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Competition Policy and the Environment

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Abstract

Traditionally, competition law and practice serve to preserve competition, with a focus on the maximization of consumer welfare. This has been criticized as conflicting with society's overarching goal of achieving greater (environmental) sustainability. Consequently, various jurisdictions have recently reformed their laws and guidance allowing them to account for sustainability benefits in the assessment of cooperation between competitors, with potentially considerable implications for how firms can jointly develop and introduce more sustainable technologies and products. This has opened a new research frontier in the long-standing tradition of marrying the theory of industrial organization with the field of environmental and resource economics. The consideration of sustainability benefits in competition analysis also requires both the transfer and adaptation of measurement techniques. We summarize recent developments and sketch potential research opportunities.



1. INTRODUCTION

Modern competition and antitrust law are built on the notion to preserve competition. They are enshrined in respective legislation of, for instance, the European Union (Eur. Union 2008, Eur. Court Justice 2011) or the United States [*United States v. American Tobacco Co.* (1911)]. They reflect the understanding that citizens' interests are best served when firms compete instead of enjoy market power or coordinate their activities. That also reflects the view that the internalization of negative externalities, such as on the environment, is best undertaken by specific policies, such as the taxation of emissions. Recent changes triggered by the priority to confront climate change have, however, rendered this description obsolete, at least to a certain extent. As we describe briefly below, various national competition authorities and the European Commission have taken steps to include environmental concerns in competition analysis. Notably, the Draft Horizontal Guidelines of the European Commission from 2022, which deal with restraints among rivals, have dedicated an entire chapter to the assessment of so-called sustainability agreements (Eur. Comm. 2022). Since 2021 in Austria, the Antitrust Act contains a specific provision on the consideration of sustainability effects within the enforcement of the cartel prohibition.

Much of the initial discourse on the general merits of such an extension of competition policy to include environmental sustainability has been left primarily to legal scholars (Kingston 2011, Nowag 2016). Now, as new legislation and guidelines have been passed at record speed in various jurisdictions, these provisions need to be put into practice. As we describe in this article, this requires the cooperation of scholars in environmental and resource economics. This certainly pertains to the application of established methods to measure the environmental benefits of proposed agreements and, as commonly required in competition law, to balance these with possible consumer harm. These developments also raise new questions at the intersection between the fields of industrial organization and environmental economics, which has already proven to be a fertile area in the past. In particular, there exists a large strand of literature that analyzes the interaction of market power and the performance of various policy instruments (Carraro et al. 2010, Lambertini 2017). The overarching objective of this article is therefore to draw attention to these developments, guide the reader through the nascent literature, and relate this literature to established strands, thereby also formulating potential future research questions.

To sharpen our focus, we illustrate the structure of this article with a hypothetical example. Suppose that firms could introduce a new car fuel resulting in fewer harmful emissions. The new product does not add any use value, such as higher performance. We further suppose that in the past one firm tried to introduce this product unilaterally, but consumers were not willing to pay the higher price, resulting in a loss of market share. A competition authority now has to assess a proposed agreement between potentially all competing providers of fuel that would oblige them to replace the less sustainable product with the more sustainable variant.

This example thus refers to a type of agreement that would, under traditional paradigms, likely be considered an illegal cooperation depriving consumers of the economic benefit of cheaper fuel. As we describe later in more detail (Section 2), firms seeking approval for a horizontal agreement of this kind would have to establish that any resulting benefits of their cooperation will offset the harm resulting from the increased prices. We also discuss how the respective issues and questions could also arise in other areas of antitrust law, such as mergers or cases of abuse of dominance. In addition, the parties to this horizontal agreement would have to establish that the cooperation is indispensable to achieve such a beneficial outcome. As we discuss, the consideration of environmental sustainability now requires adjusting the metric of such a cost-benefit analysis for the purpose of antitrust enforcement. However, because the welfare of consumers in the affected market will typically still play an important role, this requires more than a simple transfer and application of known concepts. The question of indispensability thus requires going beyond



established theories relating market structure (and market power) to the avoidance of negative externalities. We discuss this in Section 3 and address the issue of the respective metric and associated measurements in Section 4. In Section 5 we conclude by discussing the overarching question of why competition policy should be an appropriate tool to address pressing environmental problems, rather than relying solely on instruments such as minimum standards or taxes on emissions.

2. BACKGROUND

In Europe, the Draft Horizontal Guidelines, published in March 2022, now enshrine the European Commission's willingness to incorporate sustainability considerations in competition cases (Eur. Comm. 2022). Shortly before their publication, several national authorities had already undertaken unilateral steps, including drafting new guidelines focused on sustainability by the Netherlands Competition Authority (ACM 2021) and a change of the competition law in Austria in 2021, where environmental benefits are now explicitly recognized next to consumer welfare. While authorities in the United States still display reluctance toward incorporating sustainability considerations, discussions there are gaining momentum (Inderst & Thomas 2022b). Perhaps most strikingly, at the international level a comparison of the roundtables conducted by the Organisation for Economic Co-operation and Development (OECD) in 2010 and 2020–2021 (OECD 2010, 2020) shows a sharp change in attitude, as 10 years ago authorities univocally saw no need for a distinct consideration of sustainability.

In what follows, we focus our discussion largely on cooperation between competitors, for which we have provided a hypothetical example in the introductory Section 1. We note, however, that the possible measurement and incorporation of sustainability benefits relate to other areas of competition law and policy as well, such as mergers or abuse of dominance/monopolization cases, e.g., through the refusal of supply. To the extent that particular practices do not fall under a per-se prohibition, they are open to a competitive assessment, which weighs off costs and benefits. Though some jurisdictions apply a so-called total welfare standard, typically the standard is that of the welfare of consumers in the affected market, with a particular emphasis on prices. Agencies and courts in the European Union, United States, and European national jurisdictions usually prefer such a consumer welfare metric over a total welfare measurement. Against this backdrop, several antitrust practitioners and scholars have criticized that requiring a full price compensation of consumers for the effects of a sustainability agreement, which might increase prices despite the benefits for the environment, might compromise sustainability efforts undertaken by the industry to the benefit of society as a whole (key references in the legal literature are Kingston 2011, Holmes 2020). We discuss the issue of the relevant metric and resulting measurement issues in Section 4. A competitive assessment needs to establish, however, that the respective undertaking, such as a cooperation between competitors, is indispensable to achieve the claimed benefits. To what extent are sustainability benefits special, potentially requiring an extended or novel effects-based analysis (with respective new theories)?

Before turning to these issues, we note that these can also be applied in other areas of antitrust law and competition economics, apart from horizontal agreements. For instance, a merger could lead to the withdrawal of more polluting capacity, though at the expense of higher concentration and resulting in upward pricing pressure. As we discuss below, sustainability benefits could then arise from either consumer preferences or, to the extent that such an inclusion is permitted by prevailing legal standards, a reduction of emissions that also have a negative impact on nonconsumers. As a final example, we consider the abuse of a dominant position, where we now also illustrate that sustainability concerns could lead also to a more restrictive practice. A dominant firm, such as a dominant retailer, could be held liable for not granting a supplier of innovative green products access to its shelves, e.g., fearing that these would cannibalize or tarnish the reputation of its less



sustainable private label products. In contrast to sustainability agreements, however, both merger cases and those of the abuse of dominance have so far not been discussed widely, which justifies our focus on the former.

3. EFFECTS ANALYSIS

3.1. What is Special about Environmental Sustainability?

There are standard reasons for why agreements between competitors can enhance (consumer) welfare, as reviewed below, especially when they increase efficiency and reduce costs, thereby leading to lower prices. But what is special about environmental sustainability? Why should one suppose that agreements between competitors are more often conducive or even necessary to reduce environmental damages?

Although few would doubt the urgency of fighting climate change, the respective time frame is certainly different from that of responding to imminent natural disasters or the COVID-19 pandemic, for which competition authorities have granted special exceptions, notably for cooperation between competitors (OECD 2020), e.g., to jointly procure or supply scarce medical resources. Non-internalized externalities are certainly at the heart of environmental problems, but to the extent that a reduction of such externalities cannot be monetized in the market, why should cooperation lead to more sustainable production? This is the first question that we wish to answer. Further, from a consumer's perspective, the reduction of externalities on others or the realization of further environmental benefits, such as the preservation of particular species, typically represent so-called nonuse values. Our second question is how this can make sustainability agreements special within the traditional framework of antitrust assessment governed by the consumer welfare paradigm.

3.2. Cooperating to Reduce Externalities

Presently, we take the perspective of profit-maximizing firms, though this is a presumption that we challenge below. We also take as given that sustainability benefits, such as the reduction of emissions, are not sufficiently appreciated by consumers (so as to be immediately monetized by firms). In fact, as we discuss below, it is otherwise likely that cooperation reduces incentives to lower emissions.

One obvious reason why cooperation between competitors could be beneficial in terms of reducing emissions is that the parties to the horizontal agreement would have an incentive to reduce output (and with it emissions) in order to increase prices. Such agreements are typically prohibited. Competitors may, however, benefit from sustainability agreements through a reduction in price pressure via other channels. Ahmed & Segerson (2011) show this for a joint agreement to phase out more polluting but cheaper products. When an agreement limits the use of a natural resource, even if this does not restrict output, it may still affect costs in a way that benefits firms, e.g., when it increases marginal costs and thereby prices by more than average costs (Van Moer 2022). Clearly, a monopolist would not have such incentives to either reduce the variety of offered (less sustainable) products or increase costs. While these are thus channels through which cooperation between profit-maximizing competitors can decrease emissions, consumers should typically be worse off. This may, however, no longer be necessarily the case when cooperation affects both competition and sustainability more indirectly. A particularly important case is that of an R&D cooperation.

The debate about the potential benefits of R&D cooperations is long (e.g., D'Aspremont & Jacquemin 1988, Suzumura 1992), weighing off underinvestment because of a lack of appropriability and spillovers with potential overinvestment from business-stealing incentives. Again, we need to ask what externalities add to such an assessment.



There exists a small literature in environmental economics that has considered R&D cooperations under such externalities. In this context, Chiou & Hu (2001) also point to the crucial role of the aforementioned spillovers. However, the focus has typically been on comparing this to other instruments, such as subsidies (e.g., Petrakis & Poyago-Theotoky 2002, Mariel & Sandonis 2004, or Menezes & Pereira 2017). In these analyses, firms commonly have incentives to engage in abatement R&D, as emissions are taxed. In the study by Poyago-Theotoky (2007), emission taxes are set after firms have chosen their R&D, so that their cooperation can aim at affecting policy. This theme is also pervasive in the literature on firm agreements in the shadow of potential regulation (for reviews, see Fleckinger & Glachant 2011 and Segerson 2013).

This literature thus provides insights into not only how R&D cooperation affects externalities but also firms' motivation other than cost sharing or benefitting from spillovers. To the extent that firms' joint choices under an agreement affect or replace policy responses, this should also be taken into account in a competitive assessment, as this needs to compare the outcome under various counterfactuals. A key, largely open research area is to adequately capture the interaction of firm choices and policy choices, made either by a regulator or through the political process such as voting (e.g., Ambec & De Donder 2022).

3.3. First- or Single-Mover Disadvantage

Returning to the European Commission's Draft Horizontal Guidelines, which represent an important development in the integration of sustainability concerns in competition analysis, the notion of a potential first-mover disadvantage under competition has been recognized as a potential justification for an agreement. Such a disadvantage may indeed arise with respect to R&D for the aforementioned standard reasons, such as lack of appropriability and spillovers. Importantly, once we abstract from such spillovers, however, in standard models of industrial organization the opposite outcome prevails: Firms' strategies are then strategic substitutes so that a first mover has higher incentives than a second mover. This holds for a reduction in marginal costs and investment in quality (e.g., Athey & Schmutzler 2001). Thus, when greater sustainability can be monetized, akin to a product's quality, and if we can abstract from the aforementioned (R&D) spillovers, the benchmark in the industrial organization literature is that competition, not cooperation, leads to higher sustainability.

This also resonates in various empirical contributions, notably in management science (cf. Bansal & Roth 2000 and Porter & Kramer 2006, though they consider a wider notion of sustainability in terms of corporate social responsibility, or Simon & Prince 2016 in environmental economics). This literature has, however, focused on analyzing the relationship between various degrees (and measures) of competition and measures of sustainability or corporate responsibility. Lambertini (2017) surveys both theoretical and empirical contributions and notably relates this to the question of consumer preferences. Indeed, the empirical literature has also pointed to the necessity of monetizing greater sustainability, which may be facilitated when greater sustainability also has immediate use benefits, e.g., for health (e.g., Kitzmueller & Shimshack 2012, Servaes & Tamayo 2013). Moreover, the theoretical literature on green consumerism has pointed out that firms may use heterogeneous green preferences to differentiate themselves and thereby dampen competition (see Eriksson 2004 and Conrad 2005).

Nonetheless, rather than suffering from a first-mover disadvantage, according to this view, firms should gain a competitive advantage when becoming more sustainable, provided that this is sufficiently appreciated by consumers. As we explore next, such a negative view on agreements between competitors misses two key aspects of sustainability benefits (other than noninternalized externalities, as discussed previously). The first aspect concerns consumers' incentives, and the



second aspect is about firms' incentives. Consumers' willingness to pay for greater environmental sustainability may crucially depend on the choices of all firms in the market and not only on what an individual firm offers. This can turn firms' choices into strategic complements and thereby indeed generate a first- or single-mover disadvantage. Further, regarding sustainability, firms' choices may not be solely motivated by profit motives. We show how this can also substantially alter the effects of an agreement.

3.3.1. Consumer willingness to pay. As mentioned above, a willingness to pay for products that are less harmful to the environment depends more on the appreciated nonuse value than the immediate use value of the good. It should thus be influenced considerably by contextual factors, including consumers' information and awareness but also social norms. When firms cooperate on introducing a more sustainable product and therefore jointly invest in educating consumers about the respective benefits, this may raise consumers' willingness to pay for the more sustainable product to an extent that offsets the consumer harm that would come with the price increase resulting from the change in production. The willingness to pay thus elevated might be greater as it would be in a situation in which a firm acted unilaterally. The perceived use value of a more environmentally friendly product may also depend crucially on consumers' expectations of market development, such as the necessary infrastructure, and consumers should be more optimistic when firms jointly introduce such products.

We acknowledge that such network effects are clearly not confined to the realization of sustainability benefits, and there is a large literature in industrial organization on how firm coordination and cooperation can be beneficial in such circumstances (e.g., Farrell & Saloner 1985, even though the subsequent literature has focused much on competing networks; cf. Katz & Shapiro 1986). Disruptive technologies required to achieve a carbon-neutral economy or the information that consumers need to understand how their choices affect the environment may, however, make the realization of such network effects of particular importance for sustainability agreements.

We emphasize one additional channel through which a first-mover disadvantage may arise, which is the role of social norms (cf. Inderst et al. 2022). Consumers' incremental willingness to pay for a more environmentally friendly product compared to a less sustainable alternative may depend crucially on their anticipation of others' behavior. When more consumers purchase products that are environmentally harmful, an individual consumer may feel entitled to do the same, while her utility from consuming such a product may decline if a more sustainable product has gained a high market share. Such a feedback mechanism may derive from a change in social norms shaped by the anticipated or observed behavior of others. Such effects have indeed been observed in various general experimental contexts (e.g., Sugden 1984) and in real-world contexts (cf. the studies referenced by Schultz 2002 and more recently Alcott & Rogers 2014 for energy consumption and Jakob et al. 2017 for pollution). Admittedly, the precise channels through which the behavior of others affects individual choices are often complex, involving, inter alia, imitation and conformism (cf. Grilo et al. 2001). In environmental economics, Nyborg et al. (2006) have modeled such a feedback on preferences, and recently Inderst et al. (2022) have formally analyzed how this can give rise to a first-mover disadvantage and when firm cooperation can thereby increase sustainability.

Importantly, in the presence of such feedback mechanisms, consumers' present, only potential hypothetical willingness to pay for a more sustainable product may not be indicative of their counterfactual willingness to pay, assuming that firms jointly introduce such products and educate consumers and when sufficient market penetration is achieved. For a competitive assessment, this raises key practical questions regarding both the potential relevance and measurement of such effects, to which we turn below.



3.3.2. Firm green preferences. The notion that at least some consumers have green preferences and that firms react to this has gained wider acceptance in both environmental economics and the wider economics and management literature (cf. Constantatos et al. 2020 and for early surveys Ambec & Lanoie 2008 and Kitzmueller & Shimshack 2012 on wider social responsibility). There is also by now a long tradition of marrying this with models of industrial organization (e.g., Eriksson 2004, Conrad 2005). As in our preceding discussion, firms' incentives to become more sustainable are then only derived from consumers' preferences (although they may also derive from interaction with regulation and policy). Clearly, firms may also behave more sustainably when there are other channels through which this increases sales or reduces costs. Examples include when this allows firms to attract more productive workers, pay lower wages (e.g., Besley & Ghatak 2007) or thereby lower their costs of capital (e.g., Landier & Lovo 2020, Oehmke & Opp 2022).

Several recent contributions stress that private firms' objectives may also go beyond profit maximization, placing some weight on the reduction of emissions and on environmental benefits. This may reflect the preferences of owners or employees and management, who weigh in on decisions without fully compensating the firm through lower capital costs or lower wages. In various contributions, Oliver Hart and coauthors have shown how small investors with only a marginal stake in a firm in particular may put a relatively large weight on their nonmonetary preferences (Hart & Zingales 2017, Broccardo et al. 2022). Dewatripont & Tirole (2022) have recently modeled such wider firm preferences and provide various rationales for them.

If firms internalize emission externalities even beyond the monetary incentives provided by the market or regulation, this clearly affects the outcome. We must therefore ask how this should affect the competitive assessment of, for instance, an agreement between competitors. Under an agreement, firms may place less weight on their own profits so that they are willing to choose more sustainable production even when this undermines their competitive position. In addition, when the agreement increases their rival's sustainability, they need to worry less about leakage when they lose market share following an increase in their own sustainability (as this is not sufficiently monetized). Consumers could, however, still be worse off, as these sustainability benefits from an agreement only arise when they are underappreciated by consumers. Future research may formalize these conjectures and devise empirical tests to determine whether and to what extent the assumption of such firm preferences is realistic. If this is the case, how should this affect policy and, more specifically, the competitive assessment of various undertakings, such as agreements or mergers?

4. METRIC AND MEASUREMENT

4.1. Consumer Welfare

In what follows, we take up some of the previously developed themes, albeit with a focus on measurement. The question of measurement must be preceded by that of the applicable metric. There is obviously a long tradition in environmental and resource economics of measuring the environmental impact of various policy alternatives in a cost-benefit analysis (cf. Pearce et al. 2006, Atkinson & Mourato 2015, Atkinson et al. 2018). The measurement of benefits may take place directly at the level of affected individuals and possibly through their involvement, such as via surveys in a contingent valuation analysis or hypothetical choices in a conjoint analysis. As in the case of determining the cost of CO₂ emissions, such as through integrated assessment models, it typically goes beyond the costs imposed on individuals living in the concerned jurisdiction. In a report commissioned by competition authorities, Inderst et al. (2021b) provide an overview and raise questions about the applicability of these methods and measurement tools to a competitive assessment.



Although some competition authorities embrace a wider objective in relation to environmental benefits, it is fair to say that consumer welfare represents the main metric for a competitive assessment. Without providing more details, given the scope of this article, we note that this manifests itself both in the guidelines provided by authorities and in court decisions. As we already noted, in some jurisdictions this may be interpreted as requiring a full compensation of consumers so that potential price increases or utility lost by a reduction in product availability must be fully compensated by other appreciated benefits. Applied to our fuel example, a positive competitive assessment would thus need to establish that consumers' appreciated benefits from the jointly introduced new fuel offset the harm inherent in the price increase compared to the phased out, more polluting fuel. Traditionally, such an assessment would be undertaken *ceteris paribus*, thereby leaving all other consumer choices unaffected. Moreover, when nonprice benefits are taken into account, the antitrust viewpoint would usually be limited to improvements of the use value, e.g., through increases in quality, longevity, effectiveness, or efficiency of a product.

Obviously, this all stands in stark contrast to cost-benefit analyses in environmental and resource economics, where typically total welfare is calculated and compared across different scenarios, involving all ensuing changes in the respective production and consumption patterns and where there is a long tradition of accounting for nonuse value. This is different in competition analysis. Notably, the European Commission's Draft Horizontal Guidelines represent a key point of departure from this traditional analysis. While still (largely) remaining within a consumer welfare approach, they acknowledge the need both to account for nonuse value and with this the respective complexities in its measurement and depart from a partial, *ceteris paribus* analysis. We posit that such an approach will be widely followed across jurisdictions, which will generate considerable demand for respective input by environmental and resource economists and raise new research questions. In what follows, we thus focus on these issues.

First, we acknowledge that applying a metric of consumer welfare alone leaves unanswered various questions that arise when additional environmental benefits shall be considered as well. As noted above, national competition authorities have shown their willingness to do so, and there have also been corresponding changes in competition law. How these additional benefits can be made commensurable with the calculation of consumer welfare and how and whether the latter should be given specific weight are clearly not only legal questions. They prompt further specific questions, such as those pertaining to the applicable time frame and discounting of costs and benefits. Although a competitive assessment typically takes a very short-term perspective, this is clearly no longer sufficient if environmental benefits are taken into account. Concerning consumer welfare, this may require establishing the preferences of future cohorts of consumers and respective trade-offs (cf. Inderst & Thomas 2022a for a legal-economic discussion of these issues). We wish to at least bring these important, largely unresolved practical questions to readers' attention.

4.2. Counterfactual Analysis

We return again to our fuel example. If a consumer was asked about her willingness to pay for a less polluting fuel, she would only consider the effect of her own action. If we were to inquire instead about her incremental benefits under the assumption that other consumers also changed their behavior, this measurement should be considerably different for at least two reasons. First, the consumer could thereby take her benefits into account that there is less pollution, because other consumers would also change their behavior. As noted above, this should amount to a full comparison of the respective factual and counterfactual scenarios, as is typical in a cost-benefit analysis. When environmental externalities shall be considered, in this case consumers in the same market, it is clearly essential to take such an approach (see Inderst & Thomas 2022b for a critical discussion), in contrast to more traditional analyses where one can safely ignore externalities.



Second, willingness to pay may depend on the previously discussed network effects, such as through a change in social norms. As discussed, this should again be of particular relevance when the proposed undertakings affect mainly environmental sustainability and with it consumers' appreciated nonuse value. We briefly elaborate on this now from the perspective of measurement.

Even though this relates to animal welfare and not to environmental benefits in a narrower sense, we illustrate this with the following real-world example. In January 2015, the ACM decided on a proposed agreement between producers, traders, and retailers of chicken meat aimed at introducing a minimum welfare standard for chicken (called the Chicken of Tomorrow). For this, the ACM conducted a hypothetical choice experiment to thereby assess consumers' willingness to pay, including as an attribute hypothetical information on whether the respective choice alternative was chosen by a small or large number of other consumers. Inderst et al. (2021a) extend the analysis of Mulder & Zomer (2017) and notably show how this affects the willingness to pay for choices with lower animal welfare, which drops significantly when it is supposedly chosen only by a small number of other consumers.

4.3. Benefits Versus Willingness to Pay

Industrial organization and competition economics place much emphasis on extracting preferences from consumers' actual choices in the market. This approach has obvious limitations in data availability, most notably when the respective more environmentally friendly product is still only hypothetical. Recall further that in our petrol example we supposed that the more polluting variant was previously introduced by a single firm, but with no success. Here, the respective data would then suggest that consumers had an insufficient willingness to pay and would thus generate mere incremental benefits unable to offset the harm resulting from the concomitant price increase. Consumers' reluctance to purchase the new variant may, however, be due to a lack of information or limited awareness, which the joint introduction under the proposed agreement could overcome. The relevance of the respective context goes far beyond this, as our preceding discussion of the potential role of social norms suggests.

In fact, returning to the Chicken of Tomorrow case, results of the hypothetical choice analysis can be contrasted with an analysis of consumers' actual choices in the market. These rely on Homescan data documenting purchases of conventional chicken and chicken with a Beter Leven (Better Life) label, which was later introduced and matches the hypothetical attributes of the more sustainable chicken in the choice experiment. The extracted average willingness to pay is several times larger in the hypothetical analysis. Part of this may be explained by the still relatively low market penetration (of around 15%) for the more sustainable chicken, together with the described social norm effect. As the ACM's hypothetical choice experiment described the more sustainable chicken through four separate attributes, for which individual utilities were measured, it also is possible that the calculated aggregated willingness to pay suffers from a well-known part-whole bias (e.g., Boyle et al. 1994 or Desvousges et al. 2012). Moreover, the relatively low price differences in the market contribute to the lower extracted willingness to pay.

In contrast, one should ask to what extent consumers' choices are guided by ingrained heuristics, rather than preferences that fully reflect new information. Choices in the market may also be influenced by the salient presentation of prices. Then it is questionable whether this represents a better reflection of their welfare than a conjoint analysis or a hypothetical choice experiment where relevant features of the different choices are described in sufficient detail. This discussion taps into a large literature in behavioral economics and welfare analysis that tries to distinguish between what Bernheim & Rangel (2008) called purely ancillary conditions of choices, which may affect behavior but should not be welfare-relevant characteristics, and context that is needed to



reveal preferences (see the detailed discussion of practical methods by Atkinson & Mourato 2015). Inderst & Thomas (2021) embed this into the legal antitrust context.

5. INSTRUMENTS

For our discussion, we took it as a given that the instrument of competition policy is also used to achieve environmental objectives. As noted above, this is motivated by the rapid development in competition policy, which, at least in some jurisdictions, has made this a reality, making the requirement for such an approach practical. Nonetheless, there remains the overarching question of whether or not this is desirable.

The literature in environmental and resource economics surely has a long tradition of considering different instruments, such as caps or taxes. It is also well known that under market imperfections, e.g., due to limited information, various instruments may be needed to achieve the socially optimal outcome, as is the case when various objectives are pursued, such as in addition a reduction of inequalities (see Stern et al. 2022). The interaction between environmental policy and industrial organization, notably with the exercise of market power, has also been widely explored (starting with Buchanan 1969; cf. Menezes & Pereira 2017 for a recent contribution). Typically, when competition intensifies or even becomes perfect, in such analyses this increases the effectiveness of the respective environmental instruments.

Although our preceding effects-based discussion in Section 3 showed how cooperation between competitors can lead to greater environmental sustainability, this admittedly still begs the question of why the socially desirable outcome cannot be achieved through the appropriate choice of, for instance, a tax or a cap. This represents a key gap in the analysis, and with the expected push toward greater consideration of environmental sustainability in various jurisdictions, an answer is sorely needed. This could also consist of deviating from the assumption of optimal design. Calveras et al. (2007) and Ambec & De Donder (2022) analyze the outcome when environmental policy is set through voting, and Tirole (2012) points more generally to frictions in the political process. As discussed above, the European Commission's Draft Horizontal Guidelines refer to the concept of residual market failure, which affects the recognizability of potential sustainability benefits. Understanding the potential gap that competition policy, e.g., in connection with the assessment of horizontal agreements to advance more sustainable products, could fill is thus not only of conceptual value but also of practical importance, and it constitutes a future research question to which we want to draw attention.

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