge.

Wigger, A. (2017). Debunking the Myth of the Ordoliberal Influence on Post-war European Integration. In J. Hien & C. Joerges (Eds.), *Ordoliberalism, Law and the rule of economics* (pp. 161-178). Bloomsbury Publishing.

Wigger, A. (2023). The New EU Industrial Policy and Deepening Structural Asymmetries: Smart Specialisation Not So Smart. *Journal of Common Market Studies, 61*(1), 20-37. doi:https://doi.org/10.1111/jcms.13366

Wigger, A., & Nölke, A. (2007). Enhanced roles of private actors in EU business regulation and the erosion of Rhenish capitalism: The case of antitrust enforcement. *Journal of Common Market Studies, 45*(2), 487-513.

Wilks, S. (2015). Competition Policy: Defending the Economic Constitution. In H. Wallace, M. A. Pollack, & A. R. Young (Eds.), *Policy-making in the European Union* (pp. 141-165). Oxford University Press.

Wilks, S., & Bartle, I. (2002). The Unanticipated Consequences of Creating Independent Competition Agencies. *West European Politics, 25*(1), 148-172. doi:10.1080/713601589

Wilks, S., & McGowan, L. (1996). Competition Policy in the European Union: Creating a Federal Agency? In B. Doem & S. Wilks (Eds.), *Comparative Competition Policy. National Institutions in a Global Market*. Clarendon Press.

Zohlnhöfer, R., Engler, F., & Dümig, K. (2018). The retreat of the interventionist state in advanced democracies. *British Journal of Political Science, 48*(2), 535-562.

# APPENDICES

## Appendix 1. Calibration of *Hy2Tech Participation* (outcome)

| *Case* | State aid[a] (mn. EUR) | Aid share[b] (%) | EU GDP share[c] (%) | Participation depth ratio[d] (aid share / EU GDP share) | Part[e] (fuzzy score) |
|---|---|---|---|---|---|
| ***Austria*** | 140 | 2.6 | 2.8 | 0.9 | **0.69** |
| ***Belgium*** | 37 | 0.7 | 3.5 | 0.2 | **0.14** |
| ***Bulgaria*** | 0 | 0 | 0.5 | 0.0 | **0.05** |
| ***Croatia*** | 0 | 0 | 0.4 | 0.0 | **0.05** |
| ***Cyprus*** | 0 | 0 | 0.2 | 0.0 | **0.05** |
| ***Czech Republic*** | 30 | 0.6 | 1.7 | 0.3 | **0.23** |
| ***Denmark*** | 87 | 1.6 | 2.4 | 0.7 | **0.60** |
| ***Estonia*** | 46 | 0.8 | 0.2 | 4.2 | **1.00** |
| ***Finland*** | 150 | 2.8 | 1.7 | 1.6 | **0.90** |
| ***France*** | 2,162 | 39.9 | 17.1 | 2.3 | **0.97** |
| ***Germany*** | 734 | 13.5 | 24.6 | 0.6 | **0.55** |
| ***Greece*** | 756 | 13.9 | 1.2 | 11.6 | **1.00** |
| ***Hungary*** | 0 | 0 | 1.0 | 0.0 | **0.05** |
| ***Ireland*** | 0 | 0 | 3.1 | 0.0 | **0.05** |
| ***Italy*** | 1,078 | 19.9 | 12.4 | 1.6 | **0.90** |
| ***Latvia*** | 0 | 0 | 0.2 | 0.0 | **0.05** |
| ***Lithuania*** | 0 | 0 | 0.4 | 0.0 | **0.05** |
| ***Luxembourg*** | 0 | 0 | 0.5 | 0.0 | **0.05** |
| ***Malta*** | 0 | 0 | 0.1 | 0.0 | **0.05** |
| ***Netherlands*** | 22 | 0.4 | 6.1 | 0.1 | **0.08** |
| ***Poland*** | 24 | 0.4 | 3.9 | 0.1 | **0.08** |
| ***Portugal*** | 45 | 0.8 | 1.5 | 0.6 | **0.55** |
| ***Romania*** | 0 | 0 | 1.6 | 0.0 | **0.05** |
| ***Slovak Republic*** | 36 | 0.7 | 0.7 | 0.9 | **0.69** |
| ***Slovenia*** | 0 | 0 | 0.4 | 0.0 | **0.05** |
| ***Spain*** | 74 | 1.4 | 8.3 | 0.2 | **0.14** |
| ***Sweden*** | 0 | 0 | 3.7 | 0.0 | **0.05** |
| ***TOTAL EU*** | 5,421 | 100 | 100 | | |

*Source:* (a) European Commission (2022, pp. 81-84); (c) Eurostat (2023); (b), (d), (e) own calculations.
*Notes:* (a) Total matches official EU communication (European Commission, n.d.*e*).
(b) Total might not exactly equal 100 due to rounding of results.
(c) Total might not exactly equal 100 due to rounding of results.
(e) Cases with a participation depth ratio of 0 are awarded a 0.05 fuzzy score because they are computed using logarithmic scales. This does not affect the analysis.

## Appendix 2. Calibration of *strong business demands*

| *Case* | Share of employment in manufacturing total[a] (%) | | | Mean[b] (%) | Business[c] (fuzzy score) |
|---|---|---|---|---|---|
| | C25 | C27 | C28 | | |
| ***Austria*** | 11.54 | 6.93 | 13.68 | 10.72 | **0.88** |
| ***Belgium*** | 9.98 | 2.43 | 6.27 | 6.23 | **0.34** |
| ***Bulgaria*** | 10.58 | 4.91 | 6.62 | 7.37 | **0.44** |
| ***Croatia*** | 13.32 | 4.12 | 4.42 | 7.29 | **0.43** |
| ***Cyprus*** | 12.46 | (no data) | 1.54 | 7 | **0.41** |
| ***Czech Republic*** | 15.11 | 8.25 | 9.70 | 11.02 | **0.91** |
| ***Denmark*** | 10.75 | 3.30 | 18.09 | 10.71 | **0.88** |
| ***Estonia*** | 12.43 | 5.52 | 3.68 | 7.21 | **0.43** |
| ***Finland*** | 12.32 | 5.45 | 15.53 | 11.1 | **0.91** |
| ***France*** | 9.50 | 3.77 | 5.97 | 6.41 | **0.36** |
| ***Germany*** | 12.19 | 6.63 | 15.67 | 11.5 | **0.93** |
| ***Greece*** | 9.23 | (no data) | 3.15 | 6.19 | **0.34** |
| ***Hungary*** | 11.25 | 7.65 | 7.46 | 8.79 | **0.64** |
| ***Ireland*** | 7.30 | 1.75 | 5.06 | 4.7 | **0.22** |
| ***Italy*** | 15.33 | 4.08 | 12.58 | 10.66 | **0.88** |
| ***Latvia*** | 10.09 | 3.07 | 3.10 | 5.42 | **0.28** |
| ***Lithuania*** | 8.12 | 2.40 | 2.77 | 4.43 | **0.21** |
| ***Luxembourg*** | 11.38 | 1.25 | 13.27 | 8.63 | **0.62** |
| ***Malta*** | 7.60 | 2.72 | 2.48 | 4.27 | **0.20** |
| ***Netherlands*** | 13.19 | 3.18 | 12.78 | 9.72 | **0.78** |
| ***Poland*** | 13.61 | 4.53 | 4.62 | 7.59 | **0.46** |
| ***Portugal*** | 13.10 | 2.65 | 3.52 | 6.42 | **0.36** |
| ***Romania*** | 7.95 | 4.69 | 4.18 | 5.61 | **0.29** |
| ***Slovak Republic*** | 15.90 | 7.37 | 9.20 | 10.82 | **0.89** |
| ***Slovenia*** | 16.35 | 10.54 | 7.57 | 11.49 | **0.93** |
| ***Spain*** | 12.23 | 3.42 | 5.64 | 7.1 | **0.42** |
| ***Sweden*** | 12.32 | 3.98 | 13.60 | 9.97 | **0.81** |

*Source:* (a) Eurostat (2024*a*); (b), (c) own calculations.
*Notes:* (a) Due to data availability, the mean of Cyprus and Greece was calculated using C25 and C28 only.

## Appendix 3. Calibration of *high civil society pressure*

| *Case* | Civil Society Participation Index[a] (scale 0-1) | CivSoc[b] (fuzzy score) |
|---|---|---|
| ***Austria*** | 0.89 | **0.84** |
| ***Belgium*** | 0.94 | **0.91** |
| ***Bulgaria*** | 0.8 | **0.65** |
| ***Croatia*** | 0.7 | **0.35** |
| ***Cyprus*** | 0.86 | **0.79** |
| ***Czech Republic*** | 0.81 | **0.67** |
| ***Denmark*** | 0.98 | **0.94** |
| ***Estonia*** | 0.91 | **0.87** |
| ***Finland*** | 0.97 | **0.93** |
| ***France*** | 0.91 | **0.87** |
| ***Germany*** | 0.98 | **0.94** |
| ***Greece*** | 0.83 | **0.72** |
| ***Hungary*** | 0.56 | **0.09** |
| ***Ireland*** | 0.96 | **0.93** |
| ***Italy*** | 0.9 | **0.86** |
| ***Latvia*** | 0.86 | **0.79** |
| ***Lithuania*** | 0.8 | **0.65** |
| ***Luxembourg*** | 0.96 | **0.93** |
| ***Malta*** | 0.83 | **0.72** |
| ***Netherlands*** | 0.88 | **0.83** |
| ***Poland*** | 0.57 | **0.10** |
| ***Portugal*** | 0.85 | **0.77** |
| ***Romania*** | 0.76 | **0.53** |
| ***Slovak Republic*** | 0.79 | **0.62** |
| ***Slovenia*** | 0.8 | **0.65** |
| ***Spain*** | 0.9 | **0.86** |
| ***Sweden*** | 0.95 | **0.92** |

*Source:* (a) Varieties of Democracy (V-Dem) (Coppedge et al., 2024; Pemstein et al., 2024); (b) own calculations.

## Appendix 4. Calibration of *high fiscal capacity of a member state*

| *Case* | Per capita income[a] (EUR/capita) | FiscCap[b] (fuzzy score) |
|---|---|---|
| ***Austria*** | 45,270 | **0.80** |
| ***Belgium*** | 43,850 | **0.77** |
| ***Bulgaria*** | 10,330 | **0.11** |
| ***Croatia*** | 14,880 | **0.16** |
| ***Cyprus*** | 27,690 | **0.38** |
| ***Czech Republic*** | 23,430 | **0.30** |
| ***Denmark*** | 58,970 | **0.95** |
| ***Estonia*** | 23,430 | **0.30** |
| ***Finland*** | 45,230 | **0.80** |
| ***France*** | 36,950 | **0.61** |
| ***Germany*** | 43,480 | **0.76** |
| ***Greece*** | 17,060 | **0.19** |
| ***Hungary*** | 15,860 | **0.17** |
| ***Ireland*** | 88,220 | **1.00** |
| ***Italy*** | 30,810 | **0.45** |
| ***Latvia*** | 17,710 | **0.20** |
| ***Lithuania*** | 20,110 | **0.24** |
| ***Luxembourg*** | 112,860 | **1.00** |
| ***Malta*** | 29,590 | **0.42** |
| ***Netherlands*** | 50,850 | **0.88** |
| ***Poland*** | 15,100 | **0.16** |
| ***Portugal*** | 20,990 | **0.25** |
| ***Romania*** | 12,630 | **0.14** |
| ***Slovak Republic*** | 18,430 | **0.21** |
| ***Slovenia*** | 24,800 | **0.32** |
| ***Spain*** | 25,800 | **0.34** |
| ***Sweden*** | 51,700 | **0.89** |

*Source:* (a) Eurostat (2024*b*); (b) own calculations.

## Appendix 5. Calibration of *conservative ideology*

| Case | Cabinet name | Total cabinet | | | | | | | | | | | | Ideol[c] (fuzzy score) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Party1 | | | Party2 | | | Party3 | | | Party4 | | | Total | | |
| | | Name | Seats | Ideology | Name | Seats | Ideology | Name | Seats | Ideology | Name | Seats | Ideology | Seats[a] | Ideology[b] | |
| AT | Kurz II | Gruene | 26 | 2.4604 | OVP | 71 | 6.4733 | | | | | | | 97 | 5.40 | **0.49** |
| BE | De Croo | AGL-Gr | 8 | 2.5762 | CVP\|CD&V | 12 | 5.7667 | Ecolo | 13 | 2.641 | MR | 14 | 6.6889 | 88 | 4.43 | **0.36** |
| | | Party5 | | | Party6 | | | Party7 | | | | | | | | |
| | | PS | 20 | 2.9307 | PVV\|VLD | 12 | 7.0053 | SP | 9 | 3.2459 | | | | | | |
| BG | Borisov III[d] | DPS | 26 | 4.5828 | NFSB | 27 | 8.8 | | | | | | | 53 | 6.73 | **0.69** |
| HR | Plenkovic III | HDZ | 66 | 7.1053 | SDSS | 3 | 3.3 | ethnic | 5 | 5[e] | | | | 74 | 6.81 | **0.71** |
| CY | Anastasiades V | DISY | 17 | 8.6842 | | | | | | | | | | 17 | 8.68 | **0.89** |
| CZ | Babis II | ANO | 78 | 6 | CSSD | 15 | 3.0463 | | | | | | | 93 | 5.52 | **0.51** |
| DK | Frederiksen I | SD | 48 | 3.8011 | | | | | | | | | | 48 | 3.80 | **0.28** |
| EE | Kallas K. I | EK | 26 | 3.9562 | Ere | 34 | 7.8969 | | | | | | | 60 | 6.19 | **0.61** |
| FI | Marin | DL\|VAS | 16 | 2.1843 | KESK | 31 | 5.8027 | RKP-SFP | 9 | 6.3906 | SSDP | 40 | 3.5595 | 116 | 4.20 | **0.33** |
| | | Party5 | | | | | | | | | | | | | | |
| | | VIHR | 20 | 3.6465 | | | | | | | | | | | | |
| FR | Castex | PRG | 3 | 4.0813 | REM\|R | 308 | 6 | UDF\|MD | 42 | 6.1017 | UMP\|LR | 112 | 7.4997 | 465 | 6.36 | **0.64** |
| DE | Merkel V | CDU+CSU | 246 | 6.2503 | SPD | 153 | 3.6451 | | | | | | | 399 | 5.25 | **0.47** |
| GR | Mitsotakis Kyr I | ND | 158 | 6.7365 | | | | | | | | | | 158 | 6.74 | **0.70** |
| HU | Orban IV | Fi-MPSz | 117 | 6.5432 | KDNP | 16 | 7.4 | | | | | | | 133 | 6.65 | **0.68** |
| IE | Martin | FF | 38 | 6.0713 | FG | 35 | 6.4372 | Green | 12 | 2.435 | | | | 85 | 5.71 | **0.53** |
| IT | Draghi I | FI-PdL | 106 | 7.1459 | IV | 25 | 6 | LN | 124 | 7.8007 | M5S | 227 | 2.5[f] | 583 | 4.61 | **0.38** |
| | | Party5 | | | Party6 | | | | | | | | | | | |
| | | PD | 87 | 2.6216 | S | 14 | 1.3 | | | | | | | | | |
| LV | Karins I | JKP | 16 | 7.4 | KPV-LV | 16 | 8.8 | NA/TB/LN | 13 | 8.2588 | V | 8 | 7.4 | 53 | 8.03 | **0.84** |
| LT | Simonyte | LP | 11 | 6 | LRLS | 13 | 7.7562 | TS-LK | 50 | 7.4004 | | | | 74 | 7.25 | **0.76** |
| LU | Bettel II | DP | 12 | 6.5789 | Greng | 9 | 2.5 | LSAP | 10 | 3.2895 | | | | 31 | 4.33 | **0.35** |
| MT | Abela | PL | 37 | 4.2105 | | | | | | | | | | 37 | 4.21 | **0.33** |
| NL | Rutte VI | CDA | 19 | 5.9376 | CU | 5 | 6.1732 | D66 | 19 | 4.5066 | VVD | 33 | 7.3482 | 76 | 6.21 | **0.62** |
| PL | Morawiecki II | PiS | 235 | 7.6997 | | | | | | | | | | 235 | 7.70 | **0.81** |
| PT | Costa II | PS | 108 | 4.0492 | | | | | | | | | | 108 | 4.05 | **0.31** |
| RO | Citu | PNL | 93 | 6.0543 | UDMR | 21 | 6.016 | USR\|PLUS | 55 | 6 | | | | 169 | 6.03 | **0.59** |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***SK*** | Heger I | OLaNO | 53 | 7.4 | SR | 17 | 8.8 | SaS | 13 | 6 | ZAL | 12 | 6 | 95 | 7.28 | **0.77** |
| ***SI*** | Jansa IV | NSI | 7 | 7.9345 | SDS | 25 | 6.9996 | SMC | 10 | 3.3 | | | | 42 | 6.27 | **0.63** |
| ***ES*** | Sanchez III | ECP | 7 | 1.3 | EM\|GCE | 2 | 1.3 | PSOE | 120 | 3.7377 | | | | 129 | 3.57 | **0.26** |
| ***SE*** | Lofven IV | MP | 16 | 3.3789 | SAP | 100 | 3.4447 | | | | | | | 116 | 3.44 | **0.25** |

*Source:* (a), (b), (c) own calculations, based on ParlGov (Döring et al., 2023; other columns)

*Notes:* (d) Not in office during the period stipulated in the main text. However, data from this cabinet (May 4, 2017 – May 12, 2021) were used as this was the last fully functional cabinet before the caretaker gvernment took office.

(e) No data, therefore coded as centrist (5).

(f) No data. Coded as left-wing (2.5), as it wants to join The Left group in the European Parliament (Wax & Ahmatovic, 2024).

## Appendix 6. Calibration of *federal system*

| *Case* | Regional Authority Index[a] (scale 0-30) | Fed[b] (fuzzy score) |
|---|---|---|
| ***Austria*** | 23 | **0.71** |
| ***Belgium*** | 33.88[c] | **0.98** |
| ***Bulgaria*** | 2 | **0.06** |
| ***Croatia*** | 9.55 | **0.17** |
| ***Cyprus*** | 1 | **0.05** |
| ***Czech Republic*** | 12.32 | **0.24** |
| ***Denmark*** | 7.34 | **0.13** |
| ***Estonia*** | 0 | **0.05** |
| ***Finland*** | 7.09 | **0.13** |
| ***France*** | 21.85 | **0.64** |
| ***Germany*** | 37.67[c] | **1.00** |
| ***Greece*** | 9 | **0.16** |
| ***Hungary*** | 8.13 | **0.14** |
| ***Ireland*** | 11 | **0.21** |
| ***Italy*** | 25.82 | **0.85** |
| ***Latvia*** | 4 | **0.08** |
| ***Lithuania*** | 2 | **0.06** |
| ***Luxembourg*** | 0 | **0.05** |
| ***Malta*** | 0 | **0.05** |
| ***Netherlands*** | 17.5 | **0.41** |
| ***Poland*** | 11.32 | **0.21** |
| ***Portugal*** | 9.51 | **0.17** |
| ***Romania*** | 10.09 | **0.18** |
| ***Slovak Republic*** | 8.84 | **0.16** |
| ***Slovenia*** | 3.23 | **0.70** |
| ***Spain*** | 35.67 | **0.99** |
| ***Sweden*** | 12 | **0.23** |

*Source:* (a) Regional Authority Index (RAI) (Hooghe et al., 2016; Shair-Rosenfeld et al., 2020); (b) own calculations.
*Notes:* (c) Although RAI is designed to vary between 0 and 30, these cases score over 30 (Hooghe et al., 2021, p. 6). This stipulates the strongly federalized nature of their government systems.

## Appendix 7. Calibration of *high threat from Russia*

| *Case* | Category | Threat (fuzzy score) |
|---|---|---|
| ***Austria*** | Neighbor of a country neighboring Russia (over sea) | **0.2** |
| ***Belgium*** | Neighbor of a country neighboring Russia (over sea) | **0.2** |
| ***Bulgaria*** | Sea border only | **0.8** |
| ***Croatia*** | No neighbors | **0** |
| ***Cyprus*** | No neighbors | **0** |
| ***Czech Republic*** | Neighbor of a country neighboring Russia (over land) | **0.4** |
| ***Denmark*** | Sea border only | **0.8** |
| ***Estonia*** | Land and sea border | **1** |
| ***Finland*** | Land and sea border | **1** |
| ***France*** | Neighbor of a country neighboring Russia (over sea) | **0.2** |
| ***Germany*** | Sea border only | **0.8** |
| ***Greece*** | Neighbor of a country neighboring Russia (over sea) | **0.2** |
| ***Hungary*** | Neighbor of Ukraine | **0.6** |
| ***Ireland*** | No neighbors | **0** |
| ***Italy*** | No neighbors | **0** |
| ***Latvia*** | Land and sea border | **1** |
| ***Lithuania*** | Land and sea border | **1** |
| ***Luxembourg*** | Neighbor of a country neighboring Russia (over sea) | **0.2** |
| ***Malta*** | No neighbors | **0** |
| ***Netherlands*** | Neighbor of a country neighboring Russia (over sea) | **0.2** |
| ***Poland*** | Land and sea border | **1** |
| ***Portugal*** | No neighbors | **0** |
| ***Romania*** | Sea border only | **0.8** |
| ***Slovak Republic*** | Neighbor of Ukraine | **0.6** |
| ***Slovenia*** | No neighbors | **0** |
| ***Spain*** | No neighbors | **0** |
| ***Sweden*** | Land and sea border | **1** |

*Source*: Author.

*Notes:* A sea border is defined as the case and Russia both bordering the same sea (i.e. the Baltic Sea and the Black Sea). The Russian exclave of Kaliningrad is taken into account.

## Appendix 8. Calibration of *high energy dependence on Russia*

| *Case* | Non-crude oil import from Russia[a] (100 kg) | Non-crude oil import extra-EU27[a] (100 kg) | Share of Russia in total extra-EU import[b] (%) | RusEDep[b] (fuzzy score) |
|---|---|---|---|---|
| ***Austria*** | 1,122,101 | 1,150,057 | 97.6 | 0.95 |
| ***Belgium*** | 46,150,939 | 145,012,913 | 31.8 | 0.25 |
| ***Bulgaria*** | 5,879,912 | 6,556,755 | 89.7 | 0.92 |
| ***Croatia*** | 2,330,547 | 4,213,195 | 55.3 | 0.58 |
| ***Cyprus*** | 87,386 | 13,467,124 | 0.6 | 0.05 |
| ***Czech Republic*** | 311 | 263,341 | 0.1 | 0.05 |
| ***Denmark*** | 5,799,032 | 14,270,024 | 40.6 | 0.36 |
| ***Estonia*** | 9,474,823 | 11,212,962 | 84.5 | 0.89 |
| ***Finland*** | 13,120,153 | 13,880,977 | 94.5 | 0.94 |
| ***France*** | 84,542,138 | 234,489,838 | 36.1 | 0.30 |
| ***Germany*** | 50,937,201 | 82,446,591 | 61.8 | 0.67 |
| ***Greece*** | 37,764,295 | 64,238,391 | 58.8 | 0.63 |
| ***Hungary*** | 403,385 | 1,087,907 | 37.1 | 0.32 |
| ***Ireland*** | 4,848,165 | 35,828,999 | 13.5 | 0.10 |
| ***Italy*** | 30,016,099 | 92,280,787 | 32.5 | 0.26 |
| ***Latvia*** | 1,721,292 | 2,128,511 | 80.9 | 0.86 |
| ***Lithuania*** | 4,600,679 | 4,885,970 | 94.2 | 0.93 |
| ***Luxembourg*** | 1 | 2,092 | 0.0 | 0.05 |
| ***Malta*** | 11,279 | 369,817 | 3.0 | 0.06 |
| ***Netherlands*** | 51,422,886 | 188,335,422 | 27.3 | 0.20 |
| ***Poland*** | 38,708,337 | 40,755,349 | 95.0 | 0.94 |
| ***Portugal*** | 7,760,416 | 14,327,829 | 54.2 | 0.56 |
| ***Romania*** | 18,818,953 | 21,831,642 | 86.2 | 0.90 |
| ***Slovak Republic*** | 6,995 | 202,337 | 3.5 | 0.06 |
| ***Slovenia*** | 3,200,914 | 15,667,103 | 20.4 | 0.15 |
| ***Spain*** | 50,278,199 | 89,906,589 | 55.9 | 0.59 |
| ***Sweden*** | 3,951,325 | 13,945,218 | 28.3 | 0.21 |

*Source*: (a) Eurostat (2024*e*); (b) own calculations.

## Appendix 9. Calibration of *high defense expenditures*

| *Case* | Defense expenditure[a] (% GDP) | DefExp[b] (fuzzy score) |
|---|---|---|
| ***Austria*** | 0.6 | **0.11** |
| ***Belgium*** | 0.9 | **0.16** |
| ***Bulgaria*** | 1.6 | **0.35** |
| ***Croatia*** | 1 | **0.18** |
| ***Cyprus*** | 1.8 | **0.43** |
| ***Czech Republic*** | 1 | **0.18** |
| ***Denmark*** | 1.2 | **0.23** |
| ***Estonia*** | 2.1 | **0.57** |
| ***Finland*** | 1.2 | **0.23** |
| ***France*** | 1.8 | **0.43** |
| ***Germany*** | 1.1 | **0.21** |
| ***Greece*** | 2.8 | **0.92** |
| ***Hungary*** | 1.1 | **0.21** |
| ***Ireland*** | 0.2 | **0.06** |
| ***Italy*** | 1.4 | **0.29** |
| ***Latvia*** | 2.4 | **0.77** |
| ***Lithuania*** | 1.8 | **0.43** |
| ***Luxembourg*** | 0.5 | **0.10** |
| ***Malta*** | 0.6 | **0.11** |
| ***Netherlands*** | 1.3 | **0.26** |
| ***Poland*** | 1.6 | **0.35** |
| ***Portugal*** | 0.8 | **0.14** |
| ***Romania*** | 1.9 | **0.46** |
| ***Slovak Republic*** | 1.3 | **0.26** |
| ***Slovenia*** | 1.2 | **0.23** |
| ***Spain*** | 1 | **0.18** |
| ***Sweden*** | 1.3 | **0.26** |

*Source*: (a) Eurostat (2024*c*); (b) own calculations.

## Appendix 10. Truth table ~Part

| Business | FiscCap | Ideol | RusEDep | DefExp | Threat | CivSoc | Fed | *Consistency* | ~Part | Cases |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | *0.9187* | **1** | HR |
| 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | *0.9016* | **1** | PL |
| 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | *0.8883* | **1** | NL |
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | *0.8824* | **1** | LU |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | *0.8778* | **1** | IE |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | *0.8660* | **1** | BE |
| 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | *0.8597* | **1** | CZ/SI |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | *0.8588* | **1** | ES |
| 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | *0.8537* | **1** | HU |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | *0.8522* | **1** | CY |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | *0.8448* | **1** | MT |
| 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | *0.4351* | **0** | DE |
| 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | *0.8209* | **0** | **SE,** DK |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | *0.8041* | **0** | PT |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | *0.8006* | **0** | **RO, LT, BG** |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | *0.7909* | **0** | FR |
| 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | *0.7861* | **0** | AT |
| 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | *0.7480* | **0** | EE, **LV** |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | *0.7321* | **0** | IT |
| 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | *0.7222* | **0** | SK |
| 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | *0.6511* | **0** | FI |
| 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | *0.6260* | **0** | FR |

*Notes:* Consistency cut-off point = 0.84. Contradictory cases in bold. ~*Part* = absence of Hy2Tech participation; *Business* = strong business pressure; *Fisccap* = high fiscal capacity of the member state; *Ideol* = conservative ideology; *Fed* = federal system; *RusEDep* = high energy dependence on Russia; *DefExp* = high defense expenditure; *Threat* = high threat from Russia; *CivSoc* = high civil society pressure.

## Appendix 11. Parsimonious solution ~Part

| Combination | Coverage | | Consistency | Cases |
|---|---|---|---|---|
| | *Raw* | *Unique* | | |
| ~CivSoc | 0.3719 | 0.1381 | 0.9147 | HR, PL, HU |
| ~Fed*~RusEDep*~Threat | 0.4295 | 0.2315 | 0.9014 | SI, NL, CY, IE, CZ, MT, LU |
| ~Ideol*Fed*~Business | 0.2148 | 0.0632 | 0.8727 | ES, BE |
| **Total solution** | 0.6806 | | 0.9261 | |

*Notes:* Sweden, Romania, Lithuania, Bulgaria and Latvia are not mentioned, as they are contradictory cases that are not explained by this analysis (see Appendix 10). [~] indicates the absence of the condition; [*] indicates that conditions are present/absent at the same time. Raw (unique) coverage indicates which share of cases is (only) explained by this combination. *Part* = Hy2Tech participation; *Business* = strong business pressure; *Fisccap* = high fiscal capacity of the member state; *Ideol* = conservative ideology; *Fed* = federal system; *RusEDep* = high energy dependence on Russia; *DefExp* = high defense expenditure; *Threat* = high threat from Russia; *CivSoc* = high civil society pressure.