Foreignness as an Asset: European Carbon Regulation and the Relocation Threat among Multinational Firms*

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Abstract

A central claim in the environmental regulation literature is that, in a globalized world economy, governments are willing to offer favorable regulation to firms that threaten to move their operations abroad. This logic however overlooks that firms' relocation threats are not equally credible. Focusing on variation in ownership structure, I argue that, even among generally mobile multinational corporations (MNCs), their foreign operations are more credibly movable, and hence more favorably regulated, than their operations at home. MNCs' country-specific investments into the economy and politics of their home markets drive this difference in relative mobility. An empirical analysis that relies on within-firm variation in ownership of MNCs' production sites across European countries and original plant-level carbon regulation data strongly support my argument: foreign ownership becomes an asset for favorable regulation. These findings highlight the need to account for mobility differences among multinational firms.

Keywords: environmental regulation; relocation; carbon markets; plant-level data; statistical analysis.

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Introduction

In October 2005, Johannes Teyssen, chief executive of E.ON, a German power company, openly worried about the effects of newly introduced European carbon regulation: "I am personally scared for a lot of power intensive industries in Europe. And it will not help the world climate if we help the Kyoto Protocol by killing industries here and rebuilding them somewhere else where there is even less environmental concern than at home."[1] Earlier in the year, the European Union (EU) launched the EU Emissions Trading System (EU ETS) as their flagship policy to reduce emissions from carbon-intensive sectors and meet commitments under the Kyoto Protocol (Directive 2003/87/EC). While European climate leadership was praised by environmentalists, the unilateral move by the EU stirred up concerns among industrial leaders.

Setting up the world's largest carbon market revived long-standing debates about the relationship between economic competition and environmental regulation. Some say that economic competition fast-tracks the diffusion of higher regulatory standards (Vogel, 1995; Prakash and Potoski, 2006; Distelhorst and Locke, 2018; Malesky and Mosley, 2018). Others contend that in a globalized world economy governments have incentives to cut back regulation in order to prevent losing mobile capital (Lowry, 1992; Engel, 1997; Potoski, 2001; Levinson, 2003; Woods, 2006). Whichever claim is "right" is hard to say as the empirical evidence is mixed (Konisky, 2007; Cao and Prakash, 2010; Heichel, Pape, and Sommerer, 2005).

The literature on environmental regulation in global markets makes one important assumption, and that is that firms threaten to relocate their operations in response to new or more stringent regulation. While firms clearly have incentives to make such threats, governments will understand that not all threats are equally credible. This key assumption hence downplays differences across firms and does not sit comfortably with recent research that emphasizes firm heterogeneity for international political economy outcomes (Baccini, Pinto, and Weymouth, 2017; Kim, 2017;

[1] "Manufacturers face huge losses due to ETS?" *Platts EU Energy*, 4 November 2005. Accessed through *LexisNexis*.

Osgood, 2017; Osgood et al., 2017). In this paper, I introduce differences in ownership structure within firms as a source of variation that shapes the mobility of firms' home and foreign operations differently. For multinational firms, operating across multiple countries, these mobility differences then translate into differences in regulatory outcomes.

Specifically, I argue that a multinational firm's plants that are located abroad, and hence foreign-owned in the eyes of the host government, are more mobile than domestically-owned plants that are based in an MNC's home country. This difference in mobility between foreign and home operations (within the same company, but across jurisdictions) arises from irreversible investments in the economy and politics that MNCs make to a greater extent in their home countries than abroad. Since these investments are typically lost in the case of relocation as they are highly *country specific* and *relational*, domestic operations are less movable than foreign operations. This wedge in relative relocation costs across operation types makes relocation threats from foreign-owned plants more credible. In common with the classic argument about obsolescing bargaining power in MNC-host country relations (Vernon, 1971; Kobrin, 1987) as well as newer work on the limits to MNC power in the international political economy (Wellhausen, 2015; Moehlecke, 2020), my argument also formulates conditions—related to ownership type—under which MNCs can wield influence and when they cannot: while MNCs can credibly threaten to move their foreign operations, their threats are much less credible at home.

I test this argument that ownership structure matters for the stringency of environmental regulation with new plant-level data from European carbon regulation. Taking advantage of the granularity of these regulatory data, I find strong support that foreign-owned plants receive between 10.5%-13.6% more favorable regulation. These estimates are identified from variation in carbon regulation *within* multinational firms. They point to heavy redistribution of regulatory burden that amounts to an additional 40,000-50,000 tons of CO_2/year worth of pollution rights for foreign-owned plants. A matching strategy and the use of address information of production facilities and plant owners help rule out that systematic differences in economic activities between foreign-

owned and domestically-owned operations or functional differentiation between headquarters and industrial sites are driving the results. Consistent with my argument, additional tests demonstrate that point estimates attenuate for subsamples of plants in mobility-constrained sectors, such as electricity production and those industries that are deemed as rather immobile by the European Commission. The empirical evidence offers robust support for my central claim that variation in ownership structure shapes the mobility of MNC operations, which translates into observable differences in regulatory outcomes.

This paper contributes to existing research in two ways. First, it speaks to work that seeks to understand the regulatory political economy of global climate politics (Kennard, 2020; Genovese, 2021). Here, I add surprising evidence that foreignness can be an asset rather than a liability (Kindleberger, 1969; Zaheer, 1995). Typically, foreign firms are thought to be worse off than domestic competitors for lack of access to domestic policymakers, restricted access to protected industries, or institutional constraints on lobbying and procurement (Hansen and Mitchell, 2000; Malesky, Gueorguiev, and Jensen, 2015; Rickard and Kono, 2013). However, when foreignness is tied to greater mobility, foreign ownership can be beneficial and lead to preferential regulation. This complements a recent argument that less replaceable foreign firms are more likely to receive favorable government treatment (Johns and Wellhausen, 2021).

Second, and engaging the growing firm-level literature in international political economy more broadly (Kim, 2017; Osgood, 2017; Osgood et al., 2017; Baccini, Pinto, and Weymouth, 2017; Jensen, Quinn, and Weymouth, 2015; Malesky, Gueorguiev, and Jensen, 2015; Malesky and Mosley, 2018; Distelhorst and Locke, 2018; Cory, Lerner, and Osgood, 2020), my findings suggest that differences in outcomes which we observe across firms, for example, between MNCs and domestic producers, can mask heterogeneity among MNCs. While others have used the geographic location of industrial plants (Monogan, Konisky, and Woods, 2017) and plant-level inspection data (Gordon and Hafer, 2005) to probe regulatory arguments in national contexts, this paper draws on plant-level ownership as a source of variation within multinational firms to explain carbon regulation

across European countries. Studying variation "below" the firm-level may offer new insights into the microfoundations of firm preferences and firm behavior. In my case, the relative distribution of foreign-owned and domestically-owned plants determines a firm's overall mobility, and with it, how favorably it will be regulated as a whole. These differences in regulatory treatment have implications for bargaining power in government-firm relations, the design of regulatory policy, and intra-industry collective action more broadly, which I will return to in the conclusion.

Economic Competition and Environmental Regulation

The literature on economic competition and environmental regulation has been studying questions of how internationally mobile firms respond to the introduction or tightening of regulatory policy. One strand, proposed by Vogel (1995, 1997) and known as the "California effect," argues that firms are willing to accept more stringent regulation if compliance with these standards is required to access profitable markets. While Bechtel and Tosun (2009) caution that commitment to higher standards may be on paper only, Prakash and Potoski (2006) show that trade competition can encourage firms to adopt voluntary environmental standards that even go beyond national regulatory requirements. More recently, firm-level evidence finds that this logic extends beyond environmental regulation to labor and social standards as well (Distelhorst and Locke, 2018; Malesky and Mosley, 2018). The other strand holds that, facing competition over mobile capital, governments are reluctant to impose strict regulation. Instead, they have incentives to lower regulatory stringency.

Lowering regulatory stringency does, however, not happen in a vacuum. The extent to which cutting back regulation is therefore a possibility or not varies by country and its institutions. On a very fundamental level, governments need to have enough political power to set regulatory policies as a strategic response to international economic competition over mobile capital (Konisky, 2007; Fredriksson and Millimet, 2002). Domestic veto players and issue visibility, for example, may

constrain a government's ability to adjust regulatory stringency (Cao and Prakash, 2012). Bernauer and Caduff (2004) emphasize public perceptions and concerns about corporate rent seeking as motivations to uphold regulation despite market pressures. Outside of the environmental realm, weak labor market institutions have been linked to lower welfare standards in developing countries (Rudra, 2002, 2008), and bilateral investment treaties have led governments to rescind human rights regulations in response to globalization forces (Bodea and Ye, 2020).

This body of work highlights the (institutional) conditions that shape the regulatory politics of firms that compete in international markets. Yet, it does not tell us much about how differences across firms matter for regulatory outcomes. This is largely due to the assumption in many existing arguments that all firms respond to regulation in exactly the *same* way: they would threaten to relocate over stringent regulation (Lowry, 1992; Konisky, 2007). Since governments fear the political consequences of relocation (Rickard, 2022), this seems like a compelling strategy to obtain regulatory concessions from governments. While environmental regulation has been shown to affect firms' relocation choices (Becker and Henderson, 2000; Greenstone, 2002; List, McHone, and Millimet, 2003), others argue that regulatory costs tend to be small (Jaffe et al., 1995; Dechezleprêtre and Sato, 2017) and pale relative to relocation costs (Frankel, 2003). The credibility of relocation threats is hence likely to vary across firms, rendering claims questionable that all firms are equally able to rely on relocation threats to obtain favorable regulation.

Given this variation across companies, which types of firms can we expect to be more likely to receive favorable environmental regulation? The foreign direct investment (FDI) literature is insightful here. One of its core findings is that mobile investors receive favorable investment conditions, especially at entry (recently, for instance, Jensen et al., 2014; Jensen and Malesky, 2018). Companies seeking to invest abroad will inquire about host country conditions and make investments where they are being offered the most favorable package. While governments will promise generous concessions to mobile firms before they have put their foot down, governments face a commitment problem once the investment has occurred (Guzman, 1998; Jensen et al., 2012):

following through on promises made at entry may no longer be incentive compatible, and favorable treatment of firms obsolesces over time (Vernon, 1971). This effect, however, varies by sector (Kobrin, 1987; Hajzler, 2012) and is primarily tied to investments that are high in fixed, hence immobile, assets (Kerner and Lawrence, 2014). Worries over reputational costs can constrain host countries going back on their commitments with firms (Ahlquist and Prakash, 2010; Albertus and Menaldo, 2012; Allee and Peinhardt, 2010; Cole and English, 1991), and bilateral investment treaties create legal frameworks to protect foreign investment (Büethe and Milner, 2008; Simmons, 2014). Others emphasize the importance of supply chains (Johns and Wellhausen, 2016), investor nationalities (Wellhausen, 2015), and how replaceable foreign firms are (Johns and Wellhausen, 2021) as determinants of how host country governments treat multinational investors (for a recent review, see Moehlecke and Wellhausen, 2022).

Breaking with the standard assumption in regulatory politics that firms would always resist regulation, Genovese (2021) proposes that international climate agreements offer firms opportunities for windfall profits as long as governments shield them from regulatory costs. Businesses may also support regulation for reasons of market competition: firms with low regulatory adjustment costs can benefit from regulation by gaining market share in home markets from their high-cost domestic competitors which cannot adjust to regulation as easily (Kennard, 2020). Both of these studies highlight that, similar to a recent trend in firm-level research on trade (see Kim and Osgood, 2019, for a summary), heterogeneity across firms matters greatly for understanding regulatory politics. In what follows, I advance an argument about how differences in relocation mobility as a function of ownership structure shape regulatory outcomes.

Mobility, Ownership Structure, and Regulatory Outcomes

The starting point of my argument is the central assumption in much of the environmental regulation literature that—faced with new or more stringent regulation—all firms' relocation threats

are equally credible. This claim seems untenable because firms differ in their dependence on host country inputs: resource-intensive manufacturing firms require access to affordable raw materials, high-tech companies seek a well-trained work force, and most firms value low political risk (Jensen, 2003, 2008). Differences in transportation costs, fixed plant costs, and agglomeration economies determine how geographically mobile particular firms are (Ederington, Levinson, and Minier, 2005; Cole, Elliott, and Okubo, 2010). Since limited mobility constrains the credibility of relocation threats, governments are likely to perceive threats from mobile and immobile firms differently.

While drawing on the general idea that greater mobility translates into favorable treatment of firms (Lowry, 1992; Konisky, 2007; Kerner and Lawrence, 2014), I think of mobility somewhat differently here. Instead of anchoring my argument in mobility differences across firms, either (i) between MNC affiliates and host country firms or (ii) between different types of MNC affiliates, I focus on mobility differences *within* firms. By definition, multinational companies operate across multiple countries, and I argue that the *same* MNC's home country operations are less mobile than their operations abroad. Differences in ownership structure between domestically-owned, home operations, i.e., plants located in the country an MNC is headquartered in, and foreign-owned operations, i.e., plants that are located abroad, drive a wedge in how credibly an MNC can claim to move these operations. For my regulatory argument, this within firm logic offers new insights into MNC regulation at home *and* abroad, when existing research has largely been examining the latter. With generally tighter regulation in industrialized countries, studying regulation of MNCs' home operations relative to their foreign operations has been a scholarly blind spot—despite findings that home country institutions shape multinational firms' location decisions of FDI (Beazer and Blake, 2018). While we know well that, at least under some conditions, MNCs do receive favorable regulation abroad, it is less clear whether we should expect the same to be true in MNCs' home countries.

The central building block of my argument is that MNCs' domestic operations are generally

less movable than their foreign operations, hence dealing a blow to the specter of favorable regulation at home. This, I maintain, is down to irreversible and country-specific investments in the economy and politics of home markets. On the economic side, such investments include, for instance, capital expenditure for plant infrastructure, training of local workforce, or establishing sourcing networks and customer relations; examples of political investments entail campaign contributions or lobbying expenditures (Hansen and Mitchell, 2000; Gordon and Hafer, 2005). Firms do not make these investments in error, but to thrive: a better trained work-force enhances productivity, and more direct access to government may result in a more generous tax code (Jensen and Malesky, 2018), beneficial trade policy (Kono, 2006), or favorable procurement rules (Rickard and Kono, 2013). Firms hence directly benefit from these investments, but companies often have to tailor their investments to a country's economic and political institutions (DiMaggio and Powell, 1983; Frieden, 1991; Kostova, 1999).

In the case of MNCs, these investments happen to a greater extent in their home country than in the countries of their foreign affiliates. This is the case because MNCs are not born as globally operating "superstar" firms, but grow into that role organically as a result of business success at home first and international expansion later (Helpman, Melitz, and Yeaple, 2004). Indeed, it is exactly the kind of irreversible investments in, for example, local physical and human capital or ties with national regulators that I have in mind here, which often underpin the very profits that enable domestic producers to become multinationals in the first place. Even though these past investments are sunk costs, relocating home operations elsewhere may be unattractive because firms would have to make the same unrecoverable, country-specific investments into the new host country's economy and politics to enjoy the same relational benefits as before (Fisman, 2001). Beazer and Blake (2018) also show that an MNC's home country environment serves as an institutional focal point that shapes business strategies and behaviors which firms seek to replicate across their global operations. While this increases efficiency, MNCs also become more dependent on their home countries as a result. MNCs are embedded in "home country institutional and market con-

texts" (Levy and Kolk, 2002, 276), which makes credibly threatening to move home operations more difficult than threatening to move foreign operations—not least because less movable, skill-intensive managerial, legal, or creative functions are often centralized at headquarters (Antràs and Helpman, 2004).

These differences in the credibility of relocation threats translate into regulatory policy design. Governments tailor regulation to ownership type. This becomes possible because the informational requirements for governments to assess relocation threats are not onerous. Existing research shows that governments are able to accurately target bilateral investment treaties to firms with high fixed assets (Kerner and Lawrence, 2014). In the case of the EU ETS, Genovese and Tvinnereim (2019) indicate that governments are able to assess the structural dependence of regulated industries. This reflects that governments are likely to have a good sense of how deeply MNCs are invested in their home economies and how movable such investments are, based simply, for example, on the size and number of production sites or tax and employment records. As for MNCs' political investments through lobbying or campaign contributions, governments are typically well aware of these as they are often the natural counterparty in these relational investments (Levy and Kolk, 2002; Meckling, 2015). Governments should hence be easily able to hold precise enough information to distinguish between relatively more and relatively less mobile operations. In fact, ownership type, which my argument ties to relative mobility differences, is a useful regulatory heuristic as identifying MNCs' nationality is simple (e.g., Wellhausen, 2014).

The key expectation of this argument is then that governments offer more favorable regulation to foreign operations than home operations. Since relocation threats for MNCs' domestically-owned plants lack credibility, governments have little reason to offer preferential regulation. For relatively more mobile, foreign-owned plants, however, regulatory concessions are a governmental strategy to avert losing foreign investment. Loss of FDI is economically and politically harmful to governments. Foreign investments are said to create jobs, increase productivity, stimulate growth, and facilitate technology transfer (for a review, see Pandya, 2016), while Rickard (2022) shows that

FDI loss also comes at an electoral cost: offshoring reduces incumbent vote share and the more so, the more jobs are lost to foreign competition. To hedge against these potential consequences, governments will adjust the regulatory stringency for more mobile facilities. This leads to the following testable implication.

Hypothesis (Ownership structure and regulation). *MNCs' more mobile, foreign-owned plants will receive more favorable regulation than their less mobile, domestically-owned plants.*

Carbon Market Regulation in the European Union

My empirical analysis focuses on carbon market regulation in the European Union. EU carbon markets, officially known as the European Union Emissions Trading System (EU ETS), were introduced across member states in 2005 as a coordinated effort to meet negotiated CO_2 reduction targets under the Kyoto Protocol (Ellerman, Buchner, and Carraro, 2007). The EU ETS works as a cap-and-trade system, where governments set an allowable total emissions level ("cap") and allocate tradable permits ("trade") to regulated plants either as free handouts or through auctions.[2] These permits function as the currency in the market and are denominated in units of carbon: each permit is an allowance to emit one ton of carbon. Covering half of the EU's total carbon emissions and boosting an annual market value of US$215bn in 2019,[3] the scheme is by far the largest carbon pricing policy worldwide and has recently also been shown to help reduce emissions despite widespread skepticism about its effectiveness (Bayer and Aklin, 2020).

The EU ETS makes for an ideal test case for two reasons: first, relocation threats have been made vocally throughout the history of the policy; and second, despite it being an EU policy, national governments had large control over the national implementation of the regulation—at least for the 2005-2012 period that I study.

[2] The EU ETS calls regulated sites "installations," but I will use "plants" instead as this is easier to understand and consistent with previous literature.

[3] "World's carbon markets grow 34% in value to $215 billion in 2019-report." *Carbon Pulse*, 23 January 2020. Available at https://carbon-pulse.com/90631/.

On the first point, despite keeping the cost from carbon regulation low by handing out permits for free (Markussen and Svendsen, 2005), firms and industrial associations continuously appealed to the relocation threat. For example, European cement producers warned that "approximately 80% of clinker production will be offshored if no free allowances are allocated."[4] Similarly, the Eurogypsum President, representing the €8bn-strong plasterboard industry, highlighted the immediate threat of relocating factories from Poland to Ukraine, just outside of the EU's jurisdiction to keep their business afloat.[5] Furthermore, 40% of European primary aluminum production was cut back or shut because of the introduction of carbon regulation.[6]

These threats are not stories of the past, but flare up whenever regulation is expected to tighten. After a European Court of Justice ruling in 2016, leading to an increase in the cost of regulation for EU ETS firms, the world's largest steel producer, ArcelorMittal, announced that the judges' decision jeopardizes "the existence of plants in Germany, but also across Europe."[7] Notwithstanding incentives among industry for posturing and inflating demands, relocation threats did not fall on deaf ears, but found fertile ground among political elites. Former European Commission President Barroso publicly worried that "it would be neither good environmental policy nor economically viable if energy-intensive industries were to leave Europe."[8] Politically, the specter of relocation is hence not perceived as just empty rhetoric, but is taken seriously by policymakers at the highest level. The creation of a leakage list that protects industries with significant exposure to international competition and recent discussions about a carbon border adjustment mechanism attest that

[4] "EU industry and the 'carbon leakage' threat." *EURACTIV*, 27 January 2009. Available at https://www.euractiv.com/section/trade-society/linksdossier/eu-industry-and-the-carbon-leakage-threat/.

[5] "Eurogypsum: Carbon leakage 'already happening.'" *EURACTIV*, 28 November 2008. Available at https://www.euractiv.com/section/sustainable-dev/interview/eurogypsum-carbon-leakage-already-happening/.

[6] "COP21: Why it's time for a level playing field." *Eurometaux*, no date. Available at https://eurometaux.eu/blog/cop-21-why-its-time-for-a-level-playing-field/.

[7] "ArcelorMittal says new EU plans for CO2 permits pose business threat." *Reuters*, 10 November 2016. Available at https://uk.reuters.com/article/uk-arcelormitta-eu-emissions/arcelormittal-says-new-eu-plans-for-co2-permits-pose-business-threat-idUKKBN1352B1.

[8] "Barroso: Climate change and energy 'at top of EU political agenda.'" *EURACTIV*, 5 December 2007. Available https://www.euractiv.com/section/development-policy/interview/barroso-climate-change-and-energy-at-top-of-eu-political-agenda/834889/.

relocation concerns run high among EU lawmakers and politicians.

On the second point, and in order to meaningfully test my argument, governments must be able to make regulatory concessions to credibly footloose operations. From a *de jure* perspective, there was little governments could have single-handedly done to ease the regulatory burden of the EU ETS. As an EU-wide, coordinated regulatory policy, the total emissions that each member state was allowed to emit were negotiated in the form of a burden-sharing agreement under EU law (Communication COM(1999) 230). Changing any individual country's targets would therefore have required multilateral renegotiation and intergovernmental consent.

Governments, however, controlled the *de facto* regulatory burden for regulated plants within their own national borders. Prior to a major institutional reform of EU ETS rules in 2013, it was largely up to governments to allocate pollution permits to plants. During the first eight years of operation of the EU ETS (2005-2012), governments would draft National Allocation Plans, which specified, for each regulated site, such as individual power plants, cement kilns, or glass factories, how many pollution permits each of them would receive. While these documents needed approval from Brussels, the European Commission's main concern was that the total number of allocated permits corresponded to the countries' reduction targets in the burden-sharing agreement (Ellerman, Buchner, and Carraro, 2007).

Governments enjoyed great freedoms to shape the policy's distributive effects, which play a major role in climate politics more generally (Bayer and Urpelainen, 2016; Aklin and Mildenberger, 2020; Bayer and Genovese, 2020). EU ETS allocation rules allowed governments to "bend" regulation as they saw fit. Most relevant for my argument, governments had the power to allocate more permits to particular types of plants. For instance, they could hand out relatively more permits to mobile plants and relatively fewer to less mobile ones. Permits are valuable as they can be used to offset plants' carbon emissions. Receiving more permits for free hence directly decreases regulatory cost. Complementing existing research on pandering through fiscal incentives (Jensen and Malesky, 2018; Jensen et al., 2014), relaxing regulatory stringency for some plants, but not

others was a viable pandering strategy in the context of EU carbon markets.

Plant-level Data on Regulatory Outcomes and Ownership

To test the expectation of my argument, I use original data on plant-level regulation and plant-level ownership in the EU ETS.

Dependent variable. The dependent variable is regulatory stringency, which I measure as the logged number of permits each regulated plant receives.[9] Allocated permits serve as pollution allowances. So, for any given level of carbon emissions, plants that were issued more permits for free either needed to reduce their carbon footprint by less or had to buy fewer additional permits from the secondary carbon market to cover their emissions. In both cases, additional permits reduce the regulatory cost for regulated plants. A major strength of this measure is that it directly captures regulatory stringency and avoids having to rely on indirect measures, such as emission intensities.[10]

Allocation data come from the first (2005-2007) and second (2008-2012) trading period of the EU ETS.[11] Recognizing that carbon regulation under the EU ETS was artificially lax during the initial three years to ensure industrial buy-in (Ellerman, Buchner, and Carraro, 2007; Markussen and Svendsen, 2005), my empirical analysis focuses on variation in regulatory behavior during the later 2008-2012 years of the second trading period—coinciding with the Kyoto Protocol commitment period—, when regulation tightened considerably. This focus is consistent with the European

[9] The analysis below includes all plants that did receive permits before the start of the second trading period, even if they closed operations at some point during the 2008-2012 years. Newly regulated businesses that opened during the trading period are not included because they received their allocation from a special "New Entrant Reserve," rather than through the standard allocation procedure.

[10] Plant-level allocation data come from the official European Union Transaction Log (EUTL), which consolidates allocation information from all member states' National Allocation Plans and is available at http://ec.europa.eu/environment/ets/napMgt.do?languageCode=en.

[11] The third trading period (2013-2020) saw a major institutional reform towards an increased use of auctions to allocate permits and a substantial centralization of core functions in Brussels. Both aspects limit the degree to which member state governments can influence permit allocation and hence the distributive politics of carbon regulation in their states.

Commission's staged approach, which considered the "3-year pilot [2005-2008] of 'learning by doing' to prepare for phase 2 [2008-2012], when the EU ETS would need to function effectively to help the EU meet its Kyoto targets" (European Commisson, N.d.*a*).

Permits were not handed out annually. Instead, installations received permits as one-off budgets in advance of each multi-year trading period. Even though these budgets then spanned across multiple years, they resulted from a *single* allocation decision. To do justice to this data generating process, I will treat allocation decisions in my empirical analysis as cross-sectional data. Another concern may be that the eurozone crisis, or governments' anticipation of it, could have shaped permit allocation. These worries are however unjustified. Permit budgets for the 2008-2012 trading period were set as early as 2006, much before any signs of a looming economic recession in late 2009.[12]

Explanatory variable. My main explanatory variable is plant-level ownership. This is measured with a binary indicator that scores "1" for foreign-owned plants and "0" for domestically-owned ones. As mentioned in the theory section above, a firm's operations are considered foreign operations when their plants are located in country k, while the firm is headquartered in country $k' \neq k$; in contrast, plants are domestically-owned when they are based in the same country k as their global ultimate owner.[13]

During the second EU ETS trading period, 10,631 plants received permits. Ownership information is available for 7,733 regulated sites, 4,335 of which (56%) are owned by MNCs, while the remaining 3,398 plants are owned by domestic producers. Among the MNCs, two thirds of their

[12] The European Commission officially approved National Allocation Plans for all countries in 2007, with the exception of Poland (approved in 2010) and Estonia (approved in 2011) (European Commisson, N.d.*b*).

[13] Plant-level ownership information comes from the "Ownership Links and Enhanced EUTL Dataset," which identifies global ultimate owners for regulated EU ETS plants, available at http://fsr.eui.eu/climate/ownership-links-enhanced-eutl-dataset-project/. With a plant-to-firm match rate of 80%, this is the highest quality data that currently exist. Since National Allocation Plans for permit budget allocations for 2008-2012 were due to be submitted to the European Commission on 30 June 2006, I rely on ownership information from 2005/2006 years. See https://ec.europa.eu/clima/policies/ets/pre2013/nap_en. Ownership status is measured strictly *before* allocation decisions are made, which guards against concerns that foreign-owned plants select into countries with favorable regulation.

TABLE 1: Top-15 firms by plant count

#	Firm	Home country	Sector	Total	Foreign	Share	Foreign countries
1	E.ON	Germany	Electricity	195	115	0.59	7
2	Wienerberger	Austria	Building materials	170	161	0.95	18
3	Vattenfall	Sweden	Electricity	113	64	0.57	4
4	Suez	France	Electricity	112	73	0.65	10
5	Compagnie de Saint Gobain	France	Glass	92	74	0.80	16
6	Mittal Steel Company	Netherlands	Steel	92	92	1.00	7
7	Fortum	Finland	Electricity	80	24	0.30	4
8	BASF	Germany	Chemicals	63	9	0.14	6
9	Gaz de France	France	Electricity	61	28	0.46	5
10	Eni	Italy	Oil	56	9	0.16	3
11	RAG	Germany	Coal	56	7	0.13	4
12	RWE	Germany	Electricity	56	30	0.54	2
13	Lafarge	France	Building materials	54	36	0.67	10
14	Dalkia International	France	Electricity	51	51	1.00	6
15	Endesa	Spain	Electricity	50	15	0.30	4

Note: Counts are based on plants for which ownership information is available, which comes from the ORBIS database and reflects ownership in 2005/2006, when EU ETS permits were allocated for the 2008-2012 period. Sector classification is according to 4-digit NACE codes and is based on the sector to which the majority of installations belong to. The final column shows the total number of foreign countries—regulated under the EU ETS—in which a firm operates.

plants (67%), 2,932 facilities, are foreign-owned. On average, MNCs own 5.9 plants compared to 2.0 plants owned by non-MNCs ($t = 7.129, p < 0.000$). Table 1 provides basic information about the 15 largest firms (by plant count), which jointly control 17% of all EU ETS regulated plants in the data and account for more than a quarter of all foreign-owned plants. All firms are MNCs headquartered in Europe. Most of them come from France and Germany (8 firms), and many are electric utilities (8 firms).

Differences in the total number of plants aside, MNCs also differ in how multinational they are. The German chemical giant, BASF, for example, has only 14% of its 63 plants abroad and owns plants in just six EU ETS-regulated countries outside of Germany. Wienerberger, the world's largest brick manufacturer, on the other hand, operates only nine plants at home in Austria, with the vast majority of 95% of its operations in 18 foreign countries. This variation in ownership structure is important for my argument: although both firms are MNCs and would traditionally

be considered mobile because they operate across several countries, this overlooks that foreign and home operations are differently mobile even among multinationals. While both firms' foreign operations, at least descriptively, received more favorable regulation than their home operations, the relative advantage of foreign to home operations is twice as large for Wienerberger, with the majority of operations abroad, than for BASF, which operates almost exclusively in Germany.

The EU ETS, however, also covers operations from MNCs headquartered outside the European Union. US and Swiss firms dominate here, owning seven out of ten plants on average. The glass bottle manufacturer, Owens-Illinois (36 plants) and Exxon Mobile (26 plants) are the largest regulated US firms. Holcim (27 plants), one of the largest cement producers worldwide, and Nestlé (24 plants) take the top spots among MNCs from Switzerland. Since my research design focuses on within firm variation, none of these 785 regulated plants, owned by 273 non EU-based MNCs are included in my analysis below because their home country facilities are not regulated under the EU ETS.

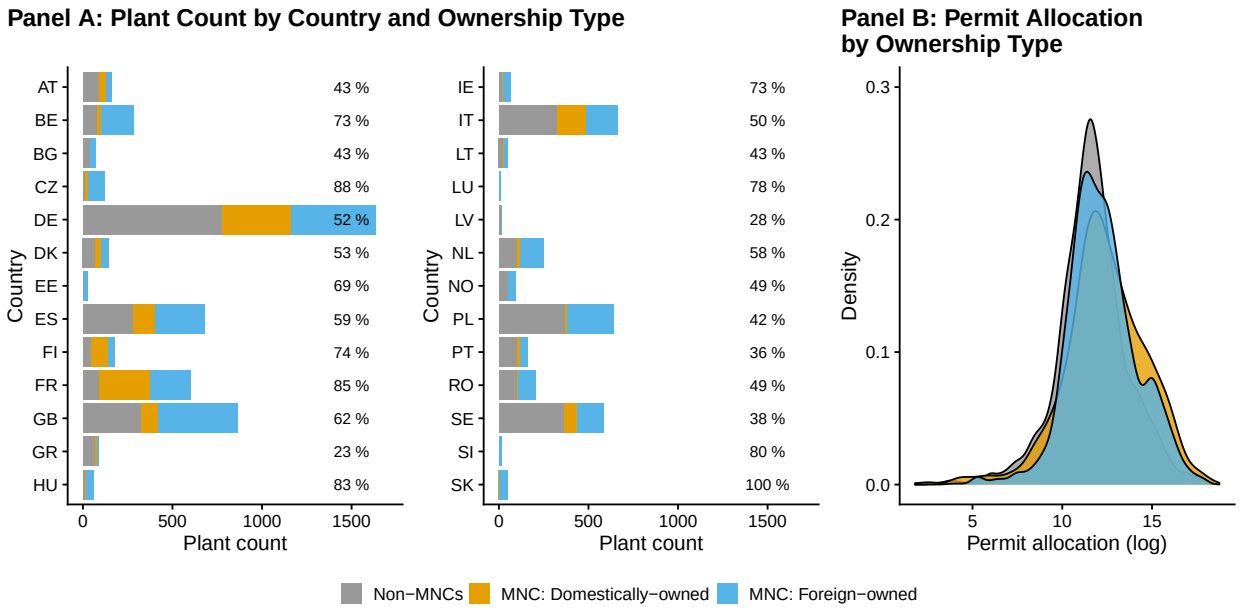
Figure 1 (Panel A) plots plant counts and ownership type by country. It shows variation in both the share of domestic producers (gray) and MNCs and, among MNCs, in domestic (yellow) and foreign (blue) ownership. Many Eastern European countries have high shares of MNC ownership, but not exclusively. With the exception of the UK, where more than 8 out of 10 MNC-owned plants are foreign-owned, these proportions are much more equal in the other largest European economies, such as in Germany (55%), France (44%), or Italy (52%).[14] Panel B plots the distribution of logged permit allocation by ownership type.

Empirical Strategy

My argument posits that regulatory outcomes in European carbon regulation are a function of ownership structure. Ownership structure is, however, not random because only the most productive firms self-select into investing abroad (Helpman, Melitz, and Yeaple, 2004). Simply comparing

[14] Appendix A shows that the main findings presented below are robust to dropping firms country-by-country and to jackknife resampling.

FIGURE 1: Permit allocation by plant ownership



Note: Panel A shows the plant count by country and by ownership type for non-MNCs (gray), domestically-owned MNC plants (yellow) and foreign-owned MNC plants (blue). The percentages report the share of MNCs relative to domestic producers. Panel B shows the kernel density of (logged) allocated permits in EU carbon markets for the same ownership types.

regulatory outcomes for foreign-owned and domestically-owned plants hence likely suffers from confounding due to firm-level differences.

My empirical strategy mitigates this risk by identifying the effects of ownership structure on regulatory outcomes from variation *within* firms instead of variation across firms. The models presented below use firm-level fixed effects to absorb observable *and* unobservable differences across firms from standard confounders, such as firm size, productivity levels, asset specificity, capital intensity, wages, or workforce unionization. This strategy relies on "below"-the-firm-level variation in regulatory outcomes across the same MNC's foreign and domestic operations. Building on the unique feature that EU carbon regulation is not limited to a single country, but operates across all EU member states, my research design harnesses the joint observability of regulatory stringency for the same firms' operations at home and abroad. E.ON's power plants in Germany are part of their domestic operations. Their electric utilities across the border in France belong to their for-

eign operations, and contrasting regulatory outcomes across these observations produces credible estimates as firm-level factors are held constant by design. This approach is distinct from other studies that often focus only on MNCs' *host* country regulation. Absent information on regulatory stringency at home, identification of ownership effects is more difficult in these contexts.

There are nonetheless two sources of potential confounding that challenge the above empirical strategy. The first one has to do with the idea that ownership structure might be the result of selective political protection of some firms and not others. For example, governments could have incentives to create national champions and therefore fend off foreign takeovers. If this was indeed true, then at least some foreign operations would likely be foreign-owned simply because these firms did not enjoy political protection when a foreign competitor wanted to buy them. In these cases, however, where governments were not prepared to shield domestic firms from foreign acquisition in the first place, it does not seem very plausible to expect that governments would then offer favorable regulation to these very same firm once they have become foreign-owned. Contrary to my argument, selective political protection hence most likely biases estimates of foreign ownership on favorable regulation downwards, making it more difficult to find empirical support for my hypothesis.

Second, identification becomes more tenuous in the case of unmeasured plant-level confounding. The geographic location of industrial plants in the US has been shown to be a strategic response to public policy (Monogan, Konisky, and Woods, 2017). Even though carbon reductions for member states were coordinated across the EU, laxer targets in some countries might encourage firms to place carbon-intensive operations there.[15] The empirical analysis therefore controls for plant-level emissions to mitigate against the potential bias from strategic plant location that is correlated with plants' carbon footprint. Equally problematic, firms' foreign operations may be systematically lower in fixed capital and hence more mobile (Kerner and Lawrence, 2014). While

[15] Contrary to this claim, plant-level emission levels for MNC operations in EU15 and Eastern European member states, for which reduction targets were less binding, are statistically indistinguishable from each other ($t = -0.374, p < 0.707$ for 2005-2007; $t = -0.286, p < 0.774$ for 2008-2012).

plant-level data on fixed assets do not exist for my sample, I rely on a matching strategy to alleviate concerns that differences in economic activity or fixed assets across foreign and home operations drive the results rather than differences in ownership structure.

Model Specification

The results presented below are estimated from regression models of the following basic form with robust standard errors:[16]

$$\log(\text{PERMIT}_i) = \beta_0 + \beta_1 \text{FOREIGN}_i + \\ + \beta_2 \log(\text{PERMIT}_{i,\text{pilot}}) + \beta_3 \log(\text{EMISSIONS}_{i,\text{pilot}}) + \delta_k + \gamma_s + \epsilon_f + u_i$$

PERMIT_i measures regulatory stringency as the total number of permits that plant i received for the full 2008-2012 years. Permits were allocated en bloc from a single allocation decision about two years before the start of the second trading period, necessitating cross-sectional analysis. The variable FOREIGN_i denotes whether plants are domestically-owned or foreign-owned; $\text{PERMIT}_{i,pilot}$ and $\text{EMISSIONS}_{i,pilot}$ capture plant i's total permit allocations and their carbon emissions during the pilot trading period, 2005-2007. These plant-level control variables account for path dependence in permit allocation across trading periods and differences in carbon footprint due to variation in plant size.

Consistent with the theoretical argument about variation in ownership structure *within* the same

[16] The number of permits is clearly a count variable, but some values are theoretically not meaningful, as none of the fully operational plants receive zero or very few permits. This makes the use of count models not necessarily superior to estimating linear models. Appendix B shows the robustness of my results and demonstrates that substantive effects from negative binomial models are remarkably similar to those of linear models. Standard errors are not clustered, for example, at the firm-level because permit allocation in the EU ETS is primarily based on plant-level characteristics (Ellerman, Buchner, and Carraro, 2007). To alleviate concerns that results depend on the particular choice of standard errors, Appendix C shows that estimates remain statistically significant across the board when clustering standard errors at the country-level, sector-level, and firm-level, and when using any combination of two-way and three-way clustered standard errors.

MNC and the empirical strategy discussed above, all models presented in the main text include firm-level fixed effects ϵ_f. These fixed effects absorb confounding from firm-level heterogeneity in, among others, productivity, profitability, liquidity, R&D intensity, or lobbying activities. Additional fixed effects δ_k for country k account for differences in, for instance, national CO_2 reduction targets or varying degrees of bureaucratic capacity to administer carbon regulation. Sector-level fixed effects γ_s get at unobserved sectoral variation that matters for regulatory stringency, such as sector-level international competitiveness or industry-level political influence (Neuhoff, Martinez, and Sato, 2006; Grubb and Neuhoff, 2006; Markussen and Svendsen, 2005).[17]

Results

Table 2 shows the main results. All models present point estimates from variation between domestically-owned and foreign-owned operations within the same firm for a sample of European multinational firms. As my research design focuses on within firm variation, the analysis excludes firms that only have domestic plants (by definition, these firms are not MNCs), that only have foreign-owned plants, or that are headquartered outside the EU, for which home regulation under the EU ETS is not meaningfully defined. In addition to firm-level fixed effects in all models, model (1) includes country fixed effects, while model (2) also includes sector fixed effects; model (3) uses a matched sample described below.

The results across all models are strong and substantively meaningful: foreign-owned plants receive favorable regulation of between 10.5%-13.6%. Relative to an average allocation of roughly 2 million permits, the substantive effect corresponds to a total of about 206,000-267,000 additional permits for foreign-owned plants over the five-year trading period, after controlling for differences in plant size. This effect is bigger than the median plant's total carbon emissions between 2008-2012 and translates to an additional 40,000-50,000 tons of CO_2/year worth of pollution rights

[17] Sectors are defined according to the ten sectoral activity codes used in the EU ETS to classify plants, such as "Combustion," "Glass," or "Ceramics." Empirical results are almost identical when using NACE sector codes instead (Appendix D.)

for foreign-owned plants. Appendix B reports average marginal effects from negative binomial models, which provide a remarkably similar range of between 197,000-295,000 extra permits. These findings are strong evidence that governments heavily redistributed the cost associated with carbon regulation. Redistribution happens away from domestic operations and towards foreign operations. MNCs with relatively larger shares of foreign plants can gain material regulatory advantages compared to multinational competitors that run much of their business in their home country.

TABLE 2: Effect of foreign plant ownership on favorable regulation

	MNC sample		Matched MNC sample
	w/o sector FEs	full FEs	full FEs
	(1)	(2)	(3)
Marginal effect	10.5%	12.3%	13.6%
95% CI	[2.2%, 19.4%]	[4.0%, 21.2%]	[5.3%, 22.6%]
Countries	21	21	21
Sectors	—	9	9
Firms	159	159	123
Observations	1899	1899	1337

Note: Table shows marginal effects of foreign plant ownership and 95% confidence intervals (CI) on logged permit allocation. All models include the logged number of permits and emissions from the previous trading period as plant-level controls. Model (1) includes fixed effects (FE) at country and firm level; model (2) additionally includes sector FEs; model (3) includes the full set of fixed effects for a smaller sample that is exact matched on economic activity *within* firms on 4-digit NACE codes. The bottom part of the table includes information on the number of countries, sectors, firms, and total observations for each model. Standard errors are heteroskedasticity robust.

As discussed above, a major concern might be that systematic differences in economic activities between foreign-owned and domestically-owned operations are driving the results. Firms may indeed keep less carbon-intensive activities in their home state, for instance, as part of headquarters functions in executive management, human resources, and legal or administrative services. I address this concern with a matching strategy that relies on matching plants (within firms) based on their economic activities at the level of 4-digit NACE codes, the official Statistical Classification of Economic Activities in the European Community. At that level of granularity, NACE codes distinguish, for example, between "Manufacturing of flat glass" (23.1.1) and "Manufacturing of hollow

glass" (23.1.3) or between "Casting of iron" (24.5.1) and "Casting of steel" (24.5.2). This approach is a credible way to ensure that model estimates are driven by variation between domestically-owned and foreign-owned plants that engage in the same economic activities. Matching plants on such nuanced NACE categories therefore makes firms' operations comparable not only in terms of economic activities, but other potential sources of plant-level confounding such as differences in capital structure or fixed asset requirements as well.[18] Model (3) reports stronger results from the matched data. Appendix F also shows that marginal effects increase to 11.8%-20.3% across the three models, when excluding firms with potential headquarters sites, as identified from address information. These additional tests lend further credibility to claims that my findings are not driven by confounding from differences in economic activities across foreign-owned and domestically-owned plants or functional differentiation between headquarters and industrial operations.

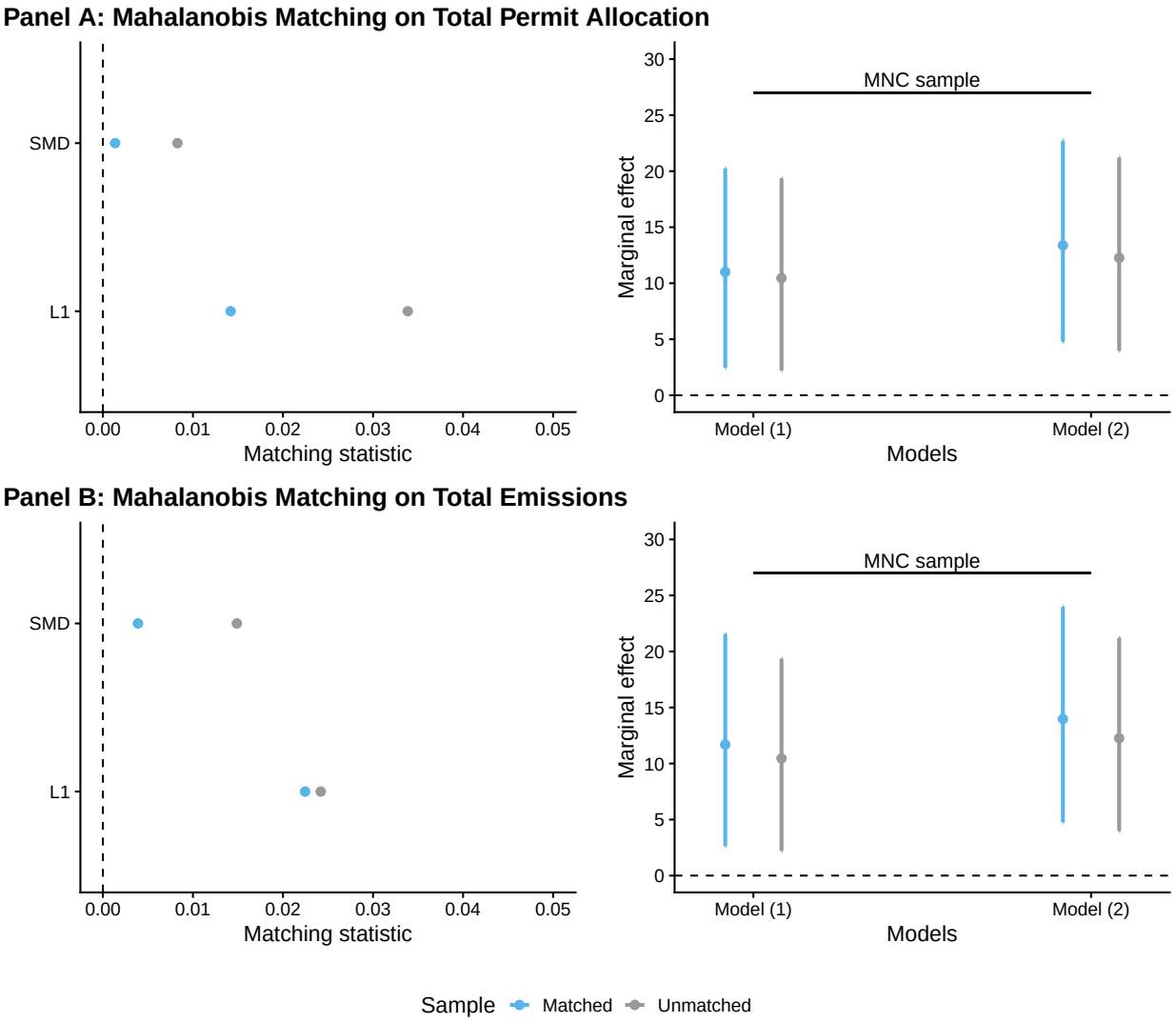
Results from Matching Analysis

Differences in economic activity aside, covariate imbalance in plant-level controls used in the main model specifications may also bias the above estimation results. In my case, it would be problematic, for example, if all foreign operations (within the same firm) were systematically more carbon-intensive than domestically-owned plants. One way to reduce imbalance and improve causal inferences in observational data is through the use of matching (Rosenbaum, 2002; Morgan and Winship, 2014). The goal of matching is to make the empirical distribution of covariates between the treated and control group more comparable (Stuart, 2010). This can be achieved by pruning or reweighting observations for which matches are difficult to find.

Figure 2 shows that Mahalanobis distance matching (Rosenbaum, 2002) improves covariate balance both in terms of standardized mean differences and the univariate imbalance measure $\mathcal{L}_1$

[18] In the absence of data on plants' fixed assets, Appendix E shows that estimates are robust to the inclusion of an alternative measure that captures plant-level fixed assets as emissions-weighted firm-level fixed assets (for which data exist). While this test offers further reassurance for my argument, the validity of the constructed plant-level measure for fixed assets depends on the assumption that plant-level emissions and fixed assets are correlated. This assumption is more reasonable in some sectors than others.

FIGURE 2: Matching diagnostics and estimation results from unmatched and matched samples



Note: Each panel shows covariate balance before (gray) and after (blue) matching in terms of (the absolute value of) standardized mean differences (SMD) and the univariate imbalance measure $\mathcal{L}_1$ (L1) on the left; on the right, marginal effects and 95% confidence intervals for models (1) and (2) from Table 2 are shown. Panel A shows results for matching on the total allocation (log) variable, Panel B for matching on total emissions (log) variable. Sample size reduces from $n = 1899$ to $n = 1692$ (-11%) as a result of matching.

(Iacus, King, and Porro, 2012). Despite fewer observations in the matched data, the main results hold up strongly: foreign-owned plants receive more favorable regulation than their domestically-owned counterparts. Indeed, after matching, point estimates increase by 5% for matching on the total allocation variable (Panel A) and by 10% for matching on the total emissions variable

(Panel B)—strengthening the link between ownership and regulatory outcomes (Appendix G).[19] Since lowering covariate imbalance has been shown to reduce model dependence in the statistical estimation of causal effects (Ho et al., 2007; Imai, King, and Stuart, 2008; Iacus, King, and Porro, 2011), the matching analysis corroborates earlier empirical findings.

Placebo Tests: Sector Mobility

My argument introduces the idea that variation in ownership structure shapes the mobility of firms' home and foreign operations differently. With the mechanism hinging on how movable operations are, it is reasonable to expect that the regulatory advantage of foreign ownership decreases in generally less mobile sectors. Among industries, whose geographical mobility is low, governments are unlikely to perceive relocation threats as credible (Ederington, Levinson, and Minier, 2005; Cole, Elliott, and Okubo, 2010)—even when these threats are made by foreign owners.

To probe this expectation, I conduct two placebo tests. First, I show that, among electric utilities, foreign ownership is no longer statistically significantly associated with favorable regulation. The power generation sector is a useful sector to study as it is one of the least footloose industries. Electricity production requires large, capital-intensive facilities and access to EU countries' energy markets is often heavily regulated (Genovese and Tvinnereim, 2019). Moving operations abroad is hence unattractive for both economic and political reasons. Based on this, and consistent with expectations of my argument, it is no surprise that point estimates of foreign ownership among power producers dip by between 20%-30% (Appendix table H1).

A second test demonstrates that the marginal effect of foreign ownership attenuates by at least a quarter for those sectors that were classified as immobile by the European Commission. Worried about the effects of carbon regulation on Europe's industrial base, the European Commission put mobile sectors that were most prone to move their emissions (and production) abroad on a so-

[19] Covariate balance is already high in the unmatched data set because of rather similar permit allocation and emission profiles among multinational firms. This makes it difficult for the matching algorithm to find appropriate matches when simultaneously matching on allocation and emission variables. As a result, balance does not improve for all matching metrics, but results maintain.

called "leakage list."[20] Listed sectors continued to receive emission permits for free when, starting in 2015, immobile, non-listed sectors had to buy their permits in auctions. According to an EU spokesperson, mobile sectors were exempted from parts of the carbon regulation to "guard against the relocation of EU industries to those regions with less stringent emission limits."[21] In contrast, sectors that were deemed to be immobile and hence lacked the possibility to evade regulation by relocating operations were kept off the leakage list. When re-estimating the above models for these immobile sectors, measured at the fine-grained level of 4-digit NACE codes, I find no evidence that foreign ownership is linked to favorable regulation (Appendix table H2); for mobile, listed sectors, however, marginal effects are comparable to those in the main models (Appendix table H3). Effects are strongest in those sectors, such as non-metallic minerals (NACE code 23), which includes the manufacturing of glass, clay building materials, or cement production, for which 99% of regulated plants come from sub-sectors on the leakage list (Appendix I). This adds evidence consistent with my argument's central claim that governments consider mobility concerns when deciding on the distributional effects of climate regulation.

These placebo tests are also helpful for identifying scope conditions of my theoretical argument that are grounded in sector-level mobility. Sectors whose operations are dependent on country-specific inputs, agglomeration economies, or transport routes are rather immobile as a whole (Ederington, Levinson, and Minier, 2005). In these sectors, foreign-owned plants should still be regulated favorably relative to domestically-owned ones, but the relative regulatory advantage that differences in ownership status bestow is expected to be reasonably smaller. Sector-level mobility conditions the hypothesized relationship between ownership structure and regulatory outcomes.

[20] Important for my research design, the leakage list became only operative in the *third* trading period from 2013-2020, ruling out the possibility that it could have affected permit allocation decisions in the earlier trading period that I study. Commission Decision C(2014) 7809 notes that sectors and sub-sectors (4-digit NACE codes) were placed on the leakage list if the implementation cost of the EU ETS, as a share of value added, was at least 5% and a sector's trade intensity with non-EU countries was above 10%. For sub-sectors these two thresholds needed to be higher than 30%.

[21] "EU proposes giving most heavy industries free carbon permits." *Reuters*, 5 May 2014. Available at https://af.reuters.com/article/commoditiesNews/idAFL6N0NR3PV20140505.

Conclusion

Relocation threats can be a powerful political lever to extract regulatory concessions. I find that foreign-owned operations, whose mobility makes their relocation threats credible, receive favorable carbon regulation in the European Union. This type of "reverse national regulation"—where foreign ownership leads to favorable regulatory treatment—illustrates the intriguing case of foreignness as an asset rather than a liability (Kindleberger, 1969; Zaheer, 1995). Whenever there is competition over capital and policymakers fear the electoral fallout from industrial relocation (Rickard, 2022), cutting back regulation can be a compelling political strategy. Introducing variation in ownership structure as a novel, theoretically meaningful variable, I demonstrate empirically—with original, granular plant-level data—that governments offer favorable regulation selectively only to the most mobile, foreign-owned plants.

Since firms did not have to pay for their permits during the early years of the EU ETS, and hence did not experience any immediate reductions in the values of their investments, it is unlikely that worries about investment disputes drive these results. This is, however, not to say that future research should not study favorable environmental regulation of foreign investors as a form of compensation to avoid international investment arbitration. At times when states have become increasingly concerned about the limits to their regulatory sovereignty that litigation creates (Thompson, Broude, and Haftel, 2019; Moehlecke and Wellhausen, 2022), more ambitious climate policy, which necessarily erodes the value of carbon-intensive assets (Colgan, Green, and Hale, 2021), raises the very serious prospect of growing tensions between stringent regulation and investor protection.

Incentives for selective regulatory concessions also explain why, absent international coordination, closing regulatory loopholes proves difficult (Urpelainen, 2010). As long as regulatory differences across countries persist, the mobility of foreign-owned operations is enough for governments to seek ways to reduce regulatory cost for those plants that can be moved most credibly.

European leaders, for example, confirmed that emission loopholes "will continue after 2020 to prevent the risk of carbon leakage" and will stay open beyond 2030 "as long as no comparable efforts are undertaken in major [non-EU] economies."[22] Political concern over industrial relocation creates the conditions for regulatory leniency towards foreign operations very likely not only in EU carbon markets, but in international regulatory politics more broadly.

I conclude by illustrating three implications of my argument for regulatory political economy and industrial collective action. First, my argument hints at interesting regulatory dynamics. Within sectors, the difference in regulatory outcomes that I document can lead to intra-industry splits across MNCs that vary in ownership structure. In a given country, these splits over time not only empower relatively more mobile MNC operations with many foreign-owned plants to pollute more as they are shielded from stringent regulation; they also create incentives for other MNCs that are currently not benefiting from regulatory concessions to invest in plants abroad to increase their foreign bargaining power in the future. So, reverse national regulation, which finds strong empirical support in my data, amplifies itself and dynamically increases industrial resistance to effective environmental regulation.

Second, heterogeneity in the mobility of MNCs' plants encourages policymakers to design tailored policies. When differences in outward mobility are large, optimal regulatory practice shifts the regulatory burden from mobile to immobile operations. However, for such targeted regulation to become politically feasible and to avoid backlash from (mostly domestic) firms on the losing end, regulation needs to be sufficiently opaque or domestic losers need to be compensated elsewhere (Gaikwad, Genovese, and Tingley, 2022; Jensen and Malesky, 2018; Rickard and Kono, 2013). Complex regulatory policies with ample special clauses make regulation difficult to attack and provide policymakers with discretion to shape policies in their favor (Kono, 2006). Regulatory capture by mobile firms is an unavoidable consequence of global competition, and tailored

[22] "Emissions loophole stays open in EU." *The New York Times*, 18 November 2014. Available at https://www.nytimes.com/2014/11/19/business/energy-environment/emissions-loophole-stays-open-in-eu.html.

regulation is a result of relative differences in the credibility of relocation threats.

Lastly, differences in the credibility of these threats have implications for lobbying behavior and intra-industry collective action more broadly. While Bombardini and Trebbi (2012) have shown that market structure affects whether firms lobby together or alone, my findings suggest that collective action within sectors might be a function of the sectoral composition of ownership structure. Foreign MNCs seek to privatize regulatory rents from their greater mobility and thus prefer to lobby individually. In contrast, relatively immobile domestic MNCs have incentives to convince more mobile competitors to lobby jointly. The extent to which this type of "benefit sharing" becomes possible likely depends on firm and sector attributes, yet my findings offer a mechanism through which variation across types of MNCs filters into firm-level lobbying behavior and industrial collective action. This adds an explanation to our understanding of the political economy of regulation that builds on the credibility of relocation threats and is grounded in differences in ownership structure across multinational firms.

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