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Reinforcing each other: How the combination of European and domestic reforms increased competition in liberalized industries☆

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ABSTRACT

There is a consensus over Europe's transformation into a highly competitive economy through a series of ambitious pro-competition reforms. However, both the European Commission and national actors have legislative authority over competition policies. Thus, who are the critical actors behind this legislative and economic transformation in this multi-level system? Focusing on the liberalization of state-owned industries and using a staggered difference-in-differences approach, the paper shows that the effectiveness of European directives in decreasing firm-level market power increased with the extent of preceding domestic pro-competition reforms. For every unit increase of the early domestic reform index, EU directives decrease market power in liberalized industries by an additional 7.8%. However, this effect is not significant in countries that did not reform their industries ex-ante. This finding contradicts the established view in the literature identifying the Commission as the dominant force driving this transformation, which implemented ambitious reforms by often overcoming the resistance of reluctant national governments. Instead, it is shown that the effectiveness of the Commission's reforms depends on the support of domestic actors and compatible national institutions.

1. Introduction

Numerous scholars argue that a revolution has occurred in European competition policy (McGowan and Wilks, 1996; Wilks, 2005 Wilks, 2007). Formerly dominated by oligopolies and entry barriers, Europe has now adopted a stringent competition regime that is widely regarded as the most pro-competition system globally (Hylton and Deng, 2007; Alemani et al., 2013). These institutional changes have been accompanied by a notable increase in competition. European economies, previously characterized by low levels of competition (Alesina and Giavazzi, 2008), have undergone a significant transformation. Industries have witnessed a decrease in concentration (Kalemli-Ozcan et al., 2015; Gutierrez and Philippon, 2023; Philippon, 2019), and powerful incumbents have experienced a decline in their market power (Badinger, 2007; Holland, 2009; Weyerstrass and Jaenicke, 2011). Philippon (2019) argues that the magnitude of the increase in competition has been so significant that he refers to it as a "Great Reversal".

Gutierrez and Philippon (2023) and Philippon (2019) have made significant contributions to our understanding of the profound changes in European competition. According to these authors, the bargain among countries in a free trade area leads to the formation of a supranational competition regulator with greater toughness and independence than national authorities. By agreeing to a high

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degree of independence, governments aim to minimize the risk of regulatory capture by another nation. This fully independent regulator enforces competition policy strictly, leading to the establishment of highly competitive markets. Gutierrez and Philippon (2023) apply their theoretical framework specifically to the European context, demonstrating how European Member States (MSs) willingly transferred substantial powers to the European Commission regarding competition policy. These powers have been utilized to enforce strict competition regulations, often opposing the interests of both MSs and businesses. As a result, European markets have become more competitive.

Although the significance of the Commission in promoting competition cannot be denied, Gutierrez and Philippon's (2023) limited role attributed to domestic actors appears to be overly minimalistic, failing to capture the historical institutional variability that has long characterized European domestic competition regimes (Doern and Wilks, 1996; Waarden and Drahos, 2002; Baldi, 2006; Guidi, 2014; Warlouzet, 2016; Ergen and Kohl, 2019). This institutional variability frequently manifested in divergent reform trajectories and varying economic outcomes, with certain countries displaying greater willingness to liberalize their economies compared to others (Héritier, 1997; Humphreys and Padgett, 2006; Schuster et al. (2013), and competition statistics evolving unevenly across different economies (Christopoulou and Vermeulen, 2012; Cook, 2011; De Loecker and Eeckhout, 2018).

This paper builds upon Gutierrez and Philippon's (2023) explanation by emphasizing the significance of domestic factors in explaining the effectiveness of pro-competition reforms in Europe. While acknowledging the importance of the Commission's pro-competition agenda, I argue that domestic actors play a crucial role through ancillary domestic reforms that lay the groundwork for EU policies. Early reforms are critical as they evidence two key mechanisms that amplify the effectiveness of European directives: the alignment of interests between European and domestic actors and complementarities between the Commission's goal and domestic institutions.

On the one hand, the alignment of interests between the Commission and domestic actors is essential in the EU institutional context, where national governments are responsible for transposing reforms and adapting them to the domestic legislative framework. Thus, the willingness of national actors becomes crucial for the effectiveness of European directives. On the other hand, the institutional complementarities consist of strong domestic competition institutions, exemplified by independent competition authorities and sector regulators. These institutions align with the Commission's pro-competition agenda by safeguarding European directives against distortion from vested interests during their transposition. Moreover, they serve as a deterrent against prospective attempts by businesses to manipulate competition policies ex-post. Consequently, institutional complementarities can amplify the pro-competition effect of supranational legislation. This mechanism contrasts with the findings of Gutierrez and Philippon (2023: 267), who contend that countries with weaker ex-ante competition institutions benefit the most from the Commission's interventions.

The mechanisms above are tested by focusing on the impact of liberalization reforms on formerly state-owned regulated monopolies, such as telecommunications, electricity, postal services, and railways. Among the various competition policies, liberalization reforms are particularly suitable for the analysis due to their multi-level nature. On the one hand, Article 86 of the Rome Treaty empowers the Commission to liberalize state-owned industries through directives. On the other hand, the implementation of the liberalization goals outlined in the Lisbon Strategy lies within the jurisdiction of Member States, resulting in variations across countries (Humphreys and Padgett, 2006). Therefore, examining liberalization policies can provide insights into the interplay between European and domestic authorities and its impact on competition.

The paper utilizes a staggered difference-in-differences methodology to examine the significance of domestic reforms in enhancing the effectiveness of EU directives. Drawing on recent contributions in industrial organization (Tortarolo and Zarate, 2018; Morlacco, 2019; Yeh et al., 2022), the primary dependent variable operationalizes competition at the firm level using a market power indicator. This comprehensive measure incorporates both product and labor market power, acknowledging the importance of considering both dimensions of competition. In this respect, Crescioli and Martelli (2023) demonstrate that overall market power can rise despite increased product market competition. Thus, the paper extends the analysis of Gutierrez and Philippon (2023), who primarily focus on product market competition. The critical treatment variable is a dummy that takes the value of 1 in the year of the deadline of a European liberalization directive. This variable captures the impact of European reforms on competition. The treatment variable is interacted with an OECD index that measures the intensity of early domestic pro-competition reforms implemented before the EU directives to capture the combined effect of European and national dimensions. This domestic index, computed before the transposition deadline of European directives, serves as a proxy for autonomous national legislative efforts.

The empirical analysis reveals that the intensity of preceding national reforms strengthens the pro-competition effects of European liberalization policies. For every unit increase of the domestic reform indicator, EU directives decrease market power in liberalized industries by 7.8% in the baseline specification. This finding suggests that the common European framework can engender divergent dynamics and underscores the significance of early reforms. Subsequently, the analysis delves into the significance of two key mechanisms contributing to effective reforms: aligned interests and institutional complementarities. The baseline results show that European directives decreased market power by 51% more in industries where domestic actors were more willing to embrace liberalization. Additionally, the study shows that a 0.1 increase in the strength of domestic competition institutions augments by 2.8% the pro-competition effect of EU directives. These findings suggest that EU directives were most successful in industries where domestic actors were more cooperative and in countries with stronger competition institutions.

The paper contributes to the literature highlighting the importance of domestic institutions in explaining the varying implementation and effectiveness of macroeconomic policies. In this regard, Mukand and Rodrik (2005) raise questions regarding the efficacy and convergence effects of one-size-fits-all policies in economies characterized by significant institutional heterogeneity. Acemoglu

et al. (2008) show the limited effectiveness of central bank independence in controlling inflation when domestic institutions, such as constraints on the executives, are not strong enough. Baccini et al. (2022) highlight the importance of labor-market institutions for determining the winners and losers of trade liberalization.

The importance of aligned interests adds to existing research emphasizing the importance of preferences and ideological alignment in federal systems. Scholars such as Berry and Berry (2007), Volden et al. (2008), Wang and Yang (2021), and DellaVigna and Kim (2022) have underscored the role of these factors in the diffusion and effectiveness of policies within such systems.

This paper also speaks to the political economy literature on competition policy in the EU by highlighting the significance of aligned interests for reforms (Héritier, 1997; Levi-Faur, 1999; Bartle, 2002; Eising, 2002; Humphreys and Padgett, 2006; Pollak and Slominski, 2011). In this aspect, the paper diverges from the perspective of Gutierrez and Philippon (2023) by illustrating the Commission's more limited capacity to achieve its objectives in the presence of reluctant MSs.

Finally, this paper also contributes to the literature examining the effects of liberalization policies on competition (Levinsohn, 1993; Blanchard and Giavazzi, 2003; Tybout, 2003; Griffith et al., 2010; Lu and Yu, 2015; Gutierrez and Philippon, 2023; Besley et al., 2021). Furthermore, several papers show that liberalization can generate other desirable economic effects in addition to the promotion of competition on productivity (Arnold et al., 2016), innovation (Impullitti and Licandro, 2018), investments (Alesina et al., 2005), and growth (Chen and Funke, 2008 and Barone and Cingano, 2011). However, in line with Amoroso and Martino (2020), the present analysis cautions against treating liberalization as a one-size-fits-all policy and reveals the importance of national regulatory structures.

The remaining sections of the paper are organized as follows. Section 2 explains the data and variables used in the analysis. The empirical strategy and the results are discussed in Section 2. Finally, Section 4 presents the study's conclusions. A separate appendix is available that includes further information on the data and variables, as well as further robustness checks.

2. Data & variables

The dataset used in the empirical analysis contains nearly 1.8 million firm-year observations for ten European countries between 1995 and 2018.[1] Since most liberalization reforms happened in the nineties and early 2000s, I exclude Eastern European countries because they were not EU members at the time.[2] These data have an inherently multi-level nature. At the top, there are European directives affecting all countries in the same year. The second level of aggregation is countries within which we have industries. Finally, firms operating in each sector are the ultimate unit of analysis.

Market Power. The primary dependent variable used is a firm-level index of market power *mp*. Following recent contributions in industrial organization (Tortarolo and Zarate, 2018; Morlacco, 2019; Yeh et al., 2022), this index takes into account both dimensions of market power: product market power and monopsony power. Market power has been estimated using firm-level data from Orbis historical archives. The Orbis dataset is provided by Bureau van Dijk and contains balance sheet information for European firms. These data have been used to implement an estimation technique based on the control function approach (Olley and Pakes, 1996; Levinsohn and Petrin, 2003; De Loecker and Warzynski, 2012; De Loecker et al., 2016, De Loecker et al., 2020). This technique requires estimating a 2-digit industry production function and modeling the evolution of unobserved firms' productivity.[3] As in De Loecker and Warzynski (2012) and De Loecker et al. (2016), the control function is defined on material costs.

This market power indicator can have limitations. For instance, unobserved firms' prices can cause an omitted variable bias. Fortunately, this bias neither affects the evolution of market power over time nor the correlation between this variable and firm-level characteristics (De Loecker and Warzynski, 2012). In the appendix, I also re-estimate production functions using industry-specific deflators since using sectoral deflators can mitigate the problem due to unobservable prices. However, the use of industry-specific deflators reduces the sample substantially since these are available only for a limited set of industries over time. Yet, despite the significantly more limited number of observations, the thrust of the main results is unchanged. Another concern is due to the use of gross-output production functions. As noted by Ackerberg et al. (2015), the estimation of production functions might be biased under scalar unobservable assumptions. Hence, I re-estimate market power in the appendix using value-added production functions. Again, the main results remain unchanged. Finally, the top and bottom 5% of the markup distribution have been trimmed to avoid outliers that could bias the empirical analysis. However, the appendix shows that the main results are robust to different levels of trimming.

European Directives. The process of liberalizing regulated industries started during the late 1980s. These sectors, characterized by the need for fixed infrastructure, presented significant barriers to entry and competition. Consequently, governments historically addressed this market failure through public management. However, technological advancements and the imperative to enhance the competitiveness of European firms vis-à-vis global rivals necessitated a radical transformation of these industries (Nicolaïdis and Vernon, 1997; Foreman-Peck, 2006).

[1] The countries considered are Belgium, Finland, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, and the UK. This selection depends on the availability of data necessary to estimate production functions.

[2] However, these countries are used in the appendix for a placebo test.

[3] I have estimated five-year country-industry (NACE 2-digit) production functions to obtain elasticities that vary with time. More information about the estimation process and data used are found in the appendix.

Table 1
Directives timeline.

Liberalized industry	Directive	Year	Transposition/Effectiveness	NACE code
Telecom	96/19/EC	1996	1998	61
Electricity	96/92/EC	1996	1999	351
Gas	98/30/EC	1998	2000	352
Postal	97/67/EC	1997	1999	53
Railways	2001/12/EC	2001	2003	491

The Commission contributed to this significant restructuring of the European economy through a series of directives. European directives impacted six sectors: aviation, electricity, gas, postal services, railways, and telecom. Aviation, however, is excluded from the analysis since the liberalization of this industry started in 1987, a period where Orbis Historical has insufficient data coverage.

I have used the timing of liberalization directives to code a treatment variable (eu) that varies across liberalized industries. This variable takes the value of 1, the year of the deadline for the transposition of the first liberalization package.[4] Table 1 assigns an industry NACE code to each liberalized industry following the mapping in Gutierrez and Philippon (2023: 26). However, unlike these authors, I adopt a more granular industry definition for electricity, gas, and railways using 3-digit instead of 2-digit codes. This choice allows me to more precisely assign financial information from Orbis to firms in these industries. Indeed, two-digit codes make it impossible to separate electricity and gas, although two different directives liberalized these industries.

Domestic Reforms.

Following the literature, I have defined a variable capturing the intensity of domestic reforms in liberalized industries starting from the OECD Product Market Regulation (PMR) indicator (Alesina et al., 2005; Belloc et al., 2014; Gutierrez and Philippon, 2023). The OECD provides this indicator for several network industries and professional services at the country level (more details in Nicoletti and Scarpetta, 2003 and Alesina et al., 2005). The overall PMR comprises four different sub-indicators measuring entry barriers, public ownership, the market share of dominant players, and vertical integration. These sub-indicators have been firstly computed at the most granular industry definition available. Then, they are aggregated for each network industry using simple or revenue-weighted averages. Finally, the overall PMR score is computed as a simple average between the four components. This indicator ranges from 0 to 6, where higher values denote more restriction to competition.

Instead of using the PMR in levels, I have used its change between the year of a liberalization directive and the first year of availability (ΔPMR).[5] Therefore, if, for instance, a given directive happens in year t, this index reflects the overall change in domestic pro-competition reforms in a specific industry between the first year of availability of PMR (1975 in most cases) and t.

The overall change in PMR is preferred to adopting a specification relying on a time-varying PMR as it allows better separation of European legislation from domestic pro-competition reforms. European directives, in fact, were explicitly tailored to abate national restrictions to competition, making it difficult to separate the domestic from the supranational dimension after the implementation of EU legislation. Using the change in PMR before a Commission's directive takes place, therefore, can help capture the intrinsically national component of pro-competition reforms. As shown in Fig. 1, MSs started reforming their industries before European directives. Furthermore, this figure shows the significant heterogeneity at which the European countries decreased restrictions to competition. In line with Schuster et al. (2013), while there is a general tendency towards lower restrictions, the timing, speed, and intensity at which these reforms take place varies significantly across countries and industries.

Domestic Competition Institutions. To assess the strength of national competition institutions, I employ Bradford and Chilton's (2018) competition law index (CLI). This index measures the de jure stringency of competition law at the country level. One of the advantages of using the CLI is its wide coverage over time, spanning from 1889 to 2010. Unlike many competition statistics that cover only limited periods (e.g., Hylton and Deng, 2007), the CLI provides a long-term perspective, allowing for a more comprehensive analysis of competition law trends. Furthermore, the CLI has a notable advantage in that MSs' competition law scores reflect solely their national law (Bradford and Chilton, 2018). Thus, this variable enables capturing inherently national features of domestic competition law regimes that are distinct from EU legislation.

Controls. To identify the causal effect of policy and institutional variables, I have included a series of covariates that can control for alternative economic mechanisms affecting market power. Larger and more productive firms tend to have more market power (Autor et al., 2020; De Loecker et al., 2020). Therefore, I include revenues (as a proxy size) and productivity to control for these potential confounding factors.[6] I also control for firms' capital intensity since firms with lower labor shares tend to have more market power (Autor et al., 2020).[7]

In addition to firm-level controls, the analysis will use for robustness a series of macroeconomic and institutional factors that can influence the adoption of structural reforms (Duval et al., 2021; Bonfiglioli et al., 2022). These variables include the GDP growth rate (OECD), a dummy for financial crises (Jordà et al., 2017), stock price volatility (World Bank), and an index of employment protection legislation (EPL, OECD).

[4] In the case of telecom, I have considered the "full liberalization directive", which sets the deadline for full liberalization on the 1st of January 1998.

[5] Here, I consider the year of the Commission's directive, not the transposition year. Moreover, ΔPMR has been multiplied by −1, so larger values denote more pro-competition reforms.

[6] Firm-level productivity has been estimated using the same methodology adopted for market power. More details are found in the appendix.

[7] Capital intensity is computed as the ratio between total fixed assets and number of employees.

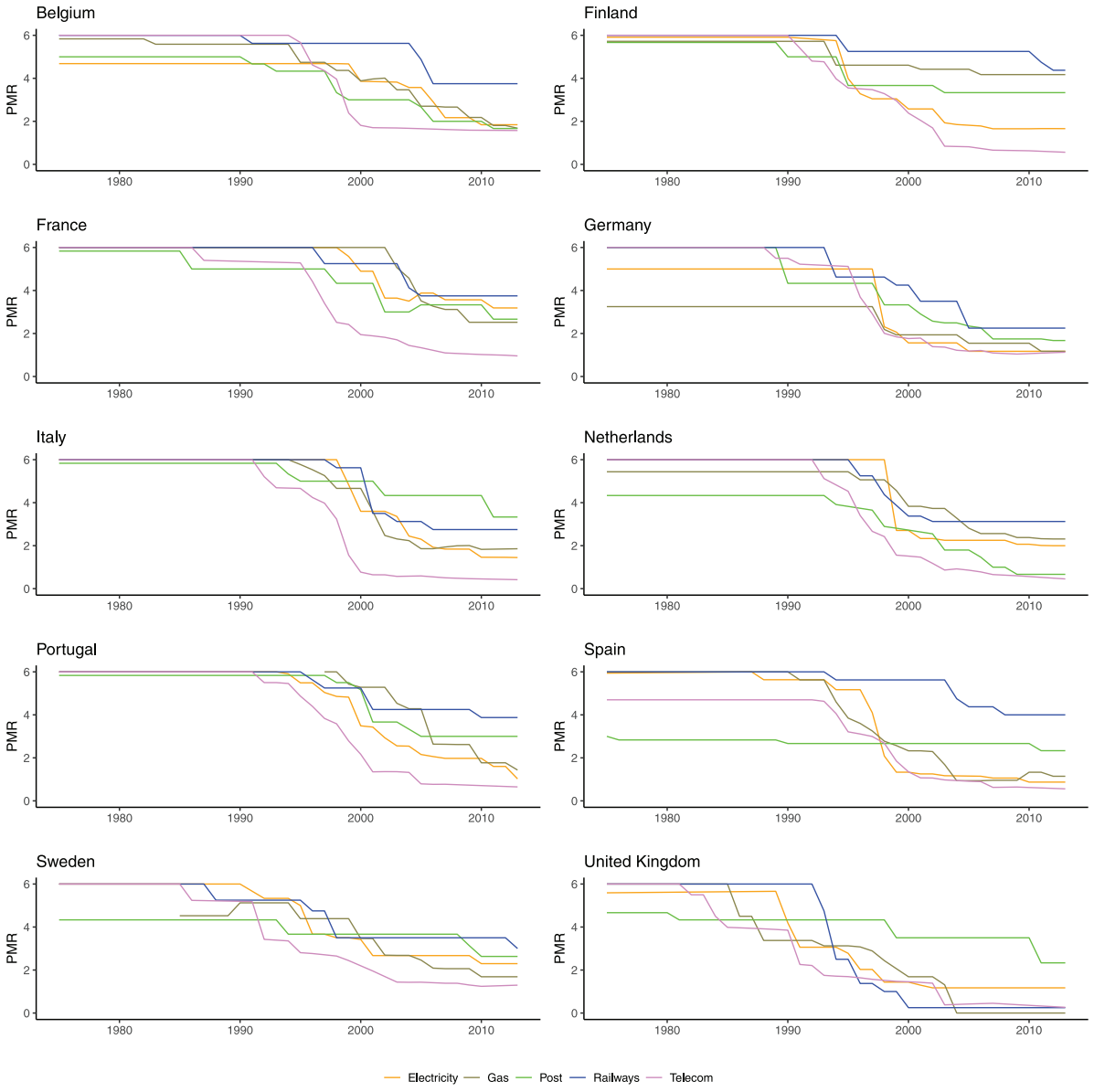

Fig. 1. Evolution of PMR index across countries and liberalized industries.

3. Empirical strategy & results

In this study, I employ a staggered differences-in-differences (DID) methodology to assess the impact of domestic and European reforms. This approach allows for a comparison between treatment and control units before and after the intervention, enabling the identification of divergent outcomes attributable to the policy. The treatment group consists of firms operating in industries liberalized through European directives, while the control group encompasses firms in sectors that have not undergone such liberalization. The treatment is "staggered" due to the varying timelines of liberalization directives, with different industries experiencing liberalization at different periods.

The dataset is an unbalanced panel due to the entry and exit of firms over time. To address this issue, the treatment group includes only firms with observations at least one year before and after the treatment. However, identifying a pre and post-treatment period

Table 2
Summary statistics.

	Control Group						Treatment Group					
	N	Mean	SD	Min	Median	Max	N	Mean	SD	Min	Median	Max
Market Power	1 798 194	2.19	1.37	0.48	1.81	8.83	19 934	2.52	1.71	0.48	2.01	8.82
Change in PMR	1 798 194	NA	NA	NA	NA	NA	19 934	1.56	1.22	0.00	1.38	5.75
CLI (1980)	1 798 194	0.34	0.27	0.00	0.39	0.83	19 934	0.35	0.25	0.00	0.39	0.83
Productivity	1 798 194	7.25	1.56	0.06	7.02	23.06	19 934	8.63	1.78	1.10	8.64	16.51
Revenues	1 798 194	21 318 520.75	199 743 154.67	1.00	4 261 000.00	58 034 486 974.00	19 934	83 145 781.34	729 089 475.39	361.00	3 266 878.00	23 591 443 000.00
CLR	1 798 194	10.06	1.44	−4.34	10.08	21.90	19 934	11.15	2.24	−0.17	11.14	18.45
EBITDA/Revenues	1 784 776	−0.10	122.94	−153 000.00	0.06	3783.53	19 530	0.02	6.67	−706.59	0.10	19.00
UVC	1 798 194	0.88	127.98	0.00	0.73	150 918.20	19 934	0.73	9.05	0.00	0.68	1048.60
Value Added p.w.	1 679 068	57 209.73	449 736.52	−51 439 926.00	45 588.24	483 318 416.00	18 393	114 692.13	610 104.22	−24 885 161.80	58 285.71	64 494 503.50
Growth Rate	1 798 194	1.77	1.88	−8.07	1.83	6.33	19 934	2.08	2.18	−8.07	2.45	6.33
Crisis Dummy	1 798 194	0.04	0.19	0.00	0.00	1.00	19 934	0.03	0.18	0.00	0.00	1.00
Volatility	1 715 116	22.25	7.33	8.17	22.20	54.62	19 232	22.10	7.78	8.33	22.12	54.62
EPL	1 798 194	2.51	0.46	1.35	2.52	4.58	19 934	2.34	0.46	1.35	2.36	3.02

for the control group becomes challenging due to the staggered nature of the treatment. Consequently, I include only those firms that are continuously observed each year from 1997 (the year before the first liberalization transposition deadline) to 2003 (the year by which the last liberalization directive had to be transposed). By doing so, I can create a stable and comparable control group, enabling a more reliable evaluation of the treatment effect.

Table 2 reports the summary statistics of covariates in the treatment and control groups. At first glance, certain variables, such as revenues, may seem to present imbalances. However, in the rest of the paper, I use techniques to remediate potential issues concerning treatment and control group imbalances.

3.1. Early domestic reform and european directives

To gauge the effect of European and domestic reforms on market power, I run the following DID model[8]:

$$\log mp_{jict} = \gamma eu_{it} + \beta eu_{it} \times \Delta PMR_{ic} + \phi X_{jict} + \alpha_j + \tau_t + \epsilon_{it}, \tag{1}$$

where in addition to controls, I also use firm fixed-effects (α_j) to account for time-invariant firm-level characteristics (e.g., location) and year effects (τ_t) to control for time-varying factors that are common across firms (e.g., economic shocks).[9]

Recent advancements in the DID literature (de Chaisemartin and D'haultfœuille, 2022, for a review) show that two-way fixed effect (TWFE) estimation can be biased in staggered design when treatment effects are heterogeneous. In particular, De Chaisemartin and d'Haultfoeuille (2020) demonstrate that the treatment coefficient obtained via a TWFE regression is the weighted average of the average treatment effect in each treatment cohort (i.e., liberalized industries in this case). The authors show that heterogeneous treatment effects among different cohorts pose a problem, as they may result in negative weights. Negative weights are a concern because they allow for the possibility of estimating an overall negative effect despite each cohort-specific effect being positive.

Given the issues associated with the canonical TWFE estimation, the empirical specifications follow Gardner's (2022) two-stage DID methodology. Gardner's (2022) approach accounts for heterogeneous treatment effects and involves two main steps. Firstly, the outcome variable is regressed on group and time-fixed effects to obtain the adjusted outcome. This regression is performed on a subsample that considers only untreated and yet-to-be-treated observations. Secondly, the treatment effect is estimated by regressing the adjusted outcome on the treatment indicator in the full sample. One key advantage of Gardner's (2022) methodology over other alternative techniques in the field, such as Callaway and Sant'Anna (2021), is that it is more flexible concerning interactions between the treatment and other relevant variables, especially for continuous variables.[10]

The key coefficients of interest are γ and β. The first one captures the effect of European directives in state-owned industries where national governments did not implement reforms before these directives (i.e., when $\Delta PMR = 0$). Domestic industries for which $\Delta PMR = 0$ are a non-negligible amount, representing 16% of the sample. β, instead, shows the combined impact of European legislation and domestic reforms preceding the directives. Therefore, the overall (marginal) effect of European directives on firm-level market power is $\gamma + \beta \Delta PMR$.

Table 3 presents the results of running model (1) with different combinations of fixed effects. The first column displays the model without any controls, while the second column represents the baseline specification, which includes relevant covariates. The third column considers a pre-European Debt Crisis sample (i.e., before 2010) to address the potential impact of the European Debt

[8] Standard errors are clustered at the EU-wide sector level (NACE 1-digit industry) given the nature of the treatment (i.e., EU liberalization directives). Industry clustering is also in line with previous studies (e.g., De Loecker et al., 2016). Clustering standard errors is also useful as it avoids autocorrelation issues affecting DID studies with several periods (Bertrand et al., 2004). Moreover, I use the log of economic variables to linearize possible non-linear relationships between the dependent and the independent variables.

[9] Baseline controls are the log of revenues, productivity, and capital intensity, and subscripts have the following meaning: j denotes firm, i NACE 3-digit industry, c the country, and t the year.

[10] In Section 3.4 I will adapt the main specification to apply Callaway and Sant'Anna (2021). Moreover, in the appendix, I follow Prager and Schmitt (2021) and implement a robustness check in the spirit of Callaway and Sant'Anna (2021) which takes into account the fact that the treatment is interacted.

Table 3
Effect of European and domestic reforms on (log) market power.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
eu	−0.020	−0.045	−0.075	−0.023	−0.006	−0.077	
	(0.054)	(0.040)	(0.051)	(0.058)	(0.011)	(0.048)	
$eu \times \Delta PMR$	−0.066***	−0.077***	−0.064***	−0.042***	−0.072***	−0.046***	−0.074***
	(0.015)	(0.008)	(0.011)	(0.016)	(0.008)	(0.017)	(0.027)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	No	Yes	Yes	No
Before crisis	No	No	Yes	No	No	No	No
Country-Industry-Year Effects	No	No	No	Yes	No	No	No
Industry time trends	No	No	No	No	Yes	No	No
Country time trends	No	No	No	No	No	Yes	No
Industry (3-digit)-Year Effects	No	No	No	Yes	No	No	Yes
Country-Year Effects	No	No	No	Yes	No	No	Yes
Observations	1 818 093	1 818 093	1 351 042	1 818 093	1 818 093	1 818 093	1 818 093

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (1) using a two-stage DID (Gardner 2022). The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

Crisis on market power. In the fourth column, I include country-sector-year effects to account for different country-industry-specific macroeconomic dynamics (e.g., technological advancement and shocks) that can impact the adoption of domestic reforms. Following Besley and Burgess (2004), the fifth column introduces industry-time trends to account for the pre-existing decreasing trend in market power across sectors. In the same spirit, the sixth column uses country-time trends to control for ex-ante trends that vary across countries.

It is important to specify that in all columns but the last the term "industry" refers to NACE 1-digit industry (i.e., the same level used for clustering standard errors). By contrast, the *eu* and ΔPMR variables are defined at NACE 2-digit and NACE 3-digit industry level following the mapping provided in Table 1. Therefore, the highest level of industry granularity for these two variables is 3-digit. Using the same 3-digit industry granularity to define fixed effects such as the country-industry-year one would be impossible as they will entirely absorb both *eu* and $eu \times \Delta PMR$. Nonetheless, there could still be important dynamics that impact industries at a more granular level. For this reason, in the last column, I run a specification with firm, country-year, and three-digit industry-year fixed effects. While this specification allows estimating $eu \times \Delta PMR$, the coefficient of *eu* is absorbed by the fixed effects combination. However, this should not be of much concern because as I will discuss in the next paragraph, the *eu* variable is never statistically significant in all the other specifications. Overall, the specification of the last column should be interpreted as an additional robustness check to control for more granular industry-specific dynamics that can impact the combined effect of European and domestic reforms on market power.

As observed in columns 1–6, the variable *eu* is not statistically significant. However, the interaction term $eu \times \Delta PMR$ is always negative and strongly significant. In the baseline specification, for every unit increase in ΔPMR, European directives lead to an additional 7.8% reduction in market power. Moreover, the interaction coefficients remain relatively stable across the seven different models, suggesting robustness in the results. The non-significant coefficient of *eu* implies that European directives may not have a particularly strong impact on promoting competition in industries where domestic governments have not implemented significant legislative efforts beforehand. Conversely, the negative and significant coefficient of the interaction term suggests that early domestic reforms amplify the effect of European directives.

The significance of these results is twofold. Firstly, they go against the primacy and centrality of the Commission in Gutierrez and Philippon's (2023) framework. Indeed, such a powerful regulator should have had the capacity to increase competition substantially, even in countries where national executives implemented limited reforms. Secondly, the reinforcing effect of domestic reforms on European directives can be interpreted as evidence of aligned interests and institutional complementarities. Indeed, the decrease of restrictions pre-EU directives can signal the willingness of domestic actors to embrace the Commission's liberalization agenda. At the same time, these early reforms can reveal the existence of a set of pro-competition institutions and laws, such as independent competition authorities and utility regulators, which are compatible with the highly competitive Single Market envisaged by the Commission and thus facilitate the transposition of EU legislation. Furthermore, it is worth emphasizing that the amplifying effect of early domestic reforms on EU directives is not a trivial or obvious result. Indeed, in countries that have already opened their industries, the scope for additional reforms in increasing competition may be more limited than in countries where reforms have not occurred. In other words, EU directives could have instead generated convergence dynamics in countries where governments did little or no reforms.

3.1.1. Parallel trends and selection bias

The correct specification of a DID design requires the treatment and the control group to be on "parallel trends": absent the treatment, outcomes in both groups should change at the same rate. The non-satisfaction of parallel trends results in the conditional independence assumption violation and a biased causal effect. Unfortunately, there is no standard way to check for parallel trends.

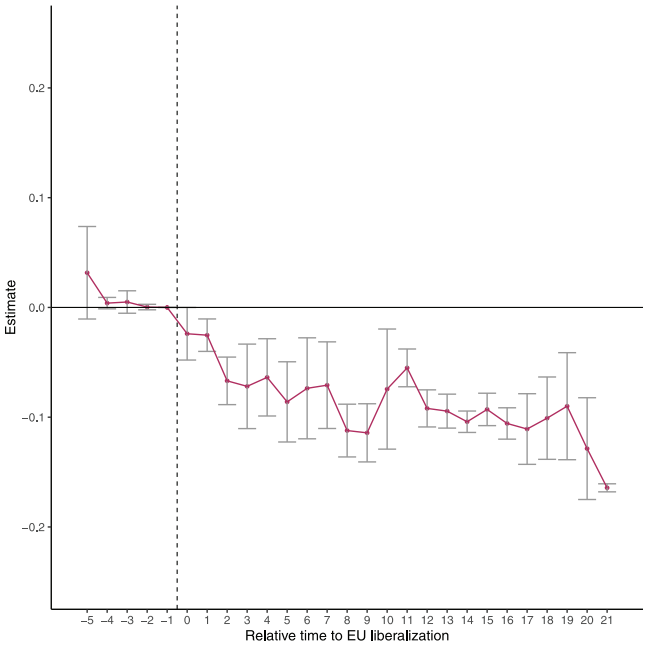

Fig. 2. Leads and lags of $eu \times \Delta PMR$.
Note: The figure reports the results of running model (1) adding leads and lags of $eu \times \Delta PMR$ and using a two-stage DID (Gardner, 2022). 95% confidence intervals are shown.

For this reason, I follow common practice in the literature by plotting leads and lags of the $eu \times \Delta PMR$.[11] Evidence of statistically insignificant pre-treatment coefficients is usually interpreted to support parallel trends.

Fig. 2 brings some evidence in line with the existence of parallel trends since every pre-intervention coefficient is not significant. Besides being a helpful check for parallel trends, lagged coefficients also serve as a "placebo test".[12] The rationale behind placebo tests is to improve the soundness of the research design by checking whether a fictitious treatment affects the outcome. In this specific case, a placebo test using lagged treatment coefficients allows checking for Granger's' (1969) causality by investigating whether "causes happen before consequences" (Angrist and Pischke 2008: 237). This test seems satisfactory since pro-competition policies reduce market power only after their implementation. Finally, Fig. 2 shows that the combined pro-competition effect of domestic and European reforms strengthens over time. This behavior seems plausible since these reforms often radically change the industrial organization of a sector, whereby they need time to manifest their effects entirely.

As previously mentioned, it is impossible to test for parallel trends directly; thus, non-significant pre-treatment coefficients are usually not enough to ensure the soundness of the research design. A concern regarding the present specification is that firms in liberalized industries inherently differ from the rest of the economy. These differences could potentially influence trends in market power between the treatment and control groups, leading to selection bias and biased estimates.

Inverse probability weighting is a technique that can limit selection bias in non-randomized design (Rosenbaum and Rubin, 1983). The first step of this procedure involves estimating the treatment model, where the treatment indicator is regressed on a set of covariates that can influence the treatment assignment. This first regression allows me to estimate the propensity score, representing the probability that units received the treatment. The estimated propensity scores are then used to define regression weights that vary inversely with the treatment probability. In this way, more weight is assigned to untreated (treated) units with a high (low) probability of becoming treated.

As treatment is assigned at the sector level, I estimate the propensity score using a logit model that uses industry-average variables.[13] In addition to the (average) baseline controls, I include the values relative to the entire sample mean of industry productivity, EBITDA/revenue ratios, and unit variable costs. I also consider three lags of the industry market power indicator and year effects. The inclusion of relative values of these variables accounts for potential factors influencing the Commission's decision to liberalize specific industries, as they may correlate with the treatment. These variables are likely to correlate with the treatment

[11] In principle, the number of pre-treatment periods is 8. However, given the timing of liberalization in Table 1 and the fact that the dataset starts in 1995, only very few firms in the railway industry have a pre-treatment period −6, −7, and −8. Thus, these periods are excluded from the analysis. Following common practices, the pre-treatment period −1 is taken as the baseline.

[12] An additional placebo test is conducted in the appendix.

[13] Industry classification is based on NACE 3-digit codes, following the mapping provided in Table 1.

Table 4
Accounting for selection bias and pre-treatment differences.

	IPW	Same NACE 1-Digit control group	Only liberalized industries
eu	−0.041	−0.036	0.263
	(0.033)	(0.044)	(0.190)
$eu \times \Delta PMR$	−0.090***	−0.063***	−0.071**
	(0.004)	(0.012)	(0.029)
Controls	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	1 818 093	124 784	8558

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (1) using a two-stage DID (Gardner 2022). The first column uses inverse probability weighting. In the second column, the control group includes firms in the same NACE 1-digit industry, while in the third, the regression sample includes only liberalized industries. The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

since the leitmotiv of liberalization was to increase the relatively low productivity and profitability of state-owned industries while remedying their cost-inefficiencies (Buch-Hansen and Wigger, 2011). Furthermore, including lags of the market power indicator helps assess whether trends in industry market power influenced the decision to liberalize an industry.

The treatment model is estimated over the period 1995–2003, which corresponds to the time frame in which the liberalization directives were implemented. Once propensity scores have been estimated, these are used to define industry inverse probability weights.[14]

As a second check for sample selection and pre-treatment differences, I have created a new control group with firms belonging to the same NACE 1-digit industry segment of liberalized industries. The reason is that firms within the same NACE 1-digit code are expected to have more comparable characteristics, thereby serving as a better control group for liberalized industries. In a similar vein, as the third and last check, I have run (1) using only firms in industries that eventually will be liberalized.

Table 4 shows the results of this robustness exercise. The interaction of European directives with national reforms is negative and strongly significant in all three specifications. Concerning the IPW model in the first column, it is worth noting that when estimating the treatment model, the lags of market power do not influence the probability of liberalizing an industry.[15] This result can be interpreted as further evidence supporting the parallel trends assumption since the dynamics concerning pre-treatment outcomes seem to not influence the probability of receiving the treatment. Overall, the results mitigate the concern that the paper's main results are biased by sample selection and inherent differences between treatment and control units.

3.2. Aligned interests & cooperation

After having shown the importance of early domestic reforms for European directives, this section tries to bring more evidence on one of the key underlying mechanisms: the alignment of interests between the Commission and domestic actors.

A body of sector-specific studies on liberalization consistently agrees on the greater willingness of domestic actors to liberalize the telecommunication sector compared to the electricity sector. This higher willingness is underpinned by three key factors. Firstly, technological developments in telecommunication technologies made the services of this sector more easily tradable than electricity, resulting in fewer constraints to competition (Levi-Faur, 1999; Bartle, 2002; Humphreys and Padgett, 2006). Secondly, the higher growth rates of the telecom industry made it less susceptible to job losses following liberalization (Levi-Faur, 1999; Pollak and Slominski, 2011). As a result, governments perceived lower political risk in liberalizing the telecom industry. Thirdly, large European businesses recognized significant opportunities in the liberalization of the telecom sector as it allowed them to access services at more affordable rates and facilitated their entry into the market (Sandholtz, 1998; Levi-Faur, 1999).

The alignment of interests between the European Commission, on the one hand, and politicians and firms, on the other, further facilitated the liberalization of the telecom sector. Consequently, I expect that EU directives would have a larger effect on competition in the telecom sector than in the electricity sector. This claim is tested by running the following regression:

$$\log mp_{jict} = \gamma telecom_i \times eu_{it} + \beta electricity_i \times eu_{it} + \phi X_{jict} + \alpha_j + \tau_t + \epsilon_{it}, \tag{2}$$

where I interact the EU liberalization variable with two dummy variables for the telecom and electricity industries, respectively.[16]

Table 5 presents the results of three different specifications. The first column shows the results of running Eq. (2). Columns 2 and 3 report the results of the IPW model and the specification with industry-time trends, respectively. Notably, in each specification,

[14] This procedure produces time-varying industry propensity scores, of which I take the yearly average to have a unique time-invariant indicator for each industry. This time-invariant propensity score has been used to define the industry inverse probability weights. Since the treatment model is estimated at the industry level, all firms in the same industry share the same weight.

[15] The table can be checked in the appendix.

[16] The other liberalized industries are excluded from the regression sample since otherwise, they will be included in the control group.

Table 5
Effect of European directives on (log) market power in the telecommunications and electricity industries.

	Baseline	IPW	Baseline plus industry-time trends
$eu \times telecom$	−0.236***	−0.222***	−0.205***
	(0.028)	(0.030)	(0.013)
$eu \times electricity$	−0.156***	−0.158***	−0.064***
	(0.033)	(0.033)	(0.008)
Controls	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	1 811 868	1 811 868	1 811 868

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (2) using a two-stage DID (Gardner 2022). The first column reports the baseline specification. The second column uses inverse probability weighting, and the third column adds industry-time trends to the baseline. The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

the effect of European directives is significantly larger in the telecom industry than in the electricity industry. These findings can be interpreted as evidence supporting the importance of aligned interests in fostering the effectiveness of European directives. The convergence of interests between the European Commission, politicians, and firms in the telecom sector contributed to a smoother and more successful implementation of pro-competition policies, resulting in a more substantial impact on competition.

3.2.1. Disentangling domestic liberalization & privatization

Until now, I have used the term pro-competition reforms rather than liberalization to refer to national policies. This semantic choice is motivated by the fact that domestic reforms can involve both liberalization and privatization. Indeed, these two terms are often used interchangeably since these policies tend to be highly correlated (Belloc et al., 2014). For this reason, it is necessary to examine the role of privatization as well when investigating liberalization policies.

There is a rich literature on the economic and political determinants of privatization policies, of which Obinger et al. (2016) represents an excellent overview. Among the economic factors, this literature investigates the role of economic growth (Boix, 1997; Bortolotti et al., 2001; Belke et al., 2007; Zohlnhöfer et al., 2008; Schmitt, 2011; Roberts and Saeed, 2012; Schuster et al., 2013), public finances (Brune et al., 2006; Henisz et al., 2005; Bortolotti et al., 2001; Fink, 2011; Schmitt, 2014), unemployment (Belke et al., 2007), and inflation (Meseguer, 2004; Roberts and Saeed, 2012). The political determinants explored include the role of parties (Schmidt, 2000; Biais and Perotti, 2002; Megginson et al., 2004), interest groups (Obinger and Schmitt, 2011; Bortolotti and Pinotti, 2008) and institutions (Bortolotti and Pinotti, 2008).

Concerning the above literature, the present paper focuses more on how political and institutional factors shape the effect of EU liberalization directives and domestic pro-competition reforms rather than the determinants of these policies. Nonetheless, a neat distinction between liberalization and privatization is highly relevant for the analysis. European directives aimed at reducing entry barriers without any element of privatization. The reason is that the EU must be ownership neutral: its role is limited to ensuring that effective competition is achieved in a specific sector (Clifton et al., 2006, Article 220 of the EC Treaty). However, MSs, when implementing domestic reforms, can combine both policies. Although these policies have often been paired, their mix varies substantially across countries. For example, countries like Ireland and the United Kingdom privatize their industries significantly more than France and Germany (Clifton et al., 2006).

The timing and inherently domestic nature of privatization can be exploited to bring additional evidence in favor of aligned interests. Privatization, on average, started one decade in advance of European liberalization. As Clifton et al. (2006) argue, some MSs autonomously privatized their industries to facilitate the reception of European liberalization directives. Therefore, showing that privatization increased competition – when considered in conjunction with liberalization directives – would further corroborate the importance of early reforms and aligned interests for European competition. Moreover, the inherently national nature of privatization can further defend the analysis from the potential critique that domestic reforms – despite their heterogeneity – are simply the result of the Commission imposing its will on MSs, which, otherwise, would not have implemented those policies.

Privatization, however, is also important as it affects competition. Privatization alone means that state-owned enterprises become private, but it does not require reducing entry barriers to competition. As argued by Belloc et al. (2014), privatization per se is not conducive to more competition, but it can simply transform a public into a private monopoly. Thus, for privatization to promote competition, it needs to be combined with some degree of liberalization.

When combined with liberalization, as it is for European economies, privatization can reinforce the effect of liberalization policies. Despite liberalization, foreign firms might be discouraged from investing in countries where powerful incumbents are publicly owned since they could feel a lack of a level playing field. In fact, governments tend to support more state-owned firms, which also have higher access to insider information (Sarkar et al., 1999, Bonardi, 2004).

To assess the role of privatization, I decompose ΔPMR into sub-indicators disentangling the economic effects of liberalization and privatization. As in Alesina et al. (2005), I define a variable capturing the intensity of domestic liberalization (Δlib) by averaging the

Table 6
Effect of European reforms and domestic reforms on (log) market power, decomposing between national liberalization and privatization.

	Baseline	IPW	Baseline plus industry-time trends
eu	−0.035	−0.043	0.008
	(0.047)	(0.034)	(0.022)
$eu \times \Delta lib$	−0.057***	−0.063***	−0.056***
	(0.015)	(0.003)	(0.018)
$eu \times \Delta priv$	−0.020***	−0.021***	−0.019***
	(0.004)	(0.003)	(0.001)
Controls	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	1 818 093	1 818 093	1 818 093

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (3) using a two-stage DID (Gardner 2022). The first column reports the baseline specification. The second column uses inverse probability weighting, and the third column adds industry-time trends to the baseline. The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

entry barriers and vertical integration components of the PMR score. The extent of privatization ($\Delta priv$) is captured by considering only the public ownership component of the PMR score. Then, I run the following model:

$$\log mp_{jict} = \gamma eu_{it} + \beta eu_{it} \times \Delta lib_{ic} + \theta eu_{it} \times \Delta priv_{ic} + \phi X_{jict} + \alpha_j + \tau_t + \epsilon_{it}, \tag{3}$$

At this stage, it is necessary to clarify the interpretation of the various interaction terms. The variable $eu \times \Delta priv$ combines the effects of European liberalization with domestic privatization. Instead, $eu \times \Delta lib$ accounts for the combined impact of liberalizations at the national and European levels. Finally, the previously used $eu \times \Delta PMR$ captures the joint impact of European directives with domestic pro-competition reforms, combining both elements of privatization and liberalization.

The results of this empirical exercise are reported in Table 6 with the usual three specifications: baseline, IPW, and baseline plus industry-time trends. Privatization has a negative and strongly significant effect on market power when combined with European directives. Yet, this effect is lower than the combination of "pure" liberalization ($eu \times \Delta lib$). In turn, both $eu \times \Delta priv$ and $eu \times \Delta lib$ are lower than $eu \times \Delta PMR$ (Table 3).

In line with the aligned interest argument, early privatization efforts are important for competition as they amplify the pro-competitive effects of European directives. However, this effect was greater when governments combined privatization with domestic liberalization. Thus, this result is in line with Belloc et al. (2014) and the fact that foreign firms may prefer to enter an industry where the dominant players do not hold strong government ties.

After having shown the relevance of privatization for competition, it is important to note that a crucial factor determining the adoption of such reforms is policy learning and diffusion (Obinger et al., 2016). The importance of policy diffusion is empirically investigated by studies like Fink (2011) and Schmitt (2011), Schmitt (2014). For this reason, the appendix implements a robustness test that consists of adding the interaction between eu and an indicator that for each country represents the weighted PMR of trading partner countries, where the weight is the share of trading volume with a partner as a percentage of the total trading volume. As the appendix shows, the thrust of the main result is unchanged.

3.3. Institutional complementarities

The second key mechanism proposed in this framework involves institutional complementarities between the European and domestic dimensions, which facilitate the adoption of EU legislation and shield it from future distortions. To test this mechanism, I run (1) while substituting the PMR indicator with the CLI score, which serves as a proxy for the strength of national competition institutions. A potential concern is that domestic competition institutions may already incorporate elements of European legislation. However, as discussed in Section 2, the CLI is specifically designed to consider only elements of national legislation, thereby capturing distinct characteristics of domestic competition institutions. Additionally, I choose the value of the CLI in 1980 as the reference point, a period during which European competition law was not extensively developed.[17]

Table 7 presents the results of three different specifications: the baseline model, the inverse probability weighting (IPW) model, and the one with industry-time trends. As in the case of early reforms, domestic competition institutions amplify the pro-competition effects of European directives. For every 0.1 increase in the CLI index,[18] European directives bring down firm-level market power by an additional 2.8%. These results can be interpreted as evidence of the importance of institutional complementarities in ensuring

[17] In the appendix, other reference years are considered.
[18] The index is bounded between 0 and 1.

Table 7
Effect of European reforms and domestic competition institutions on (log) market power.

	Baseline	IPW	Baseline plus industry-time trends
eu	−0.069	0.005	−0.001
	(0.045)	(0.040)	(0.017)
$eu \times CLI$	−0.275***	−0.559***	−0.336***
	(0.057)	(0.066)	(0.042)
Controls	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	1 818 093	1 818 093	1 818 093

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (1) with the CLI index and using a two-stage DID (Gardner 2022). The first column reports the baseline specification. The second column uses inverse probability weighting, and the third column adds industry-time trends to the baseline. The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

the effective transposition and implementation of EU directives. In this respect, they align with Mukand and Rodrik's (2005) critique of adopting one-size-fits-all reform packages, such as IMF reforms in America Latina, in countries where institutions were not strong enough. Similarly, the present results show that European directives were more effective in decreasing market power in countries with solid competition institutions that were already compatible with the legislative framework designed by the Commission to create a competitive Single Market.

3.4. Robustness checks

Section 3.1.1 has addressed some issues concerning the possible selection into treatment. However, there could be other concerns regarding the other critical independent variable capturing the intensity of domestic reforms. An issue could be reverse causality since high market power firms can influence domestic reforms. Second, the Commission may have influenced the design of reforms in certain countries; thereby, the variable may not capture any more inherently domestic factors. Both concerns, however, can be mitigated by the fact that ΔPMR is computed before EU directives and by showing the importance of domestic privatization reforms, on which the Commission exerts no formal power.

Another issue concerns the existence of macroeconomic and institutional factors that can drive structural reforms. In this respect, the literature has shown that economic growth, or better, the lack of thereof, and economic instability are correlated with the adoption of major reforms (Duval et al., 2021; Bonfiglioli et al., 2022). Moreover, pro-competition reforms tend to go hand in hand with labor market reforms. To control for these potential confounding factors, I run model (1) where I progressively add the interaction between *eu* and the national growth rate ($growth$), a crisis dummy ($crisis$), stock price volatility ($volatility$), and EPL (EPL).

Table 8 presents the results of this robustness exercise. The pro-competition effect of European directives and national reforms survive the progressive inclusion of these interactions while coefficients are relatively stable across the different specifications. As before, the effect of European directives in industries where MSs did not engage in early reform is not significant.

As previously mentioned, the adoption of Gardner's (2022) approach to account for heterogeneous treatment effects is preferred to Callaway and Sant'Anna (2021), another popular technique to address this issue, given its flexibility to accommodate interactions with continuous variables. However, as a further robustness check, I modify the main specification to adapt it to the Callaway and Sant'Anna (2021) case.[19] More specifically, I estimate the following model three separate times using Callaway and Sant'Anna (2021), where the main variable of interest is the interaction between *eu* and $\Delta PMRQ^{v}$, with $v \in \{1, 2, 3\}$ representing the tertile of the ΔPMR distribution[20]:

$$\log mp_{jict} = \beta^{v} eu_{it} \times \Delta PMRQ_{t}^{v} + \phi X_{jic} + \epsilon_{it}. \tag{4}$$

Table 9 presents the results of applying Callaway and Sant'Anna (2021) methodology to estimate the effect of European and domestic reforms on market power. This effect is non-significant for the first, tertile, while it is strongly significant for the second and the third, with the latter displaying the larger effect. These results are in line with those obtained by applying Gardner's (2022) technique as they reveal that the effect of European directives grows with the extent of early reforms, being non-significant in countries with limited ex-ante reform efforts.

[19] Callaway and Sant'Anna (2021) is implemented using the doubly robust estimand of Sant'Anna and Zhao (2020). The doubly robust method is advantageous compared to alternatives such as inverse probability weighting and the regression outcome model because it requires fewer modeling assumptions.

[20] Callaway and Sant'Anna (2021) does not allow to estimate more than one treatment parameter at a time. For this reason, I run three different estimations for each tertile of ΔPMR. However, in the appendix, I run a similar model using Gardner's (2022) technique, considering the three interactions together and obtaining similar results. Another difference between Callaway and Sant'Anna (2021) and Gardner's (2022) is that the first methodology allows for pre-treatment time-invariant controls only, which in this case are set at their value in the last pre-treatment period.

Table 8
Effect of European and domestic reforms on (log) market power controlling for macroeconomic and institutional factors.

	(1)	(2)	(3)	(4)
eu	−0.033	−0.027	−0.007	0.300
	(0.042)	(0.041)	(0.060)	(0.203)
$eu \times \Delta PMR$	−0.076***	−0.076***	−0.067***	−0.090***
	(0.009)	(0.009)	(0.010)	(0.014)
$growht$	0.000	0.000	0.002***	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
$eu \times growth$	−0.008	−0.009	−0.008	−0.007
	(0.008)	(0.008)	(0.010)	(0.011)
$crisis$		−0.010***	−0.005***	−0.009***
		(0.001)	(0.001)	(0.001)
$eu \times crisis$		−0.085*	−0.097*	−0.081
		(0.047)	(0.053)	(0.050)
$volatility$			0.000***	−0.001***
			(0.000)	(0.000)
$eu \times volatility$			0.000	0.002**
			(0.001)	(0.001)
EPL				0.007***
				(0.002)
$eu \times EPL$				−0.135*
				(0.078)
Controls	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	1 818 093	1 818 093	1 733 670	1 733 670

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (1) using a two-stage DID (Gardner 2022). The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

Table 9
Effect of European and domestic reforms on (log) market power using Callaway & Sant' Anna (2021).

	(1)	(2)	(3)
$eu \times \Delta PMRQ^1$	−0.022		
	(0.047)		
$eu \times \Delta PMRQ^2$		−0.154***	
		(0.018)	
$eu \times \Delta PMRQ^3$			−0.183***
			(0.023)
Controls	Yes	Yes	Yes
Observations	1 802 713	1 807 394	1 804 379

Note: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. All columns show the results obtained by running model (1) using Callaway and Sant' Anna's approach (Callaway and Sant' Anna 2021). The controls used are the log of revenues, productivity, and capital intensity. Standard errors are clustered at the industry level.

4. Conclusions

This paper has tried to clarify the political-economic factors that contributed to the rise in competition in Europe. The analysis has focused on the effect of European liberalization directives on firm-level market power. This effect has been estimated using a staggered DID approach where the EU directive variable has been interacted with an index of earlier domestic reforms. The main finding is that European directives decrease firm-level market power by an extra 7.8% for each domestic reform indicator unit increase. By contrast, in countries that engaged in limited legislative efforts before EU legislation, the effect of European directives on competition is much more limited. While not disproving it, this result imposes a reconsideration of Gutierrez and Philippon (2023) individuation of the Commission as the hegemonic critical actor behind the European increase in competition. In particular, the Commission, although probably the engine behind this economic transformation, continues to require the support of domestic actors to advance an effective reform agenda.

The analysis has then proceeded to investigate the mechanisms behind the willingness of national governments to support EU legislation: aligned interests and institutional complementarities.

Early reforms signal the willingness of domestic actors to espouse the Commission's agenda. This support is essential for drafting more ambitious European directives and the later effective transposition into national statutes. The analysis supports this claim by showing that European directives decreased market power by 51% more in the telecom than in the electricity industry. This

finding is consistent with the sectoral studies comparing these industries and showing the higher willingness of governments and large businesses to liberalize this sector. Again, these results contrast with Gutierrez and Philippon's (2023) characterization of an independent Commission, able to superimpose its will over reluctant political and corporate interests.

Early reforms were also possible because of complementarities between national competition institutions and the Commission's ambitions. Solid domestic competition institutions in the form of independent competition authorities and sectoral regulators prevent distortions of EU legislation during the implementation and ex-post. Therefore, such institutions are highly compatible with the legislative framework the Commission intended to create to support a competitive Single Market. Based on the baseline specification, European directives are shown to reduce firm-level market power by an additional 2.8% for every 0.1 increase in the CLI index. In this respect, this result aligns with Mukand and Rodrik (2005), who argue that adopting standardized reform packages does not produce the desired results in countries that do not possess institutions compatible with these policies.

CRediT authorship contribution statement

Tommaso Crescioli: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.ejpoleco.2024.102552.

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