Declining Allocative Efficiency, Falling Labour Shares, and Corporate Lobbying in European Manufacturing*

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Abstract

The concurrent trends of the fall in labour's share of income, rise output market concentration, and rise markups observed in advanced economies are often attributed to a shift of activity toward more productive and lower labour share firms. Using data on around 253,000 manufacturing firms in 17 European economies for the period 2009–2019, we show that the negative relationship between the reallocation components of productivity and labour share growth is driven by country-3-digit-industries with smaller falls in allocative efficiency experiencing greater declines in the same component of their labour share. Matching firm level data from Orbis to information on lobbying in the European Transparency Register, corporate lobbying intensity is shown to be related to the shift of activity toward less productive and lower labour share firms. Using stacked long differences on a system of equations, we show that corporate lobbying is related to lower allocative efficiency growth to a greater extent than to falling labour shares. The timing of the effects suggests that lobbying constructs barriers to competition by first limiting productive shifts before expanding rents through higher markups and lower labour shares. These effects are more pronounced in industries with increasing output concentration where lobbying is also related to exit of more productive firms in the long run. While our estimates are not causal, they are consistent with an environment where corporate lobbying distorts the mapping of productivity to costs required for a welfare positive interpretation of recent trends.

Key Words: Lobbying, Allocative Efficiency, Labour Share
JEL Codes: E25, L1, J3, L4

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1 Introduction

In the past two decades, developed economies have seen a decline in the labour share of income, a rise in product market concentration, increasing markups, and stable or declining aggregate productivity growth.[1] The mechanisms behind these trends have different welfare implications. If rising concentration and increased markups are the result of a few productive firms producing socially valuable goods, these trends reflect a well-functioning market rewarding novel and productive activities while the declining aggregate productivity growth indicates a slump in technological innovation. If, instead, the declining labour share, rise in markups, and increasing concentration trends are driven by rent-seeking behaviour, the welfare impact is more negative as they may distort resource allocation, discourage investment, discourage business dynamism, and limit growth through creative destruction (Decker et al. 2020). Of course, these trends may be driven by a combination of these mechanisms, with more productive firms being rewarded for their productivity initially after which they start to engage in rent-seeking activities. In this paper, we examine the extent to which rent-seeking behaviour by firms through lobbying explains the trends observed in the labour share of income, product market concentration, and productivity growth in Europe over the last decade.

A recent stylized fact is that the falling labour share observed globally is due to the movement of activity towards low labour share firms within sectors and is not driven by sectoral or average within-firm shifts (Autor et al. 2020, Abdih & Danninger 2017, Dimova 2019, Kehrig & Vincent 2021, Lawless & Rehill 2022, Mertens 2022). Autor et al. (2020) propose the superstar firm model as an explanation for these trends, where globalisation and technology push activity towards more profitable firms which, by construction, have a lower labour share of value added and sales. Their mechanism works through the underlying relationship between the productivity distribution, the markup distribution, and product demand elasticities. They propose that since high-productivity firms have lower marginal costs, these firms can have lower prices and higher markups under certain demand systems.[2] Therefore, a shock that causes markets to become tougher, as measured by an increase in the elasticity of demand or a decrease in maximal marginal costs that will allow a firm to survive, will tend to lower the markups, and therefore increase the labour share within firms. However, since high-productivity firms face a lower elasticity of demand they can better adjust to the changing market conditions and therefore capture more of the market. Rising concentration and falling labour shares can therefore be interpreted in a qualitatively positive light, where the market rewards the

[1] A discussion of the evidence for these trends is provided in section 2.

[2] Specifically, demand systems characterised by Marshall's Second Law of Demand, where consumers are more price inelastic at higher levels of consumption and lower prices (Autor et al. 2020, Edmond et al. 2018).

most productive firms and the *winner-takes-most*, or rather the *most-productive-takes-most* (Van Reenen 2018, Autor et al. 2020, CompNet 2020). In summary, increasing concentration, falling labour shares, and rising markups reflect a response to tougher markets forcing the reallocation of resources towards more competitive firms (Autor et al. 2020, Syverson 2019). This interpretation, however, is only consistent in an environment where the mapping of demand elasticities, prices, markups, and productivity are free from distortions. Where firms can charge markups that are in excess of their productivity premium or change the marginal cost structure of their competitors, rent extraction becomes possible so that the impact of reallocation on welfare becomes ambiguous (De Loecker et al. 2021, Berthou et al. 2020).

An alternative interpretation of the coexistence of falling labour shares and increasing concentration focuses on the ability of large firms to extract rents and create barriers to competition (De Loecker et al. 2021, Covarrubias et al. 2020).[3] In this context, De Loecker et al. (2020) discusses the rise of market power of listed US firms as being driven by the reallocation of activity toward high-markup firms. The work of Gutiérrez & Philippon (2018, 2019), Philippon (2019), and Covarrubias et al. (2020) propose that institutional factors, specifically those related to anti-trust, increasing regulation, and corporate lobbying, in constructing barriers to competition which preserve economic rents, discourages innovation, limits knowledge diffusion, and serves to limit creative destruction by creating barriers to entry.

We argue that the slow rates of productivity growth experienced in recent decades are difficult to square with the allocative productivity improvements required if the market is truly rewarding more productive firms as proposed by Autor et al. (2020).[4] Specifically, if total productivity growth is simply the sum of productivity growth within firms and productivity growth due to changes in the allocation of activity, increased concentration due to factors moving towards more productive firms must cause an increase in the latter. If productivity remains stable or declining through the period and positive reallocation is contributing positively to productivity growth, then the productivity growth of the average firm must be low or declining, a trend that is difficult to reconcile with increased information and communications technology (ICT) adoption, the rise of smartphones, the rise of smart technologies, robots, 3D-printing, and the use of big data in supply chain management.[5] Furthermore, there is substantial evidence that the role of allocative efficiency growth has declined in the post-2000 period, casting doubt on the positive interpretation of recent trends.[6]

[3]Gutiérrez & Philippon (2017), for example, find that declining competition in the US can partly explain the low rates of investments.

[4]See Akcigit & Ates (2021), Cette et al. (2021), Andrews et al. (2016), Cette et al. (2016), Decker et al. (2017), and Kim & Loayza (2019) for evidence of declining productivity growth.

[5]Further discussion of these trends is provided in Section 2.

[6]See Bouche et al. (2021), Cette et al. (2016), Goldin et al. (2020), Gutiérrez & Philippon (2019) and Hsieh et al. (2017) for examples. Gutiérrez & Philippon (2019) specifically shows that the contribution of large firms to productivity growth in the US has been essentially zero in recent years.

In this paper, we use firm-level data on the European manufacturing sector to examine the relationship between the reallocative components of changes in productivity and the labour share in the context of differential concentration trends. We use data on around 244,000 unique firms from 17 countries for the period between 2009–2019 from Orbis (2022). The findings of Lawless & Rehill (2022) of modest and varied changes in the labour share of value added in Europe are supported. While consistent evidence that the reallocation component of labour share growth is the most important factor driving labour share trends is not found, it is almost universally the case that this reallocation component is negative or smaller than the within-firm component when positive. That is, the declining portion of labour share is consistently driven by the reallocation of activity towards lower labour share firms as in Autor et al. (2020) and Kehrig & Vincent (2021) and not a fall in the labour share of the average firm. We find mixed or stable concentration trends in European manufacturing for the past decade, consistent with the findings of Bighelli et al. (2021) and Gutiérrez & Philippon (2018). While our results also support the findings of Bighelli et al. (2021) and Autor et al. (2020), that increased concentration is generally correlated with more productive reallocations, our analysis suggests that this relationship is not driven by industries with higher positive allocative efficiency growth also experiencing steeper declines in the labour share. Rather we find that industries with less negative allocative efficiency growth experience smaller shifts towards low labour share firms. That is, there exists a sizeable portion of industries that are experiencing simultaneous declines in reallocation components of labour share and productivity. We further show that the combination of falling labour shares and falling productivity are not consistently correlated with changes in concentration in either direction.

We examine lobbying as an explanation for this apparent paradox and shed light on the role of non-market behaviour by dominant firms in maintaining their status despite being less efficient. We construct a large dataset on lobbying in the EU and link this to the firm-level Orbis data. We show that higher lobbying intensity at the EU level increases the probability that a geo-industry, here defined as a NACE 3-digit industry in a country, experienced both a decline in the labour share through reallocation and declining allocative efficiency over the 2009–2019 period. We also show that lobbying intensity is consistently related to declining allocative efficiency growth to a greater extent than it is related to declining labour shares through reallocation. Lobbying appears to work through constructing barriers to competition by first limiting productive shifts of activity and, in the long run, allowing these firms to become higher-markup and lower labour share firms while increasing in size. While these results are not casual they suggest that lobbying activities in European manufacturing are detrimental to optimal allocations.

We contribute to the literature in three main ways. First, we document mixed evidence of the purely positive welfare interpretation of the Autor et al. (2020) mechanism in the case of European manufacturing, as a substantial portion of sectors experiences a decline in allocative efficiency combined with a reallocation-driven increase in markups and a decline in the labour share. Second, we contribute to the literature on the welfare implications of lobbying, specifically, the hypothesis that lobbying can be welfare-increasing if it favours more productive firms, by providing evidence that it is consistently related to declining allocative efficiency and reallocations to higher markup and low labour share firms (Choi 2021, Wiedemann 2022, Dellis & Sondermann 2017, Bombardini et al. 2021). We provide evidence that lobbying is related to the breakdown of the mapping between productivity and markup required for the *winner-takes-most* interpretation of the superstar model. We show that lobbying works like market toughness in only the labour share (markup) dimension, where lobbying is related to an increase (decrease) in the average component and a fall (rise) in the reallocation component. Lobbying does not, however, promote the movement of activity towards more productive firms and is instead related to a movement of activity toward less productive firms while having no impact on the productivity growth of the average firm. Third, our work contributes to the potential role of lobbying in European dynamism specifically by showing that while absolute expenditures are smaller than in the US, lobbying in Europe is related to the same welfare-reducing incentives as those documented for the US (Gutiérrez & Philippon 2018, 2019, Philippon 2019).

The paper is organised as follows: section 2 reviews the literature and provides further motivation for the empirical analysis; section 3 discusses the stylised facts on lobbying at both the firm and macroeconomic level; section 4 explains the various measures and estimation procedures used in the analysis and provides justification for their choice; section 5 discusses the firm-level manufacturing and lobbying data created for the purpose of this paper; section 6 presents the results; and section 7 concludes.

2 Literature and Motivation

A large body of literature focuses on the decline in the labour share of income over the past 40 years, with arguments about the size of the decline, underlying causes, and consequences abound.[7] The declining labour share is generally found to be due to a shift of economic activity towards low labour share firms and not the decline in the labour share of the average firm (Autor et al. 2020, Song et al. 2019, Lawless & Rehill 2022, Mertens 2022, Kehrig & Vincent 2021). A substantial literature has emerged linking the fall in the labour

[7] See Grossman & Oberfield (2022) for a more detailed general literature review of the evidence regarding the decline in the labour share of income.

share to increasing product market concentration, markups, and productivity (Autor et al. 2020, De Loecker et al. 2020, Gutiérrez & Philippon 2018, Gutiérrez & Piton 2020). It is on the latter point, productivity, where the literature diverges on the implications of these trends for welfare from both a theoretical and an empirical standpoint.

This section discusses the superstar firm model of Autor et al. (2020) as a prominent example of the positive interpretation of the coexistence of these trends. The main predictions and mechanisms of the model are discussed and compared to the empirical literature. The implications of the positive interpretation for productivity growth are then contrasted with trends observed in recent decades. An alternative interpretation of these trends, namely, that their coexistence reflects increasing barriers to competition and rent-seeking activities by dominant firms is then discussed. The subsequent section provides a detailed discussion on the role of lobbying as a rent-seeking activity in explaining these aggregate trends.

In the superstar firm model, globalisation and technological change push output to the most productive firms leading to increases in concentration (Autor et al. 2020). These highly productive firms can produce more output with fewer inputs, implying that even where they employ more workers and pay them higher wages than their less productive competitors, the aggregate labour share will decline (Autor et al. 2020, Song et al. 2019).[8] In this *winner-takes-most* interpretation of the superstar firm model, increasing concentration, rising markups, and declining labour shares reflect a more competitive economy rewarding more productive firms (Covarrubias et al. 2020). The superstar firm model makes several key predictions that have received varied support in the literature. These predictions are that: (i) market toughness will increase sales concentration; (ii) industries with the highest concentration increases will have the largest fall in the labour share;[9] (iii) the fall in the labour share will be driven by a reallocation between firms rather than a fall in the labour share of the average firm;[10] (iv) industries with the highest concentration growth will be those with the highest reallocation driven fall in the labour share;[11] (v) industries with the highest concentration growth will be those with the highest productivity growth;[12] (vi) aggregate markups will rise;[13] and (vii) the coexistence of these trends are global.[14]

[8] Section 4 provides more detail on the relationship between demand elasticities and the productivity distribution.

[9] This result is found in the US by Autor et al. (2020) and in the EU by Autor et al. (2020), Lawless & Rehill (2022).

[10] This result if found for the US by Autor et al. (2020), US manufacturing by Kehrig & Vincent (2021), OECD countries with declining labour shares by Schwellnus et al. (2018), and the EU by Lawless & Rehill (2022).

[11] This result is supported for the US by Autor et al. (2020) and Lawless & Rehill (2022) for the EU.

[12] Autor et al. (2020) find for the US that industries with the highest concentration growth are also those with the highest productivity growth measured by patents per worker, value added per worker and total factor productivity. Bighelli et al. (2021) find for Europe that increasing concentration growth is correlated with increasing productivity.

[13] This result is supported by De Loecker et al. (2020) for the US, but has less substantial support for the EU. Cavalleri et al. (2019) finds limited evidence for increasing markups in France, Germany, Italy, and Spain.

[14] While Lawless & Rehill (2022) and Bighelli et al. (2021) find evidence supporting the superstar firm hypothesis using European firm-level data from Compnet, Gutiérrez & Philippon (2018) and Covarrubias et al. (2020) highlight the fact that Europe has seen significantly more stable concentration and markup trends than the US.

There are a number of complementary studies in the literature that explore the mechanisms that support the *winner-takes-most* interpretation of the superstar firm model. Covarrubias et al. (2020) separates these mechanisms into a technological change component and a product substitution component. The technological change literature generally argues that the decline in the price of investment goods relative to labour allows firms to substitute away from labour (Dao et al. 2019, León-Ledesma & Satchi 2018, Karabarbounis & Neiman 2014).[15] In this context, several authors have noted the role of ICT and automation in the replacement of routine jobs and the decline in the labour share (Autor et al. 2020, Acemoglu & Restrepo 2019, Frank et al. 2019). Automation and ICT technologies are generally found to lead to falls in the labour share while also favouring large firms due to large initial fixed costs and the scale effects of intangible capital (Acemoglu et al. 2020, Koch et al. 2021, Stiebale et al. 2020, Yeaple 2005, Autor et al. 2020, Haskel & Westlake 2017). The labour-saving effect of offshoring is consistently found to favour large firms and can also be interpreted as a technological component (Grossman & Oberfield 2022, Wagner 2011, Egger et al. 2015, Hummels et al. 2018). The product substitution mechanism of Autor et al. (2020) argues that globalisation increases product market competition through firms competing in both larger export markets and import markets. This increase in competition leads to greater substitutability between varieties implying that consumers are more sensitive to the price and quality of products (Covarrubias et al. 2020). Therefore, the only firms that can survive are those that are able to make better products at lower prices: the most productive firms. Kehrig & Vincent (2021) show that the declining labour share in US manufacturing is not driven by firms with initially low labour shares capturing more of the market, but by firms whose labour share fell as they grew. They further note that these firms generally have higher revenue labour productivity and not lower wages. The role of the change in the composition of firms at the frontier in driving falls in the labour share is also supported by Schwellnus et al. (2018) providing further evidence for the *winner-takes-most* interpretation.

Whatever the mechanism, the *winner-takes-most* interpretation of increasing concentration and falling labour shares hinges on the reallocation of activity towards more productive firms. It is this relationship, however, that has less consensus in both the theoretical and empirical literature as total factor productivity growth has been stable or declining in most advanced economies since at least the 2000s (Grossman et al. 2017, Antolin-Diaz et al. 2017, Decker et al. 2017, Kim & Loayza 2019, Cette et al. 2021).[16] As noted in the introduction, productivity growth has been stable so that if activity is moving toward more productive firms the productivity growth of average firms, technical efficiency, must be declining or very low. This latter

[15] Karabarbounis & Neiman (2014) find that the fall in relative prices of investment goods explains around half of the decline in the labour share after controlling for profits, factor augmenting technical change, and changes in skill composition. Autor et al. (2020) and Grossman & Oberfield (2022) note, however, that the investment-specific technological change literature generally require capital-labour substitution elasticities that are not supported by the broader literature.

[16] See Syverson (2017) and Byrne et al. (2016) for a discussion on why it is not ICT mismeasurement driving the decline in observed productivity.

trend is difficult to reconcile with increased ICT adoption, the rise of smart technologies, 3D-printing,[17] and the use of big data in supply chain management.[18]

Perhaps more significantly, the evidence for increasing allocative efficiency is mixed at best.[19] For the US, Decker et al. (2017) find that the contribution of allocative efficiency growth to productivity has declined between 1997 and 2014. Bils et al. (2021) find falling allocative efficiency growth of 15% from 1978–2013 using their measure which corrects for two-thirds of the downward trend. Baqaee & Farhi (2020) find that improvements in allocative efficiency account for about half of aggregate TFP growth in the US from 1997–2015. They do note, however, that while allocative efficiency has positively contributed to growth, it has also resulted in a movement away from the Pareto-Frontier, removing misallocation resulting from markup distortions would result in an increase in aggregate TFP of around 15%.[20] Goldin et al. (2020) find evidence of declining allocative efficiency in the US, France, Germany, Japan, and the UK. Cette et al. (2016) show that productivity growth has been slowing well before the Great Recession in the US and Europe. They highlight the interaction of the ICT revolution and the fall in interest rates due to the adoption of the Euro in explaining lower productivity growth due to increasing misallocation in Southern Europe. In this context, Bouche et al. (2021) document a large literature arguing that the decline in real interest rates in Europe, specifically southern European economies, since the early 1990s resulted in high-productivity firms not being able to crowd out low-productivity large firms resulting in increased misallocation (Reis 2013, Aghion, Bergeaud, Cette, Lecat & Maghin 2019, Borio et al. 2016). Gopinath et al. (2017) find that capital misallocation in Europe is driven by financial frictions favouring firms with relatively high net worth and low productivity. CompNet (2020) finds falling allocative efficiency in Europe from 2009 onward, with a steep

[17]See Wang et al. (2019) and Pandian & Belavek (2016) for discussions on the dramatic rise in the number of patents in 3D-printing technologies post-2010. See Choi (2018) for a discussion on arguments that 3D printing is a general printing technology and the growth and use of 3D printing by user firms. Pose-Rodriguez et al. (2020) find that 3D-printing patent applications in the European Patent Office more or less doubled in absolute terms in the transportation, industrial tooling, construction, and consumer good sectors between 2014–2015 alone, with patents related to electronics increasing from 42 in 2010 to 137 in 2018.

[18]It should be noted that while there is evidence that *good ideas are getting harder to find* as discussed by Bloom et al. (2020), their analysis, focusing on Moore's law, agricultural crop yields, cancer research, and general manufacturing R&D, is difficult to square with advances in big-data, computer-vision, machine-learning, and internet-of-things related advancements in the manufacturing process. For example, machine learning and computer vision are widely used in predictive maintenance Andronie et al. (2021). See also Andronie et al. (2021) for a discussion on the rise of publications related to machine learning post-2012; Fahle et al. (2020) for a short but comprehensive discussion on the role of machine learning methods in process planning, quality control, predictive maintenance, and logistics. See Xu et al. (2018) for a discussion on the role of the internet-of-things, cloud computing, and cyber-physical systems in the manufacturing process. See Wang et al. (2018) for a discussion on the growth of deep learning technologies in the manufacturing process, with specific relation to the widespread use of sensors and big data. See Wu et al. (2017) for an example of process-monitoring using the Amazon cloud to predict tool wear in milling operations. See Dogan & Birant (2021) for a discussion on the use of machine learning and data mining in manufacturing. The fall in the prices of ICT technologies and the rise of cloud-based activities has also lowered the fixed cost of investing in such technologies.

[19]See Bouche et al. (2021), Cette et al. (2016), Goldin et al. (2020), Gutiérrez & Philippon (2019) and Hsieh et al. (2017) for examples.

[20]It should be noted that where Baqaee & Farhi (2020) focus on a Petrin & Sivadasan (2013) style measure of aggregate productivity, Decker et al. (2017) use a model-free Melitz & Polanec (2015) decomposition of labour productivity weighted by employment in US firms. See section 4 for a discussion of these terms.

decline starting in 2016.[21] Similarly, De Santis et al. (2022) find falling allocative efficiency growth in Italy at the 5-digit industry level from 2011–2018. Wolski & Maurin (2021) using Orbis data from 2005–2017 find evidence for limited positive allocative efficiency contributions to growth for Europe in the post-crisis period.

In addition to the mismatch of the *winner-takes-most* interpretation to the allocation literature, evidence for the expected dynamic mechanisms of the superstar model is also lacking. Covarrubias et al. (2020) argue that the *winner-takes-most* interpretation requires that increases in concentration should be partly driven by firm exit, higher productivity coinciding with lower prices, and increasing investment rates relative to Tobin's Q in general, but particularly for industry leaders. They show that post-2000, increasing concentration is correlated with increasing prices, lower TFP, and declining investment rates of market leaders. Berthou et al. (2020) cast doubt on the trade mechanism, finding that while both import and export expansion increases the average firm's productivity, implying increasing technical efficiency, exports shift activity towards more productive firms whereas imports shift activity away from them. Similarly, Dorn et al. (2020) find that increasing import competition from China results in declining innovation at the firm and patent level and that firms respond to greater import competition by scaling back global operations. Gutiérrez & Philippon (2019) cast significant doubt on the *winner-takes-most* interpretation by showing that superstar firms in the US have not become larger or more productive, but that their contribution to total productivity growth has decreased by 40% over the 20-year period in their sample.

An alternative interpretation of the coexistence of increasing concentration, declining labour shares, and increasing markups is that they are a consequence of increasing barriers to competition and the rent-seeking activities of dominant firms (Covarrubias et al. 2020, Grossman & Oberfield 2022, Autor et al. 2020, De Loecker et al. 2021). The role of barriers to competition and rent-seeking activities is not orthogonal to the superstar model: productive firms can grow while taking steps to ensure their dominance (Covarrubias et al. 2020). These steps can include both innovation and lobbying activities that seek to alter the *rules of the game* in their favour (Autor et al. 2020, De Loecker et al. 2022).

In the case of innovation-based dominance-preserving activities, Aghion, Bergeaud, Boppart, Klenow & Li (2019) propose that the scalability of ICT allows initially productive firms to span more markets resulting in a short-run burst in productivity. The expansion of these firms into more markets eventually dissuades entrants and laggards from innovating due to the high cost of matching the productivity of the leader, which in turn results in lower innovation incentives for the leader. In this context, the firm's act of dominance is its entrance into a new market. The zombie-firm literature argues that while historically low-interest rates

[21] Specifically they find that the within-sector covariance between firm size and labour productivity since 2009 has declined.

allow easier credit access for would-be innovators these positive effects are offset by the survival of large and unproductive incumbents which discourage entry and innovation (Aghion, Bergeaud, Cette, Lecat & Maghin 2019, Liu et al. 2022, Banerjee & Hofmann 2018, Adalet McGowan et al. 2018). In this context, Liu et al. (2022) show that the present value of remaining a market leader becomes extremely high in low-interest rate environments which may lead firms to engage in investment strategies that construct entry barriers or predatory acquisitions (Cunningham et al. 2021).

In the case of lobbying-based dominance-preserving activities, Covarrubias et al. (2020), Philippon (2019), and Gutiérrez & Philippon (2018) argue that the relative rise in concentration, markups, and the fall in labour share in the US compared to the EU can be explained by weaker anti-trust policy and higher regulatory capture in the former. Blundell et al. (2022) argue that while the *winner-takes-most* effect may drive economic activity to productive firms in the short run, these winners are incentivised to protect their dominant positions through lobbying. Therefore, in a low-interest rate environment, where the present value of remaining market leader is extremely high and competition becomes lower, dominant firms will have the funds available to engage in lobbying in order to preserve their dominance (De Loecker et al. 2022, Liu et al. 2022). Furthermore, even where firms use innovation to preserve their dominance, they will be incentivised to lobby for intellectual property protection, dominant-firm favouring regulation, and licensing rights which in turn can lead to lower rates of knowledge diffusion implying lower productivity growth of the average firm (Akcigit & Ates 2019, 2021, Bessen 2016, Andrews et al. 2016). The timing of the rise in corporate lobbying since the 2000s, especially in the US, further coincides with the lagging allocative efficiency growth and the decoupling of investment rates from their marginal value (Gutiérrez & Philippon 2019, Philippon 2019, Covarrubias et al. 2020).[22]

The focus of this paper is on the role of business-sector lobbying. In the next section, the literature and mechanisms through which lobbying can affect productivity growth, concentration, and welfare are discussed with a focus on the differences in the European and US experiences. We argue that while it is true that the total lobbying expenditure in the EU is dwarfed by lobbying expenditure in the US, the literature generally finds support for lobbying being associated with higher firm-level profits and lower firm-level productivity growth in both economies.

[22] OpenSecrets (2022) documents roughly a doubling in real lobbying expenditure in the US between 2000 and 2009. OECD (2021) shows that lobbying expenditure by the US technology sector quadrupled between 2010 and 2020.

3 Lobbying

Lobbying in the broadest sense is every activity that aims to influence the decision-making of public authorities (Dionigi 2017). In the present paper, we focus on lobbying as an activity taken by groups to influence the *rules of the game* in economic interactions (De Loecker et al. 2022). The welfare implications of lobbying generally separate the information-enhancing perspective from the rent-seeking perspective.

The information-enhancing perspective envisions lobbying as a mechanism whereby well-informed interest groups or technical experts supply information to time, resource, and information-constrained policymakers (Bertrand et al. 2014, Chalmers 2013, Philippon 2019). Even where the information conveyed may be biased, the view holds that they still provide beneficial information and may signal the intensity of the underlying interest in an environment where information transmission is costly (Philippon 2019, Grossman & Helpman 2001). Related to the information-enhancing perspective, certain strands of the literature highlight the relationship between lobbying and more profitable firms and argue that lobbying may increase total factor productivity if it allows more productive firms to overcome burdensome regulation (Wiedemann 2022, Choi 2021). The alternate view is that lobbying is a form of rent-seeking or rent protection where firms engage in lobbying with the explicit purpose of changing the rules of the game in their favour (Grossman & Helpman 2001). In this view, even the informational channel discussed above may serve as a form of rent-seeking.

The literature on the underlying method of lobbying generally distinguishes between informational, relational, and quid-pro-quo lobbying (Bombardini et al. 2021, Bertrand et al. 2014). Where informational lobbying is based on providing policymakers with information, relational lobbying leverages interpersonal relationships to advance interests (Bertrand et al. 2014, Groll & McKinley 2015). The quid-pro-quo literature focuses on the role of campaign contributions in securing access to political decision-makers (Bombardini et al. 2021, Lohmann 1995). In this paper, the exact method of lobbying is not the main object of interest. The maintained assumptions are that firms are profit maximising and lobbying is costly so that firms will only lobby up to the point where the expected marginal value of lobbying equals the marginal cost of lobbying (Philippon 2019, Huneeus & Kim 2021). This approach does not exclude any of the methods of lobbying activity discussed above. A firm with high informational value may not need to engage in relational activities or quid-pro-quo lobbying, while a firm without political connections may need to pay for access, whereas a firm with a close relationship with the representative of interest may not need to pay to have information transmitted (Bombardini et al. 2021, Lohmann 1995). These three mechanisms all impose costs on the firm that may have been spent on productive activities.

At the macroeconomic level, the majority of the literature notes the extremely difficult nature of measuring the impact of lobbying, not least of which is due to the difficulty in measuring lobbying effort but also distinguishing between successes and failures (Philippon 2019, Bombardini & Trebbi 2020, Huneeus & Kim 2021, Lowery 2013, Junk 2020). Huneeus & Kim (2021) show, for the US, that eliminating lobbying would increase aggregate productivity by about 6%. This measure accounts for slightly more than a third of the TFP gain obtainable by eliminating markup distortions in the US economy found by Baqaee & Farhi (2020). Huneeus & Kim (2021) use the churn of committee assignments as an exogenous source of variation in the value of a political representative based on the geographical proximity of their districts to the firm's head office.[23] Using their model, they find that around 61% of this gain is due to improvements in allocation, 31% is due to improvements in entry, and 8% is due to resources not used for lobbying. The closest other macroeconomic study is that of Gutiérrez & Philippon (2018) who provide a political economy model to show that the relative independence of the European Parliament in policy-making, compared to the US, explains the lower concentration and markup growth in the EU compared to the US.

Bombardini & Trebbi (2020) document the substantial literature on the impact of lobbying on firm-level outcomes and note the limited literature on the aggregate implications of lobbying. For the US, Bessen (2016) find that a substantial share of the rise in corporate valuation and profits can be explained by growing lobbying expenditures and regulation, with increases in regulatory complexity causing subsequent increases in profits for publicly-listed firms. Chen et al. (2015) find that corporate lobbying is positively related to the financial performance of firms. Kang (2015) finds returns to lobbying expenditure of between 137% and 152% per dollar spent in the US energy sector. Bombardini et al. (2021) find evidence that large laggard firms, here meaning less productive, are more likely to lobby instead of innovate in the face of rising import competition whereas Gutiérrez & Philippon (2019) find evidence that lobbying and increasing regulation caused firm entry to fall in US industries.

For the EU, Bernhagen & Mitchell (2009) show that lobbying activities are a consequence of profit-seeking by firms. Hanegraaff & Poletti (2021) discusses the substantial increase in European lobbying from 2008 to 2019 in terms of demand and supply-side factors.[24] From the supply side they argue that the presence

[23]This approach is not appropriate for the present study as the churn in directorate generals in the EU is over a significantly longer term than for the US, specifically 5 years. Furthermore, as discussed in section 5.2 the data available for meetings with specific directorate generals start from December 2014, the start of the Junker Commission.

[24]Note Hanegraaff & Poletti (2021) combines data from the transparency register with data from the INTEREURO project, see http://www.intereuro.eu.

of multi-national corporations in the EU may be related to the rise of the relative shares of individual firms, relative to NGO's and Associations, active in lobbying, but note that the structure of the underlying country-industry-temporal unit may imply differing lobbying incentives. In this context, they note that firms in more concentrated markets are more likely to reap the benefits of lobbying and are thus more likely to lobby as their incentives are more aligned (Hanegraaff & Poletti 2021, Kim 2017, Bernhagen & Mitchell 2009). Hanegraaff & Poletti (2021) note the impact of government regulations on firm operational activity as it relates to trade, research and development funds, or sheltering from competition as factors creating lobbying demand.

Wiedemann (2022) links lobbying data from the European Transparency Register to listed firms in Orbis and Eikon to show that larger and more profitable companies tend to lobby more and that firms strategically choose the level of lobbying target within the European institutional structure. Wiedemann (2022) provides evidence of abnormal stock market returns for lobbying by European firms. They show that increased lobbying, measured by meetings, yield higher grant and procurement allocations from the commissioner met with, by using shared nationality between the commissioner and the lobbying firm to instrument for the effectiveness of lobbying.[25] Wiedemann (2022) shows that lobbying activity is correlated with changes in EU regulations, and finds that firms meeting with commissioners a year before the proposal date for a specific regulation were more likely to experience increases in abnormal cumulative returns than firms that did not.

Dellis & Sondermann (2017) also link the European Transparency Register to firm-level data in Orbis. They find higher shares of lobbying in non-tradable or regulated sectors, and that lobbying firms tend to have higher profit margins and lower productivity. Akcigit et al. (2018) finds for Spain, that market leaders are more politically connected but less likely to innovate, and that their connectedness results in higher survival rates and revenue growth without being related to productivity growth. Chalmers & Macedo (2021) use the average "lobbying-expenditure-to-total-assets" ratio as an instrument for individual firm lobbying expenditures to show that, for Europe, increasing lobbying expenditure is related to increased profit margin for firms. Unlike Wiedemann (2022) they find limited evidence for a link between European commission access and firm profitability.[26]

In this context, the similarity between the returns to lobbying for European and US lobbying firms suggests that lobbying in the EU should have some observable impact on the economic environment. The

[25] Note here that there is significantly more variation at the firm level than the industry level so that weak instruments are likely less of a concern in Wiedemann (2022).

[26] It should be noted that Chalmers & Macedo (2021) method uses a single binary variable for meetings with high-ranking officials over their sample whereas Wiedemann (2022) uses a continuous variable based on the number of meetings.

evidence further suggests that, much like the decline in real interest rates in Southern Europe, lobbying favours larger and less productive firms. The fact that European economies have different experiences in concentration, productivity, markup, and labour share growth while sharing the same regulator may allow for the identification of the macroeconomic channels through which lobbying affects welfare. We thus seek to answer some of the open questions in the macroeconomic lobbying literature, specifically, the channels through which lobbying affects welfare through reallocation (Bombardini & Trebbi 2020, Hanegraaff & Poletti 2021). That is, instead of focusing on the firm-level consequences and correlates of lobbying in the EU, as in Wiedemann (2022) and Dellis & Sondermann (2017), the present paper analyses the role lobbying plays in explaining the changes in allocative efficiency and the labour share. Aside from Gutiérrez & Philippon (2018) and Philippon (2019) who analyse the comparative impacts of lobbying between the EU and the US, this is the first paper that examines the role of lobbying in explaining differences in productivity growth, labour shares, and markups between industries and countries in EU manufacturing.

The first question we seek to answer is whether increased lobbying is associated with the breakdown of the *winner-takes-most*, or rather *most-productive-takes-most*, interpretation of the superstar model. That is, are industries with higher lobbying intensity more likely to experience both a decline in allocative efficiency and a decline in the labour share? If so, this would suggest that there is a mechanism whereby the mapping of productivity to markups is distorted through rent-seeking activities. In this context, firms can use lobbying as a mechanism to artificially increase market toughness, while this artificial increase may cause within-firm markups to fall as in Autor et al. (2020), the effect would not be associated with a similar rise in allocative efficiency but rather a rise in concentration.

The second question is the extent to which lobbying intensity affects the allocation-driven movements in the labour share, markups, and productivity. Where lobbying is associated with a reallocation-driven decline (rise) in labour share (markups) of a similar magnitude to its impact on productivity it may be argued that lobbying not only serves as a barrier to competition by protecting rents but also to expanding rents. Where the effect of lobbying causes a larger decline in allocative efficiency than between-firm markup increases or declining labour shares, it is more likely that lobbying serves as a rent-protection mechanism. In this context, the differential impact of lobbying in increasingly concentrated markets compared to less concentrated markets can be informative. Specifically, if lobbying in increasingly concentrated markets is related to the exit of more productive firms it is likely not the case that lobbying is simply a response to a tougher environment for these industries as less productive firms should be exiting. In this sense, lobbying may not only serve to limit the market cleansing effect of creative destruction but serve to counteract it (Cette et al. 2018, Liu et al. 2022).

The approach in this paper is different from Huneeus & Kim (2021) as we distinguish between the effects of lobbying on the distribution of labour shares and productivity. Furthermore, we impose no structure on the nature of welfare or distortions in the economy and estimate the effects in a reduced form. In the next section we discuss the measurement of our main variables of interest.

4 Measurement and Methods

This section documents the various measures and methods that are used in the empirical analysis of section 6. The focus is on the rationale for the choice of measures used rather than the construction of the variables which are explained in section 5. An important part of our analysis is the decomposition of the change in labour shares, productivity, and markups into within-firm and between-firm components. In section 4.1 we explain the Melitz-Polanac approach which we use in our analysis (Melitz & Polanec 2015). Section 4.2 provides a rationale for the use of this approach in the context of the broader literature on aggregate productivity growth, mark-ups and welfare. Section 4.3 describes the actual productivity estimator used, while section 4.4 provides details on the measures of concentration used and discusses the rationale for using these measures as compared with other measures of markups commonly found in the literature.

4.1 The Melitz-Polanac Decomposition

The Melitz-Polanac (MP hereafter) decomposition is a dynamic version of the Olley-Pakes (OP hereafter) productivity decomposition which allows for firm entry and exit (Melitz & Polanec 2015, Olley & Pakes 1996). In both cases, the aggregate value of some firm-specific variable $x_{i,t}$, for example, labour share, productivity, or factor-elasticity is constructed as the share weighted average of that variable, as in (1), with $s_{i,t}$ being the share of firm i in the weighting measure such that the shares sum to unity.

$$X_t = \sum_i s_{i,t} x_{i,t} \tag{1}$$

The static OP approach decomposes this aggregate value into a within- and between-firm component, where the between-firm component captures the extent to which firms with larger market shares also have higher values of the variable of interest. The OP decomposition is shown in (2) where $\bar{x}_t = \frac{1}{n_t}\sum_i^{n_t} x_t$ is the simple unweighted average of the variable in question and $\bar{s}_t$ is the average of the firm's share, usually market share, over the time period under consideration. The second component of the decomposition is the covariance between the firm's share and the variable of interest.

$$X_t = \bar{x}_t + \sum_i (s_{i,t} - \bar{s}_t)(x_{i,t} - \bar{x}_t) = \bar{x}_t + cov(s_{i,t}, x_{i,t}) \tag{2}$$

The MP decomposition makes the OP decomposition dynamic and allows for entry and exit. The approach defines firms according to their status across two periods. In period one, a firm can either be a survivor or an exiter, while in period 2 a firm can either be a survivor or an entrant. Defining the aggregate share of each group in a period as $s_{G_t} = \sum_{i \in G} s_{i,t}$, with $s_{i,1} = s_{S,1} + s_{X,1}$ and $s_{i,2} = s_{S,2} + s_{E,2}$, a group's aggregate value of some variable x is then simply $X_{G,t} = \sum_{i \in G} \frac{s_{i,t}}{S_{G,t}} x_{i,t}$. MP then decomposes the variable of interest in period 1 and 2 as in (3) and (4), respectively.

$$X_1 = s_{S,1}X_{S,1} + s_{X,1}X_{X,2} = X_{S,1} + s_{X,1}(X_{X,1} - X_{S,1}) \tag{3}$$

$$X_2 = s_{S,2}X_{S,2} + s_{E,2}X_{X,2} = X_{S,2} + s_{E,2}(X_{X,2} - X_{S,2}) \tag{4}$$

The change in the aggregate value of interest is defined as $\Delta X = X_2 - X_1$ and can be written as in (5) where $\Delta \bar{x}_s$ is the change in the average value in question, i.e. the within change, and the $\Delta cov_s(s, x)$ is the change in the covariance of the firm's weight and variable of interest, i.e. the between change. The remaining terms are the entry and exit terms.

$$\begin{aligned} \Delta X &= (X_{S,2} - X_{S,1}) + S_{E,2}(X_{E,2} - X_{S,2}) - S_{X_1}(X_{X,1} - X_{S,1}) \\ &= \Delta \bar{x}_s + \Delta cov_s(s, x) + S_{E,2}(X_{E,2} - X_{S,2}) - S_{X_1}(X_{X,1} - X_{S,1}) \end{aligned} \tag{5}$$

4.2 Allocative Efficiency

To determine the appropriate measure of productivity and allocative efficiency we consider the mechanisms underlying the Autor et al. (2020) model. In Autor et al. (2020), greater market toughness increases the absolute elasticity of demand meaning that markups are pushed down for all firms, but firms with lower demand elasticities do not need to lower their markups by the same extent as firms with higher elasticities.[27] Firms with higher demand elasticities have higher marginal costs which are directly related to their lower productivity draw. Autor et al. (2020) show, using the insights of Costinot (2009), that the aggregate impact of this change will then depend on the distribution of costs in the market, which Autor et al. (2020) directly relate to the inverse of the productivity distribution. Where the cost distribution is more skewed than the Mirror-Pareto distribution, meaning that there are fewer firms with low cost than in the general Pareto distribution, a shock lowering maximal viable cost will allow firms with lower cost to capture more of the market and since they do not need to lower their price by the same degree as high-cost firms, the reallocation of output implies that aggregate markups increase.In the superstar-type models, the cost distribution is treated as some inverse of the productivity distribution. Therefore, the reallocation of output to firms with higher markups must correspond to a movement of activity towards more productive firms. The model, therefore, predicts that the falling labour share must coexist with an increase in concentration, an increase in weighted markups compared to unweighted markups, and an improvement in allocative efficiency. Note, however, that the maintained assumption is that this mapping of markups to productivity is free from distortions and that firms cannot directly affect the distribution of viable marginal costs on the market. If a firm can, for example, lobby for regulations that would increase the proportional marginal costs of its competitors relative to its own, it may change the underlying viability of firms in the market while keeping its productivity unchanged. In this context, the productivity measure of interest is a mapping of inputs to outputs and not necessarily the accumulated impact of the marginal cost distribution. This distinction is important in the context of aggregate measures of allocative efficiency, especially where they are based on representative agent models. For example, in Petrin & Levinsohn (2012) and Basu & Fernald (2002) measures

[27] Key to the Autor et al. (2020)'s mechanism is that the demand function satisfies Marshall's Second Law of Demand (MSLD), meaning that the elasticity of demand is increasing in price. This shape of price elasticity of demand implies that the profit maximising point for firms with higher costs is at a price closer to their marginal costs compared to firms with lower costs. Therefore, firms with lower costs can charge a higher markup despite having lower prices. That is, when facing a demand function that is log-concave in log-price firms with lower costs will charge lower prices compared to other firms, but higher prices compared to their marginal costs meaning that they have higher markups. Note that the MSLD property also implies that firms with lower costs can adjust their markups by a greater proportion than high-cost firms, by definition they have lower prices meaning a lower price elasticity of demand. This logic is the reason that Covarrubias et al. (2020) argue that the dynamic implication of the superstar firm effect should be lower prices. See Mrázová & Neary (2017) for a detailed discussion on demand manifolds as necessary and sufficient conditions for the comparative properties of firm behaviour. See Beggs (2021) for proofs that two demand functions result in the same manifold if changes if demand is affected only by changes in market size and changes in quality.

of aggregate productivity growth generally include a term capturing the gap between an input's marginal value and its cost. These measures can interpret factors moving toward higher markup firms as a reallocation towards more socially valued uses despite not necessarily coinciding with technological improvements (Basu & Fernald 2002). Furthermore, these measures of allocative efficiency directly use input shares and will be trivially related to the changes in labour shares discussed in section 6.

We do not make an assumption on the exact construction of aggregate welfare through the approaches used by Petrin & Levinsohn (2012) or Basu & Fernald (2002), and do not attempt to map the interaction of markups through the structure of the economy as in Baqaee & Farhi (2020). The main object of interest is the measure of productivity growth as measured by the Solow residual used in the industrial organisation literature (Baily et al. 1992, Mertens 2022, Melitz & Polanec 2015). In this context, the main measure of productivity growth is simply the Melitz & Polanec (2015) decomposition of the residual described in section 4.3, below, with allocative efficiency growth measured as the change in the covariance component in (5).

4.3 Productivity Estimation

Total Factor Productivity (TFP) is estimated at the firm level using the Wooldridge (2009) and Ackerberg et al. (2015) approaches based on Cobb-Douglas and Translog value added production functions. The log of value added for firm i in period t is given by $q_{i,t}$, so that where the production function is separable in productivity the function to be estimated is as in (6). Here $\omega_{i,t}$ is the Hicks neutral productivity parameter, $\boldsymbol{\phi}_{i,t}$ is the vector of inputs in the shape of the production function, β is the vector of their coefficients, and $\varepsilon_{i,t}$ is an i.i.d. error term realised by the firm after all production decisions have been made.

$$q_{i,t} = \boldsymbol{\phi}(l_{i,t}, k_{i,t})'\boldsymbol{\beta} + \omega_{i,t} + \varepsilon_{i,t} \tag{6}$$

As $\omega_{i,t}$ is unobserved and time-varying, simultaneity bias may occur if the labour input can respond faster than the capital input. The standard control function approach is used to correct for the resulting bias. In order to control for firm-level price and markup variation, the approach of De Loecker et al. (2016), Autor et al. (2020), and Baqaee & Farhi (2020) are used and the firm's market share in revenues at the country 2-digit and country 3-digit level are used as control variables in the control function along with year and 3-digit industry dummies.[28]

We estimate the production function using an adjustment to the implementation of the Ackerberg et al. (2015) estimator of Rovigatti & Mollisi (2018), "PRODEST", discussed in Kreuser & Brink (2021). As discussed by Kreuser & Brink (2021) the standard "PRODEST" implementation can give rise to implausible or non-converging estimates, especially when using the Nelder-Mead method. This result is often not solved by simply changing to a gradient descent method, especially where the optimisation space has non-concave areas. We adjust the Kreuser & Brink (2021) implementation to include a Translog specification and jointly estimate the Markov process with the parameters of interest.

4.4 Concentration and Market Power

In the industrial organisation literature, the negative welfare implication of market power is represented by the ability of firms to extract rents. Generally, this is defined as the ability of firms to charge a price higher than their marginal costs. In this section, we briefly distinguish between markups, concentration, and market power.

The measurement of industry concentration and its interpretation in relation to markups have received much attention in the literature. The standard approach is to choose a particular level of aggregation (country, industry or sub-industry) and measure concentration using the standard Herfindahl-Hirschman Index, HHI hereafter, as defined in (7) and the CR4 and CR20 measures, defined as in (8). The latter measures reflect the share of the top 4 and 20 firms in the relevant country, industry, or market, respectively.

$$HHI_t = \sum_i \left(\frac{x_{i,t}}{X_{i,t}} \right)^2 \tag{7}$$

$$CRX_t = \frac{\sum_{i \in topX} x_{i,t}}{X_{i,t}} \tag{8}$$

In the context of measuring concentration growth at a more decomposed level Affeldt et al. (2021) argue that concentration and market shares are generally poorly measured at the country-industry level and instead use product-geographic markets which were impacted by mergers scrutinized by the European Commission.

[28] See De Loecker et al. (2016) and Mertens (2022) for a detailed discussion on this approach.

Their paper follows the definition of a market as defined in the industrial organisation literature where it is the substitutability of products defining a product's classification (Affeldt et al. 2021, Berry et al. 2019). They show that concentration based on their definition of markets has increased over time, but note significant heterogeneity in terms of the scope of market definitions, between industries, and within industries. They find higher concentration growth in broadly defined markets and, unlike Bighelli et al. (2021), find higher concentration growth in service sectors compared to manufacturing. Affeldt et al. (2021) find evidence that barriers to entry are significantly correlated with rising concentration at both the national- and international-level market definition. They further find that intangible investments are more correlated with increasing service-sector concentration at the international level, whereas they tend to decrease concentration at the national level. This latter finding is consistent with the results of Rossi-Hansberg et al. (2021), who find increasing national and decreasing local concentration for the US.[29]

Eeckhout (2020) highlight the concern with using HHI or any other direct concentration measure where local, national, and supranational trends matter, specifically that it ignores the ability of firms to charge a price higher than marginal cost and therefore is an imperfect measure to study welfare losses. Eeckhout (2020) notes that while Cournot models provide a direct positive relationship between markups and concentration, this relationship can be negative in models like those presented by Melitz (2003) and Melitz & Ottaviano (2008). This decoupling between concentration and market power is also evident in the results presented by Bighelli et al. (2021)

In this context, De Loecker et al. (2020) argues that markups are the most consistent measure of market power which potentially causes dead-weight loss, as it is the most consistent measure of whether firms are pricing above their marginal costs. De Loecker et al. (2020) defines markups as in (9) where P is the price of the firm's output and c is marginal costs.

$$\mu \equiv \frac{P}{c} \tag{9}$$

In a standard heterogeneous firm model, the economy has N firms that differ in their productivity, $\Omega_{i,t}$, and potentially production technology, $Q_{i,t}(.)$. These firms are described in (10) where $\boldsymbol{V}_{i,t} = \{V_{i,t}, ..., V_{i,t}\}$ is the vector of J potential variable inputs and $\boldsymbol{K}_{i,t} = \{K^1_{i,t}, ..., K^D_{i,t}\}$ is a vector of D potential dynamic inputs. Variable inputs can adjust frictionlessly, that is they can respond to shocks in this period, whereas

[29] Rossi-Hansberg et al. (2021) explains these trends by noting that where a large firm enters a local market, the current dominant firm in the local market is faced by a new larger competitor so that concentration in the area declines while total share of sales by the large firm at the national level increases so that national concentration is increasing.

dynamic inputs take time to adjust. Here, we only discuss variable inputs, but the same results must hold for dynamic inputs where the amount paid to the input will include the adjustment costs.

$$Q_{i,t} = Q_{i,t}(\Omega_{i,t}, \boldsymbol{V}_{i,t}, \boldsymbol{K}_{i,t}) \tag{10}$$

The firm seeks to minimise the cost function in (11) subject to their output constraint, $Q_{i,t}(.) - \bar{Q}_{i,t}$. In (11) $\boldsymbol{R}_{i,t} = \{R^1_{i,t}, ..., R^J_{i,t}\}$ represents the payments to variable inputs, $\underline{\boldsymbol{R}}_{i,t} = \{\underline{R}^1_{i,,t}, ..., \underline{R}^D_{i,t}\}$ represents the adjustment cost adjusted payments to dynamic inputs $d \in D$, and $F_{i,t}$ represents the firm's fixed costs.

$$min_{\boldsymbol{V}_{i,t},\boldsymbol{K}_{i,t}} \; \boldsymbol{R}_{i,t}\boldsymbol{V}_{i,t} + \underline{\boldsymbol{R}}_{i,t}\boldsymbol{K}_{i,t} + F_{i,t} \tag{11}$$

The firm's minimisation problem leads to the Lagrangian in (12).

$$\mathcal{L} = \boldsymbol{R}_{i,t}\boldsymbol{V}_{i,t} + \underline{\boldsymbol{R}}_{i,t}\boldsymbol{K}_{i,t} + F_{i,t} - \lambda_{i,t}(Q_{i,t}(.) - \bar{Q}_{i,t}) \tag{12}$$

Following De Loecker & Warzynski (2012), for any variable input $j \in J$ the first order condition will yield (13) which can be rewritten to yield the elasticity of output for each variable input j as in (14).[30]

$$\frac{\partial \mathcal{L}}{\partial V^j_{i,t}} = R^j_{i,t} - \lambda_{i,t}\frac{\partial Q(.)}{\partial V^j_{i,t}} = 0 \;\; \forall j \in J \tag{13}$$

$$\theta^j_{i,t} = \frac{V^j_{i,t}}{Q_{i,t}}\frac{\partial Q(.)}{\partial V^j_{i,t}} = \frac{1}{\lambda_{i,t}}\frac{R^j_{i,t}V^j_{i,t}}{Q_{i,t}} \;\; \forall j \in J \tag{14}$$

Then since λ is the marginal value of relaxing the constraint, it is a direct measure of marginal cost to the firm so that $\mu_{i,t} = \frac{P_{i,t}}{\lambda_{i,t}}$, where $P_{i,t}$ is the price of the firm's production. The relationship between markups and the elasticity of output with respect to the variable input can be written as in (15), where the markup is the ratio of the output elasticity of any variable input j to its share in total output $\frac{R^j_{i,t}V^j_{i,t}}{P_{i,t}Q_{i,t}} = o^j_{i,t}$.

$$\mu_{i,t} = \theta^j_{i,t}\frac{P_{i,t}Q_{i,t}}{R^j_{i,t}V^j_{i,t}} = \frac{\theta^j_{i,t}}{o^j_{i,t}} \;\; \forall j \in J \tag{15}$$

[30] Multiplying by $V^j_{i,t}/F_{i,t}(.)$ on both sides and rewriting will yield an equation for the elasticity of output for variable input j, $\theta^j_{i,t} = \frac{\partial Q_{i,t}(.)}{\partial V^j_{i,t}}$

The majority of the literature obtains the value of markups in (15) by estimating the value added production function (De Loecker & Warzynski 2012, Mertens 2022). This approach requires that the production function is as in (16), where $g(M_{i,t})$ is some linear function of material inputs which are then purged from variable inputs, $\tilde{\boldsymbol{V}}$.[31] $\tilde{Q}_{i,t}$ is the value added production function. The value added approach yields the same result as (15) except that the elasticity of inputs is measured with respect to the share of the variable input in value added $s^j_{i,t} = \frac{R^j_{i,t} V^j_{i,t}}{P_{i,t} \tilde{Q}_{i,t}}$.

$$Q_{i,t} = min\{g(M_{i,t}), \tilde{Q}_{i,t}(\Omega_{i,t}, \tilde{\boldsymbol{V}}_{i,t}, \boldsymbol{K}_{i,t}))\} \tag{16}$$

$$\mu_{i,t} = \frac{\theta^j_{i,t}}{s^j_{i,t}} \ \ \forall j \in J \tag{17}$$

Mertens (2022) and Dobbelaere & Mairesse (2013) argue that the markup measure of De Loecker & Warzynski (2012) using only the labour share of the firm should not be interpreted as indicative of purely output market power but rather as the weighted market power of the firm in its relevant input and output markets.

Where imperfect competition exists in input markets the price vector becomes $\boldsymbol{R'} = \{\boldsymbol{R}, \underline{\boldsymbol{R}}\} = \{(1 + \tau^1_{i,t})^{-1} R^1_{i,t}, ..., (1 + \tau^J_{i,t})^{-1} R^{J+D}_{i,t}\}$ so that $\tau^j_{i,t} > -1$ reflects the firm-time specific wedge for input j, where $\tau < 0$ reflects firm power in the input markets for both dynamic and variable inputs. The first order condition of the firms' problem then yields (18) and the resulting markup implied by this condition is given in (19) which now includes a measure of the firm's market power for input j $\gamma^j_{i,t} = \frac{1}{1+\tau^j_{i,t}}$. Where the wedge is zero, $\gamma^j_{i,t} = 1$, (19) coincides with (15), where the firm has monopsony power in the input market $\gamma > 1$ so that if $\gamma = 1$ is assumed then product market power is incorrectly assigned to firms where they actually have input market power.

$$\frac{\partial Q(.)}{\partial V^j_{i,t}} = \frac{R^j_{i,t}}{(1 + \tau^j_{i,t})\lambda_{i,t}} \tag{18}$$

$$\mu_{i,t} = \theta^j_{i,t} \frac{1}{o^j_{i,t}} \frac{1}{\gamma^j_{i,t}} \tag{19}$$

[31] Where $\boldsymbol{V} = \{\tilde{\boldsymbol{V}}, M\}$.

The result in (19) implies that the firm's true product market markup can only be obtained by using an input over which the firm is a pure price taker. The approach further allows for the identification of input market power in (20) where the output market markup must be constant across all inputs so that the ratios of markups, (20), exactly identifies input market power of an input, $\gamma_{i,t}^{j}$, when compared to a perfectly competitive input, $\gamma_{i,t}^{M} = 1$.

$$\frac{\gamma_{i,t}^{j}}{\gamma_{i,t}^{M}} = \frac{\theta_{i,t}^{j}}{\theta_{i,t}^{M}} \frac{R_{i,t}^{M} M_{i,t}}{R_{i,t}^{j} V_{i,t}^{j}} \tag{20}$$

The standard markup result in (17) must hold for all variable inputs. Under the assumption of no pure profits accruing to variable inputs and no imperfect competition in input markets De Loecker et al. (2020) and Baqaee & Farhi (2020) instead use a composite of all variable inputs to estimate markup. Their approach allows them to estimate the gross-output production function with two inputs, the cost of goods sold and fixed capital stock, and then back out markup as in (17). Note, however, that this approach does not solve the misattribution of input market power to output market power.[32] The resulting markup from this function will then be the weighted average of input market powers, where $R_{i,t}V_{i,t}$ can be interpreted as the weight of market power through input γ.[33] Where the firm has input market power the true marginal costs of labour are not observed directly.

In this context, for our empirical analysis, the use of markups as a correlate of labour share is inappropriate as it will, by definition, be negatively correlated with the outcome (Autor et al. 2020, Mertens 2022). The labour share is defined as the total wage bill over output and any markup measure, whether measuring total cost or labour inputs only, will include the wage bill in the denominator. Where the markup is defined as in (17) the only way for the labour share not to drive the change in markup is for the output elasticity of the input to vary more significantly. This effect will be impossible for any Cobb-Douglas specification that does not allow temporal variation.[34] This effect is possible for Translog specifications as used by Mertens (2022), but would still not result in markups that are not driven by changes in the labour share if within-firm elasticities are less variable than shares.[35]

[32]Since the vector of aggregate variable inputs solves the cost minimisation the treatment of $\boldsymbol{R}_{i,t}\boldsymbol{V}_{i,t}$ as a scalar seems unproblematic.

[33]See Mertens (2020) for a more detailed discussion.

[34]De Loecker et al. (2020) and Baqaee & Farhi (2020) estimate their production functions in temporal windows.

[35]De Loecker et al. (2020) finds that markups are almost entirely driven by the share in input costs for US data, implying significantly lower variation in output elasticities than input shares over time. Mertens (2022) finds evidence for Germany, that the aggregate labour elasticity of output has fallen by about 9% between 1995-2014, while the labour share of output was falling by about 18%.

For these reasons, in our analysis, we use the standard concentration measures, specifically HHI defined in (7), and the CR4 and CR20 measures, as defined as in (8) and interpret them in the context of the labour share and productivity distribution.

5 Data

This section discusses the construction of the data used in the empirical analysis. Section 5.1 focuses on the Orbis dataset and discusses the assumptions made in the construction of the key variables and the treatment of invalid entries in the raw data. Section 5.2 discusses the construction and matching of the lobbying data to the Orbis data and highlights the main assumptions made.[36]

5.1 Construction of Orbis data and Key variables

The European version of the Orbis data from 2005-2020 is used in this paper. Due to reporting issues in earlier years, data from the 2005-2008 period are only used to inform imputations as they generally over-represent exiting firms or very large firms. We limit the dataset to the end of March 2020, due to the reporting lag issues discussed by Kalemli-Özcan et al. (2022) and Bajgar et al. (2020) which generally favour larger firms. The choice of this date is also made to limit the impact of the COVID19 pandemic which may have resulted in substantial differences in both reporting probabilities and variables of interest. All data are adjusted to Euro and deflated using the appropriate deflators from Eurostat.

The data requirements of the Orbis data used in this paper are more severe than the requirements of Bajgar et al. (2020) and Kalemli-Özcan et al. (2022), as staff costs, operating revenue, material costs, employment, tangible fixed assets, operating costs, and depreciation are required to construct the measures used.[37] This section briefly discusses the construction of the key variables of interest with reference to the literature and outlines the main imputations made to increase the representativeness of the sample for smaller firms.[38] The key variables of interest are output, tangible fixed assets, the deprecation rate, material costs, the total wage bill, the number of persons employed, and operating costs.

[36]Some new facts and insights from the lobbying data are presented for information in Appendix L.

[37]Specifically, Kalemli-Özcan et al. (2022) requires either employment or the firm's wage bill to be available and places no restriction on the availability of depreciation.

[38]In all cases where imputation is applied to values expressed in currency, the imputation is based on the real values after which the value is turned nominal again, in most cases ratios of key variables are used in imputations.

Output is defined as the firm's operating revenue as reported in Orbis; where this field is not available or smaller than the reported sales of the firm, the latter is used.[39] The measure of value added is constructed following a minor adjustment to the approach used in Gal (2013). Specifically, instead of using the added-value field reported in the Orbis data, the field is constructed consistently for all firms. Studies using the Orbis data usually construct an internally imputed measure of value added as the sum of the wage bill and profits, $EBITDA$, as measured by earnings before interest rates, taxes, depreciation, and amortisation as in (21) (Bajgar et al. 2020, Gal 2013). The $EBITDA$ variable in Orbis is defined as Operating Profit/Loss, PL, plus depreciation, $DEPR$, with Operating Profit/Loss defined as Gross Profit minus Other Operating Expenses. Gross Profit, in turn, is defined as Operating Revenue minus Cost of Goods Sold, so that $EBITDA$ can be defined as in (22). This definition allows for several sources of missing data to contaminate the sample resulting in poor representation in the data. Several firms will report operating profit and loss data, but will not have consistent depreciation data. Furthermore, several firms do not report anything in the Other Operating Expenses field or in the Gross Profits field. It is not clear whether firms consistently staff costs in the Cost field or the Other Operating Expenses field.[40] In this context, we construct an Operating Cost field as the difference between the commonly reported value of Output minus Operating Profit/Loss as in (23). This approach ensures that independent of where staffing cost and the like are included, missing values in other fields do not further contaminate the cost data which allows for better temporal imputation. The construction of this measure takes place after the simple within-imputation of output as discussed by Gal (2013) and Kreuser & Brink (2021).[41] The simple within-imputation allows for up to two consecutive periods of data to be interpolated via distanced weighted smoothing. Value added in this paper is thus constructed as in (24).

$$VA = StaffCost + EBITDA \tag{21}$$

$$\begin{aligned} EBITDA &= OPPL + DEPR = GROS - OOPE + DEPR \\ &= OPRE - COST - OOPE + DEPR \end{aligned} \tag{22}$$

$$OPCOST = COST + OOPE = OUTPUT - OPPL \tag{23}$$

$$VA = OUTPUT - OPCOST + STAF + DEPR \tag{24}$$

[39] See Gal (2013) for a further discussion.

[40] Several firms have a Material Costs field exactly equal to the Cost of Sales field, while for other firms the Material Costs field is dramatically lower.

[41] Several firms report operating profits and losses without reporting output.

The capital stock data is constructed using Gal (2013)'s perpetual inventory approach after the main imputation methods discussed below are used. Where depreciation rates are missing, the depreciation rates instead of the actual value of the depreciation field is smoothed over time. This approach allows for implausible values of depreciation resulting in negative capital stock to be neutralised. Where a firm never reports depreciation rates a depreciation rate of 10% is assumed.[42] The capital stock field itself uses only the tangible assets field reported in Orbis. The intangible asset field reflects the accounting basis of assets and goodwill and not necessarily the use of software or other intangibles (Bajgar et al. 2020, Gal 2013). This approach is consistent with that used by Kalemli-Özcan et al. (2022).

Where data is missing for periods longer than 2 years a machine learning approach is used to construct the variables of interest. The main feature of the approach is that it uses only within-firm data so that it overcomes the issues noted by White et al. (2018) where industry-level regression models or mean imputation methods are used which will by construction limit variation in productivity dispersion. This approach is also different to the externally imputed values of Gal (2013), who use the SBS database for further construction as it does not improve representativeness significantly (Bajgar et al. 2020, Kalemli-Özcan et al. 2022).[43] In our approach, each key variable is imputed by running a battery of within-firm regressions on a mean standardised value of the key variable on the mean standardised value of $EBITDA$, opening stocks, materials, total assets, wages, employment, the materials to output ratio, the fixed assets to total asset ratio, or tangible assets to total assets ratio. As the regressions are within-firm, they require that the firm has at least 3-observations between 2005-2021 in order to be included in the sample. In order to limit the small sample effects resulting in dramatic outliers caused by overfitting, feasible maxima and minima of the scaled value of the full manufacturing sample within the country are constructed using a non-parametric regression approach. The final stage takes the predicted value from the standardised independent variable explaining the most variation in the dependent variable after which, the independent variable must explain at least 70% of the variation in the dependent variable to qualify for use.[44] In this context, the imputation approach has the benefit of imputing values for very small firms without using the information mostly available to larger firms thereby overcoming one of the main concerns of Bajgar et al. (2020). It should be noted, that while this approach does end up saving a significant number of entries, this is often due to single variables being imputed for a period of three years causing a firm not to be dropped from the sample due to missing data.[45]

[42] Several different depreciation rates were attempted with limited effect on the resulting trends.

[43] In addition, using moments from the SBS database may still cause similar variation limiting effects noted by White et al. (2018) but over smaller bins. In this context, it may increase the variation between size categories of firms while limiting the variation within them so that changes in industry-level variation may be driven by firms entering and exiting size bins.

[44] The average used variable explains about 90% of the variation in the dependent variable.

[45] Recall that missing variables will be smoothed for two consecutive periods of missing data.

Unlike the approaches of Kalemli-Özcan et al. (2022) and Bajgar et al. (2020) we prefer the use of consolidated financial statements in the construction of industry aggregates and productivity. First, the consolidated statements are generally more complete than their unconsolidated partners, meaning less imputations are required in general. Second, it means that we do not miss-attribute output of one corporate entity to multiple entities for purposes of productivity, labour share, and concentration purposes.

Firms with consistently negative value added are removed from the sample as productivity estimates cannot be obtained for them; firms with temporarily negative value added are generally saved by smoothing over the negative value based on its temporal neighbours.[46] The labour share of value added is constructed as the firm's staff cost divided by value added as defined in (24). Where the labour share is above unity the value is generally smoothed over; values above unity at the beginning or end of the sample are imputed based on their closest neighbour. The labour share in terms of output is constructed as staffing costs as a proportion of measured output and the same smoothing approach is used for firms with values above unity. In section 6 we show that our approach does a decent job at matching the aggregates reported in Eurostat.

5.2 Lobbying Data

In this paper we consider lobbying activities undertaken by formal organisations or individuals related to direct or indirect communication with officials, political decision-makers, or their representatives with the purpose of influencing the design, implementation, execution, and evaluation of public policies or regulations undertaken by the European Commission (OECD 2021, Transparency International 2015).

The lobbying data are extracted from the European Union's Transparency Register as obtained from the official website[47] and `LobbyFacts.eu`.[48] The Transparency Register data are complemented with `LobbyFacts.eu` as the latter does a significantly better job at capturing lobbying activities prior to 2014 than the former. Furthermore, it captures meetings with members of the council in machine-readable form.[49]

The Transparency Register reports data in Excel and XML formats, with the XML data being slightly more consistently available in earlier years. The Transparency Register updates entries at the biannual level,

[46] Firms consistently reporting negative capital stock, staff costs, or material costs are also removed in this way.

[47] See `https://data.europa.eu/data/datasets/transparency-register?locale=en`.

[48] The latter source has been used by Gutiérrez & Philippon (2018) to construct their measures of EU lobbying.

[49] At present the official Transparency Register Website provides a list of meetings by firms. This list of meetings is included as PDF attachments to an entry in a deeply nested table making effective scraping infeasible. The meeting data available from sources like Integrity Watch for the period 2014-2019, available at `https://integritywatch.eu/ecmeetings.php?junckercommission=1`, and used by Wiedemann (2022) do not include the identification number of the represented parties and so may lead to miscounting and misattribution of meetings of an entity. Due to the complex matching process of the data described below, the marginal costs of including this source exceeded its value at the time of writing.

but these entries do not always coincide with the underlying financial year in which lobbying activity has occurred. As an example, Google's entry in both the January and June 2021 Excel Transparency register is based on data for the financial year ending on 31/12/2019. In situations where a lobbying entity reports data in multiple versions of the Transparency Register the maximum value of its expenditure or accredited persons is kept and the surrounding details in the latest entry are kept, unless the maximum value would result in the firm being an outlier as discussed in section 5.2.2.[50]

In table 1, the number of unique entities used from each year in the construction of the data for this paper by data source is shown. The XLS source dominates the entries in the later years, while the LobbyFacts.eu and XML sources tend to dominate the years at the beginning of the sample.[51] The table also illustrates the dramatic changes in the underlying reporting obligations of entities starting in 2014. In the main specification, the first registration date of an entity is used and data are imputed for earlier years; we simply take the value of the closest available data point and apply it to the firm up to its registration date. This imputation is shown to increase the number of entities in earlier years substantially in the last column of table 1.

Table 1: Lobbying Entities by Source and Year

Year	Off. XLS	Off. XML	LobbyFacts	Total	Imputed
2008	0	2	1	3	580
2009	0	6	18	24	1,222
2010	0	83	939	1,022	2,342
2011	0	304	1,820	2,124	3,592
2012	5	1,009	1,767	2,781	4,715
2013	2,257	3,072	351	5,680	6,787
2014	7,488	548	17	8,053	8,968
2015	9,201	30	16	9,247	10,376
2016	9,814	33	14	9,861	11,208
2017	10,306	46	23	10,375	11,557
2018	10,606	59	32	10,697	11,705
2019	10,718	128	51	10,897	11,578
2020	4,694	581	167	5,442	5,447
Total	65,089	5,901	5,216	76,206	90,077

Source: Author's own calculations based on the Transparency Data and LobbyFacts Data.
This table shows the number of lobbying entities in each year by data source after removing duplicate entries. Off. XLS refers to the data from the Official Excel tables, Off. XML refers to the data from the Official XML tables and LobbyFacts refers to the data from the Lobbyfacts Database. The Imputed column shows the number of entities in each year that were added filling every period from their first registration date to their last reported financial year.

[50] Were only the latest entry kept for each year, we would have British American Tobacco report lobbying expenditures of around 950,000 Europe in 2012, 9,999 Euro in 2013, and 1,624,500 Euro in 2014. British American Tobacco reports a value of 1,625,000 Euro for 2013 for its registrations of 10 June 2014 and 19 January 2015 while reporting the 9,999 Euro amount in its 28 April 2015 registration covering the same financial year. While British American Tobacco documents the reason for this discrepancy as a good faith adjustment based on updated guidelines in the European Unions that were adjusted later, it is not clear that this adjustment in a single year would not lead to measurement error since we are interested in relative intensities. See British American Tobacco's entry on LobbyFacts.eu here https://www.lobbyfacts.eu/datacard/british-american-tobacco?rid=2427500988-58&sid=35988.

[51] It should be noted that these numbers are lower than those reported by Secretariat General (2022) as, in our case, the year indicator relates to the financial year information reported by the entity and not the date at which the form was submitted.

5.2.1 Matching the Lobbying Data

This section describes the process of matching the lobbying data to the Orbis data. Where the entity represents customers or clients, the names of clients reported in the data are obtained from the Transparency Register. These names are then matched to firms via the Orbis web terminal as used by Wiedemann (2022); only high-quality matches are kept.[52] The largest corporate lobbying groups are examined more closely to determine their clients. For these firms, the names of the firms that they represent are listed on their websites. We use these to link them to the Orbis data.[53] In-house lobby groups, meaning entities assumed to be representing a single firm's interests, are matched to a firm via one of three approaches. As these entities generally provide information on their city and country, a match is first attempted on the firm's name, city, and country, then only on the firm's name and country, and finally based only on the firm's name. Only the match with the most variables are kept in the case of conflicts. The second approach uses a fuzzy-matching approach based on the firm's name, phone number, and address. As this approach uses most of the information used in the matching process through the Orbis web terminal it is used sparingly with only high-quality matches not linked by the Orbis web terminal included. The majority of matches made that were not linked through the Orbis web terminal were due to firms in the lobbying data with names not written using the Latin alphabet. The final approach is the use of domain names in the matching of entities. The lobbying register allows firms to submit their website along with their phone number and physical addresses. The website is reduced to its domain name and matched to a domain name in Orbis. Large hosting websites are removed from this matching process as several lobbying entities report their website as a Facebook group (an example is the European Mobile Seed Association (EMSA)).[54]

Based on these classifications we achieve a match rate of around 64% as shown in table 2. While this number appears high, it also represents a substantial number of entities that have industry classifications belonging to sectors in which lobbying takes place. For example, there is no information gained by linking advertising consultancy firms to NACE codes listed under Advertising and Market Research Activities as these firms engage in these activities on behalf of clients in other industries. In this context, where information

[52] The Orbis web terminal classifies batch search matches as either an A or B; here only A ratings are kept. These matches are confirmed by hand to conform to industry and country.

[53] An example of this approach for the European Chemical Industry Council is discussed in section L below. The specific entities where we use this approach are the Association for Financial Markets in Europe, lobbying id 65110063986-76; European Chemical Industry Council (Cefic), lobbying id 64879142323-90, The Society of Motor Manufacturers and Traders Ltd. (SMMT), lobbying id 92040678068-73; Flanders Make (Flanders Make), lobbying id 116561428290-45; European Federation of Pharmaceutical Industries and Associations (EFPIA), lobbying id 38526121292-88; and BUSINESSEUROPE, lobbying id 3978240953-79.

[54] Websites removed this way include `pagesjaunes.fr`, `facebook.com`, `veletex.com`, `aholaser.fi`, `declarations.com.ua`, `fr.mappy.com`, `hours.be`, `sites.google.com`, `adresarfiriem.sk`, `itis.si`, `bipa.at`, `consumer.gov.ua`, `heures.be`, `home.mobile.de`, `volny.cz`, `fr.mappy.com`, `firmas.lv`, `consumer.gov.ua`, `sabac.rs`, `m.facebook.com`, `linkedin.com`, `sites.google.com`, `e-lecrec.com`, and `etsy.com`.

on clients or customers are not available for entities and no valid NACE code is provided, the entity is excluded from the sample.

Table 2: Matches from Orbis data to Unique Lobbying Entity by type of Lobbying Entity and Nature of Match

	Match Type				Totals		
	Name	ML	Domain	Clients	Matched	Valid Nace	Total
In House & Assoc.	5,314 (49.86%) [57.32%]	522 (4.90%) [38.51%]	5,125 (48.09%) [75.55%]	0 (0.00%) [0%]	7,563 (70.96%)	4,453 (41.78%) [58.88%]	10,658 (50.03%)
Prof., Law., & Self.	1,220 (49.80%) [48.52%]	94 (3.84%) [41.49%]	891 (36.37%) [58.36%]	717 (29.27%) [100.00%]	1,743 (71.14%)	956 (39.02%) [54.85%]	2,450 (11.50%)
NGO	2,034 (37.23%) [21.29%]	245 (4.48%) [23.67%]	1,196 (21.89%) [51.09%]	0 (0.00%) [0%]	2,760 (50.52%)	747 (13.67%) [27.07%]	5,463 (25.64%)
TT, Res.,& Aca.	559 (34.00%) [32.20%]	73 (4.44%) [28.77%]	553 (33.64%) [56.42%]	0 (0.00%) [0%]	903 (54.93%)	356 (21.65%) [39.42%]	1,644 (7.72%)
Relig.	22 (22.68%) [18.18%]	3 (3.09%) [0.00%]	18 (18.56%) [66.67%]	0 (0.00%) [0%]	36 (37.11%)	12 (12.37%) [33.33%]	97 (0.46%)
Public	292 (29.47%) [43.15%]	46 (4.64%) [43.48%]	347 (35.02%) [67.72%]	0 (0.00%) [0%]	508 (51.26%)	265 (26.74%) [52.17%]	991 (4.65%)
Total	9,441 (44.32%)	983 (4.61%)	8,130 (38.16%)	717 (3.37%)	13,513 (63.43%)	6,789 (31.87%) [50.24%]	21,303 (100.00%)

Source: Author's own calculations based on Orbis data and Lobbying Data
This table shows the number of matches made between the Orbis and Lobbying Data by the nature and type of match based on the category of registered lobbying Entity. Prof., Law., & Self refer to the category "I - Professional consultancies/law firms/self-employed consultants", In House & Assoc. refer to the category "II - In-house lobbyists and trade/business/professional associations", NGO refers to the category "III - Non-governmental organisations", IV - Think tanks, TT, Res.,& Aca. refer to the category research and academic institutions, Relig. refers to the category "V - Organisations representing churches and religious communities", and Public is a collective category referring to an entity belonging to "Associations and networks of public authorities, Entities, offices or networks established by third countries, or Other organisations, public or mixed entities". The match type Name refers to entities matched using their name using the Orbis Terminal, ML refers to the entities matched using a combination of their name, phone number, address, zip code; Domain refers to the number of entities matched by Domain names, and Clients refers to the number of entities matched using the names of either Customers or Clients as reported in the Data. The number in round parentheses below each of the Match Type numbers is the percentage of matches linked to the specific type, note that due to the substantial overlap between the ML matches and the name matches only the ML matches not found in the name matches are reported. The number in square brackets refers to the proportion of entries matched by the type that have valid NACE codes, that is a NACE Rev. 2 entry in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

In tables 3 and A.1 the total lobbying expenditure of In-house and Professional groups, respectively, are compared to the total aggregates represented by the matches. As seen, lobbying by in-house lobbyists and trade associations accounts for around 55% of lobbying costs in the sample whereas professional lobbying groups account for approximately 12%. Table 4 and A.2 show the same trends for the number of persons; while in-house groups account for 55% of total persons with European Parliament, EP hereafter, accreditation, corporate groups account for about 15%. In tables 5 and A.3 it is shown that in-house lobbying groups account for the lion's share of meetings with members of the commission, at around 70%, while professional groups account for around 5%.

In terms of match rates, the procedures perform exceptionally well with around 88% of in-house lobby expenditure, 88% of in-house accredited persons, and 90% of in-house meetings being matched to some entity in the Orbis database. Once entries with invalid NACE data are removed, these figures drop to around 60% of costs, 55% of accredited persons, and 60% of meetings. The professional groups, on the other hand, are matched at much higher rates, with close to 98% of lobbying costs and accredited persons being matched to an entity with a valid NACE code.

Table 3: Representativeness of the Cost Lobbying of In-House Groups

	Total		Matched			Val. NACE		
	Total	% of Agg	Total	% of Total	% of Agg.	Total	% of Total	% of Agg.
2008	149, 813, 808	(69.41%)	136, 823, 808	(91.33%)	(68.67%)	87, 149, 240	(58.17%)	(66.15%)
2009	233, 314, 368	(69.92%)	210, 123, 488	(90.06%)	(70.04%)	134, 233, 024	(57.53%)	(68.78%)
2010	357, 853, 344	(62.42%)	321, 975, 424	(89.97%)	(62.21%)	215, 457, 168	(60.21%)	(63.79%)
2011	444, 479, 200	(60.41%)	392, 856, 032	(88.39%)	(60.30%)	282, 599, 648	(63.58%)	(63.36%)
2012	524, 499, 232	(56.60%)	467, 484, 256	(89.13%)	(60.68%)	333, 042, 624	(63.50%)	(64.87%)
2013	602, 753, 280	(55.32%)	527, 831, 552	(87.57%)	(60.52%)	379, 344, 032	(62.94%)	(65.71%)
2014	921, 771, 200	(57.82%)	821, 746, 496	(89.15%)	(62.19%)	610, 008, 768	(66.18%)	(70.21%)
2015	1, 044, 121, 280	(55.16%)	919, 486, 080	(88.06%)	(59.17%)	648, 237, 376	(62.08%)	(68.58%)
2016	1, 021, 998, 976	(53.35%)	892, 921, 216	(87.37%)	(56.49%)	613, 821, 248	(60.06%)	(64.80%)
2017	1, 057, 476, 608	(54.84%)	906, 396, 928	(85.71%)	(57.33%)	614, 836, 224	(58.14%)	(64.92%)
2018	1, 131, 165, 952	(55.56%)	962, 615, 360	(85.10%)	(58.44%)	664, 130, 688	(58.71%)	(66.80%)
2019	1, 179, 820, 416	(57.61%)	1, 004, 568, 064	(85.15%)	(60.54%)	669, 544, 128	(56.75%)	(68.91%)

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the total matched lobbying costs by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations. The Total column refers to the total value of lobbying costs, after imputations and outliers, and the % of Agg reports the total lobbying costs of In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations as a proportion of all lobbying measured by lobbying costs for all entities. The matched column provides the same statistics, where the % of total refers to the proportion of lobbying costs by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations accounted for by matched entities. % of Agg reflects the the total lobbying measured by lobbying costs reported by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations as a proportion of all lobbying measured by lobbying costs by matched entities. The Val. NACE column reflects the same as the matched column, but limits the matched sample to entities with NACE Rev. 2 codes in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

Table 4: Matched Lobbying Data by Accredited Persons by In-House Lobbying Groups

	Total		Matched			Val. NACE		
	Total	% of Agg	Total	% of Total	% of Agg.	Total	% of Total	% of Agg.
2008	611	(67.36%)	559	(91.49%)	(66.08%)	331	(54.17%)	(65.03%)
2009	925	(66.26%)	841	(90.92%)	(65.75%)	502	(54.27%)	(65.88%)
2010	1, 388	(60.74%)	1, 262	(90.92%)	(60.70%)	763	(54.97%)	(62.70%)
2011	1, 690	(57.60%)	1, 530	(90.55%)	(58.04%)	960	(56.78%)	(62.02%)
2012	2, 083	(56.08%)	1, 873	(89.91%)	(56.40%)	1, 160	(55.71%)	(60.99%)
2013	2, 958	(54.36%)	2, 628	(88.83%)	(55.10%)	1, 626	(54.95%)	(59.77%)
2014	3, 868	(54.97%)	3, 443	(88.99%)	(55.91%)	2, 135	(55.18%)	(61.71%)
2015	4, 245	(53.77%)	3, 769	(88.79%)	(54.90%)	2, 355	(55.47%)	(60.36%)
2016	4, 342	(52.78%)	3, 836	(88.36%)	(54.00%)	2, 403	(55.35%)	(59.34%)
2017	4, 375	(52.68%)	3, 883	(88.77%)	(54.03%)	2, 412	(55.15%)	(58.65%)
2018	4, 223	(53.02%)	3, 728	(88.27%)	(54.53%)	2, 308	(54.65%)	(59.18%)
2019	3, 622	(56.32%)	3, 188	(88.01%)	(58.10%)	1, 948	(53.78%)	(63.16%)

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the total matched number of persons with EP accreditation by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations. The Total column refers to the total value of number of persons with EP accreditation, after imputations and outliers, and the % of Agg reports the total number of persons with EP accreditation of In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations as a proportion of all lobbying measured by number of persons with EP accreditation for all entities. The matched column provides the same statistics, where the % of total refers to the proportion of number of persons with EP accreditation by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations accounted for by matched entities. % of Agg reflects the the total lobbying measured by number of persons with EP accreditation reported by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations as a proportion of all lobbying measured by number of persons with EP accreditation by matched entities. The Val. NACE column reflects the same as the matched column, but limits the matched sample to entities with NACE Rev. 2 codes in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

While the total match rate is high on the whole, we are only interested in lobbying activities representing manufacturing interests. In this context, we attempt to match a lobbying entity to the underlying interests it represents. A lobbying entity linked to the Orbis data may have multiple industry codes or may belong to a global ownership group that spans multiple markets. Unilever, for example, reports 550,000 Euro in lobbying expenditures for the financial year ending in December 2015. While the company can be matched to the Manufacturing of Other Food Products (N.E.C.) sector in the UK, assigning all of Unilever's interests to this narrow sector definition will dramatically underestimate the variation and impact of its various lobbying activities in different European economies. In order to construct a composite measure of any corporate

Table 5: Matched Lobbying Data by Meetings by In-House Lobbying Groups

	Total		Matched			Val. NACE		
	Total	% of Agg	Total	% of Total	% of Agg.	Total	% of Total	% of Agg.
2014	1, 936	(76.07%)	1, 726	(89.15%)	(76.27%)	1, 166	(60.23%)	(81.14%)
2015	4, 011	(77.03%)	3, 620	(90.25%)	(77.48%)	2, 551	(63.60%)	(84.16%)
2016	3, 411	(73.17%)	3, 040	(89.12%)	(74.02%)	2, 100	(61.57%)	(78.53%)
2017	2, 823	(74.90%)	2, 543	(90.08%)	(75.98%)	1, 758	(62.27%)	(79.84%)
2018	2, 428	(72.54%)	2, 187	(90.07%)	(74.06%)	1, 483	(61.08%)	(78.26%)
2019	1, 830	(69.00%)	1, 607	(87.81%)	(70.42%)	1, 047	(57.21%)	(78.08%)

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the total matched number of meetings by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations. The Total column refers to the total value of number of meetings, after imputations and outliers, and the % of Agg reports the total number of meetings of In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations as a proportion of all lobbying measured by number of meetings for all entities. The matched column provides the same statistics, where the % of total refers to the proportion of number of meetings by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations accounted for by matched entities. % of Agg reflects the the total lobbying measured by number of meetings reported by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations as a proportion of all lobbying measured by number of meetings by matched entities. The Val. NACE column reflects the same as the matched column, but limits the matched sample to entities with NACE Rev. 2 codes in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

group's interests, the ownership structure of the entity is obtained via the Orbis ownership module.[55] Each of its child companies are weighted by their operating revenue in EU countries, meaning, for example, that Unilever's 550,000 Euro expenditure on lobbying would be divided among these sources.[56] Therefore, where a company has multiple child firms or branches in the same country for the same NACE 3-digit sector, the operating revenue of these branches or subsidiaries are aggregated to construct the appropriate weight. This approach is also followed for a lobbying entity that shares a domain name with multiple firms in the Orbis dataset.

Table 6 provides the aggregate statistics of in-house lobbying costs and it components represented by manufacturing interests, EU level interests, and the proportion of expenditure captured in our preferred sample of countries. In-house lobbying connected to manufacturing interests generally account for around 12% of total lobbying costs for in-house lobbying groups and between 13%-30% of lobbying costs for professional lobbying groups, in table A.5. In terms of accredited persons, table 7 shows that manufacturing entities account for around 10% of all accredited persons, whereas manufacturing interests account for around 25% of accredited persons in professional lobbying groups as shown in table A.4. The proportions are broadly similar for total meetings. The preferred sample of countries accounts for the lion's share of attributable interests for countries within the EU.[57] In terms of the manufacturing-specific sample, the total cost of interests represented by in-house groups is around 17% of all in-house lobbying at the EU level and 20% in the preferred sample. In terms of accredited persons for in-house lobbying groups table 7 reports that around 7% of all accredited persons are represented by manufacturing interests in the preferred sample of

[55]Due to licensing limitations, only the January 2022 version of the ownership structure could be used.
[56]Note that the entities are matched to all countries available in the Amadeus Module.
[57]Our preferred sample of countries are limited to Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. We focus on these countries as their Orbis data most closely reflect the trends observed in the Eurostat data as discussed in Section 6.

countries, with this figure increasing to 15% of interests attributable to EU countries and 18% of interests of in-house lobbying firms in the preferred sample of countries. These proportions for in-house lobbying groups are similar for meetings as well.

Taken at face value, tables A.5, A.4, and A.6 suggests that professional lobbying groups are significantly more likely to represent EU firms than foreign firms. Caution should be taken with this interpretation as the Orbis data is by construction limited to European firms and only matched data can be assigned countries.[58] Manufacturing interests in the preferred sample of countries account for 10%-26% of all lobbying costs attributable to professional groups, around 24% of all lobbying costs attributable to lobbying in EU countries, and around 27% of lobbying costs by professional groups in the preferred sample of countries. The meetings proportions are similar.

The total number of meetings matched in this paper is 22,182 with 7,752 meetings reported between 2014-2015 alone, a number slightly higher than the 7,084 meetings reported by Fruend (2015) for the period from December 2014 to November 2015.[59] The total number of meetings represented by manufacturing interests is around 1,537, which is about 42% of the total meetings used by Wiedemann (2022) in a study spanning all sectors over the same period. It should be noted that these meetings may in some instances reflect parties at the same meeting due to the way it is reported in the data.

5.2.2 Representativeness of the Transparency Register and Imputation of Lobbying Values

The Transparency Register likely underestimates lobbying in general, but specifically prior to 2014. Prior to 2014, the Transparency Register only required voluntary disclosure by lobbyists with limited incentives for them to do so. In 2014, a new inter-institutional arrangement resulted in a lobbying register that many considered to be mandatory in practice (Dinan 2021). To increase compliance with the register the Commission pledged to only meet with registered lobbyists resulting in the spike of entries noted above. Despite these efforts, Dinan (2021) notes that the lack of legislative authority and inconsistent application of the aforementioned pledge still gives rise to non-compliance issues.

Even where entities submit to the lobbying register, these entries often include missing or implausible data. The present paper deals with the largest cost and accredited persons reported by firms by confirming

[58]Unmatched in-house entities can still be assigned a country due to the geo-codes provided in the Transparency Register. It should be noted that the global ownership structure of large firms are used in the construction of the firm interests meaning that if there is an entity outside of the EU in Orbis, those interests will be represented as well.

[59]It should be noted that the higher number of meetings may also be due to the fact that the meeting dates are set to March of the next year to correspond to the dates used in Orbis.

Table 6: Matched Lobbying Data by Cost of Lobbying by In-House Lobbying Groups

	Total	Tot. Man.	Tot. EU*	Tot. Samp.	Tot. Man. Samp.	Man. Prop.
2008	149, 813, 808	20, 739, 236	81, 457, 336	67, 648, 752	15, 659, 867	19.22%
		(13.84%)	(54.37%)	(45.16%)	(10.45%)	[23.15%]
2009	233, 314, 368	32, 199, 072	127, 257, 896	102, 940, 952	23, 795, 360	18.70%
		(13.80%)	(54.54%)	(44.12%)	(10.20%)	[23.12%]
2010	357, 853, 344	42, 941, 600	205, 136, 096	167, 938, 704	31, 368, 090	15.29%
		(12.00%)	(57.32%)	(46.93%)	(8.77%)	[18.68%]
2011	444, 479, 200	60, 517, 340	270, 560, 768	224, 518, 400	47, 672, 704	17.62%
		(13.62%)	(60.87%)	(50.51%)	(10.73%)	[21.23%]
2012	524, 499, 232	70, 419, 080	318, 629, 824	260, 491, 232	55, 108, 844	17.30%
		(13.43%)	(60.75%)	(49.66%)	(10.51%)	[21.16%]
2013	602, 753, 280	85, 431, 312	361, 563, 488	290, 718, 464	64, 212, 464	17.76%
		(14.17%)	(59.99%)	(48.23%)	(10.65%)	[22.09%]
2014	921, 771, 200	129, 025, 184	582, 917, 312	456, 594, 976	94, 265, 616	16.17%
		(14.00%)	(63.24%)	(49.53%)	(10.23%)	[20.65%]
2015	1, 044, 121, 280	136, 283, 904	620, 424, 640	499, 186, 656	108, 758, 248	17.53%
		(13.05%)	(59.42%)	(47.81%)	(10.42%)	[21.79%]
2016	1, 021, 998, 976	113, 336, 840	585, 870, 464	469, 385, 664	83, 408, 000	14.24%
		(11.09%)	(57.33%)	(45.93%)	(8.16%)	[17.77%]
2017	1, 057, 476, 608	123, 242, 320	585, 412, 736	464, 292, 864	92, 532, 944	15.81%
		(11.65%)	(55.36%)	(43.91%)	(8.75%)	[19.93%]
2018	1, 131, 165, 952	133, 642, 136	632, 554, 368	499, 766, 752	99, 990, 712	15.81%
		(11.81%)	(55.92%)	(44.18%)	(8.84%)	[20.01%]
2019	1, 179, 820, 416	136, 951, 376	637, 395, 968	505, 094, 912	101, 255, 896	15.89%
		(11.61%)	(54.02%)	(42.81%)	(8.58%)	[20.05%]

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the annual aggregates of lobbying as measured by lobbying costs based on the country-industry classification of the lobbying entity's interests. All figures refer to values reported by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations lobbying entities and all proportions refer to values with respect to the relevant total of these entities. Total refers to the total value of lobbying costs for all lobbying entities classified in a financial year independent of matching status, Tot. Man. refers to the total interest weighted lobbying costs that can be attributed to manufacturing industries. Tot EU represents EU level lobbying, where $\star$ indicates that this is limited to Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.. Tot. Samp. Reflects the total lobbying costs associated with entities in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Tot Man. Samp. refers to the total lobbying costs attributable to manufacturing interest in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Man. Prop. provides additional proportions of the manufacturing sub-sample. The top row, without parentheses, reflects the proportion of total lobbying costs attributable to manufacturing interest as a proportion of the total lobbying costs in EU$\star$ countries. The second row, in square brackets, reflects the proportion of lobbying costs associated to manufacturing interests in terms of all lobbying costs in the preferred sample countries. The percentages in round parentheses reflect the proportion of lobbying costs attributable to the group in terms of lobbying costs in the second column.

that they are in fact outliers through the notice listed on their `Lobbyfacts.eu` page.[60] Where temporal information is available for the entity, the value is smoothed over rather than being dropped as in Gutiérrez & Philippon (2018). Furthermore, entities do not always report their total costs in absolute amounts but rather in bins. Following Gutiérrez & Philippon (2018) the mid-point of the bin is used. Where the figure is reported as lower than a specified amount, half of the figure is used and where the figure is reported as higher than a specified amount 150% of the amount is used. Temporal smoothing is used over the entire period where a lobbying entity reports missing values for accredited persons or costs. No imputation is used for the meetings data as these data, when available, consistently list all meetings the firm had and is more readily comparable to external statistics. As noted by Gutiérrez & Philippon (2018), the lobbying register may be subject to some over-counting, not only because entities may report directly on costs themselves, which would later be reported by an intermediary, but also because there is no consistent ID given to entities when they drop out and re-register. The fact that the lobbying entities can register, de-register, and register again and obtain different identification numbers does make temporal imputation more difficult but does not directly affect the matching approach as the names are relatively consistent and where they are not, the domain names, phone numbers, and addresses generally are.

[60] `Lobbyfacts.eu` put a banner on lobbying entities where their reported values of costs and accredited person measures are inconsistent or implausible. Gutiérrez & Philippon (2018) also uses their classification to remove outliers.

Table 7: Matched Lobbying Data by Number of Accredited persons by In-House Lobbying Groups

	Total	Tot. Man.	Tot. EU⋆	Tot. Samp.	Tot. Man. Samp.	Man. Prop.
2008	611	76	304	256	59	19.30%
		(12.48%)	(49.79%)	(41.92%)	(9.61%)	[22.92%]
2009	925	110	467	396	85	18.14%
		(11.85%)	(50.45%)	(42.85%)	(9.15%)	[21.36%]
2010	1, 388	146	703	596	109	15.43%
		(10.51%)	(50.66%)	(42.91%)	(7.82%)	[18.22%]
2011	1, 690	167	882	746	126	14.30%
		(9.88%)	(52.16%)	(44.16%)	(7.46%)	[16.89%]
2012	2, 083	213	1, 067	909	161	15.09%
		(10.21%)	(51.23%)	(43.64%)	(7.73%)	[17.72%]
2013	2, 958	298	1, 491	1, 264	229	15.35%
		(10.09%)	(50.39%)	(42.74%)	(7.74%)	[18.10%]
2014	3, 868	372	1, 960	1, 646	287	14.65%
		(9.61%)	(50.68%)	(42.56%)	(7.42%)	[17.45%]
2015	4, 245	421	2, 157	1, 811	321	14.88%
		(9.93%)	(50.80%)	(42.67%)	(7.56%)	[17.72%]
2016	4, 342	434	2, 204	1, 854	335	15.21%
		(10.01%)	(50.76%)	(42.71%)	(7.72%)	[18.08%]
2017	4, 375	411	2, 220	1, 865	317	14.30%
		(9.39%)	(50.74%)	(42.63%)	(7.26%)	[17.02%]
2018	4, 223	397	2, 124	1, 781	307	14.46%
		(9.40%)	(50.30%)	(42.17%)	(7.28%)	[17.25%]
2019	3, 622	329	1, 789	1, 488	256	14.32%
		(9.09%)	(49.39%)	(41.08%)	(7.07%)	[17.21%]

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the annual aggregates of lobbying as measured by number of persons with EP accreditation based on the country-industry classification of the lobbying entity's interests. All figures refer to values reported by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations. lobbying entities and all proportions refer to values with respect to the relevant total of these entities. Total refers to the total value of number of persons with EP accreditation for all lobbying entities classified in a financial year independent of matching status, Tot. Man. refers to the total interest weighted number of persons with EP accreditation that can be attributed to manufacturing industries. Tot EU represents EU level lobbying, where ⋆ indicates that this is limited to Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.. Tot. Samp. Reflects the total number of persons with EP accreditation associated with entities in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Tot Man. Samp. refers to the total number of persons with EP accreditation attributable to manufacturing interest in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Man. Prop. provides additional proportions of the manufacturing sub-sample. The top row, without parentheses, reflects the proportion of total number of persons with EP accreditation attributable to manufacturing interest as a proportion of the total number of persons with EP accreditation in EU⋆ countries. The second row, in square brackets, reflects the proportion of number of persons with EP accreditation associated to manufacturing interests in terms of all number of persons with EP accreditation in the preferred sample countries. The percentages in round parentheses reflect the proportion of number of persons with EP accreditation attributable to the group in terms of number of persons with EP accreditation in the second column.

Table 8: Matched Lobbying Data by meetings by In-House Lobbying Groups

	Total	Tot. Man.	Tot. EU⋆	Tot. Samp.	Tot. Man. Samp.	Man. Prop.
2014	1, 936	183	1, 102	894	130	11.80%
		(9.43%)	(56.94%)	(46.19%)	(6.72%)	[14.55%]
2015	4, 011	384	2, 431	2, 021	297	12.20%
		(9.57%)	(60.61%)	(50.39%)	(7.39%)	[14.67%]
2016	3, 411	348	2, 001	1, 617	271	13.56%
		(10.21%)	(58.67%)	(47.41%)	(7.96%)	[16.79%]
2017	2, 823	291	1, 664	1, 363	213	12.82%
		(10.32%)	(58.93%)	(48.30%)	(7.55%)	[15.64%]
2018	2, 428	270	1, 408	1, 133	193	13.72%
		(11.12%)	(58.00%)	(46.68%)	(7.96%)	[17.05%]
2019	1, 830	172	989	812	130	13.19%
		(9.41%)	(54.02%)	(44.35%)	(7.13%)	[16.07%]

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the annual aggregates of lobbying as measured by number meetings based on the country-industry classification of the lobbying entity's interests. All figures refer to values reported by In-House Lobbying from Companies and groups, Trade and Business Associations, and Trade Unions and Professional Associations lobbying entities and all proportions refer to values with respect to the relevant total of these entities. Total refers to the total value of number meetings for all lobbying entities classified in a financial year independent of matching status, Tot. Man. refers to the total interest weighted number meetings that can be attributed to manufacturing industries. Tot EU represents EU level lobbying, where ⋆ indicates that this is limited to Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.. Tot. Samp. Reflects the total number meetings associated with entities in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Tot Man. Samp. refers to the total number meetings attributable to manufacturing interest in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Man. Prop. provides additional proportions of the manufacturing sub-sample. The top row, without parentheses, reflects the proportion of total number meetings attributable to manufacturing interest as a proportion of the total number meetings in EU⋆ countries. The second row, in square brackets, reflects the proportion of number meetings associated to manufacturing interests in terms of all number meetings in the preferred sample countries. The percentages in round parentheses reflect the proportion of number meetings attributable to the group in terms of number meetings in the second column.

6 Empirical Analysis

This section discusses the relationship between the labour share, concentration, and productivity growth in the European manufacturing sector. First, the aggregate trends are presented followed by a descriptive analysis of the relevant associations. The results documented here largely confirm the prediction of the superstar firm hypotheses and the results of Lawless & Rehill (2022) and Bighelli et al. (2021). Specifically, the labour share is negatively correlated with concentration and it is the between-firm component of labour share that is most affected by increases in concentration. Concentration growth is further found to be positively correlated with productivity growth, which is positively related to between-firm productivity growth. We find, however, significant heterogeneity in the aggregate relationships.

Our results suggest that the trends observed in European manufacturing should not be interpreted as increasingly concentrated industries experiencing allocative efficiency growth, but rather that high-concentration growth industries tend to have less negative allocative efficiency growth coinciding with lower allocation-driven falls in the labour share. The section concludes with an examination of the role of corporate lobbying in explaining the heterogeneity in the long-run relationship between allocative efficiency growth and the decline in the labour share.

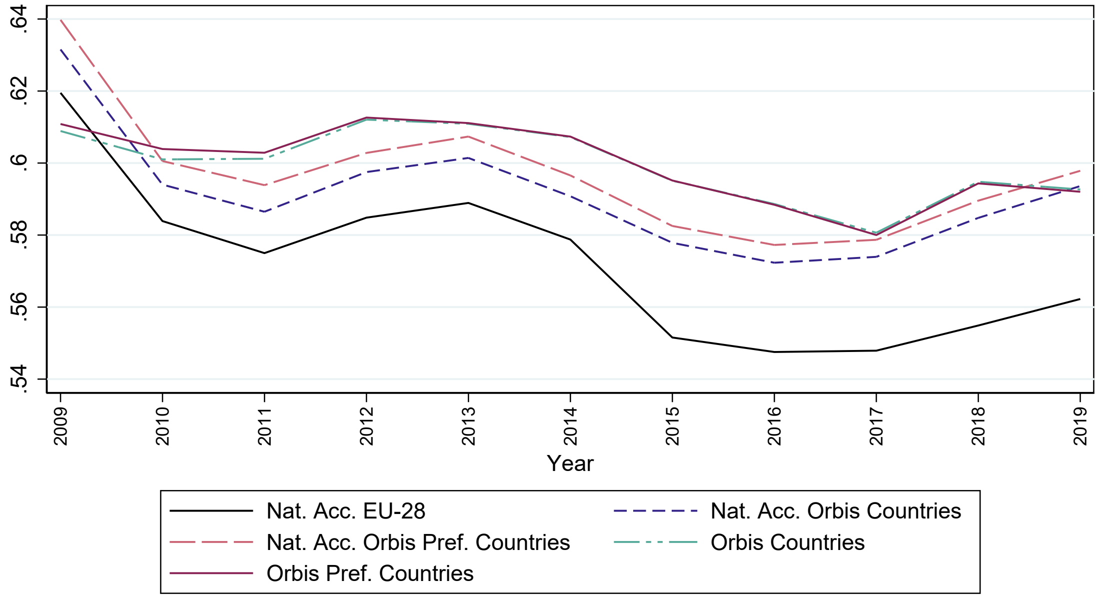
6.1 Aggregate Trends

6.1.1 The Labour Share of Value Added

In figure 1 the aggregate labour share of value added in European manufacturing is shown to be declining between 2009 and 2019.[61] The figure further compares the labour shares in value added estimated using the National Accounts data provided by Eurostat and the Orbis data used in this paper. Superficially, the data shows a rapid decline in the labour share in the immediate aftermath of the 2008 financial crisis, followed by a slight rebound in the share, until a second dramatic fall in 2014-2015, followed by a slight recovery. Notable for our empirical analysis, the Orbis data does a reasonable job at matching these aggregate trends both in levels and dynamics.

[61] Figure 5 in appendix B shows the evolution of the labour share based on the Eurostat National Accounts data from 2000–2019 and shows more stable trends as discussed in CompNet (2020) and Cette et al. (2020) over this period.

Figure 1: Labour Share of Value Added in Manufacturing



Author's own calculations based on Orbis and EU National Accounts Data. This figure shows the aggregate evolution of the labour share of value added constructed according to the approach discussed in section 5 for EU countries using the Orbis and National Accounts Data. The Nat. Acc. Orbis countries are limited to Austria, Belgium, Bulgaria, Croatia, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, and the United Kingdom. The Orbis Pref. Countries refer to the preferred sample of countries Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. These countries are chosen as the Orbis data more closely matches the data reported in Eurostat as shown in figure 2.

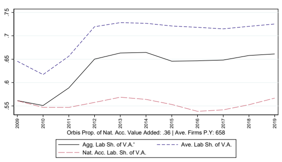
In figure 2 the change in the labour share of value added is shown for all countries in the sample over the period 2009-2019 and decomposed into the values reported by the national accounts data, the aggregate labour share in the Orbis data, and the average labour share in the Orbis data. The Orbis data matches the general trends in the labour share movements for the majority of countries.[62] The National Accounts measure of the labour share of income is falling in Belgium, Finland, France, Italy, Slovenia, Spain, and the United Kingdom. The share is weakly falling for Germany, Portugal, and Sweden while being more or less stable in Norway. The labour share of income appears to be increasing in Eastern European countries like Czechia, Estonia and Hungary.

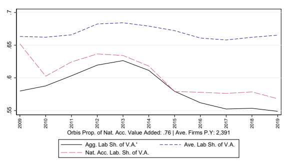
In all of the figures the absolute value of the average labour share of income is significantly lower than the aggregate labour share, providing evidence that larger firms have lower labour shares as found by Autor et al.

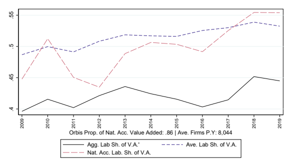
[62] Notable exceptions include Austria, Croatia and Romania, which we subsequently exclude from our analysis. In Austria, the Orbis data diverges dramatically from the national accounts data at the beginning of the sample. Croatia's aggregate labour share, in levels, is closer to the Orbis Average and the sample captures less than half of value added reported by Eurostat. Romania's aggregate labour share in the Orbis data is about two times larger than its corresponding value in the national accounts. It is worth noting that the Bulgarian Orbis sample also deviates from the national accounts: for 86% of reported Bulgarian value added, neither the sizeable volatility of labour share nor the dramatic rise in the labour share from 45% to 55% are documented in the Orbis data. That being said, the general increase in the labour share of value added is shown in the Orbis data and so it is retained in the empirical analysis. Slovakia's aggregate trends also fail to capture the full range of dynamics of the national accounts data, but the beginning and end points of the data appear to reflect the same broadly rising labour share of income.

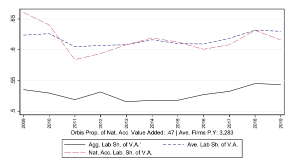
(2020), Lawless & Rehill (2022), Bouche et al. (2021), and others. In general, the evidence finds support for declining or stable labour shares in the majority of countries over the period in question.

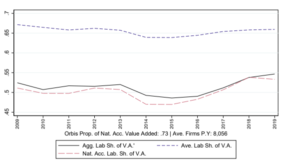
Figure 2: Labour Share of Value Added by Country

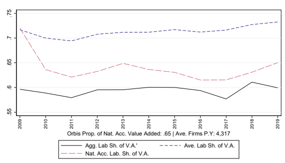

(a) Austria

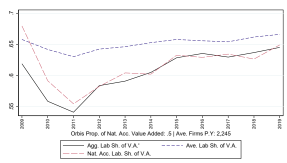

(b) Belgium

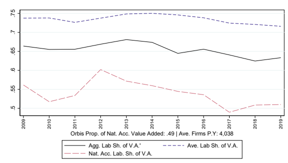

(c) Bulgaria

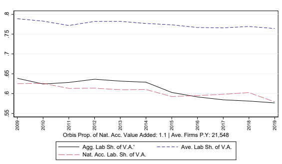

(d) Croatia

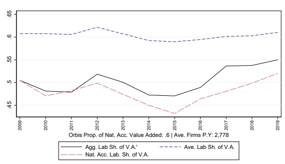

(e) Czechia

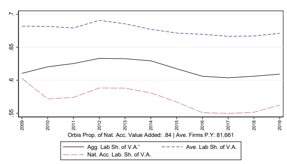

(f) Germany

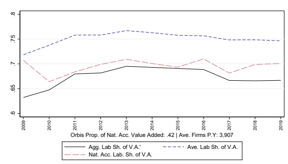

(g) Estonia

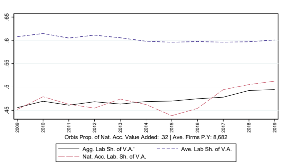

(h) Finland

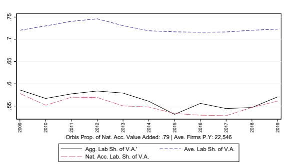

(i) France

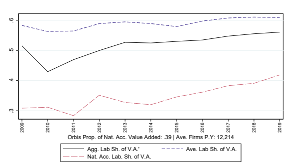

(j) Hungary

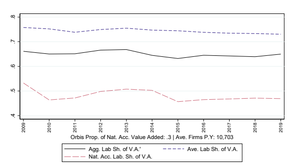

(k) Italy

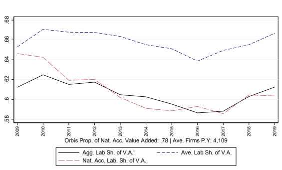

(l) Norway

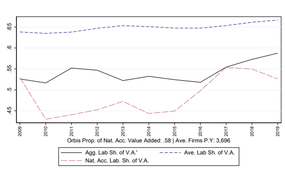

(m) Poland

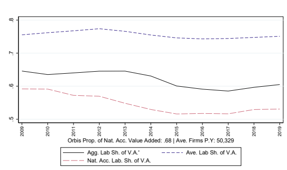

(n) Portugal

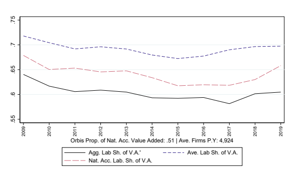

(o) Romania


(p) Sweden


(q) Slovenia


(r) Slovakia


(s) Spain


(t) UK

Author's own calculations based on Orbis and EU National Accounts Data.
This figure shows the evolution of the labour share of value added, based on the measured constructed in section 5. The solid black lines are the aggregate labour share in the Orbis data for the relevant country. The blue dashed lines are the labour share of the average firm. The pink long-dashed line is the aggregate labour shares reported by Eurostat. Each figure reports the average value of value added reported in the Orbis data in each year to the average value of value added reported in Eurostat in each year. The Ave. Firms. P.Y is the average number of firms in each year over the sample period.

6.1.2 Melitz-Polanac Decomposition of the Labour Share

In figure 3 the MP decomposition is shown for the preferred sample of countries.[63] The results of Autor et al. (2020) are broadly confirmed. Where labour share is declining (Belgium, Finland, France, Portugal, Spain, Sweden and the UK), this is driven by the between-component (the pink square). Moreover, in most cases where the labour share is increasing (Bulgaria, Estonia, Hungary and Norway) the between shift in labour share is negative meaning that value added is moving towards the low-labour share firms.[64]

Figure 3: Accumulated Changes in Labour Share of Value Added

Author's own calculations based on Orbis Data.
This figure is the MP decomposition of the labour share of value added in Manufacturing for the Orbis Data by country. The results including Austria, Croatia, and Romania, are provided in 6.

[63]Due to the nature of the Orbis data, some firms are dropped from the sample due to data reporting issues, non-submission of documents, or not being updated at the time of extraction. In order to limit the impact of these reporting issues on the aggregate trends, only firms with reported birth dates after 2010 are allowed to enter the sample after said date, that is false entrants are allowed up to 2010 meaning that the firm starts existing with all required data in 2010 despite being born earlier. Firms with reported death or dormant dates are allowed up to 2017, so that firm's that drop from the sample due to data issues must exist to at least 2018. A firm with incomplete data on both sides must thus exist for 8 of the 10 years to be allowed in the sample while firms with entry and exit data can be included at any point. In this context, the Orbis data will tend to favour larger firms at the beginning of the sample and therefore underestimate the aggregate labour share at the beginning of the sample as shown in figure 1. Firms that enter and exit due to missing data or other reasons are termed false entrants and false exits.

[64]The only countries where the between shift in labour share is positive are Czechia, Poland, and Slovakia, with the positive contribution of the between shifts being lower than the within shift for the latter two countries and the contribution between the two being indistinguishable for Czechia. It is also interesting to note that Austria and Romania have small positive between contributions but sizeable positive within contributions (see Appendix B).

6.1.3 Concentration

Table 9 shows the HHI for the European manufacturing sector computed using the preferred sample from the Orbis data.[65] HHI's computed for the manufacturing sector as a whole are presented along with weighted and unweighted averages of indices computed at the 2-digit and 3-digit sector levels for each country in our sample. These indices broadly conform to the results in Bighelli et al. (2021).[66]

Table 9: Output HHI in Manufacturing by Country

		Unweighted		Weighted	
Country	Agg.	2-digit	3-digit	2-digit	3-digit
Austria	0.015	0.104	0.391	0.109	0.283
Belgium	0.007	0.106	0.241	0.085	0.200
Bulgaria	0.033	0.115	0.256	0.231	0.337
Croatia	0.006	0.085	0.349	0.056	0.194
Czechia	0.013	0.071	0.252	0.086	0.179
Estonia	0.044	0.153	0.437	0.231	0.390
Finland	0.093	0.160	0.346	0.323	0.408
France	0.018	0.131	0.198	0.179	0.254
Germany	0.044	0.145	0.223	0.184	0.264
Hungary	0.018	0.087	0.312	0.102	0.274
Italy	0.002	0.036	0.094	0.039	0.084
Norway	0.005	0.092	0.337	0.051	0.164
Poland	0.003	0.069	0.195	0.042	0.113
Portugal	0.003	0.049	0.218	0.046	0.128
Romania	0.017	0.058	0.218	0.085	0.227
Slovakia	0.035	0.119	0.339	0.139	0.267
Slovenia	0.010	0.106	0.320	0.101	0.276
Spain	0.003	0.034	0.097	0.028	0.068
Sweden	0.031	0.142	0.339	0.116	0.227
UK	0.010	0.099	0.205	0.126	0.192

Source: Author's own calculations based on Orbis Data. This table shows the HHI of output as discussed in section 5 at the aggregate, 2-digit, and 3-digit level. The aggregate value is the concentration measure over the entire manufacturing sample for the country averaged over all periods. The unweighted values reflect the unweighted mean of the concentration measure in the country averaged over all period. The weighted values reflect the weighted means where each sector's concentration is weighted by output the resulting aggregate is then averaged over time. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample.

Table 10 shows the change in HHI concentration by country and provides the 2 and 3-digit MP decompositions over the entire period.[67] Aggregate concentration, that is the HHI computed over the entire manufacturing sample, is increasing most for Slovakia and Germany. It is also increasing, but to a lesser extent, for Belgium, Czechia, Estonia, France, Portugal and Sweden but is declining for Bulgaria, Finland, Hungary, Italy, Norway, Poland, Slovenia, Spain and the United Kingdom. The differences in concentration trends across countries is generally supported in the literature.[68]

German concentration is largely increasing due to increasing concentration within 2-digit and 3-digit industries and is, if anything, falling due to shifts in output towards less concentrated industries. Concentra-

[65] See appendix C for the results based on the full sample which are consistent with those presented in Table 9.

[66] For example, we find that Finland has higher concentration levels than Germany and Poland and that Italy has the lowest concentration levels. There are some discrepancies in our findings compared with Bighelli et al. (2021), however, which may be due to the fact that they include multiple sectors while we focus on manufacturing only.

[67] The change in HHI and decomposition for the full sample are presented in appendix C along with the changes in the CR4, CR20 and decomposition for the full and preferred samples.

[68] For example, Bighelli et al. (2021) find falling concentration across all sectors for the majority of European countries and that German firms are largely driving the increasing concentration trends in Europe.

tion in France is largely increasing due to within-industry concentration although it appears that output is shifting towards more concentrated sectors. Italy reports slightly declining aggregate output concentration, with negative within-industry concentration appearing to drive the result at the 2-digit level, with movement towards more concentrated industries offsetting it at this level. At the 3-digit level, both within and between components are at about the same order of magnitude. The tables in Appendix C provide the same decomposition for the the full sample and the HHI growth rates. We provide the further tables for HHI, CR20, and CR4 measured by output, value added, and employment concentration in the online appendix Online.M.

Table 10: Output HHI Growth in Manufacturing by Country in Preferred Sample

		2-Digit			3-Digit		
Country	Agg.	W. Total	Within	Between	W. Total	Within	Between
Austria	0.004	−0.004	−0.031	0.027	−0.041	−0.053	0.012
Belgium	0.001	0.018	0.010	0.007	0.025	0.003	0.023
Bulgaria	−0.008	−0.036	−0.002	−0.033	−0.030	−0.021	−0.009
Croatia	−0.002	−0.008	−0.002	−0.006	−0.028	0.023	−0.051
Czechia	0.007	0.016	0.004	0.012	0.039	0.030	0.008
Estonia	0.008	0.010	−0.006	0.016	0.009	−0.013	0.022
Finland	−0.040	−0.079	0.018	−0.096	−0.071	0.029	−0.100
France	0.003	0.035	0.035	0.000	0.032	0.031	0.001
Germany	0.013	0.002	0.005	−0.003	−0.018	0.008	−0.026
Hungary	−0.007	−0.036	−0.009	−0.026	−0.061	−0.011	−0.050
Italy	−0.001	−0.018	−0.012	−0.006	−0.027	−0.010	−0.017
Norway	−0.002	−0.029	−0.047	0.018	−0.061	−0.040	−0.021
Poland	−0.003	−0.028	−0.008	−0.020	−0.050	−0.017	−0.033
Portugal	0.002	0.015	0.011	0.004	0.012	0.008	0.004
Romania	0.014	0.010	−0.008	0.019	0.057	0.012	0.045
Slovakia	0.016	−0.001	−0.000	−0.000	−0.007	0.013	−0.020
Slovenia	−0.003	−0.030	−0.006	−0.024	−0.043	0.029	−0.072
Spain	−0.000	−0.005	−0.011	0.006	−0.006	−0.017	0.011
Sweden	0.005	0.034	0.027	0.007	0.034	−0.014	0.048
UK	−0.003	−0.021	−0.005	−0.017	−0.014	0.005	−0.019

Source: Author's own calculations based on Orbis Data.
This table shows the HHI of output as discussed in section 5 in terms of changes at the aggregate, 2-digit, and 3-digit level. The aggregate value is the change in the concentration measure over the entire manufacturing sample for the country from 2009-2019. The 2-digit and 3-digit decompositions reflect the Melitz & Polanec (2015) decomposition for each country where the within component reflect changes in the average industry concentration and the between component reflects the change in concentration due to changes in the shift of output to or from more concentration industries. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample.

6.2 The Relationship between Concentration, Productivity Growth, and the Labour Share

6.2.1 The Labour Share and Concentration

One of the main predictions of the superstar model is that the decline in labour share is positively correlated with product market concentration (Autor et al. 2020). In table 12 the coefficients of an OLS regression of the labour share on concentration measures and a set of controls, in (25), are shown to broadly align with these predictions and are close to those found by Autor et al. (2020) for the US. Each regression is run at the Country and 3-digit industry level for the accumulated change over the period in question. The labour share measures include labour share of value added and labour share of output. The baseline regression refers to a regression with only year controls, whereas the country, industry, and country and industry specifications include additional dummy variables. Regressions are weighted using the contribution of each country-3-digit industry to total value added in 2013.[69] We provide the full tables appendix D.

$$\Delta_t Labour\ Share_{i,c,t} = \beta_0 + \beta_C \Delta_t Concentration_{i,c,t} + Controls'\gamma \quad (25)$$

As in Autor et al. (2020), the correlation between the value added measures of concentration and value added labour share of value added are generally larger than output concentration. The inclusion of industry and country controls appears to lower the correlation between HHI and labour share in general, but other than that the relationship appears to be robust for whichever controls are included. The only exception to this general trend is the relationship between labour share and employment concentration which is not consistently statistically significant in any sign in general, a result also found by Autor et al. (2020).

The choice of concentration measure does not appear to have an impact on the sign or significance levels for the correlation structure between the labour share of value added and value added concentration or labour share of output on output concentration. The concentration trends are only consistently statistically significant for HHI where the value added labour share is regressed on output concentration. Movements in the CR4 measure appear to be statistically significant only for short periods, whereas the CR20 measure becomes significant over a longer period of time. The regressions for the labour share of value added on output concentration show broadly similar trends with significance for the HHI measures becoming robust to the industry specification for any period larger than 3 years. The CR20 measures in these regressions only become significant after about 5 years of accumulation.

The superstar firm model predicts that the falling labour share is due to a between-firm shift, specifically, that industries, where concentration is rising the most, have the largest fall in between-firm labour shares. This hypothesis is tested in this sample using a simple seemingly unrelated regression as in (26) where $M \in \{Within, Between, Entrants, Exits\}$. That is each component of the change in labour share is run separately on the change in the concentration measure of choice, but errors are allowed to be correlated across equations.

$$\Delta_t Labour\ Share_{M,i,c,t} = \beta_M + \beta_{M,C} \Delta_t Concentration_{i,c,t} + Controls'\gamma_M \quad (26)$$

[69]This date is chosen in an attempt to limit the potential impact of over-reporting of large firms at the beginning of the sample.

Table 11: Decomposed Labour Share of Value Added and Output Concentration

	1 Year			3 Years		
	HHI	CR20	CR4	HHI	CR20	CR4
Within	−0.038	0.079	−0.002	−0.026	0.112	0.016
	(0.031)	(0.050)	(0.032)	(0.029)	(0.074)	(0.037)
Between	−0.052	−0.194***	−0.105**	−0.170***	−0.220***	−0.046
	(0.068)	(0.061)	(0.051)	(0.059)	(0.068)	(0.061)
Entrants	−0.008	−0.009	−0.013	−0.005	−0.018	−0.015*
	(0.009)	(0.018)	(0.011)	(0.005)	(0.014)	(0.009)
Exits	−0.002	0.000	0.002	−0.000	0.005	0.001
	(0.006)	(0.006)	(0.008)	(0.005)	(0.009)	(0.006)
R^2-adj Within	0.140	0.141	0.138	0.205	0.211	0.205
R^2-adj Between	0.056	0.061	0.060	0.116	0.116	0.106
R^2-adj Entrants	0.079	0.078	0.086	0.166	0.174	0.179
R^2-adj Exits	0.052	0.052	0.052	0.136	0.137	0.136
Observations	6,440	6,440	6,440	5,152	5,152	5,152
	5 Years			**10 Years**		
	HHI	CR20	CR4	HHI	CR20	CR4
Within	−0.042*	0.111	0.062	−0.082**	−0.018	0.010
	(0.025)	(0.093)	(0.050)	(0.039)	(0.057)	(0.046)
Between	−0.190***	−0.218**	−0.079	−0.312***	−0.246	−0.064
	(0.071)	(0.092)	(0.066)	(0.093)	(0.171)	(0.095)
Entrants	−0.001	−0.016	−0.014	0.008	−0.014	0.007
	(0.005)	(0.012)	(0.009)	(0.016)	(0.018)	(0.022)
Exits	0.007	0.006	0.002	0.014	0.019	0.016
	(0.010)	(0.015)	(0.010)	(0.022)	(0.033)	(0.027)
R^2-adj Within	0.288	0.295	0.293	0.547	0.534	0.534
R^2-adj Between	0.280	0.275	0.267	0.550	0.513	0.497
R^2-adj Entrants	0.231	0.237	0.242	0.434	0.435	0.434
R^2-adj Exits	0.212	0.211	0.210	0.311	0.311	0.314
Observations	3,864	3,864	3,864	644	644	644

Source: Author's own table using Orbis data.
This table shows the results of a seemingly unrelated regression with each of the decomposed labour shares listed in the second row on the Output concentration measures listed in the column title accumulated over the period in the heading. All regressions includes country, 3-digit industry, and year effects. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table 12: Labour Share and Concentration Measures in European Manufacturing

		1 Year			3 Years			5 Years			10 Years		
		HHI	CR20	CR4	HHI	CR20	CR4	HHI	CR20	CR4	HHI	CR20	CR4
Labour Share of Val. Added on Val. Added Concentration	Base	-0.460^{***}	-0.595^{***}	-0.404^{***}	-0.393^{**}	-0.520^{***}	-0.341^{***}	-0.293	-0.405^{***}	-0.286^{**}	-0.369^{*}	-0.475^{***}	-0.371^{***}
		(0.095)	(0.115)	(0.085)	(0.140)	(0.078)	(0.091)	(0.176)	(0.077)	(0.099)	(0.175)	(0.132)	(0.121)
	Country	-0.460^{***}	-0.606^{***}	-0.402^{***}	-0.403^{***}	-0.564^{***}	-0.340^{***}	-0.308^{*}	-0.492^{***}	-0.294^{**}	-0.367^{*}	-0.582^{***}	-0.341^{**}
		(0.095)	(0.115)	(0.088)	(0.136)	(0.076)	(0.098)	(0.169)	(0.063)	(0.109)	(0.175)	(0.113)	(0.145)
	Industry	-0.478^{***}	-0.591^{***}	-0.399^{***}	-0.479^{***}	-0.519^{***}	-0.330^{***}	-0.391^{***}	-0.355^{***}	-0.235^{**}	-0.503^{***}	-0.393^{***}	-0.259^{**}
		(0.088)	(0.114)	(0.083)	(0.119)	(0.064)	(0.088)	(0.129)	(0.060)	(0.093)	(0.097)	(0.063)	(0.090)
	Country and Industry	-0.478^{***}	-0.604^{***}	-0.400^{***}	-0.489^{***}	-0.578^{***}	-0.339^{***}	-0.414^{***}	-0.471^{***}	-0.260^{**}	-0.503^{***}	-0.538^{***}	-0.259^{**}
		(0.087)	(0.115)	(0.083)	(0.115)	(0.066)	(0.086)	(0.119)	(0.062)	(0.091)	(0.087)	(0.115)	(0.093)
Labour Share of Val. Added on Output Concentration	Base	-0.093^{***}	-0.132	-0.124^{**}	-0.107^{*}	-0.107	-0.043	-0.042	-0.085	-0.027	-0.179^{**}	-0.248^{*}	-0.121^{**}
		(0.016)	(0.109)	(0.054)	(0.058)	(0.082)	(0.063)	(0.065)	(0.083)	(0.063)	(0.077)	(0.124)	(0.057)
	Country	-0.088^{***}	-0.143	-0.121^{**}	-0.100^{*}	-0.148^{**}	-0.040	-0.038	-0.185^{***}	-0.035	-0.156^{**}	-0.346^{***}	-0.099^{*}
		(0.017)	(0.105)	(0.055)	(0.055)	(0.069)	(0.067)	(0.054)	(0.059)	(0.069)	(0.065)	(0.098)	(0.056)
	Industry	-0.102^{***}	-0.116	-0.119^{**}	-0.197^{*}	-0.073	-0.043	-0.203^{**}	-0.005	-0.018	-0.375^{***}	-0.149^{**}	-0.057
		(0.035)	(0.106)	(0.054)	(0.103)	(0.068)	(0.061)	(0.096)	(0.074)	(0.064)	(0.096)	(0.068)	(0.062)
	Country and Industry	-0.100^{***}	-0.124	-0.118^{**}	-0.201^{*}	-0.121^{**}	-0.043	-0.225^{**}	-0.117^{*}	-0.029	-0.372^{***}	-0.259^{***}	-0.031
		(0.034)	(0.103)	(0.053)	(0.097)	(0.052)	(0.060)	(0.082)	(0.064)	(0.065)	(0.080)	(0.066)	(0.061)
Labour Share of Output on Output Concentration	Base	-0.149^{***}	-0.165^{***}	-0.114^{***}	-0.117^{***}	-0.170^{***}	-0.121^{***}	-0.111^{***}	-0.167^{***}	-0.109^{***}	-0.125^{***}	-0.175^{***}	-0.135^{***}
		(0.023)	(0.043)	(0.037)	(0.018)	(0.033)	(0.024)	(0.024)	(0.032)	(0.019)	(0.030)	(0.047)	(0.022)
	Country	-0.145^{***}	-0.167^{***}	-0.112^{***}	-0.110^{***}	-0.180^{***}	-0.120^{***}	-0.102^{***}	-0.184^{***}	-0.108^{***}	-0.101^{***}	-0.197^{***}	-0.119^{***}
		(0.022)	(0.042)	(0.038)	(0.017)	(0.032)	(0.025)	(0.026)	(0.035)	(0.019)	(0.033)	(0.029)	(0.016)
	Industry	-0.156^{***}	-0.163^{***}	-0.112^{**}	-0.122^{***}	-0.169^{***}	-0.118^{***}	-0.120^{***}	-0.156^{***}	-0.105^{***}	-0.158^{***}	-0.164^{***}	-0.116^{***}
		(0.027)	(0.045)	(0.039)	(0.031)	(0.031)	(0.028)	(0.031)	(0.029)	(0.027)	(0.041)	(0.050)	(0.022)
	Country and Industry	-0.154^{***}	-0.165^{***}	-0.111^{**}	-0.117^{***}	-0.181^{***}	-0.117^{***}	-0.112^{***}	-0.177^{***}	-0.102^{***}	-0.135^{***}	-0.191^{***}	-0.096^{***}
		(0.026)	(0.043)	(0.039)	(0.027)	(0.031)	(0.028)	(0.026)	(0.027)	(0.026)	(0.034)	(0.019)	(0.023)
Labour Share of Val. Added on Employment Concentration	Base	-0.005	0.117	0.014	0.015	0.110^{**}	0.077^{*}	0.087^{*}	0.137^{***}	0.076^{**}	-0.186^{*}	-0.044	-0.090
		(0.014)	(0.087)	(0.025)	(0.062)	(0.050)	(0.040)	(0.044)	(0.039)	(0.032)	(0.102)	(0.104)	(0.061)
	Country	-0.001	0.116	0.020	0.016	0.089^{**}	0.088^{**}	0.080^{*}	0.080^{**}	0.080^{**}	-0.160	-0.086	-0.032
		(0.014)	(0.084)	(0.024)	(0.061)	(0.039)	(0.041)	(0.040)	(0.030)	(0.028)	(0.098)	(0.076)	(0.052)
	Industry	-0.002	0.129	0.025	-0.031	0.126^{***}	0.096^{*}	-0.037	0.154^{**}	0.093	-0.393^{**}	0.042	0.032
		(0.023)	(0.091)	(0.022)	(0.090)	(0.041)	(0.050)	(0.085)	(0.061)	(0.055)	(0.135)	(0.082)	(0.065)
	Country and Industry	0.003	0.134	0.028	-0.032	0.111^{***}	0.096^{**}	-0.050	0.108^{**}	0.084^{*}	-0.338^{**}	0.074	0.075
		(0.021)	(0.088)	(0.020)	(0.086)	(0.025)	(0.044)	(0.081)	(0.049)	(0.047)	(0.126)	(0.088)	(0.067)
Observations		6,440	6,440	6,440	5,152	5,152	5,152	3,864	3,864	3,864	644	644	644

Source: Author's own table using Orbis data.
Each cell shows the coefficient from an OLS regression of with the change in the labour share variable in the first row as the y-variable on the concentration in the column over the period reported in the first row. The baseline specification controls for time trends. The country specification controls for time and country trends separately. The industry specification includes year and industry trends separately. The country and industry specification controls for time, country, and industry trends separately Trends are controlled for by including dummy variables. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

In table 11 the results of the above regression show that increased concentration is, in fact, most correlated with the between-firm driven falls in the labour share and generally uncorrelated with the change in the contribution of entrants and exits. All results control for country, industry, and year effects separately. Only HHI remains negatively correlated with the between component of labour share over all time periods when measuring concentration using output. In appendix Online.N, we show that as in the aggregate results above, the relationship is consistently negative and statistically significant for the value added concentration measures.[70] The size of the coefficients on value added concentration measured are weakly falling over time, while the size of the coefficient on output concentration measured by HHI is increasing over time. That is, our results generally support one of the main predictions of the superstar model and the results found by both Autor et al. (2020) and Lawless & Rehill (2022).

6.2.2 Productivity and Concentration

The superstar model proposes that the correlation between the falling labour share and industry concentration (as observed above) is due to the shift of activity towards more productive firms, meaning that we should expect increasing allocative efficiency in higher concentration sectors.

Bighelli et al. (2021) run a static regression of HHI on value added labour productivity in aggregate, within, and between, measures separately. They find a statistically significant positive relationship between concentration and the between component of productivity. Autor et al. (2020) use a dynamic regression on the 5-period value added per worker and the standard Solow residual on concentration and find a strongly significant result for value added per worker on HHI, CR20, and CR4 for manufacturing but a somewhat statistically weaker relationship between the residual based measure of TFP.

In table 13, we run a dynamic specification similar to (26) where we use TFP instead of the labour share. Our results support the superstar model in regressions using country, industry, and year controls. Specifically, increased concentration growth by any measure is correlated with increased productivity growth in both aggregate and decomposed levels. Decomposing productivity growth, we see that it is in fact the between component that drives the result in all cases; while the size of the coefficients on entrant and exits are high and significant over shorter horizons they become indistinguishable from zero as the period of interest goes past 6 years.[71] Table Online.Q.1 shows that the results are generally robust when including

[70] We also find the same null result of employment concentration in table Online.N.2.

[71] In appendix Online.Q tables Online.Q.1-Online.Q.39 show that the role of entrant and exits remain significant at longer terms when not controlling for both country and year effects, with country specific trends appearing to drive the sign and significance of the coefficients.

the entire sample for the Translog approach. The results are further robust to the GMM and Cobb-Douglas approaches with the coefficients on the Cobb-Douglas specification being around the same size as the Translog specification over shorter horizons, but becoming larger than the translog specification over longer periods. In table Online.Q.44 the between component of the HHI concentration measure is about twice the size of the coefficient on the Translog regression. This result is expected if larger firms have differing returns to scale. The Wooldridge (2009) approach to estimation provide coefficients somewhere between the Cobb-Douglas and Translog specifications. Tables Online.Q.88, Online.Q.92, and Online.Q.96 show the results are robust for the full series of specifications for value added concentration independent of the TFP measure used. Tables Online.Q.25-Online.Q.96 show that these results are generally robust to a battery of controls and specifications.

These results support those of Lawless & Rehill (2022) and Bighelli et al. (2021) for European countries using the CompNet data, at the country-2-digit level. Lawless & Rehill (2022) use a static regression of sector-country labour shares on the HHI level and productivity dispersion. The latter is measured as the standard deviation of labour productivity at the sector level. In their sample they find that the within and between components of productivity contribute in equal measure to the fall in labour share.[72]

6.2.3 Productivity, Concentration, and the Labour Share

The *winner-takes-most* interpretation of the superstar firm model requires that the reallocation component of the labour share is falling most in industries where concentration is increasing and greater output is accruing to more productive firms. In tables 14 and D.6 the regression results of a set of seemingly-unrelated regressions of the component of change in labour share on the component of change in productivity and concentration is shown for productivity measured using the Translog ACF, Cobb-Douglas ACF, and Cobb-Douglas GMM approach for HHI concentration of output and value added respectively.

In these regressions the general results of the previous sections are confirmed: the strength of the relationship between the reallocation component of productivity and labour share increases over time whereas the within-firm component becomes insignificant. The concentration measure on the other hand has the most sizeable negative coefficient on the between component of labour share. These regressions control for country, industry and year effects and the results are in line with those of Autor et al. (2020), Lawless & Rehill (2022), and Bighelli et al. (2021). These results may be interpreted as supporting the *winner-takes-*

[72] They find for manufacturing a stronger negative correlation for the between component.

Table 13: Output Concentration and Productivity Growth

		1 Year			3 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Aggregate	Total	0.046***	0.017***	0.042***	0.037***	0.027***	0.052***
		(0.014)	(0.004)	(0.005)	(0.013)	(0.007)	(0.005)
	R^2-adj.	0.214	0.149	0.132	0.313	0.224	0.167
Decomposed	Within	0.016**	−0.006	0.010	0.010	−0.003	0.013**
		(0.006)	(0.004)	(0.006)	(0.016)	(0.006)	(0.005)
	Between	0.071***	0.035***	0.068***	0.051***	0.043***	0.069***
		(0.014)	(0.008)	(0.011)	(0.011)	(0.011)	(0.014)
	Entrants	0.256	0.172**	0.332***	0.228	0.222*	0.347**
		(0.162)	(0.061)	(0.096)	(0.208)	(0.118)	(0.139)
	Exits	0.190**	0.286***	0.417***	0.097	0.153***	0.283***
		(0.073)	(0.035)	(0.115)	(0.066)	(0.030)	(0.073)
	R^2-adj.	0.249	0.199	0.175	0.325	0.254	0.191
Observations		6,440	6,440	6,440	5,152	5,152	5,152
		5 Years			10 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Aggregate	Total	0.037***	0.029***	0.058***	0.079***	0.058***	0.093***
		(0.010)	(0.006)	(0.007)	(0.026)	(0.007)	(0.017)
	R^2-adj.	0.444	0.355	0.273	0.622	0.517	0.474
Decomposed	Within	0.003	−0.004	0.012	0.034	0.017	0.032
		(0.012)	(0.006)	(0.010)	(0.020)	(0.011)	(0.020)
	Between	0.059***	0.050***	0.086***	0.108***	0.086***	0.133***
		(0.016)	(0.009)	(0.013)	(0.033)	(0.008)	(0.023)
	Entrants	0.112	0.141	0.237	−0.021	0.021	−0.082
		(0.183)	(0.109)	(0.169)	(0.046)	(0.067)	(0.063)
	Exits	0.081	0.134**	0.254**	0.071	0.024	0.046
		(0.085)	(0.060)	(0.105)	(0.087)	(0.083)	(0.108)
	R^2-adj.	0.454	0.376	0.293	0.632	0.534	0.496
Observations		3,864	3,864	3,864	644	644	644

Source: Author's own table using Orbis data.
This table shows the results of a regression of Output concentration growth, defined in the column, on TFP growth over the relevant period listed. The aggregate reports the coefficient on Total TFP growth on concentration growth, Total refers to the aggregate non-decomposed productivity growth in the 3-digit industry in the relevant country. The decomposed regression reports the coefficients of a regression on output concentration growth on the MP decomposition of TFP growth in a single regression for each concentration measure.
The sample is limited to industries with at least 20 firms, valid TFP data, and outlying industries are dropped. The sample includes only firms from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. All regressions are weighted by the country-industry's value added in 2013. All regressions include country, industry and year controls.
Standard errors are in parenthesis and clustered by country.
$^{***}p < .01, ^{**} p < .05, ^{*} p < .1$

most interpretation of the declining labour share. The key concern, however, is whether this result matches the evidence on declining allocative efficiency (Decker et al. 2020, Hsieh et al. 2017). Below, we document lacking support for improvements in allocative efficiency in Europe from 2009-2019 at the country-3-digit sector level in line with (CompNet 2020, De Santis et al. 2022).[73]

In figure 4 scatter-plots of the relationship between the aggregate, stayers, within, and between change in productivity and labour share are shown by rate of output concentration growth. In these figures, the upper-left, quadrant II, and lower right quadrants, quadrant IV, are consistent with the Autor et al. (2020) model. That is, in these quadrants, the labour share and productivity in the sector are moving in opposite directions so that higher productivity growth is correlated with lower labour shares in the particular country-industry. The upper-right quadrant, quadrant I, reflects industries where productivity and the labour share are increasing, whereas the lower left quadrant, quadrant III, are industries where both the labour share and productivity are falling. Firms in quadrant III are particular candidates for the negative interpretation

[73] CompNet (2020) reports results from the 4th vintage of CompNet showing that the average within sector covariance between firm size and labour productivity has declined since 2009, with a dramatic fall in 2016.

Table 14: Labour Share, Output HHI, and Productivity Growth

		1 Year			3 Years		
		TLG	CD	GMM	TLG	CD	GMM
TFP	Within	-0.064^{***}	-0.068^{***}	-0.155^{***}	-0.063^{***}	-0.070^{***}	-0.122^{***}
		(0.008)	(0.007)	(0.029)	(0.014)	(0.015)	(0.029)
	Between	-0.002	-0.016	-0.255^{***}	-0.044^{**}	-0.052^{*}	-0.273^{***}
		(0.027)	(0.031)	(0.031)	(0.022)	(0.028)	(0.033)
	Entrants	-0.132	-0.196^{**}	-0.152^{***}	-0.122	-0.195^{*}	-0.159^{***}
		(0.121)	(0.086)	(0.054)	(0.095)	(0.111)	(0.046)
	Exits	-0.057	-0.159^{***}	-0.169^{***}	-0.099	-0.163	-0.170^{**}
		(0.122)	(0.050)	(0.056)	(0.136)	(0.118)	(0.083)
HHI Out.	Within	-0.025	-0.021	-0.021	-0.024	-0.025	-0.037
		(0.028)	(0.028)	(0.026)	(0.027)	(0.026)	(0.028)
	Between	-0.050	-0.036	0.107	-0.139^{***}	-0.143^{***}	0.072
		(0.051)	(0.049)	(0.033)	(0.052)	(0.051)	(0.032)
	Entrants	-0.001	0.006	0.011	-0.000	0.008	0.012
		(0.011)	(0.010)	(0.011)	(0.007)	(0.010)	(0.008)
	Exits	0.000	-0.001	0.005	0.001	0.000	0.003
		(0.008)	(0.006)	(0.006)	(0.005)	(0.004)	(0.005)
	R^2-adj Within	0.197	0.204	0.313	0.244	0.252	0.305
	R^2-adj Between	0.056	0.055	0.480	0.127	0.129	0.544
	R^2-adj Entrants	0.214	0.296	0.404	0.280	0.356	0.473
	R^2-adj Exits	0.072	0.386	0.279	0.206	0.357	0.362
	Observations	6, 440	6, 440	6, 440	5, 152	5, 152	5, 152
		5 Years			10 Years		
		TLG	CD	GMM	TLG	CD	GMM
TFP	Within	-0.040^{**}	-0.050^{***}	-0.082^{***}	-0.002	-0.017	-0.008
		(0.019)	(0.017)	(0.028)	(0.025)	(0.024)	(0.023)
	Between	-0.043^{*}	-0.051	-0.241^{***}	-0.074^{**}	-0.121^{**}	-0.204^{***}
		(0.023)	(0.035)	(0.025)	(0.031)	(0.057)	(0.026)
	Entrants	-0.096	-0.178	-0.157^{***}	-0.062	-0.149	-0.143^{*}
		(0.083)	(0.152)	(0.056)	(0.056)	(0.149)	(0.081)
	Exits	-0.086	-0.155	-0.176^{*}	-0.051	-0.164^{*}	-0.174^{**}
		(0.142)	(0.165)	(0.097)	(0.104)	(0.084)	(0.082)
HHI Out.	Within	-0.044^{*}	-0.044^{**}	-0.051^{**}	-0.082^{**}	-0.078^{**}	-0.083^{**}
		(0.023)	(0.022)	(0.024)	(0.040)	(0.038)	(0.038)
	Between	-0.164^{**}	-0.166^{**}	0.061	-0.234^{**}	-0.197^{**}	-0.064
		(0.067)	(0.065)	(0.042)	(0.093)	(0.088)	(0.083)
	Entrants	0.001	0.009	0.011	0.006	0.007	0.009
		(0.007)	(0.013)	(0.008)	(0.016)	(0.015)	(0.012)
	Exits	0.008	0.007	0.007	0.016	0.012	0.015
		(0.009)	(0.008)	(0.007)	(0.020)	(0.019)	(0.016)
	R^2-adj Within	0.303	0.312	0.338	0.547	0.549	0.547
	R^2-adj Between	0.288	0.287	0.581	0.582	0.586	0.744
	R^2-adj Entrants	0.306	0.372	0.499	0.467	0.505	0.594
	R^2-adj Exits	0.274	0.385	0.444	0.329	0.531	0.522
	Observations	3, 864	3, 864	3, 864	644	644	644

Source: Author's own table using Orbis data.
This table shows the results of a seemingly unrelated regression with each of the decomposed labour shares listed in the second row on output concentration growth and the productivity growth based on the measure listed in the column accumulated over the time period in the heading. The sample is limited to industries with at least 20 firms and outliers are dropped. The sample is limited to country-industries with valid TFP data. The countries are limited to Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. All regressions include country, industry, and year controls. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parenthesis and clustered by country via Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

of rising concentration trends as these sectors are not in fact receiving the benefits of positive productivity growth while declining labour shares imply increasing labour market power and markups. This interpretation follows directly from the De Loecker et al. (2020) markup measures, $\mu = \frac{\theta^L}{Labour\ Share}$. Since activity is moving towards firms with lower labour shares, the only way for markups to decline is if this shift is matched by a shift of activities towards lower labour output elasticity firms. In general, this will only be possible where the variance in θ_L is higher than that of the labour share, a very unlikely prospect even in the Translog specification. In figure 1, in appendix E, this relationship is shown to be borne out in the data.[74]

[74] Where the cost share approach is used $\mu_c = \frac{\theta^V}{costshare}$ the labour component of the cost share of value added will be declining so that the firm's labour market power is increasing as found by Mertens (2020) for Germany. Fo Whether market power comes from labour or product market power is beyond the scope of the present paper.

The aggregate relationship, in panel 4a, shows the expected result in the aggregate trends, specifically that most sectors experience positive productivity growth with sectors with increasing concentration being more likely to experience this growth. In panel 2a of figure 2 and panel 3a of figure 3 the same relationship is shown for the Cobb-Douglas and GMM measures of productivity. The Cobb-Douglas relationships are very similar to the Translog. The GMM coefficients are remarkably different, however, with aggregate growth being dramatically higher in general and larger industries, in particular, showing higher growth trends. This result is similar to the difference in the relationship between firm size and productivity for the ACF and GMM regressions found by Kreuser & Brink (2021) for South Africa, where the generally lower elasticities estimated by the GMM function implies that more of the firm's productivity is captured by its relative size.[75] The similarities in panels (a) and (b) of figures 4, 2, and 3 highlight the limited role of entry and exit in explaining these trends in the Orbis data.

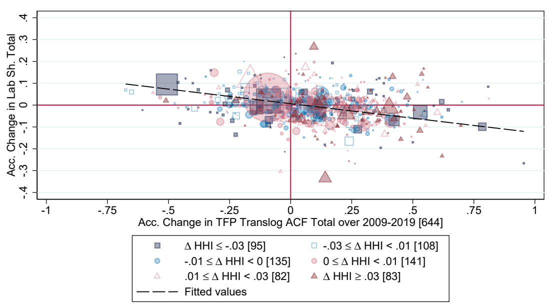
In all figures the relationship between the change in the within component of labour share and the change in within-firm productivity is non-existent. It should be noted that most of the country-industry pairs fall in the first quadrant for the within change, broadly conforming to the Autor et al. (2020) mechanism in the sense that a change in market conditions resulting in increasing market toughness will increase the elasticity of demand for all firms, resulting in lower markups implying higher labour shares. This result is somewhat borne out in panel 1c of figure 1a, where the within markup is falling, if anything, and the relationship between the within TFP and within markup components are virtually non-existent.

Panel (d) of figures 4, 2, and 3 is the main panel of interest and challenges the positive *winner-takes-most* interpretation of the correlations presented in tables 14 and D.6. The negative trend is not driven by a sizeable chunk of firms in quadrant four, but rather the downward and leftward shift in the relationship between productivity growth and labour share. That is, the combined existence of both falling labour shares and declining productivity growth due to changes in value added reallocation. Panel 1d of figure 1 again shows that while the between component of markup is increasing in general there is a substantial portion of industries where allocative efficiency has fallen, casting doubt on only market forces driving activity towards more productive firms and suggesting a role for rent-seeking activities of large potentially non-productive firms.

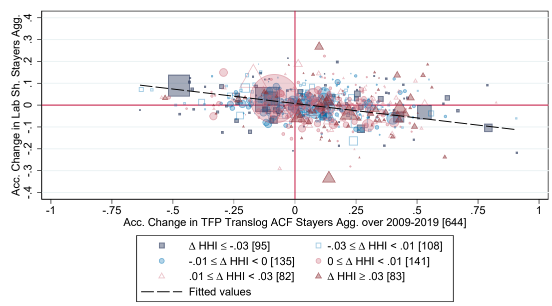
[75] This explanation is further supported by the disappearance of significance for the Concentration measures on value added labour share for the GMM specification in tables 14 and D.6 since the regression estimates $\sum_i \frac{va_i}{VA} \frac{staff_i}{va_i} = \beta_0 + \beta_t \sum_i \frac{va_i}{VA}(y - \beta_l l - \beta_k k) + \beta_b \sum_i \left(\frac{va_i}{\sum va_i}\right)^2 + \epsilon$ so that where $y = log(va)$ the negative relationship is driven by the uncompensated numerator in the term.

The present paper, therefore, challenges the notion that the increased concentration relationship and productivity relationship is necessarily indicative of a more efficient market environment rather than increasing market power as suggested by Bighelli et al. (2021). Rather, the results are indicative of substantial heterogeneity between country sectors where a substantial portion of country-industries had worse allocations despite having more activity move to low labour share firms. That is, the declining labour shares effect is not offset by actual increases in allocative efficiency so that there is a disconnect between the productivity growth and labour share of firms. The next section examines the role of corporate lobbying at the industry level in explaining this relationship.

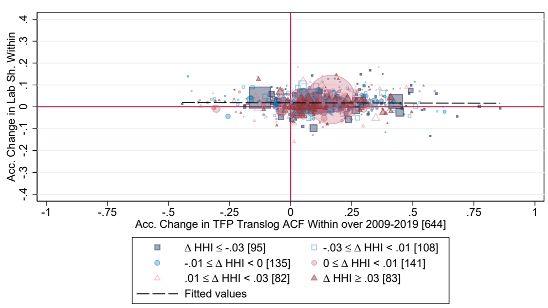
Figure 4: Translog TFP and Labour Share Decomposition



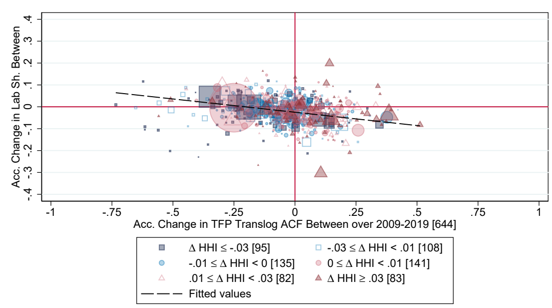
(a) Aggregate



(b) Stayers



(c) Stayers-Within



(d) Stayers-Between

Author's own table using Orbis data.
This figure plots the relationship between the Melitz & Polanec (2015) decomposed measure of TFP, estimated via the Translog Production function, and the labour share of value added, as discussed in section 4.1. The aggregate relationship is reported in panel (A). Panel (B) limits the motion in the two measures to only firms that stay in each period. Panel (C) reports the within relationship between the two measures and Panel (D) reports the relationship of the between component of the two measures.

6.3 Lobbying, Allocative Efficiency, and the Labour Share

In this section, we discuss the role of lobbying in explaining the different trends observed in the reallocation of productivity and labour share in European manufacturing. We use the accumulated share of the lobbying variable of interest for industries with valid TFP data as our lobbying intensity measure. The lobbying variable of interest defined as in (27), so that the lobbying share of a given variable in a given year for a specified lag structure is the sum of all of that industry, j, country, c, and type, g, of lobbying interests in all of the periods included in the lag structure up to the previous period as a percentage of all lobbying for all country, industry, and types in the sample of choice.[76]

$$Lobby\,Share_{j,c,g,t,lag} = \left(\frac{\sum_{y=t-lag}^{t-1} Lobby_{j,c,g,y}}{\sum_{j,c,g \in Sample} \sum_{y=t-lag}^{t-1} Lobby_{j,c,g,y}} \right) \times 100 \tag{27}$$

Since the regressions in the lobbying specifications are large difference regressions with trend and country-industry controls, the accumulated lobbying share reflects the cross-sectional variation in lobbying intensity for country-industries over time. The country, sector, and temporal controls capture the general trend effects of changes in the aggregate regulatory environment across the EU as well as those specific to all industries within a sub-sector or within a country. In this way, the lobbying intensity measure no longer needs to capture absolute lobbying amounts consistently over time but does need to be representative of the relative intensity of lobbying between industries. We interpret the data provided in the Transparency Register as a sequence of draws from the lobbying interest distribution; as lobbying intensity increases more the draws would update more frequently so that the relative share increases. Recall the significant churn in the lobbying database discussed in section 5.2. The literature overwhelmingly finds that lobbying is persistent, especially where it is large in magnitude (Huneeus & Kim 2021, Wiedemann 2022, Bombardini & Trebbi 2020). It is therefore difficult to interpret the entry and exit of a large lobbying entity as a true once-off act of influencing policy. Furthermore, the Juncker commission incentivises registration by prioritising meetings with registered entities (Dionigi 2017, Dinan 2021). This incentive may result in a firm only registering in years where it needs to have a formally recorded meeting or seeks to attend a meeting that will be attended by other registered groups. The entity may still be using non-meeting communication methods like emails, letters, or informal meetings to lobby in other periods.[77] In this context, the large expenditure reported by an entity in a year stays recorded in the lobbying share measure but will reduce in value as more entities enter the sample. While this approach implies the introduction of heteroskedasticity, it does not change the biasedness of our estimates and is corrected for by clustering the standard errors.[78] Our results are generally robust to clustering at the country, NACE 3-digit, and country-NACE-3-digit level.

[76]The preferred specification limits the sample to the share of lobbying in manufacturing industries with valid productivity and labour share data in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom for In-house and Professional lobbying entities.

[77]See Truth Initiative (2021) for a discussion on the use of these methods in the Tobacco industry obtained through document requests by the European Public Health Alliance, Corporate Europe Observatory, and the global tobacco industry watchdog, STOP.

[78]Note the bias caused by measurement error is not entirely solved, but we argue our approach does not worsen this bias.

Table 15 presents the results of a set of regressions where a binary variable indicating whether a country-industry is in quadrant III of panel 4d in figure 4 (i.e., a country-industry with both declining labour share and declining allocative efficiency growth) is regressed on the lag of the accumulated EP accredited persons share. The relationship is shown to be positive, statistically significant and increasing over time. While the effect when including non-corporate interests appears to be inconsistent over time, the effect is readily seen when restricting the sample to the lobbying activity of corporate interests. The specification further shows that the lobbying related increase in the probability of being in an industry with both declining labour share and declining allocative efficiency growth is driven by industries with increasing concentration growth. These results are similar for the specification based on lobbying expenditures, reported in table F.1, but we do not show that lobbying by corporate groups are mainly driven by country-industries with increasing output concentration. In table F.2 the results for lobbying intensity measured by meeting share show similar qualitative results, but we fail to find consistently statistically significant relationships. It should be noted that the effects in the meeting regressions are aggregated over a shorter time frame as the meeting data is only available from 2014 onward. These effects are significantly higher where concentration is measured in terms of value added as shown in tables Online.O.2, Online.O.6, and Online.O.11 in the online appendix Online.O. The general trends for lobbying measured based on cost is only robust for periods greater than 8-years where the Cobb-Douglas measure of TFP, in table Online.O.1, is used and does not appear to be robust to the GMM definition of productivity, shown in table Online.O.4. The specifications based on the accredited persons and meetings measures appear significantly more robust in the Cobb-Douglas specification, in tables Online.O.7 and Online.O.12, and somewhat more robust in the GMM specification, in tables tables Online.O.9 and Online.O.14, when compared to the cost measure of lobbying.

Taken together, these results suggest that lobbying increases the likelihood that a country-industry experiences both a decline in allocative efficiency and a decline in the labour share due to the movement of activity between firms, that is firms with more market power are capturing more of the market despite not necessarily being more productive. This result is supported by the shift of activity toward high-markup but less productive firms reported in figure 1. These effects are somewhat sensitive to specification.

In order to better understand the dynamic relationship between lobbying, productivity growth, and the labour share we estimate a seemingly unrelated regression in the shape of (28) with $Y \in \{LabourShare, TFP\}$, $M \in \{within,\ \ between,\ \ enter,\ \ exit\}$, and $Lobby \in \{\ Cost\ \ Share,\ \ Accredited\ \ Person\ \ Share,$ $Meeting\ \ Share\}$. The lobbying shares in all instances are constructed over their relevant period as in (27). All regressions include country, industry, year, and concentration controls as well as the change in

Table 15: Accredited Person and Translog based Binary

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
Inh., Prof., & Other	All	−0.062	0.042	0.035	0.041	0.090*	0.083	0.102	0.226**	0.193*	0.209*
		(0.072)	(0.091)	(0.069)	(0.066)	(0.050)	(0.064)	(0.062)	(0.082)	(0.106)	(0.108)
	$\Delta HHI > 0$	−0.058	0.174***	0.076	0.042	0.104**	0.136**	0.084	0.364***	0.357***	0.429**
		(0.077)	(0.057)	(0.061)	(0.046)	(0.045)	(0.057)	(0.069)	(0.093)	(0.091)	(0.189)
	$\Delta HHI < 0$	−0.047	−0.098	−0.107	0.032	0.085	0.014	−0.014	0.089	−0.075	−0.198
		(0.037)	(0.121)	(0.103)	(0.094)	(0.079)	(0.093)	(0.067)	(0.091)	(0.092)	(0.151)
Inh & Prof.	All	−0.059	0.071	0.073	0.081	0.139**	0.114*	0.159**	0.331***	0.275**	0.317***
		(0.084)	(0.108)	(0.090)	(0.084)	(0.059)	(0.060)	(0.059)	(0.064)	(0.098)	(0.087)
	$\Delta HHI > 0$	−0.077	0.209***	0.101	0.090	0.161***	0.216***	0.205*	0.512***	0.490***	0.420**
		(0.086)	(0.058)	(0.065)	(0.052)	(0.043)	(0.066)	(0.103)	(0.116)	(0.142)	(0.188)
	$\Delta HHI < 0$	−0.016	−0.077	−0.061	0.083	0.178	0.038	0.019	0.240**	0.000	−0.138
		(0.051)	(0.141)	(0.136)	(0.120)	(0.118)	(0.095)	(0.073)	(0.085)	(0.101)	(0.222)
Obs.	All	6, 440	5, 796	5, 152	4, 508	3, 864	3, 220	2, 576	1, 932	1, 288	644
	$\Delta HHI > 0$	3, 154	2, 805	2, 518	2, 208	1, 887	1, 563	1, 263	948	616	306
	$\Delta HHI < 0$	3, 286	2, 991	2, 634	2, 300	1, 977	1, 657	1, 313	984	672	338

Source: Author's own table using Orbis and Lobbying data.
This table shows the regression results of separate OLS regressions on a binary variable indicating whether both $\Delta_t Labour\ Share < 0$ and $\Delta_t TFP < 0$ on the country-industry share of total EP accredited persons over the period reported in the top row. $\Delta_t TFP$ is informed by Translog. The sample labelled All includes all country-industries in the preferred sample as in tables 12-D.6. The samples labelled $\Delta_t HHI > 0$ and $\Delta_t HHI < 0$ limits the sample to industry with positive and negative output HHI respectively. The coefficients in the Inh., Prof., & Other group are on the country industry share of total EP accredited persons for all matched lobbying groups whereas the Inh. & Prof. groups limits the shares to matched lobbying groups identifying as In-house lobbying groups or Professional Lobbying groups. The observations reported in Obs. are for each group. All specifications includes country, 3-digit industry, and year effects. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

the other factor; that is, the change in the within labour share will include the change in within productivity whereas the change in between productivity will include a control for the between labour share. In these regressions, all variables are normalised so that the coefficients are interpreted in terms of variation in standard deviations.[79]

$$\Delta_t Y_{M,i,c,t} = \beta_{y,M} + \beta_{M,C} Lobby_{i,c,t,\Delta_t} + Controls'_{-Y}\gamma_M \tag{28}$$

In table 16 we report the results of (28) using the share of accredited persons as the lobbying measure. An increase of a standard deviation in lobbying is shown to be correlated with a fall in allocative productivity of around 4% of a standard deviation over one year and increasing up to around 29% over 10 years. At the same, the negative relationship between lobbying intensity and the between-firm labour share is about a third of the size. This difference is statistically significant at the .005 level for all regressions except the 10 year specification, where it is significant at the .05 level. In table G.3 the result is shown to be robust to the lobbying costs measure in terms of the productivity variable in general, while the between component of the labour share is only statistically significant for the specifications from 5-8 years. In table G.4 we show the result is robust to lobbying measured through meetings, but cannot reject the hypothesis that lobbying has equivalent effects on the between components of the labour share and productivity for periods between 3 and 5 years. Tables Online.P.1-Online.P.6, in online appendix Online.P, show that these findings

[79] The normalisation takes into account the country, industry, and year controls.

are generally robust to the productivity and lobbying measures used, but perform worse for the GMM productivity measure.[80]

Table 16: Normalised Productivity, Labour Share, and Accredited Persons Share

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	0.001	0.060***	0.064***	0.084***	0.087***	0.090***	0.079*	0.069	0.002	−0.136
		(0.016)	(0.020)	(0.023)	(0.026)	(0.032)	(0.034)	(0.043)	(0.055)	(0.064)	(0.087)
	Between	−0.049***	−0.118***	−0.136***	−0.190***	−0.242***	−0.288***	−0.312***	−0.333***	−0.326***	−0.284***
		(0.012)	(0.019)	(0.021)	(0.029)	(0.039)	(0.051)	(0.054)	(0.063)	(0.071)	(0.086)
	Enter	−0.020	−0.026	−0.029	−0.029	−0.032	−0.031	−0.031	−0.024	−0.009	0.004
		(0.019)	(0.024)	(0.030)	(0.035)	(0.041)	(0.046)	(0.051)	(0.058)	(0.060)	(0.067)
	Exit	−0.009	0.004	0.005	0.007	0.003	−0.000	0.001	0.004	0.007	0.004
		(0.025)	(0.022)	(0.028)	(0.031)	(0.032)	(0.034)	(0.035)	(0.037)	(0.036)	(0.040)
Lab. Share	Within	0.009	0.065***	0.073***	0.090***	0.097**	0.089**	0.123**	0.168***	0.199***	0.183**
		(0.012)	(0.016)	(0.021)	(0.031)	(0.039)	(0.045)	(0.049)	(0.058)	(0.062)	(0.076)
	Between	0.029**	−0.039**	−0.044**	−0.071***	−0.100***	−0.168***	−0.193***	−0.218***	−0.138**	−0.145*
		(0.013)	(0.018)	(0.018)	(0.023)	(0.032)	(0.048)	(0.056)	(0.063)	(0.057)	(0.081)
	Enter	−0.000	−0.025	−0.029	−0.021	−0.017	−0.007	0.003	0.018	0.036	0.046
		(0.020)	(0.028)	(0.037)	(0.043)	(0.050)	(0.056)	(0.063)	(0.071)	(0.071)	(0.069)
	Exit	0.002	0.021	0.024	0.034	0.038	0.042	0.045	0.054	0.075	0.129*
		(0.025)	(0.028)	(0.036)	(0.042)	(0.050)	(0.055)	(0.058)	(0.063)	(0.063)	(0.067)
R^2-adj. TFP	Within	0.047	0.048	0.020	0.011	0.008	0.008	0.007	0.004	0.002	0.024
	Between	0.088	0.052	0.053	0.061	0.089	0.136	0.144	0.163	0.189	0.213
	Enter	0.046	0.065	0.055	0.042	0.037	0.037	0.039	0.034	0.028	0.031
	Exit	0.028	0.057	0.077	0.063	0.052	0.043	0.042	0.036	0.028	0.017
R^2-adj. Lab. Share	Within	0.052	0.054	0.024	0.011	0.013	0.023	0.030	0.038	0.051	0.057
	Between	0.003	0.003	0.015	0.034	0.026	0.047	0.060	0.086	0.089	0.135
	Enter	0.039	0.054	0.046	0.032	0.025	0.024	0.024	0.020	0.018	0.019
	Exit	0.025	0.055	0.073	0.056	0.044	0.036	0.036	0.032	0.025	0.029
	Obs.	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	p-value	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.003	0.011

Source: Author's own calculations based on Orbis and Lobbying Data.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog approach on normalised lobbying intensity as measured by the accumulated share of EP accredited persons. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of EP accredited persons includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table 17: Normalised Productivity, Markup, and Accredited Persons Share

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	−0.001	0.061***	0.062**	0.082***	0.082**	0.092**	0.075	0.051	0.004	−0.139
		(0.018)	(0.023)	(0.025)	(0.029)	(0.033)	(0.037)	(0.047)	(0.051)	(0.058)	(0.096)
	Between	−0.049***	−0.116***	−0.128***	−0.180***	−0.226***	−0.258***	−0.280***	−0.293***	−0.299***	−0.221***
		(0.012)	(0.018)	(0.020)	(0.028)	(0.039)	(0.047)	(0.050)	(0.058)	(0.068)	(0.079)
	Enter	−0.012	−0.019	−0.025	−0.025	−0.027	−0.025	−0.024	−0.017	−0.002	0.004
		(0.020)	(0.027)	(0.034)	(0.038)	(0.044)	(0.049)	(0.054)	(0.060)	(0.064)	(0.072)
	Exit	−0.009	−0.002	−0.006	−0.008	−0.013	−0.020	−0.021	−0.022	−0.027	−0.049
		(0.031)	(0.028)	(0.027)	(0.037)	(0.046)	(0.051)	(0.050)	(0.049)	(0.056)	(0.078)
μ	Within	−0.006	−0.066***	−0.072***	−0.085**	−0.088*	−0.092	−0.123*	−0.150*	−0.181**	−0.145
		(0.020)	(0.021)	(0.027)	(0.038)	(0.049)	(0.057)	(0.066)	(0.077)	(0.091)	(0.112)
	Between	−0.035**	0.028	0.005	0.031	0.029	0.089*	0.119**	0.153***	0.105*	0.108
		(0.015)	(0.021)	(0.026)	(0.031)	(0.042)	(0.048)	(0.053)	(0.057)	(0.056)	(0.081)
	Enter	−0.013	0.015	0.021	0.013	0.005	−0.008	−0.020	−0.040	−0.070	−0.069
		(0.019)	(0.030)	(0.039)	(0.043)	(0.050)	(0.055)	(0.061)	(0.067)	(0.066)	(0.063)
	Exit	−0.012	−0.023	−0.022	−0.035	−0.044	−0.051	−0.053	−0.056	−0.080	−0.149
		(0.032)	(0.041)	(0.052)	(0.067)	(0.085)	(0.095)	(0.100)	(0.108)	(0.108)	(0.100)
R^2-adj. TFP	Within	0.046	0.045	0.019	0.011	0.007	0.008	0.004	0.001	0.001	0.024
	Between	0.088	0.054	0.053	0.062	0.089	0.134	0.142	0.171	0.196	0.259
	Enter	0.047	0.074	0.063	0.043	0.034	0.031	0.032	0.024	0.017	0.015
	Exit	0.006	0.013	0.016	0.008	0.005	0.003	0.002	0.002	0.002	0.006
R^2-adj. Lab. Share	Within	0.044	0.047	0.024	0.016	0.019	0.028	0.031	0.030	0.048	0.052
	Between	0.005	0.003	0.008	0.024	0.030	0.055	0.052	0.078	0.095	0.172
	Enter	0.041	0.066	0.055	0.034	0.024	0.021	0.021	0.017	0.012	0.010
	Exit	0.004	0.012	0.013	0.007	0.006	0.007	0.008	0.007	0.010	0.027
	Observations	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	Between p-val	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.002	0.017

Source: Author's own calculations based on Orbis and Lobbying Data.This table is uses the same approach as the results reported in 16 in the main text but substitutes labour share with markups.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of markup and TFP based on the Translog approach on normalised lobbying intensity as measured by the accumulated share of EP accredited persons. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of EP accredited persons includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of markup, whereas the markup regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

In table 17 the results of the same specification using markups, instead of the labour share, show the same large and statistically significant negative relationship between lobbying intensity and productive re-

[80]In appendix J, these results are also shown to be robust to the inclusion of the industry's output share.

allocations. As expected, the reallocation of activity toward high markup firms is positively associated with lobbying. Unlike the observed sizable relationship between the labour share and lobbying, lobbying appears to be positively associated with the between markup component and only becomes large and statistically significant at about 6 years.

The labour share specifications in tables 16, G.3, and G.4 report a positive relationship between lobby intensity and the within component of labour share. That is the labour share of the average firm is increasing in lobbying intensity.[81] This effect is exactly what would be expected if lobbying works by increasing the toughness of the market as in the Autor et al. (2020) model. Recall, that the Autor et al. (2020) mechanism predicts that tougher markets lower the maximum viable marginal cost resulting in a decline in average markups while increasing aggregate markups through reallocating activity towards high markup firms. In the results presented here, lobbying is related to a shift in resources toward lower labour share and higher markup firms but it does not move resources to more productive firms. That is, it is related to a break down in the mapping of productivity to the labour share.

In the lobbying cost and accredited persons specifications, the coefficients on lobbying intensity on the between component of the labour share and productivity growth are statistically different from one another implying that lobbying plays a larger role in allowing less productive firms to capture more activity than it does in allowing lower labour share firms to capture more of the market. While the effect of the two components are statistically identical in the meetings specification for labour share, they are not identical in the markup specifications.[82]

The interpretation that lobbying is more related to the construction of barriers to competition rather than a response to a more competitive economic environment is supported by the differential impact of lobbying in industries based on their concentration trends. Specifically, as discussed in section 3, if lobbying is simply a response to a more competitive environment the expectation is that lobbying and concentration increases should be related to the exit of less productive firms. Instead, tables H.5 and H.7 show that lobbying is associated with a decrease in productivity due to the exit of more productive firms in increasingly concentrated markets. That is, the average firm exiting is more productive than the average firm surviving. In this sense, we offer cautious initial evidence that lobbying may counteract the market cleansing forces of creative destruction while allowing firms to extract more rents (Cette et al. 2018, Liu et al. 2022). The latter conclusion is supported by the relatively longer time taken for the effects of lobbying to become visible

[81] Similarly, we observe a negative coefficient on the within component of markups.

[82] The markups specification test whether $\beta_{tfp,between} = -\beta_{\mu,between}$ whereas the labour share specification tests whether $\beta_{tfp,between} = \beta_{laboursshare,between}$.

in the between firm component of markups. This interpretation is further consistent with the hypothesis that lobbying works by increasing the costs of certain firms, some at the upper end of the productivity distribution, through its impact on the institutional environment. Where, for example, lobbying results in policies that necessitate legal consultation, smaller firms may not be covered by their retainer to the same degree as large firms. Regulatory burdens are generally found to be more costly for smaller firms than larger firms and this is generally modelled through fixed costs (García-Quevedo et al. 2020, Bordo & Duca 2018, Davis 2017, Huneeus & Kim 2021).[83] This interpretation is consistent with the mechanisms proposed by Gutiérrez & Philippon (2018) and Gutiérrez & Philippon (2019) where entrenched incumbents create barriers to entry. While business entry and exit is not the main focus of this paper and likely under-represented in the Orbis data, this mechanism has some support shown in figure 1 in appendix K where lobbying is shown to have a negative relationship with entry and a U-shaped relationship with exit. That is, there is some evidence that increased lobbying is related to lower entry and exit in a market in general, but does correlate to higher exit rates compared to entry rates at higher levels of intensity. Taken together these results, while not causal, suggest that lobbying may contribute to the misallocation of productive activity and is related to a breakdown of the mechanism underlying the *winner-takes-most* interpretation of the super-star firm model of Autor et al. (2020). Reverse causality is unlikely as we find a clearer breakdown of the mechanism in increasingly concentrated markets coinciding with the exit of more productive firms. While interpreted with caution, our results are consistent with lobbying being related to declining business dynamism measured by entry and exit and lower allocative improvements. Our evidence suggests that lobbying starts by limiting productive reallocations first before expanding rents, a result again consistent with Gutiérrez & Philippon (2018), Gutiérrez & Philippon (2019), and Huneeus & Kim (2021).

7 Conclusion

This paper discussed the mixed evidence of the positive welfare interpretation of the Autor et al. (2020) firm model, that increasing concentration and higher markups reflect a more competitive economic environment, in the context of lobbying activities by firms. We confirmed the main prediction of the Autor et al. (2020) model that output market concentration growth is positively correlated with allocative efficiency growth and negatively correlated with the between-firm movement of the labour share. In examining the data more closely we show that this relationship is not borne out of an increase in allocative efficiency moving activity towards significantly lower labour share firms, but rather smaller declines in allocative efficiency

[83] Note here, that this effect would also work if firms are lobbying to maintain the current regulatory burden in a given market.

being related to smaller, but still negative, between shifts in the labour share. This result is completely consistent with the relatively subdued growth in markups, fall in labour share, rise in concentration, and falling productivity growth in Europe and suggests that even where labour share is falling it is not because of absolute improvements in allocative efficiency. In this context, the positive welfare interpretations of the coexistence of falling labour shares, rising markups, and increased profits should be tempered.

We then examined corporate lobbying in Europe and linked it to our productivity data. We show that a 1% increase in relative lobbying intensity corresponds to an increase in the probability of an industry experiencing both negative allocative efficiency growth and the reallocation of factors to low labour share firms to the order of .1%-.3% depending on the lobbying measure. We show that this probability is generally higher for industries with higher growth in output concentration over the same period. We decomposed the effect of lobbying on productivity, labour share, and markup reallocations and show that while it works like tougher markets in the Autor et al. (2020) model: by increasing the average labour share while decreasing the aggregate labour share; it is not related to an improvement in allocative efficiency but rather allocation toward less productive firms. That is, lobbying is associated with a breakdown in the proposed mapping of productivity to markups in the positive welfare implication of Autor et al. (2020)'s superstar firm model. We show that the relative lobbying intensity in an industry is associated with a greater decline in allocative efficiency than reallocations to low labour share or high markup firms. This result, along with the relationship between lobbying and entry and exit, and the dynamics of long-run markup responses, suggests that lobbying works in exactly the way expected if firms are constructing barriers to competition: first we see an immediate decrease in allocative efficiency increasing in intensity over time with the relative effect on markups and labour share increasing in relative size over a longer time frame. That is, lobbying serves to first stop productive reallocations and then to expand markups.

While we interpret our results with caution, our results are in line with the negative welfare implications found by Huneeus & Kim (2021) for the US. Furthermore, our results shed light on some of the open questions in the lobbying literature in the EU in so far as it relates to its aggregate implications. Our results suggest that while firm-level lobbying may be correlated with bigger and more profitable firms in general, it does not serve to improve allocation by allowing more productive firms to overcome regulatory burdens as suggested by Choi (2021) and as implied by the results of Wiedemann (2022). Our results further contribute to the literature on the differential experiences of the US and the EU in terms of regulatory capture. We show that while lobbying in the EU may be small compared to the US, lobbying can still have substantially negative welfare effects.

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A Additional Tables for Lobbying Data

Table A.1: Matched Lobbying Data by Cost of Lobbying by Professional Lobbying Groups

	Total		Matched			Val. NACE		
	Total	% of Agg	Total	% of Total	% of Agg.	Total	% of Total	% of Agg.
2008	40,609,216	(18.81%)	40,566,220	(99.89%)	(20.36%)	40,501,220	(99.73%)	(30.74%)
2009	48,415,728	(14.51%)	48,362,732	(99.89%)	(16.12%)	47,327,704	(97.75%)	(24.25%)
2010	94,363,224	(16.46%)	94,250,224	(99.88%)	(18.21%)	77,304,848	(81.92%)	(22.89%)
2011	121,670,520	(16.54%)	121,124,224	(99.55%)	(18.59%)	97,184,216	(79.87%)	(21.79%)
2012	154,940,848	(16.72%)	139,076,080	(89.76%)	(18.05%)	113,014,728	(72.94%)	(22.01%)
2013	163,285,072	(14.99%)	142,484,320	(87.26%)	(16.34%)	116,728,992	(71.49%)	(20.22%)
2014	201,960,016	(12.67%)	181,769,296	(90.00%)	(13.76%)	128,549,104	(63.65%)	(14.80%)
2015	233,247,584	(12.32%)	211,712,592	(90.77%)	(13.62%)	156,923,200	(67.28%)	(16.60%)
2016	208,102,592	(10.86%)	199,958,048	(96.09%)	(12.65%)	155,153,104	(74.56%)	(16.38%)
2017	193,168,432	(10.02%)	186,526,752	(96.56%)	(11.80%)	156,479,152	(81.01%)	(16.52%)
2018	189,352,976	(9.30%)	182,737,584	(96.51%)	(11.09%)	151,243,408	(79.87%)	(15.21%)
2019	157,915,280	(7.71%)	152,590,608	(96.63%)	(9.20%)	127,116,224	(80.50%)	(13.08%)

Source: Author's own calculations based on Orbis and Lobbying Data.
This table shows the total matched lobbying costs by Professional Consultancies, Lawyers, or Self-employed individuals. The Total column refers to the total value of lobbying costs, after imputations and outliers, and the % of Agg reports the total lobbying costs of Professional Consultancies, Lawyers, or Self-employed individuals as a proportion of all lobbying measured by lobbying costs for all entities. The matched column provides the same statistics, where the % of total refers to the proportion of lobbying costs by Professional Consultancies, Lawyers, or Self-employed individuals accounted for by matched entities. % of Agg reflects the the total lobbying measured by lobbying costs reported by Professional Consultancies, Lawyers, or Self-employed individuals as a proportion of all lobbying measured by lobbying costs by matched entities. The Val. NACE column reflects the same as the matched column, but limits the matched sample to entities with NACE Rev. 2 codes in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

Table A.2: Matched Lobbying Data by Accredited Persons of Lobbying by Professional Lobbying Groups

	Total		Matched			Val. NACE		
	Total	% of Agg	Total	% of Total	% of Agg.	Total	% of Total	% of Agg.
2008	158	(17.42%)	157	(99.37%)	(18.56%)	152	(96.20%)	(29.86%)
2009	194	(13.90%)	193	(99.48%)	(15.09%)	188	(96.91%)	(24.67%)
2010	331	(14.49%)	330	(99.70%)	(15.87%)	321	(96.98%)	(26.38%)
2011	439	(14.96%)	434	(98.86%)	(16.46%)	411	(93.62%)	(26.56%)
2012	563	(15.17%)	555	(98.54%)	(16.72%)	519	(92.15%)	(27.28%)
2013	793	(14.58%)	777	(97.94%)	(16.29%)	709	(89.36%)	(26.06%)
2014	997	(14.16%)	969	(97.25%)	(15.74%)	861	(86.35%)	(24.88%)
2015	1,191	(15.09%)	1,145	(96.14%)	(16.68%)	1,018	(85.46%)	(26.10%)
2016	1,304	(15.85%)	1,257	(96.43%)	(17.70%)	1,125	(86.27%)	(27.77%)
2017	1,342	(16.16%)	1,299	(96.80%)	(18.08%)	1,176	(87.63%)	(28.59%)
2018	1,275	(16.01%)	1,228	(96.31%)	(17.96%)	1,110	(87.06%)	(28.46%)
2019	880	(13.69%)	856	(97.22%)	(15.60%)	755	(85.80%)	(24.49%)

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the total matched number of persons with EP accreditation by Professional Consultancies, Lawyers, or Self-employed individuals. The Total column refers to the total value of number of persons with EP accreditation, after imputations and outliers, and the % of Agg reports the total number of persons with EP accreditation of Professional Consultancies, Lawyers, or Self-employed individuals as a proportion of all lobbying measured by number of persons with EP accreditation for all entities. The matched column provides the same statistics, where the % of total refers to the proportion of number of persons with EP accreditation by Professional Consultancies, Lawyers, or Self-employed individuals accounted for by matched entities. % of Agg reflects the the total lobbying measured by number of persons with EP accreditation reported by Professional Consultancies, Lawyers, or Self-employed individuals as a proportion of all lobbying measured by number of persons with EP accreditation by matched entities. The Val. NACE column reflects the same as the matched column, but limits the matched sample to entities with NACE Rev. 2 codes in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

Table A.3: Matched Lobbying Data by Meetings Persons of Lobbying by Professional Lobbying Groups

	Total		Matched			Val. NACE		
	Total	% of Agg	Total	% of Total	% of Agg.	Total	% of Total	% of Agg.
2014	121	(4.75%)	120	(99.17%)	(5.30%)	118	(97.52%)	(8.21%)
2015	227	(4.36%)	225	(99.12%)	(4.82%)	212	(93.39%)	(6.99%)
2016	309	(6.63%)	308	(99.68%)	(7.50%)	301	(97.41%)	(11.26%)
2017	217	(5.76%)	214	(98.62%)	(6.39%)	202	(93.09%)	(9.17%)
2018	230	(6.87%)	228	(99.13%)	(7.72%)	220	(95.65%)	(11.61%)
2019	116	(4.37%)	113	(97.41%)	(4.95%)	109	(93.97%)	(8.13%)

Source: Author's own calculations based on Orbis and Lobbying Data.
This table shows the total matched number of meetings by Professional Consultancies, Lawyers, or Self-employed individuals. The Total column refers to the total value of number of meetings, after imputations and outliers, and the % of Agg reports the total number of meetings of Professional Consultancies, Lawyers, or Self-employed individuals as a proportion of all lobbying measured by number of meetings for all entities. The matched column provides the same statistics, where the % of total refers to the proportion of number of meetings by Professional Consultancies, Lawyers, or Self-employed individuals accounted for by matched entities. % of Agg reflects the the total lobbying measured by number of meetings reported by Professional Consultancies, Lawyers, or Self-employed individuals as a proportion of all lobbying measured by number of meetings by matched entities. The Val. NACE column reflects the same as the matched column, but limits the matched sample to entities with NACE Rev. 2 codes in sections A, B, C, D, E, F, G, H, I, J, K, or L. That is all entities with NACE codes belonging to Professional, Scientific, or technical activities are removed. Furthermore, all matches only linking to entities in J62, Computer programming, consultancy, and related activities are removed.

Table A.4: Matched Lobbying Data by Accredited persons by Professional Lobbying Groups

	Total	Tot. Man.	Tot. EU⋆	Tot. Samp.	Tot. Man. Samp.	Man. Prop.
2008	158	59	139	126	48	34.40%
		(37.23%)	(87.93%)	(79.51%)	(30.25%)	[38.04%]
2009	194	68	174	151	57	32.66%
		(35.26%)	(89.55%)	(77.76%)	(29.24%)	[37.61%]
2010	331	107	296	263	90	30.26%
		(32.29%)	(89.53%)	(79.44%)	(27.09%)	[34.11%]
2011	439	132	382	335	105	27.54%
		(30.02%)	(86.95%)	(76.25%)	(23.95%)	[31.41%]
2012	563	162	480	427	129	26.77%
		(28.75%)	(85.26%)	(75.86%)	(22.82%)	[30.09%]
2013	793	207	659	587	165	25.07%
		(26.05%)	(83.04%)	(74.03%)	(20.82%)	[28.12%]
2014	997	238	799	713	191	23.87%
		(23.92%)	(80.19%)	(71.51%)	(19.14%)	[26.77%]
2015	1, 191	284	941	839	224	23.85%
		(23.80%)	(78.98%)	(70.41%)	(18.84%)	[26.75%]
2016	1, 304	327	1, 041	928	264	25.36%
		(25.07%)	(79.85%)	(71.17%)	(20.25%)	[28.45%]
2017	1, 342	354	1, 088	969	284	26.13%
		(26.37%)	(81.04%)	(72.22%)	(21.17%)	[29.32%]
2018	1, 275	334	1, 022	899	268	26.21%
		(26.18%)	(80.15%)	(70.50%)	(21.00%)	[29.79%]
2019	880	225	698	609	183	26.21%
		(25.55%)	(79.24%)	(69.12%)	(20.77%)	[30.05%]

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the annual aggregates of lobbying as measured by number of persons with EP accreditation based on the country-industry classification of the lobbying entity's interests. All figures refer to values reported by Professional Consultancies, Lawyers, or Self-employed individuals lobbying entities and all proportions refer to values with respect to the relevant total of these entities. Total refers to the total value of number of persons with EP accreditation for all lobbying entities classified in a financial year independent of matching status, Tot. Man. refers to the total interest weighted number of persons with EP accreditation that can be attributed to manufacturing industries. Tot EU represents EU level lobbying, where ⋆ indicates that this is limited to Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.. Tot. Samp. Reflects the total number of persons with EP accreditation associated with entities in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Tot Man. Samp. refers to the total number of persons with EP accreditation attributable to manufacturing interest in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Man. Prop. provides additional proportions of the manufacturing sub-sample. The top row, without parentheses, reflects the proportion of total number of persons with EP accreditation attributable to manufacturing interest as a proportion of the total number of persons with EP accreditation in EU⋆ countries. The second row, in square brackets, reflects the proportion of number of persons with EP accreditation associated to manufacturing interests in terms of all number of persons with EP accreditation in the preferred sample countries. The percentages in round parentheses reflect the proportion of number of persons with EP accreditation attributable to the group in terms of number of persons with EP accreditation in the second column.

Table A.5: Matched Lobbying Data by Cost of Lobbying by Professional Lobbying Groups

	Total	Tot. Man.	Tot. EU⋆	Tot. Samp.	Tot. Man. Samp.	Man. Prop.
2008	40, 609, 216	12, 852, 488	38, 958, 052	33, 792, 740	10, 578, 232	27.15%
		(31.65%)	(95.93%)	(83.21%)	(26.05%)	[31.30%]
2009	48, 415, 728	14, 732, 700	45, 615, 732	39, 612, 080	12, 187, 206	26.72%
		(30.43%)	(94.22%)	(81.82%)	(25.17%)	[30.77%]
2010	94, 363, 224	23, 387, 974	73, 604, 872	64, 977, 764	19, 387, 146	26.34%
		(24.79%)	(78.00%)	(68.86%)	(20.55%)	[29.84%]
2011	121, 670, 520	29, 101, 614	92, 746, 392	79, 054, 064	23, 529, 402	25.37%
		(23.92%)	(76.23%)	(64.97%)	(19.34%)	[29.76%]
2012	154, 940, 848	33, 361, 612	108, 152, 968	90, 675, 256	26, 790, 918	24.77%
		(21.53%)	(69.80%)	(58.52%)	(17.29%)	[29.55%]
2013	163, 285, 072	33, 379, 996	111, 326, 240	97, 752, 144	27, 493, 570	24.70%
		(20.44%)	(68.18%)	(59.87%)	(16.84%)	[28.13%]
2014	201, 960, 016	28, 013, 044	123, 970, 656	104, 497, 616	22, 838, 958	18.42%
		(13.87%)	(61.38%)	(51.74%)	(11.31%)	[21.86%]
2015	233, 247, 584	30, 428, 710	134, 067, 472	120, 189, 624	24, 896, 946	18.57%
		(13.05%)	(57.48%)	(51.53%)	(10.67%)	[20.71%]
2016	208, 102, 592	35, 380, 248	129, 349, 136	113, 139, 344	29, 776, 860	23.02%
		(17.00%)	(62.16%)	(54.37%)	(14.31%)	[26.32%]
2017	193, 168, 432	41, 884, 856	147, 841, 376	127, 262, 704	34, 689, 672	23.46%
		(21.68%)	(76.53%)	(65.88%)	(17.96%)	[27.26%]
2018	189, 352, 976	40, 829, 176	142, 486, 128	120, 850, 200	32, 995, 872	23.16%
		(21.56%)	(75.25%)	(63.82%)	(17.43%)	[27.30%]
2019	157, 915, 280	38, 093, 280	120, 550, 632	104, 216, 184	30, 783, 768	25.54%
		(24.12%)	(76.34%)	(65.99%)	(19.49%)	[29.54%]

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the annual aggregates of lobbying as measured by lobbying costs based on the country-industry classification of the lobbying entity's interests. All figures refer to values reported by Professional Consultancies, Lawyers, or Self-employed individuals lobbying entities and all proportions refer to values with respect to the relevant total of these entities. Total refers to the total value of lobbying costs for all lobbying entities classified in a financial year independent of matching status, Tot. Man. refers to the total interest weighted lobbying costs that can be attributed to manufacturing industries. Tot EU represents EU level lobbying, where ⋆ indicates that this is limited to Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.. Tot. Samp. Reflects the total lobbying costs associated with entities in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Tot Man. Samp. refers to the total lobbying costs attributable to manufacturing interest in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Man. Prop. provides additional proportions of the manufacturing sub-sample. The top row, without parentheses, reflects the proportion of total lobbying costs attributable to manufacturing interest as a proportion of the total lobbying costs in EU⋆ countries. The second row, in square brackets, reflects the proportion of lobbying costs associated to manufacturing interests in terms of all lobbying costs in the preferred sample countries. The percentages in round parentheses reflect the proportion of lobbying costs attributable to the group in terms of lobbying costs in the second column.

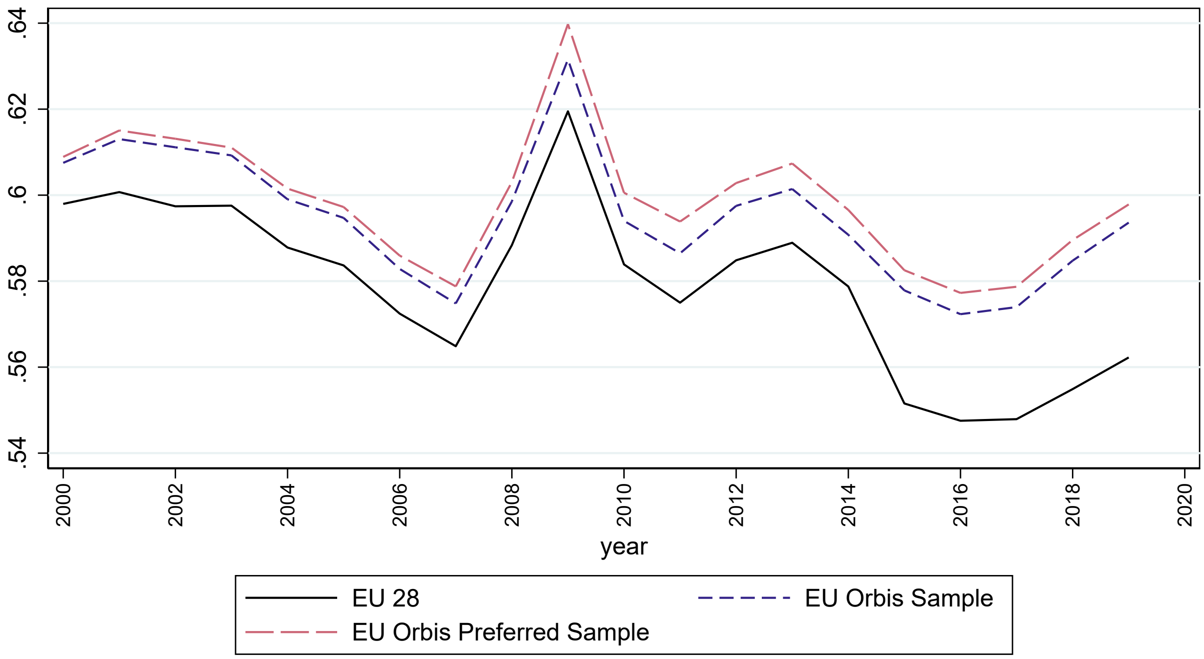
Table A.6: Matched Lobbying Data by meetings by Prof Lobbying Groups

	Total	Tot. Man.	Tot. EU⋆	Tot. Samp.	Tot. Man. Samp.	Man. Prop.
2014	121	32	113	99	25	22.33%
		(26.32%)	(93.44%)	(81.49%)	(20.86%)	[25.60%]
2015	227	54	202	181	46	22.67%
		(23.66%)	(89.19%)	(79.60%)	(20.22%)	[25.40%]
2016	309	80	289	256	67	23.17%
		(25.81%)	(93.44%)	(82.81%)	(21.65%)	[26.14%]
2017	217	47	195	177	41	21.18%
		(21.62%)	(89.70%)	(81.46%)	(19.00%)	[23.33%]
2018	230	53	207	186	45	21.83%
		(23.03%)	(89.86%)	(80.95%)	(19.61%)	[24.23%]
2019	116	24	101	89	21	20.28%
		(20.89%)	(87.29%)	(76.62%)	(17.70%)	[23.11%]

Source: Author's own calculations based on Orbis and Lobbying Data
This table shows the annual aggregates of lobbying as measured by number of meetings based on the country-industry classification of the lobbying entity's interests. All figures refer to values reported by Professional Consultancies, Lawyers, or Self-employed individuals lobbying entities and all proportions refer to values with respect to the relevant total of these entities. Total refers to the total value of number of meetings for all lobbying entities classified in a financial year independent of matching status, Tot. Man. refers to the total interest weighted number of meetings that can be attributed to manufacturing industries. Tot EU represents EU level lobbying, where ⋆ indicates that this is limited to Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.. Tot. Samp. Reflects the total number of meetings associated with entities in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Tot Man. Samp. refers to the total number of meetings attributable to manufacturing interest in Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom. Man. Prop. provides additional proportions of the manufacturing sub-sample. The top row, without parentheses, reflects the proportion of total number of meetings attributable to manufacturing interest as a proportion of the total number of meetings in EU⋆ countries. The second row, in square brackets, reflects the proportion of number of meetings associated to manufacturing interests in terms of all number of meetings in the preferred sample countries. The percentages in round parentheses reflect the proportion of number of meetings attributable to the group in terms of number of meetings in the second column.

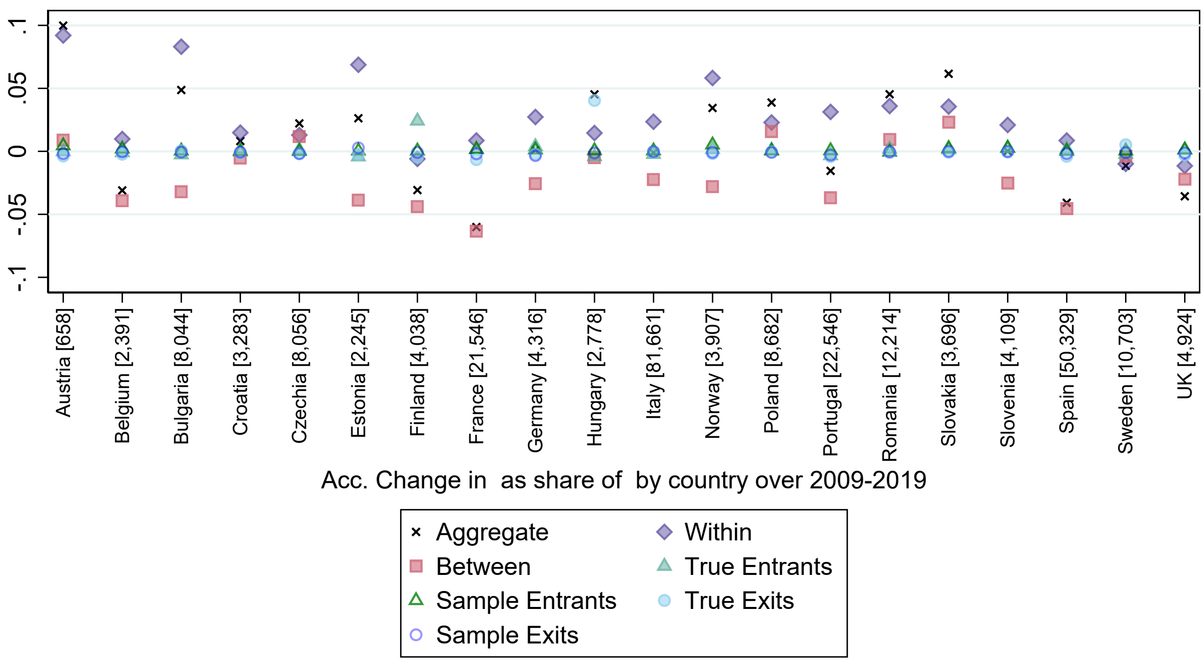
B Additional Figures for Labour Share

Figure 5: Labour Share of Value Added in Manufacturing in National Accounts



Author's own calculations based EU National Accounts Data from Eurostat.
This figure shows the aggregate evolution of the labour share of value added for EU countries using the National Accounts Data from Eurostat. The Orbis sample includes Austria, Belgium, Bulgaria, Croatia, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, and the United Kingdom. The Orbis Preferred sample refers to Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.

Figure 6: Accumulated Changes in Labour Share of Value Added



Author's own calculations based on Orbis Data.
This figure is the Melitz-Polanac decomposition of labour share of value added for the Orbis Data by country.

C Additional Tables on Concentration

Table C.1: Output HHI in Manufacturing for Full Sample

		Unweighted		Weighted	
Country	Agg.	2-digit	3-digit	2-digit	3-digit
Austria	0.011	0.192	0.403	0.117	0.284
Belgium	0.018	0.208	0.273	0.195	0.295
Bulgaria	0.032	0.128	0.271	0.231	0.337
Croatia	0.005	0.103	0.357	0.061	0.198
Czechia	0.013	0.092	0.267	0.087	0.182
Estonia	0.041	0.242	0.478	0.235	0.393
Finland	0.053	0.196	0.351	0.260	0.361
France	0.018	0.162	0.205	0.181	0.255
Germany	0.044	0.146	0.221	0.184	0.264
Hungary	0.018	0.161	0.333	0.109	0.280
Italy	0.002	0.063	0.099	0.040	0.084
Norway	0.005	0.162	0.350	0.071	0.195
Poland	0.003	0.082	0.197	0.045	0.116
Portugal	0.017	0.108	0.236	0.158	0.234
Romania	0.018	0.097	0.234	0.119	0.256
Slovakia	0.034	0.120	0.336	0.139	0.267
Slovenia	0.010	0.187	0.360	0.136	0.315
Spain	0.010	0.063	0.124	0.094	0.134
Sweden	0.006	0.152	0.277	0.077	0.166
UK	0.010	0.099	0.205	0.126	0.192

Source: Author's own calculations based on Orbis Data. This table shows the HHI of Output at the aggregate, 2-digit, and 3-digit level. The aggregate value is the concentration measure over the entire manufacturing sample for the country averaged over all periods. The unweighted values reflect the unweighted mean of the concentration measure in the country averaged over all period. The weighted values reflect the weighted means where each sector's concentration is weighted by Output the resulting aggregate is then averaged over time. The sample does not exclude firms without valid TFP data or outlying industries.

Table C.2: Output HHI in Manufacturing for Preferred Sample

		Unweighted		Weighted	
Country	Agg.	2-digit	3-digit	2-digit	3-digit
Austria	0.015	0.104	0.391	0.109	0.283
Belgium	0.007	0.106	0.241	0.085	0.200
Bulgaria	0.033	0.115	0.256	0.231	0.337
Croatia	0.006	0.085	0.349	0.056	0.194
Czechia	0.013	0.071	0.252	0.086	0.179
Estonia	0.044	0.153	0.437	0.231	0.390
Finland	0.093	0.160	0.346	0.323	0.408
France	0.018	0.131	0.198	0.179	0.254
Germany	0.044	0.145	0.223	0.184	0.264
Hungary	0.018	0.087	0.312	0.102	0.274
Italy	0.002	0.036	0.094	0.039	0.084
Norway	0.005	0.092	0.337	0.051	0.164
Poland	0.003	0.069	0.195	0.042	0.113
Portugal	0.003	0.049	0.218	0.046	0.128
Romania	0.017	0.058	0.218	0.085	0.227
Slovakia	0.035	0.119	0.339	0.139	0.267
Slovenia	0.010	0.106	0.320	0.101	0.276
Spain	0.003	0.034	0.097	0.028	0.068
Sweden	0.031	0.142	0.339	0.116	0.227
UK	0.010	0.099	0.205	0.126	0.192

Source: Author's own calculations based on Orbis Data. This table shows the HHI of Output at the aggregate, 2-digit, and 3-digit level. The aggregate value is the concentration measure over the entire manufacturing sample for the country averaged over all periods. The unweighted values reflect the unweighted mean of the concentration measure in the country averaged over all period. The weighted values reflect the weighted means where each sector's concentration is weighted by Output the resulting aggregate is then averaged over time. The sample does exclude firms without valid TFP data and removes outlying industries.

Table C.3: Change in Output HHI in Manufacturing for Full Sample with Industry Decomposition

		2-Digit			3-Digit		
Country	Agg.	W. Total	Within	Between	W. Total	Within	Between
Austria	0.002	−0.007	−0.060	0.052	−0.041	−0.061	0.020
Belgium	−0.005	−0.013	−0.001	−0.012	−0.003	0.001	−0.004
Bulgaria	−0.008	−0.037	−0.008	−0.028	−0.030	−0.018	−0.013
Croatia	−0.002	−0.010	−0.010	0.000	−0.029	0.022	−0.051
Czechia	0.007	0.014	0.006	0.009	0.036	0.030	0.006
Estonia	0.007	0.009	−0.034	0.043	0.008	−0.015	0.023
Finland	−0.028	−0.076	0.009	−0.086	−0.058	0.032	−0.090
France	0.002	0.034	0.026	0.008	0.031	0.028	0.002
Germany	0.014	0.002	0.004	−0.002	−0.018	0.009	−0.027
Hungary	−0.006	−0.042	−0.021	−0.021	−0.065	−0.016	−0.049
Italy	−0.001	−0.018	−0.022	0.004	−0.027	−0.013	−0.014
Norway	−0.006	−0.073	−0.049	−0.024	−0.123	−0.028	−0.095
Poland	−0.003	−0.035	−0.012	−0.024	−0.056	−0.018	−0.038
Portugal	0.003	0.012	−0.001	0.013	0.009	0.004	0.005
Romania	0.012	0.005	−0.009	0.015	0.050	0.011	0.039
Slovakia	0.016	−0.001	−0.001	0.000	−0.007	0.024	−0.031
Slovenia	−0.002	−0.018	−0.010	−0.008	−0.038	0.027	−0.064
Spain	0.004	0.025	−0.007	0.032	0.023	−0.014	0.036
Sweden	0.000	−0.002	−0.013	0.012	−0.008	−0.008	0.000
UK	−0.003	−0.021	−0.001	−0.020	−0.014	0.007	−0.021

Source: Author's own calculations based on Orbis Data.
This table shows the HHI of Output in terms of changes at the aggregate, 2-digit, and 3-digit level. The aggregate value is the change in the concentration measure over the entire manufacturing sample for the country from 2009-2019. The 2-digit and 3-digit decompositions reflect the Melitz & Polanec (2015) decomposition for each country where the within component reflect changes in the average industry concentration and the between component reflects the change in concentration due to changes in the shift of Output to or from more concentration industries. The sample does not exclude firms without valid TFP data or outlying industries.

Table C.4: Change in Output HHI in Manufacturing for Preferred Sample with Industry Decomposition

		2-Digit			3-Digit		
Country	Agg.	W. Total	Within	Between	W. Total	Within	Between
Austria	0.004	−0.004	−0.031	0.027	−0.041	−0.053	0.012
Belgium	0.001	0.018	0.010	0.007	0.025	0.003	0.023
Bulgaria	−0.008	−0.036	−0.002	−0.033	−0.030	−0.021	−0.009
Croatia	−0.002	−0.008	−0.002	−0.006	−0.028	0.023	−0.051
Czechia	0.007	0.016	0.004	0.012	0.039	0.030	0.008
Estonia	0.008	0.010	−0.006	0.016	0.009	−0.013	0.022
Finland	−0.040	−0.079	0.018	−0.096	−0.071	0.029	−0.100
France	0.003	0.035	0.035	0.000	0.032	0.031	0.001
Germany	0.013	0.002	0.005	−0.003	−0.018	0.008	−0.026
Hungary	−0.007	−0.036	−0.009	−0.026	−0.061	−0.011	−0.050
Italy	−0.001	−0.018	−0.012	−0.006	−0.027	−0.010	−0.017
Norway	−0.002	−0.029	−0.047	0.018	−0.061	−0.040	−0.021
Poland	−0.003	−0.028	−0.008	−0.020	−0.050	−0.017	−0.033
Portugal	0.002	0.015	0.011	0.004	0.012	0.008	0.004
Romania	0.014	0.010	−0.008	0.019	0.057	0.012	0.045
Slovakia	0.016	−0.001	−0.000	−0.000	−0.007	0.013	−0.020
Slovenia	−0.003	−0.030	−0.006	−0.024	−0.043	0.029	−0.072
Spain	−0.000	−0.005	−0.011	0.006	−0.006	−0.017	0.011
Sweden	0.005	0.034	0.027	0.007	0.034	−0.014	0.048
UK	−0.003	−0.021	−0.005	−0.017	−0.014	0.005	−0.019

Source: Author's own calculations based on Orbis Data.
This table shows the HHI of Output in terms of changes at the aggregate, 2-digit, and 3-digit level. The aggregate value is the change in the concentration measure over the entire manufacturing sample for the country from 2009-2019. The 2-digit and 3-digit decompositions reflect the Melitz & Polanec (2015) decomposition for each country where the within component reflect changes in the average industry concentration and the between component reflects the change in concentration due to changes in the shift of Output to or from more concentration industries. The sample does exclude firms without valid TFP data and removes outlying industries.

D Full Tables for Labour Share and Concentration Regressions

Table D.1: Labour Share and Concentration Measures in European Manufacturing - Part 1

		1 Year			2 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Labour Share of Val. Added on Val. Added Concentration	Base	-0.460^{***}	-0.595^{***}	-0.404^{***}	-0.413^{***}	-0.594^{***}	-0.362^{***}
		(0.095)	(0.115)	(0.085)	(0.115)	(0.074)	(0.089)
	Country	-0.460^{***}	-0.606^{***}	-0.402^{***}	-0.418^{***}	-0.626^{***}	-0.357^{***}
		(0.095)	(0.115)	(0.088)	(0.112)	(0.072)	(0.095)
	Industry	-0.478^{***}	-0.591^{***}	-0.399^{***}	-0.463^{***}	-0.595^{***}	-0.355^{***}
		(0.088)	(0.114)	(0.083)	(0.100)	(0.065)	(0.089)
	Country and Industry	-0.478^{***}	-0.604^{***}	-0.400^{***}	-0.465^{***}	-0.632^{***}	-0.359^{***}
		(0.087)	(0.115)	(0.083)	(0.098)	(0.067)	(0.088)
Labour Share of Val. Added on Output Concentration	Base	-0.093^{***}	-0.132	-0.124^{**}	-0.108^{**}	-0.144^{**}	-0.072
		(0.016)	(0.109)	(0.054)	(0.038)	(0.064)	(0.052)
	Country	-0.088^{***}	-0.143	-0.121^{**}	-0.097^{**}	-0.173^{***}	-0.066
		(0.017)	(0.105)	(0.055)	(0.035)	(0.053)	(0.055)
	Industry	-0.102^{***}	-0.116	-0.119^{**}	-0.147^{**}	-0.121^{**}	-0.065
		(0.035)	(0.106)	(0.054)	(0.062)	(0.051)	(0.054)
	Country and Industry	-0.100^{***}	-0.124	-0.118^{**}	-0.145^{**}	-0.150^{***}	-0.063
		(0.034)	(0.103)	(0.053)	(0.058)	(0.036)	(0.052)
Labour Share of Output on Output Concentration	Base	-0.149^{***}	-0.165^{***}	-0.114^{***}	-0.136^{***}	-0.170^{***}	-0.133^{***}
		(0.023)	(0.043)	(0.037)	(0.024)	(0.036)	(0.025)
	Country	-0.145^{***}	-0.167^{***}	-0.112^{***}	-0.128^{***}	-0.178^{***}	-0.130^{***}
		(0.022)	(0.042)	(0.038)	(0.021)	(0.034)	(0.026)
	Industry	-0.156^{***}	-0.163^{***}	-0.112^{**}	-0.138^{***}	-0.169^{***}	-0.127^{***}
		(0.027)	(0.045)	(0.039)	(0.037)	(0.035)	(0.028)
	Country and Industry	-0.154^{***}	-0.165^{***}	-0.111^{**}	-0.134^{***}	-0.177^{***}	-0.126^{***}
		(0.026)	(0.043)	(0.039)	(0.034)	(0.034)	(0.028)
Labour Share of Val. Added on Employment Concentration	Base	-0.005	0.117	0.014	0.043	0.053	0.059
		(0.014)	(0.087)	(0.025)	(0.043)	(0.037)	(0.036)
	Country	-0.001	0.116	0.020	0.048	0.039	0.072^{*}
		(0.014)	(0.084)	(0.024)	(0.043)	(0.031)	(0.039)
	Industry	-0.002	0.129	0.025	0.039	0.066^{**}	0.081^{*}
		(0.023)	(0.091)	(0.022)	(0.070)	(0.023)	(0.045)
	Country and Industry	0.003	0.134	0.028	0.043	0.059^{***}	0.082^{*}
		(0.021)	(0.088)	(0.020)	(0.066)	(0.017)	(0.042)
Observations		6,440	6,440	6,440	5,796	5,796	5,796

Source: Author's own table using Orbis data.
Each cell shows the coefficient from an OLS regression of with the change in the labour share variable in the first row as the y-variable on the in the concentration in the column over the period reported in the first row.
The baseline specification controls for time trends. The country specification controls for time and country trends separately. The industry specification includes year and industry trends separately. The country and industry specification controls for time, country, and industry trends separately Trends are controlled for by including dummy variables. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table D.2: Labour Share and Concentration Measures in European Manufacturing - Part 2

		3 Years			4 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Labour Share of Val. Added on Val. Added Concentration	Base	−0.393**	−0.520***	−0.341***	−0.321*	−0.467***	−0.318***
		(0.140)	(0.078)	(0.091)	(0.161)	(0.080)	(0.102)
	Country	−0.403***	−0.564***	−0.340***	−0.330*	−0.533***	−0.322**
		(0.136)	(0.076)	(0.098)	(0.156)	(0.075)	(0.110)
	Industry	−0.479***	−0.519***	−0.330***	−0.408***	−0.449***	−0.293***
		(0.119)	(0.064)	(0.088)	(0.136)	(0.064)	(0.099)
	Country and Industry	−0.489***	−0.578***	−0.339***	−0.422***	−0.539***	−0.310***
		(0.115)	(0.066)	(0.086)	(0.131)	(0.066)	(0.098)
Labour Share of Val. Added on Output Concentration	Base	−0.107*	−0.107	−0.043	−0.091	−0.102	−0.041
		(0.058)	(0.082)	(0.063)	(0.055)	(0.084)	(0.063)
	Country	−0.100*	−0.148**	−0.040	−0.084	−0.171**	−0.044
		(0.055)	(0.069)	(0.067)	(0.048)	(0.066)	(0.069)
	Industry	−0.197*	−0.073	−0.043	−0.237**	−0.050	−0.046
		(0.103)	(0.068)	(0.061)	(0.087)	(0.073)	(0.062)
	Country and Industry	−0.201*	−0.121**	−0.043	−0.250***	−0.130**	−0.052
		(0.097)	(0.052)	(0.060)	(0.076)	(0.057)	(0.061)
Labour Share of Output on Output Concentration	Base	−0.117***	−0.170***	−0.121***	−0.105***	−0.176***	−0.113***
		(0.018)	(0.033)	(0.024)	(0.018)	(0.033)	(0.025)
	Country	−0.110***	−0.180***	−0.120***	−0.097***	−0.190***	−0.113***
		(0.017)	(0.032)	(0.025)	(0.019)	(0.034)	(0.025)
	Industry	−0.122***	−0.169***	−0.118***	−0.111***	−0.172***	−0.112***
		(0.031)	(0.031)	(0.028)	(0.030)	(0.032)	(0.030)
	Country and Industry	−0.117***	−0.181***	−0.117***	−0.103***	−0.188***	−0.110***
		(0.027)	(0.031)	(0.028)	(0.025)	(0.030)	(0.030)
Labour Share of Val. Added on Employment Concentration	Base	0.015	0.110**	0.077*	0.056	0.131***	0.079**
		(0.062)	(0.050)	(0.040)	(0.045)	(0.042)	(0.031)
	Country	0.016	0.089**	0.088**	0.053	0.092***	0.087***
		(0.061)	(0.039)	(0.041)	(0.043)	(0.031)	(0.028)
	Industry	−0.031	0.126***	0.096*	−0.029	0.149***	0.100*
		(0.090)	(0.041)	(0.050)	(0.088)	(0.044)	(0.049)
	Country and Industry	−0.032	0.111***	0.096**	−0.036	0.119***	0.096**
		(0.086)	(0.025)	(0.044)	(0.084)	(0.033)	(0.041)
Observations		5,152	5,152	5,152	4,508	4,508	4,508

Source: Author's own table using Orbis data.
Each cell shows the coefficient from an OLS regression of with the change in the labour share variable in the first row as the y-variable on the in the concentration in the column over the period reported in the first row.
The baseline specification controls for time trends. The country specification controls for time and country trends separately. The industry specification includes year and industry trends separately. The country and industry specification controls for time, country, and industry trends separately Trends are controlled for by including dummy variables. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table D.3: Labour Share and Concentration Measures in European Manufacturing - Part 3

		5 Years			6 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Labour Share of Val. Added on Val. Added Concentration	Base	−0.293	−0.405***	−0.286**	−0.290	−0.403***	−0.310***
		(0.176)	(0.077)	(0.099)	(0.176)	(0.077)	(0.082)
	Country	−0.308*	−0.492***	−0.294**	−0.307*	−0.505***	−0.320***
		(0.169)	(0.063)	(0.109)	(0.169)	(0.059)	(0.093)
	Industry	−0.391***	−0.355***	−0.235**	−0.409***	−0.342***	−0.251***
		(0.129)	(0.060)	(0.093)	(0.113)	(0.053)	(0.067)
	Country and Industry	−0.414***	−0.471***	−0.260**	−0.438***	−0.485***	−0.284***
		(0.119)	(0.062)	(0.091)	(0.099)	(0.060)	(0.066)
Labour Share of Val. Added on Output Concentration	Base	−0.042	−0.085	−0.027	−0.051	−0.106	−0.058
		(0.065)	(0.083)	(0.063)	(0.067)	(0.085)	(0.055)
	Country	−0.038	−0.185***	−0.035	−0.046	−0.224***	−0.069
		(0.054)	(0.059)	(0.069)	(0.055)	(0.056)	(0.063)
	Industry	−0.203**	−0.005	−0.018	−0.241**	−0.016	−0.057
		(0.096)	(0.074)	(0.064)	(0.084)	(0.070)	(0.048)
	Country and Industry	−0.225**	−0.117*	−0.029	−0.270***	−0.159**	−0.074
		(0.082)	(0.064)	(0.065)	(0.066)	(0.061)	(0.053)
Labour Share of Output on Output Concentration	Base	−0.111***	−0.167***	−0.109***	−0.122***	−0.161***	−0.113***
		(0.024)	(0.032)	(0.019)	(0.027)	(0.029)	(0.013)
	Country	−0.102***	−0.184***	−0.108***	−0.113***	−0.181***	−0.113***
		(0.026)	(0.035)	(0.019)	(0.029)	(0.030)	(0.011)
	Industry	−0.120***	−0.156***	−0.105***	−0.142***	−0.146***	−0.109***
		(0.031)	(0.029)	(0.027)	(0.024)	(0.030)	(0.020)
	Country and Industry	−0.112***	−0.177***	−0.102***	−0.133***	−0.171***	−0.106***
		(0.026)	(0.027)	(0.026)	(0.018)	(0.018)	(0.017)
Labour Share of Val. Added on Employment Concentration	Base	0.087*	0.137***	0.076**	0.082	0.124**	0.047
		(0.044)	(0.039)	(0.032)	(0.049)	(0.044)	(0.040)
	Country	0.080*	0.080**	0.080**	0.074	0.056	0.051
		(0.040)	(0.030)	(0.028)	(0.044)	(0.038)	(0.034)
	Industry	−0.037	0.154**	0.093	−0.084	0.142**	0.061
		(0.085)	(0.061)	(0.055)	(0.110)	(0.064)	(0.053)
	Country and Industry	−0.050	0.108**	0.084*	−0.103	0.083	0.049
		(0.081)	(0.049)	(0.047)	(0.105)	(0.056)	(0.045)
Observations		3,864	3,864	3,864	3,220	3,220	3,220

Source: Author's own table using Orbis data.
Each cell shows the coefficient from an OLS regression of with the change in the labour share variable in the first row as the y-variable on the in the concentration in the column over the period reported in the first row.
The baseline specification controls for time trends. The country specification controls for time and country trends separately. The industry specification includes year and industry trends separately. The country and industry specification controls for time, country, and industry trends separately Trends are controlled for by including dummy variables. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table D.4: Labour Share and Concentration Measures in European Manufacturing - Part 4

		7 Years			8 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Labour Share of	Base	-0.291	-0.413^{***}	-0.326^{***}	-0.323^{*}	-0.409^{***}	-0.318^{**}
Val. Added		(0.184)	(0.091)	(0.090)	(0.173)	(0.107)	(0.112)
on Val. Added	Country	-0.305	-0.517^{***}	-0.332^{***}	-0.343^{*}	-0.506^{***}	-0.314^{**}
Concentration		(0.177)	(0.074)	(0.105)	(0.165)	(0.092)	(0.131)
	Industry	-0.438^{***}	-0.366^{***}	-0.276^{***}	-0.520^{***}	-0.375^{***}	-0.274^{**}
		(0.137)	(0.061)	(0.082)	(0.124)	(0.076)	(0.114)
	Country and	-0.468^{***}	-0.522^{***}	-0.311^{***}	-0.553^{***}	-0.528^{***}	-0.301^{**}
	Industry	(0.123)	(0.065)	(0.079)	(0.107)	(0.086)	(0.112)
Labour Share of	Base	-0.058	-0.128	-0.063	-0.081	-0.139	-0.064
Val. Added		(0.061)	(0.098)	(0.066)	(0.055)	(0.109)	(0.081)
on Output	Country	-0.048	-0.243^{***}	-0.068	-0.067	-0.237^{**}	-0.058
Concentration		(0.052)	(0.069)	(0.076)	(0.045)	(0.085)	(0.091)
	Industry	-0.266^{*}	-0.045	-0.080	-0.311^{*}	-0.060	-0.073
		(0.132)	(0.076)	(0.056)	(0.152)	(0.077)	(0.073)
	Country and	-0.291^{**}	-0.200^{***}	-0.097	-0.331^{**}	-0.201^{***}	-0.077
	Industry	(0.118)	(0.048)	(0.056)	(0.139)	(0.047)	(0.070)
Labour Share of	Base	-0.128^{***}	-0.156^{***}	-0.107^{***}	-0.140^{***}	-0.146^{***}	-0.113^{***}
Output		(0.024)	(0.030)	(0.014)	(0.026)	(0.033)	(0.018)
on Output	Country	-0.118^{***}	-0.178^{***}	-0.107^{***}	-0.127^{***}	-0.168^{***}	-0.109^{***}
Concentration		(0.025)	(0.029)	(0.012)	(0.026)	(0.027)	(0.015)
	Industry	-0.158^{***}	-0.142^{***}	-0.103^{***}	-0.177^{***}	-0.136^{***}	-0.101^{***}
		(0.034)	(0.033)	(0.025)	(0.040)	(0.036)	(0.032)
	Country and	-0.149^{***}	-0.166^{***}	-0.097^{***}	-0.167^{***}	-0.162^{***}	-0.094^{***}
	Industry	(0.027)	(0.012)	(0.020)	(0.032)	(0.017)	(0.027)
Labour Share of	Base	0.070	0.091	0.018	0.033	0.061	0.012
Val. Added		(0.064)	(0.063)	(0.039)	(0.081)	(0.091)	(0.045)
on Employment	Country	0.064	0.022	0.030	0.035	0.005	0.040
Concentration		(0.061)	(0.047)	(0.032)	(0.079)	(0.069)	(0.045)
	Industry	-0.103	0.112	0.043	-0.132	0.087	0.052
		(0.165)	(0.069)	(0.061)	(0.234)	(0.079)	(0.081)
	Country and	-0.121	0.048	0.031	-0.141	0.035	0.048
	Industry	(0.157)	(0.059)	(0.050)	(0.221)	(0.059)	(0.066)
Observations		2,576	2,576	2,576	1,932	1,932	1,932

Source: Author's own table using Orbis data.
Each cell shows the coefficient from an OLS regression of with the change in the labour share variable in the first row as the y-variable on the in the concentration in the column over the period reported in the first row.
The baseline specification controls for time trends. The country specification controls for time and country trends separately. The industry specification includes year and industry trends separately. The country and industry specification controls for time, country, and industry trends separately Trends are controlled for by including dummy variables. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table D.5: Labour Share and Concentration Measures in European Manufacturing - Part 5

		9 Years			10 Years		
		HHI	CR20	CR4	HHI	CR20	CR4
Labour Share of	Base	-0.381^{**}	-0.395^{**}	-0.345^{***}	-0.369^{*}	-0.475^{***}	-0.371^{***}
Val. Added		(0.157)	(0.148)	(0.107)	(0.175)	(0.132)	(0.121)
on Val. Added	Country	-0.393^{**}	-0.508^{***}	-0.320^{**}	-0.367^{*}	-0.582^{***}	-0.341^{**}
Concentration		(0.150)	(0.130)	(0.134)	(0.175)	(0.113)	(0.145)
	Industry	-0.596^{***}	-0.341^{***}	-0.289^{**}	-0.503^{***}	-0.393^{***}	-0.259^{**}
		(0.099)	(0.107)	(0.109)	(0.097)	(0.063)	(0.090)
	Country and	-0.620^{***}	-0.490^{***}	-0.310^{**}	-0.503^{***}	-0.538^{***}	-0.259^{**}
	Industry	(0.085)	(0.126)	(0.108)	(0.087)	(0.115)	(0.093)
Labour Share of	Base	-0.141^{**}	-0.145	-0.123^{**}	-0.179^{**}	-0.248^{*}	-0.121^{**}
Val. Added		(0.053)	(0.135)	(0.053)	(0.077)	(0.124)	(0.057)
on Output	Country	-0.113^{**}	-0.248^{**}	-0.097	-0.156^{**}	-0.346^{***}	-0.099^{*}
Concentration		(0.039)	(0.110)	(0.063)	(0.065)	(0.098)	(0.056)
	Industry	-0.374^{***}	-0.053	-0.102^{*}	-0.375^{***}	-0.149^{**}	-0.057
		(0.111)	(0.106)	(0.055)	(0.096)	(0.068)	(0.062)
	Country and	-0.379^{***}	-0.178^{**}	-0.097^{**}	-0.372^{***}	-0.259^{***}	-0.031
	Industry	(0.097)	(0.080)	(0.044)	(0.080)	(0.066)	(0.061)
Labour Share of	Base	-0.150^{***}	-0.140^{***}	-0.143^{***}	-0.125^{***}	-0.175^{***}	-0.135^{***}
Output		(0.028)	(0.048)	(0.018)	(0.030)	(0.047)	(0.022)
on Output	Country	-0.129^{***}	-0.166^{***}	-0.131^{***}	-0.101^{***}	-0.197^{***}	-0.119^{***}
Concentration		(0.030)	(0.034)	(0.010)	(0.033)	(0.029)	(0.016)
	Industry	-0.177^{***}	-0.128^{**}	-0.113^{***}	-0.158^{***}	-0.164^{***}	-0.116^{***}
		(0.044)	(0.054)	(0.026)	(0.041)	(0.050)	(0.022)
	Country and	-0.160^{***}	-0.154^{***}	-0.101^{***}	-0.135^{***}	-0.191^{***}	-0.096^{***}
	Industry	(0.035)	(0.031)	(0.018)	(0.034)	(0.019)	(0.023)
Labour Share of	Base	-0.126	0.049	-0.072	-0.186^{*}	-0.044	-0.090
Val. Added		(0.082)	(0.111)	(0.061)	(0.102)	(0.104)	(0.061)
on Employment	Country	-0.107	-0.006	-0.016	-0.160	-0.086	-0.032
Concentration		(0.076)	(0.081)	(0.041)	(0.098)	(0.076)	(0.052)
	Industry	-0.367^{**}	0.103	0.006	-0.393^{**}	0.042	0.032
		(0.160)	(0.112)	(0.062)	(0.135)	(0.082)	(0.065)
	Country and	-0.351^{**}	0.079	0.007	-0.338^{**}	0.074	0.075
	Industry	(0.147)	(0.092)	(0.045)	(0.126)	(0.088)	(0.067)
Observations		1,288	1,288	1,288	644	644	644

Source: Author's own table using Orbis data.
Each cell shows the coefficient from an OLS regression of with the change in the labour share variable in the first row as the y-variable on the in the concentration in the column over the period reported in the first row.
The baseline specification controls for time trends. The country specification controls for time and country trends separately. The industry specification includes year and industry trends separately. The country and industry specification controls for time, country, and industry trends separately Trends are controlled for by including dummy variables. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

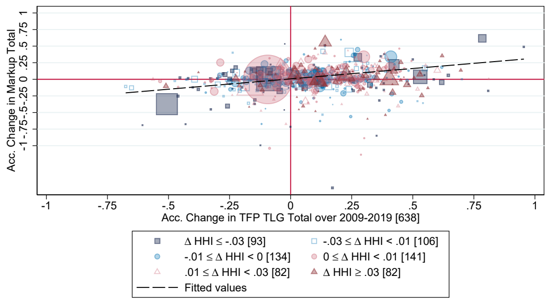
Table D.6: Labour Share, Value Added HHI, and Productivity Growth

		1 Year			3 Years		
		TLG	CD	GMM	TLG	CD	GMM
TFP	Within	-0.065^{***}	-0.069^{***}	-0.154^{***}	-0.063^{***}	-0.069^{***}	-0.122^{***}
		(0.008)	(0.008)	(0.029)	(0.015)	(0.015)	(0.029)
	Between	0.025	0.001	-0.241^{***}	-0.032^{*}	-0.043^{**}	-0.266^{***}
		(0.025)	(0.024)	(0.031)	(0.018)	(0.021)	(0.035)
	Entrants	-0.132	-0.195^{**}	-0.149^{***}	-0.123	-0.196^{*}	-0.158^{***}
		(0.119)	(0.085)	(0.052)	(0.094)	(0.109)	(0.044)
	Exits	-0.057	-0.160^{***}	-0.168^{***}	-0.099	-0.163	-0.170^{**}
		(0.121)	(0.050)	(0.055)	(0.136)	(0.118)	(0.083)
HHI VA	Within	0.090	0.090	0.068	-0.018	-0.018	-0.030
		(0.028)	(0.027)	(0.026)	(0.025)	(0.025)	(0.025)
	Between	-0.572^{***}	-0.555^{***}	-0.151^{***}	-0.460^{***}	-0.463^{***}	-0.020
		(0.066)	(0.067)	(0.038)	(0.065)	(0.064)	(0.044)
	Entrants	-0.001	0.005	0.005	0.005	0.011	0.012
		(0.005)	(0.006)	(0.006)	(0.004)	(0.007)	(0.005)
	Exits	0.002	-0.002	0.006	0.003	0.001	0.005
		(0.004)	(0.003)	(0.002)	(0.004)	(0.005)	(0.003)
	R^2-adj Within	0.204	0.212	0.317	0.244	0.252	0.305
	R^2-adj Between	0.168	0.164	0.483	0.209	0.212	0.542
	R^2-adj Entrants	0.214	0.296	0.401	0.282	0.359	0.474
	R^2-adj Exits	0.073	0.386	0.279	0.207	0.357	0.362
	Observations	6,440	6,440	6,440	5,152	5,152	5,152
		5 Years			10 Years		
		TLG	CD	GMM	TLG	CD	GMM
TFP	Within	-0.041^{**}	-0.051^{***}	-0.084^{***}	0.003	-0.010	-0.012
		(0.020)	(0.018)	(0.028)	(0.028)	(0.024)	(0.023)
	Between	-0.027	-0.038	-0.238^{***}	-0.064^{**}	-0.109^{**}	-0.207^{***}
		(0.022)	(0.029)	(0.027)	(0.027)	(0.053)	(0.033)
	Entrants	-0.096	-0.178	-0.156^{***}	-0.062	-0.149	-0.142^{*}
		(0.083)	(0.150)	(0.055)	(0.056)	(0.150)	(0.080)
	Exits	-0.086	-0.155	-0.176^{*}	-0.048	-0.166^{**}	-0.174^{**}
		(0.141)	(0.164)	(0.097)	(0.103)	(0.084)	(0.080)
HHI VA	Within	-0.062^{***}	-0.062^{***}	-0.074^{***}	-0.123^{**}	-0.117^{**}	-0.124^{***}
		(0.017)	(0.017)	(0.016)	(0.049)	(0.046)	(0.042)
	Between	-0.346^{***}	-0.348^{***}	0.015	-0.319^{***}	-0.300^{***}	-0.028
		(0.072)	(0.071)	(0.048)	(0.079)	(0.088)	(0.093)
	Entrants	0.002	0.009	0.009	0.008	0.010	0.007
		(0.004)	(0.010)	(0.005)	(0.009)	(0.010)	(0.009)
	Exits	0.006	0.006	0.006	-0.005	0.009	-0.002
		(0.008)	(0.008)	(0.006)	(0.014)	(0.013)	(0.011)
	R^2-adj Within	0.306	0.315	0.342	0.564	0.564	0.565
	R^2-adj Between	0.334	0.335	0.580	0.609	0.616	0.743
	R^2-adj Entrants	0.306	0.372	0.497	0.468	0.507	0.594
	R^2-adj Exits	0.273	0.385	0.444	0.324	0.529	0.516
	Observations	3,864	3,864	3,864	644	644	644

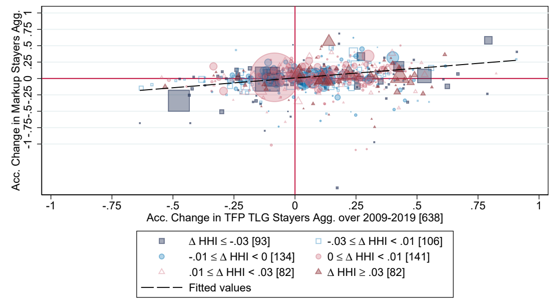
Source: Author's own table using Orbis data.
This table shows the results of a seemingly unrelated regression with each of the decomposed labour shares listed in the second row on the value added concentration measures listed in the column title accumulated over the period in the heading. The baseline specification includes only year dummies while the Country and industry specification uses country, industry, and year dummies. The sample is limited to industries with at least 20 firms and outliers are dropped. All regressions are weighted by the industry-country's value-added in 2013. Standard errors are in parenthesis and clustered by country Kolev (2021). The sample is limited to country-industries with TFP data. The countries are limited to Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
$^{***}p < .01, ^{**} p < .05, ^{*} p < .1$

E Additional Figures on the Labour Share, Productivity, and Markup Decompositions

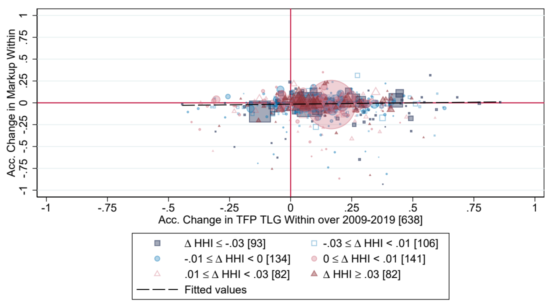
Figure 1: TFP and Markups Decomposition



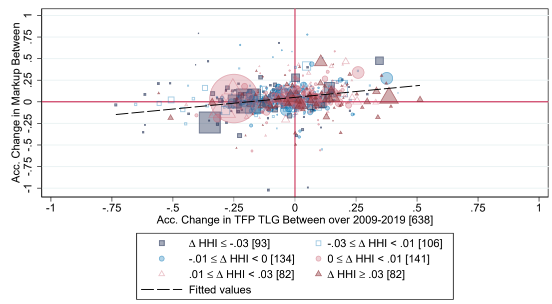
(a) Aggregate



(b) Stayers



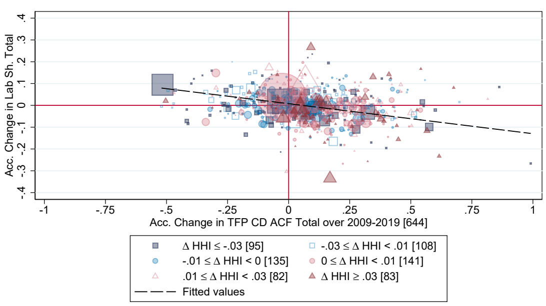
(c) Stayers-Within



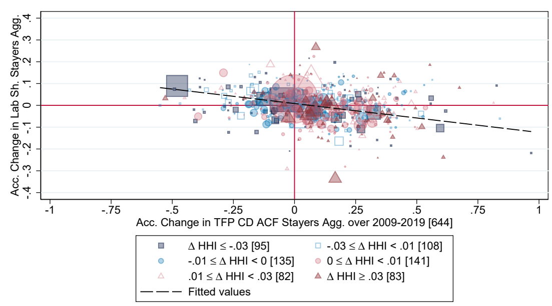
(d) Stayers-Between

Author's own table using Orbis data.
This figure plots the relationship between the Melitz & Polanec (2015) decomposed measure of TFP, estimated via the Translog Production Function, and Markups defined as $\mu = \frac{\theta^L_{i,t}}{Labour\ Share_{i,t}}$, as discussed in section 4.1. The aggregate relationship is reported in panel (A). Panel (B) limits the motion in the two measures to only firms that stay in each period. Panel (C) reports the within relationship between the two measures and Panel (D) reports the relationship of the between component of the two measures.

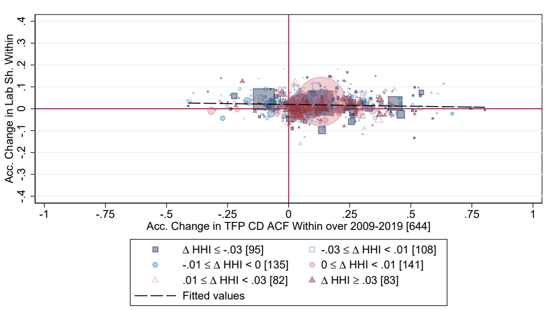
Figure 2: TFP Cobb-Douglas and Labour Share Decomposition



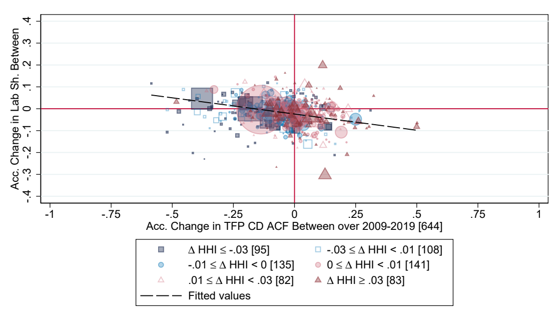
(a) Aggregate



(b) Stayers



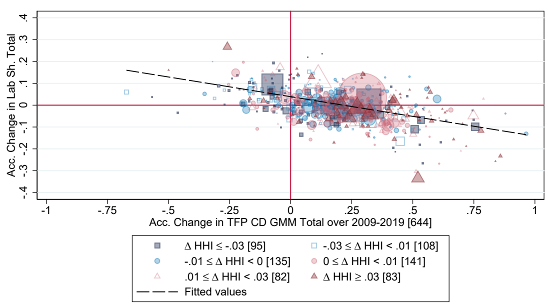
(c) Stayers-Within



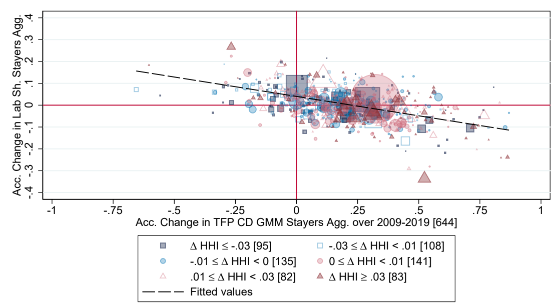
(d) Stayers-Between

Author's own table using Orbis data.
This figure plots the relationship between the Melitz & Polanec (2015) decomposed measure of TFP, estimated via the Cobb-Douglas Production Function, and labour share of value added, as discussed in section 4.1. The aggregate relationship is reported in panel (A). Panel (B) limits the motion in the two measures to only firms that stay in each period. Panel (C) reports the within relationship between the two measures and Panel (D) reports the relationship of the between component of the two measures.

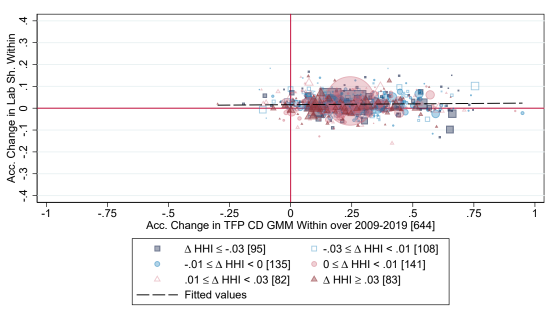
Figure 3: TFP Cobb-Douglas GMM and Labour Share Decomposition



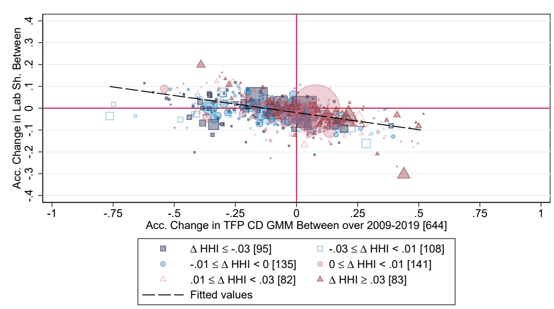
(a) Aggregate



(b) Stayers



(c) Stayers-Within



(d) Stayers-Between

Author's own table using Orbis data.
This figure plots the relationship between the Melitz & Polanec (2015) decomposed measure of TFP, estimated via the Cobb-Douglas Production Function using the Wooldridge (2009) approach, and labour share of value added, as discussed in section 4.1. The aggregate relationship is reported in panel (A). Panel (B) limits the motion in the two measures to only firms that stay in each period. Panel (C) reports the within relationship between the two measures and Panel (D) reports the relationship of the between component of the two measures.

F Robustness of Binary Regressions and Additional Specifications

Table F.1: Lobbying Cost Share and Translog based Binary

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Year
Inh., Prof., & Other	All	-0.028	0.047^{*}	0.030	0.041^{*}	0.120^{***}	0.135^{**}	0.122^{*}	0.174^{**}	0.190^{*}	0.358^{***}
		(0.049)	(0.025)	(0.033)	(0.021)	(0.030)	(0.057)	(0.062)	(0.062)	(0.099)	(0.077)
	$\Delta HHI > 0$	-0.036	0.043^{***}	0.041^{*}	0.032	0.075^{***}	0.088^{***}	0.159^{**}	0.196^{*}	0.294^{**}	0.417^{***}
		(0.047)	(0.012)	(0.019)	(0.020)	(0.017)	(0.030)	(0.055)	(0.098)	(0.130)	(0.139)
	$\Delta HHI < 0$	-0.018	0.049	-0.060	0.044	0.112	0.075	-0.005	0.228^{**}	0.009	-0.057
		(0.040)	(0.033)	(0.084)	(0.042)	(0.104)	(0.136)	(0.123)	(0.102)	(0.125)	(0.248)
Inh & Prof.	All	-0.033	0.043	0.040	0.035	0.151^{***}	0.154^{***}	0.160^{**}	0.231^{***}	0.241^{**}	0.356^{***}
		(0.046)	(0.048)	(0.040)	(0.027)	(0.049)	(0.052)	(0.067)	(0.066)	(0.083)	(0.061)
	$\Delta HHI > 0$	-0.086^{*}	0.053	0.013	-0.022	0.065^{*}	0.104^{*}	0.328^{***}	0.229^{*}	0.341^{*}	0.350
		(0.042)	(0.033)	(0.032)	(0.017)	(0.033)	(0.053)	(0.100)	(0.130)	(0.178)	(0.202)
	$\Delta HHI < 0$	-0.030	0.052	-0.018	0.049	0.142	0.097	-0.009	0.270^{**}	0.059	0.016
		(0.051)	(0.042)	(0.075)	(0.041)	(0.091)	(0.104)	(0.099)	(0.104)	(0.104)	(0.229)
Obs.	All	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	$\Delta HHI > 0$	3,154	2,805	2,518	2,208	1,887	1,563	1,263	948	616	306
	$\Delta HHI < 0$	3,286	2,991	2,634	2,300	1,977	1,657	1,313	984	672	338

Author's own table using Orbis and Lobbying data.
This table shows the regression results of separate OLS regressions on a binary variable indicating whether both $\Delta_t Labour\ Share < 0$ and $\Delta_t TFP < 0$ on the country-industry share of total cost over the period reported in the top row. $\Delta_t TFP$ is informed by Translog. The sample labelled All includes all country-industries in the preferred sample as in tables 12-D.6. The samples labelled $\Delta_t HHI > 0$ and $\Delta_t HHI < 0$ limits the sample to industry with positive and negative output HHI respectively. The coefficients in the Inh., Prof., & Other group are on the country industry share of total cost for all matched lobbying groups whereas the Inh. & Prof. groups limits the shares to matched lobbying groups identifying as In-house lobbying groups or Professional Lobbying groups. The observations reported in Obs. are for each group. All specifications includes country, 3-digit industry, and year effects. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table F.2: Meeting Share and Translog based Binary

		1 Year	2 Years	3 Years	4 Years	5 Year
Inh., Prof., & Other	All	-0.008	0.020	0.060	0.121^{***}	0.109
		(0.055)	(0.099)	(0.066)	(0.025)	(0.084)
	$\Delta HHI > 0$	0.044	0.078^{***}	0.034	0.306	0.262^{*}
		(0.053)	(0.027)	(0.059)	(0.243)	(0.127)
	$\Delta HHI < 0$	-0.092^{*}	-0.034	-0.357	0.017	0.389^{*}
		(0.049)	(0.212)	(0.368)	(0.239)	(0.220)
Inh & Prof.	All	-0.005	0.023	0.058	0.119^{***}	0.100
		(0.053)	(0.089)	(0.058)	(0.024)	(0.080)
	$\Delta HHI > 0$	0.041	0.070^{**}	0.027	0.314	0.235^{*}
		(0.053)	(0.025)	(0.057)	(0.229)	(0.118)
	$\Delta HHI < 0$	-0.089^{*}	-0.010	-0.332	0.041	0.372
		(0.048)	(0.202)	(0.352)	(0.218)	(0.218)
Obs.	All	3,220	2,576	1,932	1,288	644
	$\Delta HHI > 0$	1,726	1,359	1,036	695	361
	$\Delta HHI < 0$	1,494	1,217	896	593	283

Author's own table using Orbis and Lobbying data.
This table shows the regression results of separate OLS regressions on a binary variable indicating whether both $\Delta_t Labour\, Share < 0$ and $\Delta_t TFP < 0$ on the country-industry share of total meetings over the period reported in the top row. $\Delta_t TFP$ is informed by Translog. The sample labelled All includes all country-industries in the preferred sample as in tables 12-D.6. The samples labelled $\Delta_t HHI > 0$ and $\Delta_t HHI < 0$ limits the sample to industry with positive and negative output HHI respectively. The coefficients in the Inh., Prof., & Other group are on the country industry share of total meetings for all matched lobbying groups whereas the Inh. & Prof. groups limits the shares to matched lobbying groups identifying as In-house lobbying groups or Professional Lobbying groups. The observations reported in Obs. are for each group. All specifications includes country, 3-digit industry, and year effects. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country.
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

G Additional Measures for Normalised Lobbying, Productivity, and the Labour Share

Table G.3: Normalised Productivity, Labour Share, and Lobbying Cost Share

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	−0.025**	−0.012	−0.003	0.003	0.019	0.017	0.015	0.003	−0.049	−0.154*
		(0.011)	(0.015)	(0.020)	(0.027)	(0.035)	(0.042)	(0.048)	(0.051)	(0.059)	(0.092)
	Between	−0.037***	−0.097***	−0.111***	−0.127***	−0.160***	−0.213***	−0.251***	−0.277***	−0.302***	−0.256***
		(0.011)	(0.018)	(0.022)	(0.026)	(0.037)	(0.052)	(0.058)	(0.063)	(0.077)	(0.084)
	Enter	−0.006	−0.010	0.002	0.022	0.034	0.041	0.039	0.040	0.041	0.052
		(0.019)	(0.030)	(0.042)	(0.049)	(0.057)	(0.062)	(0.066)	(0.067)	(0.066)	(0.068)
	Exit	−0.031	−0.049**	−0.044*	−0.039	−0.041	−0.044	−0.042	−0.040	−0.045	−0.065*
		(0.021)	(0.022)	(0.024)	(0.028)	(0.034)	(0.037)	(0.037)	(0.037)	(0.034)	(0.037)
Lab. Share	Within	−0.027*	−0.012	−0.005	0.022	0.065*	0.060	0.066	0.092	0.127*	0.117
		(0.016)	(0.019)	(0.024)	(0.030)	(0.034)	(0.039)	(0.045)	(0.057)	(0.067)	(0.086)
	Between	0.070***	0.016	−0.004	−0.028	−0.062**	−0.117***	−0.137***	−0.135***	−0.071	−0.067
		(0.023)	(0.022)	(0.020)	(0.024)	(0.031)	(0.043)	(0.050)	(0.050)	(0.051)	(0.072)
	Enter	0.009	−0.001	0.016	0.039	0.044	0.040	0.031	0.026	0.043	0.033
		(0.017)	(0.035)	(0.047)	(0.052)	(0.060)	(0.065)	(0.071)	(0.074)	(0.071)	(0.070)
	Exit	−0.035	−0.048	−0.032	−0.016	−0.009	−0.004	0.007	0.015	0.029	0.074
		(0.027)	(0.033)	(0.040)	(0.054)	(0.071)	(0.079)	(0.079)	(0.079)	(0.076)	(0.078)
R^2-adj. TFP	Within	0.047	0.046	0.018	0.007	0.004	0.004	0.005	0.004	0.005	0.031
	Between	0.087	0.050	0.048	0.044	0.061	0.104	0.118	0.147	0.185	0.213
	Enter	0.046	0.065	0.055	0.041	0.036	0.036	0.039	0.034	0.028	0.033
	Exit	0.028	0.058	0.079	0.065	0.054	0.046	0.044	0.039	0.031	0.023
R^2-adj. Lab. Share	Within	0.052	0.051	0.020	0.007	0.011	0.022	0.023	0.023	0.030	0.040
	Between	0.007	0.005	0.015	0.033	0.025	0.044	0.056	0.078	0.086	0.135
	Enter	0.039	0.054	0.046	0.033	0.027	0.025	0.024	0.019	0.017	0.017
	Exit	0.026	0.056	0.072	0.055	0.042	0.034	0.034	0.029	0.021	0.021
	Obs.	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	p-value	0.000	0.001	0.004	0.021	0.057	0.026	0.012	0.009	0.014	0.010

Author's own calculations based on Orbis and Lobbying Data.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated lobbying cost share. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated lobbying cost share includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table G.4: Normalised Productivity, Labour Share, and Meetings Share

		1 Year	2 Years	3 Years	4 Years	5 Years
TFP	Within	-0.061^{***}	-0.022	0.047	0.001	-0.051
		(0.015)	(0.021)	(0.029)	(0.042)	(0.048)
	Between	-0.045^{**}	-0.086^{***}	-0.167^{***}	-0.268^{***}	-0.257^{***}
		(0.018)	(0.024)	(0.027)	(0.026)	(0.039)
	Enter	-0.010	-0.028	-0.030	-0.027	-0.028
		(0.016)	(0.018)	(0.020)	(0.030)	(0.028)
	Exit	0.010	0.021	0.027	0.015	-0.014
		(0.015)	(0.015)	(0.018)	(0.021)	(0.028)
Lab. Share	Within	-0.053^{***}	-0.017	0.105^{***}	0.134^{***}	0.046
		(0.013)	(0.021)	(0.021)	(0.025)	(0.036)
	Between	0.043^{***}	-0.014	-0.144^{***}	-0.244^{***}	-0.220^{***}
		(0.014)	(0.019)	(0.015)	(0.017)	(0.021)
	Enter	-0.008	-0.045^{*}	0.015	0.060^{*}	0.032
		(0.015)	(0.023)	(0.024)	(0.035)	(0.041)
	Exit	0.043^{***}	0.053^{***}	0.071^{***}	0.083^{***}	0.094^{***}
		(0.016)	(0.017)	(0.019)	(0.022)	(0.024)
R^2-adj. TFP	Within	0.052	0.065	0.038	0.022	0.020
	Between	0.078	0.028	0.069	0.077	0.083
	Enter	0.026	0.063	0.054	0.050	0.036
	Exit	0.011	0.009	0.013	0.008	0.008
R^2-adj. Lab. Share	Within	0.059	0.082	0.057	0.042	0.024
	Between	0.014	0.009	0.023	0.075	0.037
	Enter	0.024	0.068	0.055	0.056	0.037
	Exit	0.006	0.010	0.015	0.013	0.012
	Obs.	3, 220	2, 576	1, 932	1, 288	644
	p-value	0.000	0.004	0.432	0.409	0.392

Author's own calculations based on Orbis and Lobbying Data.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated share of meetings. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of meetings includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

H Normalised Lobbying, Productivity, and Labour Share Specifications based Concentration growth

Table H.5: Normalised Productivity, Labour Share, and Lobbying Costs for Country-Industries with Increasing Output Concentration

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	-0.035^{***}	-0.029	-0.007	0.003	0.035	0.040	-0.034	-0.009	0.003	-0.185
		(0.013)	(0.020)	(0.036)	(0.033)	(0.037)	(0.049)	(0.069)	(0.060)	(0.076)	(0.146)
	Between	-0.029^{*}	-0.113^{***}	-0.136^{***}	-0.111^{***}	-0.132^{***}	-0.176^{***}	-0.290^{***}	-0.309^{***}	-0.274^{***}	-0.332^{**}
		(0.016)	(0.024)	(0.028)	(0.030)	(0.044)	(0.056)	(0.065)	(0.068)	(0.083)	(0.138)
	Enter	0.032^{*}	0.015	0.037	0.080^{*}	0.085	0.111	0.118^{*}	0.102^{*}	0.075	0.102
		(0.018)	(0.032)	(0.045)	(0.048)	(0.057)	(0.070)	(0.067)	(0.060)	(0.063)	(0.088)
	Exit	0.004	-0.032	-0.025	-0.037	-0.041	-0.078	-0.093^{*}	-0.090^{**}	-0.095^{*}	-0.155^{**}
		(0.027)	(0.027)	(0.030)	(0.040)	(0.045)	(0.055)	(0.051)	(0.042)	(0.050)	(0.077)
Lab. Share	Within	-0.036^{*}	-0.001	-0.003	0.024	0.064	0.042	0.030	0.065	0.081	0.126
		(0.019)	(0.023)	(0.045)	(0.053)	(0.052)	(0.063)	(0.063)	(0.058)	(0.087)	(0.125)
	Between	0.106^{***}	-0.020	-0.042^{***}	-0.025	-0.043	-0.086	-0.138^{**}	-0.166^{***}	-0.138	-0.154
		(0.023)	(0.016)	(0.016)	(0.027)	(0.042)	(0.056)	(0.068)	(0.062)	(0.096)	(0.104)
	Enter	0.042^{***}	0.016	0.029	0.059	0.058	0.095	0.104	0.108	0.121	0.119
		(0.015)	(0.030)	(0.041)	(0.050)	(0.056)	(0.077)	(0.075)	(0.071)	(0.083)	(0.101)
	Exit	-0.004	-0.031	-0.010	-0.007	0.004	-0.018	-0.027	-0.022	0.015	0.075
		(0.024)	(0.042)	(0.042)	(0.063)	(0.071)	(0.089)	(0.089)	(0.079)	(0.082)	(0.143)
R^2-adj. TFP	Within	0.029	0.025	0.008	0.006	0.008	0.004	0.010	0.003	0.001	0.044
	Between	0.077	0.030	0.059	0.051	0.057	0.096	0.130	0.159	0.158	0.231
	Enter	0.110	0.140	0.117	0.068	0.076	0.032	0.023	0.030	0.009	0.016
	Exit	0.025	0.089	0.113	0.073	0.053	0.050	0.051	0.048	0.051	0.054
R^2-adj. Lab. Share	Within	0.035	0.024	0.006	0.002	0.005	0.009	0.012	0.025	0.031	0.075
	Between	0.012	0.022	0.050	0.059	0.040	0.094	0.129	0.147	0.091	0.194
	Enter	0.117	0.136	0.109	0.056	0.063	0.021	0.012	0.023	0.016	0.014
	Exit	0.024	0.088	0.110	0.068	0.052	0.045	0.042	0.045	0.043	0.045
	Observations	3,154	2,805	2,518	2,208	1,887	1,563	1,263	948	616	306
	Between p-val	0.000	0.005	0.004	0.074	0.201	0.111	0.072	0.108	0.312	0.173

Author's own calculations based on Orbis and Lobbying Data.This table limits the specification of table G.3 in the main text to country-industries with increasing output concentration as measured by HHI.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated lobbying cost share. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated lobbying cost share includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table H.6: Normalised Productivity, Labour Share, and Lobbying Costs for Country-Industries with Decreasing Output Concentration

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	-0.011	0.005	0.003	0.009	0.010	0.001	0.063	0.020	-0.088	-0.126
		(0.015)	(0.027)	(0.045)	(0.040)	(0.049)	(0.049)	(0.050)	(0.065)	(0.073)	(0.082)
	Between	-0.058^{***}	-0.073^{***}	-0.081^{***}	-0.143^{***}	-0.185^{***}	-0.230^{***}	-0.212^{***}	-0.236^{***}	-0.328^{***}	-0.182^{***}
		(0.021)	(0.025)	(0.025)	(0.042)	(0.053)	(0.062)	(0.060)	(0.067)	(0.095)	(0.064)
	Enter	-0.036	-0.030	-0.043	-0.040	-0.024	-0.014	-0.036	-0.029	-0.017	0.002
		(0.025)	(0.043)	(0.065)	(0.082)	(0.092)	(0.091)	(0.105)	(0.123)	(0.101)	(0.097)
	Exit	-0.074^{**}	-0.070^{***}	-0.061^{***}	-0.041^{*}	-0.042	-0.018	0.002	0.009	0.007	0.005
		(0.034)	(0.021)	(0.019)	(0.022)	(0.033)	(0.035)	(0.042)	(0.051)	(0.051)	(0.044)
Lab. Share	Within	-0.020	-0.020	-0.007	0.023	0.060	0.066	0.100^{*}	0.123	0.163^{**}	0.106
		(0.017)	(0.025)	(0.027)	(0.036)	(0.037)	(0.042)	(0.054)	(0.078)	(0.078)	(0.083)
	Between	0.033	0.068^{*}	0.030	-0.024	-0.073^{**}	-0.129^{***}	-0.115^{**}	-0.087	-0.003	-0.010
		(0.025)	(0.039)	(0.037)	(0.034)	(0.031)	(0.046)	(0.055)	(0.057)	(0.055)	(0.067)
	Enter	-0.024	-0.009	0.005	0.029	0.047	-0.002	-0.042	-0.056	-0.040	-0.042
		(0.020)	(0.059)	(0.078)	(0.082)	(0.082)	(0.078)	(0.100)	(0.110)	(0.089)	(0.086)
	Exit	-0.069^{**}	-0.073^{**}	-0.058	-0.030	-0.027	-0.001	0.025	0.033	0.025	0.066
		(0.031)	(0.031)	(0.041)	(0.059)	(0.087)	(0.093)	(0.098)	(0.113)	(0.107)	(0.069)
R^2-adj. TFP	Within	0.071	0.070	0.033	0.019	0.013	0.010	0.009	0.008	0.019	0.024
	Between	0.041	0.050	0.022	0.023	0.042	0.101	0.099	0.104	0.177	0.185
	Enter	0.033	0.043	0.036	0.036	0.026	0.050	0.075	0.047	0.051	0.057
	Exit	0.038	0.035	0.052	0.059	0.054	0.043	0.043	0.040	0.026	0.017
R^2-adj. Lab. Share	Within	0.077	0.075	0.042	0.019	0.028	0.021	0.019	0.022	0.054	0.023
	Between	0.001	0.009	0.001	0.006	0.010	0.035	0.029	0.038	0.020	0.123
	Enter	0.015	0.027	0.031	0.033	0.027	0.037	0.052	0.032	0.039	0.043
	Exit	0.036	0.039	0.044	0.046	0.039	0.031	0.033	0.027	0.014	0.012
	Observations	3,286	2,991	2,634	2,300	1,977	1,657	1,313	984	672	338
	Between p-val	0.028	0.004	0.047	0.069	0.062	0.013	0.002	0.000	0.002	0.000

Author's own calculations based on Orbis and Lobbying Data.This table limits the specification of table G.3 to country-industries with decreasing output concentration as measured by HHI.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated lobbying cost share. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated lobbying cost share includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table H.7: Normalised Productivity, Labour Share, and Accredited Persons Share for Country-Industries with Increasing Output Concentration

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	−0.032	0.033*	0.024	0.029	0.070**	0.070*	0.005	0.034	0.041	−0.164
		(0.021)	(0.020)	(0.025)	(0.022)	(0.032)	(0.040)	(0.057)	(0.066)	(0.089)	(0.127)
	Between	−0.058**	−0.170***	−0.166***	−0.196***	−0.232***	−0.272***	−0.320***	−0.398***	−0.361***	−0.381***
		(0.025)	(0.029)	(0.026)	(0.030)	(0.038)	(0.048)	(0.050)	(0.066)	(0.077)	(0.119)
	Enter	0.009	0.004	−0.002	0.035	0.032	0.041	0.051	0.061	0.043	0.046
		(0.017)	(0.040)	(0.043)	(0.045)	(0.044)	(0.056)	(0.067)	(0.064)	(0.075)	(0.089)
	Exit	0.000	0.003	−0.003	−0.010	−0.024	−0.036	−0.053	−0.067*	−0.059*	−0.072**
		(0.036)	(0.038)	(0.043)	(0.053)	(0.050)	(0.054)	(0.047)	(0.040)	(0.034)	(0.030)
Lab. Share	Within	−0.049**	0.049**	0.047*	0.038	0.038	0.055	0.073*	0.131***	0.164**	0.199
		(0.023)	(0.023)	(0.029)	(0.027)	(0.030)	(0.036)	(0.042)	(0.050)	(0.068)	(0.122)
	Between	0.086***	−0.064***	−0.087***	−0.113***	−0.128***	−0.191***	−0.205***	−0.312***	−0.206**	−0.220**
		(0.025)	(0.018)	(0.020)	(0.023)	(0.031)	(0.039)	(0.045)	(0.061)	(0.088)	(0.104)
	Enter	0.027	0.018	0.006	0.046	0.042	0.074	0.086	0.103	0.114	0.115
		(0.018)	(0.039)	(0.043)	(0.048)	(0.047)	(0.062)	(0.061)	(0.065)	(0.075)	(0.085)
	Exit	0.001	0.028	0.018	0.030	0.014	0.015	0.004	−0.003	0.033	0.113
		(0.041)	(0.055)	(0.053)	(0.065)	(0.065)	(0.076)	(0.078)	(0.084)	(0.090)	(0.119)
R^2-adj. TFP	Within	0.028	0.023	0.008	0.007	0.013	0.007	0.008	0.003	0.003	0.037
	Between	0.079	0.043	0.066	0.075	0.095	0.136	0.141	0.188	0.205	0.269
	Enter	0.110	0.140	0.116	0.062	0.069	0.021	0.011	0.023	0.006	0.011
	Exit	0.025	0.088	0.112	0.071	0.052	0.045	0.045	0.042	0.042	0.031
R^2-adj. Lab. Share	Within	0.037	0.026	0.008	0.003	0.002	0.010	0.018	0.038	0.054	0.100
	Between	0.008	0.023	0.051	0.062	0.043	0.104	0.138	0.174	0.099	0.202
	Enter	0.116	0.136	0.108	0.057	0.064	0.022	0.013	0.025	0.016	0.019
	Exit	0.024	0.089	0.110	0.069	0.052	0.046	0.042	0.045	0.043	0.052
	Observations	3,154	2,805	2,518	2,208	1,887	1,563	1,263	948	616	306
	Between p-val	0.001	0.000	0.000	0.014	0.044	0.022	0.036	0.124	0.176	0.150

Author's own calculations based on Orbis and Lobbying Data.This table limits the specification of table 16 to country-industries with increasing output concentration as measured by HHI.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated share of EP accredited persons. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of EP accredited persons includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01$, $^{**}p < .05$, $^{*}p < .1$

Table H.8: Normalised Productivity, Labour Share, and Accredited Persons Share for Country-Industries with Decreasing Output Concentration

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	0.055**	0.088***	0.107**	0.156***	0.125*	0.114*	0.174***	0.119	−0.039	−0.116
		(0.022)	(0.028)	(0.047)	(0.053)	(0.068)	(0.062)	(0.065)	(0.098)	(0.096)	(0.108)
	Between	−0.045**	−0.060**	−0.109***	−0.198***	−0.266***	−0.316***	−0.303***	−0.265***	−0.284***	−0.158**
		(0.020)	(0.025)	(0.028)	(0.042)	(0.058)	(0.067)	(0.070)	(0.071)	(0.074)	(0.067)
	Enter	−0.036	−0.031	−0.045	−0.084*	−0.096	−0.103	−0.115	−0.111	−0.090	−0.056
		(0.024)	(0.028)	(0.033)	(0.044)	(0.067)	(0.083)	(0.072)	(0.103)	(0.068)	(0.097)
	Exit	−0.016	0.004	0.017	0.024	0.036	0.038	0.058	0.078	0.080	0.090
		(0.015)	(0.017)	(0.028)	(0.040)	(0.048)	(0.049)	(0.057)	(0.066)	(0.069)	(0.075)
Lab. Share	Within	0.082***	0.083***	0.103***	0.148***	0.155**	0.130*	0.197**	0.222**	0.222***	0.170*
		(0.020)	(0.021)	(0.036)	(0.053)	(0.072)	(0.079)	(0.079)	(0.102)	(0.072)	(0.100)
	Between	−0.039*	0.000	−0.001	−0.023	−0.070	−0.147**	−0.153*	−0.102	−0.049	−0.039
		(0.020)	(0.029)	(0.025)	(0.034)	(0.044)	(0.069)	(0.079)	(0.075)	(0.071)	(0.075)
	Enter	−0.035	−0.064**	−0.059*	−0.072*	−0.059	−0.078	−0.084	−0.067	−0.053	−0.039
		(0.024)	(0.029)	(0.035)	(0.043)	(0.064)	(0.076)	(0.080)	(0.116)	(0.081)	(0.089)
	Exit	0.006	0.006	0.027	0.034	0.065	0.067	0.079	0.091	0.099	0.132
		(0.014)	(0.017)	(0.041)	(0.061)	(0.081)	(0.087)	(0.088)	(0.112)	(0.121)	(0.099)
R^2-adj. TFP	Within	0.071	0.074	0.039	0.030	0.018	0.015	0.021	0.011	0.011	0.018
	Between	0.040	0.046	0.026	0.038	0.068	0.133	0.138	0.114	0.137	0.156
	Enter	0.032	0.043	0.034	0.037	0.030	0.056	0.083	0.055	0.056	0.059
	Exit	0.036	0.033	0.050	0.057	0.053	0.043	0.044	0.042	0.028	0.021
R^2-adj. Lab. Share	Within	0.082	0.077	0.048	0.030	0.037	0.025	0.031	0.042	0.069	0.036
	Between	0.001	0.004	0.000	0.006	0.009	0.034	0.029	0.038	0.015	0.113
	Enter	0.015	0.030	0.032	0.033	0.025	0.039	0.053	0.030	0.038	0.040
	Exit	0.032	0.035	0.042	0.047	0.043	0.035	0.038	0.032	0.020	0.019
	Observations	3,286	2,991	2,634	2,300	1,977	1,657	1,313	984	672	338
	Between p-val	0.881	0.140	0.012	0.002	0.000	0.000	0.001	0.001	0.002	0.009

Author's own calculations based on Orbis and Lobbying Data.This table limits the specification of table 16 to country-industries with decreasing output concentration as measured by HHI.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated share of EP accredited persons. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of EP accredited persons includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table H.9: Normalised Productivity, Labour Share, and Meetings for Country-Industries with Increasing Output Concentration

		1 Year	2 Years	3 Years	4 Years	5 Years
TFP	Within	-0.051^{***}	-0.040^{***}	0.055^{**}	0.023	-0.015
		(0.014)	(0.015)	(0.027)	(0.044)	(0.054)
	Between	-0.060^{***}	-0.099^{***}	-0.244^{***}	-0.333^{***}	-0.274^{***}
		(0.017)	(0.021)	(0.030)	(0.040)	(0.034)
	Enter	0.026^{***}	0.003	0.016	0.012	0.004
		(0.009)	(0.017)	(0.024)	(0.047)	(0.039)
	Exit	0.010	0.012	0.024	-0.002	-0.046
		(0.013)	(0.015)	(0.020)	(0.029)	(0.049)
Lab. Share	Within	-0.051^{***}	-0.007	0.164^{***}	0.211^{***}	0.084
		(0.011)	(0.019)	(0.021)	(0.046)	(0.070)
	Between	0.001	-0.050^{***}	-0.223^{***}	-0.255^{***}	-0.234^{***}
		(0.012)	(0.017)	(0.021)	(0.037)	(0.043)
	Enter	0.030^{***}	-0.013	0.026	0.061^{**}	0.059
		(0.012)	(0.017)	(0.020)	(0.028)	(0.044)
	Exit	0.031	0.037	0.048^{*}	0.032	0.030
		(0.020)	(0.025)	(0.029)	(0.054)	(0.074)
R^2-adj. TFP	Within	0.034	0.017	0.011	0.007	0.003
	Between	0.079	0.019	0.100	0.153	0.106
	Enter	0.032	0.032	0.035	0.013	0.015
	Exit	0.003	0.035	0.062	0.050	0.035
R^2-adj. Lab. Share	Within	0.046	0.019	0.053	0.056	0.013
	Between	0.001	0.068	0.113	0.091	0.071
	Enter	0.044	0.030	0.036	0.019	0.020
	Exit	0.004	0.037	0.064	0.054	0.062
	Observations	1,726	1,359	1,036	695	361
	Between p-val	0.007	0.025	0.325	0.078	0.311

Author's own calculations based on Orbis and Lobbying Data.his table limits the specification of table G.4 to country-industries with increasing output concentration as measured by HHI.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated share of meetings. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of meetings includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**} p < .05, ^{*} p < .1$

Table H.10: Normalised Productivity, Labour Share, and Meetings for Country-Industries with Decreasing Output Concentration

		1 Year	2 Years	3 Years	4 Years	5 Years
TFP	Within	-0.082^{***}	-0.030	-0.077	-0.120	-0.115
		(0.030)	(0.052)	(0.085)	(0.121)	(0.142)
	Between	-0.016	-0.073	-0.046	-0.207^{*}	-0.261
		(0.040)	(0.045)	(0.041)	(0.120)	(0.175)
	Enter	-0.088^{**}	-0.102^{**}	-0.164^{***}	-0.129	-0.102
		(0.035)	(0.049)	(0.058)	(0.133)	(0.154)
	Exit	0.015	0.027	0.029	0.007	0.079
		(0.024)	(0.026)	(0.042)	(0.067)	(0.109)
Lab. Share	Within	-0.063^{**}	-0.059	-0.077	0.025	0.069
		(0.026)	(0.046)	(0.077)	(0.127)	(0.150)
	Between	0.153^{***}	0.129^{**}	0.019	-0.350^{***}	-0.086
		(0.041)	(0.057)	(0.054)	(0.088)	(0.121)
	Enter	-0.094^{***}	-0.122^{***}	-0.062	0.054	0.032
		(0.031)	(0.041)	(0.070)	(0.130)	(0.158)
	Exit	0.073^{***}	0.057^{***}	0.104^{***}	0.110	0.002
		(0.008)	(0.019)	(0.028)	(0.069)	(0.114)
R^2-adj. TFP	Within	0.082	0.167	0.099	0.095	0.090
	Between	0.030	0.008	0.007	0.012	0.057
	Enter	0.031	0.071	0.072	0.079	0.046
	Exit	0.035	0.001	0.002	0.000	0.020
R^2-adj. Lab. Share	Within	0.114	0.209	0.122	0.082	0.122
	Between	0.019	0.030	0.011	0.067	0.034
	Enter	0.026	0.083	0.061	0.060	0.032
	Exit	0.014	0.015	0.009	0.013	0.020
	Observations	1,494	1,217	896	593	283
	Between p-val	0.003	0.000	0.338	0.143	0.474

Author's own calculations based on Orbis and Lobbying Data.This table limits the specification of table G.4 to country-industries with decreasing output concentration as measured by HHI.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated share of meetings. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of meetings includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

I Productivity and Markups

Table I.11: Normalised Productivity, Markup, and Lobbying Expenditure

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	−0.022	−0.004	0.008	0.011	0.020	0.020	0.015	−0.006	−0.046	−0.156*
		(0.014)	(0.018)	(0.024)	(0.032)	(0.040)	(0.049)	(0.056)	(0.054)	(0.057)	(0.095)
	Between	−0.037***	−0.100***	−0.109***	−0.120***	−0.147***	−0.178***	−0.212***	−0.229***	−0.264***	−0.171*
		(0.010)	(0.019)	(0.023)	(0.028)	(0.040)	(0.055)	(0.061)	(0.066)	(0.076)	(0.098)
	Enter	0.004	−0.003	0.006	0.021	0.031	0.039	0.037	0.039	0.044	0.056
		(0.022)	(0.025)	(0.035)	(0.042)	(0.049)	(0.054)	(0.055)	(0.056)	(0.058)	(0.060)
	Exit	−0.023	−0.038	−0.039*	−0.042*	−0.048	−0.052	−0.055	−0.057	−0.067	−0.104
		(0.023)	(0.025)	(0.023)	(0.025)	(0.030)	(0.035)	(0.038)	(0.038)	(0.046)	(0.078)
μ	Within	0.022	−0.002	−0.018	−0.041	−0.071	−0.067	−0.077	−0.096	−0.128	−0.095
		(0.017)	(0.024)	(0.038)	(0.050)	(0.062)	(0.073)	(0.087)	(0.101)	(0.114)	(0.139)
	Between	−0.054***	−0.001	−0.006	0.004	0.003	0.029	0.044	0.049	0.021	0.009
		(0.019)	(0.019)	(0.027)	(0.036)	(0.049)	(0.062)	(0.067)	(0.064)	(0.056)	(0.078)
	Enter	−0.025*	−0.009	−0.021	−0.036	−0.039	−0.038	−0.027	−0.024	−0.054	−0.045
		(0.014)	(0.023)	(0.031)	(0.037)	(0.043)	(0.047)	(0.050)	(0.050)	(0.048)	(0.047)
	Exit	0.023	0.032	0.016	−0.002	−0.010	−0.018	−0.029	−0.035	−0.058	−0.129
		(0.035)	(0.048)	(0.062)	(0.089)	(0.116)	(0.125)	(0.124)	(0.121)	(0.115)	(0.104)
R^2-adj. TFP	Within	0.046	0.043	0.017	0.008	0.003	0.003	0.002	0.001	0.005	0.031
	Between	0.087	0.052	0.049	0.045	0.061	0.102	0.116	0.153	0.191	0.252
	Enter	0.047	0.074	0.063	0.042	0.033	0.031	0.032	0.025	0.018	0.017
	Exit	0.006	0.014	0.017	0.010	0.007	0.006	0.005	0.005	0.006	0.013
R^2-adj. Lab. Share	Within	0.044	0.044	0.020	0.013	0.019	0.027	0.025	0.020	0.034	0.042
	Between	0.007	0.004	0.008	0.024	0.030	0.056	0.053	0.080	0.102	0.182
	Enter	0.042	0.066	0.055	0.035	0.025	0.021	0.020	0.015	0.008	0.006
	Exit	0.004	0.012	0.013	0.006	0.005	0.005	0.006	0.006	0.008	0.021
	Observations	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	Between p-val	0.000	0.000	0.001	0.006	0.013	0.005	0.002	0.001	0.004	0.022

Author's own calculations based on Orbis and Lobbying Data.This table is uses the same approach as the results reported in G.3 but substitutes labour share with markups.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of markup and tlgnotes on normalised lobbying intensity as measured by the accumulated lobbying cost share. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated lobbying cost share includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of markup, whereas the markup regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table I.12: Normalised Productivity, Markup, and Meetings

		1 Year	2 Years	3 Years	4 Years	5 Years
TFP	Within	−0.040*	0.009	0.046	0.006	−0.050
		(0.022)	(0.022)	(0.031)	(0.049)	(0.045)
	Between	−0.050**	−0.084***	−0.155***	−0.242***	−0.224***
		(0.019)	(0.023)	(0.024)	(0.020)	(0.032)
	Enter	−0.007	−0.028	−0.023	−0.019	−0.022
		(0.017)	(0.017)	(0.027)	(0.043)	(0.037)
	Exit	0.010	0.020	0.018	0.002	−0.043
		(0.026)	(0.029)	(0.034)	(0.033)	(0.035)
μ	Within	0.022	−0.031	−0.109***	−0.159***	−0.074*
		(0.032)	(0.022)	(0.021)	(0.022)	(0.040)
	Between	−0.093***	0.000	0.079***	0.172***	0.123***
		(0.017)	(0.021)	(0.023)	(0.020)	(0.024)
	Enter	0.003	0.042*	−0.022	−0.073**	−0.047
		(0.016)	(0.023)	(0.025)	(0.032)	(0.037)
	Exit	−0.056***	−0.063***	−0.079***	−0.103***	−0.138***
		(0.021)	(0.021)	(0.022)	(0.024)	(0.027)
R^2-adj. TFP	Within	0.062	0.062	0.031	0.019	0.016
	Between	0.078	0.028	0.070	0.080	0.091
	Enter	0.038	0.079	0.061	0.052	0.037
	Exit	0.008	0.004	0.003	0.002	0.007
R^2-adj. Lab. Share	Within	0.061	0.064	0.039	0.049	0.019
	Between	0.026	0.009	0.004	0.039	0.022
	Enter	0.037	0.085	0.061	0.064	0.043
	Exit	0.005	0.007	0.008	0.011	0.022
	Observations	3,220	2,576	1,932	1,288	644
	Between p-val	0.000	0.002	0.016	0.027	0.017

Author's own calculations based on Orbis and Lobbying Data.This table is uses the same approach as the results reported in G.4 but substitutes labour share with markups.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of markup and TFP based on the Translog production function on normalised lobbying intensity as measured by the accumulated share of meetings. The entry in each cell reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of meetings includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of markup, whereas the markup regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

J Translog Productivity with Industry Share control

Table J.13: Normalised Productivity, Labour Share, and Lobbying Costs with Industry Output Share

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	−0.030**	−0.013	−0.002	0.013	0.035	0.032	0.022	0.003	−0.044	−0.143
		(0.013)	(0.016)	(0.019)	(0.024)	(0.033)	(0.040)	(0.045)	(0.049)	(0.058)	(0.100)
	Between	−0.029***	−0.093***	−0.099***	−0.108***	−0.128***	−0.182***	−0.205***	−0.214***	−0.178***	−0.175**
		(0.008)	(0.017)	(0.018)	(0.021)	(0.031)	(0.050)	(0.053)	(0.058)	(0.060)	(0.077)
	Enter	−0.003	−0.010	−0.002	0.019	0.031	0.039	0.034	0.033	0.037	0.042
		(0.019)	(0.030)	(0.045)	(0.053)	(0.066)	(0.073)	(0.078)	(0.080)	(0.078)	(0.081)
	Exit	−0.032	−0.054**	−0.051*	−0.045	−0.045	−0.046	−0.044	−0.044	−0.050	−0.076*
		(0.024)	(0.026)	(0.029)	(0.034)	(0.042)	(0.046)	(0.045)	(0.045)	(0.042)	(0.045)
Lab. Share	Within	−0.037**	−0.027	−0.029	0.005	0.061	0.031	0.026	0.053	0.068	0.038
		(0.018)	(0.021)	(0.028)	(0.033)	(0.039)	(0.044)	(0.050)	(0.065)	(0.078)	(0.103)
	Between	0.078***	0.015	−0.015	−0.058***	−0.110***	−0.150***	−0.159***	−0.164***	−0.108**	−0.126*
		(0.026)	(0.022)	(0.017)	(0.018)	(0.029)	(0.044)	(0.047)	(0.046)	(0.043)	(0.069)
	Enter	0.009	−0.015	−0.001	0.021	0.026	0.021	0.008	0.006	0.032	0.018
		(0.018)	(0.038)	(0.052)	(0.059)	(0.071)	(0.076)	(0.085)	(0.086)	(0.083)	(0.081)
	Exit	−0.044*	−0.063*	−0.049	−0.032	−0.025	−0.022	−0.013	−0.008	0.003	0.040
		(0.026)	(0.034)	(0.044)	(0.061)	(0.082)	(0.094)	(0.097)	(0.097)	(0.094)	(0.091)
R^2-adj. TFP	Within	0.047	0.047	0.019	0.008	0.005	0.006	0.006	0.004	0.006	0.031
	Between	0.088	0.050	0.050	0.047	0.067	0.114	0.134	0.174	0.245	0.264
	Enter	0.046	0.066	0.055	0.041	0.036	0.037	0.039	0.035	0.028	0.033
	Exit	0.028	0.058	0.079	0.065	0.054	0.046	0.044	0.039	0.032	0.023
R^2-adj. Lab. Share	Within	0.054	0.055	0.026	0.009	0.012	0.027	0.031	0.029	0.042	0.060
	Between	0.008	0.005	0.017	0.038	0.038	0.056	0.066	0.096	0.107	0.189
	Enter	0.039	0.057	0.048	0.035	0.029	0.027	0.027	0.021	0.018	0.017
	Exit	0.028	0.058	0.074	0.056	0.044	0.035	0.036	0.032	0.024	0.025
	Observations	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	Between p-val	0.001	0.002	0.009	0.119	0.624	0.350	0.207	0.247	0.309	0.375

Author's own calculations based on Orbis and Lobbying Data.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog approach on normalised lobbying intensity as measured by the accumulated lobbying cost share. The entry in each reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated lobbying cost share includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
Results reported here also control for the country-industry's share in total output, this measure is also normalised. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

Table J.14: Normalised Productivity, Labour Share, and Accredited Persons share with Industry Output Share

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
TFP	Within	−0.001	0.064***	0.068***	0.095***	0.099***	0.103***	0.087**	0.074	0.010	−0.120
		(0.016)	(0.021)	(0.023)	(0.026)	(0.032)	(0.033)	(0.040)	(0.053)	(0.061)	(0.085)
	Between	−0.043***	−0.115***	−0.127***	−0.178***	−0.223***	−0.266***	−0.277***	−0.286***	−0.243***	−0.227***
		(0.011)	(0.017)	(0.018)	(0.026)	(0.034)	(0.047)	(0.048)	(0.056)	(0.058)	(0.076)
	Enter	−0.018	−0.026	−0.033	−0.036	−0.041	−0.040	−0.042	−0.035	−0.018	−0.009
		(0.019)	(0.024)	(0.029)	(0.035)	(0.041)	(0.046)	(0.052)	(0.060)	(0.062)	(0.069)
	Exit	−0.008	0.004	0.005	0.009	0.007	0.005	0.006	0.008	0.011	0.007
		(0.026)	(0.023)	(0.028)	(0.032)	(0.033)	(0.035)	(0.036)	(0.038)	(0.037)	(0.042)
Lab. Share	Within	0.004	0.059***	0.064***	0.085***	0.095**	0.073	0.103**	0.148**	0.168***	0.143*
		(0.013)	(0.017)	(0.023)	(0.032)	(0.041)	(0.047)	(0.051)	(0.060)	(0.064)	(0.078)
	Between	0.033**	−0.043**	−0.053***	−0.087***	−0.121***	−0.179***	−0.196***	−0.223***	−0.141***	−0.157**
		(0.013)	(0.018)	(0.018)	(0.023)	(0.033)	(0.047)	(0.053)	(0.060)	(0.053)	(0.073)
	Enter	−0.001	−0.035	−0.042	−0.036	−0.034	−0.023	−0.013	0.005	0.027	0.037
		(0.019)	(0.027)	(0.036)	(0.043)	(0.050)	(0.056)	(0.065)	(0.072)	(0.073)	(0.071)
	Exit	−0.002	0.016	0.019	0.030	0.033	0.037	0.038	0.044	0.064	0.112
		(0.023)	(0.028)	(0.035)	(0.043)	(0.051)	(0.057)	(0.062)	(0.068)	(0.068)	(0.071)
R^2-adj. TFP	Within	0.047	0.049	0.021	0.013	0.011	0.013	0.009	0.005	0.004	0.027
	Between	0.089	0.052	0.055	0.064	0.096	0.148	0.166	0.201	0.269	0.281
	Enter	0.046	0.066	0.055	0.042	0.037	0.037	0.040	0.035	0.029	0.033
	Exit	0.028	0.057	0.078	0.064	0.053	0.044	0.042	0.037	0.029	0.017
R^2-adj. Lab. Share	Within	0.053	0.056	0.027	0.013	0.014	0.029	0.037	0.043	0.062	0.075
	Between	0.003	0.004	0.017	0.040	0.037	0.056	0.068	0.103	0.111	0.191
	Enter	0.039	0.058	0.050	0.036	0.029	0.027	0.027	0.021	0.019	0.019
	Exit	0.027	0.056	0.073	0.057	0.045	0.037	0.037	0.034	0.027	0.033
	Observations	6,440	5,796	5,152	4,508	3,864	3,220	2,576	1,932	1,288	644
	Between p-val	0.000	0.000	0.001	0.003	0.006	0.005	0.010	0.066	0.094	0.215

Author's own calculations based on Orbis Data.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog approach on normalised lobbying intensity as measured by the accumulated share of EP accredited persons. The entry in each reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated share of EP accredited persons includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
Results reported here also control for the country-industry's share in total output, this measure is also normalised. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

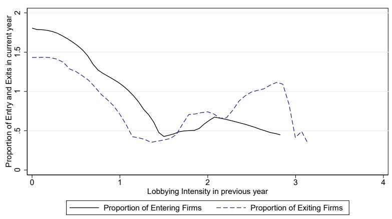
Table J.15: Normalised Productivity, Labour Share, and Meetings with Industry Output Share

		1 Year	2 Years	3 Years	4 Years	5 Years
TFP	Within	-0.079^{***}	-0.029	0.032	0.007	-0.075
		(0.014)	(0.022)	(0.029)	(0.041)	(0.047)
	Between	-0.007	-0.010	-0.075^{***}	-0.163^{***}	-0.118^{***}
		(0.012)	(0.019)	(0.028)	(0.030)	(0.032)
	Enter	0.005	-0.008	-0.026	-0.034	-0.034
		(0.020)	(0.034)	(0.031)	(0.037)	(0.044)
	Exit	0.010	0.024	0.029	0.017	-0.012
		(0.014)	(0.018)	(0.023)	(0.026)	(0.029)
Lab. Share	Within	-0.072^{***}	-0.046^{*}	0.072^{**}	0.113^{***}	0.020
		(0.014)	(0.025)	(0.028)	(0.034)	(0.048)
	Between	0.056^{***}	-0.004	-0.149^{***}	-0.240^{***}	-0.194^{***}
		(0.016)	(0.022)	(0.016)	(0.021)	(0.021)
	Enter	-0.011	-0.107^{***}	-0.058^{**}	-0.052	-0.081^{*}
		(0.018)	(0.033)	(0.030)	(0.040)	(0.048)
	Exit	0.034^{*}	0.039^{*}	0.053^{**}	0.058^{*}	0.050^{*}
		(0.018)	(0.022)	(0.025)	(0.032)	(0.030)
R^2-adj. TFP	Within	0.053	0.066	0.039	0.023	0.021
	Between	0.087	0.049	0.100	0.114	0.155
	Enter	0.029	0.075	0.063	0.058	0.042
	Exit	0.011	0.009	0.013	0.009	0.008
R^2-adj. Lab. Share	Within	0.061	0.086	0.061	0.045	0.025
	Between	0.015	0.009	0.024	0.077	0.038
	Enter	0.025	0.098	0.090	0.119	0.103
	Exit	0.006	0.011	0.017	0.015	0.019
	Observations	3,220	2,576	1,932	1,288	644
	Between p-val	0.001	0.771	0.017	0.033	0.043

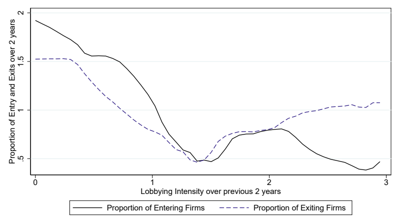
Author's own calculations based on Orbis Data.
This table shows the coefficients on results of a seemingly unrelated regression with each of the normalised components of Labour Share and TFP based on the Translog approach on normalised lobbying intensity as measured by the accumulated lobbying meeting share. The entry in each reports the coefficient on the normalised lobbying intensity measure in that specific regression only. Lobbying intensity measured by the accumulated lobbying meeting share includes In-house and professional lobbying firms only. The sample includes only 3-digit manufacturing industries from Belgium, Bulgaria, Czechia, Estonia, Germany, Finland, France, Hungary, Italy, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and the United Kingdom.
All regressions include controls for the growth in output concentration measured by HHI. The TFP specifications include a control for the change in the same component of Labour Share, whereas the Labour Share regressions include a control for the same component of TFP. The normalisation procedure controls for country, industry, and year effects and the constant in all regressions is indistinguishable from machine zero.
Results reported here also control for the country-industry's share in total output, this measure is also normalised. The sample is limited to country-industries a mean of at least 20 firms over the period in question. Country-industries must have all TFP values available to be included in the sample. Outlying country-industries are dropped from the sample. All regressions are weighted by the country-industry's value added in 2013. Standard errors are in parentheses and clustered by country in the second stage using Kolev (2021).
$^{***}p < .01, ^{**}p < .05, ^{*}p < .1$

K Entry, Exit, and Lobbying

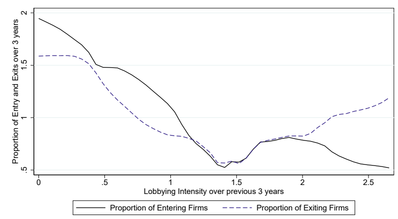
Figure 1: EP Accredited Person share, entry, and exit over time



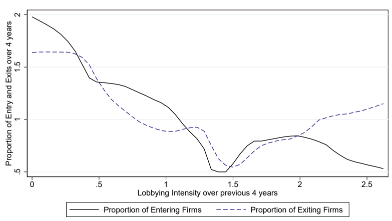
(a) 1 Year



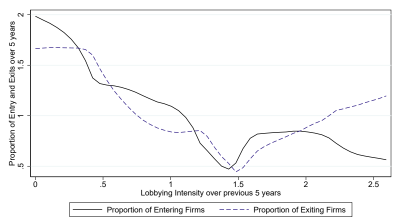
(b) 2 Years



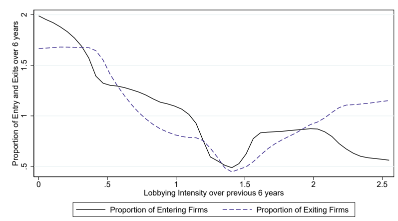
(c) 3 Years



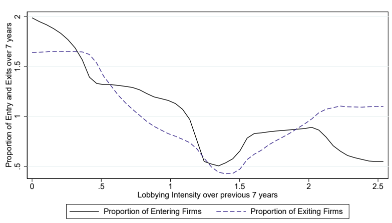
(d) 4 Years



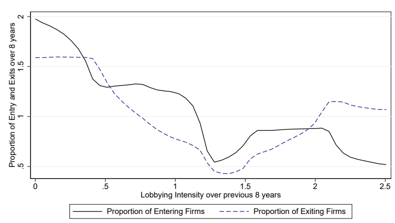
(e) 5 Years



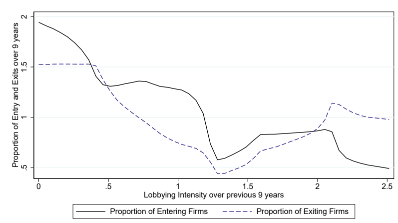
(f) 6 Years



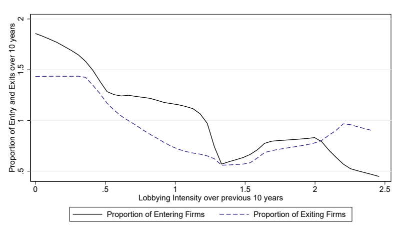
(g) 7 Years



(h) 8 Years



(i) 9 Years



(j) 10 Years

Author's own table using Orbis data.
This figure shows the relationship between the relative intensity of lobbying over the previous years reported in the figure title on the proportion of entrants and exits of firms in country 3 digit industry of the given year. Each 3 digit country industry are weighted by their contributions to total value added in 2013.

L Some new facts about lobbying in the EU

Despite the literature on lobbying in the EU, very little is known about the specific distribution of lobbying interests, with the majority of the literature classifying interests in terms of the directorate-general with which a meeting was held (OECD 2021, Wiedemann 2022). OECD (2021) documents that the digital economy portfolio was the most targeted for meetings followed by the Euro and financial markets portfolios. These figures are supported by the meeting data in the present paper, although this variation is not exploited at present.

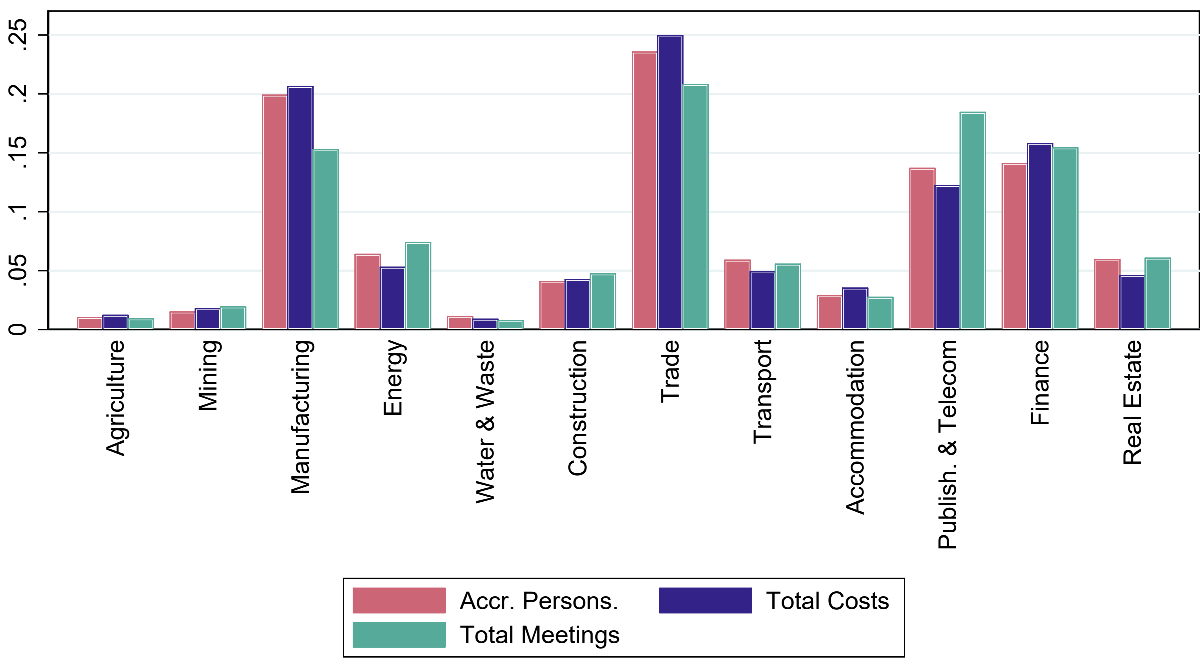
This paper, contributes to the literature by providing more detail on where lobbying is occurring and how much interests it represents. In terms of lobbying representation by identified interests in EU countries figure 2 shows that the Wholesale, Trade, and Retail sector as a whole dominates followed by Manufacturing, Finance, Publishing and Telecommunication, and Energy. While Energy as an entire sector accounts for only around 5%-7% of all lobbying interest, the Electric Power Generation, Transmission and Distribution sector is the single biggest 3-digit lobbying sector accounting for almost all of the macro sector's lobbying activity. In so far as it relates to the relative size of the Trade sector it should be noted that many of the manufacturing sectors are linked to firms in the trade sectors via upstream or downstream markets. As an example, BP reports around 2,624,500 Euro in lobbying expenses for the financial year ending in December 2015. The Orbis database links BP to both Coke & Refined Petroleum products, the Extraction of Crude Petroleum, and the Extraction of Natural Gas, while the company's corporate ownership structure also includes several entities in the Wholesale of Solid, Liquid and Gaseous Fuels and Related Products NACE classifications. In our data, the lobbying expenditures of BP are therefore split between all the areas of interest weighted by the operating revenue of that interest. It should therefore not be surprising that the third largest 3-digit sector as measured by lobbying costs or accredited persons is Specialised Wholesale and Retail, which includes firms in the Sale of Petroleum and Chemicals industry amongst others. When measured in terms of meetings, the dominance of 3-digit industries within the trade sector cedes ground to firms with interests in Telecommunication services, activities auxiliary Financial Services, Other Financial Services, and Information Service Activities (like Google).

In figure 3 the lobbying shares within the manufacturing sector are shown to follow roughly the same trend as those found for the US, with Chemical and Pharmaceutical Sectors dominating the sample, followed by firms with interests in Computer Products and Electrical equipment. The high proportion of lobbying expenditure in Chemicals compared to Pharmaceuticals should not be surprising as the European Chemical Industry Council is consistently one of the biggest lobbying expenditure groups in Europe (Lundy 2017).[84] The split in these sectors is again due to many manufacturing firms with interests classified in chemicals also having interests in pharmaceuticals.[85] Firms with interests in Other Transport Equipment are mainly aircraft manufacturers with Airbus and AERNNOVA accounting for about 23% of total costs in the period while several entities relate to either logistics software or to space technologies. The relatively low figure for Coke and Refined Petroleum is somewhat surprising, but can be understood in the context of the interests of these entities being in mining and trade as well.

[84] The European Chemical Industry Council is one of the firms that required additional matching via its corporate partners listed at `https://cefic.org/app/uploads/2022/05/ACOM-Public-Website-May-2022.pdf` and it's business partners listed at, `https://cefic.org/library-item/cefic-corporate-members-acom/`, as it's lobbying reports at both lobbyfacts, `https://www.lobbyfacts.eu/datacard/european-chemical-industry-council?rid=64879142323-90` and the official register `https://ec.europa.eu/transparencyregister/public/consultation/displaylobbyist.do?id=64879142323-90`, does not provide a full list of clients and instead links to a general page `https://cefic.org/about-us/membership/` that include members in format that is not directly machine readable.

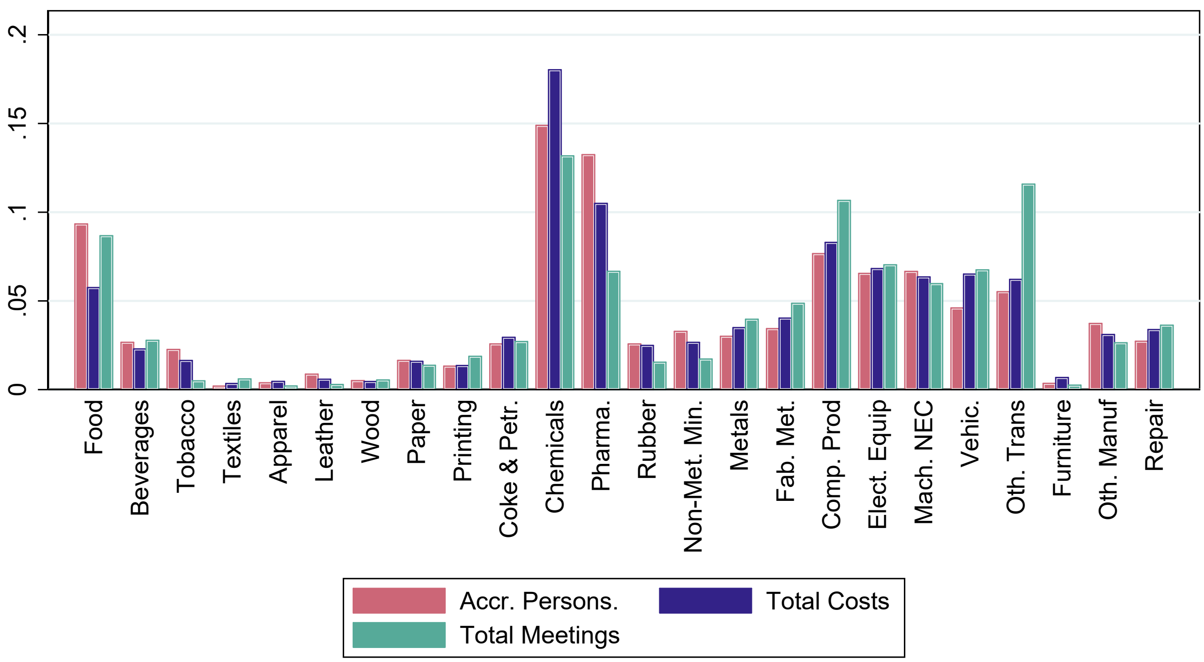
[85] A key example of the is BAYER AG which would have 40% of its reported interests in Chemicals, 17% in Pharmaceuticals, 15% in Trade, and about 7% in the manufacture of other food products due to their interests in animal feeds through their holdings of KVP PHARMA+VETERINAER PRODUKTE GMBH. The remainder is split through several other industries include some with invalid NACE codes.

Figure 2: Lobbying Shares by Macro Sector by In-House and Professional Lobbying Groups in the EU



Author's own calculations based on Orbis and EU National Accounts Data.
This figure shows the Lobbying share of the measure of interest of 1-Digit NACE sectors. Accr. Persons refers to the number of Accredited Persons, Total Costs refer to the total costs reported for lobbying, and total meetings refer to the total number of meetings attended. All figures are aggregated over the entire period.

Figure 3: Lobbying Shares within Manufacturing by In-House and Professional Lobbying Groups in the EU



Author's own calculations based on Orbis and EU National Accounts Data.
This figure shows the Lobbying share of the measure of interest of 2-Digit NACE sectors within manufacturing.
Accr. Persons refers to the number of Accredited Persons, Total Costs refer to the total costs reported for lobbying, and total meetings refer to the total number of meetings attended. All figures are aggregated over the entire period.