

Competition Law in Latin America and Global Greenhouse Gas Emissions – The Way Forward

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ABSTRACT

The Latin American region is rich in minerals – such as lithium and copper – that are critical for the global transition to clean energy, is home to the largest rain forest in the world, and enjoys geographical advantages for the deployment of renewable energy technologies. The latter could provide the region with an opportunity to develop green hydrogen, an energy source with the potential to play a significant role in energy transitions of hard-to-abate industries such as steel production. The region has therefore a strategic importance in the global effort to achieve reduction targets of greenhouse gas emissions required for the goal to keep global warming below 1.5 degrees Celsius as established in the Paris Agreement. This paper provides an overview of the possible market power problems associated with the development of this potential, such as high concentration of mining and refining activities, as well as market power in food value chains that may be driving deforestation in the Amazon. The paper sketches antitrust enforcement interventions that do not require changing the prevailing goals and analytical framework of competition law enforcement as well as interventions that would require such a change, identifying areas where future research should be conducted in order to inform policy change.

Keywords :

Competition law and climate change, competition and greenhouse gas emissions, antitrust law and sustainability, Competition law in Latin America

1. Introduction

Competition as a market phenomenon and competition law have straightforward relationships to some of the sustainable development goals (SDGs). SDG 2 and SDG 3 concern access to food and healthcare, respectively, which is promoted by more competitive markets with lower prices and better quality products. There are other relationships, especially with regard to access to clean energy (SDG 7), sustainable production of goods and services (SDG 12), and take urgent action to combat climate change and its impacts (SDG 13) that are less straightforward from a competition law and policy perspective, on which the present paper will focus. The relationships in this regard are less clear because they require the introduction of performance measures of the market – such as pollution – that are not usually found in microeconomics and industrial organization textbooks, especially in scenarios where there are tradeoffs between consumer welfare in a market and environmental protection for the general population.

The present paper focuses on the relationship between competition and competition law, on the one hand, and climate change, on the other. Specifically, this paper deals with the problem of greenhouse gas (GHG) emissions. Even if other sustainable development goals – or even other environmental problems such as water scarcity and environmental disasters – are relevant in Latin America, these are only mentioned in relation to the issue of GHG emissions.

The present paper aims to present issues and opportunities in competition law specific to Latin American countries that have at the same time the potential to contribute to the solution at the global stage. Therefore, the data on environmental and economic indicators presented in this paper focuses on selected countries of this region. The legal analysis follows the same scope, even if mention is made of examples of developments in other jurisdictions such as the EU and the US. On the other hand, the conceptual economic framework is more general and not restricted to this regional focus since the relationships of interest do not necessarily depend on geographical location.

One can differentiate between economic and legal issues arising from the relationship between environmental challenges and market competition. The economic issues pertain to establishing relationships of interest – whether competition as measured by price-cost margins or concentration has an effect on the emissions of GHGs of firms or whether collaboration between competitors (and the specific form this may take) is necessary to establish industry-wide environmental standards — as well as assigning monetary values to different types of harm to aid in the task of balancing in the policymaking process. The legal issues can be considered as a subsequent step once it is established what we know and what we do not regarding these economic relationships. The adequacy of the law to address social harm and the possible changes that would be required should be assessed against the backdrop of our current knowledge of how competition or the lack thereof influences environmental outcomes. For this reason, the approach of this paper is to lay down an overview of the current stand of the economic literature on different aspects of the relationship between competition and the environmental performance of markets before proceeding to the legal analysis.

The relevance of this paper can be stated in terms of the following question: if competition law cannot contribute (or do so only marginally) to the solution of the main socio-economic challenges of a society, can we still say that it is relevant economic policy? Antitrust law enforcement does not exist in a vacuum in national and regional budgets. If its capacity to contribute to the solution of grand challenges that affect societies around the world is weak then it is difficult to justify the need for spending on antitrust enforcement in comparison to the added benefits of spending the same amount of financial resources in other areas of public policy. That is unless one could formulate ways in which current antitrust laws can contribute to the solutions to pressing social challenges or how such laws and their enforcement can be modified or adjusted for that purpose. At a bare minimum, one should ensure that current principles of antitrust enforcement do not run counter to environmental goals. Much has been written in the past decade and a half on how competition law can be adjusted to contribute to wider and more impactful social goals different from static consumer welfare such as income and wealth equality, innovation, and socioeconomic development in general. The present paper focuses on antitrust law's contribution to the quest for a solution to human-made climate change.² It presents avenues of action that are available under the prevailing competition law paradigm focused on consumer welfare, courses of action that require rethinking the scope of antitrust analysis as well as areas where further research is needed to inform policy change.

Section II of this paper presents indicators that describe the situation of GHG emissions in the biggest emitters in the region, namely, Brazil, Mexico, Argentina, and Colombia. This selection is justified given the large differences between countries in terms of total emissions. As the data presented in Section 2 will show, the emissions of Brazil are one order of magnitude above that of the next largest emitter, which is Mexico, and two orders of magnitude above the vast majority of countries in the region. Section II presents in addition related economic indicators such as reserves of minerals relevant for the production of cleaner technologies, the composition of the energy grid, and data on the deforestation of the Amazon rainforest given its ability to be one of the main carbon sinks in the world. Section III presents an overview of the economic relationships of interest to competition authorities that aim at contributing to the attainment of reduction objectives of GHG emissions. The current stand of the literature in these areas serves as a basis to the legal discussion in Section IV, which covers antitrust interventions that do not require an adjustment of the competition laws and their analytical framework and the interventions that would require such an adjustment. As a way of conclusion, Section V summarizes the immediate policy implications of what has been discussed as well as areas where future research is needed to support the discussion of adequate competition law intervention.

2.Environmental and economic indicators

The region of Latin America and the Caribbean has a combined GDP (nominal) of 6.25 trillion USD and a population of 659 million people (World Bank [dataset] (2023)). In 2022, CO₂ emissions in the region reached 1,660 million tonnes and are expected to increase slightly to 1,690 million tonnes in 2030 (IEA (2023), p. 61). This represents between 4-5 percent of global emissions, a share which has remained stable since 1971 (Id, p. 15). As already mentioned in the introduction, the largest emitters of GHGs in the region are Brazil, with 1,304 million tonnes of

CO₂-equivalent units (CO₂-eq),⁴ Mexico, with 793 million tonnes of CO₂-eq, Argentina, with 397 million tonnes of CO₂-eq, and Colombia with 210 million tonnes of CO₂-eq, all figures for 2019 (Minx et al. [dataset] (2022)). It is worth noting that, according to data from the Organization for Economic Co-operation and Development (OECD), the net emissions of Mexico from land use, land-use change and forestry (LULUCF) activities are negative, -202 million tonnes of CO₂-eq in 2019. The net emissions in this category for Brazil, Colombia, and Argentina are positive and amounted to 290 million tonnes of CO₂-eq in 2016 (last available year), 98 million tonnes of CO₂-eq in 2018 (last available year) and 36 million tonnes of CO₂-eq in 2018 (last available year), respectively.

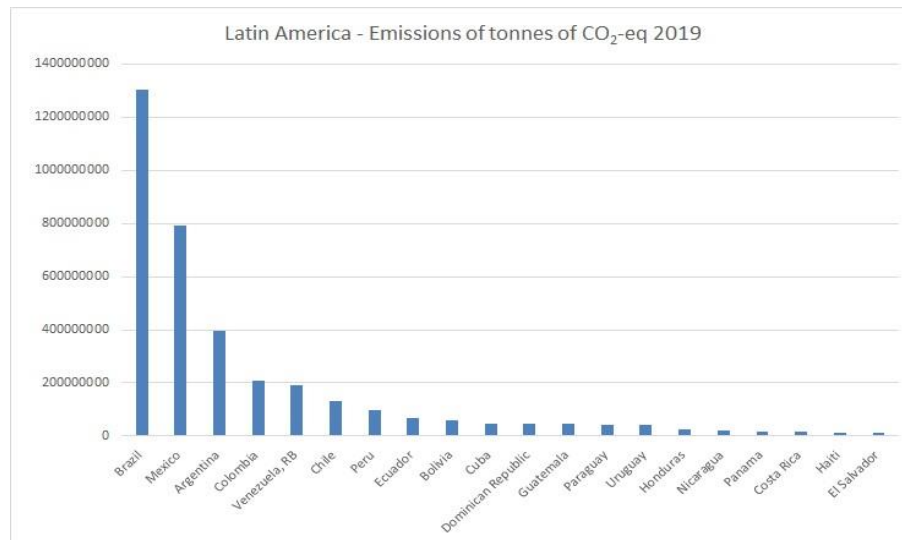


Figure 1 Data from Minx et al. [dataset] (2022)

As can be seen in Figure 1, there are substantial differences in total GHG emissions among Latin American countries. Brazil lies one order of magnitude above Mexico, the next largest emitter, and two orders of magnitude above 14 of the 21 countries in the region. Therefore, indicators regarding emissions focus on the 4 largest emitters in the region. This of course does not delimit the geographic scope of analysis of the rest of the paper given the relevance of other variables such as reserves and production of critical minerals for technologies related to clean energy.

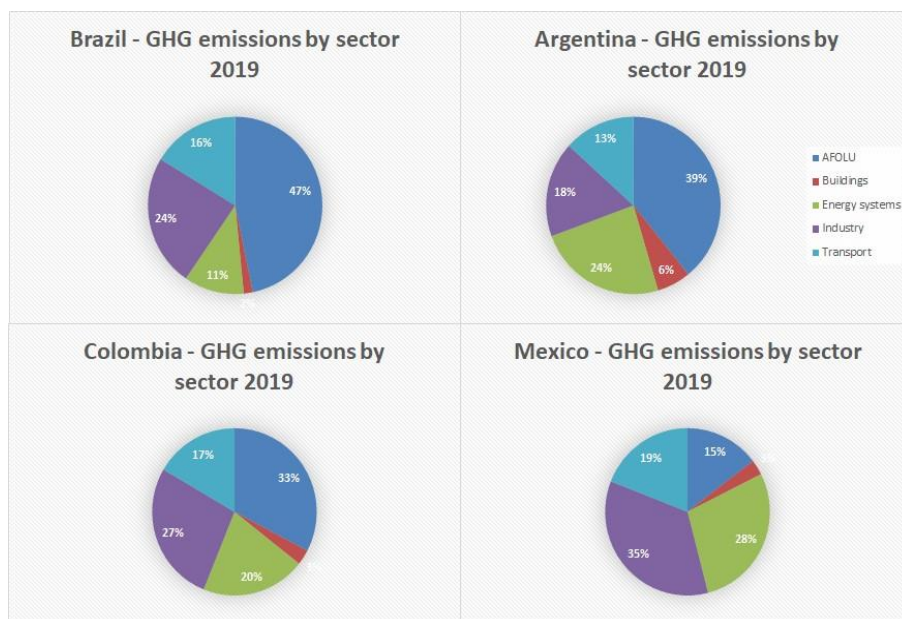


Figure 2 Data from Minx et al. [dataset] (2022)

Figure 2 shows the composition of GHG emissions by sector of the 4 largest emitters. In the case of Brazil, almost half of the emissions come from the Agriculture, Forestry and Other Land Use (AFOLU) sector. This is also a large contributor in Argentina (39 percent) and Colombia (33 percent) but less so in Mexico, where the largest source is the Industry sector. This shows, especially in the case of Brazil, the importance of mitigation efforts to reduce emissions and carbon sequestration from agriculture activities.

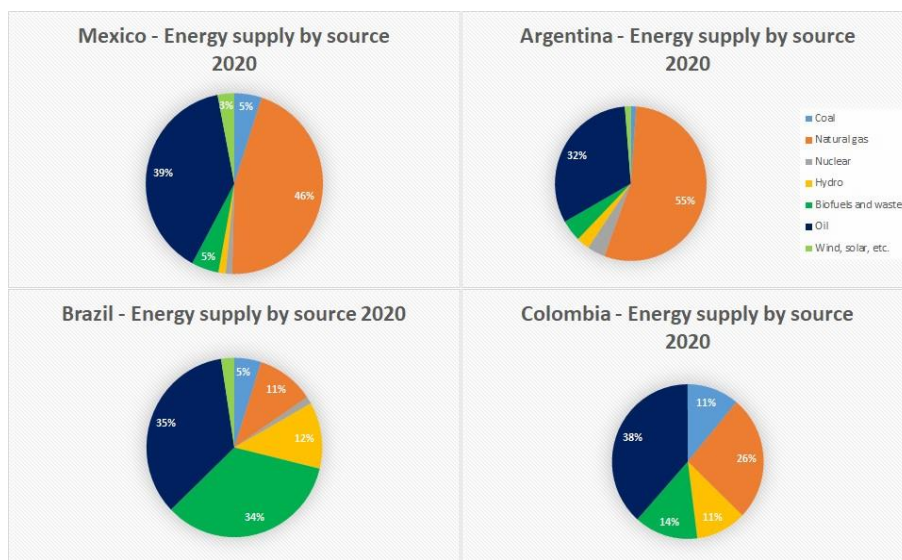


Figure 3 Data from IEA (2022)

Figure 3 shows the structure of the energy supply — which encompasses energy used for residential, industry, commercial, transport, and agricultural purposes — of the 4 largest emitters in the region. A prominent feature of this structure is the relatively high percentage of low-carbon

sources (nuclear, biofuels, wind, solar, and hydro) in Brazil, which account for 50 percent of the energy supply. Colombia has the second largest percentage of energy supply of lowcarbon sources, with 29 percent. This number amounts to around 12

percent in both Mexico and Argentina.

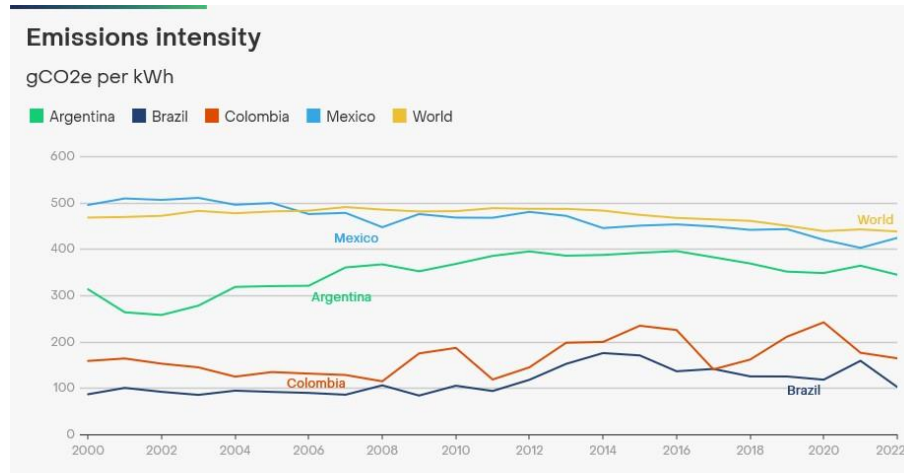


Figure 4 Source: ember-climate.org

As can be seen in Figure 4, the story of the carbon intensity of electricity generation in these 4 countries mirrors that of the structure of the energy supply. Brazil and Colombia have the lowest carbon intensity, with 102 grams of CO2-eq per kiloWatt/hour (gCO2-eq/kWh) and 164 gCO2-eq/kWh in 2022, respectively, with Brazil having the 3rd lowest carbon intensity in the region. As can be seen, Mexico and Argentina have a higher carbon-intensive electricity generation, although still below the world average.

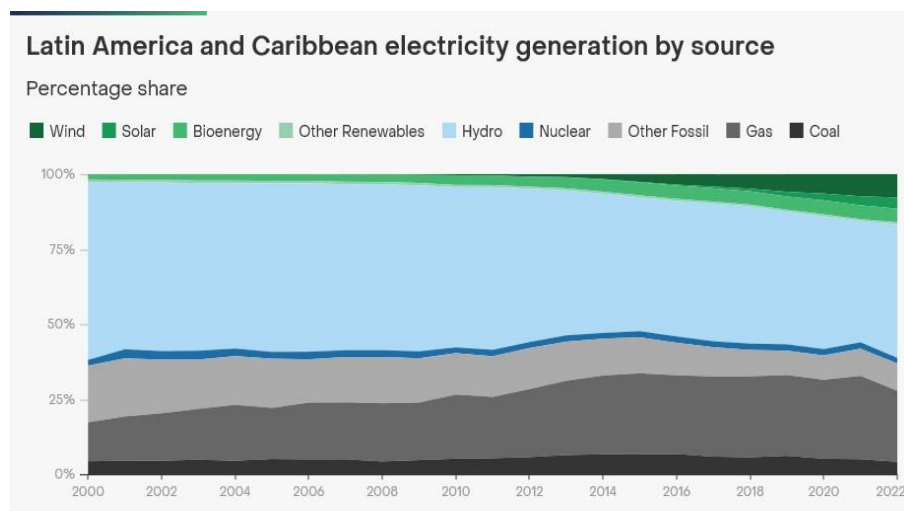


Figure 5 Source: ember-climate.org

These statistics on emissions and energy supply show the areas of opportunities for further improvement in mitigation efforts to reduce emissions in Latin America. One example is the agricultural sector in Brazil and, to a lesser extent, in Argentina and Colombia. Industrial and

energy production emissions are other target areas where large gains could be attained. The promotion of competition in related markets has a role to play in this struggle to reduce emissions, for example, by promoting innovation in/adoption of cleaner production technologies and more efficient use of farming land and inputs. In terms of technology adoption, there is definitely more room for growth regarding the production of energy from low-carbon sources such as wind and solar, as evidenced in Figure 5. Chile is a successful example in the region, where the combined share of wind and solar increased from 0.8 percent in 2013 to 27.5 percent in the 12 months leading to September 2022, overtaking the share of energy produced by coal, which in the same 12-month period was 26.5 percent (Ember (2022), p.

4).

The relatively clean electricity grid in Latin America and the potential for expansion of technologies such as wind and solar can play a vital role in producing cost-efficient hydrogen. This fuel, in turn, has the potential to be a driver of cleaner industrial production in Latin America, helping to abate the GHG footprint of traditionally difficult products such as iron and steel and at the same time expanding industrial output (IEA (2023, pp. 105, 129-130)). The potential for clean hydrogen production has been recognized by many countries in the region such as Chile, Colombia, Argentina, and Brazil, which have recently published national strategies for its production (Id., p. 130). A more detailed analysis of how competition and competition law are related to these problems will be taken up in the next sections.

Several factors highlight the importance of the region to achieve GHG emission targets at the global stage. First, its large population, with a projected 760 million by 2050 (McKeen et al. [dataset] (2023)), coupled with its development potential — as per capita income grows, energy requirements can be expected to increase significantly — make it a necessity to ensure a swift transition to clean production processes and energy sources. Second, the region is well positioned to play an “outsized” global role in the attainment of GHG emissions targets due to its leadership in the production of biofuels and substantial reserves of minerals that are critical to sustainable technologies such as lithium, copper, and nickel (IEA (2023), p. 15). Chile, for example, is the largest producer and holder of reserves of copper in the world. In terms of copper, Peru is another country of interest, with the third largest reserves in the world and the second largest production. Lithium is also abundant in the region with Chile and Argentina holding the largest and 3rd largest reserves of Lithium in the world, respectively. Finally, Latin America is home to the largest rainforest in the world, which is of paramount importance in terms of global emissions.

Even if the electricity grids in the region are comparatively clean, the data presented show that there is still room for improvement in large emitters, especially in Mexico and Argentina. The penetration of wind and solar in the region, with notable exceptions such as Chile, is low. This is of course a multifactor problem. However, competition conditions in electricity generation could play a role since we are discussing competing technologies. In addition, the development of wind and solar electricity capabilities in the region is connected to its strategic geographical advantage in terms of the availability of renewable resources as well as critical minerals such as copper and nickel that form an important part of the cost of these technologies, as will be explained in further detail below.

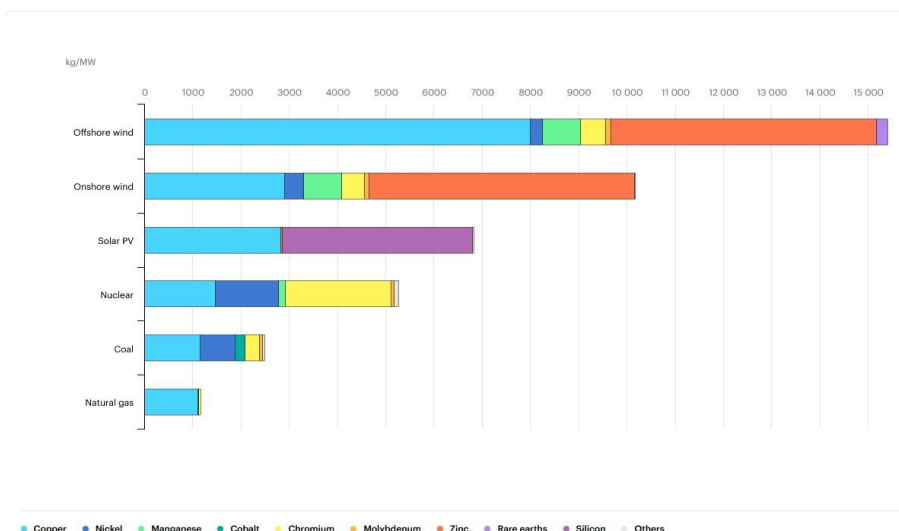


Figure 6 Source: IEA (2022)

The increase in demand spurred by the global clean energy transition is expected to cause a wide gap with the supply based on current and planned capabilities to mine and refine critical minerals such as lithium, copper, and nickel, which are in abundant supply in the region. Lithium and nickel are critical to the production of rechargeable batteries. Copper and nickel are important components of clean energy technologies such as wind and solar (IEA (2022, p. 6)). Copper, in general, is a main component of any energy-related product. A few countries in Latin America present great potential for the mining and refining of these minerals, as can be seen from the share of worldwide reserves of lithium and copper in countries such as Chile, Peru, and Argentina presented below. Nickel, in addition, is abundant in Brazil, which stores the third largest reserve in the world, behind Australia and Indonesia (US Department of the Interior (2023, p. 123)).

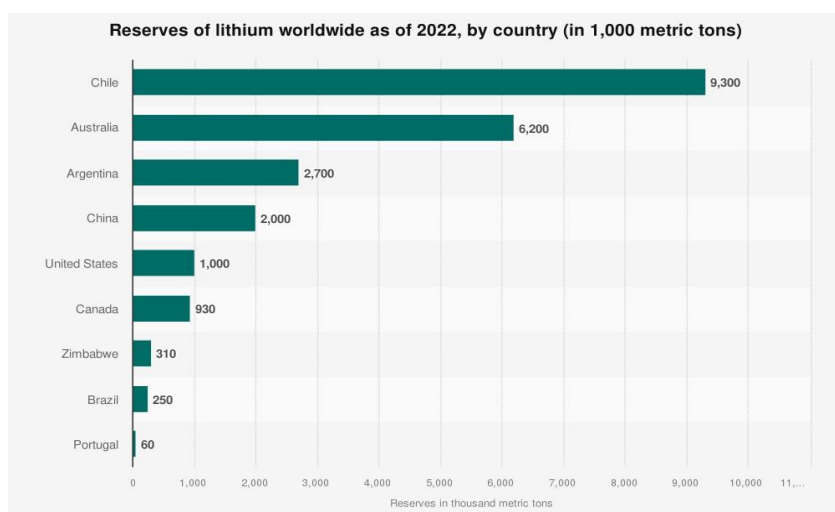


Figure 7 Source: © Statista 2024

Data from the US Department of the Interior (2023)

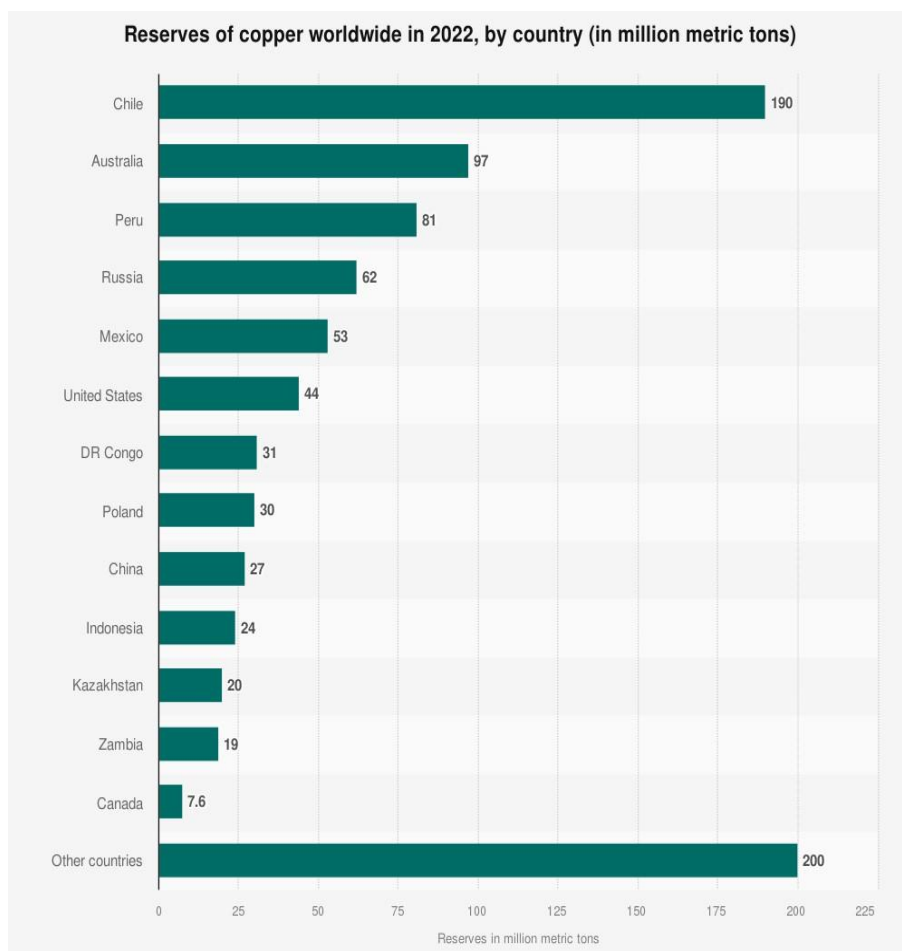


Figure 8 Source: © Statista 2024

Data from the US Department of the Interior (2023)

Mineral reserves offer Latin American countries the opportunity to develop by moving along the value chain to greater added value activities. Technology transfer can play a role and could therefore be a relevant area for antitrust intervention. The importance of these industries is highlighted by the fact that competition from Latin American countries in more value-added activities is needed in order to mitigate risks associated with the geographical concentration of minerals mining and refining. Adequate competition conditions in the production of critical minerals may aid in avoiding risks of price volatility and security of supply identified by the IEA. The IEA has identified that in the future a surplus of raw materials such as lithium can be expected. On the other hand, more refined versions of this mineral are expected to be in short supply in the coming years. The production of raw materials already presents a high level of geographical concentration. The situation of refined products is much more acute, with China's global share of lithium refining hovering around 50 percent. Chinese companies are also reported to have made investments in overseas assets in Chile. (IEA (2022, pp. 11-12))

In terms of competition on the global stage, the mining industry saw a notable wave of consolidation between 2006 and 2012, with mergers and acquisitions (M&A) activities peaking in

2011 at a value of deals of US\$ 142 billion. From 2018, there has been an upward trend again, however, with deal values much below those observed in the 2006-2012 period. Deal activity in battery minerals began to accelerate in 2018, with deal value reaching US\$ 1.2 billion, which may be part of a strategy to capitalize on the future demand for batteries in electric vehicles and electricity storage (EY (2019, p. 5))

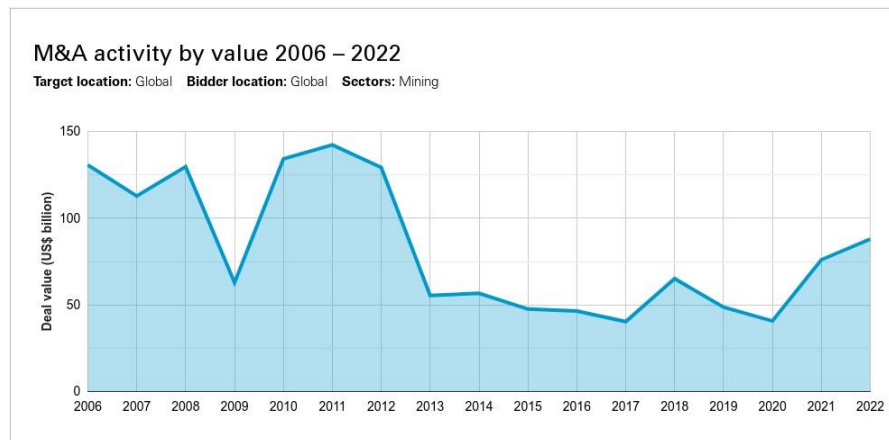


Figure 9 Source: © White and Case 2023

In Chile, the top copper mining sites are operated by some of the largest corporations in the world such as BHP, Anglo American, Rio Tinto and Glencore, in addition to two local companies, Codelco and Antofagasta Minerals (Comisión Chilena del Cobre (2022)). Lithium mining is similarly concentrated, with only two companies currently operating mining sites in Chile (Gobierno de Chile (2023, p. 21)). In

Argentina, there are 6 mining sites at the stage of construction, owned or co-owned by 5 different mining companies. There are, however, numerous sites under earlier stages of exploitation that are poised to exponentially increase production in Argentina (Gobierno de Argentina (2023)). It is important to state at this level that this information is not enough to make any inference on competition conditions in any of these industries in the region. At this stage, it is enough to say that the information presented highlights the importance and need to explore the competition dynamics, especially in view of what has already been explained on the global relevance of competition in the production and refining of these minerals.

Another area where the region can play a significant global role is LULUCF activities as a source of GHG emissions, especially the countries that share the Amazonia. This region is host to the largest rainforest in the world, with its corresponding importance in terms of carbon absorption. Research shows that the emissions from the rainforest, excluding emissions from fires, have almost entirely caught up with the amount of carbon that it absorbs (Gatti et al. (2021)7). Including the emissions from fires, the Amazon forest is a net emitter of carbon into the atmosphere (Ibid). Public and private efforts to preserve and restore the Amazon are critical to climate change efforts since the forest may be close to a threshold of dieback. Beyond this threshold, a positive feedback loop will be triggered between deforestation and environmental stressors, such as droughts, that push back the forest area. (Boulton, Lenton, & Boers (2022)). More than three-quarters of the

Amazon has been losing resilience since the 2000s, with the main contributors likely being decreases in rainfall and human land-use activity (Id, pp. 274-276). The dieback of the forest would not only eliminate one of the largest carbon sinks in the world but also release back into the atmosphere the carbon that the lost trees had captured in the past.

Humanmade deforestation in the Amazon can be connected to market competition in at least two ways: 1) private coordination initiatives between market players to prevent deforestation activities which may be captured by competition law prohibitions on coordinated conduct (Gutiérrez and Solarte-Caicedo (2023)) and 2) commercial conditions imposed by firms with market power along the food value chain may be incentivizing deforestation by local farmers.

Over the past 4 to 5 decades, of the total amount of deforested land in the Amazon, 89 percent has been converted to pasture land (Gatti et al. (2022, p. 388)). There is evidence that suggests that the largest meat exporting companies in Brazil still buy significant amounts of beef from deforested areas subject to national government-imposed embargoes. Part of the problem appears to be regulatory design and oversight by the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA). Farmers and meat exporters are able to introduce illegal meat into international trade through a lack of control of embargoed land and of the supply chain - in particular, it has been reported that illegal farms transfer cattle to compliant farms before slaughter, enabling meat packers and exporters to label the laundered meat as deforestation-free. (The Bureau of Investigative Journalism (2019)). Trase, an NGO that tracks the environmental impact of global supply chains, estimates that the deforestation exposure related to beef trade originating in Brazil affects 564,890 ha of forest. JBS and Minerva's exports are linked to a combined 300,000 ha of deforestation exposure (Trase (2023)).

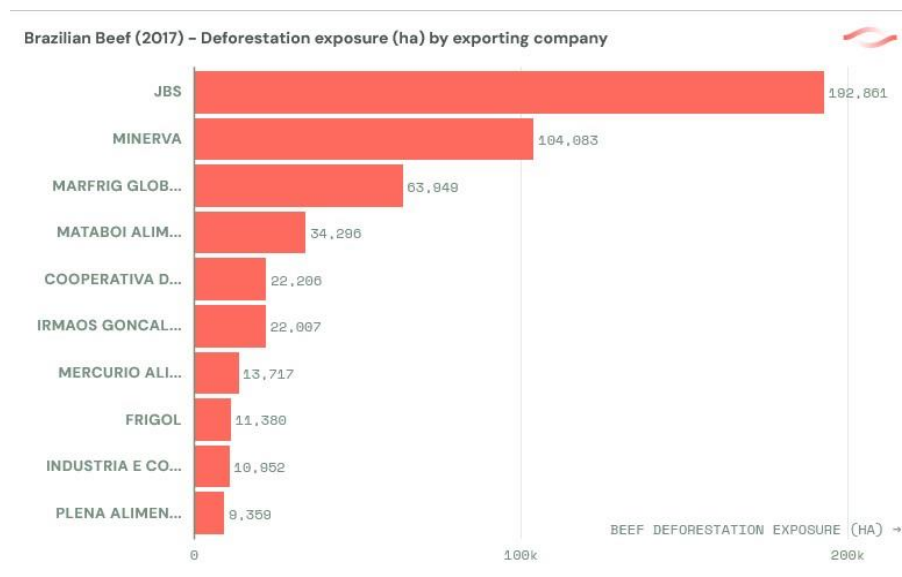


Figure 10 Source: trase.earth

More research and information are needed to establish the nature of the relationship between competition and deforestation exposure. In general, the information presented here suggests that a possible mechanism at play — in addition to the obstacles that competition law may pose for the

coordination of private initiatives identified by Gutiérrez and Solarte-Caicedo (2023) — could be the interaction between firms with market power and the government, which may be negatively affecting efforts to close loopholes and strengthen the enforcement of regulations aimed at curbing the incentives of cattle farmers to clear forest areas.

3. The economics of assessing the effects of market power on environmental performance — the state of the art in economic analysis

The previous section broadly laid down the situation in Latin America in terms of emissions, the potential to contribute to a global clean energy transition given by the rich availability of renewable resources and critical minerals, and the essential role of the preservation of the Amazon forest as a carbon sink. This has helped to preliminarily identify topics of interest in the region that relate to climate change and competition law that have at the same time global relevance.

There are competition law interventions that could contribute to the solution of these problems that do not require the adjustment of the scope of the objectives of the law and its analytical framework and there are interventions that do require such an adjustment. In either case, antitrust authorities need to understand the likely effects of competition and competition law interventions on GHG emissions in order to make informed policy decisions. This understanding should be the basis for the balancing that law enforcement authorities perform — for example in proportionality test assessments. The present section presents the stand of the economic literature on the relationships of interest that could serve as a basis for policy recommendations or to identify areas of future research. The focus is on 1) the literature that approaches the theoretical and empirical relationships between competition and environmental performance of markets as well as 2) the trade-off analysis of the effects on social welfare — which includes welfare economics as well as the more practical issue of assigning monetary values to GHG emissions.

a. What is the relationship between market competition and the environmental performance of firms?

To begin with, we can examine the literature on competition and the direct environmental effects of a firm — that is, the effect attributable to its operation, excluding the environmental effects along the supply chain associated with the commercial conditions it imposes on other firms. There is literature that finds an association between market concentration and toxic substance emissions. Simon and Prince (2016) find a negative association between competition and toxic pollution releases in a panel of US-based facilities. Polemis and Stengos (2019) find an inverted V relationship using a panel threshold model for US-based facilities as well. The literature review suggests no empirical studies focusing on the effects of competition on GHG pollution. There are differences between GHG and toxic substance pollution that can alter the dynamic of the relationship with market structure. One such difference can be the public salience of GHG emissions compared to other forms of pollution, which can impact the incentives of firms to improve their performance and disclose information. This would caution against generalizing from toxic substance pollution studies.

How competition affects the incentives to decrease or increase GHG emissions is unclear. It is possible to envision scenarios in which productive efficiency gains align with lower emissions —

for example, process efficiencies in steelmaking — as well as scenarios in which emissions reductions negatively affect profits — for example, production of steel using green hydrogen requires different facilities and as an alternative to coal is still more expensive (McKinsey (2020, p. 8)). Therefore the theoretical effects of competition on GHG emissions are ambiguous, highlighting the need for empirical work in this area.

A subsequent set of questions relates to the specific mechanisms through which competition could have an impact on the environmental outcomes of markets. One of the possibilities is the relationship between competition, political connections, and environmental regulation. Firms with market power may use their economic profits to pursue rent-seeking activities such as lobbying in order to influence policy that enhances or protects their profits. This is linked to the issue identified in Section II regarding the influence that firms with market power might be exerting to oppose the necessary regulatory improvements to curb the deforestation of the Amazon. Investments in political connections can be directed at promoting lower regulatory environmental standards, their underenforcement¹¹ or other policies that lead to higher levels of GHG emissions. Relatedly and in regard to international supply chains, environmental standards could also influence the allocation of investment in facilities in countries with the lowest compliance costs. Of interest to the present paper, one question that future empirical research could address is whether lower deforestation controls may be fuelling investment in meat slaughter and packing facilities close to illegally cleared land in the Amazon.

The empirical literature on whether investments in political connections affect pollution is mixed. Although Simon and Prince (2016) – who focus on toxic substance pollution – do not find evidence supporting this hypothesis, Delmas et al. (2016), who estimate a model based on greenhouse gas (GHG) emissions at the firm level, do find an association between lobbying expenditures and environmental pollution.

From a more general perspective, the literature does support a connection between market competition, investment in political connections, and policy outcomes. Competition variables such as firm size have been found to be a good predictor of lobbying expenses (Kerr et al. (2014)). In Italy, Akcigit et al. (2023) find that as firms become market leaders they are more likely to invest in political connections.

With regards to the effectiveness of political activism by firms and their interest groups, there is growing evidence that their preferences are a stronger predictor of policy outcomes compare to those of the general population (Gilens and Page (2014)). This is a relevant insight for the present paper given that the interest of reducing costs by firms sometimes does not align with the general social interest of environmental protection.

In Latin America, there is literature in other policy areas on how effective political connections are in shaping policy. In Brazil, there is evidence of the effectiveness of campaign donations and lobbying in obtaining state credits (Claessens et al. (2008)) and public contracts (Boas et al. (2014, pp. 415-429)). In the case of Argentina, there is empirical evidence suggesting an association between the intensity of lobbying activities and donations to political campaigns of incumbents,

on the one hand, and the amount of public contracts awarded (Freille et al. (2019)). No specific literature regarding environmental policies was found.

In the case of climate change policies in Latin America, the question of political connections and environmental regulation becomes more relevant as the four largest emitters are considered by Climate Action Tracker to have critically insufficient (Argentina and Mexico) and insufficient (Brazil and Colombia) targets and policies to achieve the 1.5 oC target. In Brazil, one particular field where policy deficiencies were identified is deforestation control. Future field research is needed in order to identify the main ways in which incumbent firms are preventing governments from undertaking policy changes necessary to meet emissions targets.

As mentioned, another way in which market power can affect deforestation rates is through the incentives that large meat exporters set for cattle farmers. One straightforward possibility from a competition point of view is that buying power drives ranches to cut costs, which could be achieved by illegal deforestation in cases where the detection risk is low. To examine this issue, the literature on the economics of market power imbalances in the supply chain is useful. Increased competition in the food industry has been found to improve the contractual conditions of farmers (Swinnen and Vandeplass (2010)). Relatedly, market power at the retail level has been found to increase the waste of fruits and vegetables from suppliers further up in the supply chain in Germany (Herzberg (2022)). However, this is only indirect evidence for the hypothesis mentioned in this paragraph. There is a lack of studies directly measuring the impact of market power imbalances along the food supply chain and deforestation. Future research is needed to address the specific issue of deforestation or that of environmental outcomes in general.

Aside from the effects on the environment, the stability of the supply chain (related to shortages and price volatility) is also important in the context of the global transition to clean energy. As mentioned, the IEA has identified the geographic concentration of mining and refining of critical minerals such as lithium to be an obstacle to the adoption of clean energy technologies (IEA (2022, pp. 11-12)).

Furthermore, in 2020, lithium production in only three sites accounted for more than half of the global supply (Berger (2022, p. 12)). This should change with the expected growth of production in Argentina. Further research is needed in order to examine mining authorization policies in reserves-rich countries such as Chile and Argentina in order to determine if they are conducive to more competitive global markets that are needed for more resilient supply chains. In terms of competition, it would be preferable to avoid further market concentration when granting exploitation rights of mining sites.

In terms of the adoption of cleaner technologies, the literature on the relationship between innovation and competition can also provide useful insights. When improvements in the rate of emissions also align with the profit-maximizing objectives of the firm – either by increasing the value of the product for consumers or by reducing costs – the same lessons derived from the literature on innovation and competition apply to some extent. The caveat is made because the innovation and competition literature focuses on market performance measures and not necessarily on externality effects. This scenario in which there is alignment between environmental protection

and firm profitability relates to the issue of low penetration of clean energy technologies in Latin America such as wind and solar as well as the movement of local players to more added value activities in the supply chain of critical minerals.

Policies that open markets, such as investments in international networks that increase energy trade, might encourage investments in solar and wind capacity. This in turn promotes innovation in cost reductions of these technologies, which in turn contribute to the goal of access to affordable clean energy. For example, production pushes in solar cells have been associated with greater R&D investments leading to cost reductions (Ding et al. (2020)). Competition law intervention regarding anticompetitive conduct in energy generation and distribution might be able to play a role in promoting higher penetration rates that contribute to innovation in cost reductions.

The relationship between competition–innovation–environment is of a different nature when improving the environmental performance of a firm results in lower profits either because consumers do not assign added value to cleaner production and/or because lowering the environmental impact increases production costs. This scenario is connected to the issue of supply chain control from meat packing and exporting companies to avoid the purchase of meat produced in illegally cleared areas in the Amazon forest. A mixture of technological and soft innovations might be needed in order to better monitor the origin of raw materials and avoid the purchase of illegal meat. This may require financial investments that would increase the costs of meat packers/exporters. This causes a first-mover disadvantage of developing and adopting cleaner technologies which may only be overcome either by government-mandated standards that apply to all market players or by private coordination.

To be sure, the firm might still have self-serving objectives to innovate in order to reduce its environmental footprint when short term profits do not align with improvements in environmental footprint. There could still be indirect benefits to the long-term objectives of the firm even if short-term profitability is sacrificed. One such benefit is improved corporate image, which does not necessarily translate into an upward shift of the demand curve but plays a role into the success of the company with other stakeholders such as employees and investors (Pruzan (2001)).

Along this line, Nowag (2020) argues that the assumption of a rational profit maximizer that serves as a basis in studies on sustainability initiatives of firms can be questioned on the basis that: 1) investments in corporate social responsibility show a willingness to sacrifice profits and 2) companies might be willing to sacrifice profits for sustainability purposes in the context of the public debate on sustainability and pressure from investors. Both points have a direct connection to corporate image and the concern regarding investors does relate to financial resources. Therefore, these arguments against the profit maximization objective can also be framed as motivations to invest in sustainability at the expense of short term profits when this serves the ultimate financial success of the firm in the long run. In other words, investments in sustainability that improve corporate image are still consistent with selfish motivations even in the presence of short-term profit sacrifices. On the supply side, employees might value working for such a company and the same for suppliers, which has an effect on the financial bottom line of firms. This is not to say that the incentives derived from the benefits of a stronger corporate image are enough to lead companies in the right direction regarding their environmental impact when this increases the cost

of production that is not offset by an upward shift of the demand curve. The above was only to illustrate that the incentives to innovate when there is a lack of alignment between environmental protection and firm profits are not inexistent. Whether the benefits that can be reaped by exploiting environmental externalities will dominate is an empirical question.

Trade-offs between competition and sustainability exist when the discussion turns on whether state regulation or private initiative through coordination in a market is a more efficient and effective way to improve the environmental performance of a market in case of nonalignment between firm and society interests (Nowag (2020, p. 17)). In the abstract, coordination in a market, even if it is regarding variables and information sharing that do not directly relate to price and output, increases the risk of tacit or express collusion for exploitative or exclusionary purposes. Both regulation and private initiative have their advantages and disadvantages so the question of the optimal solution depends on specific circumstances. Private initiative may prove the best option even if not the most efficient one if a regulatory solution is not feasible in political terms and/or if its implementation would be deficient (Ibid.). When private coordination is the better choice, its benefits should be assessed against the risks to competition.

b. Trade-off analysis of GHG pollution as a basis for the balancing of interests performed by antitrust enforcement authorities

The analytical framework used in antitrust cases is built on the foundations of neoclassical price theory and industrial organization. In some countries such as the US and in certain Latin American jurisdictions, this has led to an approach known as the consumer welfare paradigm, by which harms to competition are distinguished from mere harm to inefficient competitors to the extent that negative effects to consumer surplus can be identified. Price effects tend to be the dominant metric, in part perhaps because of their observability and ease of measurement as opposed to the problem of quantitative measures of effects on quality and innovation. Even if one could reasonably capture quantity and innovation effects in a market, these metrics are too narrow to account for the effects of oligopolistic and monopolistic behavior on the environment, which will necessarily transcend the boundaries of a market of a defined set of producers and consumers/customers.

It is well-established economic theory that environmental harm not internalized by market participants leads to decreased aggregate welfare. Firms that do not internalize the cost of pollution will tend to over-pollute. Information asymmetries can also hinder consumers from choosing greener products even if they value them more. Firms that do not disclose environmental performance information or do so in a misleading way contribute to the problem of information asymmetry. However, there are real difficulties in assessing the overall welfare effect of firm conduct that affects efficiency through different channels (types of market failure) at the same time – for example by affecting market power and externalities. As a matter of law enforcement, this becomes more of a problem if the effects on market power and externalities run in different directions.

This paper focuses on trade-off analysis in terms of social welfare (Glick et al (2023)), which goes beyond total welfare effects of an individual market. The analysis proposed here is however narrower than the polycentric approach put forth by Lianos (2019) since we are still focusing on

comparative static welfare effects to which a monetary value can be assigned. A greater degree of polycentricity would be achieved, for example, if the analytical framework would include citizen preferences as they are revealed outside of the market, such as voting and other forms of political participation. The approach of this paper is incremental — going from consumer welfare to total social welfare — acknowledging however the need to work on analytical frameworks that capture human behavior in a more holistic manner.

The question of how to quantify environmental harm/benefits in monetary units that allow to perform a tradeoff analysis with competition variables such as price and quality is crucial to provide guidance on how authorities and courts could perform this balancing. Unsurprisingly, current methodologies to assign monetary values to GHG emissions struggle to capture the complexity of the damage pathways from emissions to areas of concern such as human health and ecosystems, which leads to high levels of uncertainty in the estimates (Dong et al. (2019)). In order to arrive at a monetary value, the first step is to account for the emissions associated with the lifecycle of a product or service. In the context of competition law, an example could be a merger. This step already poses a challenge given what has been explained regarding the difficulties of estimating the relationship between competition and GHG emissions.

Even if one could have a reliable estimate of the effect of a transaction on GHG emissions, after converting them to CO₂ equivalent units (CO₂-eq) in case other GHGs are emitted, one has to establish the damages that the emissions cause. Different methodologies vary in the coverage of areas evaluated. The most well-assessed parameter tends to be human health (Dong et al. (2019, p. 543)). Areas such as ecosystems are less well covered because of a lack of data and understanding of the causality between emissions and ecosystem damage. In essence, this means that monetary values of GHG emissions tend to underestimate the damage caused.

The final step is to assign a monetary value to the damages. For example, if public health is being assessed, sometimes the damage in terms of disability-adjusted life years — a measure that adjusts life expectancy by the loss of healthy life years — one possibility is to count income lost as the monetary value of that part of the damage. Damage to non-market goods such as biodiversity loss is sometimes monetized via surveys that gauge willingness to pay. Another option to assign a monetary value to such goods is to use prevention costs, that is, the financial costs of averting the damage (Dong et al. (2019, p. 541)).

It is not realistic to provide a perfect conversion or exchange rate between the volume of emissions and a specific currency because of the complex nature of environmental harm. If we however have imperfect methods of estimation then the question turns into a policy choice. Authorities would have to choose an imperfect financial measure of emissions to trade off against price and output effects. This tradeoff between accuracy and manageable policies is present in other areas of antitrust analysis – per se or by object offenses are a prominent example – so there is no reason to discard this possibility at the outset.

Another policy option is to avoid this type of currency conversion entirely and give environmental effects precedence over price and output effects if the former cross a certain threshold, say the effect on greenhouse gas emissions go over a pre-specified amount of metric tons as a result of a

merger. This choice would result in the transaction being blocked regardless of the efficiencies in terms of price and output that it would bring about.

4. Legal issues – How can competition law address the relationship between market power and the environmental performance of firms?

On the basis of the issues identified in Section II and the state of the art of the economic literature described in Section III, this section presents the legal analysis of the potential interventions that antitrust authorities can undertake in order to contribute to the reduction of GHG emissions. The section presents first the interventions that do not require an adjustment of the current legal frameworks and their objectives — traditionally, consumer welfare and efficiency. Then the analysis moves towards the interventions that would require an adjustment of the prevailing analytical framework. In this case, the analysis includes the risk of conflict with other authorities by overstepping its competence and how to mitigate this. In both subsections, the analysis covers both preventative (sword) and supportive (shield) integration of sustainability into competition law enforcement.

a. Interventions using traditional competition tools GHG emissions as a quality parameter

The environmental impact of a product can sometimes be considered as a quality parameter in competition cases (Nowag (2020, p. 18) and Volpin (2020)). For example, if consumers value meat that has not been produced through the deforestation of the Amazon forest, then this could be considered in the analysis of the effects of the conduct or merger. Another example would be if end-consumers would value low carbon-intensity energy more than carbon-intensive sources. In these cases, the objectives of the law would not need to be modified in order to include environmental protection.

The inclusion of sustainability as a quality parameter presents substantial challenges linked to the complexity of quantitatively assessing quality in competition cases. Quality has been predominantly analyzed qualitatively through either testimony or consumer surveys, which are imperfect measures when compared to more direct econometric methods to gauge demand changes attributable to a given quality characteristic (OECD (2013, p. 7 & 31-40)). In the specific field of sustainability, a recent well-known example in the EU of the use of qualitative analysis was the “Chicken of Tomorrow” case analyzed by the Dutch Competition Authority (ACM). The ACM, in the context of justifying efficiencies of an anti-competitive agreement, attempted to gauge how much consumers valued chicken that was produced according to higher animal welfare standards. This was done through a willingness-to-pay survey by which it was estimated that consumers were willing to absorb a premium of EUR€ 0.68 per kilo for improved animal welfare due to the cooperation under investigation and an extra EUR€ 0.14 per kilo for improvements in environmental effects (ACM (2014, p. 6)). In the end, these benefits were not deemed sufficient to offset the price increase effects of the agreement and the ACM advised the organizers of the “Chicken of Tomorrow” initiative to adjust the terms of the cooperation.

Regardless of the result, the ACM case illustrates one avenue to incorporate GHG emissions into antitrust analysis without adjusting the consumer welfare framework. This was done in the context

of an agreement but one could also think of other possibilities. One such could be if the parties to a merger present an improved environmental footprint (e.g. avoiding deforestation of the Amazon) as an efficiency. This could be evaluated in the same way if there is evidence that consumers are willing to pay for such improvements. If there is enough data available, econometric methods should be preferred in order to gauge the market value of the environmental quality parameter. However, imperfect measures such as surveys could be used in case of data limitations.

It could be argued that in critical cases such as the deforestation of the Amazon, consumer willingness to pay for more environmentally friendly products severely underestimates the effects of the conduct attributable to the market power of firms. In this paper the focus is placed on the impact on GHGs in the atmosphere. However, as already mentioned, the impact of the deforestation transcends climate change given the loss of biodiversity associated with deforestation. For this reason, the next subsection offers complementary considerations to take into account that do expand the scope of the prevailing objectives of competition laws. However, the inclusion of GHG emissions related to deforestation as a quality parameter is a first step in the right direction.

Prioritizing enforcement in markets strategic to GHG emissions targets

Environmental objectives could also be introduced in priority-setting policies. Competition authorities could target their law enforcement to markets that are of special importance to environmental goals and thus contribute without the need to change the substantive analysis of the conduct. Nowag identifies two ways in which this can be done without causing controversy on the limits of competition law: 1) an antitrust authority can target anticompetitive practices where sustainability is a parameter of competition (either because sustainability aligns with cost reductions or consumer willingness to pay) and 2) the authorities can also seek to intervene in order to spur competition in the development of climate-friendly technologies. Under these scenarios, antitrust enforcement would collaterally lead to improvements in environmental outcomes.

In this bag of priority setting one could subsume interventions that would aim at promoting the inclusion of Latin American players in more value-added activities in the supply chain of critical minerals such as lithium and copper, ensuring competition conditions at the mining stage of the industry. The same could be said regarding the objective to promote the penetration of low-carbon electricity sources such as wind and solar. Competition law enforcement in these areas could be performed using the prevailing analytical framework and bring at the same time collateral environmental and development benefits. In the case of more value-added activities, one area to be explored is technology transfer practices. The economic analysis in antitrust cases pits two types of innovation effects against each other: the innovation incentives of technology producers and the innovation effects that the dissemination of the technology produces in order to evaluate the short and long-term effects on consumer welfare. EU, US, and increasingly Indian and Chinese antitrust agencies have accumulated experience in targeting technology transfer practices. This could serve as a starting point for obtaining guidance for authorities in Argentina, Chile, and Brazil, where minerals critical to clean technologies are found in abundance.

Historically speaking, the leading Latin American competition authorities have shown little interest in markets involving IP rights in production technologies, with only a handful of cases to be found in this area. In the specific case of technology transfer, there are two cases that could — not without controversy — be considered to involve an actual transfer of productive knowledge. There are no concrete answers as to why this is the case, especially in competition law regimes with a long tenure such as Colombia and Chile — and to a lesser extent Brazil and Mexico. Future research should address this question in the context of a broader exercise focused on enforcement priorities setting. This is especially relevant in the case of refining critical minerals, activity which, as mentioned in Section II, presents a high geographical concentration that threatens the stability of the supply of lithium.

The literature on what considerations should be made in order to establish enforcement priorities, especially in developing countries, is scant. Brook and Cseres (2021, p. 15 ff) advance a theoretical framework to evaluate the priorities chosen by antitrust authorities in the EU based on the fact that priority setting is an exercise of administrative discretion and as such should be subjected to general administrative law principles of proportionality, fairness, predictability, and the duty to provide justification. Brook and Cseres' work is enlightening in the area of how to evaluate the priorities chosen by authorities but only indirectly provides guidance on how to choose the markets. Their framework suggests a balanced portfolio of cases in terms of types of conduct and market size, among others, but does not explicitly include criteria such as socio-economic relevance of the market. In the case of developing countries, where competition agency budgets may be more constrained, there is a greater need to align competition law interventions with wider development objectives in order to justify the use of taxpayer resources.

The question of priority setting according to development objectives — including the preservation of the environment — is far from trivial. As a first step, one should specify the policy goal one is trying to attain such as sustainable development. Within this realm, there are competing goals — competing in the sense of vying for attention — such as affordable healthcare and access to clean energy. How to prioritize one goal over the other is a complex exercise that includes an assessment of the harm caused by firms with market power that antitrust intervention could avoid. This is a substantial task given the paucity of literature on how competition affects environmental outcomes and the variability in the estimates of monetary values of the harm caused by GHG emissions in the prevailing methodologies.

If for example that policy goal is set to be sustainable development – which can be set as a policy goal of priority setting without modifying the focus on market power that serves as a framework of analysis in antitrust cases – then the next step is to assess the expected benefits that antitrust scrutiny can bring. Electric power generation is one of the most relevant markets in terms of GHG emissions but it should only be included in the enforcement agenda if one can identify beforehand promising avenues of competition law intervention that can contribute to the solution.

More research is needed to provide more specific advice on which markets to include in the enforcement priorities of antitrust authorities in Latin America, and in developing countries more generally. The socio-economic development potential of industries such as lithium mining and refining, clean electricity technologies, and the meat exporting industry in Brazil (as well as other

industries linked to the deforestation of the Amazon forest) and the global relevance of the performance of these markets are strong arguments in favor of including them in the regional agenda. This, nonetheless, should be weighed according to a holistic framework to choose priorities based on sustainable development objectives.

Assessing industry cooperation initiatives to improve the carbon footprint

Another interaction between competition law and environmental objectives that, under some circumstances, does not require expanding the scope of anti-trust analysis is private initiatives in which industry participants coordinate to improve their environmental footprint. As pointed out elsewhere, balancing between consumer welfare and environmental protection is only required after it is established that the agreement does fall within the scope of coordinated conduct prohibitions (Nowag (2022, p. 151)).

Even in cases where the agreements do pose competition-related risks, an explicit balancing against environmental considerations can be avoided. In support of this approach when discussing EU competition provisions, Ullrich (2022) argues against modifying the existing framework of analysis of Art. 101(3) TFEU regarding efficiencies defenses of anticompetitive agreements. The author argues that the current framework is already broad enough to entertain plausible environmental efficiencies and that the competition authorities can focus on alleviating concerns of competitive harm.

In practice, when anti-trust authorities examine sustainability agreements, most of the time the assessment does not focus on the environmental effect proffered as a justification. Rather, the authorities focus on the commitments offered by the parties to alleviate concerns of loss of competition. This approach was used by the CADE when analyzing a joint venture (JV) that standardized the information on sustainability practices along the food supply chain (CADE (2023)). The JV was ultimately approved subject to the commitments submitted by the parties to mitigate competition concerns around information sharing and exclusionary effects of the agreement. The disposition of the parties to amend the cooperation agreement as required by CADE shows that competition law intervention can be used as a tool of regulatory dialogue that should not have deterrence effects on private initiative. In some cases, however, there can be a conflict between competition and the environment. The analysis of this constellation of collaborations will be performed in the next subsection.

b. Interventions that require an adjustment of the prevailing analytical framework in competition law

A focus on consumer welfare underestimates the harm caused by market power on the environment

In the previous subsection it was discussed that the lack of environmental exposure could be a characteristic that beef consumers value. Therefore, its assessment as a quality parameter would introduce this environmental problem within the traditional competition law analytical framework (Nowag (2020, p. 18) and Volpin (2020)). However, in terms of environmental protection of

complex ecosystems, the socio-economic effects of the harm, in this case in terms of deforestation and climate change, go beyond the artificial market definition boundaries imposed in antitrust cases. An underestimation of the effects of an exercise of market power can lead to an underdeterrence of harmful conduct. To frame the problem in specific terms, we can use a set of questions related to the problem of the preservation of the Amazon forest. What if consumers do not assign any extra value to product not exposed to deforestation? Or in a less extreme scenario, what if the value assigned by consumers to the lack of deforestation exposure is still below the value of the environmental damage that only beef consumers will suffer? In addition, what if the evidence would show that market power by meat exporters is a driving factor of the deforestation? Should a competition authority completely disregard these effects since consumer welfare in a strict sense is not affected? In such a case one could argue that other policy interventions such as environmental regulation could be better options. However, if firms with market power are found to be investing resources to oppose such regulations, should they be allowed to do so? What does society lose if the ability of companies to influence the policy-making process is restricted?

The point of the questions laid down in the previous paragraph is to set the terms of the debate as follows: when conduct that is enabled or facilitated by the market power of firms causes environmental damage that could be valued at orders of magnitude above the effects of the conduct to consumers in a defined relevant market, should competition authorities disregard the analysis of the environmental effects if they cannot readily be subsumed within our prevailing notions of consumer harm? To approach this problem, it is useful to divide the relevant considerations to be made in questions of legal scope and legal administrability, which in turn are based on our economic understanding of the underlying problems.

Do competition laws allow the inclusion of environmental harm beyond the specific market in question?

On the issue of scope, the starting point is the wording of the objectives of competition laws in order to establish the room left to make considerations beyond consumer welfare and productive efficiency. The wording should also be put in the context of the constitution in each country and international law commitments (Nowag (2020, p. 15)).

In Brazil and Argentina, the competition laws define the legal interest to be protected broadly as the economic order and the general economic interest, respectively. However, even in these cases, the question remains how narrowly the competition authorities and courts have interpreted these legal interests to be. In the case of Brazil, it has been suggested that CADE has focused on traditional consumer welfare considerations (see Kira (2023)). This is in line with the findings in Gutiérrez and Solarte-Caicedo (2023, p 130) regarding the lack of interest on the part of CADE in a merger case to entertain arguments regarding the compliance of the merger parties with deforestation regulations. In addition, in the context of the previously mentioned joint venture case in Brazil regarding the standardization of sustainability information along the food supply chain, the president of CADE recognized the relevance of other interests at hand such as sustainability but clarified that the analysis of CADE cannot include them in order to avoid overextending its competence (CADE (2023)). In that occasion, the president of the institution

voiced its concerns to use competition authorities to fill the gap left by the inaction of other institutions.

In the abstract, the concerns of the president of CADE are indeed valid. The intervention of antitrust authorities needs to have boundaries required by principles of rule of law and separation of powers. Antitrust authorities should not be empowered to fill regulatory gaps that go beyond their mandates or against our best current understanding of the effects of competition in the performance of markets. More specifically, antitrust authorities should not supervise compliance with environmental rules and objectives if there is no connection between the facts of the case and market power, which is the market failure that competition authorities have traditionally addressed.

Even if avoiding the overstepping of boundaries is a consideration with a strong legal basis, some overlapping between antitrust and other areas of public policy is unavoidable. As a matter of legal interpretation, it is difficult to argue that competition on the basis of environmental degradation and pushing externalities away from market suppliers is competition on the merits (Persch (2023, p. 156)) or in accordance to the protection of the economic order in terms of the Brazilian statute.

How to avoid risks of conflict with other authorities

The inclusion of regulatory compliance considerations in antitrust analysis is not without precedence. There are valuable lessons to learn from the antitrust prosecution of Facebook in Germany and the decision by the German Federal Supreme Court regarding violation of data protection laws as a form of abuse of dominance. Drawing from the lessons of this case and the literature analyzing its implications, it has been suggested that antitrust authorities do not overstep their competence if compliance with other legislative frameworks is analyzed subject to two requirements: 1) that the non-compliance is enabled or facilitated by the market power of the firm and 2) that the harm caused by non-compliance can be framed in terms of consumer welfare and efficiency, the latter understood in its broader meaning of allocative efficiency (Beneke Avila (2024)).

The legal foundation of these requirements can be drawn from a systematic interpretation of competition statutes. Even if consumer welfare and efficiency goals can have broad interpretations from a textualist point of view, the norms on the type of conduct that is punished put in place a restraint on the circumstances in which a competition authority can address environmental harm. Actionable conduct in most statutes relates to the exercise of market power either through unilateral behavior or through coordination. As a consequence, it can be argued that environmental harm can be considered as part of the theory of harm to the extent that it is associated to market power. Otherwise, environmental regulation could be a better option to address pollution. To summarize, the above considerations do not justify an unbounded ability of competition law enforcement to address environmental harm but rather serve as the foundation of the cautious approach with which this should be carried out.

Such an approach would make antitrust a complementary tool to other forms of environmental regulation. Competition law and environmental law have different substantive approaches and therefore they should be able to co-exist in situations of overlap. Competition law enforcement addresses harm that arises from market power and the remedies that competition statutes include

are geared towards mitigating this market phenomenon. Environmental law addresses harm to the environment more directly with a set of ex-ante (such as authorization processes) and ex-post interventions (such as policing violations to environmental standards) but does not tend to address structural industry problems, such as market power, that may be causing worse outcomes in terms of pollution and overuse of natural resources.

Overstepping problems can also be mitigated with coordination mechanisms. For example, environmental agencies could aid the competition authority with the necessary expertise to assess environmental damage. In addition, behavioral remedies that involve environmental standards could also be done in conjunction with environmental protection agencies. More research is needed in order to establish the best forms of cooperation.

The problem of meat exports and deforestation of the Amazon can be used to put the discussion in less abstract terms. As the current stand of the literature is, there is indication of plausible connections between market power imbalances in the supply chain and the incentives of farmers to illegally clear parts of the forest to raise cattle. In addition, economic profits in the supply chain arising from market power could be used to invest in political activism in order to oppose regulations against deforestation and their enforcement. To be sure, there is no economic consensus on these dynamics. Such consensus could be useful in order to establish rebuttable presumptions of harm — as is done for example in the case of conduct prohibited on a per se/by object basis. The lack of consensus, however, does not prevent antitrust authorities to make case-specific inquiries.

A case-specific inquiry into the environmental effects of the exercise of market power by firms in the meat supply chain would introduce additional costs to the litigation of cases, such as a higher likelihood of error due to the added complexity of the case and the costs of generating and analyzing evidence on environmental effects as a new point of discussion (and political activism in the case of the use of political influence to avoid regulatory oversight). Such costs argue in favor of conducting such an inquiry only in exceptional circumstances, which could be justified in the case of the deforestation of the Amazon because of its global relevance.

Further research should be carried out in order to provide guidance on which evidence and methods could be used in order to make an assessment of this nature. There would be in addition other non-trivial questions in cases involving a supply-chain approach. One such is the question of liability for indirect harm. More concretely, should the effect of contractual terms on deforestation by cattle farmers be included in the calculation of the fine and damages owed by meat exporting companies? Would a remedy to modify the contractual terms suffice? Could the remedies imposed include obligations to improve the monitoring of the supply chain to ensure that deforestation exposed meat is not purchased? Could CADE require meat packers to present a plan to reforest an area equivalent to that which has been cleared by suppliers?. In the case of political activism, should lobby efforts to oppose regulatory oversight be considered as an exploitative abuse of dominance? could CADE impose restrictions to lobbying spending and political party contributions as a remedy? Similar considerations can be made in the case of carbon intensity of the electricity supply as a parameter of competition in the energy industry.

When restrictions of competition substantially improve the effectiveness of industry initiatives to improve its carbon footprint

Another area in which the scope of competition law provisions would need to be adjusted is in the assessment of cooperations to achieve sustainability that include restrictions of competition that improve the performance of the agreement in environmental terms. This would be, for example, a boycott to suppliers of meat exposed to deforestation. Certainly, a boycott would give meat suppliers a stronger incentive to improve their practices than a mere database that grades their sustainability practices. If mitigating competition risks does compromise the effectiveness of a sustainability agreement, then the assessment of competition authorities within a narrow focus on the consumers of a defined market would be harmful to environmental objectives. As a question of good policy, an explicit balancing between environmental and consumer welfare effects would be preferable.

In order to avoid risking a permissive approach to anticompetitive practices, it has been suggested that in the balancing of countervailing environmental efficiencies, agreements should only be exempted when the companies show a decrease in total GHG emissions and not in GHG emissions per unit produced (Persch (2023, p. 155)). Under such a narrow exemption, the most environmentally beneficial agreements would not be captured by antitrust provisions, even if other beneficial agreements would not pass antitrust scrutiny. Nonetheless, this seems like a balanced approach to the uncertainties involved in quantifying the effects in monetary terms and the room for error that this implies.

In addition to carving narrow exemptions to sustainability agreements, there still could be a need to amend legal statutes to explicitly include environmental or sustainable development objectives as a goal of competition law. Such explicit consideration would be necessary to avoid the chilling effect that the risk of prosecution would have on sustainability agreements that require a degree of competitive restrictions. This importance is highlighted by the current Republican-led effort in the United States to prosecute investment funds that insist on improving the environmental, sustainable, and governance standards (Sisco and Wolman (2023)). At this stage it is not possible to determine the risk of such a practice to be captured by the Sherman Act. However, the mere risk of liability could be enough to deter practices beneficial to GHG emissions objectives, especially if the environmental impact is not an explicit part of the assessment of the prosecuting authorities and the judges. A similar threat to a boycott on soy exposed to deforestation in Brazil has been pointed out by Gutiérrez and Solarte-Caicedo (2023). Soy producers had threatened antitrust action against the boycott. In the end no proceedings were instated but the effects of the mere threat cannot be readily disregarded.

As a final point of discussion, expanding the scope of competition law to include the analysis of deforestation effects or GHG emissions reductions from private coordination initiatives comes with the challenge of converting environmental effects into monetary values in order to balance the trade-offs. As explained in Section III, current methodologies struggle to capture the complexity of the damage caused by emissions. As a result, the actual damage tends to be underestimated and the estimates from different methodologies varies substantially. In the face of imperfect measures, the issue turns into that of a policy choice between them. Further research is

needed in order to identify the methodologies most compatible with antitrust analysis in order to make the assessment more manageable within the litigation. One issue to be explored is that of the burden of proof regarding the monetary estimates. Preliminarily it can be said that when environmental effects are considered as a countervailing efficiency, the burden of proof should lie with the party alleging it. Conversely, when environmental effects are considered as part of the theory of harm, the damage or fines, the burden of proof should lie with the plaintiff/competition authority.

4. The way forward

As a way of conclusion, this section presents the immediate policy recommendations that can be drawn from the discussion and the points for a future research agenda. We start with the areas that do not require an adjustment of the scope of antitrust prohibitions before moving to those that do require such modifications. The courses of action in the former category may enjoy greater consensus, which renders them as a path of least resistance. Identifying such paths can be an important contribution of legal research.

For competition law interventions where environmental benefits would be a collateral, one issue is whether competition authorities prioritize them. Of interest to the present paper we have 1) the interventions that promote dissemination of technologies to generate clean electricity and process critical minerals so that regional players can move to greater value-added activities and improve the stability of the global supply chain, and 2) targeting obstacles to the penetration of clean energy such as wind and solar.

The first argument for them to be considered among the enforcement priorities of the authorities in the region — in Chile, Argentina, and Brazil in the case of critical minerals and the rest of Latin American countries in the case of clean energy generation technologies such as wind and solar — is the ability of increased competition to promote their sustainable development potential. These industries could form part of a development agenda that has environmental protection as one of its main axes. Production of wind turbines and solar panels, as well as their dissemination, would give the national energy grids in Latin America a further push from their already low carbon-intensity baseline. This would further enhance the comparative advantage of countries in the region to produce clean hydrogen, which could itself be a critical component of the development of the manufacturing industry in Latin America as the costs of production of this industrial fuel are reduced. The promotion of competition conditions along the value chain of critical minerals, on its part, would be vital in order to procure stability in their global supply chains, which is threatened by current trends of geographical concentration.

The importance of these industries also justifies further research in the policy and academic spheres that could give antitrust authorities valuable guidance on how to approach these markets. Narrowing the focus to a few industries to explore issues such as obstacles to entering more added value activities in the supply chain offers the opportunity to make the analysis more manageable in economic and legal terms without losing socio-economic relevance of the results. Case studies of wind and solar energy penetration in the region as well as the supply chain of critical minerals

could be used to offer competition authorities further guidance when setting their priorities and subsequent enforcement actions.

The introduction of competition in mining and refining of critical minerals and in energy generation could be done with a broader focus than competition law. Other policy areas aimed at increasing market dynamism could be considered such as the granting of exploitation rights of mine reserves and regulation that affects intra and international commerce of energy.

Another important contribution on which policy and academic research could contribute is in developing a framework that competition authorities could use in order to choose enforcement priorities according to sustainable development objectives. This does not require an adjustment of the analytical framework of cases to include socioeconomic development variables in the analysis of effects. The development factors would be used only to choose industries where increased competition would have environmental benefits as a collateral effect. The paucity of the literature on this framework as well as the necessity to maximize the effects of scarce budget resources in Latin America underpin the importance of this research.

Another way to include environmental considerations in competition law cases that does not require the adjustment of the prevailing analytical framework is assessing GHG emissions of a market as a quality parameter. The issue then turns on how such assessment would be performed in practice. As the “Chicken of Tomorrow” case shows, one possible avenue is to use qualitative methods — such as willingness-to-pay surveys — to estimate how much consumers value improved environmental performance in order to quantify the loss of consumer surplus in terms of quality degradation. This is a first step to include a more accurate assessment of the effects of a conduct or merger, at least according to the traditional consumer welfare focus. Further research should be done to assess the adequacy of other methods of estimation — for example, regression analysis — and how they perform against qualitative ones in terms of the accuracy of the predictions as well as the costs of using them in the course of the litigation.

Finally, another policy action course that does not require expanding the scope of competition laws is to use the process of regulatory dialogue between the authority and private initiatives that coordinate industry players to improve their environmental footprint. As the Brazilian case shows, in some cases the restrictions of competition do not have a significant association with the overall effectiveness of the scheme. Therefore, when the authorities engage in a process to obtain commitments that mitigate the competition concerns, private initiative should not experience chilling effects due to competition law intervention. This process also avoids the need to add complexity to the analysis since the environmental effects do not need to be balanced against the restrictions to competition.

Notwithstanding the above courses of action and research that may enjoy greater consensus, an expansion of the scope of analysis in competition cases may be necessary to capture the relationship between market competition and environmental performance. The inclusion of GHG emissions as a quality parameter will lead to an underestimation of the social harm of anticompetitive behavior and mergers because environmental harm extends beyond the boundaries of defined relevant markets. In addition, consumer valuation of sustainable production can be

below the actual harm of the specific industry in question. If this harm arising from the exercise and entrenchment of market power is not taken into consideration at the stage of the liability and remedies, the deterrent effects of competition law may be undershooting the mark.

In the case of the deforestation of the Amazon rainforest, there are two ways in which competition or the lack thereof may be playing a role: 1) market power imbalances in the meat exporting industry may be leading to contractual conditions with farmers that incentivize forest clearance as a way of cutting costs and 2) firms with market power may be using their economic profits to invest in political activism aimed at avoiding regulatory oversight of deforestation activities.

Regarding 1), market power imbalances have been shown to lead to unsustainable practices in other industries such as the discussed example of fruits and vegetables in Germany. There is no specific literature on the meat supply chain in Brazil, but the considerations presented in this paper would justify a case-specific investigation of the Brazilian antitrust authority. Still, further research in this specific area would be useful in order to guide CADE regarding the specific causal mechanisms to explore and the type of evidence that can be gathered.

Research on market power imbalances and their effects on sustainability practices in the supply chain would also be necessary in the mining and refining of critical minerals. The exploitation of nickel deposits along the Amazon basin could put further stress to affected ecosystems. In addition, the mining and refining of lithium has been linked to water scarcity and pollution of sources used by indigenous populations in Chile and Argentina (Rodríguez (2023)). Therefore, the topic of competition and mining of critical minerals should have a general sustainability focus that looks at effects beyond the development of clean energy technologies.

Point 2) starts with a factual inquiry. Testimony and documents of the investigated firms and the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) could shed light on the role that meat exporters and large landowners have on the policymaking process. Evidence showing opposition to regulatory improvements could be addressed through behavioral remedies restricting lobbying efforts and other forms of political activism by incumbent firms with market power along the supply chain. Such remedies could be imposed in the context of mergers and acquisitions and anticompetitive conduct proceedings under exceptional conditions.

Political activism by firms with market power should only be captured as a theory of harm and as part of a remedy in a narrowly defined set of circumstances. One such is the relevance of the socioeconomic harm at play, which in the case of the Amazon forest could be presumed due to its global relevance for GHG emissions targets. The intervention restricting the rights to be involved in the political process of firms should be weighed against constitutionally protected rights. This balancing has to include the potential loss to social welfare from the reduction of lobbying activities and political party donations of firms considering at the same time that the process of drafting and enacting of regulations already offers opportunities for participation such as public comments phases. Such forms of participation may in addition put stakeholders with less financial resources on a more equal footing with respect to incumbent firms with more substantial financial resources. Further research in this area would be helpful for competition authorities and the judiciary to perform an assessment and balancing of this nature.

Expanding the scope of antitrust analysis carries with it the risk of overstepping the jurisdiction of other authorities such as environmental agencies. This in turn would run counter to principles of rule of law and separation of powers. On the other hand, an overlap between competition law and other legal fields is unavoidable when harm arising from market power can affect consumer welfare and other public interests at the same time. In order to mitigate overstepping risks, antitrust law should only be used as a tool to prevent and correct harm from firm conduct subject to the following requirements: that the harm is caused or enhanced by an exercise of market power and that the harm can be framed in terms of allocative efficiency, which can be affected by externalities and market power at the same time.

Another area that requires an explicit balancing between environmental concerns and consumer welfare in a relevant market is the case of private coordination activities where competition restrictions have a substantial effect on the efficacy of the scheme. One such example is boycott of suppliers that are linked to environmental degradation. In such cases, requiring the mitigation of competitive effects by exploring less restrictive alternatives has the potential of running against sustainability objectives. In such cases, it has been proposed that narrow exemptions are carved out in order to mitigate the risk that environmental concerns are misused as a justification for agreements that affect consumers in a market. A narrow exemption could be implemented through strict standards on justifying environmental effects such as requiring that the agreement has the effect to reduce total GHG emissions and not just emissions per unit supplied (Persch (2023)). The difficulty still remains in establishing how much emissions would compensate a given effect on higher prices paid by consumers, which brings us back to the point of assigning monetary values to a CO₂-eq unit.

Expanding the focus of competition law to the analysis of deforestation effects or GHG emissions reductions from private coordination initiatives presents the common challenge of converting environmental effects into currency in order to balance the trade-offs. As explained in Section III, current methodologies struggle with the complexity of the damage pathways of emissions. As a result, the real damage tends to be underestimated and the estimates from different methodologies varies substantially. In the face of imperfect measures, the issue turns into that of a policy choice. Further research is needed in order to identify the methodologies most compatible with antitrust analysis in order to make the assessment more manageable within the litigation. One issue to be explored is that of the burden of proof regarding the monetary estimates.

In order to better understand the relationship between competition and environmental performance and fill gaps in this literature, one promising focus point of research in terms of feasibility and relevance of the results would be the relationship between competition in electricity generation and carbon intensity of the grid. Even if one could not generalize the results of such a study to other industries or measures of pollution, the relevance of this industry for attaining GHG emissions reduction goals globally would make the results a valuable guide for antitrust authorities around the world that wish to intervene in this market. Possible mechanisms to be explored through which the degree of competition (measured through direct or indirect indicators) could be affecting carbon intensity is through lack of innovation/adoption of the latest technologies and through the

obstaculization of entry of firms using clean sources of energy through market foreclosure or promoting policies that close the market.

Studies on the association between market power imbalances in food supply chains and deforestation in the Amazon rain forest would be helpful to guide enforcement in this industry. Similar considerations apply in the sense that the narrow focus of the study makes it manageable and at the same time the socio-economic relevance of the results would be substantial.

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