Return of Industrial Policy in the V4 Countries: Insights From the NIPO Database

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Abstract

Industrial policy, which has long been marginalised in economic thought, is now experiencing a global revival. This new industrial policy renaissance has also reached the dependent market economies of the Visegrád Four (V4). However, there has been limited quantitative analysis of industrial policy in the region. This paper addresses this gap by using the recently developed NIPO database to evaluate industrial policies in Slovakia, Hungary, the Czech Republic, and Poland between 2017 and 2023. In addition to the core NIPO categories, we have developed a customised classification system to analyse the objectives, beneficiaries and primary funding sources of industrial policy interventions. According to our results, the V4 countries, which predominantly outsourced their industrial policy to multinational companies after the 1989 regime change and focused on attracting FDI, started to implement vertical, sector-specific interventions alongside horizontal industrial policy. Nevertheless, this shift remains heavily dependent on external financing, particularly EU and EIB funds, and continues to prioritise foreign firms, highlighting the ongoing reliance on the dependent market economy model. Based on the results, we identify four distinct national industrial policy trajectories: Slovakia's industrial policy is the most EU-embedded, with a particular focus on the automotive industry. Hungary's industrial policy is centred on domestic resources, but heavily supports foreign (notably Asian) capital. In contrast,

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Poland pursues an industrial policy oriented towards domestic firms, while the Czech Republic's industrial policy is EU-embedded and focused on foreign firms, but with a more diverse and RDI-focused approach than Hungary's.

Keywords: industrial policy, Visegrad 4 countries, NIPO database, dependent market economy

JEL codes: L52, O52, P52

Introduction

"The best industrial policy is none at all",- wrote Nobel Prize-winning economist Gary Becker in 1985 (Becker, 1985, p. 1) - a statement that became deeply embedded in the thinking of entire generations of economists and defined the mainstream economics of the neoliberal era. The collapse of the socialist system in the 1990s appeared to validate Becker's claim in practice, as the failure of extensive industrial policy seemed conclusive. While a handful of scholars continued to defend the relevance of industrial policy (e.g., Chang, 2002), it was largely pushed to the margins of mainstream economic thought for decades (Wraight, 2024).

After this prolonged period of neglect, industrial policy has made a strong comeback in recent years - both in academic discourse and policy practice. Since the 2008 global financial crisis, the necessity of industrial policy has become increasingly evident in policymaking, and this trend was only accelerated by the COVID-19 pandemic and the Russian-Ukrainian war. Concrete manifestations of this shift include the Biden administration's CHIPS and Science Act and the European Union's renewed industrial strategy (European Commission, 2021; White House, 2022).

This resurgence is mirrored in academic research as well. In 2024, one of the economics' most prestigious journals, the Journal of Economic Perspectives, devoted a special issue to industrial policy (Juhász & Lane, 2024), signalling a major change in how the topic is viewed. Leading figures in this intellectual revival include Dani Rodrik, Ha-Joon Chang, Justin Yifu Lin, Mariana Mazzucato, Réka Juhász, and Joseph Stiglitz - economists who argue that industrial policy is essential for tackling inequality, climate change, and technological transformation (e.g. Andreoni & Mazzucato, 2020; Chang & Andreoni, 2020; Juhász, Lane & Rodrik, 2024). In addition to theoretical breakthroughs, there has also been growing interest in quantitatively grounding the study of industrial policy. A notable recent development is the emergence of structured policy databases — such as the New Industrial Policy Observatory (NIPO) (Evenett et al., 2024) or the OECD QuIS database — reflecting a broader effort to systematically map and analyse industrial policy initiatives across countries. These mark a significant return of industrial policy to the analytical core of economic research.

Our paper contributes to this growing trend in the literature. It investigates the return of industrial policy from a quantitative perspective, focusing on the Visegrád Four (V4) countries using the insights from the NIPO database. The V4 region is a particularly compelling case for three reasons. First, due to their socialist legacy, these countries became enthusiastic adopters of neoliberal orthodoxy after the 1990s, leading to some of the most extensive dismantling of industrial policy (Appel & Orenstein, 2016). This makes the current revival of industrial policy in these former neoliberal strongholds especially worthy of analysis.

Second, there is an ongoing scholarly debate about whether the region's post-transition dependent market economy model (Nölke & Vliegenthart, 2009) - built on the primacy of foreign direct investment inflows - is undergoing structural transformation. Some argue we are witnessing the rise of a new economic model (Bluhm & Varga, 2020), while others emphasise the resilience of the dependent trajectory (Bohle & Greskovits, 2019). Industrial policy plays a key role in this debate, as it may signal an attempt to shift toward a new model of economic development. Our findings suggest that the dependency on global production chains and foreign capital, as well as on the policy agenda set by the EU, remains.

Third, comprehensive quantitative research on industrial policy interventions in the V4 countries remains limited. Most existing work relies on qualitative assessments of industrial policy. These assessments use either comparative country case studies (e.g. Hrubý, 2024), sectoral studies (e.g. Győrffy, 2024; Ricz & Éltető, 2025), or historical-institutionalist approaches (e.g. Voszka, 2019; Kovács & Domonkos, 2024). Furthermore, studies employing quantitative methodologies tend to analyse specific elements of industrial policy, such as investment aids or EU funding (e.g. Medve-Bálint & Scepanovic, 2020; Medve-Bálint & Éltető, 2024; Tankovsky & Endrődi-Kovács, 2023). Alternatively, they use industry statistics to analyse the consequences of industrial policy rather than the policy interventions themselves (e.g. Csath, 2022). To the best of our knowledge, this is the first study to analyse the NIPO database in such depth, specifically for the V4 countries. Therefore, this paper adds significant value to the debate on industrial policy trajectories in Central and Eastern Europe by providing novel empirical insights.

Our research focuses on industrial policy in the four Visegrád countries (the Czech Republic, Slovakia, Poland, and Hungary) between 2017 and 2024. We analyse the structure, instruments, levels, and sources of industrial policy interventions. We aim to answer three questions: 1) What is the broader objective of the interventions applied in V4 countries? 2) Who are the beneficiaries of these interventions? 3) What financial resources are used for these interventions? To address these questions, we analyse the key variables in the NIPO database, such as the number of interventions, types of policies, instruments used and levels of implementation. However, in our research, we did not simply use the classifications available in the NIPO database; we also conducted a more in-depth analysis and determined our own classifications in order to compare the V4 countries more precisely. This involved examining individual industrial policy interventions in detail in order to assess objectives, sources and beneficiaries, which adds significant value to the quantitative analysis of industrial policy in the V4 countries.

The paper is organised into four main sections. The first section reviews the relevant literature, with special attention to the international revival of industrial policy and the evolving industrial policy of the V4 countries over the past 30 years. The second section presents our methodology and describes the core features of the NIPO database. The third section discusses our empirical findings. The paper concludes with a summary of key insights and implications for future research.

1. Literature review

1.1. Return of industrial policy after 2010

While industrial policy is still a relatively new term in the context of the Visegrad 4 region's economic development, it has been gaining prominence in innovation and political economy research since the early 2010s. A decisive early breakthrough has been made by Marianna Mazzucato's *The Entrepreneurial State* (Mazzucato, 2013), which challenges the narrative of an inefficient state versus a dynamic private sector. Under closer scrutiny, Mazzucato argues, we learn that states have always been vital for achieving technological progress by providing guidance and resources for exploring risky new venues that the private sector tends to avoid. This argument fits well in the broader debate on the "crisis of capitalism" following the 2008 financial crisis. In its aftermath, a wave of new research speculated on the return of industrial policy, and presented first attempts at its conceptualisation (Aiginger, 2014; O'Sullivan et al., 2013; Andreoni & Chang, 2016; Wade, 2012).

Alongside the 2008 financial crisis, another trigger for the return of industrial policy has been the intensifying debate on the climate change mitigation (Aiginger 2013; Rodrik 2014; Scoones, Leach, and Newell 2015; Altenburg and Assman 2017; Veugelers and Tagliapietra 2020), which emphasizes the role of the state as an irreplaceable actor in the process of green transition in existing sectors, as well as in the development of new green technologies. Especially after the pandemic, the industrial policy debate is also broadened with concepts such as sustainable and inclusive development, and growing emphasis on normative goals as inextricable parts of development strategies (Ferrannini et al. 2021; Rodrik and Stantcheva 2021; Aiginger 2022; Mazzucato and Rodrik 2023).

With the rising geopolitical tensions in the 2020s, industrial policy has become a central point of economic policy-making, illustrated by major initiatives such as the US Inflation Reduction Act or the New Industrial Strategy for Europe. In light of these developments, numerous scholars have made the argument that industrial policy has now become a legitimate research topic (Andreoni and Mazzucato 2020; Juhász et al. 2022; Juhász, Lane, and Rodrik 2024). The number of "agenda-setting" publications has also grown (Andreoni and Chang 2019; Chang and Andreoni 2020; Mazzucato, Kattel, and Ryan-Collins 2020; Aiginger and Rodrik 2020; Chang 2023; Juhász and Lane 2024), establishing what could become the foundation of a new industrial policy theoretical corpus.

Overall, the return of industrial policy as a legitimate policy practice and topic of research signifies a paradigm shift towards greater involvement of the state in the process of technological transformation and economic development. This approach is still fundamentally market-based in the sense that the state does not aspire to replace markets. However, whereas the previous era hailed the free market as a universal solution to economic, technological and societal problems, the new approach sees the state engaging with the process to guide, and sometimes shape, the markets.

1.2. Emerging industrial policy in the Visegrad 4 region?

The return of industrial policy is particularly exciting in the context of the V4 region, where the term still carries a negative connotation. It evokes the failed, large-scale state planned industrialisation efforts of the socialist regimes (see: Kornai, 1992). Within this historical context, it is perhaps not surprising that after the regime change, the V4 region distanced itself significantly from the idea of expansive state-led industrial policy and became heavily influenced by neoliberalism. As Appel and Orenstein (2016: 313) put it, "no region has embraced neoliberalism more enthusiastically and persistently than post-communist Europe". Neoliberalism was built around the trinity of privatisation, deregulation and liberalisation (Steger & Roy, 2010), leaving relatively little room for industrial policy. Instead, the evolution of economic structures was entrusted to the 'invisible hand of the market' (Schmidt & Thatcher, 2013). This approach was famously summarised by Tadeusz Syryjczyk, the Polish Minister of Industry in the late 1980s and early 1990s: 'The best industrial policy is no industrial policy' (Anioł, 2015).[1]

Nevertheless, it would be a mistake to assume that industrial policy disappeared entirely following the regime change. While coherent industrial policy strategies were largely absent in the neoliberal era (Zavarska et al, 2023), Losoncz (2006) notes that even the passive industrial policy reflects a form of industrial policy. Therefore, this neoliberal industrial policy can be interpreted as the 'outsourcing' of shaping the economic structure to market forces - or, more precisely, to the decisions of large multinational corporations. This approach to industrial policy saw foreign direct investment (FDI) as the most effective tool for developing the economic structure. Therefore, industrial policy focused on attracting FDI inflows, which allowed multinational companies to enter the country and become a dominant force in shaping the economic structure.

To some extent, this process was inevitable. Under the socialist system, internal capital accumulation was severely limited, and the region faced chronic capital shortages after the transition (Farkas, 2011). This emphasised the importance of relying on foreign capital from multinational companies. Privatisation, especially in Hungary, also facilitated the inflow of foreign capital as the process often relied heavily on external investors, who were mostly foreign due to the lack of domestic capital (Szanyi, 2020). The inflow of foreign capital was also aided by the trans-

[1] This statement was borrowed directly from Chicago School economist Gary Becker (Voszka, 2019).

formational recession following the regime change, which triggered significant deindustrialisation and a decline in employment (Kornai, 1994). Economic policy had to address this, and foreign capital provided a solution. From the mid-1990s, foreign capital inflow became central to industrial policy in the V4 region, initiating a foreign capital-led reindustrialisation (Lux, 2017). As a result, the stock of FDI increased from 9,2% of GDP in 1994 to 59,5% by 2013, representing a 545% increase (WiiW, 2025). This was further strengthened by EU accession, which explicitly supported the consolidation of FDI-friendly policies in the region (Medve-Bálint, 2014).

This process culminated in a particular economic model in the region, referred to in the literature as a 'dependent market economy' (Nölke & Vliegenthart, 2009) or an 'FDI-dependent growth model' (Ban & Adascalitei, 2022). The essence of this model is that the institutional aspects of the economy are shaped according to the interests of multinational companies. This is reflected in moderately flexible labour market regulations, relatively weak trade unions and an education system that is increasingly geared towards vocational training (Nölke & Vliegenthart, 2009). In this model, foreign companies make a significant contribution to the economic performance. For example, in 2020, foreign companies generated an average of 43% of added value in the V4 countries (Eurostat, 2025). In this dependent economy, the state's role is to create the most attractive environment for foreign capital, leading to competition among the V4 economies. This is expressed by the concept of the 'competition state', as governments use tax incentives and harmful wage competition to attract foreign investment (Drahokoupil, 2009). Within this context, the role of industrial policy was limited to attracting foreign capital.

However, since the global financial crisis of 2008, the region's dependent economic model has been under increasing strain (Zavarska et al., 2023). This has coincided with the return of the industrial policy debate. In line with that, the V4 region has witnessed a gradual but significant shift towards greater state intervention to directly shape national economic structures. This shift is most evident in Hungary and Poland, though similar tendencies have also emerged in the Czech Republic and Slovakia.

Bluhm and Varga (2020) argue that Hungary and Poland are evolving towards a conservative developmental state, characterised by an increased state presence in guiding economic development. This ambition has been explicitly articulated by the Polish Prime Minister, Mateusz Morawiecki, who stated that 'our new industrial policy for identifying the sectors of the future is modelled on that of the Asian Tigers' (Morawiecki, 2016, p. 1). The state's more assertive role is also evident in the renationalisation of industries, particularly in the financial sector (Benczes & Orzechowska-Wacławska, 2024; Naczyk, 2022). This has been characterised as financial nationalism (Johnson & Barnes, 2015). In the Czech Republic, targeted industrial policy efforts have emerged, for instance, in the semiconductor sector (Hrubý, 2024), indicating growing interest in strategic sectoral development across the region.

Nevertheless, other scholars argue that these shifts are largely symbolic or rhetorical, leaving the underlying dependent growth model intact. As Bohle and Greskovits (2019) argue, although some state interventions target foreign capital, they are usually confined to sectors focused on the domestic market. In contrast, export-oriented sectors are still dominated by foreign-owned multinational companies. Similarly, Medve-Bálint and Éltető (2024) highlight that, despite the nationalist shift in Hungary and Poland between 2004 and 2022, the majority of state subsidies favoured foreign enterprises.

Nevertheless, it is becoming increasingly clear that, albeit in a contradictory manner, industrial policy is gradually gaining ground, even in the V4 region that was once the poster child of neoliberalism (Trautmann & Vida, 2021). This raises the intriguing question of how the resurgence of industrial policy is reflected in the data. What exactly is the content and scope of the industrial policies emerging in the Visegrád countries? Are there notable differences among the individual states? We aim to explore these questions in our research through the lens of the GTA's NIPO database.

2. Data and methodology

2.1. Industrial policy databases

As industrial policy is climbing high on political agendas, and policy-makers' focus is shifting from its *why* towards its *how* (Juhász et al., 2022; Rodrik, 2009), databases aimed at capturing and quantifying industrial policy are increasingly used by researchers and analysts. Several different institutions are collecting data on industrial policy, such as the OECD, the European Commission and the GTA. While these institutions' effort in creating such databases doubtlessly contributes to developing analysts' understanding of how industrial policy tools are used by different states across the globe, due to their different coverage, focus and definitions, data remain incomparable across them (Hodge et al., 2024) (Box 1).

This is just one in a list of complications related to an empirical, especially quantitative analysis of industrial policy. As argued by Rodrik (2008), who dissects the possibility of empirically measuring industrial policy's efficiency (often in search of a definitive claim on whether industrial policy is "good" or "bad"), it is nearly impossible to divorce a particular intervention from its broader political and economic context. In a thorough review of the difficulties related to empirical study of industrial policy, Lane (2020) reaffirms Rodrik's argument, describing the tendency of empirical and quantitative approaches to industrial policy as flattening in various ways: be it for the inability to capture the political context of the intervention or the specific policy episode of interventionism delimited in time, or the inability to distinguish between varying types of interventions aiming at different objectives. Additionally, a low volume of data, e.g. in the case of smaller and less researched countries, may hinder our ability to analyse an industrial policy in its full complexity. We will reflect on these complications in the discussion section of the article.

Box 1. Industrial policy-related databases

OECD – QuIS database

The OECD has launched a project under the title Quantifying Industrial Strategies, which is aimed at measuring industrial policy expenditures across OECD countries. Within the framework of the project, industrial policy is defined as „interventions intended to improve structurally the performance of the business sector" (Criscuolo, Díaz, & Lalanne, 2022). The first analysis based on this database covered the period between 2019 and 2021 and included data from nine countries participating in the project (Canada, Denmark, France, Ireland, Israel, Italy, the Netherlands, Sweden, and the United Kingdom), later extended to the period to 2022 and to eleven countries (Germany and Slovenia joined the project). The database categorises industrial policy by scope (horizontal or targeted), instrument types (grants and tax expenditures or financial instruments), eligibility criteria (e.g. digital, green, R&D, SMEs and young firms) and selectiveness (non-discretionary, selective or first-come, first-served) (Criscuolo et al., 2023). Besides providing data for cross-country analysis, the QuIS project also informs country reviews, such as the one on the industrial strategy of Slovenia, published recently by the OECD (OECD, 2025).

European Commission - State Aid Scoreboard

Within its competition policy framework, the EU aggregates data on state aid grants annually reported by the member states. This benchmarking instrument was launched in 2001; thus, the time coverage of the database is much wider than that of the QuIS or the NIPO database. State aid is defined by Article 107 of the Treaty on the Functioning of the European Union as „any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods" (European Commission, n.d.). The Scoreboard differentiates between aid objectives (19 modalities) and instruments (12 modalities) (European Commission, 2025). The 2024 edition features six focus points, including:

- State aid measures supporting the economy in mitigating the impact of Russia's war against Ukraine and to foster the transition to a net-zero economy;
- State aid provided in the context of the coronavirus crisis;
- Block-exempted State aid expenditure;
- State aid for energy and environmental protection, renewables and energy savings;
- State aid to deploy broadband networks;
- -State aid to boost industrial innovation and clean tech manufacturing (European Commission, 2025).

2.2. The NIPO database

In our analysis, we primarily rely on data extracted from the GTA's New Industrial Policy Observatory database. Within this project, industrial policy is defined as „any targeted government intervention aimed at developing or supporting specific domestic firms, industries, or economic activities to achieve national economic or non-economic (e.g., security, social, or environmental) objectives" (Evenett et al., 2024). The NIPO database relies heavily on the GTA database[2] that has been developed since 2009, but goes beyond it by i) identifying the level of the policy intervention (industrial strategy or plan, policies or regulations, or firm-specific intervention); ii) recording the states' official stated motive for implementing the respective industrial policy; iii) associating interventions with pre-specified product groups in strategic sectors; and iv) tracking several technology-related interventions.

[2] The Global Trade Alert was launched in 2009, and has been monitoring policy changes affecting global trade ever since. The NIPO initiative builds on their previous work on this area while complementing it with an industrial policy approach.

The database's inclusion criteria rest on three pillars, and tracked GTA measures need to meet at least 1 of the 3 principles to be included in the NIPO database (Evenett et al., 2024). The measure must either a) be associated with a predefined set of motives (point ii) above; b) cover at least one of the pre-specified strategic sectors and technologies (point iii) above; or c) be identified as an industrial strategy or plan. The set of motives and the sectors and technologies included are detailed in the Methodological Note to the NIPO database (GTA, 2024). The rationale for limiting the database to interventions associated with the predefined motives and/or technologies is that these criteria are aligned with a new, emerging global framework for industrial policy within which states explicitly use policies for enhancing, for instance, their strategic competitiveness, green and digital transition or economic security by reducing supply chain dependencies. As such, the database does not aim to cover all industrial policy interventions implemented in a given jurisdiction, but is limited to those aligned with this new industrial policy context. The GTA database, as well as the more detailed NIPO database, has been used by several researchers and analysts. For example, Juhász et al. (2022) apply a text-based approach to study policy patterns across the world using the GTA database covering trade policies implemented in the period between 2009 and 2020. Among other findings, their results reveal that industrial policies in most countries are targeted toward a small set of industries and are highly correlated with an industry's revealed comparative advantage. In a working paper, the World Bank's analysts examine the trade effects of industrial policies, relying on GTA data, and find that the introduction of a new industrial policy measure in a destination market reduces export growth to that market on average by about 0.28% (Barattieri, Mattoo, & Taglioni, 2024). Boulieris et al. (Boulieris, Smichowski, Fourka, & Lianos, 2025) use a text-as-data approach to assess the effect of industrial policy measures on competition, extracting data from the NIPO database. Their results suggest that techno-globalist industrial policies, i.e. those aimed primarily at enhancing the green transition and sustainable development, are generally more pro-competitive compared to techno-nationalist industrial policies aimed at improving national competitiveness or security. The European Bank for Reconstruction and Development (EBRD) publishes its Transition Report annually. The 2024-2025 edition provides a comprehensive overview of the evolution of industrial policy in EBRD economies, using a number of databases, including the NIPO (EBRD, 2024). The NIPO also informs country-level analysis. For example, Armstrong et al. (Armstrong, Solis, & Urata, 2025) study Japan's economic security strategy amid heightened geopolitical tension and present data from the GTA's database.

2.3. Methodology and data description

We used the NIPO 2.0 version of the database, which was accessed in January 2025 and covers industrial policy measures that were implemented or announced between 2017 and 2024. As there were few interventions in 2024, and none were available for Hungary and Slovakia, we decided to focus our examination on the

years between 2017 and 2023. Our data consists of information on the type of policy instrument (see Table A in Appendix), the level of the policy intervention (policy or regulation, firm specific), the prespecified sector or technology categories targeted by the intervention (see Table B in Appendix), and the stated motive of the policy if there's any (see Table C in Appendix). Moreover, the NIPO 2.0 includes the classification of certain types of interventions, such as horizontal or R&D-related interventions (see Table D in the Appendix). It is important to note that one policy intervention does not have to be associated with a certain category across all these aspects. For example, not all interventions are classified according to the targeted sector across the pre-defined categories, or according to the prespecified set of motives. However, these aspects provided us with a limited insight into the similarities and differences in industrial policy interventions across the V4 countries.

Beyond relying on the pre-defined classification methodology of the NIPO 2.0, we analysed several further aspects of the interventions included in the dataset. Examining the individual interventions was possible, as the dataset includes specific URL links to the GTA's recordings that provide detailed information on each intervention. Specifically, we identified five distinct groups of interventions based on their broadly defined objectives. These five groups include COVID-related interventions, Ukraine war-related interventions, Infrastructure investments, Production scale-up investments, and Research, development and innovation (RDI) investments (Table 1).

Table 1. A five-group classification of the interventions included in the NIPO 2.0 dataset

Category	Description
COVID-related interventions	Includes all interventions explicitly aimed at tackling challenges caused by the COVID-19 pandemic, including compensation for specific sectors, state aids, export bans or in some cases, RDI interventions focusing on COVID-related medical products.
Ukraine war-related interventions	Consists of interventions implemented in the aftermath of the Russian invasion of Ukraine, expanding to interventions such as compensations for high energy prices, financial grants for grain producers and sanctions targeting Russian imports or specific Russian companies.
Infrastructure investments	Includes interventions aimed at developing or improving infrastructure, including telecommunications, transport and energy distribution networks. Furthermore, this group includes interventions targeting the energy transition, such as the development of renewable energy sources.
Production scale-up interventions	This includes interventions that target the scaling up of existing production capabilities or the introduction of new production activities, primarily through the attraction of foreign direct investment. These interventions can also be horizontal, sector-specific or firm-specific.
Research, development and innovation interventions	Consists of interventions specifically aimed at enhancing RDI capabilities at the national, sectoral or firm level.

Source: Authors' elaboration

We also identified the beneficiaries of the respective interventions, detailing firm-specific interventions according to the type of firms (foreign, domestic, state-owned), while differentiating, e.g sector-specific or SME and Midcap specific measures within the policy intervention, i.e. non-firm-specific group. Importantly, we defined beneficiaries as foreign if the policy intervention targeted the operations of foreign entities in the respective country, or if it benefited the local subsidiaries of an international company. Due to a lack of ownership data, we were unable to identify the country of origin of the ultimate owner and instead classified beneficiaries based on the location of the companies' (or their parent companies') headquarters. We classified companies as state-owned if the state (or a local government) held the largest share in them. Therefore, these companies are not necessarily majority state-owned.

In addition, we categorised the interventions according to the type of financing source associated with each measure. The database includes primarily projects financed through the European Investment Bank and interventions that fall under the EU's state aid rules. In the latter case, we attempted to differentiate between interventions financed through the state budget and those financed through EU funds. Where the European Commission's decisions on the respective State aid case included explicit information on the involvement of EU funds, we grouped the interventions under the heading "EU funds involved". When such information was not accessible in these documents, we labelled the interventions as "State resources". However, it is important to note that EU funds managed at a Member State level (e.g. ESIF) are subject to state control, and we cannot exclude the possibility that aid cases not explicitly referring to certain EU funds are co-financed by EU resources. Moreover, we grouped interventions under "State resources" when financial grants or loan agreements were channelled through state financial institutions such as the Polish Development Bank or executed through an export agency such as the EXIM Hungary or the Polish KUKA. "State resources" also include interventions that do not directly involve monetary resources, such as FDI screening regulations, import or export bans, sanctions, and tax exemptions.

In the following section, we will present an overview of the data extracted from the NIPO dataset, organised according to our three research questions. 1) What is the broader objective of the interventions applied in V4 countries? 2) Who are the beneficiaries of these interventions? 3) What financial resources are used for these interventions? First, we will introduce the results of our classification methodology, describing the similarities and differences in the objectives of industrial policy interventions across V4 countries. This will be followed by an overview of the beneficiaries of these measures. Finally, we analyse the reliance of V4 countries' industrial policy interventions on EU funds and EIB financing.

3. Data analysis

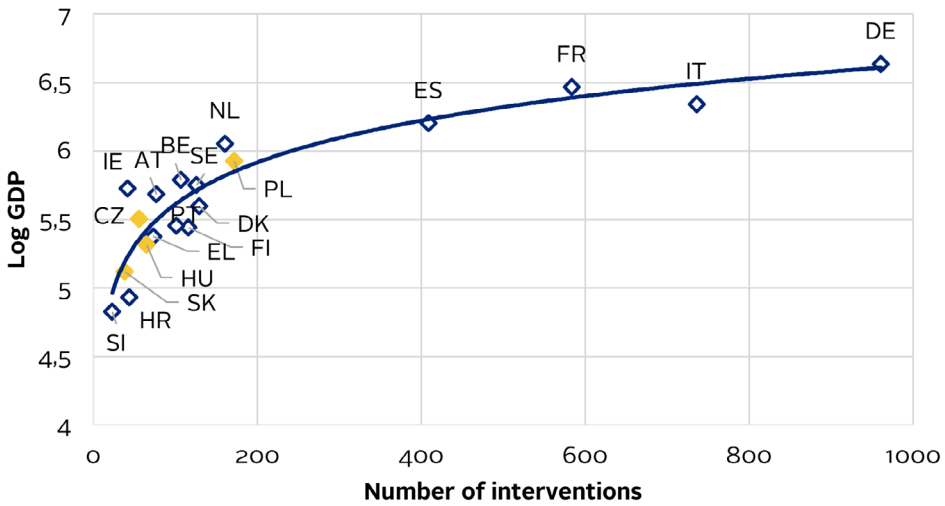
3.1. Main trends in the NIPO database

Several studies point out that industrial policy interventions are on the rise globally, with advanced economies leading the way, resulting in a highly uneven distribution of these interventions across countries (Evenett, 2024; Juhász et al., 2023; Juhász et al., 2022). Figure 1 shows the relationship between GDP and the number of interventions for 19 EU member states monitored by the GTA. We observe a strong positive, nonlinear relationship with V4 countries, fitting this overall pattern well. However, no conclusive relationship exists for GDP per capita, suggesting that the absolute size of the economy can better explain the number of industrial policy interventions in an implementing jurisdiction.

Among V4 countries, an increasing trend in industrial policy interventions can be observed for the Czech Republic and Poland between 2017 and 2023 (Figure 2), but the trends present in Hungary and Slovakia are less straightforward. The number of interventions increased significantly in Hungary in 2020, followed by a return to 2018 levels in the next year, after which a moderate increasing trend seemed to be unfolding. The sudden increase in interventions from 2019 to 2020 was similar in magnitude in Slovakia as well, followed by a gradual decrease between 2020 and 2023.

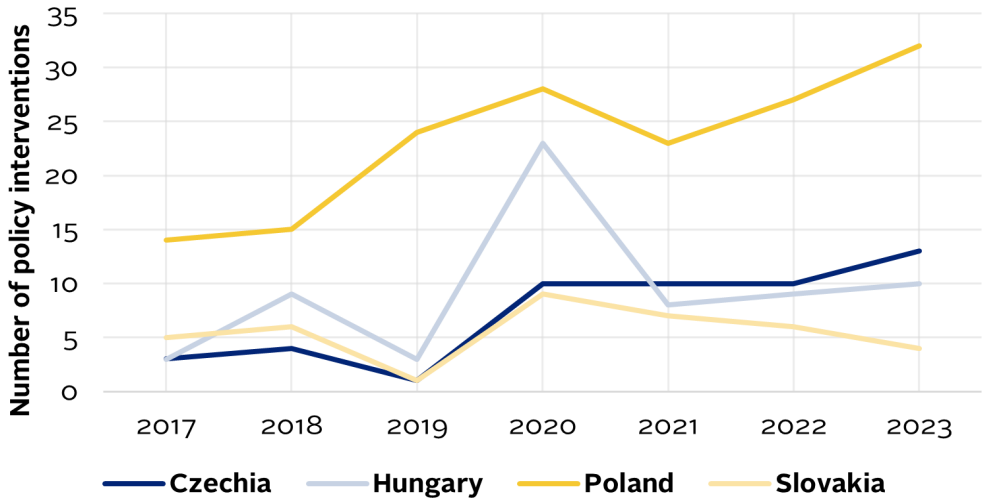
The majority of interventions registered for V4 countries are subsidies (Figure 3). While the Czech Republic and Hungary exhibit similar patterns, Slovakia and Poland demonstrate some minor differences. Unlike the Czech Republic and Hungary, Slovakia has no registered export incentives in the database, although a small proportion of instruments (2.6%) were import policy tools, which are not present in the former two countries. Meanwhile, Poland, with the lowest share of subsidies, uses export incentives most frequently, and is the only country for which sanctions were registered in this period, under the 'Other Policy' heading.

Figure 1.The relationship between log GDP and the number of interventions



Source: Edited by the author based on Evenett et al. (2024)

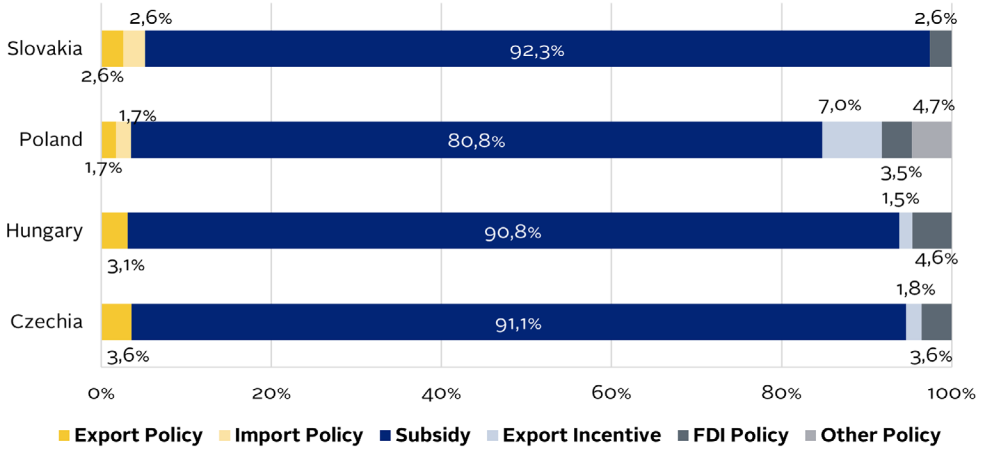
Figure 2. The number of policy interventions between 2017 and 2023 in the V4 countries



Source: Edited by the author based on Evenett et al. (2024)

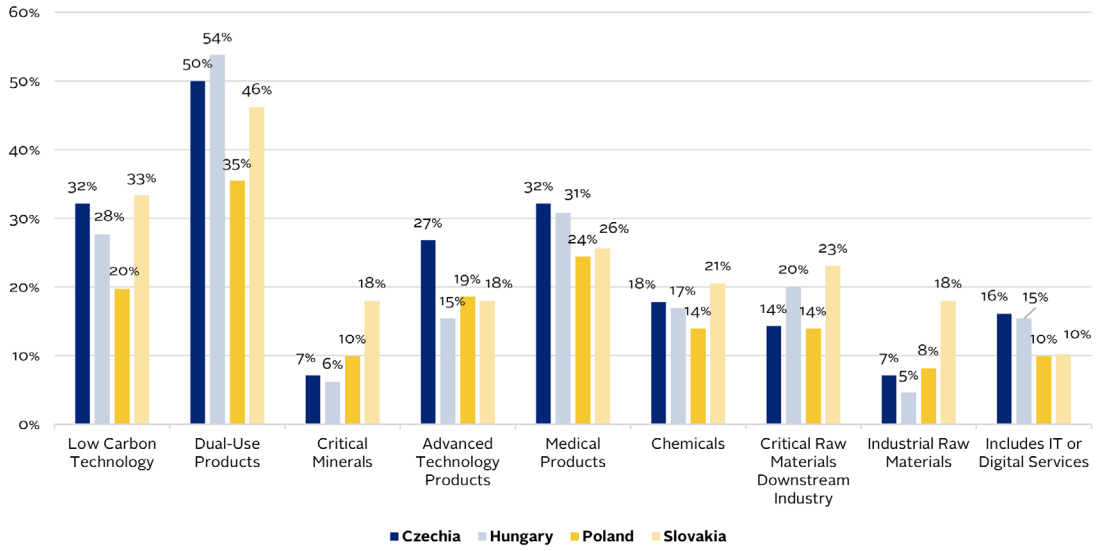
It is difficult to discern country-level patterns regarding the prespecified sectors and technologies targeted by industrial policy interventions across the V4 countries (Figure 4). Low-carbon technology, dual-use products and medical products are frequently targeted in all four countries, but Poland consistently has a lower proportion of interventions in these three technology groups. Slovakia places greater emphasis on critical minerals, critical raw materials, and industrial raw materials than the other three countries. These interventions target primarily the green transition or are international EIB projects that subsidise companies in the battery value chain. Meanwhile, the Czech Republic has the highest share of interventions targeting advanced technologies, suggesting its ambition to increase the prominence of these technologies in its industrial structure.

Figure 3. The type of policy instruments across the V4 countries



Source: Edited by the author based on Evenett et al. (2024)

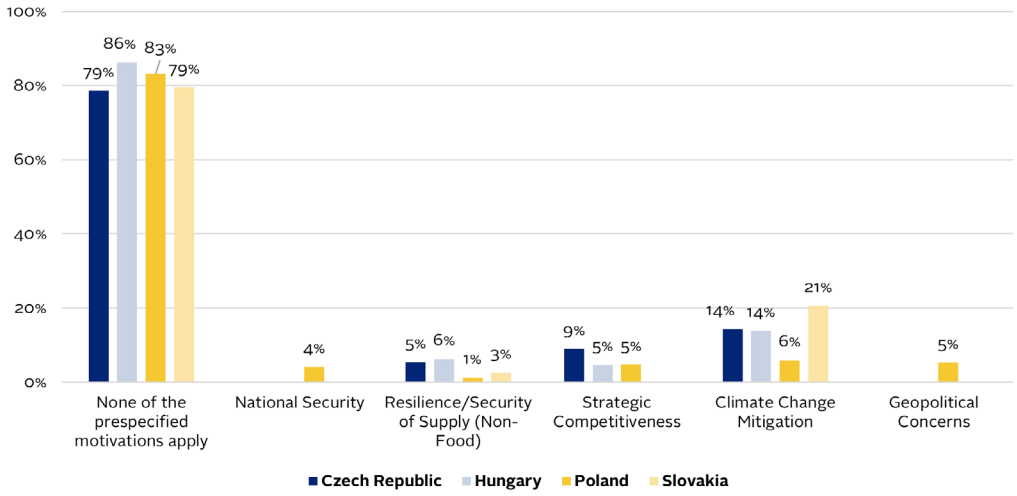
Figure 4. Sectors/technologies targeted by industrial policy interventions across V4 countries



Source: Edited by the author based on Evenett et al. (2024)

Generally, only a minority of interventions were motivated by at least one of the predefined motivations included in the NIPO database (Figure 5). Geopolitical and national security concerns behind industrial policy interventions appear only in Poland, but only for 5% of all interventions, as the two groups overlap. In contrast, in the other three countries, security considerations concern supply chain resilience. Strategic competitiveness motivated interventions most frequently in the Czech Republic (9%), compared to the rest of the V4 countries, partly overlapping with interventions targeting advanced technologies. In all four countries, climate change mitigation was the most common justification for applying industrial policy interventions, accounting for between 6% (Poland) and 21% (Slovakia) of all interventions. However, as we will see later in the case of Poland, we found that around 30% of interventions were aimed at the energy transition, which is the highest share across the V4 countries. This suggests that examining stated motivations can provide an inaccurate impression of industrial policy strategies, which may be due to a lack of data or officially unexpressed motivations.

Figure 5. Stated motives behind industrial policy interventions across the V4 countries



Source: Edited by the author based on Evenett et al. (2024)

3.2. Industrial policy interventions in V4 countries

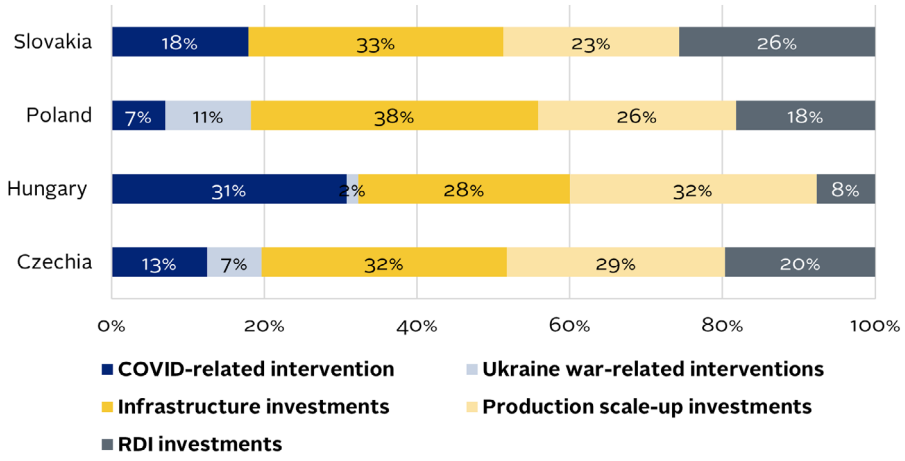
As described above, we developed a five-group classification framework to group industrial interventions implemented in V4 countries. These groups consist of i) COVID-related interventions, ii) Ukraine war-related interventions, iii) Infrastructure investments, iv) Production scale-up interventions, and v) RDI interventions. We use this classification to complement the NIPO project's own categories and to shed light on the broader objectives targeted by the interventions included in our dataset.

Figure 6 presents the share of interventions across these five groups in V4 countries. The share of crisis-response type of interventions, including interventions aimed at counteracting the economic consequences of the COVID-19 pandemic and the Russian invasion of Ukraine, is at 18% in Poland and Slovakia as well. However, while Slovakia did not implement any industrial policy interventions as a response to the war in Ukraine, Poland reacted to this crisis with more interventions compared to the pandemic. Meanwhile, pandemic responses dominate in the Czech Republic, but few interventions were also directed at compensating for high energy prices and emerging difficulties in exporting due to Russia's war in Ukraine. In Hungary, almost one-third of the interventions were aimed at tackling the consequences of the pandemic. Importantly, one-fifth of these COVID-related interventions aimed at facilitating COVID-related RDI activities, which were nevertheless grouped in this category instead of being assigned to the group of RDI investments. The rationale for this is that despite their RDI focus, these interventions were essentially encouraged by the pandemic and conceived as a response to it.

The proportion of interventions aimed at developing or improving infrastructure is highest in Poland (38%), accounting for around a third of interventions in the Czech Republic (32%) and Slovakia (33%), and lowest in Hungary (22%). Around 70% of these infrastructure investments support the energy transition in all four countries, primarily by expanding and improving electricity distribution and modernising and improving the efficiency of existing energy infrastructure. While the installation of renewable energy sources accounts for a relatively small proportion of interventions in the Czech Republic, Hungary and Slovakia, it accounts for around half of those targeted at the energy transition in Poland.

In Hungary, production scale-up interventions accounted for the highest share (32%), followed by the Czech Republic (29%). Around one quarter of the interventions in Poland targeted production scale-up, while the proportion was lowest in Slovakia (23%). There are no clear patterns or sharp differences in terms of the sectors targeted by these interventions. Some interventions target the automotive industry, the chemical industry and construction in all four countries. The medical sector is present in the Czech Republic, Hungary and Poland, but not Slovakia. The Czech Republic is the only country to target the semiconductor industry, while Poland's interventions target a wide range of sectors, including food production, fintech, IoT, AI and biotech.

Figure 6. Intervention categories across V4 countries



Source: Edited by the author based on Evenett et al. (2024)

RDI investments account for 26% in Slovakia, the highest share across V4 countries. Importantly, 80% of these interventions are international EIB projects related to the automotive industry. This speaks of Slovakia's strong international ties in a strategically important sector. The share of RDI investments is somewhat lower in the Czech Republic (20%) and Poland (18%). In the Czech Republic, 73% of the RDI investments are likewise integrated in EIB projects and are related to the automotive industry, while the rest of the interventions are targeting electronics,

semiconductors and sustainable product solutions as well. In Poland, medical RDI has the largest share (29%), followed by interventions targeting the automotive industry (26%). While the automotive RDI projects are internationally embedded in Poland as well, projects in the medical sector have a strong domestic pillar. The rest of the interventions target different sectors, such as communications, fintech, food production or construction. In Hungary, RDI interventions account for only 8% of all interventions. However, as noted above, several interventions were aimed at enhancing COVID-related RDI activities, classified by us as COVID-related measures. When reclassifying these interventions, the share of RDI measures increases to 15%, comparable to that observed in Poland. Only two RDI interventions are targeting the automotive industry in Hungary; this sector is more prominently represented in the production scale-up category, mainly through state aid provided to battery manufacturers installing production facilities in the country.

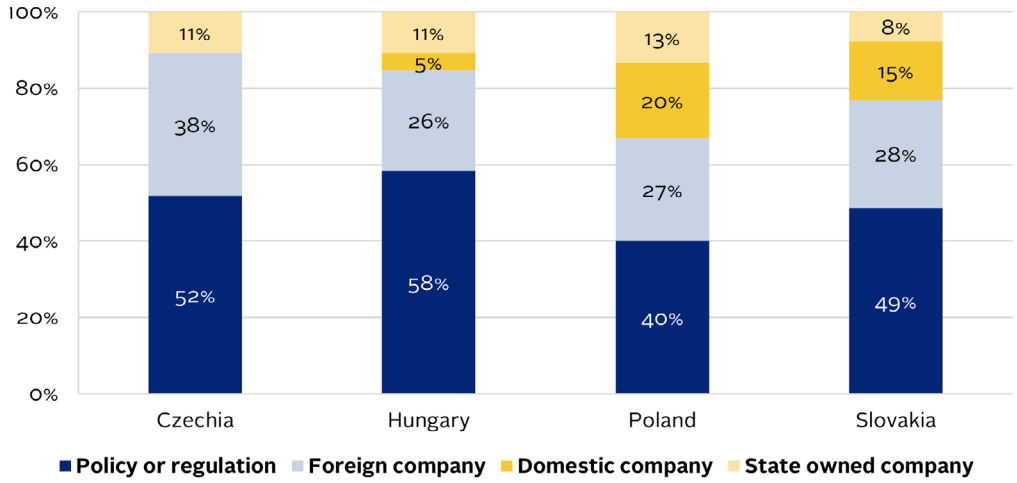
3.3. Beneficiaries

Cross-country differences can also be observed regarding the beneficiaries of industrial policy interventions across V4 countries (Figure 7). In Hungary, the majority (58%) of the interventions are policies or regulations, i.e. not firm-specific, while in Poland, such interventions account for 40% of the measures. Domestic companies play a marginal role in Hungary, representing 5% of the beneficiaries, primarily in the chemical sector, while in Poland they account for 20%, covering a wide range of sectors such as the medical sector, the automotive industry, food production and construction. As regards foreign companies, they represent around one quarter of the beneficiaries in both countries. Importantly, while around 87% of the foreign companies benefiting from interventions in Poland are headquartered in Europe, this share is only around one quarter in Hungary, where Asian companies have a prominent role, accounting for more than half of the beneficiaries. In the Czech Republic and Slovakia, around half of the interventions are firm-specific. As there are no domestic private companies among the beneficiaries, foreign companies clearly dominate Czech firm-specific interventions, with 38% of all interventions targeting them. Around 80% of these companies are headquartered in Europe, while only around 15% are based in Asian countries (Japan and Taiwan).Meanwhile, domestic companies are present among the beneficiaries in Slovakia, representing 8% of all interventions. These companies include a privately owned mining company, an electricity generation company, an electric mobility provider, and companies taking part in international IPCEI projects. In the case of Slovakia, all foreign beneficiaries are headquartered in Europe. State-owned companies have a similar share across all countries, representing primarily state-owned energy providers.

Taking a closer look at the type of policy and regulatory interventions reveals additional cross-country differences in the industrial policy practices of the V4 countries (Figure 8). While the Czech Republic relies mainly on sector-specific interventions, general interventions with all firms eligible are dominant in Hungary and

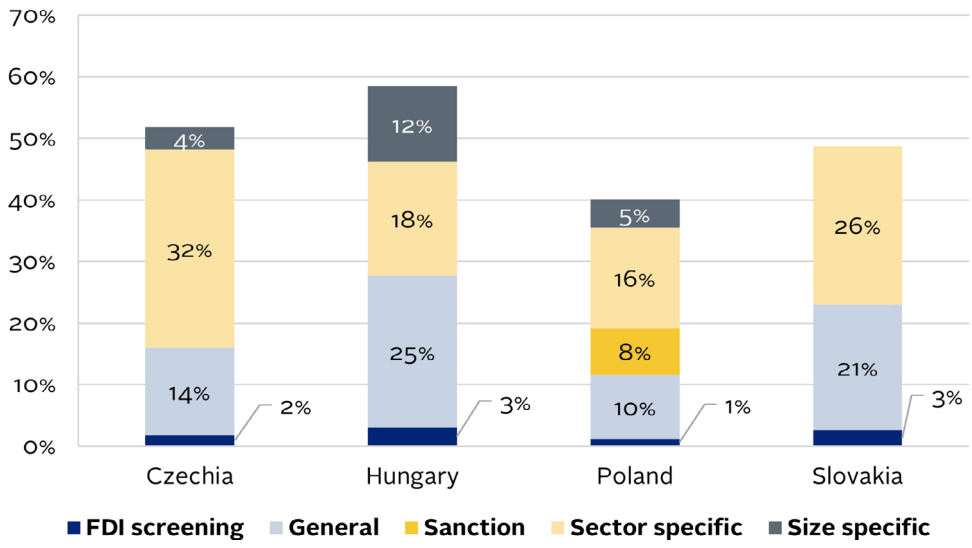
Slovakia. However, Hungary implemented size-specific interventions (for SMEs, midcaps and large companies), while this beneficiary group is not present in Slovakia. Meanwhile, Poland was the only country to apply sanctions. Of the sector-specific interventions, the energy sector is targeted most frequently in the Czech Republic, the medical sector in Hungary, and both of these sectors play a prominent role in Poland. In Slovakia, the energy, medical and transportation sectors have equal shares in sector-specific interventions.

Figure 7. Share of interventions by beneficiaries across V4 countries



Source: Edited by the author based on Evenett et al. (2024)

Figure 8. Share of policy intervention categories as a percentage of policy and regulation type interventions across V4 countries



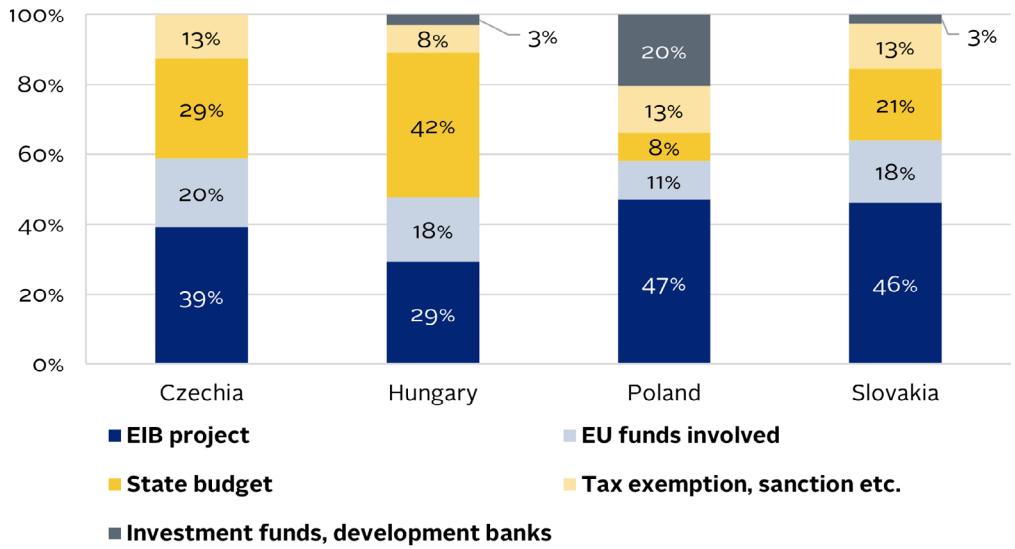
Source: Edited by the author based on Evenett et al. (2024)
Note: Percentages are shares of all policy interventions.

3.4. Source of finance

Arguably, EU member states' industrial policy is strongly embedded in the EU-level framework, subject to EU-level political forces and interests. Several studies account for the unfolding political forces that led to the EU's embracement of industrial policy by the early 2020s (e.g. Ambroziak, 2015; Di Carlo & Schmitz, 2023). However, EU membership creates not just constraints in the form of uniform state aid and competition policy, but opportunities as well, providing member states with a wide range of funds and the possibility to join international research or innovation projects (Bykova et al., 2023). As such, member states, and more specifically V4 countries, have room for implementing their own strategies and policies at the national level, especially in the light of loosening EU state aid rules (Hrubý, 2024). Nevertheless, policy interventions are often conceived within EU policy frameworks and target objectives that are in line with the EU's main priorities, such as the digital and green transitions.

The strong reliance of V4 countries on EU policies and EIB funding is reflected in the large share of those interventions that are financed through such sources (Figure 6). While the EU is considered the source of finance when the respective State aid decision published by the European Commission explicitly refers to the use of EU funds, interventions are linked to the EIB when it acts as a primary or co-financing institution. The rest are those financed through state resources, including state budget, financing through state entities or agencies and interventions that do not directly involve monetary resources.

Figure 9. Share of interventions by source of finance across V4 countries



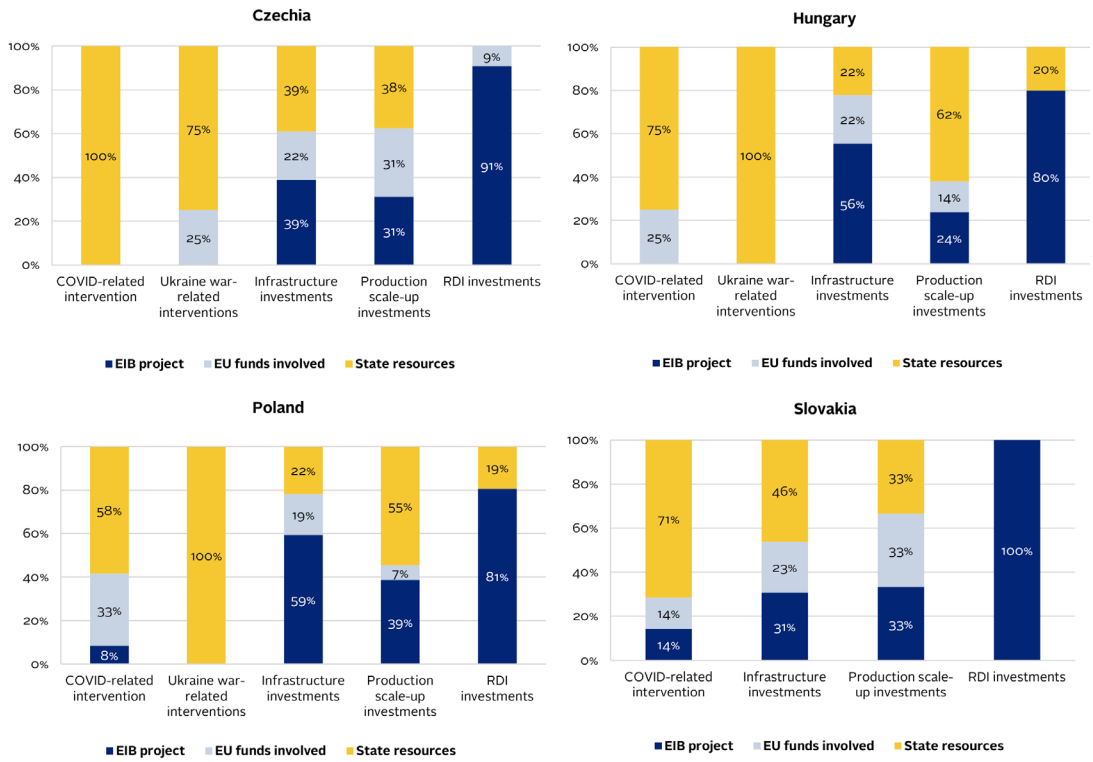
Source: Edited by the author based on Evenett et al. (2024)

Figure 9 shows similar patterns in this respect across V4 countries, albeit some differences exist. The share of EU measures is comparable across the Czech Republic (20%), Hungary (18%), and Slovakia (18%), while in the case of Poland, they account for only 11% of the interventions. The share of interventions financed

through the EIB ranges between 29% in Hungary and 47% in Poland, with the Czech Republic in the middle of this range and Slovakia close to the Polish share. Although the overall EIB investment to GDP ratio is the second highest in Hungary (16.5%) following Poland (18%) and outperforming the Czech Republic (13%) and Slovakia (11%) (EIB, 2025), the share of EIB projects implemented between 2017 and 2024 in all EIB projects is smaller in Hungary (24%) compared to the other three V4 countries where around one third of the EIB projects was implemented in this period. Moreover, not all EIB projects are included in the NIPO 2.0; only those that fit in the new industrial policy context. These can partly explain the apparent low reliance on EIB sources in Hungary, but it must also be emphasised that our analysis does not account for the size of the interventions, i.e. the money invested. Interestingly, while the majority of EIB projects are international in the sense that they affect multiple countries in the Czech Republic (64%) and Slovakia (72%), the share of such EIB projects is 38% in Poland and only 21% in Hungary.

Interventions financed through domestic financial resources account for the majority of all industrial policy interventions in Hungary, and play a slightly smaller role in the rest of the countries. Within this category, the State budget has a clear dominance in the case of Hungary, where interventions not involving monetary resources directly play a relatively small role compared to the region. Meanwhile, state agencies and entities such as the KUKA export credit agency, the Polish Development Bank and the Polish Development Fund play a prominent role in Poland, accounting for one-fifth of the interventions.

Figure 10. Source of finance by intervention categories across V4 countries



Source: Edited by the author based on Evenett et al. (2024)

Importantly, our analysis is based on the number of interventions and does not take into account the amount of money involved in these industrial policy interventions. Nevertheless, our findings align with those of Landessman and Stöllinger (2020), who examined the proportion of domestic spending on industrial policy and EU industrial policy funding, grouping five CEE countries, consisting of the V4 countries and Slovenia. In their analysis, the authors relied on two main sources, the Multiannual Financial Framework and the EU State Aid Scoreboard. Based on these sources, they estimated an EU funding-to-domestic spending ratio of 1.31, while we calculated an average ratio of 1.38 for the V4 countries.

A more detailed picture reveals some cross-country differences in what type of interventions were pursued through EU, EIB and State resources (Figure 10). In terms of crisis-response type of interventions, countries relied primarily on state resources; however, in the case of Poland, interventions backed by external resources accounted for about 40% of the interventions responding to the COVID-19 crisis. In contrast, RDI interventions are heavily reliant on external resources across all countries. In the Czech Republic and Slovakia, no state resources were targeted at improving RDI capacities, while in Hungary and Poland, only one quarter of the RDI interventions were sourced through state resources. While in the Czech Republic and Slovakia, the sources of finance are relatively balanced in the infrastructure investments and production scale-up interventions categories, Hungary and Poland exhibit a strong reliance on external sources for infrastructure investments, while domestic resources play a prominent role in production scale-up in these countries.

Discussion and concluding remarks

To our knowledge, this is the first study to specifically assess the development of industrial policy in the V4 countries in a quantitative manner using data from the NIPO database. In addition, we not only used existing classification, but also conducted a more in-depth analysis, developing our own categorisation to analyse the industrial policies of the V4 countries more precisely. Therefore, our findings provide a valuable contribution to the literature on industrial policy in Central and Eastern Europe.

Our results are summarised in Table 2, which presents the country profiles based on the NIPO database, broken down by country. These show that the region is in line with the broader return of the industrial policy trend. Rather than the outsourced industrial policy of the post-regime change era, which largely left the management of the economic structure to multinational firms and focused on attracting foreign direct investment (FDI), a more active industrial policy appears to be emerging. As well as horizontal instruments, this industrial policy incorporates vertical, sector-specific elements, clearly reflecting the state's ambitions to actively change the structure of the economy. In line with international trends, this new industrial policy primarily employs subsidies as a tool. In terms of industrial policy objectives, infrastructure development, production scale-up, and RDI also play an important role alongside crisis responses in the V4 countries.

In many respects, however, this new industrial policy is not autonomous but remains dependent. It is generally marked by a reliance on external sources, particularly EU funds and EIB projects, which demonstrates their heavy dependence on the European Union and its policy agenda. This reflects a strong integration within the EU industrial policy framework (Tankovsky et al, 2025). It is also evident that support for foreign companies remains a key element of industrial policy interventions. This highlights the difficulties in shifting away from the dependent market economy model in the region. In fact, industrial policy still aims to support foreign companies to a large degree. These findings reaffirm the literature that stresses the ongoing existence of dependency (see, for example, Bohle & Greskovits, 2019; 2018; Medve-Bálint & Éltető, 2024). This contrasts with studies that identify a decreasing dependency and transitioning towards a developmental state model (see, for example, Bluhm and Varga, 2020).

However, there are notable differences between the industrial policies of the four countries. Poland's industrial policy is the most domestically focused, prioritising support for domestic and state-owned enterprises. Infrastructure investments, especially those targeting energy efficiency, also feature prominently. This emphasis may relate to Poland's unique position in the green transition, as it is Europe's largest coal producer. The industrial policy actively addresses this challenge, with considerable efforts regarding the green transition. Moreover, Poland's sectoral structure of industrial policy is relatively diverse.

In contrast, Slovakia adopts an EU-embedded industrial policy integrated within the EU framework, relying heavily on external sources. Nonetheless, domestic companies also benefit significantly from these external sources. Additionally, Slovakia's industrial policy is characterised by a high specialisation in the automotive sector, particularly evident in RDI investments, which is strongly embedded in international value chains.

Table 2. Country profiles

Country	Intervention category	Beneficiaries	Source of finance
The Czech Republic	The share of interventions is relatively balanced across infrastructure investments, production scale-up interventions, and RDI interventions. Besides the prominent role of the (international) automotive industry, RDI investments are present in electronics and the semiconductor industry as well.	Almost an equal share between firm-specific and policy-level interventions. No domestic private companies are targeted by firm-specific interventions, while sector-specific policies have the largest share here, targeting primarily the energy sector. The vast majority of the foreign beneficiaries are headquartered in Europe, but the share of Asian beneficiaries is the second highest here (15%).	External resources are overall dominant, with EU funds-related interventions accounting for the highest share in the Czech Republic across V4 countries. Additionally, international EIB projects involving multiple EU member states have the highest share in the Czech Republic, which speaks of the country's international embeddedness. While the Czech Republic is fully reliant on external resources when it comes to RDI interventions, both infrastructure investments and production scale-up interventions have a solid domestic pillar.
Hungary	A relatively high share of interventions is used as crisis responses, while infrastructure and RDI interventions have a relatively low share. Unlike in the other three countries, in the automotive industry, RDI interventions have a marginal role. In Hungary, most interventions in this sector target production scale-up through incentivising foreign entities' operation in the country.	Relatively low share of firm-specific interventions targeting mainly foreign companies, with domestic companies having a marginal role. The majority of the beneficiaries of firm-specific interventions are headquartered in Asia. Although general interventions dominate the non-firm-specific interventions, sector- (mainly medical) and size-specific interventions are also present here, with the latter representing the largest share in Hungary across the four countries.	Unlike in other V4 countries, the majority of interventions implemented in Hungary were financed through state resources. Reliance on state resources is prominent in the production scale-up interventions category, within which investment incentives provided to Asian companies operating in the battery value chain account for the majority of the interventions. In contrast, Hungary is more dependent on external resources when it comes to infrastructure investments, compared to the Czech Republic and Slovakia.
Poland	Infrastructure investments have the largest share in Poland among the V4 countries. This encompasses, besides interventions targeted at improving energy efficiency present in all countries, a relatively large share of renewable energy projects. Production scale-up interventions target a wide range of sectors here, while medical RDI has a prominent role.	The highest share of firm-specific interventions across V4 countries, with the domestic private sector playing an important role, and a diverse sectoral representation. As regards policy-level interventions, general interventions have a limited role in Poland, while sector-specific interventions target mostly the energy and medical sectors.	In Poland, overall reliance on external resources is comparable to that observed in the Czech Republic and Slovakia. Domestic resources, like in Hungary, have an important role in production scale-up interventions. However, in contrast to the Hungarian case, these interventions target primarily domestic firms, with only 20% of the interventions targeting foreign entities.

Table 2 continued

Slovakia	The share of interventions is relatively balanced across infrastructure investments, production scale-up investments, and RDI investments. International investments in the automobile industry dominate RDI investments.	Almost an equal share between firm-specific and policy-level interventions. The share of domestic companies is relatively high, while foreign beneficiaries are all headquartered in Europe. Meanwhile, policy-level interventions are mostly sector-specific (energy, transport, medical), with general interventions accounting for a comparable share.	Reliance on external resources is strongest in Slovakia, with 64% of the interventions funded through EU funds or the EIB. However, the domestic pillar of infrastructure investments is strongest in Slovakia, while in the production scale-up category, the three sources of finance represent equal shares. Importantly, all RDI interventions are international EIB projects, which speaks of a lack of domestic initiative on this front.

Source: Authors' own elaboration

Hungary has a state-driven, Asian FDI-focused industrial policy. The reliance on state resources is highest in Hungary. At the same time, Hungary's industrial policy strongly supports foreign companies, especially those from Asia, with investments in the automotive and battery manufacturing sectors playing a key role. This aligns with other research indicating Hungary's recent openness to the Asian (South Korean, Chinese) automotive and battery sectors, which has resulted in social and environmental challenges (see Ricz & Éltető, 2025). Furthermore, a substantial portion of Hungarian industrial policy interventions were crisis response measures during the COVID-19 pandemic, reflecting a more vigorous response compared to other nations. The proportion of infrastructure and RDI investments is slightly lower, raising concerns about dependency issues.

Although this case seems to be the most difficult to characterise, the data suggest that the Czech Republic employs an EU-embedded, diverse, FDI-oriented industrial policy. Similar to Slovakia, external sources (EU, EIB) play a vital role in Czech industrial policy in terms of resources. Like Hungary, there is notable support for foreign companies, including investments from Asia. However, Czech industrial policy is more diversified than Hungary's and places greater emphasis on RDI, which can aid upgrading within value chains. Beyond the automotive industry, the industrial policy also fosters the electronics and semiconductor sectors, with the latter aligning with Hruby's (2024) results. Importantly, no interventions targeting domestic private companies were found in the NIPO database. We interpret this as evidence of the database's limitations rather than a lack of a domestic pillar of industrial policy in the Czech Republic.

While data from the NIPO database do add significantly to our understanding of the industrial policy in the V4 countries, we argue that there is still a limit to what can be revealed by a quantitative analysis alone. Our examination of the V4 countries' industrial policy confirms the arguments of Rodrik (2008) and Lane (2024) mentioned earlier, who stress that industrial policy is a complex process

which cannot be divorced from its political context: while the data reveal a general direction in which a country's industrial policy strategy develops, a mere descriptive analysis is unable to cast light on other aspects of the process, such as the main drivers behind a particular strategy. In the case of the V4's industrial policy, our analysis reveals a number of key differences between the countries, such as the stronger domestic focus of the Polish industrial policy, the pivot to Asian investors in Hungary, or the mixed and relatively unclear industrial policy of the Czech Republic. While a careful study of the literature could reveal underlying causes of these findings for each country (e.g. Naczyk 2022, Éltető 2024), a mere quantitative analysis can only present a part of the picture.

Another limitation to our research stemmed from a relatively low amount of data on V4 countries' industrial policy offered by the NIPO database, as well as by the tendency to rely on a limited number of sources often published by the EU institutions (e.g. European Commission, European Investment Bank). The former complication is arguably more pressing in the case of smaller countries, as the amount of data entries varied greatly between Poland, as the most represented (169) and Slovakia, as the least represented (39), with the Czech Republic (56) and Hungary (65) taking a middle position. A small sample or a comparison of unequal samples can distort our understanding of the general picture, especially in the case of cross-country comparisons (such as Figures 4 and 5). Additionally, the fact that a significant portion of the data is based on a limited amount of mainly EU-related sources can further distort the conclusions by, e.g. overemphasising the relevance of the EU in the V4 countries' industrial policies and downplaying the role of domestic initiatives. For example, a recent study (Medve-Bálint & Éltető, 2024) relied on domestic databases of regional state aid granted across the V4 countries. These databases include interventions that are not registered in the EU State Aid Register or the NIPO database. This could be for two reasons: 1) the NIPO is restricted to monitoring a few sources of information, including the State Aid register, or 2) some interventions are considered irrelevant to the 'new industrial policy framework', as defined by the database's developers (Evenett et al., 2024). Just as in the case of simplifications resulting from the omission of political context, the size and source of the data sample can influence the qualitative analysis of a country's industrial policy. While we argue that presenting such a study is a useful contribution despite these complications, we also stress that a purely quantitative analysis of industrial policy has its unavoidable limitations.

Finally, we want to dedicate a few words to further research possibilities opened by the article. We identify three directions in which a study of the V4 countries' industrial policy might continue. First, we see an opportunity for continuation of the quantitative research by expanding on the existing data set in the NIPO database and creating a new database focusing solely on the V4 countries. This would allow us to at least partially counterweight the criticisms mentioned above by collecting a larger data sample (especially for the less represented countries such as Slovakia) and including a higher number of domestic sources. Second, we propose to expand the existing quantitative study by placing the data in a dialogue with the

broader political context of the V4 countries' industrial policy strategies. Doing so would allow us to present a more complex, coherent picture of industrial policy in the region, and especially elaborate on the country strategies we presented above. Finally, we propose that more attention should be paid to the interplay between the EU- and national-level industrial policy, as this is a crucial framework for the development of the V4's industrial policy, yet it is also full of paradoxes (e.g. the pull tendencies of the EU in areas such as RDI investment and the green transition versus a limiting effect in terms of EU rules on state aid).

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Appendix

Table A: Type of policy instruments

Categories	Definition
Export Policy	Such entries cover export bans, export licensing requirements, export quotas, export tariff quotas, export taxes, local supply requirements for exports, and export-related non-tariff measures.
Import Policy	Such entries cover import bans, import monitoring, import licensing requirements, import quota, import tariff, import tariff quota, internal taxation of imports, and import-related non-tariff measures.
Trade Defence	Such entries cover anti-dumping, anti-subsidy and safeguards.
Subsidy	Such entries cover capital injections and equity stakes, financial grants, import incentives, in-kind grants, interest payment subsidies, price stabilisation, production subsidies, state aid, state loans, state aid unspecified, and tax or social insurance relief.
Export Incentive	Such entries cover export subsidies, financial assistance in foreign markets, other export incentives, tax-based export incentives, and trade finance.
FDI Policy	Such entries cover FDI: entry and ownership rules, FDI: financial incentives, and FDI: treatment and operations.
Procurement Policy	Such entries cover changes to public procurement law or practice.
Localisation Policy	Such entries include localisation incentives or requirements.
Other Policy	Such entries include measures which were not classified under one of the previous categories.

Source: Global Trade Alert (2024, p. 5)

Table B: Pre-defined sectors and technologies part of NIPO 2.0

B1: Sectors

Sectors	Description
Low-Carbon Technology	The entry affects one or more tariff lines from the low-carbon technology list from the IMF Climate Change Indicators Dashboard.
Dual-Use Products	The entry affects one or more tariff lines from the dual-use items list from the EU covering the main 4 multilateral export control regimes (Wassenaar Arrangement, Nuclear Suppliers Group, Australia Group, Missile Technology Control Regime).
Critical Minerals	The entry affects one or more tariff lines from the list of critical raw minerals of the 31st Global Trade Alert Report: "The Scramble for Critical Raw Materials: Time to Take Stock?"
Advanced Technology Products	The entry affects one or more tariff lines from the Advanced Technology Products list assembled by the US Census Bureau.

Medical Products	The entry covers tariff lines related to medical consumables, medical equipment, medicines and drugs, and vaccines from the GTA "Essential Goods Initiative" as well as organic and inorganic chemicals related to the production of medicines and active pharmaceutical ingredients from the OECD report titled "Shortages of medicines in OECD countries" (by Chapman, Dedet, and Lopert, 2022).
Chemicals	The entry affects tariff lines from the HS chapters 28 (inorganic chemicals) and 29 (organic chemicals, except those included in the previous category of medical products related to the production of medicines), 32 (tanning or dyeing extracts), 38 (chemical products n.e.c), and individual chemicals or groups of chemicals from the Rotterdam and Stockholm Convention.
IT or Digital Services	The entry affects one or more technological, digital or IT service sectors (CPC codes: 623, 831, 834, 839, 841, 842, 843).

B2: Technologies

Categories	Technologies
Advanced IT Products	Semiconductors; ICT; Smartphones
Green Goods	Electric Vehicles; PV Cells; Wind Turbines; Hydrogen; Air Pollution Control Equipment; Solid Waste Management; Wastewater Management Equipment
Power and Batteries	Power Generation Equipment; Lithium-ion Battery; Fuel-cell Battery; Other Battery
Machinery	Industrial Robots; 3D Printing; Industrial Machines
Defence	Drones: Common High Priority Items List by the Bureau of Industry and Security of the US Department of Commerce
Inputs	Plastics; Glass; Aluminium; Iron & Steel; Cement; Fertiliser
Cars	Cars

Source: Global Trade Alert (2024, p. 4)

Table C: Stated motives

Motives	Definition
National security	The stated motivation refers to the current or future military security of the implementing country, or specifically quotes "national security"
Resilience/security of supply (non-food)	The stated motivation refers to raising the stability or security of local supplies now or in the future.
Strategic competitiveness	The stated motivation is to promote domestic competitiveness or innovation in a particular product or sector.
Geopolitical concern	This value is used if an intervention's stated motivation is to counter the risk from a country or a class of countries. Classes can be defined by political system (e.g. autocracies), alliance (eg NATO, "axis of evil"), ideology (e.g. liberal) or geography (e.g. Middle East).
Climate change mitigation	The government stated motive of the action taken refers to climate change mitigation, countering global warming, or the transition to a low-carbon economy.

Source: Global Trade Alert (2024, p. 6)

Table D: Special classification categories

Category	Description
Horizontal	The NIPO 2.0 identifies industrial policies applying broadly across all sectors in a country.
R&D related	The NIPO 2.0 captures industrial policies covering research, innovation or R&D activities.
Infrastructure, transport, cargo and logistics	The NIPO 2.0 identifies industrial measures referring to industrial and transport infrastructure, cargo handling and logistics.
Support electrical energy	The NIPO 2.0 captures industrial policies related to electrical energy and electricity generation.
Recycling service	The NIPO 2.0 identifies industrial measures based on recycling services.
Screening mechanisms	The NIPO 2.0 captures the screening of outward and inward FDI by domestic firms.
Sanctions	The NIPO 2.0 identifies industrial measures referring to trade-related sanctions imposed on national security or other foreign policy grounds.

Source: Global Trade Alert (2024, p. 8)