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Competition policy and the labor share

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ABSTRACT

Recent years have seen intense debate about the causes of the observed decline in the labor share. We extend this inquiry by investigating whether the design and enforcement of competition law and policy are associated with changes in the labor share. Using a panel of 22 industries in 12 OECD economies, we find a positive statistical association between the effectiveness of competition policy and changes in the labor share over the period 1995–2005. This suggests a potential link between the design and effectiveness of competition policy and the labor share, and more broadly to distributional outcomes. Our results reinforce the importance of accounting for country-specific factors, including the design and enforcement of local laws, when examining dynamics in the labor share. The analysis implies that effective competition law and policy could mitigate the decline of the labor share, particularly in settings characterized by low levels of labor protection and limited labor bargaining power. (*JEL*: E21, E24, E64, J01, J21, K21, L40).

1. INTRODUCTION

The decline of the labor share in recent decades is well documented and widely acknowledged. However, the rate of change has varied across countries, a fact that has given rise to questions about the factors contributing to this decline (Gutiérrez and Piton 2020). A range of possible, and at times inconsistent, explanations for the decline in the labor share are presented in the literature (Grossman and Oberfield 2021). Broadly, some argue that the decline in the labor share is a global phenomenon reflecting structural change, technological advances (Acemoglu and Restrepo 2020), and changes in *global* trading patterns (Elsby et al. 2013). In contrast, others argue that the decline in the labor share cannot be generalized in this way and also reflects idiosyncratic *local* factors such as national and regional differences in labor regulation (Ciminelli et al. 2022), and product market competition (Gutiérrez and Philippon 2018). One prominent explanation is that the decline of the labor share is partly a consequence of an increase in market power over the same period (De Loecker et al. 2020).

According to this view, lower levels of competition intensity have allowed firms to gain market power and set high consumer prices relative to costs (i.e., markups or monopoly rents). These rents, however, have not been equally shared between capital and labor, with a greater proportion of the rents being captured by capital vis-à-vis labor. This particular explanation has gained traction with policymakers and subsequently focused attention on the way in which changes in market power might account for declines in the labor share in specific countries.

While studies that show a connection between increases in market power and the decline in the labor share are compelling, they typically assume that market power is exogenously determined as a result of technological change or specific structural conditions. Accordingly, laws or other policies directed at constraining market power or increasing the bargaining position of labor are not factored into the analysis. In addition, these studies adopt different approaches to estimating market power, including different methodologies for estimating markups.

In this article, we investigate whether, and how, competition policy might interact with the labor share, given its ability to affect levels of concentration and market power. Introducing this aspect to the analysis is important for three reasons.

First, our inquiry introduces a new focus on how the effectiveness of competition policies in controlling market power may have contributed to changes in the labor share. Our analysis captures the variation within a country's competition policy, allowing us to investigate how various aspects of *the design and implementation* of a country's competition policy—for example, benchmarks for appraising merger transactions; use of threshold for "dominance" versus "monopolization"; choices about the *enforcement* of competition law with respect to mergers and abuse of dominance (e.g., killer acquisitions and approach to big tech); and decisions about the resources and independence of bodies charged with enforcing competition law—may have been more or less successful in controlling market power and thus contributed to changes in the labor share.

Second, it allows us to test whether changes in the labor share partly reflect domestic or *local* policy choices about the type and nature of competition law and labor protections, or whether the changes in the labor share are largely invariant to these policies and are driven by *global* factors. Specifically, we investigate two local legal instruments that could affect the level of market power and the labor share: competition law and labor protection laws (such as a minimum wage). These policies vary both between countries in our sample, and within countries, over time.

Third, by directly comparing how changes in competition policies relate to changes in the labor share, our main results are not contingent on how proxies for market power are estimated (such as markups) which can be difficult and contested. Although we do use estimates of "competitive margins" as part of the interaction analysis, this is not the focus of our investigation. Rather the competitive margins estimates are only used to examine whether different levels of labor protection interact with competition policy in shaping changes in the market outcomes.

To capture nuances in a country's competition policy, and changes over time, we use the competition policy index (CPI; Buccirossi et al. 2011). We apply this index (as well as other variables) to a panel dataset of 22 industries nested in 12 OECD countries, to test whether changes in competition policy were associated with changes in the labor share over the period 1995–2005.

Overall, our findings provide support for the conclusions of previous studies on the decline in the labor share and its relationship with increases in market power by introducing another dimension to the debate. Our results imply that effective competition policy (as

measured by the CPI) may have contributed to the rise of the labor share observed in some countries in our sample. In contrast, ineffective competition policy could have had the opposite effect (i.e., suggesting a decline in competition and the labor share). The results also highlight the importance of accounting for a range of local factors, particularly laws and institutions that shape and condition the levels of labor protection and labor bargaining power, when investigating changes in the labor share.

This article comprises eight sections. Section 2 summarizes the findings of relevant research on market power and the decline in the labor share, and on competition policy and market power. Section 3 describes our dataset and econometric specifications. Section 4 describes the main results from our analysis of competition policy and the labor share, while Section 5 discusses the results of models which account for differences in labor protections and institutions, focusing on their association with competitive margins. Section 6 summarizes the results of the sensitivity analysis. Section 7 considers the policy implications of our findings while Section 8 concludes. The Appendix includes extensions such as an instrumental variable (IV) model, and sensitivity and robustness checks that use alternative model specifications and proxy measures for the level of competition.

2. MARKET POWER, THE LABOR SHARE, AND COMPETITION POLICY

Two strands of research are most relevant to our investigation. The first strand is the literature examining the causes of the decline in the labor share, and in particular the role of increasing market power as a potential explanation for that decline. The second strand of research explores whether the design and implementation of competition law and policy can affect market outcomes (e.g., in terms of market concentration, firms' productivity, profits, and markups).

2.1 Rising markups and declining labor shares

Previous research on the decline of the labor share has identified various factors as potential causes for its global decline, including globalization and technological change (Acemoglu 2003; Azmat et al. 2012; Bassanini and Manfredi 2012; Karabarbounis and Neiman 2014; Piketty and Zucman 2014).

Within this work, the most relevant for our purposes are studies on rising markups (De Loecker and Eeckhout 2018) that find that the labor share is inversely proportional to markups and negatively correlated to profit rates and market concentration (The Herfindahl-Hirschman Index (HHI)) measures (Barkai 2016; De Loecker et al. 2020) in the United States and globally (De Loecker and Eeckhout 2018). Closely related is the work by Autor et al. (2020), who argue that the observed rise in measures of markups is a result of faster innovation of "superstar" firms like Google or Amazon reacting to changes in the product market environment, for example, globalization and technological changes. They suggest that monopolistic competition ("winner takes most"), and not necessarily market power, has contributed to the labor share decline. While they posit that the rise of superstar firms is a global phenomenon (contradicting the claim that it is relevant for US antitrust only), their analysis does not rule out a possible role of competition policy. Furthermore, they call for future work to analyze more precisely the economic and regulatory forces that lead to the emergence of superstar firms.

Some argue that these two macroeconomic trends, the rise of market power and the decline in the labor share, are not common to all developed countries. Specifically, issues of measurement of the labor share, like the ownership of housing (Rognlie 2016) and revenue

of self-employed (Gollin 2002), might challenge the emerging consensus on the global decline in labor share. Similar issues of measurement error might challenge the observation of rising market power (Lipsius 2018; Traina 2018; Basu 2019; Cette et al. 2019).

A recent study by Gutiérrez and Piton (2020) directly contests the observation of global decline in labor shares and suggests that after adjusting for cross-country measurement issues, the US and Canadian economies are the only developed economies that exhibit a clear decreasing trend since the middle of the 1980s. This study puts greater focus on idiosyncratic country-specific explanations (i.e., local factors) for these macroeconomic trends. It suggests that reduced competition intensity in selected US industries might have led to rising profits, directly linking changes in antitrust laws and institutional drift, an observation supported by other research (Gutiérrez and Philippon 2018; Zac 2022).

Debates that associate the decline in labor share with market power in some, but not all, countries are of special interest to us. However, these studies often make particular assumptions about the market and institutional (legal) environment, and as such do not incorporate potentially relevant empirical factors such as the role of competition policy and other local factors which shape market dynamics.

2.2 Competition policy: empirical findings

Only a few studies have sought to empirically investigate the link between the design and implementation of competition law and policy and market outcomes (e.g., market concentration, firms' productivity, profit, or markups). Gutiérrez and Philippon (2018, 2020) find that political and structural independence of competition institutions and other economic institutions like central banks can explain why EU markets have become more competitive than the US markets, in relative terms.[1] Affeldt et al. (2021) find evidence that stricter merger enforcement (proxied by the percentage of mergers blocked or remedied) is predominantly negatively related to concentration levels; implying that more active merger regulation enforcement is linked to higher levels of competition.[2] Besley et al. (2021) study a large sample of countries over 10 years, using firm-level data and a proxy for the scope of competition law ("law of the books"). Their study compares firms operating in tradable markets (i.e., those sectors that are subject to international competition, namely agriculture, mining, and quarrying and manufacturing) with firms in non-tradable markets (i.e., all others). They find that profit margins of firms operating in non-tradable sectors are significantly lower in countries with wider competition policies (in terms of scope) compared with firms operating in tradable sectors.

Putting these two strands of research together one could reasonably argue that more effective competition law and policy should be associated with higher levels of competition which in turn could decrease markups and profits and increase the labor share. In this article, we test this hypothesis directly using data on industry level labor shares and country level implementation of competition policy.

3. DATA AND METHODS

This section describes the data used in the various model specifications. The country–industry-level dataset was compiled by combining data from different sources: the EU-KLEMS and the OECD database for 12 OECD countries—Canada, Czech Republic, France,

[1] The empirical analysis only focuses on product market regulations (pmr) as their main proxy for policy changes, and therefore is limited in capturing competition policy effects.

[2] Prior work also includes Dierx et al. (2017) from the OECD, which focuses on the distributional effects of EU law in one particular year (2014). Ennis et al. (2019) study the effects of excessive market power using the theoretical model of Comanor and Smiley (1975). However, they do not, consider the direct role of competition policy.

Germany, Hungary, Italy, Japan, Netherlands, Spain, Sweden, United Kingdom, United States—in the period between 1995 and 2005.[3] Table A1 in the Appendix lists the 22 industries on which we perform our analysis.

The policy variables, which do not vary between industries, are recorded at country-year level. Importantly, they capture key changes in these countries' competition policy during the period. For some countries, this includes fundamental changes such as the introduction of the Enterprise Act in the United Kingdom and the Dutch Competition Act (*Mededingingswet*). For other countries, changes captured reflect variations in the way competition policy is applied, changes in enforcement inputs (budget and staff) and outputs (enforcement activities), as well as institutional independence. Our sample includes countries from North America, Europe, Japan, and two ex-communist economies (Hungary and Czech Republic). The heterogeneity in the data is of value and allows us to capture differences in the goals and "philosophies" which underpin the national competition policy, as well as differences in the specific drafting of the laws. Overall, the variation between countries, and within countries over time, allows us to explore whether there is a link between the design and enforcement of a country's competition policy and changes in the labor share.

3.1 Description of the variables

3.1.1 The competition policy index

The CPI was compiled by Buccirossi et al. (2011) as a measure of the quality of competition policy.[4] The index includes the data for 12 developed countries over the time span 1995–2005 as presented in Figure 1. The CPI is an aggregated index of a sub-set of indices which are calculated covering two main areas of study: competition policy infringements (including hard-core cartels, anti-competitive agreements, and abuse of dominance) and merger control policy. The aggregate CPI index is constructed using a "pyramidal" approach from "low-level" indicators, through "medium-level" sub-indices, to "high-level" indices. This is a key advantage of the CPI compared with other classic "scope" or "law of the books" measures (Bradford and Chilton 2018). At the lowest level, data were gathered on each area of policy under five categories: independence of enforcement; separation of powers; quality of law; powers of investigation; sanctions policy and damages (the level of the overall loss that can be imposed on firms and their employees); resources (budget, staff) and in the case of hard-core cartel and mergers enforcement activity the number of cases opened or reviewed. Hence, the CPI reflects the nuances of competition policy, allowing for a comparison of the relative effectiveness of such policies.[5]

As can be seen in Figure 1, some countries show large variation in the CPI over time, notably: the Czech Republic, Hungary, Netherlands, and United Kingdom. In contrast, other countries—such as Italy or Germany—exhibit a flat trend, while Sweden shows a negative trend in the CPI. These last countries are still relevant to our investigation because they

[3] The EU-KLEMS database covers all the countries involved in our study except for Canada. Data related to Canada are retrieved from the Groningen Growth and Development Centre (GGDC). The GGDC methodology is consistent with the approach adopted by the EU-KLEMS consortium. The correlation between the EU-KLEMS TFP and the GGDC TFP is high (0.7) and strongly significant (see the "data generation" do file of Buccirossi et al. 2013).

[4] The Buccirossi et al. dataset (2011) is available at https://dataverse.harvard.edu. The data underlying this article are available in the article and in its online supplementary material. Most of the data can also be found in the public domain (The dataset is available at https://dataverse.harvard.edu.) listed in our package for replication, alongside necessary code and instructions. Please follow the 'read me' file.

[5] The weighted aggregation of the information is assigned a score on a continuous scale from 0 to 1 (from worst to best). While offering a valuable qualitative measure, the CPI shares some of the limitations of other competition policy measures such as potential survey bias (concerning data which were gathered directly by questioning competition agencies), limited timespan, and a small country sample. For these reasons, we add additional variation to the independent variable using other legal and institutional variables.

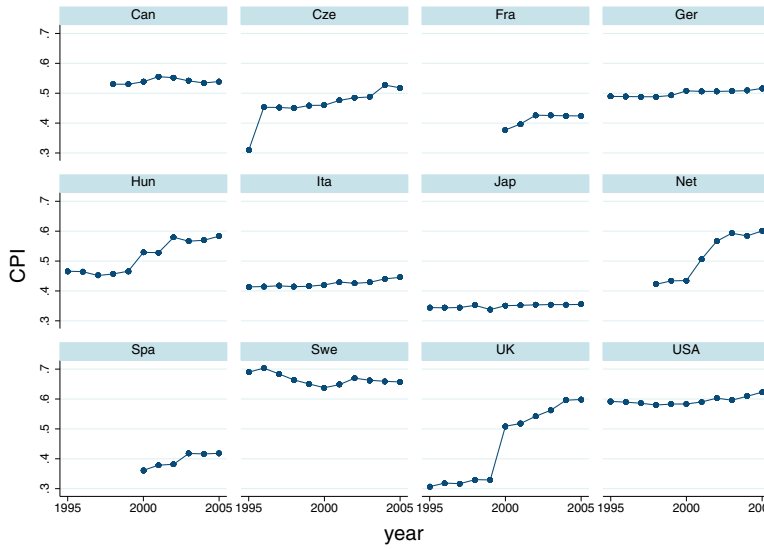

Figure 1. CPI over time, by country; the graph shows the aggregate CPI over the period 1995–2005.

Source: Buccirossi et al. (2011), Authors' elaboration.

allow us to test whether no changes in the levels of the labor share (or a decline of the labor share) are associated with a flat or negative trend in the CPI.

3.1.2 The labor share

The labor share (Labor share) is defined as the ratio between the gross total labor compensation (including wages and the additional costs of employing labor) and the gross total value added (both components are in nominal terms). There are two potential limitations of the available data on labor share which could potentially limit cross-country comparisons and should be acknowledged.

First, labor compensation for the self-employed is not recorded in the national accounts. Yet, our data on self-employed labor compensation and value added are retrieved from the EU-KLEMS database, which applies a standard imputation by assuming that the hourly compensation of the self-employed equals the hourly compensation of employees,[6] and therefore allows for cross-country comparisons of the labor share.[7] A second issue that can affect cross-country comparisons is the inclusion or omission of housing data in some national accounts. To mitigate this issue, we have excluded the housing sector from our sample of 22 industries in the 12 countries we examine, but we still retain data for other non-manufacturing sectors.[8]

[6] This assumption is made at the industry level in each country and can be rather crude for industries where there is significant variation across the earnings of the self-employed and employees. To account for potential measurement errors in specific sectors, we re-run the model by discarding the bottom and the top percentiles of observations (to limit the impact of these values) and the results are confirmed.

[7] Thus, it addresses the first criticism identified by Gutiérrez and Piton (2020), albeit in a crude way.

[8] To further build confidence in our sample, we compare our aggregated country estimates with those suggested by Gutiérrez and Piton (2020) who raised the issue of a potential "cross-Atlantic" bias in the literature. The trends are correlated 0.6 (statistically significant at <0.01). A graphical comparison shows a common trend between the two labor share measures in most countries. Although the estimates of the labor share are generally lower using the second proxy (with the exception of France), the changes over time in the labor share appear to follow a similar pattern for both proxies in most countries.

3.1.3 Other variables

The first group of variables we use are non-legal, economic factors, at country–industry level. They include some factors that were found to be associated with changes in the labor share in previous studies. These include: trade liberalization and globalization (tradelib) which is a ratio of industry imports over value added; high skilled workers (HHS) and medium skilled workers (HMS) to capture the degree of human capital accumulation/education and the changing skill composition of the labor; labor compensation (wagegrowth), as reductions in the salaries of workers across industries tend to decrease the labor share (Arpaia et al. 2009; Ennis et al. 2019); business cycles (industry_trend), which allows us to account for different demand fluctuations; and R&D intensity as a proxy for technological progress (R&D), measured as the ratio between R&D expenditure and the value added.

The second group of variables are legal factors at the country level. These variables are used to control for other product market regulations, competition policy metrics, and labor institutions that could also impact the labor share. These include: a product market regulation indicator (prod_mkt_reg); a scope of competition law index (CLI), and text similarity proxies which examine the extent to which various national laws replicate the language used in the US and EU competition laws using human coding (US_text or EU_text)[9]; and a variable (empl.protec) which captures the strictness of employment protection and data on unionization.

In Table 1, we present the descriptive statistics of our main variables, based on the sample size used in the main analysis (Table 2). In the Appendix, we include a full list of variables (Table A2) and sources.

3.2 Econometric specifications

To assess the relationship between competition policy (CPI) and the country–industry level labor share (Labor share), we use the estimation strategy in Buccirossi et al. (2013) as:

$$\text{Labor share}_{,i,j,t} = \alpha + \beta \text{CPI}_{i,t-1} + \sum X_{i,j,t-1} + \sum Z_{i,t-1} + \varepsilon_{i,j,t}. \quad (1)$$

Overall, we expect a positive relationship between competition policy (CPI) and the labor share (Labor share) with the coefficient $E(\beta_{\text{CPI}}) > 0$. In Equation (1), "$i$" refers to country,

Table 1. Descriptive statistics, main variables

Variable	Description	Obs.	Mean	Std. Dev.	Min	Max
Labor share	Labor share	1649	0.63	0.19	0.04	1.48
CPI	Competition policy index	1649	0.49	0.09	0.32	0.68
prod_mkt_reg	Product mkt regulation	1649	1.72	0.49	0.92	3.03
tradelib	Import penetration	1482	1.24	2.00	0	17.28
ind trend	Industry trend	1649	0.11	0.43	−0.01	3.99
empl.protec	Employment protection	1649	2.30	0.96	0.09	3.64
wagegrowth	Compensation growth rate	1649	0.03	0.07	−0.50	0.67
HHS	% of high skilled	1649	0.11	0.08	0.01	0.56
HMS	% of medium skilled	1649	0.71	0.15	0.12	0.98
R&D	R&D intensity (%VA)	1450	0.03	0.06	0	0.59

[9] We use Bradford and Chilton's (2018) textual laws analysis, which examines the extent to which various national laws replicate the language used in the US and EU competition laws using human coding. For example, the law is considered to resemble US law if it uses any of the following phrases: "substantially lessen competition"; "every contract, combination"; "every person who shall monopolize" which specify the important legal tests for merger regulation, cartel enforcement, and abuse of market power and are distinct in the choice of words in comparison to the EU. See full list of variables and sources in Table A3.

Table 2. Regression results: labor share and aggregate CPI

	Labor share				
	(1)	(2)	(3)	(4)	(5)
CPI_{t-1}	0.185**	0.185**	0.185**	0.174**	0.158*
	(0.064)	(0.065)	(0.068)	(0.068)	(0.077)
Obs.	2244	2244	1958	1649	1649
Adj. R^2	0.084	0.606	0.919	0.919	0.919
Economic controls	No	No	No	Yes	Yes
Legal controls	No	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	No	No	No
Industry FE	No	Yes	No	No	No
Country–industry FE	No	No	Yes	Yes	Yes

Notes: CPI_{t-1} is the CPI lagged by one year. The set of economic controls include: as a proxy for import penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D). The legal controls include product market regulation index (prod_mkt_reg) and the employment protection index (empl_protec). Clustered standard errors by country are in parenthesis.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

"j" to industry, and "t" to year. As described in Section 3.1, we include a set of country–industry controls $X_{i,j,t-1}$ related to the main dependent variable (such as human capital and import penetration), while $Z_{i,t-1}$ captures country-specific controls (such as product market regulation and scope of law). Following Buccirossi et al. (2013), we model the unobserved heterogeneity through the error term's structure: $\varepsilon_{j,i,t} = \psi_{i,j} + \varphi_t + u_{i,j,t}$. Specifically, we control for country–industry fixed effects $\psi_{i,j}$ to capture a variety of specific time-invariant unobservable factors, and year fixed effects φ_t, to consider macroeconomic shocks that might affect the labor share (Labor share) in all countries at the same time. Lastly, we include the residual standard component of the error term $u_{i,j,t}$. We cluster the standard errors at country level (as our main independent variable CPI), to allow for correlation across industries within the same country (and for the presence of possible *spillovers*).[10]

To limit the potential bias from reverse causality, we use the standard approach of lagging the control variables by one period with respect to the labor share indicator (Griffith et al. 2004; Buccirossi et al. 2013), based on the assumption that lagged values are uncorrelated with the error terms of the equation. While we do not suspect the presence of two-way causality bias in our analysis, we prefer to adopt a conservative approach.[11]

The main source of endogeneity which might affect our analysis is omitted variable bias. While we control for the time-invariant unobserved heterogeneity, by using the wide set of fixed effects in our estimation, there might be other variables and policies that may affect the CPI and the labor share and are not captured in our baseline model. Specifically, an index like the CPI, might capture the effect of the more general quality of economic institutions in a country such as central banks (Gutiérrez and Philippon 2018). To address this issue, we implement an IV estimation strategy to make the analysis more robust and reliable. The results are included in the Table A4.

[10] We also test the sensitivity of the results to controlling for different types of clusters, individual effects, and error correlation structure. Results are reported in Section B in the Appendix.

[11] There is no apparent reason why the value of the labor share should affect competition policy. Moreover, even if values of the labor share are relevant for competition law enforcement the process of policy change will take some time to take effect.

We employed an interaction analysis to allow for greater variation in our CPI measure. Specifically, we examine the marginal effect of competition policy on the labor share, by accounting for: (i) the type of industry (services versus manufacturing); (ii) the scope of competition policy (i.e., the "size of the net" capturing anti-competitive behavior); and (iii) the legal background or model of law (i.e., countries that adopt the US antitrust laws' text compared with the EU competition law text). Our last interaction model offers an additional contribution to the debate on whether movements in the labor share are global or partly reflect local factors and could help explain the different results observed in the literature for North America (United States and Canada) compared with other developed countries.

Lastly, we also explore the effects of competition policy against the background of labor protection levels in a separate reduced model, as we believe that both factors and their interplay can influence the level of competition intensity and ultimately the labor share.

4. RESULTS

4.1 Main results

Table 2 presents the results for the baseline model, with different sets of fixed effects. The positive sign and the statistical significance of the CPI are consistent across all specifications. We started our analysis with the univariate model and gradually included all the controls in the full specification (see Column 5). The coefficient of the (lagged) CPI is always positive and statistically significant, suggesting that more effective competition policy is positively linked to the labor share. As expected, given that we account for several fixed effects in our model (allowing us to control for time-invariant unobserved heterogeneity at country–industry level), the (adjusted) *R*-squared takes high values in Columns 3–5. This means that specific country–industry characteristics already explain much of the variance of our outcome variable. Table A5 reports the standardized betas to aid the comparison in terms of magnitude of the effect across the controls. One SD change in the CPI is associated with a statistically significant increase of 0.087 SD in the labor share. Although the CPI does not have the strongest effect on the labor share (high skilled human capital [HHS] is the highest), it is also not the weakest (the effect of the CPI on the labor share is higher than the effect of trade liberalization in our sample).

With respect to control variables in the baseline model (Table A3), the negative coefficient for the ind_trend variable suggests that economic fluctuations and business cycle effects (deviations from the predicted levels of production) tend to be negatively associated to the country–industry labor share (see Growiec at al. (2018) for the counter-cyclicality of the labor share in the short-run).[12] As expected, the coefficient for wage growth on the labor share is positive and highly statistically significant (ranging from 0.103 to 0.116). The rest of the controls are statistically insignificant as we elaborate on in the Appendix, where we present different specifications by including each control at a time. Given the relevance and possible policy implications, we further investigate different underlying settings of labor markets in Section 5.

Overall, the findings of the OLS model suggest that effective competition policy is positively linked to the labor share. As set out in the Appendix, this result is confirmed using an IV approach and is robust to a range of sensitivity tests.

[12] In circumstances where the additional industrial production is caused by an increase in productivity but wages are stagnant, then the overall effect on the labor share might be negative (potentially dragged down by wage stagnation and/or capital labor substitution). In the work of Buccirossi et al. (2013), they find a positive effect of the ind_trend both on the total factor productivity and the labor productivity, validating our intuition of the reason why its coefficient takes a negative sign in our analysis.

Table 3. Interaction regressions

	Labor share		
	(1)	(2)	(3)
CPI_{t-1}*service	−0.005		
	(0.121)		
CPI_{t-1}*manufacturing	0.220**		
	(0.070)		
Manufacturing	0.129		
	(0.083)		
CPI_{t-1} *CLI_{t-1}		0.224***	
		(0.052)	
CPI_{t-1}		0.019	
		(0.060)	
CLI_{t-1}		−0.197***	
		(0.045)	
EU_text*CPI_{t-1}			0.16** (0.071)
US_text*CPI_{t-1}			−0.61 (0.438)
US_text			0.13 (0.258)
Obs.	1649	1649	1649
Adj. R^2	0.919	0.919	0.93
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country–industry FE	Yes	Yes	Yes

Notes: CPI_{t-1} is the CPI lagged by one year. The set of controls include: as a proxy for import penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS), the share of medium skilled workers (HMS), R&D intensity (R&D), and the product market regulation index (prod_mkt_reg). Service and manufacturing dummies refer to the type of industry; EU_text and US_text dummies are to capture the origin of the legal text. Clustered standard errors by country are in parenthesis.
In column 1 a 'reparametrized' version of the full model (including all the constitutive terms) has been applied. This is a valid praxis which applies specifically to those cases when one of the interactive terms is a dummy (0/1) – categorical variable. See Brambor (2006).
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2 Interaction analysis

We make use of the heterogeneity in our data and investigate the interaction between the CPI and other potentially endogenous factors using an interaction analysis. This analysis allows us to explore how the scope of competition policy, and the degree of industry-specific regulation, might affect the relationship between the CPI and the labor share. Table 3 presents the results for three different interaction specifications.

4.2.1 Type of industry

The first interaction specification tests whether the relationship between the CPI and the labor share differs according to the type of industry (Column 1), namely manufacturing versus services. The results presented in Column 1 of Table 3 suggest a stronger and more statistically significant relationship between competition policy and the labor share in capital-intensive industries (e.g., manufacturing), compared with service industries.[13] These results

[13] We believe that the services industry is typically subject to greater sectoral-specific economic regulation and oversight (such as sector-specific regulators for financial services and telecommunications), than the manufacturing sector. In addition, higher levels of enforcement activity are observed in manufacturing industries compared with the services industries. This was evident in our own work on UK competition law enforcement over the past two decades (Decker et al. 2022). The trend was particularly prominent in those areas of enforcement that are significant to the effectiveness of competition policy, for example,

contrast with the findings of Besley et al. (2021) who differentiate between tradable sectors (i.e., manufacturing) and less-tradable sectors (i.e., services) and find that the "scope" of competition law only affects profitability in the latter case. However, a direct comparison of the results of the two studies and others (e.g., Affeldt et al. 2021) is limited by the fact that the studies use: different proxies for competition law and competition intensity; are conducted at different levels of aggregation; and examine different countries and time frames.[14] Additional work using consistent measures and datasets is needed to shed light on these findings.

4.2.2 "Scope" of competition policy

Column 2 of Table 3 presents the results of the second interaction analysis which focuses on the relationship between the "scope" of competition policy and the labor share. We test the hypothesis that the greater the scope of competition policy, the greater the impact of the CPI (which captures competition policy effectiveness) on the labor share. As a proxy for the scope of competition policy, we use the CLI, retrieved from the dataset of Bradford and Chilton (2018). As the CPI already reflects an element of the scope of competition policy, we expect the CLI and the CPI to correlate to a certain extent, but the correlation is small and negative.[15] The CLI is limited to scope alone (presence of competition policy) and reflects the letter of that law. By contrast to the CPI, this more formal index does not take account of the actual level of enforcement or other factors in the policy. This limitation of the CLI should be noted, as some jurisdictions may have enacted the laws but engage in limited effective enforcement. Other jurisdictions may have gone through a significant policy change which affected the intensity of enforcement, without changing their laws. Accordingly, measures of scope could fail to capture meaningful differences between developed countries that already have a more harmonized scope of law including articles for mergers, cartels, and abuse of dominance.

The results shown in Column 2 of Table 3 are in line with our hypothesis that the greater the scope of competition policy the greater the impact of the CPI on labor share. The overall effect of both indexes of competition law is positive and so is their interaction effect, captured by the coefficient of the term CPI_{t-1}* CLI_{t-1}. Figure 2 shows the predicted marginal effects of the CPI on the labor share (on the *y*-axis), for fixed values of the CLI (on the *x*-axis). As shown, the marginal effect of the CPI on the dependent variable becomes gradually bigger as the CLI increases.

4.2.3 Similarity in legal text ("model of law")

Column 3 in Table 3 shows that the interaction between EU countries (or countries whose competition laws closely resemble the EU legal text) and the CPI is positive and statistically significant. Theoretically, under the pure global argument, we should not expect to see heterogeneous effects for competition law text and no significant cross-country differences should be observable. In other words, if the claim that market power is on the rise merely

merger control (Bernhardt and Dewenter, 2022) estimate that around 40% of enforcement decisions in the EU (1990–2019) were in the manufacturing sectors. While further analysis is needed, we believe that these two factors might potentially explain the interaction between the CPI and the type of industry.

[14] For example, Besley et al. (2021) use the "total scope index score" from Hylton and Deng (2007) as a proxy for competition policy while we use the CPI from Bradford and Chilton (2018). Similarly, Besley et al. (2021) focus on profits and HHI as measures of relative competition, while we look at competitive margins using the approach adopted in Buccirossi et al. (2013). Besley et al. (2021) examine data for 94 countries, while our analysis focuses on 12 OECD countries. Finally, Besley et al. (2021) use data for the 10-year period 2006–2015 while our data are for the time period 1995–2005.

[15] In our sample, the correlation is −0.36. This suggest that overall, the scope of law is not a strong proxy for effectiveness or quality of the regime (and vice versa).

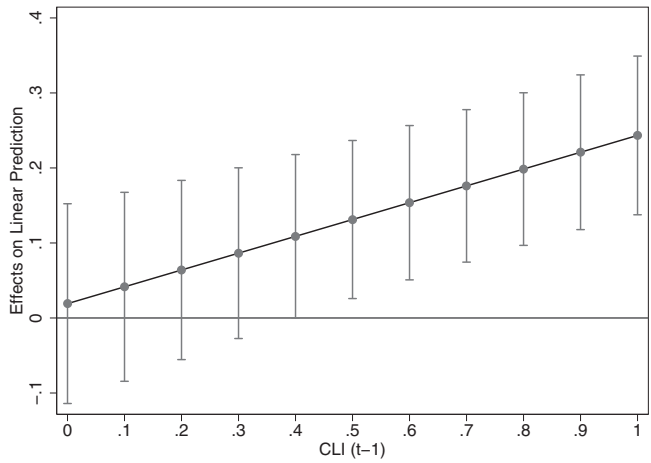

Figure 2. Marginal effects of the CPI index on the labor share, for different levels of the CLI.

Notes: The graph displays the marginal effects of the CPI on the labor share, for different levels of the CLI, with 95% CIs. Lower values of the CLI reflect less scope of the law.

Source: Authors' elaboration.

due to global factors is robust (Diez et al. 2020), then competition laws have likely played a passive part in these two common trends, that is, decline of the labor share and the reduction in the level of competition (i.e., rise of markups). However, if market power is also affected by local factors, then the rise in concentration levels observed in previous studies could be explained by a combination of innovation and efficiencies (the superstar firms hypothesis or other global forces), as well as ineffective competition policy (Gutiérrez and Philippon 2018; Covarrubias et al. 2019).[16] In this case, it is possible that some local competition law enforcers did slightly "better" than others in controlling market power and anti-competitive practices. In our small sample, the countries that experienced a positive change in the CPI (United Kingdom, Netherlands, Hungary, and the Czech Republic) were all in Europe, while the "US similar" countries (like the United States, Canada, and Japan) experienced a stagnant CPI in the period examined (see Figure 1). Our results are, therefore, more in-line with the local (or mixed) explanations for changes in the labor share and can partly explain why some countries seem to experience stronger declines in the labor share than others. As we only observe a decade (1995–2005), we cannot contribute to the debate over the long-term trends of markups and the labor share.

5. COMPETITION LAW AND LABOR PROTECTION AND INSTITUTIONS

An important interaction we set out to explore concerns the link between a country's competition law and labor protection laws and institutions. To explore how these two laws jointly associate with market outcomes, we empirically investigate the link between both laws and a proxy for the level of competition. Our analysis in this section is also consistent with a

[16] Previous work suggested that competition laws in the United States have potentially drifted away from optimal levels of enforcement compared with EU (Gutiérrez and Philippon 2018; Covarrubias et al. 2019; Zac 2022). In the Appendix A.3, we explore the different factors of the CPI. In accordance with previous work on competition policy institutions and merger enforcement (Affeldt et al. 2021), we find that these factors (i.e., institutions and mergers) dominate the CPI effect. See Table A7.

markups (i.e., market power) mechanism, showing that the CPI is negatively correlated with our proxy of competition.

For the competition dependent variable, we use, as a proxy, the estimates of industry markups presented in Buccirossi et al. (2013)[17] which in turn are based on the approach adopted in Griffith et al. (2007). The competition dependent variable is defined (Equation 2) as value added over the input costs and is intended to capture, in a rather crude way, the price/costs margin for each country–industry. Higher levels of this measure correspond to less intense (and possibly more distorted) competition.[18] We note, however, that although Buccirossi et al. (2013) refer to this measure as "markups," the methods that have been developed since then—which rely on the estimations of elasticities—are more likely to reflect firms' production costs estimations (Loecker and Warzynski 2012) and actual markups. We therefore refer to these estimates as a general proxy for industry "competitive margins" to make it clear that we do not argue for an accurate estimation of firm-level markups:

$$\text{Comp\_margins}_{i,j,t} = \frac{\text{Value Added}_{i,j,y}}{\text{Labor Costs}_{i,j,t} + \text{Capital Costs}_{i,j,t}}. \quad (2)$$

Note that the capital costs measure is not a residual of the labor share but rather is estimated by multiplying the capital stock for the user cost of capital. This approach takes into account the real interest rate and the extent of capital depreciation (Griffith et al. 2007; Buccirossi et al. 2013).[19] The "competitive margins" measure we use tends to closely approximate markups (or the price cost margin such as the Lerner Index) whenever average costs closely match marginal costs. Indeed, the major limitation of this approach lies in the assumption of constant returns to scale. Whenever this assumption does not hold, the proxy will be downward (upward) biased with increasing (decreasing) returns to scale. However, by controlling for year and country fixed effects, we mitigate this possible concern (Griffith et al. 2007). While this approach has limitations (including that marginal costs are not observed), it has the advantage of being easily implementable and data driven.[20] As our data are aggregated at the industry level, we need not go into difficulties of estimating production functions (Traina 2018).

As a robustness check, we compare this measure to other publicly available datasets including the recent estimates of the OECD for aggregated country markups. This can be seen in Figure 3, where we plot our estimates of the "competitive margins" (defined in Equation (2)) against recent work on country-level markups from Schreyer and Zinni (2020).[21]

In our sample, the average value of the competitive margins proxy is 1.23 and is consistent with the findings of Schreyer and Zinni (2020), who find an average markup of 1.25. This is also in line with Christopoulou and Vermeulen (2012) (who find an average of 1.37 for

[17] They calculate this proxy, which they also refer to as "price-cost margin," as the ratio between the value added over the sum of input costs (labor and capital, accounting for its user cost and corrected for depreciation). For a more thorough description, see line 248 of the do.file "datageneration" of Buccirossi et al. (2013) and page 10 of their Appendix. They used as sources the EUKLEMS, the STAN, and the OECD-Main Economic Indicators (MEI) datasets.

[18] We also reconstructed this measure to reflect profit shares. Since the results are similar, we report the results using Equation (2) in the main text, while the profit shares are reported in the (Table A12).

[19] For the computation of capital costs, Buccirossi et al. (2013) use data on the inflation rate, as well as on the yield on 10-years Federal Reserve Bonds. These come from the OECD MEI database.

[20] Given the complexity of calculating markups and the many empirical caveats, there is still no consensus in the empirical literature on what should be a well-established approach to measure the price-over-marginal cost proxy. For a detailed overview of the several empirical methods used to calculate markups, see Basu (2019).

[21] The correlation between the time series is roughly 0.40 (significance level < 0.01) with two countries behaving as outliers: Japan and the Netherlands. Excluding these two countries the correlation is 0.71 and once again highly statistically significant.

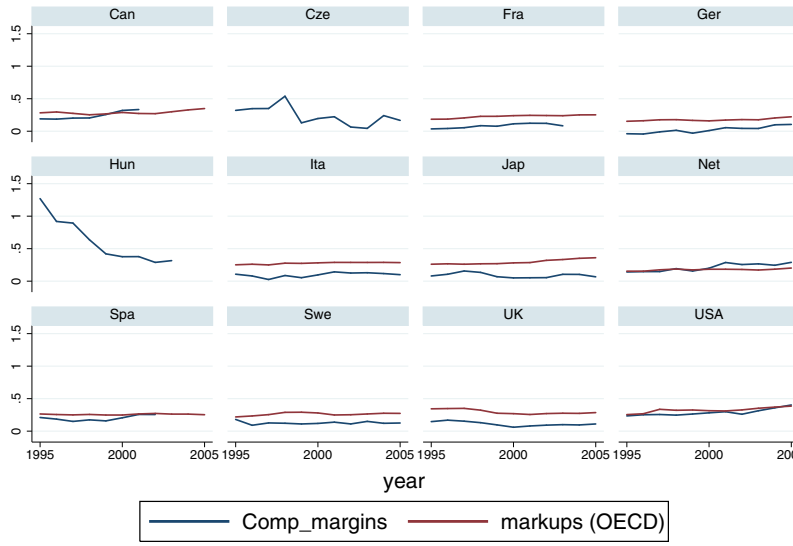

Figure 3. Comparison between the competitive margins proxy and the OECD markups proxy by Schreyer and Zinni (2020). The graph displays the trends over time of two proxies (competitive margins [blue] versus markups [red], Schreyer and Zinni [2020]), both in logs. For some countries (Hungary and Czech Republic), the markups by Schreyer and Zinni (2020) are not calculated.

European countries and 1.32 for the United States) and Loecker and Warzynski (2012), using firm-level data of Slovenian manufacturing firms, obtaining markups in the range of 1.17–1.28. De Loecker et al. (2020) find average markups in the United States increased from 1.31 in 1986 to 1.45 in 2006, which is relatively close to our time-series range of values. While the competitive margins proxy we use is broadly consistent with other estimated markups, it should nevertheless be interpreted with care, given the discussed limitations.[22]

We followed a similar econometric specification to Equation (1) using the competitive margins proxy. The only difference is the inclusion of several economic factors identified in previous studies as being co-founding factors next to competition policy.[23]

Besides these standard economic controls, we also include the CPI and three additional policy proxies to capture local variations in laws and institutions. These are product market

[22] We recognize that there are other possible proxy measures for markups that could be estimated, including measures that use KLEMS data, such as the log ratio of gross output divided by material inputs. While we have considered these approaches, the reasons why we chose to follow the approach of Buccirossi et al. (2013) are as follows: First, the Buccirossi et al. (2013) markups measure is well established in the literature and thus allows for greater comparability across studies. Second, as discussed, our estimates of competitive margins are broadly comparable (and similar by construction) to a large group of other markup estimates presented in other studies, which gives us confidence in our estimates. Third, adopting an alternative markups proxy using the KLEMS data would have had the effect of substantially limiting the scope of our analysis to the manufacturing sector only, thus reducing our ability to examine the interaction between competition law and the labor share across all sectors in the economy.

[23] These factors include a proxy for import penetration (tradelib) used in the main analysis, to capture the relative exposure of different industries to international trade, which might have consequences in terms of production (and especially low-skilled labor) outsourcing, potentially widening the price-cost margin (Goldschmidt and Schmieder, 2017). To control for the profits potentially being related to scale, we use a size of the industry proxy in the form of value added (log_va) as markups and profits tend to be a positive function of the size of the firms (Autor et al., 2017, 2020). Similarly to account for the fact that most innovative and productive industries tend to grow faster than others, and as a consequence have higher market shares and markups (Autor et al. 2020), we include an R&D variable (R&D) as proxy for innovation, following De Loecker et al. (2020). However, we cannot exclude the existence of a negative correlation between competition and R&D intensity, as the incentive for investing and innovating might become lower as the competition pressure declines and market power increases (Gutierrez and Philippon 2017).

Table 4. CPI and competitive margins

	Comp_margins (log)					
	(1) Below emp.prot	(2) Above emp.prot	(3) Below t. union	(4) Above t. union	(5) Below union m.	(6) Above union m.
CPI_{t-1}	−0.524***	−0.581***	−0.608***	−0.199**	−0.659***	−0.395***
	(0.133)	(0.110)	(0.101)	(0.080)	(0.126)	(0.054)
$tradelib_{t-1}$	−0.006	0.011	0.024***	0.015	−0.000	0.033***
	(0.012)	(0.009)	(0.007)	(0.011)	(0.010)	(0.006)
$R\&D_{t-1}$	0.336	0.221	0.363*	−0.069	0.027	0.255
	(0.361)	(0.182)	(0.187)	(0.181)	(0.202)	(0.164)
$Prod\_mkt\_reg_{t-1}$	0.361***	0.423***	−0.042	0.150***	0.284***	0.058**
	(0.120)	(0.028)	(0.031)	(0.039)	(0.034)	(0.024)
log_va	0.139***	0.768***	0.653***	0.699***	0.816***	0.525***
	(0.039)	(0.026)	(0.020)	(0.032)	(0.031)	(0.017)
Obs.	623	916	788	718	637	869
Adj. R^2	0.861	0.849	0.958	0.836	0.853	0.956
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country–industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the CPI lagged by one year. Higher values of competitive margins proxy reflect more long-run distortions (profits), and therefore less competition. The set of controls include: as a proxy for import penetration (tradelib), R&D intensity (R&D), the product market regulation index (prod_mkt_reg), and the country–industry value added in log (log_va). The dependent variables are the employment protection (empl_protec), trade union density (t_union), number of union members (union_m). Robust standard errors by country are in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

regulations (prod_mkt_reg) and labor market policies and institutions in the form of employment protection, trade union density (t. union), and number of union members (union m.). We expect the CPI to be negatively correlated with competitive margins, as it should reduce distortions in the market. As for the product market regulation, increasing levels of prod_mkt_reg indicate a higher economic burden in the form of high barriers to entry, which are expected to be positively associated to profits (Autor et al. 2017) and market distortions.[24] The relationship between labor market regulation and institutions and competition is more difficult to predict. On the one hand, stricter labor market regulation and institutions could bolster the ability for labor to negotiate which could raise costs and reduce markups and profits. On the other hand, in some industries this might induce firms to substitute labor with capital, hence widening the price–cost margins (assuming that attributable capital costs are lower than labor costs).

To account for possible heterogeneity in the relationship between the CPI and the competitive margins in different labor market settings, we split our sample according to whether a particular labor market regulation or institution is below or above the median, indicating, respectively, less and more regulated labor markets. This method has advantages in dealing with possible outliers or multiple distributions (Bailey and Goodman-Bacon 2015). The central hypothesis is that the CPI might impact competition differently, depending on the strength of labor regulation in place.[25] Table 4 reports the results. The coefficient of the (lagged) CPI is negative and statistically significant at 1% level across all specifications.

[24] The OECD's product market regulation (prod_mkt_reg) index measures the degree of vertical integration, public ownership, open access, and market concentration in regulated markets. Prod_mkt_reg values range from 0 (full deregulation) to a maximum of 6 (most restrictive conditions for competition).

[25] As for the issue of endogeneity, we lag the CPI to avoid reverse causality that might be a concern in this set-up: indeed, competition policy may affect the competition proxy, but the opposite might also hold (high levels of market power might

With the exception of Columns 1 and 2 (that model the variation in the level of employment protection), the coefficient for the CPI drops dramatically in the above median subsamples (Columns 4 and 6), which account for the relative strength of labor bargaining power (e.g., low versus high level of trade unions and low versus high level of union membership). As discussed further in Section 7, this could suggest that competition policy may be more important in environments characterized by limited labor protection and labor bargaining power.

6. SENSITIVITY ANALYSIS

The results of testing the baseline model using an IV approach are contained in Appendix A.1, next to several sensitivity tests. We summarize here the main tests and their results: IV, CPI sensitivity, sample sensitivity, clustering, and modelling the error term's structure.

First, we applied an IV model to control for endogeneity as a direct consequence of potential omitted variable bias, for the main results in Tables 3 and 4. We followed a similar approach to that of Buccirossi et al. (2013) and used as an instrument the average of the CPI in neighboring countries. The logic is straightforward: while it is likely that competition policy in each country may be influenced by the policy of neighboring countries over time, there is no reason to believe that the latter should substantially affect the labor share dynamics of a neighboring country (especially in the studied period, where the global convergence of competition law and markets was only beginning). Results are confirmed and provide us with further reassurance about the validity of the main analysis (Table A4).

Second, the aggregate CPI is constructed according to the discretionary weights chosen by Buccirossi et al. (2011) which might affect our overall estimation in a systematic manner. We therefore re-ran the baseline model using one of the alternative weighting schemes for the CPI, which implements a factor analysis. Our results are confirmed (Table A5).

Third, to address the risk that potential outliers might be skewing our results, we ran sample sensitivity tests by removing four pairs of country observations (keeping 10 countries in our data). For historical-development reasons, we removed Hungary and the Czech Republic on the basis that they were in the process of transitioning toward market-based economy in the period we examine (1995–2005) and thus might bias our estimation upward. Similarly, we removed the top CPI values in our sample (treating them as outliers), that are associated with Sweden and the United States, both highly developed economies at the time. The results are consistent with the main findings and presented in the Appendix (Tables A8 and A9).

As described above, to test whether our results hold using other estimates of the labor share we ran our baseline model (in Table 2) excluding the United States and Canada (Table A10) and again without Japan and the Netherlands (Table A11). Our results are confirmed when we exclude these countries. The exclusion of the United States and Canada from our sample shows that our findings are not affected by the cross-country labor share estimation issues identified in Gutiérrez and Piton (2020). The exclusion of the Netherlands and Japan serves to test the possible difference between our measures of competitive margins and the markups extracted by Schreyer and Zinni (2020), which as shown in Figure A1 (in the Appendix) are mostly similar except for these two countries.

dictate the interventions of competition authorities). However, reverse causality effect under this modeling choice is not likely to distort our estimation as policy tends to respond slowly and surely not in advance. We also run the IV-2SLS model and results (available upon request) are confirmed both in size and in statistical significance.

Finally, we presented our results based on specific assumptions about fixed effects and the error term structure based on previous work and standard practice. However, to test the robustness of our findings, we checked whether they are sensitive to the types of individual effects, the type of clustering, and an alternative structure of the error term (see Table A13). Therefore, we re-run the model by clustering at different levels of aggregation and by controlling for different fixed effects. Moreover, as the choice of the error term structure might still appear subjective, we re-run the OLS model by shaping the error term structure as an AR(1) model. Results are confirmed, both in size and statistical significance. This additional set of results further validates our analysis.

7. POLICY IMPLICATIONS

Our results suggest that the effectiveness of competition policy, as measured by the CPI, is positively associated with the labor share. These results hold over several specifications, using fixed effects, IV, and interaction models. Several points can be made about these results.

First, our findings support and expand on the conclusions of previous studies (Affeldt et al. 2021), by introducing another factor that can help explain changes in the labor share, and its association with changes in market power. Our results imply that the effectiveness competition policy (as measured by the CPI) may have contributed to the rise of the labor share observed in some countries in our sample, and therefore the ineffectiveness of competition policy could have had the opposite effects (i.e., suggesting a decline in competition and the labor share).

Second, our results suggest that the specific characteristics of a country's competition policy (i.e., the scope of competition law [as measured by the CLI] and the text of competition law in a jurisdiction) matter, and reinforce the positive link between the competition policy and the labor share. In addition, our results suggest that choices about whether to model a country's competition law on the EU or US text can have potential implications. These findings connect to the comparative literature on US antitrust, institutional differences, and appetite for intervention in the US, relative to EU competition law model (Zac 2022).

Third, the results highlight the importance of accounting for a range of local factors, particularly laws and institutions which shape and condition the levels of labor protection and labor bargaining power, when investigating changes in the labor share. The interaction between competition policy (which focuses on the product market prices), labor policies, and institutions (labor bargaining power and wage setting) illustrates how these forces jointly contribute to the competitive environment, labor market outcomes, and macroeconomic trends. When strong labor institutions are in place, they help compensate for limitations in competition policy, as employees can use their bargaining power in labor markets to demand higher wages. However, where the bargaining power of labor is weak, or there are inadequate employment protections, this provides scope for firms with market power to increase profits and markups by lowering wages, and the task falls to competition policy alone to constrain the implications of market power. In the context of inequality, this suggests that competition policy will have a greater role to play in reducing economic inequality in jurisdictions with weak labor laws or limited labor bargaining power.

While our results provide new insights into the factors that may have contributed to changes in the labor share in some jurisdictions, there are three main caveats to our analysis which should be borne in mind. First, the results only cover a single decade (1995–2005). While they are corroborated with other studies in that time horizon (Affeldt et al. 2021), we cannot exclude the possibility that relationship between competition policy and the labor

share we have investigated changed after 2005. Second, while we consider the CPI to provide the most suitable available metric to measure competition policy (Ezrachi et al. 2022) we recognize that competition policy is, in fact, not merely a corrective tool for markets but, at the same time, it may shape or correlate with the quality of economic institutions in general (e.g. central banks). Such factors could act as omitted confounders if they are also connected with economic performance and labor market outcomes (Hartmann et al. 2017; Gutiérrez and Philippon 2020). Third, our analysis is based on aggregated industry data which do not allow us to account for labor shares among firms within the same industry. Recent studies by De Loecker et al. (2020) and Song et al. (2019) suggest that re-allocation between firms of markups and profits is key to understanding aggregated trends, suggesting more studies are needed to inform policy in this area.

8. CONCLUSIONS

We find that more effective competition policies, as measured by the CPI, were statistically associated with higher labor shares at country–industry level in 12 OECD sample of economies during the period 1995–2005. By focusing on how competition policy interacts with the labor share, our findings supplement existing work on the relationship between markups and the labor share. This positive relationship between competition policy and the labor share is robust to several econometric specifications, using IVs methods and sensitivity tests, while controlling for the standard confounders identified in previous studies.

Competition policy appears to be more strongly positively associated with the labor share in sectors not subject to heavy or sector-specific regulatory oversight (manufacturing sector versus services sector). In addition, the link between competition policy and the labor share is stronger in countries with a broader scope of the competition law, and countries that use an EU text of competition law. Finally, we find evidence that competition policy is negatively correlated with competitive margins and that the effects of competition law are reinforced when labor protection is weaker. Our findings contribute to studies that seek to better understand the observed changes in labor share, by identifying the effectiveness of competition policy as a relevant "local" factor that could explain some of the differences between developed countries, and some of the apparent inconsistencies in debates about the causes of the decline of the labor share.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Journal of Law, Economics, & Organization* online.

Conflict of interest statement. None declared.

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APPENDIX

This appendix comprise two sections. Section A includes the main extensions to our analysis such as the instrumental variable (IV) model and the standardizing betas. Section B includes sensitivity testing. Tables A1–A3 are elaborations of the tables in the main text.

Table A1. Description of the 22 ISIC industries.

ISIC code	Description
1	Agriculture, hunting, and forestry and fishing
2	Mining and quarrying
3	Manufacture of food products and beverages
	Manufacture of tobacco products
4	Manufacture of textiles
	Manufacture of wearing apparel; dressing and dyeing of fur
	Tanning and dressing of leather, manufacture of luggage, handbags, saddlery, harness, and footwear
5	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
6	Manufacture of paper and paper products
	Publishing, printing, and reproduction of recorded media
7	Manufacture of coke, refined petroleum products, and nuclear fuel
8	Manufacture of chemicals and chemical products
9	Manufacture of rubber and plastics products
10	Manufacture of other non-metallic mineral products
11	Manufacture of basic metals
	Manufacture of fabricated metal products, except machinery and equipment
12	Manufacture of furniture; manufacturing n.e.c.
13	Manufacture of office, accounting, and computing machinery
	Manufacture of electrical machinery and apparatus n.e.c.
	Manufacture of radio, television, and communication equipment and apparatus
	Manufacture of medical, precision and optical instruments, watches, and clocks
14	Manufacture of motor vehicles, trailers, and semi-trailers
	Manufacture of other transport equipment
15	Manufacture of furniture; manufacturing n.e.c.;
	Recycling
16	Electricity, gas, steam, and hot water supply
	Collection, purification, and distribution of water
17	Construction
18	Hotels and restaurants
19	Land transport; transport via pipelines; water transport; air transport
	Supporting and auxiliary transport activities; activities of travel agencies
20	Post and telecommunications
21	Financial intermediation, except insurance and pension funding
	Insurance and pension funding, except compulsory social security
	Activities auxiliary to financial intermediation
22	Renting of machinery and equipment without operator and of personal and household goods
	Computer and related activities
	Research and development
	Other business activities

Table A2. Description of variables.

Variable	Description	Source
	Legal	
CPI	Competition policy index (scale 0–1, from worst to best)	Buccirossi et al. (2013)
prod_mkt_reg	Product market regulation (scale 0–6, from more to less competitive friendly regulation)	OECD
empl.protec	Employment protection Index (scale 0–6, from less to stricter labor market regulation)	OECD
t.union	Trade union density	OECD
union m.	Union members (% in industry)	OECD
labour share	Labor share (gross tot. labor compensation/gross Tot.V.A.)	EU-KLEMS/GGDC
	Economic	
tradelib	Trade openness (industry import/country-industry VA)	OECD-STAN
ind trend	Industry trend (actual industry production−predicted level of production)	Buccirossi et al. (2013)
wagegrowth	Compensation growth rate	EU-KLEMS
HHS	Share of high skilled	EU-KLEMS
HMS	Share of medium skilled	EU-KLEMS
R&D	R&D intensity (R&D expenditure/VA)	EU-KLEMS and OECD-ANBERD
log_va	Value added (logs)	Buccirossi et al. (2013)
comp_margins	Competition proxy (value add/labour cost + capital costs)	Buccirossi et al. (2013)

Table A3. Main results full table.

	Labor share							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CPI_{t-1}	0.185**	0.184**	0.181**	0.159**	0.159***	0.174**	0.187**	0.158*
	(0.068)	(0.069)	(0.069)	(0.063)	(0.048)	(0.068)	(0.071)	(0.077)
$tradelib_{t-1}$		−0.003	−0.003	0.003	0.003	0.003	0.003	0.003
		(0.009)	(0.009)	(0.009)	(0.009)	(0.012)	(0.012)	(0.012)
ind_trend			−0.058***	−0.065***	−0.069***	−0.091***	−0.091***	−0.091***
			(0.008)	(0.008)	(0.010)	(0.011)	(0.011)	(0.011)
$wagegrowth_{t-1}$				0.103***	0.103***	0.114***	0.116***	0.114***
				(0.025)	(0.024)	(0.028)	(0.027)	(0.027)
HHS_{t-1}					0.390*	0.428*	0.452*	0.466**
					(0.198)	(0.212)	(0.204)	(0.205)
HMS_{t-1}					0.192	0.120	0.121	0.130
					(0.134)	(0.108)	(0.099)	(0.105)
$R\&D_{t-1}$						0.286	0.282	0.275
						(0.189)	(0.192)	(0.192)
$prod\_mkt\_reg_{t-1}$							−0.014	−0.014
							(0.017)	(0.017)
$empl\_protec_{t-1}$								0.044
								(0.084)
_cons	0.453***	0.723***	0.546***	0.930***	0.699***	0.352***	0.378***	0.280
	(0.034)	(0.034)	(0.120)	(0.044)	(0.152)	(0.036)	(0.052)	(0.342)
Obs.	2244	2244	2244	1958	1958	1649	1649	1649
Adj. R^2	0.919	0.919	0.919	0.922	0.923	0.919	0.919	0.919
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index lagged by 1 year. The set of controls include: a proxy for import penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg), the employment protection index (empl_protec). Clustered standard errors by country in parenthesis.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

APPENDIX A: EXTENSIONS

A.1 Endogeneity and omitted variable bias: labor share and CPI

We apply an IV model to control for endogeneity as a direct consequence of potential omitted variable bias. An IV is valid when it: (i) is uncorrelated with the error term (exogeneity); (ii) is correlated with the regressor of interest, namely the CPI in our case (relevance); and (iii) does not exert a direct effect on the dependent variable or it is excluded in the structural form (exclusion).

We follow a similar approach to that of Buccirossi et al. (2013) and use as an instrument the average of the CPI in neighboring countries, CPI_G. The logic is straightforward: while it is likely that competition policy in each country may be influenced by the policy of neighboring countries over time, there is no reason to believe that the latter should substantially affect the labor share dynamics of a neighboring country (especially in the studied period, where the global convergence of competition law and markets was only beginning). Results are confirmed and provide us with further reassurance about the validity of the main analysis.

While for historical reasons and similar institutional development, we might expect a positive correlation between the CPI in a given country and the average policy in similar/neighboring

Table A4. IV model with CPI_G as single instrument.

	IV Labor share	First-stage CPI
CPI_{t-1}	0.163***	
	(0.045)	
CPI_G_{t-1}		−5.318***
		(0.188)
$tradelib_{t-1}$	0.003	0.00
	(0.009)	(0.002)
ind_trend	−0.091***	0.015
	(0.023)	(0.024)
$wagegrowth_{t-1}$	0.114***	−0.007
	(0.034)	(0.009)
HHS_{t-1}	0.429***	0.22***
	(0.138)	(0.057)
HMS_{t-1}	0.118	0.01
	(0.094)	(0.05)
$R\&D_{t-1}$	0.29	−0.007
	(0.309)	(0.032)
_cons	0.122	2.805***
	(0.094)	(0.127)
Obs.	1649	1705
R-squared	0.93	0.94
Year FE	Yes	Yes
Country-industry FE	Yes	Yes
Instrument	CPI_G	
First-stage *F*-test	108.31	
Kleibergen–Paap Wald *F*-stat.	3494	
Wu–Hausman test	0.34	

Notes: CPI_{t-1} is the competition policy index lagged by one year. CPI_G_{t-1} is the average competition policy index in neighboring countries, lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg). Clustered standard errors by country in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

countries, this intuition is not confirmed in our model (see the first-stage regression). Indeed, it is not a priori clear whether these policies should be expected to positively correlate for the entire sample period.[26] Table A4 reports the first and the second stage of the IV and the coefficient of the CPI is similar to one obtained in the main results (Table 2).

A.2 Model with standardized coefficients

To better compare the magnitude of the impact among variables in a "unitless" way, we ran the baseline model (see specification 7 in Table A3) by standardizing the betas, as shown in Table A5. *βStdX* refers to the standardization of the independent variables only, while *βStdXY* presents the betas if the dependent variable is also standardized. One SD change in the CPI is associated with an increase of 0.087 SD in the labor share. In both types of the model (partially or fully standardized) the magnitude of the effect of the CPI is lower than other statistically

[26] We divide the sample between EU versus non-EU (United States, Japan, Canada) and we use as instrument in a country the average CPI value of all the other countries belonging to the same group (e.g., for Canada the CPI_G will be the CPI average of United States and Japan). Note that the CPI here measures the country-individual laws and enforcement and not the EU level regulation which is a shared legal system among EU countries.

Table A5. Standardized betas: baseline model.

Variables	*p*-value	*βStdX*	*βStdXY*	*St DevX*
$tradelib_{t-1}$	0.796	0.006	0.031	2.011
ind_trend	0.000	−0.039	−0.204	0.434
$wagegrowth_{t-1}$	0.000	0.009	0.044	0.075
HHS_{t-1}	0.044	0.036	0.184	0.083
HMS_{t-1}	0.269	0.018	0.093	0.151
$R\&D_{t-1}$	0.129	0.019	0.098	0.066
CPI_{t-1}	0.011	0.017	0.087	0.097

Notes: CPI_{t-1} is the competition policy index lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D).

significant controls, such as the high skilled human capital (HHS) or R&D, even though the last one is not statistically significant. However, the effect of the CPI is higher than the effect of trade liberalization, and broadly similar to that of medium skilled workers (HMS) and R&D.

A.3 Alternative CPI index and disaggregated components of the CPI

This section presents the set of findings by using an alternative weighting scheme for the competition policy index (CPI_FA). The CPI index we used in the main analysis was created by Buccirossi et al. (2013) who constructed it by assigning arbitrary (equal) weights to the CPI's features and sub-indices. We want to test whether our results remain consistent if we use an alternative CPI_FA index (created by Buccirossi et al. (2013) as well) which implements the factor analysis and overcomes the problem of exerting too much discretion in choosing the weights to assign while constructing the index. Table A6 reports the results, which appear to be similar, in both size and statistical significance (0.165***), to the main estimates presented in Table 2.

We also disaggregate the CPI into its subcomponents and run the baseline model to see whether heterogeneous effects emerge. Table A7 reports the set of findings. Interestingly, the CPI_institutions and the CPI_mergers are the subcomponents that seem to be more strongly correlated with the labor share (both in size and statistical significance). However, the CPI_enforcement is not statistically significant. This suggests that the main drivers of the effect of competition policy on the labor share are the institutional component and merger policy. These findings are consistent with Gutiérrez and Philippon (2018) and Affeldt et al. (2021).

Table A6. Labor share and CPI FA-factor analysis.

Labor share							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
CPI_FA_{t-1}	0.181***	0.181***	0.18***	0.147***	0.136***	0.166***	0.18***
	(0.036)	(0.036)	(0.036)	(0.037)	(0.03)	(0.035)	(0.042)
$tradelib_{t-1}$		−0.003	−0.003	0.003	0.003	0.003	0.003
		(0.009)	(0.009)	(0.009)	(0.009)	(0.012)	(0.012)
ind_trend			−0.061***	−0.068***	−0.072***	−0.091***	−0.091***
			(0.008)	(0.008)	(0.01)	(0.011)	(0.01)
$wagegrowth_{t-1}$				0.099***	0.099***	0.11***	0.111***
				(0.025)	(0.024)	(0.028)	(0.026)
HHS_{t-1}					0.328	0.355	0.376*
					(0.205)	(0.212)	(0.205)
HMS_{t-1}					0.159	0.079	0.076
					(0.135)	(0.109)	(0.099)
$R\&D_{t-1}$						0.291	0.287
						(0.188)	(0.193)
$Prod\_mkt\_reg_{t-1}$							−0.016
							(0.017)
_cons	0.445***	0.715***	0.538***	0.936***	0.748***	0.351***	0.38***
	(0.018)	(0.018)	(0.11)	(0.035)	(0.145)	(0.022)	(0.04)
Obs.	2244	2244	2244	1958	1958	1649	1649
Adj. R^2	0.929	0.929	0.93	0.932	0.933	0.93	0.93
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_FA_{t-1} is the competition policy index obtained with the factor analysis, lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg). Clustered standard errors by country in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A7. OLS model with disaggregated CPI components.

Labor share				
	(1)	**(2)**	**(3)**	**(4)**
$tradelib_{t-1}$	−0.008	0.002	0.003	0.003
	(0.009)	(0.012)	(0.012)	(0.012)
ind_trend	−0.093***	−0.091***	−0.091***	−0.091***
	(0.012)	(0.01)	(0.012)	(0.01)
$wagegrowth_{t-1}$	0.107***	0.112***	0.114***	0.111***
	(0.028)	(0.028)	(0.028)	(0.028)
HHS_{t-1}	0.258	0.474	0.425*	0.448*
	(0.197)	(0.288)	(0.213)	(0.213)
HMS_{t-1}	0.038	0.114	0.116	0.12
	(0.114)	(0.149)	(0.115)	(0.097)
$R\&D_{t-1}$	0.304	0.336	0.293	0.284
	(0.185)	(0.193)	(0.187)	(0.191)
CPI_inst_{t-1}	0.175***			
	(0.032)			
CPI_enf_{t-1}		0.03		
		(0.045)		
$CPI\_antitrust_{t-1}$			0.152*	
			(0.074)	
$CPI\_mergers_{t-1}$				0.187***
				(0.048)
_cons	1.011***	0.408***	0.362***	0.339***
	(0.114)	(0.031)	(0.039)	(0.029)
Obs.	1797	1649	1649	1649
Adj. R^2	0.919	0.918	0.919	0.919
Year FE	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index lagged by one year in its disaggregated components: CPI_inst_{t-1}, CPI_enf_{t-1}, $CPI\_antitrust_{t-1}$, $CPI\_mergers_{t-1}$. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg). Clustered standard errors by country in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

APPENDIX B: SENSITIVITY

B.1 Sample composition and outliers

To check the sensitivity of our results to the sample selection, we run the model by excluding countries that, for different reasons, might be considered as outliers.[27] In Table A8, we exclude two former Communist economies Hungary and Czech Republic, that experienced different economic and market development process. This might have influenced the labor share dynamics and the quality of the competition law enforcement. However, even excluding these countries our baseline results still hold and are not dissimilar from the main analysis reported in Table 2. We also run the analysis by excluding the United States and Sweden, to check whether the overall results are being affected by the high CPI values. Table A9 reports the findings and shows that the coefficient associated to the CPI is even greater in size (0.21***, Column 6).

[27] For the sake of brevity, we only report the first set of results between the labor share and the CPI, but complete results are available upon request (including the 2SLS, the interaction model, and the model with the competitive margins). In all cases, findings are similar to the ones reported in the main analysis.

Table A8. Labor share and CPI excluding Hungary and Czech Republic.

Labor share								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CPI_{t-1}	0.205**	0.204**	0.201**	0.169**	0.165**	0.182**	0.191**	0.138
	(0.074)	(0.076)	(0.077)	(0.073)	(0.053)	(0.071)	(0.069)	(0.075)
$tradelib_{t-1}$		−0.003	−0.003	0.001	−0.000	−0.002	−0.002	−0.002
		(0.006)	(0.006)	(0.005)	(0.005)	(0.009)	(0.009)	(0.009)
ind_trend			−0.05***	−0.06***	−0.066***	−0.085***	−0.085***	−0.08***
			(0.005)	(0.006)	(0.008)	(0.005)	(0.005)	(0.005)
$wagegrowth_{t-1}$				0.079**	0.086**	0.081**	0.081**	0.078**
				(0.031)	(0.034)	(0.028)	(0.029)	(0.029)
HHS_{t-1}					0.560**	0.633***	0.642***	0.676***
					(0.169)	(0.167)	(0.153)	(0.15)
HMS_{t-1}					0.291**	0.180	0.178	0.196
					(0.118)	(0.104)	(0.099)	(0.109)
$R\&D_{t-1}$						0.340	0.336	0.326
						(0.203)	(0.208)	(0.206)
$Prod\_mkt\_reg_{t-1}$							−0.011	−0.009
							(0.032)	(0.032)
$empl\_prot_{t-1}$								0.071
								(0.09)
_cons	0.70***	0.35***	0.52***	0.52***	0.34***	0.34***	0.36***	0.413
	(0.037)	(0.028)	(0.087)	(0.083)	(0.031)	(0.039)	(0.086)	(0.366)
Obs.	1804	1804	1804	1562	1562	1284	1284	1284
Adj. R^2	0.933	0.933	0.933	0.934	0.935	0.931	0.931	0.931
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index, lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg). Clustered standard errors by country in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In Table A10, we report the baseline results by excluding United States and Canada. The decision to exclude these observations is based on the findings of Gutiérrez and Piton (2020), who, after adjusting for the share of self-employed and for housing residential assets, found a downward trend in the labor share only in the United States and Canada. To test whether our results are only driven by the inclusion of these two countries we run the analysis excluding the United States and Canada. Our results show that the coefficients remain very similar in size and statistical significance, albeit at a lower level of significance (10% level).

As discussed in Section 5, we use a proxy for competition margins to study the interaction between competition policy and labor protection. As already explained, in doing so we follow the approach of Griffith et al. (2007) and Buccirossi et al. (2013). While we are aware of other proxies and empirical methods for estimating market power, we believe this choice is appropriate for the purposes of our analysis which is to investigate whether there is a link between competition policy and the labor share.[28]

[28] As an alternative we could have measured markups by relying on the EUKLEMS data. However, this would have restricted our analysis to the manufacturing sector only. This would have severely limited our analysis, as one of our main findings is the existence of heterogeneous effects of the CPI depending on the type of industry (manufacturing versus services). Hence, we decided in favor of using the competitive margins proxy, which allows us to include each industry in our analysis.

Table A9. Labor share and CPI excluding United States and Sweden.

	Labor share							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CPI_{t-1}	0.23***	0.23***	0.22***	0.19***	0.19***	0.21***	0.23**	0.17*
	(0.06)	(0.057)	(0.059)	(0.057)	(0.052)	(0.062)	(0.072)	(0.076)
$tradelib_{t-1}$		0.001	0.001	0.008	0.007	0.008	0.01	0.008
		(0.012)	(0.012)	(0.011)	(0.011)	(0.013)	(0.013)	(0.013)
ind_trend			−0.06***	−0.06***	−0.06***	−0.08***	−0.08***	−0.08***
			(0.008)	(0.009)	(0.011)	(0.014)	(0.014)	(0.013)
$wagegrowth_{t-1}$				0.10***	0.103***	0.12***	0.123***	0.12***
				(0.025)	(0.024)	(0.027)	(0.024)	(0.025)
HHS_{t-1}					0.156	0.174	0.212	0.20
					(0.179)	(0.237)	(0.234)	(0.232)
HMS_{t-1}					0.17	0.067	0.081	0.073
					(0.175)	(0.118)	(0.116)	(0.11)
$R\&D_{t-1}$						1.009*	1.03*	1.012*
						(0.467)	(0.467)	(0.465)
$Prod\_mkt\_reg_{t-1}$							−0.018	−0.02
							(0.025)	(0.027)
$empl\_prot_{t-1}$								0.12*
								(0.057)
_cons	0.44***	0.44***	0.47***	0.43**	0.35***	0.98***	0.99***	0.82***
	(0.02)	(0.016)	(0.143)	(0.145)	(0.038)	(0.158)	(0.153)	(0.139)
Obs.	1804	1804	1804	1562	1562	1334	1334	1334
Adj. R^2	0.926	0.926	0.927	0.932	0.932	0.933	0.933	0.933
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index, lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg), the employment protection index (empl_protec). Clustered standard errors by country in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

As seen in Figure 3 of the main text, for most of the countries (e.g., United Kingdom and France), the markup proxy and our proxy are very similar. To confirm that they are comparable measures we inspected any divergences over time, especially for Japan and Netherlands (see Figure A1). The sample correlation for our full sample is 0.40***, but when we remove these two countries, it jumps to 0.70***. We therefore run the reduced model (CPI and competitive margins) analysis by removing Japan and Netherlands (for which we have the highest divergence between the proxies) and report the results in Table A11. We found coefficients that are bigger in size and statistically significant for the reduced model. However, we treat these estimates with caution as the size of the subsamples below and above the median is very unequal in most cases. Nevertheless, we still find similar qualitative heterogeneous effects, by accounting for different labor market regulation settings (Table A11).

Table A10. Labor share and CPI excluding United States and Canada.

	Labor share							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CPI_{t-1}	0.17**	0.17**	0.166*	0.142*	0.144**	0.157*	0.166*	0.141
	(0.072)	(0.073)	(0.073)	(0.066)	(0.055)	(0.073)	(0.086)	(0.1)
$tradelib_{t-1}$		−0.00	−0.003	0.004	0.003	0.002	0.003	0.002
		(0.01)	(0.01)	(0.009)	(0.009)	(0.012)	(0.012)	(0.012)
ind_trend			−0.06***	−0.07***	−0.07***	−0.09***	−0.09***	−0.09***
			(0.009)	(0.009)	(0.012)	(0.012)	(0.012)	(0.012)
$wagegrowth_{t-1}$				0.12***	0.12***	0.13***	0.13***	0.13***
				(0.026)	(0.025)	(0.027)	(0.024)	(0.025)
HHS_{t-1}					0.348	0.393	0.411	0.422
					(0.226)	(0.243)	(0.252)	(0.25)
HMS_{t-1}					0.141	0.064	0.072	0.077
					(0.158)	(0.115)	(0.118)	(0.119)
$R\&D_{t-1}$						0.45**	0.45**	0.44**
						(0.173)	(0.173)	(0.167)
$Prod\_mkt\_reg_{t-1}$							−0.007	−0.006
							(0.026)	(0.026)
$empl\_prot_{t-1}$								0.035
								(0.082)
_cons	0.66***	0.46***	0.55***	0.95***	0.76***	0.36***	0.37***	0.37
	(0.021)	(0.021)	(0.126)	(0.046)	(0.182)	(0.039)	(0.057)	(0.336)
Obs.	1914	1914	1914	1760	1760	1495	1495	1495
Adj. R^2	0.914	0.914	0.914	0.919	0.919	0.916	0.916	0.916
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index, lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg), the employment protection index (empl_protec). Clustered standard errors by country in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

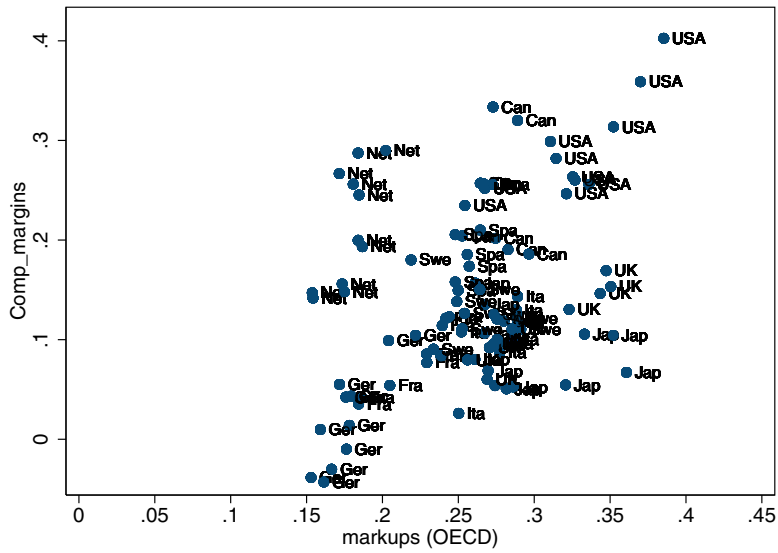

Figure A1. Scatterplot between competitive margins proxy and OECD national markups from Schreyer and Zinni (2020). The graph displays two market power proxies (competitive margins (*y*-axis) versus markups (*x*-axis) Schreyer and Zinni (2020)) and allows us to identify two possible outliners: Netherlands (where the competitive margins are higher than markups) and Japan (where the opposite is observed). For some countries (Hungary, Czech Republic), the markups by Schreyer and Zinni (2020) are not calculated.

Table A11. Competitive margins and the CPI excluding Netherlands and Japan.

Comp_margins (log)						
	(1) Below emp.prot	**(2) above emp.prot**	**(3) Below t. union**	**(4) above t. union**	**(5) Below union m.**	**(6) above union m.**
CPI_{t-1}	−0.893***	−0.414**	−2.047***	−0.199**	−1.326***	−0.344***
	(0.154)	(0.186)	(0.288)	(0.08)	(0.218)	(0.059)
$tradelib_{t-1}$	0.042**	0.003	−0.004	0.015	−0.001	0.04***
	(0.017)	(0.01)	(0.01)	(0.011)	(0.011)	(0.008)
$R\&D_{t-1}$	−0.074	0.333*	0.391*	−0.069	0.106	0.183
	(0.41)	(0.194)	(0.206)	(0.181)	(0.221)	(0.185)
$Prod\_mkt\_reg_{t-1}$	4.949***	0.466***	−0.023	0.15***	0.164***	0.057**
	(0.498)	(0.038)	(0.039)	(0.039)	(0.054)	(0.026)
log_va	0.364***	0.73***	0.704***	0.699***	0.784***	0.558***
	(0.055)	(0.029)	(0.028)	(0.032)	(0.036)	(0.022)
_cons	−8.648***	−6.269***	−5.856***	−6.789***	−9.597***	−4.509***
	(0.997)	(0.292)	(0.375)	(0.307)	(0.534)	(0.175)
Obs.	449	777	475	718	498	695
Adj. R^2	0.761	0.782	0.926	0.836	0.779	0.92
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index lagged by one year. The set of controls include: as a proxy for import penetration (tradelib), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg), the country-industry value added in log (log_va). The dependent variables are the employment protection (empl_protec), trade union density (t_union), number of union members (union_m). Robust standard errors in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

B.2 Profit share, CPI, and labor market regulation

Table A12 replicates the analysis reported in Table 4, in the article, but using a measure of "profit share" instead of the competitive margins as dependent variable.[29] Specifically, profit share is defined as:

$$\text{Profit share}_{i,j,t} = 1 - \frac{\text{Labor Costs}_{i,j,t} + \text{Capital Costs}_{i,j,t}}{\text{Value Added}_{i,j,y}}. \quad (3)$$

The magnitude, the size, and the pattern across the subsamples (below and above the labor market regulation) in the main analysis are confirmed, strengthening our confidence in our results and in the role of competition policy in limiting market distortions in the presence of weaker labor market regulation.

Table A12. Profit share and the CPI.

	(1)	(2)	(3)	(4)	(5)	(6)
			Profit share			
	Below emp.prot	Above emp.prot	Below t. union	Above t. union	Below union m.	Above union m.
CPI_{t-1}	−0.358***	−0.682***	−0.755***	−0.152**	−0.677***	−0.328***
	(0.089)	(0.119)	(0.143)	(0.063)	(0.137)	(0.05)
$tradelib_{t-1}$	−0.007	−0.012	−0.018*	0.017**	−0.026**	0.021***
	(0.008)	(0.009)	(0.01)	(0.008)	(0.011)	(0.005)
$R\&D_{t-1}$	0.117	0.488**	0.343	−0.107	0.338	0.085
	(0.24)	(0.197)	(0.266)	(0.144)	(0.219)	(0.152)
$Prod\_mkt\_reg_{t-1}$	0.221***	0.346***	−0.134***	0.089***	0.213***	0.012
	(0.079)	(0.031)	(0.044)	(0.031)	(0.037)	(0.023)
log_va	0.133***	0.791***	0.638***	0.629***	0.883***	0.437***
	(0.026)	(0.028)	(0.028)	(0.026)	(0.033)	(0.016)
_cons	−1.984***	−7.11***	−9.984***	−6.32***	−6.93***	−3.202***
	(0.419)	(0.289)	(0.479)	(0.245)	(0.296)	(0.149)
Obs.	624	916	788	718	637	869
R-squared	0.908	0.806	0.9	0.876	0.81	0.948
Adj. R^2	0.889	0.774	0.874	0.852	0.763	0.941
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: CPI_{t-1} is the competition policy index lagged by one year. The set of controls include: as a proxy for import penetration (tradelib), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg), the country-indsutry value added in log (log_va). The dependent variables are the employment protection (empl_protec), trade union density (t_union), number of union members (union_m). Robust standard errors in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[29] The analysis of the profit shares is based on the useful comments and suggestions of one of the reviewers of the article.

B.3 Alternative model assumptions

Our analysis relies on some sets of assumptions with respect to (i) the type of errors' clustering (at country level in the baseline model), (ii) the types of individual effects (country-industry FE and time FE), and (iii) the structure of the error terms (see Equation (1) in the article). However, some of these assumptions might be subjective and based on a certain degree of discretion. Hence, we want to test the robustness and consistency of our findings, by relaxing some of these assumptions and be further reassured on the consistency of our analysis. Results are reported in Table A13.

We first re-run the benchmark model with OLS, by clustering this time at industry level (rather than at country level) allowing for spillovers effects within sectors across countries (Column 1), and then clustering at country-industry level, controlling for different and separate sets of fixed effects (year, country, and industry FE), as reported in Column 2.

We also include in Column 3 both country-time FE and industry-time FE, to make sure to identify plausibly exogenous shifts in the CPI and not merely picking-up heterogeneous time

Table A13. Labor share and the CLI alternative models.

Labour_share					
	(1) OLS	**(2) OLS**	**(3) OLS**	**(4) OLS**	**(5) OLS**
CPI_{t-1}	0.174***	0.158**	0.401***	0.13***	0.126**
	(0.045)	(0.068)	(0.053)	(0.051)	(0.05)
$tradelib_{t-1}$	0.003	0.024***	0.025***	0.014***	0.006
	(0.017)	(0.007)	(0.007)	(0.003)	(0.004)
ind_trend	−0.091**	0.011	0.014	−0.045**	−0.112***
	(0.042)	(0.034)	(0.01)	(0.021)	(0.036)
$wagegrowth_{t-1}$	0.114***	−0.003	−0.051	0.046**	0.049**
	(0.038)	(0.058)	(0.081)	(0.022)	(0.021)
HHS_{t-1}	0.428*	−0.218	−0.221	0.138	0.34**
	(0.208)	(0.145)	(0.229)	(0.113)	(0.148)
HMS_{t-1}	0.12	0.316**	0.309**	0.147	0.124
	(0.139)	(0.139)	(0.106)	(0.094)	(0.114)
$R\&D_{t-1}$	0.286**	0.572***	0.606*	0.274***	0.251**
	(0.125)	(0.188)	(0.303)	(0.098)	(0.114)
_cons	0.352***	0.311***	0.138	0.438***	0.187
	(0.031)	(0.119)	(0.083)	(0.088)	(0.12)
Obs.	1649	1649	1649	1649	1649
Correlation structure	Cluster (ind)	Cluster (country-ind)	Cluster (country)	AR(1)	AR(1)
Country FE		Fixed	Fixed	Fixed	
Industry FE Industry-within-country FE	Fixed	Fixed	Fixed	Fixed	Fixed
Time FE	Fixed	Fixed		Fixed	Fixed
Country-time FE			Yes		
Industry-time FE			Yes		

Notes: CPI_{t-1} is the competition policy index, lagged by one year. The set of controls include: a proxy for penetration (tradelib), a measure of the deviation over time between the actual industry production and the predicted level of production (ind_trend), the growth rate of the labor compensation (wagegrowth), the share of high skilled workers (HHS); the share of medium skilled workers (HMS), R&D intensity (R&D), the product market regulation index (Prod_mkt_reg). Clustered standard errors by country in parenthesis.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

trends. In doing so, we can better account for country-specific shocks, such as the economic transition and institutional change that some economies might have undergone over the time sample considered in our analysis (such as the Czech Republic and Hungary) and some sector-specific shocks (e.g., the boom of the financial service sector or the oil/gas industry).[30]

Lastly, as reported in Column 4 of Table A13, we decided to focus on the correlation structure of the error term and shape it as an AR(1) component, to account for a possible presence of serial correlation, by also including year, country, and industry fixed effects. Similarly, in Column 5 we impose an AR(1) structure on the errors and control for industry-within-country effects and year fixed effects.

The overall estimates, especially with respect to the CPI, are similar in size and in statistical significance to the OLS estimates of the benchmark analysis reported in the main body of the article. The coefficient of the CPI ranges between 0.126 and 0.40 and is statistically significant at the 1% level.

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[30] We also control for both country and industry FE, to account for the unobserved time-invariant heterogeneity in the model. We also re-run the same model by including each of these heterogeneous trends separately (to rule out the chance of overlapping/propagation from industry to country in specific years), and results are still confirmed.

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