



Intervention triggers and underlying theories of harm

Expert advice for the Impact Assessment of a New Competition Tool

Expert study

Prepared by

Prof. Massimo Motta

Prof. Martin Peitz

EUROPEAN COMMISSION

Directorate-General for Competition

E-mail: comp-publications@ec.europa.eu

European Commission

B-1049 Brussels

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Authors:

ICREA-Universitat Pompeu Fabra and Barcelona Graduate School of Economics	• Prof. Massimo Motta
University of Mannheim and MaCCI	• Prof. Martin Peitz

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Abstract

This report assesses the possible role of a New Competition Tool (NCT) consisting of a market investigation instrument endowed with broad remedies, when a market suffers from competition problems and infringement cases under 101 TFEU and 102 TFEU would be infeasible or ineffective. The report lays out a number of theories of harm, that is, reasons why certain market features or behavior by market participants may lead to consumer harm compared to a relevant counterfactual. The report identifies theories of harm (i) in markets in which none of the firms is dominant and (ii) in markets with a dominant firm but article 102 TFEU is not effective or applicable or there may be a dominant firm in the future. It also argues that the European Commission should look for simple measures as “intervention triggers” for a market investigation under the NCT and identifies some possible triggers.

While some of the identified harms are more likely or more pronounced in digital markets, a presumption that the NCT primarily addresses competition problems in digital markets is misguided. Finally, when sector regulation is, in principle, applicable, the NCT is seen as filling a gap between standard competition tools and sector regulation.

Executive summary

This report informs the Inception Impact Assessment for the New Competition Tool (NCT). More specifically, it informs the definition of the test for the deployment of the tool and the theories of harm to be addressed with it.

The starting point of our analysis is the presumption that markets tend to work reasonably well, but in some circumstances, which may not necessarily be ascribed to the firms operating in the markets at issue, they do not – in the sense that they would not result in consumers benefiting from low enough prices and satisfactory products, in terms of quality, range and service.

Of course, there exist some special sectors where one would not expect competition to be effective and perhaps even desirable, and which are designed to be subject to sectoral regulation or to a public monopoly. However, even in other sectors in which a priori market forces might deliver a good outcome for consumers and society, there may be reasons why they do not function as they should. These reasons could consist of (i) market features which are not necessarily caused by the firms' behavior (although they may be reinforced by it) – such as scale or scope economies, (direct or indirect) network effects, switching costs and lock-in effects, asymmetric information, and behavioral biases by consumers; or (ii) the conduct of the firms themselves – such as (tacit or explicit) collusion, other (horizontal or vertical) agreements, contractual clauses imposed on consumers, and business practices that may be deemed abusive. Note also that (i) and (ii) may co-exist within the same sector.

Current “traditional” competition law tools in the EU would not allow to restore effective competition in markets which do not function properly due to the market features mentioned above (because such features are not, or not entirely, the product of firms' actions. Further, they would not allow to take care of some of the firms' conduct which may have anti-competitive effects. For instance, competition law does not preclude firms from tacitly colluding (and for good reasons); and as things stand, there are few obstacles for rivals to have minority shareholding in each other, or to have common owners, although this may dampen market competition and/or possibly promote collusive outcomes. Arguably, there may also exist conduct that may be anti-competitive but for which the intervention threshold is for various reasons very high or the timing of intervention very long,¹ thereby making it difficult to use competition law in a timely and effective way. This implies that only a subset of the conduct category (ii) may be covered by the competition law provisions contained in articles 101 and 102 TFEU and the Merger Regulation.

For these reasons, we submit that it would be desirable to integrate the existing competition tools with the NCT, which may help promote effective competition in situations where markets do not work properly.²

Furthermore, there may exist markets which are not currently experiencing problems, but which for different reasons (whether conduct by the incumbent or other market features, or both) may be at risk in the near future. In such cases, it is conceivable

¹ When consumer harm is uncertain, we submit that expected costs and benefits to consumers should be considered. This means that even if an intervention is not very likely to reduce consumer harm, this intervention may be desirable when the reduction in consumer harm is large.

² We do not address here the issue of whether it might be optimal in certain cases to resort to sectoral regulation. However, in the concluding section we shall indirectly touch upon this point: if one identifies features that make it unlikely that competition could be effective, but it is very difficult or impossible to design a proper remedy under an NCT, then regulation may be more adequate. In other instances, it may also be a matter of judgment how to negotiate the trade-off between a market investigation remedy and continuous regulation.

that the NCT might provide a preventive tool of intervention that is currently not available under EU competition law.

An NCT investigation should identify what are the mechanisms which lock competition in the market, and hence what are the interventions which should possibly neutralize those mechanisms and unlock competition. Whatever the theory of harm that may justify an NCT investigation, in order to address consumer harm in a meaningful way the EC must have the power to implement suitable remedies.

However, it should be kept in mind that markets are complex, and that different market features and firms' conducts interact to determine market outcomes in ways that are not always is to foresee. In other words, uncertainty may exist about the impact of a concrete intervention. We submit that the EC should carry out a cost-benefit analysis that allows for probabilistic assessments. While some remedies have virtually no likely "side-effects" and hence could be imposed relatively safely, others may have adverse consequences, not only on the firms at issue but also on consumers – and hence trade-offs should be carefully considered before being imposed.

In a section of this Report we also deal with the question of intervention triggers, that is, which data may signal that an NCT investigation is worthwhile in the first place. We suggest looking at simple indicators and data, since it is highly unlikely that before starting an NCT investigation the EC be in possession of rich databases or have the time and resources to engage into very sophisticated quantitative analyses.

Such intervention triggers should be intimately connected to the theory of harm. Without trying to be exhaustive, the Report suggests a few variables which may be used as possible screens, and which must be based on the conjectured theory of harm. For instance, if the EC is working under the hypothesis that the competitive problem in a certain market is due to tacit collusion, then looking at simple indicators such as whether prices are aligned with costs, or whether market shares are stable over time, may help. But obviously, such indicators would be of little help if the concerns were of a different nature.

More generally, we also stress that the EC will have to use its resources carefully, and that a necessary condition for opening an NCT investigation is that the potential consumer harm is sufficiently large (due to long-run effects or to immediate serious harm), and one could foresee that there may be feasible and appropriate remedies. Furthermore, in each specific case, the EC will also have to consider whether the NCT is the preferred instrument to solve the problem and dominates traditional competition law tools such as articles 101 or 102, or sectoral regulation (to the extent that they are applicable).

In its Inception Impact Assessment, the EC mentions four Options regarding NCT:

1. A dominance-based competition tool with a horizontal scope;
2. A dominance-based competition tool with a limited scope;
3. A market structure-based competition tool with a horizontal scope;
4. A market structure-based competition tool with a limited scope.

This report identifies a wide set of theories of harm which may also include narrow oligopolies or markets that will likely move towards dominance if unchecked. Thus, a dominance-based competition tool would not address several forms of consumer harm that are due to competition problems. Therefore, Options 1 and 2 would in our opinion be inferior to a market structure-based competition tool. This report also identifies a number of theories of harm that are not exclusive to digital markets. While we

acknowledge that some types of harm might be of particular concern in digital markets, an artificial limitation of the scope of the New Competition Tool to digital industries would also appear to be an inferior option (not to mention the difficulties and possible arbitrariness in defining what is digital and what is not). Thus, choosing a competition tool with a horizontal scope, as suggested by Option 3, is in our view the best choice.

1. Introduction

This report informs the Inception Impact Assessment for the New Competition Tool (NCT). It provides additional information for the assessment of the different policy options presented in the Inception Impact Assessment and their perceived impact on the Commission's ability to intervene against structural competition problems in an effective and timely manner. More specifically, this report informs the definition of the test for the deployment of the tool and the theories of harm to be addressed with it.

This report starts with the working hypothesis that the NCT can possibly be used as a complement to existing competition tools and sector regulation. Sectoral regulation is the response to severe long-term market failures, while existing competition tools may not be applicable to appropriately address an identified competition problem.

In Section 2, we argue that some markets may not work as they should, either because of market features which do not necessarily depend on firms' conduct (although firms' strategies may reinforce such features), or because firms may engage in business practices which are beneficial to them but may be detrimental to society. In the former case, traditional competition law tools would not help because they are not applicable at all; in the latter, they may be of limited use, for instance because the firm behavior at issue may not be considered unlawful, because it cannot be described as an agreement or is not adopted by a dominant firm, or because it may only address a particular business practice, but not address the more general underlying competition problem. We shall offer some examples of "theories of harm" which may motivate the use of a complementary legal instrument such as the NCT, but we should stress that the list of possible circumstances where an NCT may be deployed cannot be exhaustive. We also discuss the types of remedies that are appropriate.

In Section 3, we look for possible intervention triggers, that is, data or information which may signal that an NCT investigation may be worthwhile. We shall argue that these triggers should be intimately related to the theory of harm. In other words, when it has a suspicion that a market does not perform as it should, the European Commission (EC) will likely have some initial hypothesis about the reasons why in the market environment at hand competition is preliminary thought of not being effective, and it will be that initial hypothesis which should guide towards possible intervention triggers. If, say, it is thought that tacit collusion may be the source of the problem, then one should look for those variables which are typically associated with collusive outcomes. In that section, we shall also suggest looking for triggers which consist of simple indicators, since it is highly unlikely that before starting an NCT investigation the EC be in possession of rich datasets. Finally, we shall discuss a few concrete intervention triggers.

Section 4 will conclude the Report. We stress that the EC should start thinking of remedies already at the very early stages of an NCT process. In particular, it should start thinking of remedies as soon as a theory of harm is formulated (the type of remedy will of course depend on the theory of harm) and even before starting an NCT

investigation officially: if it is unlikely that a useful remedy may be found or implemented, then the NCT investigation would have little point. The EC should also assess whether, given the problem at hand, an NCT investigation is preferable to alternative instruments, such as starting an investigation under articles 101 or 102 TFEU.

Finally, building on our analysis, we shall conclude that we believe that a New Competition Tool allowing the EC to conduct market investigations and impose remedies under them, would be a very welcome tool which would complement the currently available competition law tools, which (as argued in Section 2) do not always allow to redress situations in which the market does not perform well, often for reasons which do not depend on firms' conduct. The NCT should be designed in as broad terms as possible, and the EC should have the possibility to deploy it in all sectors of the economy where it could be needed, not just on digital markets.

2. Reasons why markets do not work as they should (and traditional competition law tools may not help)

In this section, we explain why markets do not work as they should and traditional competition law tools may not help, either because they are not applicable at all or because they are of limited use (e.g., apply only to dominant firms or can only address a particular business practice, but not address the more general underlying competition problem).

More specifically, in Section 2.1 we spell out the possible role of the NCT and how it fits into an effective competition policy environment more broadly.

In Section 2.2, we elaborate on market features that may hinder markets from working properly or because of which competition is at risk and require timely or preventive interventions. Such features include scale economies on the supply side, network effects, consumer switching costs and behavioral biases on the consumer side. While such features hint at possible competition problems, specific theories of harm will have to be developed for specific cases. We give a few examples of such specific theories of harm. An effects-based approach acknowledges that while certain features deserve attention, these features may actually make the market more efficient and yield better outcomes for consumers; thus, a convincing case will have to be made that the associated features lead to consumer harm and that appropriate remedies can be implemented that reduce the harm.

In Section 2.3, we investigate theories of harm resulting from firm behavior that may not be addressed adequately by traditional competition law tools. We discuss common and cross-ownership and (tacit) collusion. While existing competition tools can address these issues to some extent, the NCT provides a setting in which concerns can be fully addressed, e.g. tacit collusion can be investigated, and remedies can be picked with the aim to effectively address the underlying issue (e.g. regarding information transmission). Similarly, market investigations may reveal that common ownership is a relevant issue in a specific industry and divestiture obligations are then the appropriate remedy. We also give a few instances of business practices that may lead to consumer harm and that have not effectively been addressed using existing competition policy tools, in particular, because firms using these practices are not dominant. Even in case of dominance, some practices may escape the scrutiny of competition authorities and, concretely, the EC, even though a convincing case that consumer harm is likely can be made.

An NCT investigation should identify what are the mechanisms which lock competition in the market, and hence what are the interventions which should possibly neutralize those mechanisms and unlock competition. Whatever the theory of harm that may justify an NCT investigation, in order to address consumer harm in a meaningful way the EC must have the power to implement suitable remedies. In Section 2.4, we comment upon which types of remedies may be appropriate to address certain theories of harm. We also briefly deal with the issue of when an investigation should be closed with an imposition of remedies, and when not. Since markets are complex, different market features and conducts interact to determine market outcomes, and uncertainty may exist about the impact of a concrete intervention. We submit that the EC should carry out a cost-benefit analysis that allows for probabilistic assessments. While some remedies may have virtually no likely “side-effects” and hence could be imposed relatively safely, others may have adverse consequences, not only on the firms at issue but also on consumers – and hence trade-offs should be carefully considered before being imposed.

Section 2.5 contains the main takeaways of this section.

1. New Competition Tool (NCT) and its role in competition policy

In this section, we shall explain why a New Competition Tool (NCT) may be useful in dealing with markets which do not function properly, and in which traditional competition law tools – for various reasons – do not help.

The starting point of our analysis is the presumption that markets tend to work reasonably well, but in some circumstances, which may not necessarily be ascribed to the firms operating in the markets at issue, they do not – in the sense that they would not result in consumers benefiting from low enough prices and satisfactory products, in terms of quality, range and service.

Of course, there exist some special sectors where one would not expect competition to be effective and even perhaps to be desirable, and which are designed to be subject to sectoral regulation or to a public monopoly. For instance, some activities entail so large investments that no more than a single firm could afford paying the associated fixed sunk costs; or the negative externalities for society of creating the necessary infrastructure may be so high (in terms of environment, disruption for citizens, public health, etc.) that it is optimal to have only one such infrastructure; due to informational problems or behavioral patterns, consumers would systematically be badly served; or there may be considerations related to social justice, equality, or public good provision which may lead a government not to let the supply of the products to free market forces.

But – as we shall argue in more detail below - even in other sectors in which a priori market forces might deliver an efficient outcome, there may be reasons why they do not work as they should. By and large, these reasons could consist of (i) market features which are not necessarily caused by the firms’ behavior (although they may be reinforced by it) – such as scale or scope economies, (direct or indirect) network effects, switching costs and lock-in effects, and behavioral biases by consumers; or (ii) the conduct of the firms themselves – such as (tacit or explicit) collusion, other (horizontal or vertical) agreements, contractual clauses imposed on consumers, and abusive practices. Note also that (i) and (ii) may co-exist within the same sector.

We argue below that current “traditional” competition law tools in the EU would not allow to restore effective competition in markets which do not function properly due to reasons other than firms’ conduct. Further, they would not allow to take care of some of the firms’ conduct which may have anti-competitive effects. For instance, competition law does not preclude firms from tacitly colluding (and for good reasons);

and as things stand, there are few obstacles for rivals to have minority shareholding in each other, or to have common owners, although this may dampen market competition and/or possibly promote collusive outcomes. Arguably, there may also exist conduct that may be anti-competitive but for which the intervention threshold is for various reasons very high or the timing of intervention very long, thereby making it difficult to use competition law in a timely and effective way. This implies that only a subset of the conduct category (ii) may be covered by the competition law provisions contained in articles 101 and 102 and the Merger Regulation. Furthermore, the other features (i) which may make a market malfunction, and which are not (entirely) caused by firms cannot be addressed by those provisions either.

For these reasons, we believe that it would be desirable to integrate the existing competition tools with the NCT, which may help promote effective competition in situations where markets do not work properly.³

Finally, we should add that there may be some markets which are not currently experiencing problems, but which for different reasons (whether conduct by the incumbent or other market features, or both) may be at risk in the near future. In such cases, it is conceivable that the NCT might provide a *preventive* tool of intervention that is currently not available under EU competition law.

In the following sections, we elaborate on the issues that we have briefly summarized in these introductory remarks.

2. Market features that may hinder markets from working properly or because of which competition is at risk (need for timely or preventive interventions)

One may expect that – absent ‘problematic’ conduct by the incumbent firms in an industry – the market would work well. After all, economists have been teaching generations after generations of students that markets self-correct: if there exists market power and incumbent firms set prices above average costs, some potential entrants will spot the opportunity to make profits and will want to enter the industry, thereby increasing competition, lowering prices, and reducing market power. Unfortunately, though, this self-correcting mechanism is not always present or does not work properly. There are a number of circumstances that prevent this mechanism from operating as it should. In what follows, we mention five categories of such market features which hinder the good functioning of markets: (i) scale (or scope) economies; (ii) (direct or indirect) network effects; (iii) switching costs; (iv) asymmetric information and limited information; and (v) behavioral biases by consumers. We acknowledge that the latter may lead to market failures even in very fragmented markets, but there are additional considerations in markets in which firms enjoy market power, and we focus on these.

It is important to stress that these market features are often not caused by the incumbent firms, although their conduct may possibly exacerbate those features or their effects, and as such would generally be difficult for ‘traditional’ competition law provisions to deal with. Also, even to the extent that they are under their control, it

³ We do not address here the issue of whether it might be optimal in certain cases to resort to sectoral regulation. However, in the concluding section we shall indirectly touch upon this point: if one identifies features that make it unlikely that competition could be effective, but it is very difficult or impossible to design a proper remedy under an NCT, then regulation may be more adequate. In other instances, it may also be a matter of judgment how to negotiate the trade-off between a market investigation remedy and continuous regulation.

may actually be desirable that firms invest e.g. in increasing firm-specific network effects. For instance, an improved matching algorithm of a matching platform increases gains from trade for market participants and increases indirect network effects. However, as we shall discuss later on, the NCT may in some cases allow to intervene so as to correct or reduce the effects of such features. Together with the discussion of the possible use of the NCT, let us analyze more in detail the five categories of market features listed above.

We note that market features such as the degree of consumer switching costs and the scalability of economic activities may well be related to a market being “digital”, but they are neither necessary nor sufficient for a market to be classified as a digital market. Therefore, market features serve as a better guide towards identifying potential or actual competition problems than the finding that a market is “digital”.

Scale economies and fixed costs

The self-correcting mechanism we briefly mentioned above is based on the idea that currently high prices and profits made by the incumbent firms signal profit opportunities for entrants. But this is true only to a certain extent: a potential entrant knows that the moment it enters the industry, the incumbents will react, and competition will push prices downwards. The prices the entrant will expect, therefore, and on which its decision to enter or not will be based, are necessarily lower than the current ones. A simple (and admittedly extreme) example will illustrate this point. Suppose that there is only one firm in the market and that it is charging monopoly prices and making supra-normal profits. Another firm, selling the same homogeneous good and producing at the same marginal costs as the incumbent monopolist, could enter the market by paying some fixed set-up costs. Suppose that, if entry takes place, the firms compete very fiercely (technically, there is “Bertrand competition”, with firms setting prices). Then, the potential entrant expects that, if it enters, competition will drive prices down to marginal costs, and it will make zero gross profits. As a result, it will prefer not to enter, because if it did it would not be able to recover its fixed entry costs, no matter how small they are. The incumbent firm will continue to set monopoly prices.

This simple example illustrates how the self-correcting mechanism which supposedly will allow to reduce market power might not necessarily take place, whenever there exist entry costs, fixed costs, or scale economies.⁴ Of course, under less extreme circumstances, some entry – and hence some market power correction – may take place.⁵ However, markets may possess the “finiteness property” (see, in particular, Shaked and Sutton, 1987, and Sutton, 1991): if consumers value quality of the products, and quality depends on investments in R&D or advertising, then market concentration will be bounded below even when market size becomes arbitrarily large.⁶ Intuitively, firms want to invest in order to increase the attractiveness of their

⁴ *The well-known contestable market theory (see Baumol, 1982, and Baumol, Panzar, and Willig, 1982), which states that even a monopolist would set prices equal to average costs, resulting in efficient market outcomes, assumes that the fixed costs of entry are recoverable and that prices cannot be easily adjusted. Both assumptions are demanding in many markets, fixed entry costs are sunk to a large extent, and prices would not typically be so rigid that an incumbent cannot modify them even as it observes that an entrant decides to enter, starts production, sets up a distribution network and begins to sell.*

⁵ *For instance, if there was less fierce competition (say, Cournot rather than Bertrand competition), capacity constraints, limited information about the competitor's costs, search costs, or horizontal product differentiation then entry may take place, as long as fixed set-up costs are not too large. See e.g. Belleflamme and Peitz (2015, chapters 5 to 7).*

⁶ *This finiteness property may even hold if quality can be chosen for free. For models with vertical product differentiation, which have this property, see Gabszewicz and Thisse (1980) and Shaked and Sutton (1982, 1983).*

products.⁷ With such investments in quality or advertising expenses, only a limited number of firms can profitably operate in the industry. As a result, even if there are no exogenous barriers to entry, few firms (and possibly only one) will co-exist in the market, as their investments lead to endogenous barriers to entry.⁸

Network effects

Another reason why a monopoly might persist despite the absence of 'legal' barriers to entry is due to network effects, which arise whenever the utility of a consumer or user increases with the number of other consumers using the same product.⁹

Network effects can be *direct* or *indirect*. For the former, think of communications or social networks: the more people I can reach by, say, telephone, e-mail or instant messaging, or I can be in contact with through some social networking apps, the more satisfying these services will be. For the latter, think of mutual cross-group network effects: the number of other people using the same credit card as I do does not affect my utility directly; but it increases the chance that merchants will adopt this credit card as a means of payment, which does increase my utility from the card. The same applies to video game consoles. Each gamer indirectly benefits from more people buying a particular console because this attracts more game developers who will provide games for this console.

Whatever the reason for their existence, whenever network effects exist, they tend to favor the incumbents, which already have an established customer base, and will hinder the market chances of the entrants, which need to build up a sufficient customer base in order to be desirable for consumers. Among other things, the larger the incumbents' customer base, the more mature the market (that is, the lower the number of prospective new buyers around), the more likely that consumers are 'single-homing' (that is, they do not use more than one network good), the more difficult for the entrants to challenge the incumbents. Since consumers' utility depends on both the inherent quality of the good and on the number of (current and future) users, it is not sufficient for an entrant to have a superior product. Nor will aggressive initial price offers necessarily be able to overcome the disadvantage created by network effects, for at least two reasons.

The first one is that in many industries characterized by network effects, prices are often zero for consumers – e.g. firms that monetize their services through advertising and/or access to consumer data (think of social networks such as Facebook, or search engines). Therefore, the strategy of offering very low introductory prices to gain market share may not be available to entrants (offering complementary services or usage subsidies may sometimes be possible, but negative prices are often limited by adverse selection problems, i.e. they attract users who are more interested in receiving the subsidy than in using the product or service extensively).

⁷ Such investment outlays are "endogenous sunk costs". They are sunk because typically they cannot be recovered (or only partially) if the firm exits the market; and they are endogenous because their level is determined by the firms' decisions.

⁸ Of course, there may also be firms with negligible market shares, covering small or niche segments of the market. But they would largely be irrelevant for competitive dynamics. It is important to understand that what matters for competition is that there exist firms which are sufficiently well-placed to discipline the market power possessed by the incumbent(s). Small-scale entry does not limit market power, although it may be a preliminary step in that direction.

⁹ There is a huge literature on network effects. Early contributions were Katz and Shapiro (1985), and Farrell and Saloner (1985). For a recent overview with links to the literature on network effects and two-sided platforms, see Belleflamme and Peitz (2018). Hagiu and Wright (2020) elaborate when data give rise to network effects and competitive advantage.

The second one is that such markets are affected by coordination issues. Each consumer may be very keen on the entrant's product, provided a minimum number of other consumers will also use it. Therefore, beliefs about what the others will do matter. If for some reason there is a widespread expectation that the entrant will not gather sufficient customer base, nobody will buy from it, and the expectation will be self-fulfilling.¹⁰

The incumbency advantage due to network effects implies that the incumbent firm would remain dominant after entry even if it offered lower quality for equally sized networks than the entrant. From the viewpoint of the incumbent platform, "[p]recisely because various users find it so difficult to coordinate to switch to an incompatible technology, control over a large installed base of users can be the greatest asset you can have." (Shapiro and Varian, 1999, p. 185)

Although the existence of network effects is typically determined by the kind of product at issue rather than the result of particular firm conduct, it should be stressed that *incumbents might engage in practices which contribute to entry deterrence*, or make it difficult for new firms to expand and gather sufficient custom. Leaving aside the usual abusive practices which a dominant incumbent may resort to in all other industries, such as discriminatory offers, exclusive contracts, tying, refusing access to a platform,¹¹ which might in principle be taken care of by traditional competition law instruments, there may exist other practices which are intimately related to network industries and which may be less easily deterred by article 102.

For instance, incumbents may be able to affect customers' expectations by making strategic announcements, such as spreading rumors that the rival's product has problems, that it is not getting enough users, that the incumbent is about to launch a new version which will be superior to the entrant's one; or announcing that it will incorporate some features which users find particularly attractive in the entrant's product.¹²

By the very nature of network effects, any choice by an incumbent which makes the entrant's product or service less compatible with its own will lower the chances of success of the entrant. In some cases, refusal or degradation of interoperability, may be dealt with by resorting to article 102.¹³ It would be difficult to argue that compulsory interoperability is always the best course of action. Indeed, while it does facilitate entry, it is not a policy without drawbacks in general, among other things because: (i) it may discourage entrants from developing competing standards or technologies; (ii) it may deprive an incumbent of the fruits of its investment and effort (which has disincentivizing effects). Still, on point (i) a situation where entrants may successfully introduce competing standards may be a very unlikely counterfactual. And on point (ii) the success of the incumbent may not be due to innovations which are worth protecting at the cost of locking the market forever. Consider for instance the telecom incumbents' claim of ownership of the telephone number of their clients, which at the beginning of the liberalization program greatly hindered the chances of new firms to attract clients (because everyone would like to keep one's number when changing telephone provider): it would be hard to claim that assigning phone numbers

¹⁰ On the role of expectations in determining the fate of network industries, see e.g. Dranove and Gandal (2003)'s description of the fight for the standard of music reproduction between DIVX and DVD. Biglaiser et al. (2020) provide a discussion of several mechanisms according to which network effects lead to an incumbency advantage.

¹¹ See e.g. Carlton and Waldman (2002) on tying, Giardino-Karlinger and Motta (2012) on discriminatory pricing, and Doganoglu and Wright (2010) on exclusive dealing.

¹² For formal analyses of product preannouncements as deterrence strategies, see Bayus et al. (2001) and Haan (2003).

¹³ See the Microsoft case in the EU.

was an innovation worth protecting, and accordingly the imposition of mobile number portability was certainly a good policy.

This is also a good example of a situation where – facing locked competition in the market – an intervention through articles 101 and 102 may not solve the problem: first, because there may not be an agreement among incumbents not to offer portability, and there may not necessarily be a dominant position; second, because it is important that number portability applies to all the firms in the industry, so that consumers know they could experiment with a new provider but then move back to another without costs if they are not satisfied. The NCT, instead, may allow to intervene and impose portability.¹⁴

Because network effects reward firms with large customer base, they are subject to *market tipping*, a notion which captures the idea that once a firm has obtained a certain advantage over rivals in terms of market share, its position may become unassailable and the market may tend to a situation of monopoly. Note, however, that tipping does not necessarily occur, since there are situations in which consumers multi-home, and others where network effects may co-exist with different tastes, so that more than one network good may well continue to receive a significant share of customers even beyond the short-run. This extends to multi-sided platforms, which cater to multiple groups connected through cross-group network effects. For instance, Rochet and Tirole (2003) and Armstrong (2006) provide frameworks in which product differentiation is sufficiently strong such that markets do not tip despite indirect network effects resulting from mutual cross-group network effects. The issue of single-homing versus multi-homing in markets with two-sided platforms is investigated, e.g. in Armstrong and Wright (2007), Belleflamme and Peitz (2019a), and Bakos and Halaburda (2020).

Competition among users on one side also affects the likelihood of tipping. For instance, Karle et al. (2020) show that more than one platform can be active despite the lack of product differentiation or other frictions because these platforms relax seller competition on the platform. While market tipping is correctly seen as a competition problem, the mere fact that at a given moment in time one platform carries all the trade is, however, not necessarily a concern. It may simply suggest that there is competition for the market and interventions that enable competition in the market may lead to less competitive outcomes.

Motivated by recent developments in digital markets, but not limited to those, the issue of tipping markets and entrenchment deserves careful consideration. As pointed out above, some markets have features such that, if left unchecked, only few and in the extreme only one firm can consistently make positive profits at any given moment in time. For simplicity, focus on the extreme case that all contestable users will join the firm generating the highest gains from trade. In this case, competition becomes what has been called “competition for the market”. Here, a firm that enters does so with the bet of offering the largest net benefit. If this bet turns out to be correct indeed none of the contestable users will go to a rival.

¹⁴ See Fletcher (2020), who also points out that the UK telecom regulator imposed landline number portability in 1995, after a market investigation-like review. This also brings attention to the fact that in some cases an intervention of this type can be taken by a sectoral regulator. We would submit that a market investigation may be preferable when the problem appears to be temporary and the intervention is a one-off measure or does not require frequent monitoring.

Competition concerns arise if this firm becomes eventually difficult to displace and, as a result, the firm relaxes its effort in providing a high net benefit to users. This may be reflected by high prices, low service quality, and little innovation.

As a starting point suppose that firms offer some utility $U(N)$ to each consumer who buys; for simplicity, all users are assumed to have the same intensity of use and the firm sets the same usage price. However, because of network effects this utility may depend on the firm's total number of users N . A firm provides this utility through a combination of fixed and unit cost. Denoting the average per-unit cost by $AC(N)$, the per-unit gains from trade of each unit are $U(N) - AC(N)$. They are increasing in the number of users if (i) there are scale economies, i.e. $AC(N)$ is decreasing in N or (ii) there are positive network effects, i.e. $U(N)$ is increasing in N . For example, for computational reason, a large fraction of the literature on network effects and two-sided markets assumes that network benefits are proportional to network size, i.e. $U(N) = U_0 + N U_1$. When analyzing the impact of network effects on the sustainability of competition and associated theories of harm, the shape of the network benefit function $U(N)$ drives market outcomes and market structure.

A simple numerical illustration may be useful to highlight the importance of the shape of the benefit functions. Suppose that there are two firms operating at zero costs offering incompatible products. There are two groups of consumers of equal size. Both groups may buy from the same firm or one group buys from one firm and the other group from the competitor. Firms offer a pure network good with $U(0) = 0$ and $U(2) = B$ where the number in brackets stands for how many groups buy the product in question. We distinguish between two polar cases: $U(1) = B$ and $U(1) = 0$. In the former case, the size of one group is sufficient for all network benefits to materialize, whereas in the latter case, both groups must consume the same product for network benefits to arise. In the latter case, there are social costs when the two consumer groups do not buy from the same firm: any market outcome that keeps both firms in the market with each firm catering to one group is inefficient. Prices will be equal to zero and consumers will obtain a net benefit of zero. Consumer welfare is the same or larger if both consumer groups join the same firm.¹⁵ In such a market, a successful newcomer has to quickly achieve that consumers coordinate their decisions. Here, e.g. the lock-in of one consumer group can make market entry impossible. From a competition perspective, in such a situation it is essential to keep "competition for the market" open. Any successful attempt by a firm to lock-in a group of consumers is lethal. Maintaining competition in the market would however be highly inefficient. The situation in which only one network is active is likely to be beneficial to consumers. The task of a market investigation then is to understand whether the market admits more than one active firm. We recognize that in practice identifying what is the number of firms that the market would admit is inherently difficult, but the market investigation may have a 'precautionary' or 'preventive' role, and point to tools that an incumbent may use and that would lead to having only one network being active; also firms may be forthcoming will information that allows for a better assessment. We also note that some dominant incumbent firms claim that network effects fade out quickly and that the market admits more than one firm. In our simple setting, this means that they claim that the former rather than the latter case applies, and the firm should be taken by its word.

¹⁵ If $U(1) = 0$ then consumers receive gross (and net) utility equal to zero if each firm sells to one group. If both groups consume the same good, then gross utility is positive since $U(2) = B$, and net consumer surplus will be positive if the firm cannot extract all the surplus that is generated. For instance, the firm may offer an ad-financed social network service for free and make revenues from advertisers which deliver ads to consumers.

The former case in which $U(1) = B$ looks more benign to sustaining competition since the market is large enough in the sense that both firms can attract sufficient consumers to generate benefit B . Put differently, network effects are such that a fraction of consumers is sufficient for network benefits to materialize. If any upfront investment is less than profits obtained in this situation, both firms can survive in the market and there is “competition in the market”. However, if one of the two firms operates as the incumbent and has been able to attract both consumer groups, the potential entrant has to convince at least one group to switch sides to make entry viable. Thus, even though a firm’s offer does not improve if it serves two instead of one group of consumers (since $U(2) = U(1) = B$), it has a strong incentive to attract more than one group so as to reduce the ability of the rival to become a serious competitor. This shows that despite the firm’s claim that it is actually not subject to positive network effects when further increasing its consumer base, it may have strong incentives to strategically deter entry. The claim that serving all consumers proves superior quality of its product is not necessarily correct. By depriving the rival of a sufficient user base the firm can make the rival’s offer unattractive. In effect, the market tips (if it is not straightforward that all consumers switch to the entrant almost simultaneously) and market tipping does not increase the gains from trade. While in such a market it is possible (and desirable) to have competition in the market some features may lead to market tipping – some of these features may be given and others affected by the action of the firm that has become dominant. In such markets, interventions that enable consumers to switch easily from one product to another create an environment in which potential entrants try their luck. Such interventions that make future competition viable may be the preferred option compared to a wait-and-see approach and a market investigation may well be one such intervention. If an abuse can be shown, a 102 case can possibly be made; however, a 102 case would typically go against a certain practice, while broader measures may be needed to make sure that the market is contestable in the sense that a more-efficient potential entrant will successfully enter.

In the example in which $U(1) = 0$, a large critical base is required for network effects to materialize. This led to competition for the market. In the example in which $U(1) = B$, only a smaller critical base is required for network effects to materialize. Here, the market may sustain competition in the market. In both instances, an incumbent firm has a strong incentive to lock-in consumers. In the first example it is sufficient to lock in a small number of them, while in the second example an incumbent firm has to lock in a large number to remove a competitive threat. In general, it is not obvious whether consumers actually benefit e.g. from lower prices or better products in a firm’s attempt to attract them in the first place. Through a market investigation, the authority can take a closer look at the strategies adopted by firms to attract consumers. A particular concern are coordination failures among consumers and delayed monetization. In this case inferior products may continue to dominate the market, even though other products could be made available that are more attractive for at least one group of consumers.

It should also be recognized that characteristics of the market which are partly shaped by firm actions may affect the strength of network effects. This is well recognized at least since Katz and Shapiro (1984): The degree of interoperability determines to what extent network effects are firm-specific or apply to the whole industry. A market investigation may uncover a lack of interoperability that leads to a less efficient outcome. Once said so, we acknowledge that a lack of operability may have efficiency rationales and mandated interoperability has therefore to be considered carefully.

In a market in which competition in the market is viable it may even be desirable to intervene and keep competition in the market alive because it may be difficult to

revert to actual competition once one firm has become dominant, for instance because rivals could not benefit from learning-by-doing, could not upgrade the offerings to consumers, and thus have fallen behind. Of course negotiating the trade-off between on the one hand possibly distortive effects of an early intervention and on the other hand the benefits of keeping competition open is not easy, and would require a more careful analysis; however these considerations illustrate that dynamic considerations are important. They also suggest that standard competition tools may become available too late in the process.

Consider next an intermediate case to the ones considered so far (with $U(1)$ a bit smaller than $U(2)$), where the same firm serving the second group of consumers leads to a benefit increment of $U(2) - U(1)$ for each consumer. However, if the firm that attracts both groups is able to extract more surplus per consumer than firms competing in the market,¹⁶ it may still be desirable from a consumer welfare perspective to sustain competition in the market.

The intermediate case also points to an inherent difficulty in such markets, namely that efficiencies and anti-competitive effects often come together: One firm achieved dominance through a superior offer in the past and thanks to network effects, it is able to sustain this position. In one example, this requires that the dominant firm makes switching difficult for at least one consumer group; in the other example, for both consumer groups. While it would be undesirable to impose remedies that lead to competition for the market when $U(1)$ is very small relative to $U(2)$, such remedies may be desirable when $U(1)$ is close enough to $U(2)$.

The contestability of a network industry depends on the ability of a firm with a superior stand-alone quality or larger marginal network effects to attract users. As mentioned above, in the presence of network effects users often face a coordination problem. All may agree that a particular product or service is superior, but if they are currently using a different product or service, it may be difficult to convince some of them to go first. Coordinating user expectations is a key concern for new entrants to succeed against established entrants. The lack of entrants may hint at a "kill zone"; potential entrants may have given up challenging certain incumbents protected by network effects and a lack of willingness (or ability) of users to coordinate on alternative products or services.

Of course, the market environment may be such that entrants can devise counterstrategies. If an entrant can address specific subgroups and network effects mostly materialize for such special audiences, this disadvantage may be overcome by the entrant. Also, if the entrant has rich price instruments and can convince a key group of users to adopt (by lowering the price for this key group), it is in a better position to succeed.¹⁷ Furthermore, if using the entrant's offer does not require users to drop the incumbent's offer, it becomes easier for an entrant to overcome the incumbency advantage. As illustrated above, the shape of the network benefit function determines the fraction of users that need to be convinced to adopt the new product or service. A market investigation may shed light on possible counterstrategies, as it may inform the EC about the need of remedying the status quo and the type of remedies needed (e.g. facilitating multi-homing by users).

¹⁶ For instance, in an extreme case the firm serving both groups being a monopolist, it may be able to extract all surplus from consumers; whereas two firms with one group each may compete so fiercely that consumers are able to obtain most of the generated surplus.

¹⁷ One manifestation are divide-and-conquer strategies when a firm manages to reach two groups of users connected by network effects (see Caillaud and Jullien, 2003).

Switching costs

Entrants may find it difficult to challenge incumbents also because there may exist consumer *switching costs*.¹⁸ When changing from one provider to another, a consumer may incur costs of different nature: for instance, one may have always done things one way, and not be keen on changing, out of laziness, or habit, or to avoid the costs of learning how to operate the new product. Like for network effects, switching costs may exist independently of firm conduct, but incumbents may in some cases create or reinforce them. Think of a bank which imposes “administrative fees” to close a current account or to extinguish a mortgage; of a telephone provider which (absent regulatory intervention) will delay the technical process necessary for a user to switch to a new company; of airlines offering “frequent-flyer programs” which reward those who have accumulated sufficient miles (which might be lost if one starts flying with a competing airline), and so on.¹⁹

In all these situations, one may think that a trade-off is at work. On the one hand, once customers are acquired, they will tend to be captive and be charged high prices. On the other hand, anticipating that this will be the case, and that each customer will be lucrative in the future, firms may compete fiercely to acquire the consumers in the first place. The overall effect may be positive or negative for consumers.²⁰ When new and old consumers coexist in an overlapping generations setting and firms cannot distinguish them, then, if the composition of old and new consumers does not change there is a single price charged to all consumers and this price does not change over time. If consumers keep their tastes such that there is no switching in equilibrium, this price is higher with switching costs than without (Beggs and Klemperer, 1992).²¹ This suggests that switching costs harm consumers when these costs are significant in the sense that hardly any consumer does switch.

Like for network effects, the existence of switching costs make it more difficult for entrants to contest the market position of firms which have already acquired large customer base: other things being equal, the entrant will need to compensate the costs of switching by offering price cuts, if it wants to attract consumers who have already bought from an incumbent.

In theory, the incumbent may behave less aggressively when it has already a large customer base and it faces a new rival, because it would be more profitable to exploit its existing customers (e.g. by setting high prices) than to fight entry, which is costly.

¹⁸ For early work on the (now huge) literature on switching costs, see Klemperer (1987a and 1987b). For surveys, see Klemperer (1995) and Farrell and Klemperer (2007).

¹⁹ According to the organization of this report, such practices belong to the following section on firm behavior that may not be adequately addressed by traditional competition law tools, but we cover endogenous switching costs already in this footnote. If firms reward consumers for repeat purchases, such reward programs (e.g. by providing coupons), constitute endogenous consumer switching costs. Their impact on competition is in general ambiguous. Caminal and Matutes (1990) show in a differentiated-product duopoly model with a covered market that overall consumers are worse off when firms implement reward programs in the form of lump-sum coupons. Caminal and Clatici (2007) argue that two conditions have to be satisfied for reward programs to affect consumers negatively: (i) only few firms compete in the market and (ii) firms use a reward program with a weak commitment capacity. The general message is that in some highly concentrated markets, competition problems arise due to coupons and other reward programs, but that often they are pro-competitive. However, we acknowledge that coupons or other fidelity rebates used by incumbent firms to make entry more difficult (see e.g., Giardino-Karlinger and Motta, 2012).

²⁰ Klemperer (1987b) develops a simple two-period duopoly model with differentiated in which a fraction of consumers of the first period stay on and the others are replaced by new consumers in the second period. If those consumers who stay on inherit their tastes from the first period, all consumers pay strictly higher prices in both periods compared to the setting without switching costs. By contrast, if those consumers newly draw their taste in the second period, all consumers pay weakly lower prices in both periods (and strictly lower in the second period) compared to the setting without switching costs.

²¹ With switching in equilibrium, it is possible to overturn this result. See, e.g., Rhodes (2014).

If this was the case, then switching costs may actually facilitate entry. However, (i) an incumbent behaving strategically may actually set even lower prices than what would be optimal in static terms if it expected entry, in order to build an even stronger customer base; and (ii) if the incumbent is able to price discriminate across different cohorts, then it could set lower prices to new prospective consumers and higher prices to old ones (thereby at the same time making entry difficult and exploiting customer base). We should also recall that if industries characterized by network effects (such as digital markets) are at issue, then price considerations are often less relevant, because consumers may have access to the network products for free.

We acknowledge that in markets with scale economies, network effects, or switching costs there may be fierce competition during the period prior to market consolidation, with profit sacrifices being made on the expectation of future profit recovery after the market has consolidated. Ex post intervention should therefore include considerations of the legitimacy of such dynamic business strategies; i.e. firms should not necessarily be denied the recovery of upfront investments and profit sacrifices.

Asymmetric information and limited information

Limited information and consumer search

Firms may not include all price elements when advertising products or putting them up for sale, or they may not include TVA, or credit card charges. All this combined with consumer search costs, consumers' impatience etc., hinder transparency on the consumer side and hence limit their 'shopping around', in turn reducing firms' incentives to compete aggressively. Note that one may think of policy interventions which oblige firms to disclose add-on prices, increase transparency for consumers, promote comparability of offers, and reduce their search costs as 'consumer protection' policies, but (apart from the fact that not all EU countries have strict enforcement of consumer protection laws), we should stress that if consumers cannot compare properly the different offers, a competition problem arises. In the limit, obfuscation of prices and other contractual terms would make it impossible to compare offerings and could possibly make consumers captive of the firms. As a result, instead of having effective competition one may end up with independent 'local' (or segmented) monopolies.

This could be a manifestation of the Diamond paradox (Diamond, 1971), according to which even small informational frictions can lead to massive price distortions relative to a market with perfect information. Suppose that consumers obtain price information for free from their local firm, but incur a small search cost to obtain price information from rivals. In this case, the market delivers monopoly price.²²

A less extreme situation arises if *some* consumers are fully informed. Suppose that this is the case and that all other consumers have significant search costs. In a market in which firms offer homogeneous products, the market will feature price dispersion

²² Suppose consumers have a small search cost s . To see why the monopoly price is the equilibrium, reason by contradiction and imagine there exists an equilibrium outcome where firms set a price p lower than the monopoly price. In such an equilibrium, consumers expect that all firms set the price p . However, if one firm deviates to a higher price between p and $p+s$ then consumers who have this firm as their local provider would have no incentive to search (because they would incur the cost s , which would add to the price p) and, thus, they (correctly) expect that it is not worth it to engage in search. Hence, each firm would have an incentive to set a price higher than p . Thus, no price lower than the monopoly price could be the market outcome. Obviously, firms do not have an incentive to set a lower price.

and consumers almost always pay a price above marginal cost in oligopoly.²³ Thus, the lack of price information suffered by some consumers leads to higher prices for all consumers.

The same general message holds in oligopoly markets with differentiated products. Suppose that firms cannot engage in price discrimination. If all consumers were fully informed, firms would enjoy some profit since products are horizontally differentiated. If, however, a fraction of consumers does not know about other offers than their 'local' firm (and each firm has the same share of such uninformed consumers), each firm faces a tradeoff: it wants to compete for informed consumers but also milk the uninformed consumers. In equilibrium, all firms set a price that is increasing in the share of uninformed consumers.²⁴

Lack of price information makes it more difficult for consumers to find the lowest priced goods. While price comparison websites have facilitated price comparison, there are at least two reasons why this does not completely remove informational frictions (i) price comparison websites can only make money if firms are interested to pay for the service to be listed and this limits the incentive of a price comparison website to offer full transparency regarding all available products and the fees charged by the website leads to an upward pressure on the retail price (Ronayne, 2020) and (ii) firms may still employ obfuscation strategies that hide the true price at the price comparison stage and thus make a price comparison rather cumbersome for consumers.

When consumers are engaged in costly product search, remedies may improve the information available to consumers. As Zhou (2020) shows, under some conditions this makes consumers better off and applies to search advertising, personalized recommendation, filtering, and new display technology, which are important features of many digital markets.

*Asymmetric information in the firm-consumer relationship*²⁵

If consumers are less informed than firms, e.g. about product quality, consumer protection policies (partly through sector regulation) can aim at addressing the market failure that results from asymmetric information.²⁶ However, asymmetric information may not only be a consumer protection issue, but also lead to a competition problem, which may, however, be outside the reach of standard competition tools, but which the NCT might be able to address.

Many product markets have the feature that product quality is only partially observable by consumers. This affects the incentives of high- and low-quality firms to enter. We sketch how a possible theory of harm in oligopoly could be formulated.²⁷ Consider an environment in which firms have to make observable investment

²³ The seminal paper that led to long stream of academic work on markets with search costs is Varian (1982) who considers a homogeneous product market with positive fixed costs and free entry. A seminal paper that considers consumers who engage in sequential search is Stahl (1989). Because of some consumers who have to search to obtain price information this model also delivers price dispersion.

²⁴ This is an implication of the analysis in Grossman and Shapiro (1984).

²⁵ Asymmetric information may also arise in oligopoly outside the firm-consumer relationship. Firms may have private information about cost or demand that competitors lack. Such environments may lead higher prices and consumer harm compared to the full-information counterfactual. The economic literature has developed models of signal jamming that clarify the economic mechanism at play (Riordan, 1985, Mirman et al. 1993). However, information sharing may facilitate collusion and, therefore, such obligations may backfire. We do not further discuss the associated literature on information sharing.

²⁶ Consumer protection policy may be adopted and enforced by a specific consumer protection body or a sectoral regulation.

²⁷ This sketch of a model is inspired by the formal analysis of Creane and Jeitschko (2016) whose setting is different in a number of ways. In particular, they look at competitive markets with an infinite number of active firms. In an earlier version (Creane and Jeitschko, 2009), they also analyzed the asymmetric information setting under Cournot competition.

decisions to enter the market and then draw their quality from some joint quality distribution. Each firm's quality is its private information.²⁸ In addition to quality differences that are unobservable to consumers, products are exogenously horizontally differentiated (and this is observed by consumers). After observing their own quality and the number of firms, each firm decides whether to stay and pay the quality-dependent fixed cost. Higher quality comes with higher fixed costs, but marginal cost is independent of quality.²⁹ Since entry leads to more intense competition and thus lower prices for a given distribution of quality, this would lead to adverse selection: The implied change in the distribution of qualities puts further pressure on price. As a result, to have at least some high-quality firms in the market, entry is limited and firms receive above normal profits. This suggests that asymmetric information about product quality may be reflected in above normal profits in oligopoly. Remedies addressing asymmetric information then affect market structure. Alleviating the asymmetric information problem would lead to a less concentrated market (which affects price and average quality in the market) and higher consumer welfare.³⁰ Existing competition tools cannot address such asymmetric information-induced competition problems. In some markets, NCT may be able to adequately remedy them.

If high quality comes with higher unit cost, the issue of price signalling arises. Consider an oligopoly with a fixed number of firms which have private information about the quality of their own product. Quality may be high or low. Firms with higher quality may try to signal their quality through higher prices. In the market with quality uncertainty low and high-quality firms may set higher prices than under certainty. Thus, due to the interplay of imperfect competition and asymmetric information consumers have to pay higher prices for all products.³¹ Standard competition tools cannot address this problem, but there may exist adequate remedies under the NCT.

In some markets, the asymmetric information problem between firm and consumers goes in the opposite direction: firms may lack information about consumer characteristics that affect the firm's cost. This clearly applies to insurance and credit markets, but it is also relevant in online and offline retailing. The costs from product returns can be significant. Return rates are often consumer specific (consumers with low return rates are low-cost and those with high return rates are high-cost for the firms) and incumbent firms can make less attractive offers to high-cost consumers (in particular, in a digital environment with consumer tracking). Since entrants do not yet know prospective customers and high-cost consumers do not get attractive deals from incumbent firms, these high-cost consumers are more likely to switch to the entrant's offer. This implies that entrants will start with a – from their point of view – bad pool of consumers leading to barriers to entry due to asymmetric information.³²

Mandatory return rights granted to consumers may make matters worse for entrant firms. One take-away is that well-meant consumer protection policies (here the protection of consumers allowing them to return products without hassle that do not

²⁸ Thus, a firm does not observe the rivals' product quality. Otherwise, difficult signalling issues arise as a firm may want to try to signal information about its own and the rival's quality (see Fluet and Garella, 2002).

²⁹ Otherwise, firms may try to signal their problem. We discuss this issue in the following paragraph.

³⁰ We recall that also under full information, the market may feature a finiteness property because of vertical product differentiation or endogenous quality. With endogenous quality, a quality race leads to more concentration. However, under asymmetric information (i.e. when consumers cannot observe or infer quality) firms do not have an incentive to provide quality; it is then not clear whether in such a market fewer or more firms are accommodated than under full information; in any case, under asymmetric information, there is no investment in quality and free entry leads to zero profit. Thus, these two market environments deliver markedly different results.

³¹ This has formally been analyzed and shown in Daughety and Reinganum (2008).

³² See, e.g., Dell'Arpiccia, Friedman, and Marquez (1999).

fit their taste) can backfire and lessen competition. A market investigation under the NCT may uncover that regulation-induced market features lessen competition.

Consumers' behavioral biases that are favorable to incumbent firms

Consumer behavior may be subject to "biases" which include non-standard preferences and biases in decision making. A different classification is proposed by Huck et al. (2012) distinguishing between "biases" affecting choice through (i) willingness-to-pay, (ii) quality biases, and (iii) search biases.³³

The willingness-to-pay channel may stem from reference point formation with loss aversion or misperceptions of demand. The search bias channel includes behavioral inertia and misjudgement of prices. The quality bias channel includes misjudgement of quality and a misperception of desired attributes. These biases affect oligopoly outcomes. Public interventions can be successful in some market environments to alleviate consumer harm that may stem from these market features. This may be part of a mandate of consumer protection. However, consumer harm is often the outcome of the interplay between behavioral bias and lack of competition. Then, it may also be seen as the task of the competition authority to alleviate consumer harm stemming from such market features that do not allow the market to work well.³⁴ Thus, in cases of consumer harm in oligopolistic industries due to market features associated with behavioral biases, a market investigation with the NCT may be an appropriate approach to address the issue at hand; possible remedies include the standardization of information.

Consumers may form reference points about how to value product with loss weighted more strongly than gains from this reference point. Thus, loss aversion affects consumers' willingness-to-pay, but nevertheless reflect preferences. Formation of such reference points may be based on past experiences or built on (rational) expectations. Karle and Peitz (2014) analyze a duopoly with differentiated products and price setting firms when consumers are expectation-based loss-averse. They show that loss aversion in the price dimension intensifies competition while loss aversion in the dimension of the product fit softens competition. Firms do not have an incentive to "educate" consumers if they can, whereas there may exist remedies that do. Relatedly, Zhou (2011) considers a duopoly model with sequential search with a given order in a duopoly with differentiated products and price-setting firms. Consumers choose the first result in their search process as reference point; thus, they form history-based reference points. Also, in his setting, loss aversion intensifies competition when consumers are loss-averse in the price dimension and soften competition when consumers are loss averse in the dimension of product fit.

Consumers may make wrong predictions about their own demand.³⁵ This may lead to exploitation of consumers in the sense that they pay more than what they are willing to pay if they had correct expectations. For example, if consumers purchase a product because they overestimate future usage a monopoly firm may be able to extract the surplus from the predicted high demand. Under competition, such exploitation will not occur as firms compete for users.

³³ This section draws on Huck et al. (2011).

³⁴ As discussed by Huck et al. (2011), an increase of the number of firms reduces consumer harm in some case, but not in all. The relevant issue is whether the increase in the number of firms increases the incentive of firms to offer better deals to consumers. If this is the case, then a larger number of firms reduces consumer harm.

³⁵ For instance, consumers wrongly predict their demand if they use the product or service over time and are naive hyperbolic discounters (DellaVigna and Malmendier, 2004, 2006). Consumers may also be exploited by firms offering non-linear contracts if they underestimate the variance of their demand, as in Grubb (2009).

A similar issue arises if consumers make misjudgement of quality. If consumers hold biased beliefs about desired attributes and believe that products are more differentiated than what they actually are, this relaxes competition among oligopolists, leads to higher prices and, thus, consumer harm. One such instance is that consumers do not form expectation on average performance of a product, but base their expectation on a small sample of observations. Thus, two products of the same quality are often seen as of different quality by consumers. Overall, market demand becomes less sensitive to price differences and the oligopoly market features higher markup than if consumers correctly understood quality of the market.³⁶

Consumer search costs and switching costs may arise from behavioral inertia; people may be too “lazy” to shop around. The possible associated harm in case of such inertia has been mentioned above. Search may be affected through prominence; and incumbency advantage (and strategies that increase this advantage) may lead to prominence and thus make entry more difficult if consumers are unlikely to consider non-prominent choices as they come late in the search process (see Armstrong, Vickers, and Zhou, 2009).

3. Firm behavior that may not be adequately addressed by traditional competition law tools

In this section, we consider situations in which some particular actions or business practices by incumbent firms lead to market inefficiencies. It is well understood that while the collection of individual decisions by market agents would often result in efficient outcomes for society, there are many situations where they might collide with society’s objectives. Most relevant for our discussion, rivals may decide to impose anti-competitive vertical clauses, engage in collusive behavior, resort to abusive practices, or acquire a rival thereby suppressing competition.

It is to prevent such actions, beneficial to the agents who take them but not to society, that competition laws find their main *raison d’être*, establishing provisions such as those contained in articles 101 and 102 of the TFEU and in the merger regulation. However, such provisions, and their enforcement, may take care of some but not necessarily all of those anti-competitive actions.

Common ownership and cross-ownership

Some markets are characterized by a high degree of common ownership (when one person or institution owns shares of two or more firms) or cross-ownership (when two firms own each other’s shares).³⁷ The concern is that an increase in common or cross-ownership of firms belonging to the same sector leads to a less competitive outcome.³⁸

According to economic theory a market with common or cross-ownership tends to deliver outcomes somewhere between a market without common and cross-ownership and a monopoly market (see, however, Brito et al., 2019). While there is some

³⁶ For a formal analysis, see Spiegler (2006).

³⁷ For a report on common ownership in Europe, see Frazzani et al. (2020); for an investigation of the U.S., see Backus et al. (2020b).

³⁸ See Gilo (2000) and O’Brien and Salop (2000) for an assessment that is accessible to non-economists.

similarity between common and cross-ownership on the one hand and a merger on the other hand, it is more difficult to make an efficiency defense when increasing common ownership or cross-shareholdings. Thus, *prima facie*, competition policy should be stricter regarding common and cross-ownership than regarding mergers. We acknowledge that individual risk-averse investors may be interested in holding stocks of multiple firms in the same industry (or in firms increasing cross-shareholdings) not because of competitive effects, but to reduce earning risks. It is not clear to us how competition policy guided by a consumer welfare standard can deal with these legitimate interests of owners.

Let us start by an extreme situation of a fragmented market in which one firm or person controls all firms in the industry. By exerting its control right, it can implement business practices that limit competition between all the firms it controls and can, if under full control, achieve the monopoly outcome. Note that even if this common owner does not hold a majority position it may *de facto* exert control and fear little opposition from the other owners because they enjoy supernormal profits and may not want to push for more aggressive behavior of the firm. This can be a wait-and-see game: The other owners do not push for a change of control, as long as owners of the rival firm do not push for a change of control at their firm.

Even absent control by common owners, the management of a firm may have an objective function that accounts for the interest of common owners. Common ownership requires us to take a closer look at managerial incentives; see below. In case of cross-ownership it has clear incentives to include profits of the rival in its own objective function provided that its compensation is based on profits that include profits from participation in other firms (as dividends or higher share values).

The basic economic theory on how common ownership and cross-ownership lead to less competitive outcomes in the form of higher prices is straightforward and has been around for a while (see e.g. Reynolds and Snapp, 1986 and Flath, 1991, 1992). For illustration, consider a symmetric duopoly in which firms offer substitutes and compete in prices or quantities. Suppose that under cross-ownership each firm holds a fraction λ of the shares of its rival. A particularly simple setting is the one in which each firm maximizes the profit of its owners and that owners will receive a fraction $1 - \lambda$ of the profit π_1 the firm makes from its own operations plus the fraction λ of the profit π_2 the rival makes from its operations, $(1 - \lambda)\pi_1 + \lambda\pi_2 = (1 - 2\lambda)\pi_1 + \lambda\Pi$ where Π denotes industry profit. Thus, each firm maximizes a weighted average of own profit and industry profit. Note that in a market without cross-ownership (namely, one where $\lambda = 0$), each firm just wants to maximize own profits, it does not care about the rival's, or industry, profits. As a result, a market with cross-ownership leads to a less competitive outcome than a market without. Intuitively, the higher the share λ a firm owns of its rival, the less aggressive it would like to be, because by capturing an extra sale from the rival it does not appropriate an extra euro of profits, but just a proportion $(1 - \lambda)$ of them.

Suppose instead that there is common ownership of the form that a common owner holds a fraction λ of the shares in each firm. Suppose furthermore that the management of each firm maximizes the weighted sum of shareholder value where the weight corresponds to the share in ownership. The common owner is interested in industry profit whereas the other owners are interested in the profit of each firm. Thus, the management of firm 1 maximizes $(1 - \lambda)\pi_1 + \lambda\Pi$. Also, this objective function consists of a weighted average of firm's profit and industry profit. Hence, a

market with common ownership also leads to a less competitive outcome than a market without.³⁹

An important question is the channel by which managers make their decision depend on the common ownership structure. One obvious channel is that common ownership may affect the managerial compensation scheme. Relying on changes in a modified Herfindahl-Hirschman index (MHHI), Antón et al. (2018a, p. 5) provide evidence that “managers in more commonly owned industries receive more pay for industry performance and less for their own firm’s performance, and when a given industry becomes more commonly owned, its managers receive less pay for own and more for their rivals’ performance.” However, even absent managerial compensation schemes to explicitly account for rivals’ or industry profits, managers may set prices less aggressively in response to an increase of common ownership. For instance, if they were paid a fixed compensation, they may operate under the implicit understanding that their compensation will be reduced in the future if industry profits go down and vice versa.

Finally, common owners may have some control rights and use their power to directly influence managerial decisions. Shekita (2020) documents a number of cases in which such direct intervention has happened (see also Antón et al., 2018a).

The mechanisms by which common ownership may affect competition, and the extent to which they play a role in practice, are currently at the center of a heated debate. More generally, the jury is still out with respect to the empirical evidence on the link between competition and common ownership. A prominent empirical investigation is the work by Azar et al. (2018) who regress prices on MHHI as a measure of market concentration, which reflects the degree of common ownership. In the U.S. airline industry, they find that airline ticket prices are around 3% to 7% higher in the average U.S. airline route than would be the case under separate ownership. However, their empirical approach has been criticized by Backus et al. (2019, 2020a). Elhauge (2020) defends the approach against some other critiques and refers to other empirical studies in support of the view that common ownership leads to less competitive market outcomes.

Firms and ownership portfolios are often asymmetric. Theory can account for these asymmetries and provide testable predictions. In their survey, Backus et al. (2019, p. 25) summarize their reading of existing empirical evidence as follows: “Evidence of an effect of common ownership on prices is, at this point, suggestive at best. Early methods used to investigate the question are problematic, and so more work is required before broad

conclusions should be drawn.” They suggest future research to focus “on attempts to measure the impact of within a single industry, with a focus on pairwise profit weights rather than market-level concentration measures as the variable of interest.” Such research may also provide guidance to the EC if it were to launch a market inquiry into an industry that looks suspicious at the outset.

While simple theory focuses on price effects of common and cross-ownership, other effects may exist and strongly affect consumer welfare. For instance, common or cross-ownership may stifle or encourage investment and innovation (on the theory see López and Vives, 2019; for an empirical investigation see Antón et al., 2018b). In the case of large R&D spillovers, there exist benefits from common and cross-ownership as this tends to provide managerial incentives to partly internalize those spillovers;

³⁹ We acknowledge that our presentation is rather simplistic. For a more flexible treatment of cross-ownership see e.g. Flath (1991); for a more flexible treatment of common ownership that allows for varying control rights, see e.g. O’Brien and Salop (2000).

however, theory predicts that absent such spillovers, common and cross-ownership reduce investment incentives and innovation.

Cross and common ownership may also affect incentives to exit the market. If exit boosts rivals' profits, cross and common ownership make it more attractive to leave the market. Such exit would often lead not only to higher prices, but also to lower product variety in the market. Symmetrically, theory predicts that common ownership (where firms are included as belonging to a market even if not active) leads to less entry. Supportive evidence is provided by Newham et al. (2019) for the pharma industry: In their empirical analysis the stronger the branded pharma company and a potential generic entrant are connected by common ownership the lower is the likelihood that this generic enters. They also show that this finding goes beyond a specific pair of firms and holds at the market level.

Merger control could in principle deal with common and cross-ownership. However, acquisitions are often under the radar of the competition authority, in particular, if owners do not hold controlling stakes, their cash-flow rights are small, or if they acquire stakes in small start-ups in a dynamic industry. Common ownership may be prevalent in an industry even though there may not be a single common owner with large shares but multiple common owners. In our illustrative example, there may be N owners each holding a fraction λ/N of the cash-flow rights. Clearly, it is then possible that this fraction λ/N is small whereas the overall fraction λ is large. Elhauge (2020, pp. 276-279) argues that common and cross-ownership can be addressed as an agreement or concerted practice under TFEU 101 or as collective dominance leading to excessive pricing under TFEU 102. If this can be successfully done, the NCT is not strictly needed to tackle common and cross-ownership, but may still be seen as the preferred instrument as it provides a clear procedure to deal with such cases. Also, without a market investigation the competition authority may not become aware of immanent issues of common and cross-ownership in an industry.

Tacit collusion

Another case where despite the co-existence of several firms in the industry (that is, we are not in a situation of single-firm dominance) the market outcome is inferior to a counterfactual with effective competition, is that of tacit collusion. Here it is the conduct of the firms which is resulting in higher prices (and/or lower quality, lower capacity, less investment, narrower product range etc.). However, the firms' conduct is not illegal, and cannot hence be sanctioned by competition law. Indeed, it is well-known that firms may be able to achieve a collusive outcome without explicitly coordinating their actions with rivals, but simply adapting their actions so that each oligopolist behaves in a way which is consistent with collusion. Economic theory has recognised for a long time the possibility that tacit collusion may emerge and mimic the outcome of explicit cartels, and the jurisprudence of the EU has clarified that as long as firms do not talk to each other and do not engage in other practices that allow them to enforce collusion (think of agreements to exchange sensitive, timely and disaggregate information) or to coordinate on certain outcomes (think of unilateral announcements about future price or output decisions, which allow firms to indirectly coordinate on certain actions), their conduct is not in violation of article 101 of the TFEU.

Of course, there may be many reasons why firms may sooner or later want to talk to each other in order to sustain collusion: in particular, when the industry faces demand or supply shocks, firms will be tempted to talk to each other, because the current outcome which has been reached through tacit collusion is not optimal any longer, and some adjustment would be optimal. However: firstly, some forms of collusion are more stable and need less 'renegotiation' than others. For instance, customer

allocation, or division of the markets in areas of influence allow firms to respond to shocks without the need of coordinating their reactions to shocks, and without the risk of triggering price wars (see more below). Secondly, explicit collusion is not easy to prove anyway. In order to prove it, antitrust authorities would need hard evidence that firms have talked to each other, and firms' employees are well aware that they should not leave trace of their meetings.

Whether the collusive outcome is enforced through tacit collusion, or through explicit but well-hidden coordination, the conclusion is that a market may be subject to collusion, but competition authorities may have little chances to break it by using traditional anti-cartel laws. This does not mean that an NCT investigation may always be able to stop the collusive outcome, but in some situations the EC could intervene so as to make the market environment less prone to collusion.

Vertical integration and collusion

Economic theory shows that vertical integration often improves the ability of upstream firms to tacitly collude (Nocke and White, 2007, Normann, 2009); it also improves the ability of downstream firms to tacitly collude (Biancini and Ettinger, 2017). Thus, vertical integration appears in a negative light in industries prone to collusion. Divestiture obligations as a structural remedy under the NCT would lead to vertical separation. While this makes tacit collusion more difficult to sustain, there is a priori no guarantee that tacit collusion breaks down and therefore possible efficiencies stemming from vertical integration should be taken into account when balancing expected costs and benefits of this remedy.

Vertical collusion

Recent theory has looked beyond collusion among firms in just one layer of the production chain. In particular, tacit collusion between downstream firms may involve common suppliers. If vertical contracts are secret, downstream firms cannot use the contracts between supplier and rivals as a commitment device to sustain high prices in the downstream market.⁴⁰ Nevertheless, as Gilo and Yehezkel (2020) show, under some conditions, collusion is easier to sustain than "standard" tacit collusion in the downstream market. Common suppliers are part of the game as they reject contract deviations. To make suppliers stick to such a strategy, they are compensated through higher prices for the input they supply; in return, they have to pay a slotting fee. Since downstream firms have to use a common supplier for some types of inputs for the collusive mechanism to work, exclusive dealing agreements can make sure that this is indeed the case. Thus, exclusive dealing agreements may facilitate tacit collusion even when exclusivity is for only a short period of time.

Cross-ownership and common ownership: pro-collusive effects

Cross-ownership and common ownership may increase collusive concerns for two reasons: communication channels between firms may be established and, even absent any communication, deviation incentives are affected. In the latter case, the interaction between ownership structure and deviation structure is complex. However, even there tacit collusion may be easier to sustain in the presence of cross-ownership and common ownership (see Gilo, Moshe, and Spiegel, 2006).

⁴⁰ Observability may require information sharing and thus constitute a violation of article 101 TFEU. For a setting with observable vertical contracts, see Piccolo and Miklós-Thal (2012).

Algorithmic collusion

Another risk of tacit collusion is that firms in an industry may delegate their pricing decision (or decisions that directly affect them, such as stocking decisions) to self-learning algorithms. Some legal scholars have raised the concern of “algorithmic collusion” (see, in particular, Ezrachi and Stucke, 2016). While some cases of algorithmic collusion may well be considered as explicit collusion (e.g., if several firms in an industry use the same pricing algorithm so that this constitutes a hub-and-spoke cartel), the risk that independent self-learning strategies “learn” to collude appears to be outside the realm of article 101 of the TFEU.

Different views exist in the literature about whether algorithmic collusion can arise when firms use different algorithms that aim at maximizing private profit. This discussion is not settled.⁴¹ Our understanding is that the discussion is evolving from whether algorithmic collusion by independent algorithms is possible (the short answer is ‘yes’) to how plausible or probable this is depending on the market environment. Collusion becomes more difficult if the environment changes frequently (and different firms are affected differently). Also, to be able to adjust, the algorithm must be frequently fed with new data. For an algorithm to learn it must be also fed with data that measure the success of an action (e.g., quantity sold or number of purchases made).

An important class of learning mechanisms are those using reinforcement learning (RL). A simplistic explanation is that a RL-algorithm uses trial-and error and puts over time more weight on actions in a given context that were successful in the past. Such algorithms are model-free, i.e. they do not rely on any maximization or adjustment based on forecasts involving a model.

Q-learning is a very natural version of reinforcement learning. Calvano et al. (2020) let different Q-learning algorithms play against each other in various imperfectly competitive market environments. As their simulations show, these algorithms learn to tacitly collude over time leading to prices above the level under non-cooperative behaviour but below prices charged by a monopolist. This can be seen as a proof of concept: Algorithms from a particular class are able to learn to collude in the “wild”, and this includes stochastic market environments.

There is little empirical evidence on algorithmic collusion at this point. The retail gasoline market is a good place to collect such evidence because the product is well defined and gas stations frequently change prices. In the German retail gasoline market, algorithmic-pricing software became widely available by mid-2017. Different chains were providing incentives to affiliated gas stations to implement such software to a different degree. Assad et al. (2020) employ high frequency price data. Using a convincing instrumental variable approach to infer whether a gas station uses algorithmic pricing software, they find that in duopoly markets, profit margins do not change when only one of the two gas stations adopts the software, but increase by almost 30% in markets where both do. The latter increase around one year after the implementation of the pricing software. The takeaway from this article is that algorithmic collusion may indeed be a real concern, at least in some environments.

Where data and information are not publicly available, the NCT is a promising approach to generate evidence whether in a particular sector decentralized pricing leads to supra-normal prices, i.e. price levels that are higher than in a counterfactual

⁴¹ Useful discussions include Harrington (2018), Schwalbe (2019) and Gautier, Ittoo, and Van Cleynenbreugel (2020).

in which firms did not use sophisticated price strategies that include punishments for competitors. We acknowledge that even if such evidence is obtained through the NCT, the difficult issue of finding effective remedies remains.

Contracting and business practices by non-dominant firms

In this section, we briefly consider examples of contractual or implicit clauses, as well as of other price-related practices, which may dampen competition.⁴²

Endogenous consumer search

Market features such as search cost may lead to less competitive outcomes. Firms however may strategically affect consumer search. Armstrong and Zhou (2016) investigate buy-now options, exploding offers, and other tactics to convince consumers that the price will rise if they do not buy immediately but return from their search later on. Firms may have unilateral incentives to choose such search deterrents. In a duopoly, firms adopt such search deterrents, to the detriment of consumers (and possibly firms). With differentiated products, consumers suffer from high prices and bad matches, but also firm profits would be higher if none of the firms were allowed to use search deterrents. Intervening through the NCT here leads to a Pareto improvement: firms and consumers are better off.

Bundling

Bundling is a common practice in oligopoly. The economics literature distinguishes between pure and mixed bundling. Under pure bundling, firms offer only a bundle of several products, whereas under mixed bundling, they offer the products separately as well as, at a discount, the bundle. Bundling can lead to higher or lower consumer welfare depending on the specificities of the market.⁴³

A simple intuition is that pure bundling leads to lower prices compared to the total price under separate selling and is overall beneficial to consumers because the price elasticity of demand is increased. Regarding pure bundling, the state of the art is Zhou (2017). He provides an oligopoly framework and shows that under rather general conditions, pure bundling reduces consumer welfare.

When consumers have heterogeneous evaluations for the products on offer, competitive effects of mixed bundling are in general ambiguous and depend the distribution of consumer tastes. However, as shown by Zhou (2019), when there are more than two firms consumers benefit from mixed bundling. A different setting is one in which some consumers enjoy a benefit from consuming the products from the same firm (this is a one-stop shopping advantage), while others are only interested in buying one of the products, as analyzed by Thanassoulis (2007). He shows that on average consumers are worse off under mixed bundling than under separate selling.

Low price guarantees

⁴² Some of these clauses may also facilitate collusion, but we abstract from this effect in what follows.

⁴³ For a survey of the early literature, see Kobayashi (2005). We observe that bundling may be used as a device to partially or fully foreclose competitors (see, e.g., Whinston, 1990). Here, we focus on bundling in oligopoly for a given number of firms.

The economic literature has provided a number of theoretical models that explain that supra-normal prices and profits can be achieved through the use of low-price guarantees, that is, a clause which states that if the consumer finds a cheaper product, then that price will be matched or even improved (such clauses are also called 'best price' or 'meet-or-release' clauses). The simplest setting considers a symmetric oligopoly with fully informed consumers in which firms set prices. Absent low price guarantees, firms compete fiercely in prices and the competitive outcome results.⁴⁴ However, if firms provide low price guarantees the monopoly outcome will be implemented (see Salop, 1986). Intuitively, a firm would not decrease its price to win additional customers, because it knows that a consumer served by a rival could always obtain an as good or even lower price by buying from its original provider.⁴⁵

While low price guarantees considered so far apply across firms, an alternative price guarantee is to promise the same price over time (and thus across consumers). Such a "most favored customer" or "most favored nation" clause may provide commitment for a firm not to lower its price. A firm implementing such a guarantee induces competing sellers to price less aggressively (Cooper, 1986).⁴⁶

Lear (2012) provides a detailed account of low price guarantees and most-favored nation clauses. To summarize, price guarantees may lead to high prices in markets in which neither firm has a high market share. While consumer welfare effects from such clauses are not necessarily negative, they do have the potential to harm consumers.

Price parity clauses

Some firms, in particular, in digital markets, operate as two-sided platforms bringing together consumers and sellers. These platforms often take a cut from the revenues generated by sellers on the platform. In an oligopoly environment, platforms may impose price-parity clauses; i.e. participating sellers cannot offer a lower price elsewhere. This removes the otherwise existing incentive of a consumer to bypass the platform and directly contract with the seller or to contract with the help of a competing platform that charges less to the seller. A seller takes the higher cost to transact with buyers into account and adjusts its prices. Absent the pricing restriction, the seller would have an incentive to steer the consumer to a sales channel on which it incurs lower costs. Price-parity clauses eliminate this possibility and thus have the potential to sustain higher fees paid by sellers to the platform.⁴⁷ Eventually, consumers suffer from such contractual restrictions because of higher price levels in the product market;⁴⁸ this applies also to consumers who continue to buy directly, do not benefit from the services provided by the platform, and are in no contractual relationship with the platform.

There have been a number of abuse cases in member states on hotel booking platforms. For instance, in Germany the Bundeskartellamt first investigated the use of

⁴⁴ The logic applies to homogeneous and to differentiated products. With differentiated products firms can expect positive economic profits absent low price guarantees, also in such an environment such clauses remove the incentive for competitors to offer better deals and thus lead to less competitive outcomes (Belton, 1987).

⁴⁵ Price competition may be partly replaced by competition in service quality. However, this is often not feasible and, when it is, often does not provide the same benefits to consumers (this also holds in market environments characterized by price fixing).

⁴⁶ A possible implication of such clauses is that they may facilitate entry (in general, if potential entrants expect less aggressive competition in the industry, they will have an incentive to enter); Edlin (1997) argues that entry will be excessive.

⁴⁷ The efficiency defense of such a practice is a seller's free-riding behavior on a platform's investment into recommending high-quality matches to consumers. This issue arises because of a missing-market problem for information provision, as the platform is only paid for a completed transaction.

⁴⁸ For a formal investigation, see Edelman and Wright (2015) among others.

price parity clauses by HRS, at the time the leading hotel booking platform, and only later investigated Booking which was gaining market share. With a theory of harm that applies to all platform in an oligopolistic industry, a simultaneous intervention (using the NCT) is preferable. Possible remedies include the prohibition of price-parity clauses and the prohibition of other practices that make it unattractive for sellers to serve consumers through different channels.

Strategies in response to behavioral biases

Firms respond to consumers' behavioral biases by adjusting their business strategies, as already hinted at when considering the relationship between market features and consumers harm. Firm may use non-linear prices and engage in practices that increase consumer inertia and increase prominence. Some of these practices may generate consumer benefits as their immediate effect. For example, by providing convenience, consumers may be discouraged from searching somewhere else. However, such actions can create habits such that consumers stick to suboptimal choices.

Firms may become prominent through advertising. Consider a differentiated-product oligopoly with price-setting firms in which consumers are fully informed absent advertising. Firms may engage in advertising to make consumers ignore the competing offers. If firms can identify which consumers have been reached by competitors, they have an incentive to first advertise to those consumers who have not yet been addressed by competitors. Such a model will deliver that each firm exclusively advertises to a fraction of consumers (if advertising is sufficiently costly) and the market outcome is less competitive than absent the consumers' behavioral bias.⁴⁹

Consumer harm may be more severe in digital markets (compared to non-digital ones) as firms instantly learn about consumer reactions. As Scott Morton et al. (2019, p. 36) observe regarding digital platforms, "framing, nudges, and defaults can direct a consumer to the choice that is most profitable for the platform. A platform can analyze a user's data in real time to determine when she is in an emotional 'hot state' and then offer targeted sales."

Behavioral biases or lack of information may make consumers (or at least some group of consumers) very valuable for firms. Thus, firms may compete in another dimension to attract those consumers who will later generate high profits. This implies that if firms have such strategies available they will compete hard for consumer in some other dimension and, under competition, a large part of profits will be dissipated. However, while firms may gain little or even lose compared to the environment absent bias or lack of information, consumer may still be harmed. For example, if firms advertise to attract the attention of consumers, if advertising does not generate value (or only very little) for consumers (while affecting behavior), consumer harm may be severe, but will not be reflected in high profits.

Apart from obtaining a worse deal, consumers may be harmed by the infringement of their privacy rights or by harm from a malfunctioning of the product and this harm may be particularly large if they engage with firms which have deep and broad consumer data. Theories of harm may thus have to look beyond rent extraction in the seller-consumer relationship and include non-monetary losses. While it remains true that initially firms may compete aggressively for consumers, the extra benefit from extracting rents from consumers may well be less than the harm inflicted on

⁴⁹ The analysis would be very similar to Grossman and Shapiro (1984) with the opposite interpretation that advertising reduces the share of fully informed consumers (here all consumers know at least one firm).

consumers and, therefore, consumers suffer overall even when accounting for consumers receiving more-attractive offers. While this is clearly a consumer protection issue, it may also be a competition issue since large firms have a data advantage and, thus, may be able to keep competitors at bay with more-aggressive offers and achieve supra-competitive profits. Developing appropriate remedies require a sound understanding of the specific market failure and of how consumers can be protected, e.g., from failing to take future losses into account.

Vertical integration and exclusive dealing

In an industry characterized by vertical integration, a complementary relationship in the upstream market and competition in the downstream market may have the feature that the market is less competitive when upstream inputs are pooled. In particular, Reisinger and Tarantino (2019) show that patent pools are anti-competitive when there is a lot of vertical integration between licensor and licensees and propose information-free policies to screen anticompetitive pools.

Competitive effects of vertical integration (or exclusive dealing) are also of relevance in the context of two-sided platforms. For example, some work has looked into one premium content and its provision through exclusive dealing (e.g., Weeds, 2016). Exclusive dealing and vertical integration can also be used as an instrument of product differentiation on the consumer side. For instance, providers of video streaming such as Amazon, Hulu, and Netflix engage in exclusive deals and vertical integration. To understand market forces in this world, it is important to understand to which extent consumers are willing to consider multi-homing. It will be difficult to evaluate without an NCT whether exclusive dealing and vertical integration in such markets are likely to be anti-competitive.

Dominant firms' practices which may be difficult to address under 102 TFEU

It is also conceivable that a dominant firm might engage in practices that may be difficult to address under article 102 TFEU, and for which an alternative competition tool may therefore be desirable.

NCT in response to the protection of intellectual property rights (IPR)

One case is where competition policy may overlap and somehow be in contrast with IPR laws or other laws/regulations. For instance, imagine a situation where a dominant firm possesses a key input or technology which enjoys IPR protection, and that it refuses to give access to rivals, thereby locking competition in the market. As we know, the jurisprudence sets (rightly) a high standard of proof for intervention. For a refusal to supply to be abusive, the following cumulative conditions must co-exist: the input must be indispensable, refusal must lead to complete foreclosure, i.e., elimination of all competition and it must prevent the emergence of markets for new products for which there is substantial demand.⁵⁰ The last condition ("new product test") in particular is motivated by the protection of IPRs: if competition policy allowed a competitor to offer exactly the same product as that offered by the IPR holder, then effectively the IPR protection would not be respected. However, IPR laws may award a patent or copyright protection in cases where it would be difficult to see an innovation worth protecting, and it is unclear that competition law may intervene in such cases,

⁵⁰ In the *Microsoft case in the EU*, this condition was reformulated in broader terms, to include also the cases where the refusal to deal limits further technical development to the detriment of consumers.

in the light of the above conditions established by the case law. It is conceivable that in such cases an NCT investigation may also assess the extent to which IPR is worth protecting, to the detriment of competition.

In some cases, the problem may be at the other extreme, that is, there may be insufficient IPR protection for start-ups coming up with new business models, or products, and they are systematically imitated by dominant firms, which so reduce the chances of growth of their smaller rivals, and may also affect their incentives to introduce new products or services in the first place. This is the phenomenon which is often defined as “Sherlocking” (because Apple included in its Sherlock’s search tool all the functionalities that an independent software developer had been offering, under the name “Watson”), and which was adopted by several large platforms, including Facebook (one of the most famous cases is Instagram’s “stories” copying Snapchat’s model) and Amazon (which allegedly often starts selling own products after seeing that some of the sellers in its platform are successful). In the latter case, though, an additional and possibly more important issue comes from the fact that Amazon can observe all transaction data of the sellers present on its platform and use this asymmetry to its own advantage. We understand that this feature is being investigated by the EC under 102 TFEU.

It is not clear to us to what extent these business models or products or ideas are worth protecting and/or cannot be protected, and whether such “cloning” is really harmful to consumers (clearly, in the short-run it is not, because they would have access to more variants and presumably competition would drive prices down; but in the long-run this may prevent innovative solutions from existing in the first place, because start-ups would anticipate that cloning of their ideas would occur). However, this is clearly an area where an article 102 TFEU case would not help.

Conduct by dominant firms which bypass regulations

In some cases, one or more firms may take advantage of existing imperfect laws and regulations, by using loopholes or bypassing them. Consider for instance the pharmaceutical market. Competition law has in the past managed to use abuse of dominance provisions to address such issues, for example in *AstraZeneca*. But similar cases may be “borderline” and there may be less indirect ways to solve the problem than 102 TFEU. We think for instance of those cases where some drug prices have spiked almost overnight and by exceptionally high proportions. Competition law has used excessive prices provisions to try and deal with some of them, but with mixed success.⁵¹ AN NCT investigation may have been more adequate, since it may have identified those pitfalls in the existing regulations or institutional settings which may create issues more widespread than in the particular cases at hand.

NCT as a “better” substitute to an assessment under 102 TFEU

In other cases, resorting to article 102 may be appropriate and feasible in principle, but either it would not allow for prompt intervention or the assessment under 102 may be extremely complex and uncertain. Consider the former point: in some cases, it may take simply too long to address the relevant issues within a reasonable horizon, especially in dynamic fast-changing markets such as the digital ones. *Google shopping* may be a case in point: the EC investigated Google’s practices over a very long period,

⁵¹ While the *Aspen* case conducted by the Italian CA was upheld by the Consiglio di Stato, in a similar case in the UK (*Pfizer/Flynn*), the UK Court of Appeal broadly upheld the judgment of the CAT that the case be remitted back to the CMA.

during which Google's business model – and the market itself – changed considerably. This was problematic for at least two reasons: first, during the period of the investigation the industry had evolved considerably and by the time the EC issued its Decision, its structure was completely different from what it used to be at the beginning of the investigation, and if harm had been made, it could not be undone. Second, it also made the assessment of the case more complex, as the conduct at issue and the market environment in which it was taking place have been changing considerably.⁵²

As for the latter point, one should be aware that abuse of dominance cases may be extremely difficult and uncertain, especially when their assessment may require trading off possible short-term benefits with long-term harm.⁵³ Consider for instance a situation where a firm engages in bundling of a product which is dominant in a certain market with another complementary product which is supplied also by other competitors; suppose also that in the short term this practice generates small but certain benefits to consumers (for instance, because they may save transaction costs by shopping from one firm only) but it may also have exclusionary effects, with a small probability but with pronounced impact in the long term (for instance, because sufficient consumers would desert competitors, which would be unlikely to be viable). Likewise, in a situation in which the dominant firm starts to integrate databases from two different markets, such data integration may have a short-term benefit for consumers but may have long-term irreparable effects to competition.⁵⁴

Under article 102 TFEU, the EC would need to *prove* that the conduct at issue is abusive, which may require a sophisticated economic analysis and possibly the quantification of the probabilities and magnitudes of the different possible future events,⁵⁵ and a finding that the net effect of the conduct is adverse to welfare might be very difficult to substantiate with data. (Note that even if events were certain it might be very difficult to carry out a quantitative balancing between an exclusionary effect and a pro-consumer effect.)

Conceivably, an NCT investigation might allow intervention even without proving that the conduct is abusive: quite simply, if it is thought that the adverse (dynamic) effect on competition is sufficiently high, then by applying a sort of *precautionary principle* the conduct could be discontinued.

Admittedly, in a sense this approach might be seen as amounting to lowering the standard of proof for competition intervention relative to 102 practice. However, such an intervention might allow the preservation of competition in the industry. Further, there would be no fine and no finding that the firm has done anything unlawful: quite simply, a suspicious conduct would be prevented in the name of preserving competition. The intervention may be temporary and, after market conditions have changed, the EC may no longer object to a certain business practice.

⁵² Recently, EU competition practice has rediscovered an old tool so as to allow for injunctions to be issued to avoid the situation just depicted, namely that a dominant firm may continue to use (allegedly) anti-competitive practices which may have permanent effects. Arguably such injunctions may in some cases also be a possible instrument to resort to.

⁵³ There may also exist uncertainty on the side of the EC as to whether a firm's alleged dominance will hold water, while the alleged abuse can also lead to a lessening of competition in a narrow oligopoly.

⁵⁴ See de Cornière and Taylor (2020) and Condorelli and Padilla (2020a) for a formalization of this argument. The latter also discuss possible remedies. For a discussion of envelopment strategies, see Condorelli and Padilla (2020b).

⁵⁵ It is not clear to us whether the judges would be ready to reason in terms of expected values, which would be the correct way to proceed, rather than simply assess whether the exclusionary outcome would be more likely than not. Imagine for instance that the conduct at stake gives a small welfare benefit b for sure but with a probability p it has an exclusionary harm h . Under a balance of probabilities standard, the court may find the conduct abusive only if $p > 1/2$. Under an expected terms approach, abuse should be found if $p \cdot h > b$, which may hold good also for $p < 1/2$.

If there exist several 102 cases that are similar but involve different firms and different markets, it may be more efficient to deal with all of them at once. This is something that an NCT investigation may in principle allow to do, whereas an article 102 case would not. Again, one can think of *Google Shopping*: not only Google itself engaged in similar “self-preferencing” practices in services other than vertical search, but also other platforms allegedly resorted to similar practices (see e.g. the *Apple Music v. Spotify* case). In such circumstances, an NCT investigation into these practices in the digital industry may allow to achieve a uniform approach that avoids the vagaries of the case-law, and might hence be superior to the attempt of setting a policy through the precedential values of article 102 cases.

Related to the previous point, it is also possible that the very fact that a 102 case would necessarily concern one firm and one product may not address the competition issue. For instance, consider the situation arising after liberalization in the telecom sector in Europe, where each national market was characterized by a dominant firm (the previous public monopolist) and where entrants had a difficult time in gaining market share. Initially, difficulties were also created by the dominant incumbent claiming that a consumer moving to a rival provider would not have the right to keep her telephone number (since the number should be considered as its IPR – see the discussion above of unworthy protection of IP). To promote competition, mobile number portability was imposed. This was a much better solution than what a 102 case could have achieved. The latter could have obliged the dominant firm to offer portability, but this would likely be insufficient, since consumers needed to know that they could move back (without losing their number) if unsatisfied with an alternative provider. Otherwise, they may not have tried the rival in the first place.⁵⁶

4. On remedies in NCT investigations

As argued above, there is a wide set of theories of harm that may justify an NCT investigation. As exemplified above, to address consumer harm in a meaningful way, the EC must have the power to implement appropriate remedies. In other words, if certain remedies are ruled out, NCT investigations based on particular theories of harm will be meaningless. In this section, we make a few considerations to help understand (1) which types of remedies may be appropriate in correspondence with the different theories of harm; and (2) when an investigation should be closed with an imposition of remedies, and when not. On the latter point, we anticipate that the EC should carry out a cost-benefit analysis that allows for probabilistic assessments. While some remedies may have virtually no “side-effects” and hence could be imposed relatively safely, others may have adverse consequences, not only on the firms at issue (which would be protected by the principle of proportionality) but also on consumers – and hence trade-offs should be carefully considered before being imposed.

To state the obvious, a suitable remedy is intimately related to the theory of harm. The NCT investigation should identify what are the mechanisms which lock competition in the market at hand, and hence allow to understand what are the interventions which should possibly neutralize those mechanisms and unlock competition. Inevitably, though, markets are complex, different characteristics and conducts interact to determine market outcomes, and uncertainty may exist about the impact of a concrete intervention. We briefly discuss which remedies may correspond to the different theories of harm we have discussed in Section 2. We recall that we have

⁵⁶ See *Fletcher (2020)*.

distinguished between those which relate to market features broadly independent of firms' conduct and those which relate to particular practices or behavior by the firms.

Market features and remedies

In Section 2.2, we elaborated on market features that may hinder markets from working properly or that may jeopardize competition. Such features include scale economies on the supply side, network effects, asymmetric information, consumer switching costs and behavioral biases on the consumer side.

Note that some of these features may actually lead to pro-competitive effects; thus, one has to be reasonably sure that the proposed remedies will reduce the harm. For instance, while network effects often make it difficult for a new firm without established customer base to enter the market, this is not always the case. Also, consumers may benefit from positive externalities. Hence, one should look for an intervention which facilitates entry or expansion of younger firms while not depriving the set of consumers of the increased utility derived from such network effects. Remedies which foster *interoperability* would, in some situations, be a good example of such an intervention.

Relatedly, incumbent firms may have more data and better information about consumers: this may lead them to offer more targeted and better products which is certainly benefiting consumers but gives them an advantage relative to younger and smaller rivals, which have no such detailed information. Again, a desirable remedy does not inhibit the pro-competitive effects while favoring a level-play field. In some instances, *data sharing* or *data portability* obligations may fit the bill. Note that this is a type of remedy which is not exclusive to digital industries: data and information matter in most industries. For instance, it was used in the *retail banking* and in the *home credit* market investigations in the UK: in the former case, the largest retail banks were obliged to develop and adopt an API (Application Program Interface) open banking standard so as to share information. In the latter case, the home credit companies were required to share data on their existing customers' payment records with other lenders.

In such interventions, pro-competitive effects may be large and possible adverse effects, if any, are likely minimal. In some cases, incumbent firms may argue that the data and information in their possession is the result of their investments and efforts, and obliging them to share them with rivals amounts to depriving them of the fruits of their efforts. These claims should be carefully assessed and, to the extent they are justified, a solution may consist of a fair and reasonable compensation for disclosure.

Such considerations may also apply to inputs other than data or information. For instance, there may be regulatory restrictions which may hinder entry; for example, in a town there may be only one or two bus stations which could host bus services without leading to too much traffic congestion, and their management may have been assigned to incumbents. In those cases, a remedy might take the form of imposing access obligations (if not already part of the regulation) and would likely have much higher benefits than costs.⁵⁷

Whenever there are regulatory barriers to entry, remedies may be aimed at lowering or removing them.⁵⁸ In many cases, procurement by public institutions may be designed in such a way as to – often involuntarily – reinforce scale-related competitive

⁵⁷ See the *local bus services market investigation in the UK*.

⁵⁸ See Fletcher (2020) for a list of cases where remedies to market investigations in the UK involved regulatory changes.

advantages of incumbents, or at least make it very difficult for smaller rivals to be effective competitors. Consider for instance a national government which intends to procure some good or service, say, to build a broadband infrastructure in peripheral areas of the country, or to provide computers for all the public administration. It is unlikely that small (or regional) firms may be able to make offers at such a national scale, whereas they might be competitive if procurement was divided into different "lots". If an NCT investigation identified a problem of this type, a possible remedy may consist in advocating the relevant public authorities to design their public tenders in such a way to foster participation from smaller firms. To the extent that fragmentation of contracts may involve loss of positive externalities, or loss of economies of scale (and consequently a higher price), these considerations should be traded off with the advantages resulting from fostering competition (an analysis which may be admittedly complex), before imposing the remedy. More sophisticated procurement practices may accommodate such concerns.⁵⁹

In Section 2.2, we also argued that a number of theories of harm find their roots in consumer-related features, be they switching costs, lack of information, or behavioral biases. In such cases, we believe that remedies aimed at improving transparency of prices and contractual terms, or promote search and comparability of offers, or attenuate biases are also relatively safe, in the sense that they are less likely to generate "side-effects" which are adverse to competition. Examples of such remedies may include: obliging suppliers to indicate from the outset all prices, rather than just a base price, with "add-on" components more or less hidden, including VAT; ensure that consumers have all the relevant information about the product or service, including also measures of quality;⁶⁰ require producers to timely communicate all their prices so that they can be published or showed in the same place, thereby allowing consumers to compare prices;⁶¹ in case of periodic payments for a service, require providers to send periodic statements written in a comprehensive and informative way, and/or to inform them that cheaper providers may be available elsewhere;⁶² obliging an integrated platform to show services competing with its own in a random order, rather than showing its own first, which would benefit it of the prominence bias that consumers typically display.

In some industries, competition may not function properly because (i) there is a high sectoral concentration and (ii) high barriers to entry (say, due to large fixed costs) imply that incumbents are not disciplined by new firms. Even absent consumer distortions such as those mentioned above, and without particular business practices (see next section), the very fact that few firms co-exist leads to weak competition and high prices relative to similar industries in less concentrated markets. There may be many reasons for this concentrated structure, including a liberalization process which has not been properly managed, or an antitrust authority which has been too lenient when reviewing past mergers. Whatever the reason, though, there may not be obvious remedies to unlock competition apart from a structural intervention consisting of a divestment order. This type of remedies is obviously more complex than those examined above. Apart from possible issues of proportionality (there must be clear evidence of significant consumer harm to justify a divestment order), there may be incentive issues (part of the assets of the oligopolists may be the result of investment, innovation, effort), but – perhaps less evident – there may also be inefficiencies

⁵⁹ These concerns extend to private procurement and thus barriers to entry due to market design choices by private entities.

⁶⁰ For instance, the retail banking market investigation in the UK included a remedy which required banks to display prominently a number of core indicators of service quality.

⁶¹ This is a measure which has been adopted in several countries to favor comparability of gasoline prices (for instance through websites or billboards located in major roads to allow drivers to know prices of nearby stations); in the Home Credit market investigation in the UK one of the remedies required lenders to publish prices on a website where customers can compare the prices of loans on offer.

⁶² See store cards and home credit market investigations in the UK.

created by the breaking up of a company, as well as risks inherent from the artificial redesign of the industry. The experience of remedies in merger control demonstrates that there may be many things which can go wrong when breaking up companies or divisions of companies.⁶³ First of all, the owner of the divested assets should have the *ability* to effectively compete. A company is an integrated set of assets of different nature which may interact in non-obvious ways: by breaking it up, inefficiencies may arise. For instance, some management, say located in the headquarters, may serve different subsidiaries or products: divesting a subsidiary without assigning experienced human capital may make it less viable (and if assigning it to the divested company, the incumbent may suffer). Divestment of a subsidiary without giving it the contracts with existing customers would limit its competitiveness. In some cases, there may be common inputs and may not be easy to ensure shared access.⁶⁴

But for competition to be restored, the buyer of the divested assets should have not only the ability but also the *incentive* to compete effectively. In an industry with a history of weak competition, one has to ensure that the buyer of the divested assets will have the incentive to introduce competition, and this incentive may again depend on how the design of the divestment (and hence the assets it buys).

In sum, structural remedies require an appropriate design and implementation, and it cannot be taken for granted that, say, a divestment will by itself be leading to more competition. The awareness of the risk of such remedies may in turn inform the decision of whether it should be imposed in the first place.

Firms' conduct and remedies

In Section 2.3, we investigated theories of harm resulting from firm behavior that may not be addressed adequately by traditional competition law tools. These included cases such as common ownership and cross-ownership; tight oligopolies able to reach collusive outcomes; dominant firms which use business practices that would be difficult to address using article 102 TFEU; or firms which are not dominant yet (and hence whose conduct cannot be investigated as abusive) but which may likely become absent an intervention by the EC.

Forced divestitures as remedies in case of common ownership and cross-ownership have been discussed above. Such structural remedies are less problematic than in the case of fully integrated firms since in the case of common ownership and cross-ownership businesses should be able to continue operate without disruptions after divestitures.

Tacit collusion-based theories of harm may be addressed by a number of remedies. Some remedies are unlikely to have negative side effects and are desirable if considered effective. For instance, if reducing the possibility of monitoring each other (e.g. reduce possibility to exchange information) is feasible and likely to be effective, such a remedy appears unproblematic (unless it has negative repercussions on the consumer side).

Structural remedies might be more problematic. Consider a symmetric tight oligopoly that is considered to be prone to tacit collusion. Economic theory and conventional wisdom suggest that asymmetries and fragmentation would make tacit collusion less likely to occur. However, imposing divestiture obligations may be justified only in very particular circumstances, inter alia because of the considerations we made above on

⁶³ See Federico et al. (2015).

⁶⁴ See again Federico et al. (2015) on why merger remedies involving the "carving up" of firms involving vertical relationships is especially problematic.

the ‘risk’ of divestments. Similarly, imagine that there is a duopoly and (tacit) collusion was achieved after one firm vertically integrated (the other was already vertically integrated). A remedy which requires undoing of the vertical merger would likely not be ‘proportional’, unless there is strong evidence that the merger has led to consumer harm due to tacit collusion.

In case of dominance, we elaborated on the possible limitations of running a case under 102 TFEU. The role of an NCT investigation may be to not only investigate a particular allegedly abusive practice but also to address a competition issue more broadly, e.g. by ruling out not only certain practices that are currently observed, but also possible substitute practices that may follow after prohibition of a particular practice. As argued in Section 2.3, the practice may be problematic even absent dominance and its prohibition may be the appropriate remedy. Certain practices may have hidden efficiency rationales and therefore a prohibition has to be preceded by a cost-benefit analysis.

If a firm is not yet dominant, but a risk that it will become dominant if certain practices continue or certain market features are not remedied, interventions may be appropriate so as to avoid competition problems in the future, which may be more difficult to remedy at that point. In particular, once a market has tipped and network effects have consolidated it may be more difficult to “reanimate” competition. If there are clear risks of a firm becoming entrenched, even interim measures appear to be appropriate. Moving fast before an investigation is completed always means moving under more uncertainty. However, in exceptional circumstances, this may be the better option. This may apply in particular to industries in which not yet dominant firms enjoy a strong position elsewhere.

Trigger for “remedies intervention”

Finally, there is the issue of when it is worth triggering the remedy after a market investigation. As mentioned above, the EC will have to perform a cost-benefit analysis before deciding whether to impose a particular remedy. Since some of the risks are probabilistic, a balance-of-harm approach is preferable according to which expected costs and expected benefits are to be accounted.⁶⁵ An optimal policy will have to account for type-1 and type-2 errors.

5. Takeaway points

We have explained why market forces alone will not necessarily “fix it all” and restore automatically competition in a market characterized by market power. Firstly, some exogenous market features – including scale and scope economies, network effects, switching costs, asymmetric information, and behavioral biases in consumers’ decisions - make it difficult or impossible for entrants or smaller rivals to challenge the incumbents, lead to less competitive market outcomes, or are such that as-efficient competitors are doomed to fail. Since these features are not determined by firms’ decisions (although their behavior may sometimes exacerbate the distortive effects of those features) traditional competition law tools would not be likely to correct the competitive distortions they create or are likely to create in the future. Secondly, the firms in an industry may engage in conduct that prevents self-correcting forces from operating. For a number of reasons, traditional competition law tools may not be able

⁶⁵ For instance, Furman et al. (2019, p. 19) propose such an approach in the context of mergers that remove a potential competitor. The approach could be applied in NCT investigations when the EC faces uncertainty; it constitutes a cost-benefit analysis under uncertainty. An intervention may be desirable even if consumer harm is not very likely. This is the case, if in the negative event consumer harm is severe, while it is only moderate in the positive event.

to prevent or correct such conduct. For instance, tacit collusion is (rightly) not sanctioned, common- and cross-ownership are typically allowed, firms may engage in a number of practices (e.g. price clauses) that cannot be characterized as unlawful under articles 101 (if they are not agreements) or 102 (if the firms at hand are not dominant) but are harmful to consumers none the less. For all of these reasons, an NCT in the shape of a market investigation would usefully complement the existing competition policy “arsenal” at the EU level.

3. Intervention triggers

In this section, we deal with possible “intervention triggers”, namely variables that can act as screens or indicators which may signal the need for the deployment of the NCT. To do so, we shall build upon the theories of harm (or circumstances under which a market may not work properly, and traditional competition law tools may not help) developed in the previous section: the triggers of an NCT investigation must be intimately connected with a conjectured theory of harm. We shall suggest focusing on simple indicators, because before starting a market investigation it is unlikely that the EC will have sufficient information and data to be able to apply sophisticated econometric methods.

1. From theories of harm to intervention triggers

We distinguish between market environments in which a dominant firm cannot be challenged or in which the risk that such a dominant position arises is high enough, and oligopoly environments where there is some competition problem. In the previous section we developed some theories of harm and in this section, we link them to intervention triggers. Before going into some detail, we sketch the links between the two classes of market environments and possible intervention triggers.

Uncontestable dominant position or foreseeable risk of one

A dominant position which cannot be challenged

The market may be one where a firm is already dominant, and *barriers to entry* or *barriers to expansion* exist that make it difficult/impossible for actual or potential rivals to challenge the market position of the dominant incumbent. Such barriers may arise because of scale and/or scope economies; (positive) direct or indirect network effects, and factors which hinder the shopping around of consumers, such as lock-in effects and switching costs, and/or behavioural biases which make it difficult for challengers to contest the dominant incumbent’s position.

In this case, the theory of harm is one whereby for the aforementioned reasons the dominant firm is not being challenged by actual or potential rivals. Accordingly, possible indicators of that situation include the following ones (which we shall describe more in detail in see Section 3.3 below): persistently high market share of the dominant incumbent; little evidence of entry (and if so, only at small scale); evidence of high prices and/or high profitability; complaints by buyers/consumers that they get poor services (note that in multi-sided markets one side of users, say consumers, may appear to be happy but the other side of users, say advertisers, software developers, or sellers seeking access to the platform may not be); little innovation or introduction

of new products/services. Note that when we mention “high” prices, “insufficient” innovation, “poor” quality, and so on, we mean relative to a counterfactual situation in which competition is effective; but in practice, this should translate into trying to identify similar benchmark markets and compare prices and services offered in the market at issue with the benchmark/control market.

The risk that the market may evolve into one where competition is locked

Some markets may have not yet generated a dominant firm but show clear signs of increasing market power in the hands of one firm. Certain business practices which could be seen as more innocent during the infancy of the industry (say, exclusive contracts, fidelity rebates, tying) may become more problematic as the industry matures and becomes more concentrated. These business practices may have some efficiency rationales but also contribute to barriers to entry, and the trade-off between costs and benefits may tilt towards the former as competitors are shaken out of the industry or relegated to unprofitable market niches. In combination with other factors (such as scale economies or network effects) they may lead to monopolization (but similar considerations may also arise for very narrow oligopolies, say a situation where two firms more or less equally share the market).

Some of the variables seen above may also offer some indications of a tendency for competition in the market to become locked. However, the situation will likely be more dynamic, and a more careful reading of the indicators may be needed. For instance, it may not be excluded that to increase its market power, a firm on the verge of becoming dominant may offer good deals to at least some customers. More generally, it will be more difficult to identify a sector which is prone to tipping or about to become dominated by one firm than a sector in which this process has already taken place. The role of a clear understanding of the likely theories of harm cannot be overstated in such circumstances: the EC will have to spell out clearly what it believes the evolution of the industry might look like, and why it might give rise to locked competition. This will in turn point to possibly useful indicators/triggers, which should carefully be considered before starting an NCT investigation. (Recall also that it would be a good idea to preliminarily explore whether there are likely feasible remedies, before starting an NCT.)

Lack of effective competition among oligopolists

As we have explained in the previous section, there may also exist situations where the market does not deliver good outcomes for consumers (in terms of prices, product range and quality, innovation and so on) even though there is no dominant position, nor is it likely that there will be one soon. One possible reason may be due to the existence of a collusive situation. We shall deal with possible collusive screens (that is, indicators of collusion) more in detail below, but the general idea will be to look for data and outcomes which are typically associated with collusive outcomes but not competitive industries. For instance, prices tend to be stable under collusion, but not under effective competition, even as there are cost shocks.

Another case may be one where there exist a few oligopolistic firms which behave similarly as ‘local’ monopolists with respect to an important fraction of consumers, in the sense that each of them sells to consumers some of whom are somehow ‘captive’. In such an environment captive consumers do not shop around, for instance, because of lack of transparency of the market, because of switching costs (which may or not be at least in part endogenous, i.e. arise due to firm behavior), because of asymmetric information, because of the existence of parallel restrictive clauses or vertical

contracts (e.g., most or all sellers use exclusive dealing or single-homing – which may have not been introduced from the beginning). In all such cases, attention should probably be given to demand-side indicators, and in particular to the understanding of whether and how many consumers may be ready to shop around or if instead they are unlikely to do so.

The case where several oligopolistic firms co-exist but competition is locked and hence consumers are not obtaining good deals (relative to comparable but more competitive markets) may also serve to illustrate the importance of being guided by a theory of harm when looking for intervention triggers. If the sector was characterized by tacit collusion, we would have to look for features or practices which make it more likely for firms to monitor each other, to credibly punish each other in case of deviations, and to coordinate (see below for intervention triggers in case of collusion). If instead the issue seems to consist in the market being too segmented, so that each firm effectively has a local market (or even monopoly) power, then the problem lies elsewhere, most likely in market features or contractual conditions, or others, which make it difficult for consumers to shop around. So, for instance, looking at intervention triggers related to consumer behaviour and finding that consumers would be ready to switch might discourage an NCT investigation if the problem was of the latter type (“local” market power), but would not help understand whether an NCT may be worthwhile if the problem was of the former type, namely collusion (among other things because if firms are indeed colluding, consumers would simply not have the opportunity to find better deals elsewhere).

2. Intervention triggers: The need for simple indicators

As just discussed, the conjectured theory of harm should offer insights on what observable data signal that something may not be working properly in the market. But how sophisticated, refined, and complete should such data gathering be?

We start from the presumption that the formal decision of opening an NCT inquiry needs to be taken before any sophisticated data analysis could be carried out, and only after some preliminary evidence could be gathered and studied by the EC, within a reasonable short time.

An alternative approach would be to conceive of a two-stage procedure for the market inquiry, where the first stage would consist of an exploratory market study where the EC would already announce the opening of the investigation. Depending on the time window, firms could be approached for data; survey questionnaires or interviews could be requested from customers, final consumers, and other interested parties; and the EC could already conduct some (more or less) sophisticated market analysis. After the first-stage investigation, it would issue a first-phase motivated decision on whether there is reason to suspect adverse effects on competition, and continue towards the second phase, or not (any interested party could appeal this decision). Even under this alternative structure, though, there must be an initial decision by the EC whether to open the first phase or not. Hence, having some “intervention triggers” to look at in order to inform the decision of opening the market investigation or not would still be useful.⁶⁶

We believe that intervention triggers should consist of simple indicators and (more or less) readily available data, since it is unlikely that the EC could have access to

⁶⁶ We note that if the two-phase procedure was adopted, starting the investigation would be less costly (and hence relatively less attention may be put into the intervention triggers) than if the market inquiry consisted of just one period, since the EC could decide to stop the investigation after the first phase.

detailed and complete datasets before opening a market inquiry investigation in an official way. A fortiori, it is also unlikely that it could elaborate sophisticated econometric analyses which would require a wealth of data.

One important source of information which does not require the opening of the investigation would be complaints from customers, consumer groups, or rivals.⁶⁷ Although it is well understood that not all such complaints are always justified from the viewpoint of competition protection (customers and consumers may complain about prices which they consider too high but may be the necessary reward for costs including those for innovation and investment; rivals may be unhappy about superior products of a market leader or lack of access to a resource developed by the market leader for its own use), they could nonetheless provide a signal that something in the industry may not work as it should.⁶⁸ Other sources of information could come from newspaper articles, specialised websites and press, trade reports, and so on. Information may also come from an ongoing case (at the EU or a national jurisdiction) that suggests competition problems going beyond the specific case at hand.

The kind of indicators or markers that the EC should look at in order to decide whether to open a market investigation would be to a large extent similar to those that it should look at when it decides whether to open a 101 or 102 investigation. We shall elaborate more on those in the following paragraphs, where we first deal with possible intervention triggers when unilateral behavior (by this, we mean a situation where there is no suspicion of collusive behavior, without necessarily having a dominant position in the market) is at issue; and we next deal with possible triggers when there is the risk that the market is characterized by (tacit or explicit) collusion.

3. Intervention triggers for unilateral cases

High prices (and margins)

High prices (and inferred high margins) may be a signal of uncontested dominance, lack of effective competition among oligopolists, or collusion. Of course, the issue is how to assess when prices are 'high' enough to be suspicious, and we shall argue that looking at "control markets", namely markets which are similar but operate in a more competitive environment may offer a useful benchmark.

An additional complication may be that the firms' prices are interrelated. For example, supermarkets use loss leaders (that is, they offer very low prices on some products) to attract consumers in the hope they do all of their shopping there: thus, the overall price structure of a consumer basket matters. Another example are two-sided platforms in which one side may be subsidized whereas the other side may face high prices as part of the platform's function to manage network effects (see, e.g., Armstrong 2006). This is just another instance where the EC will have to look at the overall price structure rather than one individual price.

Similar considerations also apply to *low quality, narrow product range and lack of innovation* (in competition law one often uses the term 'high prices' as a shortcut for a situation in which consumers do not have access to a "good deal", and we often

⁶⁷ Indications that the market does not perform properly may also include poor customer reviews in specialised magazines or websites.

⁶⁸ A discussion of how the EC should deal with such complaints – whether for instance it would be obliged to take a motivated decision on them or not – is beyond the scope of this paper, although we cannot help but stress that the EC should be given the choice to prioritise its cases and assess which ones to pursue and which ones not.

implicitly use this term with the same meaning). Of course, as for high prices, the main issue is how to identify a situation where, say, quality is low. Even in this case, we believe that comparisons with control markets could offer helpful hints. Price increases within the same market can be indicative of *emerging* dominance, lack of effective competition among oligopolists, or tacit collusion. In the case of digital platforms, lower quality can be associated with increased advertising nuisance, more intensive data collection, and reduced customer support (see e.g. Franck and Peitz, 2019, on indicators of platform market power). It is important to stress, though, that if reasonably good comparators were not available, then these variables would be unlikely to be helpful indicators.

In the case of two-sided platforms, similar considerations apply to the degree of sellers competition. Many such platforms operate as intermediaries between sellers or advertisers on one side and consumers on the other side. An important decision of a platform is to how to steer competition on the platform. As Belleflamme and Peitz (2019b, p. 6) observe, "imperfect competition between sellers has the standard property that an additional seller on the platform leads to lower per-buyer profit for each seller already on the platform—a negative within-group external effect. It also often leads to lower prices and more variety, which buyers like. Thus, the additional seller may generate more participation on the buyer side, which, in turn, will benefit all sellers — the combination of two positive cross-group external effects." A platform with market power but imperfect instruments to extract surplus from consumers (e.g., a platform that only charges a seller commission), is then interested in limiting the degree of competition on the platform. If this platform faced competition from other platforms it would be concerned about losing consumers and may therefore enable or encourage more seller competition.⁶⁹ Thus, limited competition on the large platform can be seen as an indicator of uncontested dominance.

Similar considerations as for price levels may also hold true for *high profitability (or margins)*, although serious concerns may exist even absent high profitability because in a situation where effective competition does not exist, firms are not under pressure to become more efficient, and hence their productive efficiency may be lower, leading to higher costs and hence lower margins or because monetization is delayed. Regarding the latter high stock market valuations may also be informative.

Persistence of market shares and lack of (effective) entry

Persistent and stable market shares and lack of *effective entry* may also signal competition problems: they could be consistent with a situation in which smaller or new firms are unable to contest the market power of incumbents, whether a single dominant firm, or oligopolistic firms and because of the lack of contestability, competition problems will arise. As we have stressed above, there exist many reasons why small firms or new entrants may not be able to challenge the status quo, despite the fact that there are no legal barriers to entry. We should also note that episodes of small-scale entry are not necessarily a proof that entrants can challenge the incumbent: indeed, there are many markets in which fringe firms continue to operate by catering for a very small segment of the market, and without ever representing a danger for the large incumbent(s). What is crucial in case of actual entry is to understand whether an entrant would ever be able to grow and challenge the market leader(s) or it is instead likely that it will always be relegated to a market niche.

Persistent market shares may also be indicative of a collusive environment: as argued below, collusive schemes often operate by holding market shares fixed. Lack of entry may appear at first inconsistent with a collusive industry, because high collusive prices

⁶⁹ See, however, Karle et al. (2020).

should in principle attract new rivals, but: (i) current incumbents may be protected by entry barriers of various type; or (ii) they might be able to tacitly coordinate so as to make new entry more difficult. For instance, if firms are vertically integrated and an entrant needs access to inputs produced by the incumbent, it may be relatively easy for the incumbent to tacitly collude not to give access to the prospective entrants.⁷⁰

Suspicious exclusionary practices

A number of business practices may be associated with market environments where competition does not work properly, and possibly contribute or reinforce that situation. Such practices may include *tying and bundling*, *exclusive dealing*, *refusal to supply or to give access* in different degrees (including constructive refusal to supply, delayed access, preferential treatment for own affiliate, reduced interoperability, etc.). In some cases these practices may have a procompetitive explanation, but when used in an environment where competition is already locked, they may be an additional risk factor and may well be considered an additional indicator (together with persistence of market shares, lack of entry or other signals that the market does not function well) that there is a problem.

Indeed, we know that such practices may play an exclusionary role and deter entry or expansion by rivals. We tend to think of them as potentially anti-competitive instruments when used by dominant firms,⁷¹ but conceivably they may also be problematic in situations in which oligopolists enjoy high and stable market shares and significant entry is unlikely.⁷²

The imposition of unusual (relative to similar enough products and services) onerous contractual conditions for customers (e.g., long-term contracts; asymmetric liability; tied-in services; request of renouncing to privacy of personal data) may also represent a possible signal that competition is not at work: unless consumers do not pay attention, it is to be presumed that if competition was working, then consumers would turn to some other providers rather than accepting such conditions.

4. Intervention triggers for collusive conduct

Suppose the EC receives complaints about possible collusive behaviour in an oligopolistic industry and it intends to look for indicators that signal that indeed there may exist (tacit or express) collusion in this industry before triggering a time-consuming NCT investigation. What indicators would it be worth looking at?

There exists a large literature in economics, both theoretical and empirical, on the factors facilitating collusion.⁷³ This literature identifies a number of variables which may foster, or hinder, collusion, and may be of some help to guide the agency in having some understanding about whether the industry at issue may be prone to a

⁷⁰ The case of gasoline retail has often been discussed as an example: in several countries, supermarkets which intended to open pump stations and sell gasoline at low prices (also as a way to attract shoppers), found it difficult to obtain gasoline from the integrated oil producers. Calcagno and Giardino-Karlinger (2019) prove that vertically integrated incumbents could tacitly collude so as to all refuse to supply the input to a new entrant.

⁷¹ See Fumagalli, Motta, and Calcagno (2018).

⁷² The economic literature has mostly focused on models where such practices are used by a monopolistic incumbent, in part because they allow for a simpler treatment, in part because for a long time it was controverted that even a monopolist could engage in anti-competitive tying, exclusive dealing or refusal to supply. But we conjecture that one could expand many of those theories to consider situations in which oligopolists – rather than a single dominant firm – are using them in an anti-competitive way.

⁷³ A full discussion of facilitating factors is beyond the scope of this paper. See e.g., Motta (2004: ch. 4).

collusive outcome. For instance, if there are few oligopolists accounting for most of the market sales; they are characterized by symmetric market shares, capacities and organisation structure (e.g., they are all vertically integrated); the market is mature, with stable and predictable demand; oligopolists are connected by a web of relationships (such as joint ventures, purchasing and/or distribution agreements, cross-ownership or cross-directorates); there are few and similar product categories, with price transparency which makes it easier to monitor each other's actions; then most of the industry features are favourable to collusion, and one would have reason to be suspicious.

But more often than not, things are not so clear-cut, and while some sectoral characteristics may appear to facilitate collusion, others may not. For instance, in the industry there may be a very high HHI, but some firms are vertically integrated whereas others are not; there may be few and relatively homogenous products, but also powerful buyers, and so on. Therefore, looking at structural factors – though relevant – may be of limited help. Furthermore, it is also possible that an industry where most structural factors appear to facilitate collusion will not necessarily be one where collusion occurs. At best, the analysis of the factors that facilitate collusion (let us call it a “structural approach”), may answer the question: “how likely is it that *collusion may form* in this market?”

Behavioural screens for collusion⁷⁴

A different, and probably more fruitful, approach could be a “behavioural approach”, where one tries to answer the question “how likely is it that *collusion has formed* in this market?” The analysis here would consist in looking at data of certain variables – the so-called screens, or markers (mainly prices and market shares) -- to see whether their pattern is consistent with either tacit or explicit collusion, and whether there are competing plausible explanations for those observed patterns.

Price levels

Since the ultimate aim of colluding firms is to raise prices, *unusually high prices* might provide some hint of collusion. As we have discussed in the previous section, the problem is to understand what a high price in a particular market is. Ideally, one would look to compare the price of the market at issue with those emerging in a counterfactual market, that is, a market where reasonably competitive conditions exist. Theoretically, one could proceed by estimating a model which predicts prices in a competitive environment, but of course such an approach would require detailed data, a lot of time and skills, and would likely result in estimates which are highly uncertain and depending on modelling choices. Another route could be to compare prices with costs of production, to try and have a feeling for whether the firms at hand are commanding high margins on the goods or services sold. Unfortunately, costs of production can rarely be observed, and estimating them is a complex exercise, sometimes even for the firms themselves.

A more useful approach could then be to compare the prices in the market at issue with some benchmark market, characterised by similar cost and demand factors. This is a well-established method for identifying excessive prices in abuse cases, but it may well be used also as an indicator that collusion is taking place. For instance, Abrantes-Metz and Bajari (2009) mention the case of the concrete market in New York, where organized crime created during the 1980s a “concrete club” which led to prices some 70% higher than in other large cities: even taking into account the higher New York prices, the comparison suggested suspiciously high prices.

⁷⁴ See also Harrington (2007), Abrantes-Metz and Bajari (2009), and Fabra and Motta (2017).

Prices do not track costs

Although cost levels are generally difficult to estimate, one may have information about changes in costs, or shocks that affect some of the cost components. This information can be exploited, since the fact that prices do not reflect costs (for instance, prices do not move despite an observed shock which is significantly affecting costs) might signal collusive behaviour.

Indeed, theory suggests that in competitive environments prices tend to move with costs of production. Bajari and Ye (2003), for instance, show that in a first-price sealed-bid auction with private values, equilibrium bids are a function of costs when firms behave competitively. Instead, in an efficient cartel, firms would share their cost estimates, and then the lowest-cost firm would

submit a serious bid while all other cartel members would either refrain from bidding or submit extremely high bids (which ensure they would not win the auction).⁷⁵

More generally and intuitively, *price rigidity* can also be the colluding firms' reaction to the fact that agreeing to adapt to changing market conditions is difficult and costly. Markets are constantly affected by unexpected events, and even if explicitly colluding, firms cannot foresee any possible future circumstances, and how to react to them, when they set their collusive agreements.⁷⁶ As a result, when such unexpected events occur, they would like to meet so as to renegotiate prices (or outputs). But communicating among each other might leave traces and is dangerous (if discovered, the antitrust authorities would use it to prove the infringement of cartel laws). As a result, firms may prefer not to meet, and they may keep on setting the same prices even if sub-optimal.

The same reasoning also applies in case of tacit collusion. Suppose for instance that firms are currently setting high prices without talking to each other, perhaps as a result of a lengthy process and several adjustments. Imagine that now each oligopolist perceives a decline in its demand, which would call for lowering prices. But (absent a mechanism to exchange information in a timely and disaggregate way) a firm does not know whether the rivals are facing the same shock. In these circumstances, decreasing its sales prices may be mis-interpreted by rivals not as a reaction to a negative demand shock, but as an attempt to deviate and gain market share. As a consequence, each firm may prefer to stick to the current prices, despite a shock which would call for a downward price adjustment.

In line with this reasoning, Abrantes-Metz et al. (2005) have suggested that price volatility could be a useful collusive screen. An interesting example consists of their analysis of a cartel in procurement auctions for food supply to military agencies in the US, which revealed that prices in frozen perch were much less volatile (and less responsive to costs) during the life of the cartel than when the cartel broke down.

⁷⁵ See also Athey et al. (2004), who analyse a model where firms' costs realisations are independently and identically distributed over time and are private information. In each period, colluding firms exchange messages over their costs before setting prices. The first best from their point of view would be for the firm with the lowest cost realisation to sell. But if they choose a high (collusive) price, even a high cost firm would want to declare that it has a low cost. Hence, for firms to have the incentive to report their true costs, the collusive price would have to be sufficiently low. But setting a low sales price would result in foregone profits. The authors show that, facing this trade-off, at the best collusive equilibrium, collusion entails stable prices and stable market shares over time.

⁷⁶ See Genesove and Mullin (2001) who offer a very insightful description of how the participants to the (initially legal) sugar cartel in the US would have troubles in dealing with unexpected shocks such as sudden changes in imports, in costs, in capacity.

Overall, therefore, whenever prices are readily available, a possible indicator that collusion may be at work in a given industry could be given by the analysis of price volatility and/or of whether prices track costs.⁷⁷

Stability of market shares or customers

Note that the same reasoning would also work for customer or market share (rather than price) stability. Firms may find it optimal to divide the market among each other, so that each of them sells to a certain and well identified group of customers. In this way, there would be no need to “negotiate” prices with rivals after a shock: each firm just keeps on selling to its own customer at whatever price it desires, while abstaining to win customers who “belong” to rivals. Similarly, firms may have developed some *modus vivendi* whereby each of them has a market share which fluctuates within a narrow interval over time.

As an example, imagine that there are two sellers of some product which is relatively costly to transport and is used by another industry as an input. Suppose the two sellers are located in two different countries, and that their customers are located neatly across national borders, irrespectively of the distance from their plants, and that this pattern is continuing over time, and is not subject to changes in demand or supply shocks. This would be suggestive of a collusive outcome (whether tacit or explicit is another matter).

Note also that the stability of market shares may exist at a more aggregate (in time or product) level, despite observing variability of sales at a more disaggregate one. For instance, if the market under scrutiny is a procurement market, collusion may take the firms of rivals winning certain auctions in turn. So, at first sight one may not identify collusion, while bid rotation would typically be constructed so as to guarantee stable market shares overall.

Sudden price changes

Although at first sight it may appear in contradiction with what was stated above, abrupt increases in prices which are not justified by cost or demand shocks may indicate that the industry is colluding. If in an industry one observes that out of the blue and without any apparent underlying reason, prices start to spike up, then one may think that somehow firms have managed to move to a more collusive outcome. Note, however, that cartels are aware that unusual price changes might attract unwanted attention from customers (and ultimately regulators), and accordingly often adopt progressive price increase policies (see Harrington, 2006).

Abrupt price decreases might also reveal the existence of a cartel. As Green and Porter (1984) have shown,⁷⁸ in markets where sellers cannot easily monitor each other's prices, price wars are a necessary ingredient for collusion: if a firm observes a drop in its sales and cannot identify whether this is due to a fall in aggregate demand or the undercutting of rivals, it is optimal to price aggressively for a period of time as

⁷⁷ Of course, such a screen could also indicate that it is unlikely that firms are behaving in a collusive way. For instance, in the DS Smith/Linpac Containers merger case, buyers claimed that there was collusion in the industry. The UK Competition Commission looked at the time series of DS Smith's unit prices and costs, and since changes in prices followed quite closely changes in costs, it concluded that it did not offer evidence of collusion. (However, if firms were able to exchange information then even under collusion would prices follow costs.)

⁷⁸ See also Porter (1983)'s empirical analysis of price wars and collusion in the Joint Executive Committee (a railroad cartel) that operated in the US at the end of the 19th century.

a way to avoid deviations from collusive prices, before returning to high prices. However, we suspect that price wars associated to collusion are rare events: cartels which are more stable –and hence more harmful – will find a way to avoid price wars which are for them very costly.

It is important to note that evidence consistent with collusion does not necessarily imply that collusion is indeed taking place. It is highly recommended to check that there are no evident alternative plausible explanations of the observed behaviour. Indeed, a sudden price increase (or decrease) may have nothing to do with collusive behaviour, but instead be the result of demand or supply shocks. For instance, in the well-known *Woodpulp* case, the Court of Justice found that significant price changes implemented by rival producers in parallel, within a short time period, and in similar proportions, might well have been caused by exogenous events such as shocks in the North American market (which determined changes in imports to Europe), and changes in Swedish policies, such as the introduction of a storage-subsidy scheme (which led Swedish producers – which held an important share of the market - to reduce their supply), and later on its discontinuation (see Motta, 2004).

Possible use of leniency applications

In some cases, firms submit leniency applications which may not be sufficient to start a cartel investigation -- for instance because it is unlikely that documentary evidence which proves coordination can be found --, but it does point nonetheless to the existence of (tacit or explicit) collusive outcomes. Such leniency applications may conceivably trigger a market investigation.

To the extent that the market investigation would not entail fines or other forms of punishment (which we understand there is agreement about), the leniency applicant would not receive fines, guaranteeing the incentives to disclose information in the first place.

If after the market investigation the EC decided that there is enough evidence to open a cartel investigation, then presumably the original leniency application should still be guaranteeing immunity.⁷⁹

Business press reporting and activities of business association

Reporting in the business press may provide information on price hikes and some underlying narrative that may suggest a collusive outcome. Also, advice by business associations to its members may give indications of attempted or achieved collusive outcomes. For example, suggestions how to inflate variable cost may be seen as an attempt to reduce competitive pressure. Such suggestions may even be successful in fragmented industries if they lead to a “social norm” within the industry to refrain from price-cutting measures or measures that increase for consumers the opacity in the market.

5. Takeaway points

⁷⁹ If under the current legal framework this were not the case, then the EC should grant a sort of ‘conditional leniency’: if an infringement case is ever opened after a market investigation, then the applicant would be granted leniency. If not, the question of the leniency application would be immaterial.

In this section, we have argued that intervention triggers, that is, data which may signal that an NCT investigation may be worthwhile, are intimately connected to the theory of harm. We have also stressed it is important to look for simple indicators and data, since it is highly unlikely that before starting an NCT investigation the EC be in possession of rich databases. Without trying to be exhaustive, we have also suggested a few variables which may be used as possible screens for market environments where the likely problem is of unilateral (in the sense of not coordinated) nature, or of a collusive one. The EC will have to use its resources carefully to investigate those cases in which potential consumer harm is particularly large, which may be due to long-run effects or due to immediate serious harm.

4. Conclusion

In this report, we have explained that under some circumstances markets do not perform as they should. We have argued that this may be due to features of the market which are not necessarily the making of firms (but that certain firm conduct may exacerbate) – and hence cannot be addressed by traditional competition law tools – or by some practices which are undertaken by the existing firms but for some reasons competition law and practice may not address them, or may do so only partially. In these situations, which may arise in very different industries and not only in digital ones, an NCT may be a possible instrument to remedy the competition problem.

We have then dwelt upon some of these “theories of harm” (that is, reasons why a market is not as competitive as it should), although it is important to stress that an exhaustive listing of such theories of harm would be meaningless: markets differ widely and evolve over time, and so do business practices.

The role of a theory of harm is to suggest why market outcomes are less competitive and hence deliver less consumer benefit than a counterfactual where some market features may be corrected or where firms cannot engage in some particular behavior. Theories of harm thus provide an economic mechanism that explains the observed outcome and why it would differ from a more satisfactory counterfactual. Note also that the counterfactual should be a realistic one, which could likely be achieved by an NCT intervention, and where such an intervention is likely preferable to others, in particular sectoral regulation. On this last point, we feel that already at the stage where a theory of harm is formulated and an NCT investigation is considered, the EC should try to understand whether such an investigation may lead to an appropriate and feasible remedy.

In the cases where competition is at risk (rather than already seriously affected) so that consumer harm is likely to arise in the future, the additional difficulty is that not only the counterfactual that would arise following an intervention but also the outcome absent intervention has to be predicted.

To start a market investigation, we proposed simple intervention triggers which must be based on the conjectured theory of harm. For instance, if the EC is working under the hypothesis that the competitive problem in a certain market is due to tacit collusion, then looking at simple indicators such as whether prices are aligned with costs, or whether market shares are stable over time, may help. But those same indicators would be of little help if the hypothesized theory of harm was different, say that consumers do not shop around so that existing firms may behave as if they had monopoly power on some groups of consumers or some regions of the market.

The NCT investigation will allow the EC to collect information, shed light on the economic channel leading to the observed market outcome (and in particular whether the data are consistent with the hypothesized theory of harm), and – importantly –

assess whether the problem at issue can be appropriately remedied under the NCT, and if so, the investigation should devote sufficient attention to remedy design. This also highlights the need for an NCT reform to allow for a sufficiently broad and powerful set of remedies. For instance, if the excessive concentration of assets were seen as the cause of a lack of competition, the EC must have divestiture obligations as a remedy at its disposal. If a particular market were prone to market tipping due to network effects, interoperability requirements may be an adequate remedy, and the EC should be able to impose them.

We believe there should be a close interaction between theory of harm, intervention triggers, and possible remedies. AN NCT investigation may know the following (logical but not necessarily sequential) steps. (1) At some point, there is growing perception of the existence of some competition problem. This perception might come from the informal or occasional observation of some variables (say, high prices, stability of market share, complaints about refusal to supply and so on). (2) The EC will formulate a theory of harm, that is, it will make some hypotheses about what the problem may be and what may cause it. (3) The theory of harm will suggest a more thorough exploration of some concrete indicators (or intervention triggers), that is, of looking more closely at some particular data or empirical regularities. (4) If such indicators are consistent with the hypothesized theory of harm, before starting an NCT investigation, the EC will also have to consider whether the NCT might lead to an appropriate remedy, and that the EC itself or perhaps another entity (say, NCAs, or sectoral regulators) have the capacity to monitor their implementation. (5) It will also have to consider whether the NCT is a better instrument to solve the problem than traditional competition law tools such as articles 101 or 102, and than sectoral regulation.

Needless to say, if an NCT investigation is conducted, then it might well reveal that there is no clear competition problem after all, for instance because some rivals may be negatively affected but competition is unlikely to be locked; or it may show that consumers are not likely to benefit if certain market features are corrected or certain business practices are discontinued. In a similar vein, an NCT investigation may reveal new facts which suggest a different tool may be desirable. For example, some evidence may be uncovered according to which suspected tacit collusion might actually be explicit collusion, suggesting a cartel infringement case under 101 TFEU may be started.

It is also conceivable that the EC builds a convincing case that certain market features (or firm behavior) are responsible for low consumer benefits, but that there simply are no adequate tools that the NCT can rely upon in order to remedy the problem. Either because of the lack of remedies or high costs of implementing them, the market investigation may then stop without adopting any measures. However, such finding may still be useful as they may lead to further actions outside the NCT if the underlying competition problem is deemed to be severe. In particular, depending on the issue, legislation – at the EU or national level – may be considered to address the identified problem. Also, existing sector regulation may be applicable.

In its Inception Impact Assessment, the EC mentions four options regarding NCT:

1. A dominance-based competition tool with a horizontal scope⁸⁰

⁸⁰ "Option 1 would address competition concerns arising from unilateral conduct by dominant companies without any prior finding of an infringement pursuant to Article 102 TFEU. Similar to the existing EU competition rules, it would be generally applicable across all sectors of the economy. The goal of this tool would be to allow the Commission, in close cooperation with the national competition authorities, to identify competition problems and intervene before a dominant company successfully forecloses competitors or raises their costs. The tool would enable the Commission to impose behavioural and, where appropriate, structural remedies. However, the Commission would not make any finding of an infringement of the EU

2. A dominance-based competition tool with a limited scope⁸¹
3. A market structure-based competition tool with a horizontal scope⁸²
4. A market structure-based competition tool with a limited scope⁸³

This report identifies a wide set of theories of harm which may also include narrow oligopolies or markets that will likely move towards dominance if unchecked. Thus, a dominance-based competition tool would not address several forms of consumer harm that are due to competition problems. Therefore, Options 1 and 2 would in our opinion be inferior to a market structure-based competition tool. This report also identifies a number of theories of harm that are not exclusive to digital markets. While we acknowledge that some types of harm might be of particular concern in digital markets, an artificial limitation of the scope of the New Competition Tool to digital industries would also appear to be an inferior option (not to mention the difficulties and possible arbitrariness in defining what is digital and what is not). Thus, choosing a competition tool with a horizontal scope, as suggested by Option 3, is in our view the best choice.

competition rules, nor impose fines and thus not generate rights to launch damage claims.” EC’s Inception Impact Assessment (p. 3)

⁸¹ *“Similar to the tool presented under Option 1, this option would address competition concerns arising from unilateral conduct by dominant companies without any prior finding of an infringement pursuant to Article 102 TFEU. Under Option 2, however, the use of the tool would be limited in scope to sectors in which the characteristics mentioned in the context and problem definition sections above are most prevalent. These could include certain digital or digitally-enabled markets, as identified in the report by the Special Advisers and other recent reports on the role of competition policy, and/or other sectors identified as being especially prone to such concerns due to entrenched dominance, high entry barriers, etc.” EC’s Inception Impact Assessment (p. 3)*

⁸² *“This option would allow the Commission to identify and remedy structural competition problems that cannot be addressed (at all or as effectively) under the EU competition rules. Thus, unlike Options 1 and 2, it would not be limited only to companies that are already dominant. Similar to already existing competition tools of this kind, this tool would be based on a test allowing the Commission to intervene when a structural risk for competition or a structural lack of competition prevents the internal market from functioning properly. The tool would enable the Commission to impose behavioural and, where appropriate, structural remedies. The Commission could also recommend legislative action to improve the functioning of the market concerned. As under the previous options, there would be no finding of an infringement, no fines and no damage claims.” EC’s Inception Impact Assessment (p. 3)*

⁸³ *“Similar to the tool presented under Option 3, this option would address structural competition problems. Under Option 4, however, the use of the tool would be limited in scope to sectors in which the characteristics mentioned in the context and problem definition sections above are most prevalent. These could include certain digital or digitally-enabled markets, as identified in the report by the Special Advisers and other recent reports on the role of competition policy, and/or other sectors identified as being especially prone to such concerns due to entrenched dominance, high entry barriers, etc.” EC’s Inception Impact Assessment (p. 3)*

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