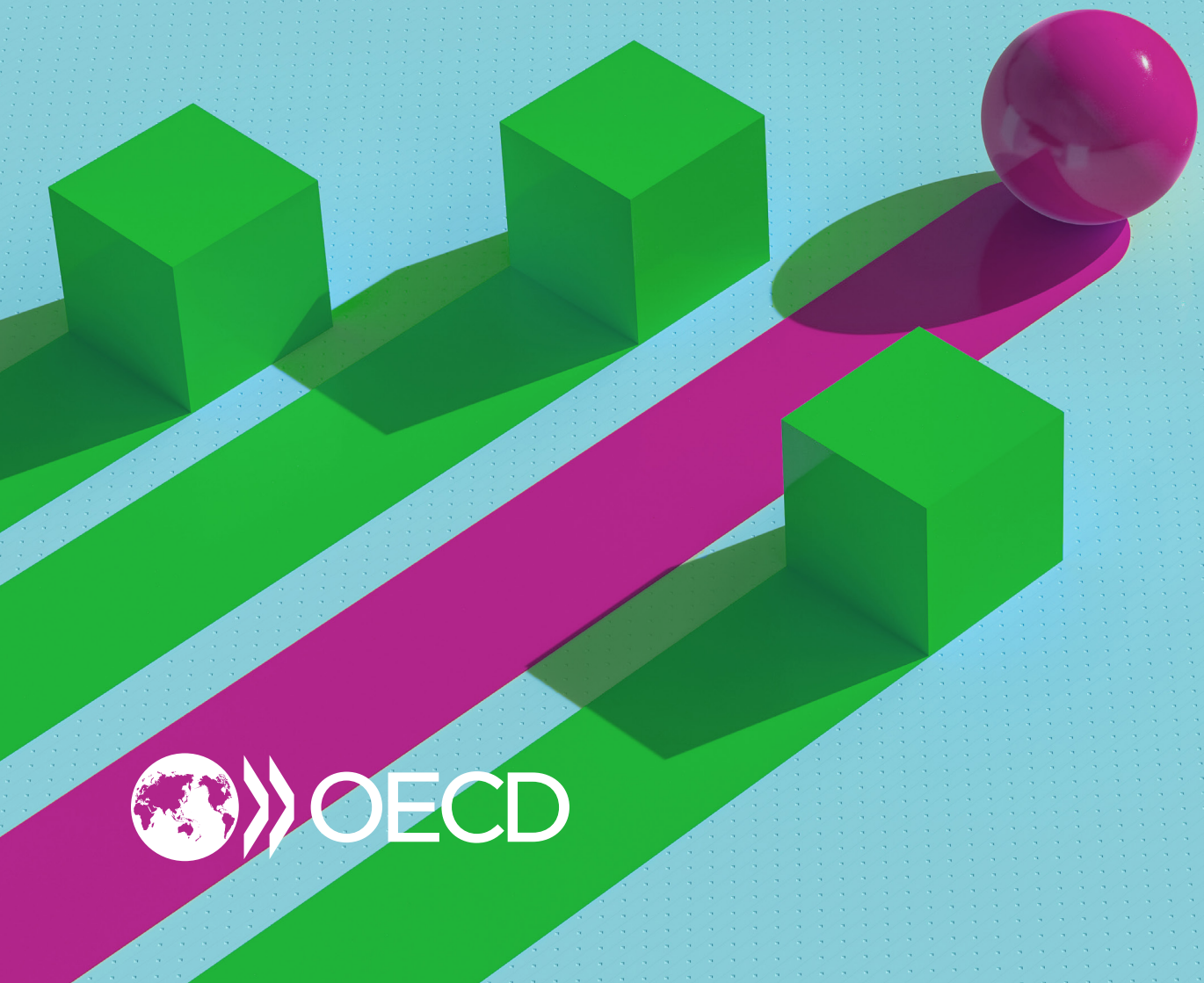
THE ROLE OF INNOVATION IN COMPETITION ENFORCEMENT

OECD Competition Policy Roundtable Background Note



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Foreword

This background note reviews how competition authorities have incorporated innovation as part of their assessment in enforcement cases. It explores scenarios that have considered innovation from a static perspective, mostly analysing current and potential competition in well-identified product markets (incentives-based approach), as well as scenarios that have considered innovation from a dynamic perspective, often defining innovation markets (impact-based approach). It also looks at cases that have considered increases in innovation as potential justifications for decreases in competition. This note reviews how these different approaches have shaped market definition, the theories of harm considered, and even the design of remedies and commitments.

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1. Introduction

Competition promotes consumer welfare and economic growth and makes markets more flexible and innovative (OECD, 2023[1]). Innovation is beneficial for consumers as it allows them to enjoy new or improved products that are better suited for their needs (Sidak and Teece, 2013[2]).

In June 2023, the OECD Competition Committee discussed the relationship between competition and innovation from a theoretical perspective. It concluded that there is no one-size-fits-all theoretical explanation of the relationship between the two variables, as innovation processes work differently across industries and depend on specific skills, technologies, capabilities and resources. It also established that there are many factors that drive innovation, which might not necessarily relate directly to competition but interact with it and impact the competitive dynamics of the markets where innovations are taking place. Incorporating such factors in the analysis of transactions or conduct is also key for the outcome of competition authorities' assessment of such conduct or transactions.

One of the roles of competition authorities is to ensure well-functioning markets, where innovation processes can occur. Moreover, a properly enforced competition policy is beneficial to innovation as it keeps markets open for innovators and could intensify the spill over effects of innovation in the economy.

Competition authorities have considered innovation in their enforcement activities for a long time and in different stages of their proceedings.[1] However, this has not been done in a systematic way and, in most of the cases, the role it has played has been secondary.[2] Although allegations of harm to innovation are often included in complaints and in competition authorities' decisions, there is no methodical way in which it has been analysed. Examinations relating to innovation have rarely determined antitrust liability, as they are usually accompanied with allegations of adverse price effects, mostly focusing on the short-term (Gilbert and Melamed, 2022[3]).

Merger review is the area where competition authorities have most frequently considered innovation. An empirical study on all mergers challenged by the US antitrust agencies between 1995 and 2008 concluded that innovation concerns were relevant in one third of the cases (Kern, Dewenter and Kerber, 2016[4]). Similarly, in the EU, a systematic analysis of the case law of the Court of Justice of the European Union revealed that the Court has considered innovation in merger review at least in 20 occasions since 1979, although using different parameters in each case (Schrepel, 2023[5]). Previous discussions by the OECD Competition Committee have touched upon innovation considerations in merger reviews, for instance, as part of non-price effects analyses (OECD, 2018[6]).

Innovation-based markets have increasingly posed new challenges and questions to competition authorities, such as competition between multi-sided platforms and the expansion of ecosystems in a range of digital and non-digital industries. In turn, authorities are seeking to strike the right balance in their enforcement. Over-enforcement could decrease incentives to innovate, as companies would consider the intense scrutiny of competition authorities as part of their risk-assessment for investment decisions, preventing innovations which could have positively impacted consumer welfare. At the same time, under-enforcement could result in more concentrated markets, which, in turn, negatively impact consumer welfare and the potential to decrease incentives to innovate in the long run.

This background note follows-up on the theoretical discussion on the relationship between competition and innovation, now from an enforcement perspective. It will introduce an analysis of how competition

authorities incorporate innovation as part of their assessment in enforcement investigations and merger review. It will also discuss how they evaluate innovation: (i) when defining and examining markets, including considerations on existing and future competition, (ii) in determining the effects of conduct and transactions on firms' incentives and ability to innovate, (iii) if there are specific innovation theories of harm or if innovation is only considered as part of a standard analysis, and (iv) if it can be, and has been, used as a defence for anti-competitive behaviour.

Innovation is considered on a case-by-case basis and analysis can differ if considered in a merger review context or if analysed in light of a potential anti-competitive conduct. Moreover, it may also differ when innovation is understood as a way to differentiate the product from competitors and gain an advantage in the product market or when companies are actually competing on innovation. Finally, the analysis may change according to the authority's understanding of the relationship between competition and innovation. That is, if the competition authority is interested in looking at whether competition impacts innovation, whether innovation affects competition or both, as well as if the assessment is done in a static or a dynamic perspective.[3]

In particular, the note explores the following approaches where competition authorities have approached the relationship between competition and innovation:

- **incentives-based approach**, which considers that competition drives innovation and that markets are competition-driven. In this sense, competition authorities examine innovation from a static perspective, considering current or potential competition in well-identified product markets.
- **impact-based approach**, which relies on an assumption that innovation also drives competition, as markets can be innovation-driven. The review of innovation is from a dynamic perspective and may involve considering innovation markets.
- **inverse relationship approach**, which considers increases in innovation as potential justifications for decreases in competition. Usually, this assumption is made in the context of innovation as a countervailing factor for market power, defence for anti-competitive conduct, or as an efficiency claim.

Across jurisdictions, there does not seem to be a systematic analysis of innovation in enforcement cases or merger decisions. Hence, this background note aims to provide a general framework on how competition authorities have considered innovation in their analysis. In this sense, the note takes stock of merger reviews and enforcement decisions and attempts to classify a competition authority's analysis into the three scenarios described above. The paper will present each scenario independently but acknowledges that all three perspectives can be complementary and present in a single decision (for instance, having a dynamic perspective for defining the market but analysing a traditional theory of harm based on static considerations).

Using examples across all three scenarios, the paper will explore: (i) which types of innovations have been considered; (ii) how competition authorities have defined markets; (iii) whether they analysed the effects of the transaction or conduct; (iv) whether they examined justifications, countervailing factors and efficiencies; and (v) aspects on the designed remedies or commitments.

While merger review is the area where competition authorities have assessed innovation the most, the assessment varies on a case-by-case basis. The paper identified that even within the same decision, competition authorities follow different approaches at different stages of the analysis. This includes the way in which markets are defined and analysed, the theories of harm examined and the design of remedies. The main source of differences in approaches to innovation is the way in which competition authorities understand the relationship between competition and innovation.

There have already been attempts to classify the way competition authorities have approached innovation, particularly in merger control. For instance, (Federico, 2017[7]) suggests the existence of three channels in which mergers are likely to affect innovation that competition authorities should look at: (i) product market

competition, (ii) innovation competition, and (iii) appropriability. The author looks at the three categories from an externalities' perspective. While in an imperfect way, the categorisation proposed by this background note captures closely his proposal. Whereas the incentive-based approach covers product market competition, the impact-based one relates more to innovation competition. Finally, the inverse relationship approach touches upon the possibility of considering countervailing effects on innovation incentives, for instance, when competition authorities evaluate increases of appropriability of innovation due to a merger as part of an efficiency claim.

The paper is organised based on how competition authorities have included innovation in the enforcement of competition law, considering different approaches to the relationship between both variables. **Section 2.** summarises the way in which innovation considerations have been introduced in competition legal frameworks, mainly in guidelines, as a basis for its assessment. **Section 3.** describes scenarios where authorities have based their assessments on the incentives-based approach, that is, using a static perspective to analyse the impact of reduced competition on innovation. **Section 4.** explores the different ways in which authorities have introduced innovation considerations using an impact-based approach, meaning that they take a dynamic approach to analyse how changes in innovation also affect competition. **Section 5.** describes approaches in which innovation has been considered using the inverse relationship approach to justify the conduct or claim efficiencies. Finally, **Section 6.** presents some conclusions.

2. The legal framework

Prior to diving into the way in which competition authorities have considered innovation in their decisions, it is relevant to look at how it has been conceived in the legal framework.

While innovation hardly ever appears formally as a factor in competition laws, there has been guidance in secondary sources on how competition authorities can introduce it in their analyses. This is mostly presented in guidelines on substantive matters, as they are generally the way by which competition authorities explain their approach to certain aspects during their decision-making. Thus, it is useful to look at how they treat innovation.

Guidelines on the substantive assessment of mergers and acquisitions normally include some explicit mention of innovation and how it relates to competition. For example, both European Commission (EC) guidelines on the assessment of horizontal and non-horizontal mergers have considerations on innovation, stating that innovation is one of the criteria against which the Commission assesses the likely effects of a merger. Other jurisdictions such as France and the United Kingdom in Europe, Brazil and Chile in Latin America, Canada and the United States (in process of update) in North America, Kenya in Africa, Japan, the Philippines, Australia and New Zealand in the Asia – Pacific region are examples of competition authorities that have merger guidelines that explicitly include innovation as a variable to be taken into account in merger control.

Although the level of detail and scope varies among jurisdictions, all consider the potential impact of a merger on innovation.[4] The background note reviews these explicit mentions as a basis to understand how competition authorities conceive the relationship between competition and innovation and their attempt to translate it into their assessments.

For example, in the United States, section 6.4 of the US Merger Guidelines (currently under review) presents come considerations on the possibility to consider whether a merger is likely to diminish competition on innovation in existing or future markets via reduction in incentives to continue product development or initiate development of new products. Likewise, the proposed Revised Merger Guidelines released by the U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC) for comment acknowledge innovation as a "*critically important dimension of competition*"[5] and present mechanisms through which reduced competition from a merger could affect ability and incentives to innovate.

The proposed Revised Merger Guidelines explicitly recognise that "*the Agencies may define relevant antitrust markets around the products that would result from that innovation, even if they do not yet exist. In some cases, the Agencies may analyse different relevant markets when considering innovation than when considering other dimensions of competition.*"[6] This would allow the US competition authorities to define markets based specifically on innovation considerations.

Moreover, they present the possibility for the competition authorities to consider capabilities of firms to innovate in the assessment, while sticking with traditional theories of harm. The proposed Revised Merger Guidelines argue that incentives to compete on innovation depend on capabilities of the firms and that development of new features depends on having appropriate expertise and resources. They add that in areas where the merging firms are "*two of a small number of companies with specialized employees, development facilities, intellectual property, or research projects in a particular area where there is a small number of companies, competition between them will have a greater impact on their incentives to*

innovate."[7] While this leaves grounds for considering capabilities and a more dynamic approach to innovation, by including competition in future markets, it still relies on the assumption that markets are competition-driven, meaning that competition impacts innovation through changes in the incentives of firms to innovate (as it will be discussed in 3.3).

One of the guidelines with the most detailed explanations on how innovation could be assessed in a review of a merger are the ones issued by Chile's Fiscalía Nacional Económica (FNE) (see Box 2.1). The guidelines cover different scenarios where the FNE considers innovation as part of the competitive analysis, ranging from market share to that of unilateral effects through a dynamic competition lens, including considerations of efficiencies that the transaction could generate.

Box 2.1. Innovation in the merger guidelines in Chile

Chile's Competition Agency (FNE) updated its guidelines on horizontal mergers in May 2022 to include some considerations on the most recent amendments to its competition law, recent experience, jurisprudence of the Chilean courts, as well as economic theory and market developments.

According to the guidelines, the FNE considers innovation in the following ways:

1. As part of the market share analysis, particularly when market shares are volatile, such as in innovation-driven markets.
2. When describing all relevant barriers to entry or expansion as investments in innovation and technology could be considered sunk costs.
3. To explain the need for a more in-depth analysis of the competitive effects of a transaction, regardless of the changes in the concentration indices. Particularly, in cases where one of the merging parties is an important innovator.
4. When analysing unilateral effects, to consider how the merged entity's market power will give it abilities or incentives to affect competition variables. Innovation, in that case, is considered as one of the competition variables to look at.
5. To analyse dynamic competition. Examination is particularly required when innovation is relevant to compete and scenarios that consider existing competitive conditions do not constitute a good counterfactual to evaluate the effects of the transaction. One example could be markets where the competition is for the market and not in the market. In those cases, the FNE proposes to evaluate the competitive position of other market players to develop innovation and the closeness of competition with the merging parties of such potential innovators.
6. To examine reductions on the incentives to innovate of merging parties, particularly when they have innovation projects of a similar nature. In such cases, the FNE will assess the likelihood that, as a result of the transaction, one of the projects will be eliminated, thus affecting the speed of market entry and/or the variety available to consumers in the near future.
7. To examine incentives to innovate and changes to them in innovation-intensive markets, in which there may be different lines of research and development from the different agents and the merging parties have the possibility to eliminate, downgrade or postpone those projects that could cannibalise the profits of a current or future product of said entity.
8. To consider positive effects on incentives to innovate, mainly in cases where the merging parties are able to better appropriate the value generated by the transaction.
9. When analysing particular effects of transactions in digital markets, as they can have effects on non-price competition.

10. In considering efficiencies (static and dynamic) from transactions. The FNE states that efficiencies could, for instance, counterbalance concerns around a loss of innovation in transactions in digital markets.

In all those scenarios, the guidelines describe as elements to be considered: past performance of companies in innovating, whether innovation processes observed corresponded to progressive or disruptive innovations, as well as the existence or absence of intellectual property rights.

Source: FNE (2022). Horizontal Merger Guidelines. Available at: https://www.fne.gob.cl/wp-content/uploads/2022/05/20220531.-Guia-para-el-Analisis-de-Operaciones-de-Concentracion-Horizontales-version-final-en-ingles.pdf

Competition authorities also take into account innovation in guidelines on abuse of dominance enforcement, which they then reflect in their proceedings, although far less so than in merger review. Examples are the Abuse of Dominance Enforcement Guidelines issued by the Competition Bureau in Canada (see Box 2.2), the EU Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings,[8] and the Competition and Consumer Commission (CCCS) Guidelines on the Section 47 Prohibition in Singapore.[9] They include, with different levels of detail, the role of innovation in the definition of a relevant market, analysis of the dominance of an undertaking and considerations on the effects of abusive conduct. In the case of the CCCS Guidelines, an acknowledgement of potential impact of remedies on innovation is also included.

Box 2.2. Innovation in the Abuse of Dominance Enforcement Guidelines in Canada

The Abuse of Dominance Enforcement Guidelines issued by the Competition Bureau in Canada and updated in 2022 describe the Bureau's general approach to enforcing the abuse of dominance provisions included in the Competition Act. Innovation seems to have a leading role in its approach.

While the Bureau recognises that sanctioning a company for simply being dominant would undermine incentives to innovate, and that in some cases the prospect of having market power provides companies with the incentive to engage in dynamic competition, it also considers, as a starting point, that, among others, innovation-driven competition could be reduced by anti-competitive conduct.

When discussing how to assess the market power, as well as the ability of the dominant firm to exclude competitors, the guidelines include innovation as one of the possible relevant factors to assess, together with technological change.

With respect to the effects of anti-competitive acts, the guidelines state that while the Bureau focuses on increased barriers to entry or expansion, it may also assess the impact of the behaviour by evaluating whether product quality, innovation or choice would be greater in the absence of such conduct. In this sense, the guidelines emphasise the need for the Bureau to consider the effects of conduct on both static and dynamic competition, including rivalry driven by process or product innovation.

On dynamic competition effects, the guidelines acknowledge the uncertainty and more challenging character of the exercise, and propose the use of natural experiments, when available, to establish the competitive effects.

Particularly, with respect to refusals to supply, the guidelines recognise that forcing firms to supply inputs which are the result of costly investment may undermine incentives for firms to innovate in the future, and therefore, the Bureau needs to consider this when concluding if a refusal to supply was an anti-competitive act.

Sources: Competition Bureau Canada, Abuse of Dominance Enforcement Guidelines, Available at: https://ised-isde.canada.ca/site/competition-bureau-canada/sites/default/files/attachments/2022/CB-ADEG-Eng.pdf; OECD (2020), Abuse of dominance in digital markets, www.oecd.org/daf/competition/abuse-of-dominance-in-digital-markets-2020.pdf

The Korean Federal Trade Commission (KFTC) issued in 2022 Guidelines on Anticompetitive Conduct in the Platform Sector[10] where it identified innovation as a key factor to consider in determining unlawfulness of conduct by platforms, particularly in two dimensions: (i) for market definition, as it recognises that the boundaries of a market "might be blurred" due to rapid market changes from innovation, and (ii) for the assessment of the effects, as it identifies the need to examine whether platforms' conduct encourages or discourages innovation.

From a brief review of some of the most relevant guidelines, it appears that innovation plays a key role in the legal framework for the assessment by competition authorities at different stages of their proceedings, starting from market definition until the design of remedies. This applies both for enforcement investigations and for merger review. The following sections will examine whether these discussions have translated into practice and how.

3. Incentives-based approach

One way to consider the relationship between competition and innovation relies on analysing innovation in the context of **competition-driven markets**, assuming that competition in markets drives innovation. In these cases, competition authorities generally conduct a static analysis in which they consider innovation as one of multiple factors that relate to competition but do not drive it. Instead, competition levels in the market should be sufficient to encourage innovation. This could be understood as a process in which competition puts firms under pressure to differentiate themselves by improving their products or services. In other words, it implies understanding innovation as a result of business activities that are motivated by the prospect of capturing rents from innovation as profitable sales shift to these successful innovations.

This approach refers to cases where competition authorities have defined competition-driven markets, analysed ability and incentives of market players to innovate and how those incentives change because of a transaction or a specific behaviour, i.e., if they were negatively influenced by changes to the market structure leading to less competition.[11] In such cases, the authorities make an underlying assumption that competition impacts innovation. In this context, competition authorities have designed and accepted remedies aimed at restoring the competitive dynamics, which would increase companies' incentives to innovate.

Within the incentives-based approach, competition authorities have considered the impact competition has on innovation in existing product markets, as well as in future ones, based on the concept of potential competition.[12]

3.1. Innovation in existing product markets

Competition authorities have argued that situations that reduce competition can also restrict innovation. In many cases, reduced competition could affect innovation in **existing product markets**. This effect is particularly relevant where innovation is a tool to keep up with the dynamism of the market (Bundeskartellamt, 2017[8]). Reduced competition could also impact innovative projects that are ongoing and have foreseeable outcomes in such markets.

When considering existing markets, two scenarios might be possible. One where the innovation affects already existing products (i.e., innovation that is purely incremental) and another one where it introduces new products or services that can be identified and that would compete in markets where other companies are already active. In these cases, the markets affected are either established markets characterised by continuous **incremental innovations**,[13] or new markets, with companies already selling products in the market and others developing products to enter it and compete. Examples of the latter are markets where there is a monopoly in the production and sales of medicines and the monopolist behaves in a way that stops advanced innovations that could compete against their existing drugs, including acquiring those projects (see Box 3.1).

Box 3.1. Market definition in pharma: acquiring advanced R&D developments

Pharmaceutical markets normally follow a pattern: first, there is a patent race between companies to produce a drug treating a specific condition. The race stops when a company develops an innovative drug that is patented, which allows the company to be the monopolist in the market for a fixed period. Once the patent expires, other companies engage in R&D developments to enter the market and compete, when they find it profitable. To avoid competition, monopolists often try to buy projects that would have as an outcome competing drugs or develop practices to stop them from entering, which could be anti-competitive.

For example, in 2017, the FTC settled a case in which it alleged that Mallinckrodt, a monopoly in the market for adrenocorticotropic hormone (ACTH) drugs, stifled competition by illegally acquiring the rights to develop a drug development project that could have competed against its existing drugs. Given the advanced state of the development project, the market affected by the alleged conduct was defined based on the existing drug, as the FTC concluded that both would be sufficiently substitutable in the future.

Merger reviews are common in this context. For instance, in 2015, the EC evaluated a merger between Pfizer and Hospira and was concerned that after the acquisition, Pfizer would have delayed or even discontinued the development of a phase II pharmaceutical by Hospira for the treatment of auto-immune diseases, eliminating future competition between the innovation and already marketed biosimilars. BMS/Celgene (2019), J&J/Actelion (2017), Novartis/GSK (2015) and Medtronic/Covidien (2014) are other examples of cases where the EC found that the transaction would have an impact on competition in markets where the merging parties had relevant R&D activities that, if successful, would have competed with existing products or very similar pipeline programmes. In those cases, the concern was that the merged entity would have been likely to rationalise its R&D programmes by discontinuing, delaying or re-orienting one of the merging parties' R&D activities.

Sources: Stipulated Order for Permanent Injunction and Equitable Monetary Relief in the Case No. 1:17-cv-120 - FTC File No. 1310172 (Mallinckrodt Ard Inc); EC, Case M. 7559 Pfizer/Hospira (2015); EC, Case M. 9294 BMS/Celgene (2019); EC, Case M.8401 J&J/Actelion (2017); EC, Case M.7275 Novartis/GSK oncology business (2015); EC, Case M.7326 Medtronic/Covidien (2014).

Competition authorities have concluded that parties compete in existing markets and the concerns normally relate to a reduction or a delay in the introduction of new features of the products, meaning that innovation in existing markets will potentially be affected by the transaction.[14] To reach these conclusions, they normally analyse third parties' opinions and internal documents of the investigated companies or merging parties, including further innovation plans; and review the market shares of the companies on the total R&D investment in the industry.

Competition authorities have made similar considerations in abuse of dominance cases where innovation is a relevant part of defining and analysing the market affected by the conduct, but they define the market based on an existing product. That is the case in the Qualcomm investigation by the FTC.[15] In its complaint, the FTC alleged that certain business practices used by Qualcomm, including a policy called "No License-No Chips", had the effect of raising the costs of its rivals in the sale of baseband processors (modem chips). For the FTC, the conduct had the effect of reducing competitors' ability and incentive to innovate and develop the next generation of these products. While the FTC recognised that competition drives firms to innovate in next-generation technologies, the focus of its analysis was on innovation in the existing market, given that potential innovations on processors would still affect the same product market where Qualcomm was already active.

This analysis has also been common in abuse of dominance proceedings against pharmaceutical companies for blocking market entry of generic drugs, where there is already one drug active in the market and projects to produce and release generic drugs are being developed (see Box 3.1 above).[16] This excludes scenarios in which R&D developments with uncertain outcomes are also affected by the abusive conduct.

What all these cases have in common is that competition authorities defined relevant markets based on existing products and services where they expected innovation to occur and mostly of incremental nature. Given that competition authorities could properly identify products and services in such cases as they were already offered in the market, uncertainty was not particularly relevant for the definition of the product market. As it will be discussed below, uncertainty does play a role in the analysis of these markets, as potential competition and substitutability in the future is examined.

3.2. Innovation in future product markets

Competition authorities have also been concerned with how reductions in competition can affect innovation in **future product markets**, for instance, because there is already an innovation in a late stage of development which would create a new product market. Transactions or conduct involving medical devices or pharmaceuticals, which are by nature R&D intensive and happen to have projects in late stages of development are an example, particularly when different market players have overlaps in their pipeline products. This approach could be, and is in practice, extended to potential competition when agents that are not yet present in an existing market are expected to launch a new or future product and start competing in it, as discussed in the previous section (OECD, 2023[9]). In all these cases, competition authorities have relied on the definition of future product markets to analyse the effects of a merger transaction or a company's behaviour and the future product is **well identified**.

In the complaint filed by the FTC seeking to block Meta's acquisition of Within in 2022, the FTC based its allegations on Meta's reasonable probability to have entered the existing VR Dedicated Fitness App market through alternative means absent the transaction. For the FTC, the functioning of Meta's Reality Labs was based on business plans, as well as relevant R&D projects that could generate innovations allowing the company to enter the market by itself. The reasoning behind that is that the efforts made by the labs could be considered, even if in the future, as innovations that were close substitutes to the products already sold by Within and therefore were relevant to define the scope of the product market and analyse its competitive dynamics.[17]

In the Ilumina/Grail merger, the European Commission defined the relevant market as the future market for early detection cancer tests. The Commission determined that Ilumina, a supplier of Next-Generation Sequencing (NGS) for genetic and genomic analysis, would compete in the future if the transaction was consummated, as Grail would use such NGS systems to develop the referred tests. Box 3.4 below presents the EC's analysis on the vertical effects of the transaction, taking into account the definition of the future market.

In both cases, the competition authorities relied on forecasts of how the market would look in terms of size and structure to reach their conclusions on future market dynamics.

Abuse of dominance proceedings have also included definitions of future markets. Box 3.2 describes two recent cases decided by the Italian Competition Authority (AGCM) on alleged abuses of a dominant position by Google.

Box 3.2. Investigations on abuse of dominance by Google in Italy: the role of future markets

Google v Enel X

The AGCM sanctioned Google in April 2021 for abusing its dominant position in the markets for licensed operating systems and app stores for the Android operating system. The abuse consisted of refusing to make the JuicePass app (owned by Enel X and developed to provide services related to the charging of electric cars such as search, booking and payment of charging stations) available on the Android Auto platform. According to the AGCM, Google did not prepare the appropriate IT solutions in response to the request from Enel X to be allowed to the platform, thus hindering and unjustifiably postponing the availability of Enel X on Android Auto.

In its assessment, the AGCM studied different dimensions of the competitive relationship between Google and Enel X. It reviewed current and potential competition between the companies, as well as competition for users and data, in which innovation played a role. Specifically, the AGCM made considerations on the long-term effects of Google's conduct, which could impact future markets. The AGCM concluded that any conduct that aims at depriving competitors of acquiring relevant data flow from users to define its operations could reduce the degree of innovation and act as an obstacle to the appearance of new products for which there is a potential demand. The definition of those future markets was left open by the authority.

Google v Hoda

In July 2022, the AGCM opened another investigation against Google for a potential abuse related to Google placing obstacles to the identification of interoperability mechanisms suitable for making the data present in its platform available to alternative platforms. The investigation was opened following a complaint in which an app developer, Hoda, alleged significant complexity for users to export their data from Google's Takeout[1], to Weople, a platform for protecting personal data and investing to gain from it.

The decision launching the investigation included some considerations of the alleged abuse restricting the ability of alternative operators, such as Hoda, to develop innovative data-based services. This would impact a future market for the use and exploitation of personal data. For the AGCM, this market would become very relevant in the future, as it presents users "*the opportunity to achieve the maximum economic potential from the use of personal data, also through modes of exploitation that are different from those currently practiced by the dominant operator*".

In July 2023, the AGCM closed the investigation by accepting commitments from Google to facilitate interoperability of user data through Takeout, including providing effective tools for the automation and improvement of the interoperability mechanism to be offered to third-party operators.

Note:
[1] a project developed by Google that allows users of Google products to export their data to a downloadable file.
Sources: AGCM (2023). A552 - Italian Competition Authority: Following the Authority's intervention, Google's data portability becomes easier. Available at: https://en.agcm.it/en/media/press-releases/2023/7/A552; AGCM (2022). A552 - Italian Competition Authority, investigation opened against Google for abuse of dominant position in data portability. Available at: https://en.agcm.it/en/media/press-releases/2022/7/A552; AGCM (2021). A529 Procedure No. 29645. Google/Compatibilità App Enel X Italia con Sistema Android Auto.

In comparison to the previous subsection on existing relevant markets, uncertainty plays a more relevant role when analysing future markets. Depending on how advanced the R&D projects are, competition authorities may be able to identify future products and services to be marketed. In other cases, what competition authorities can identify is potential paths of R&D projects, which could develop into products

or services to be sold in the market. Evidence such as internal documents and preliminary testing and results could serve as a basis for the competition authority to define a future market. In these scenarios, what competition authorities do is focus the competitive analysis on the fact that, regardless of the specific outcome, the companies analysed could be future competitors. Therefore, conduct or transactions eliminating or delaying one of the projects would have negative effects on competition. Challenges of following this approach are discussed below in 3.5.

The cases where outcomes of innovation cannot be linked to specific products so that, instead, competition authorities define the relevant market as the market for innovation will be discussed in 4.1.

3.3. Traditional theories of harm

When assessing the competitive effects of firms' behaviour, for instance in the context of an abuse of dominance investigation, competition authorities evaluate whether the conduct in question has had, is having, or is likely to have, the effect of preventing or lessening competition substantially in a market. Generally, this assessment is linked to the conduct generating exclusionary effects in the market. When conducting this analysis, competition authorities have considered the effects on innovation when competition is reduced. For this, they have looked at the impact of the conduct on the **incentives to innovate** for both the dominant firm and its competitors.[18]

In the case of analysing a dominant firm's incentives to innovate, competition authorities normally base their assessment on how the entrenchment of market power reduces the company's incentives to innovate, as there are fewer competitive threats than there would be absent the conduct. Often, authorities extend their analysis to incentives of competitors to innovate, including potential competition. For that, they consider whether, due to less competition, innovation will not occur or will occur later. Competition authorities conduct an analogous analysis when the conduct has vertical effects. For instance, they are interested in analysing how foreclosure, which reduces competition, also disincentivises competitors downstream to engage in innovation. The *Intel* case reviewed by the EC in 2009 is an example of this type of analysis (see Box 3.3). In general, the way competition authorities have incorporated innovation follows the same approach as the *Intel* case, where innovation is just one more variable affected by reduced competition, such as prices, quality, and variety.

Box 3.3. Impact of Intel's fidelity rebates on innovation downstream

In 2009, the EC sanctioned Intel for abusing its dominant position in the market for computer x86 central processing units (CPUs), where it held around 70% of the market. According to the EC's findings, Intel engaged in two illegal practices: (i) gave hidden rebates to computer manufacturers on the condition that they bought all or almost all their CPUs from Intel, and (ii) made direct payments to a major retailer on the condition that it stock only computers with Intel's CPUs.

In its analysis, the EC found that the rebates prevented customers from choosing alternative products and limited the sales channels available to competitors' products. This, in turn, delayed the launch of specific, innovative products from those competitors, as the rebates and direct payments reduced their incentives to innovate.

More specifically, the EC found that the negative impact on innovation followed from the exclusionary effects of the rebates. The conduct undermined competitors' ability to compete on the merits of their products, reducing their incentives to innovate.

Intel filed an appeal against the EC decision to the General Court, which dismissed it in June 2014. In 2017, the European Court of Justice set aside that judgement and referred the case back to the General Court based on the General Court not having analysed the effects of the rebates in light of all relevant

circumstances (including carrying out an examination of how the EC applied the as-efficient-competitor test). The General Court ended up annulling in part the EC decision as it concluded the analysis was incomplete and did not make it possible to establish that the rebates were capable of having, or likely to have, anticompetitive effects.

Sources: EC, Case No. AT.3990 Intel Corporation (2009), paras. 1597–1616; Judgment of the General Court of 12 June 2014, Intel v Commission, T-286/09 (see also Press Release No 82/14); Judgment of the Court of Justice of 6 September 2017, Intel v Commission, C-413/14 P (see also Press Release No 90/17).

In all the merger reviews that followed an incentives approach, regardless of whether competition authorities identified existing or future markets, the focus was on determining how a reduction of competition will affect innovation. For this, competition authorities have used either a traditional unilateral, horizontal effects theory of harm, where they look at the impact of the loss of competition from the transaction on variables such as prices, quantities and, of course, innovation; or a vertical foreclosure effects theory of harm where they analyse how the transaction could reduce competitors' incentives to innovate.

Within horizontal transactions, the focus could either be the loss of the number of post-merger independent companies with sufficient R&D abilities to innovate in the market or the reduction of internal R&D rivalry between the merging parties, as innovations may cannibalise profits (Petit, 2019[10]). In other words, unilateral innovation effects can be seen as analogous to unilateral price effects, with a focus on firms' decisions to invest resources to develop new products or services rather than on their pricing decisions (Federico, Scott Morton and Shapiro, 2020[11]) and assessing if there are innovation-related business stealing effects between the merging firms.

For example, in the 2015 merger between Novartis and GlaxoSmithKline's oncology businesses, which included different efforts from both companies to develop cancer treatments, the EC considered the impact of the merger on the innovation efforts of the merging parties. Particularly, it considered that the R&D projects of the merging firms would cannibalise each other with a major result of the transaction being that one of the projects was to be discontinued to avoid negative innovation externalities.[19] The conclusion was based on a unilateral effects analysis where increased concentration was presumed to produce a negative effect on innovation in a future market given the substitutability between the merging parties' future products (Solidoro, 2019[12]).

To analyse future competition in well-identified product markets, particularly when pipeline products are involved (i.e., which are not yet competing in the market), competition authorities consider elements such as projections of market shares. These could either be present in company's business plans or can be estimated using history of the companies' successful attempts to bring innovations into markets.[20]

As in the example above, in general, it is possible to establish that the internalisation of business stealing resulting from a merger will be larger, the higher the correlation between the innovations, or the R&D projects, of the merging firms. This happens because if products are meant to be substitutable, the merged company would tend to eliminate "duplicative" projects, which from a competition authority perspective also means that it would eliminate the prospect of future competition.

The 2022 prohibition of the merger Illumina/Grail by the EC exemplifies how competition authorities evaluate innovation in vertical mergers from an incentives-based perspective using a traditional foreclosure theory of harm. Box 3.4 presents the case.

Box 3.4. Prohibition decision by the EC on the Ilumina/Grail merger

In 2022, the EC prohibited a transaction where Ilumina, a supplier of Next-Generation Sequencing (NGS) for genetic and genomic analysis, planned to acquire Grail, a company that would use such NGS systems to develop early detection cancer tests. The prohibition was based on the merger stifling innovation and reducing choice in the downstream market. While the theory of harm was a conventional potential foreclosure effect in a vertical transaction, interesting issues were raised by how the authority assessed harm to innovation in **future markets**.

For the assessment of the transaction, the European Commission considered the likelihood of the vertical integration foreclosing Grail's rivals in the downstream market, making it impossible for them to access an essential input to develop and market their own tests or, at least, putting their rivals at a disadvantage.

While companies operating downstream were still in an **innovation race** to develop and commercialise early cancer detection tests, and there was uncertainty of the results and the future of the market, the EC concluded that, if successful, the tests would revolutionise the fight against cancer, saving millions of lives, making it vital to preserve competition in a critical stage of innovation. The EC observed that multiple companies were developing tests that in the future would closely compete with those from Grail, absent the transaction.

To reach its conclusions, particularly on the incentives to foreclose, the authority used predictions up until 2035 that showed the value the future market could reach and how lucrative it would quickly become. The fact that Ilumina was the only credible supplier of NGS systems at least in the medium term and that the barriers to enter the market were high was also relevant to assess its ability to foreclose Grail's rivals.

Note: the review of the transaction was done based on a referral to the European Commission by France, Belgium, Greece, Iceland, the Netherlands and Norway under Article 22 of the EU Merger Regulation, as it did not meet the turnover thresholds and it was not notified in any Member State.
Source: EC, Case No. M.10188 – Ilumina/Grail (2022).

A relevant update of the proposed US Merger Guidelines made this incentives-based approach more explicit and reinforced the possibility of considering capabilities of firms to innovate in the assessment, while sticking with traditional theories of harm. The proposed guidelines argue that incentives to compete on innovation depend on the capabilities of the firms and that development of new features depends on having appropriate expertise and resources. While this leaves grounds for considering a more dynamic approach to innovation, by including competition in future markets, it still relies on the assumption that companies compete within well-identified markets that are competition-driven. In turn, the theory of harm to explore impact of the merger on innovation still resembles a traditional unilateral effects analysis that examines how decreased competition could reduce the firms' incentives to innovate.

When evaluating innovation through a traditional theory of harm where the R&D projects relate to specific well-defined products, competition authorities can transpose the traditional analytical techniques to define and analyse competition in the market to these types of mergers with some additional considerations. Those additional considerations include the remaining time to market of the pipeline product, the substitutability of the innovation with other pipelines or existing products in the market, and the information on the potential future demand for it, information that can be obtained or predicted by competition authorities from the history of previous innovations by the company, behaviour and characteristics of the relevant market, internal documents, among others.

Due to overlaps between the concepts and theories of harm, competition authorities have analysed innovation effects in the context of other theories of harm in the digital mergers reviewed by competition authorities. For example, in Microsoft/LinkedIn (2016), when analysing the vertical input foreclosure theory of harm, the EC found it unlikely that, if post-merger LinkedIn data were used only by Microsoft to improve its customer relations management product through machine learning, this would reduce innovation by Microsoft's competitors, in particular due to the limited relevance of LinkedIn data for competing in customer relations management software.[21] While this is not the focus of this background note, previous OECD work has emphasised on theories of harm in digital mergers.[22]

3.4. Remedies

Whenever competition authorities have followed an incentives-based approach to discuss effects of reduced competition in innovation, remedy design aims to restore the levels of competition in the market, assuring similar levels of innovation.[23]

The design of remedies, particularly if they are of a structural nature, depends on whether existing products or pipelines are on the table. If the remedies involve R&D projects, competition authorities have focused on analysing what are the necessary assets, i.e., the extent of the divestiture, that will allow the innovation, if successful, to enter the market. This involves discussions on intellectual property rights and licensing (Majure, Hipsman and Liu, 2022[13]).

Competition authorities still prefer remedies of a structural nature when looking at restoring incentives to innovate in the market. The creation or strengthening of an independent innovator, which can replicate the levels of competition and, thus, innovation that the market had before are the most common ones.

The FTC has shown this preference for divestitures, focusing on products already in the market, if possible.[24] In the Celgene/Bristol-Myers Squibb merger,[25] a merger between the market leader for oral products to treat psoriasis and a potential competitor, the merged entity divested Celgene's Otezla business – the product already on the market. The FTC concluded that divesting the product market was the safest path to ensure that the buyer became an independent, viable and effective competitor of the merged firm in the US market.

However, competition authorities also are inclined to include in the remedy package the assets that do not directly relate to existing products, but instead are necessary for future developments. Box 3.5 presents de GE/Alstom transaction, conditionally approved by the EC, which considered divestiture of assets that went further than only existing products.

Box 3.5. Remedy package design in the GE/Alstom case

In September 2015, the EC approved the acquisition of Alstom's energy business (which included power generation and transmission assets) by General Electric subject to conditions. The in-depth analysis of the EC revealed concerns in the heavy-duty gas turbines market, used in gas-fired power plants, where GE was the world's largest manufacturer and Alstom was the third biggest player globally. In particular, the EC was concerned that after the transaction, General Electric would reduce or discontinue the production of certain models, meaning that some of the most advanced technology developed by Alstom, essential to meeting climate change goals, would be removed from the market due to reduced competitive pressure. This included a newly developed model that was not yet being commercialised.

The parties proposed structural remedies that included selling to a competitor some of the key assets of Alstom's business, including existing products, pipeline technology for future upgrades, key R&D personnel for further developments, and test facilities. Because the concern relied on a reduction of innovation in an existing market (the heavy-duty gas turbine business), the commitments were approved as they aimed at providing a third competitor, who was also active in the market, with all the necessary elements to replace the role of Alstom as a relevant innovator in the same market and keep the number of effective competitors unchanged. In words of the EC, "*the divestment guarantees the continuation of Alstom's distinctive dual combustion heavy duty gas turbine technology, which is particularly well suited for the needs of European customers, while at the same time offering the purchaser advanced R&D capabilities and incentives to continue pushing innovation on this important market for Europe*."

Within the market testing phase of the remedies, the EC identified that a pure transfer of the models from Alstom was not enough to convert the buyer into a viable competitor as the restrictions to upgrade the models might reduce incentives to invest on them. Thus, in the final remedies, the EC included the transfer of all the necessary tools (i.e., test facilities, technologies, personnel, and expertise) to facilitate and enhance the incentives for the buyer to upgrade such models.

Source: EC, Case No. M.7278 – General Electric / Alstom (Thermal Power – Renewable Power & Grid Business) (2015).

As mentioned above, the common concern for competition authorities seems to be that the assets to be divested include all the necessary elements for the buyer to compete in the market, including those needed to keep competing in the future, and to produce further developments in the affected markets.

3.5. Challenges of the incentives-based approach

Concerns about innovation in competition enforcement that have been addressed under an incentives-based approach, namely analysing how reduced competition affects innovation, still follow a rather static approach. Although competition authorities acknowledge the existence of future competition due to innovations entering the market at some point in the future, they seem to have been cautious regarding how to define and analyse markets based on future market developments and, in very few instances, such analyses have included considerations on what those innovations might mean for competition (which will be discussed in section 4. below). The use of traditional theories of harm does not seem to be sufficient to capture dynamic aspects of competition and innovation (Kerber and Vezzoso, 2021[14]).

Challenges generally arise in three situations: (i) to define and analyse relevant markets that have high innovation rates, (ii) to consider future competition, and (iii) to assess unilateral effects. In all cases, a lack of evidence due to uncertainty is one of the main issues.

With respect to market definition, a drawback from following a traditional product-market approach is that it cannot capture the fact that competing innovators might not be identical to the competitors in the product market, as some incumbent firms might not innovate, and non-incumbent firms might take part in innovation competition. Further, it does not capture relevant information on who has the relevant resources for innovation and the incentives to engage in it to compete in the future (Kern, Dewenter and Kerber, 2016[4]). In line with this, calculations on market shares and concentration levels in product markets might not be good indicators for assessing competitive pressures, which come mostly from innovation.

Predicting future competition is highly uncertain. In these scenarios, competition authorities face the possibility that the assessment does not meet substantive legal tests as the use of probabilities to conclude on the impact on competition introduces uncertainty. However, in this regard, one cannot forget that a merger review, given its nature, is a speculative process even when innovation is not involved. Therefore, merging parties cannot use the argument to dismiss the analysis on the role of innovation in the market dynamics. Even when traditional markets are considered with the tools available, there will always be a certain degree of uncertainty as to the counterfactual chosen for the assessment of a merger. By acknowledging the existence of a certain degree of uncertainty, more considerations on potential competition can be envisaged.

On an ex-post assessment on the Google/Waze merger in 2013, which was cleared by the Office of Fair Trading in the United Kingdom (now the CMA), the authors identified that the authority dismissed a theory of harm based on lost innovation due to the uncertainty in Waze's future growth projections and potential market developments (Argentesi et al., 2020[15]). According to the OFT, the transaction had the potential to affect innovation in the market for mobile turn-by-turn navigation services, however, for the authority, there was not sufficient evidence of a significant potential for growth through network effects from Waze in the UK, nor did it view Waze as a disruptive force in the future.

The dismissal of the theory of harm, as stated in the ex-post assessment, had to do with a cautious assessment of the evidence that Waze could have become a relevant competitive force by the OFT, as well as on the synergies that could occur between Waze and Google Maps in terms of data collection and sharing, and access to cloud infrastructure. In light of the review, considering Waze as a disruptive innovator in the market, could have meant that the merger had the potential to dampen Google's incentives to innovate and improve product quality.

The application of a unilateral effects test is further complicated by the qualitative nature of innovation, and again, the degree of uncertainty of the outcome, which means it cannot be measured as easily as prices. As shown in the different examples above, relying on third-party opinions, business plans, executed investments, and past innovations and outcomes have proven to be useful for competition authorities to anticipate effects on ability and incentives to innovate of companies and their competitors. This is particularly true in cases in which R&D projects are already at advanced stages and potential outcomes are easier to predict.

In summary, key challenges arise when evaluating innovation from an incentives-based perspective. First, when capturing possible substitutability dynamics that are not clear when innovation plays a key role in the market. This includes the risk of defining an overly broad or narrow market due to uncertainty of innovation outcomes. Second, when dealing with unexpected developments in the market, which involve considering evidence such as growth projections and forecasts on the presence of innovation in the market. Third, for the lack of quantitative measures of innovation that could allow for anticipating the effects of certain behaviour on ability and incentives to innovate. These challenges increase if competition authorities find themselves in a restrictive legal framework where the definition of a relevant market, the calculation of market shares and other steps are required in their enforcement decisions.

4. Impact-based approach

A second way in which competition authorities have incorporated innovation considerations in their enforcement proceedings relies on an impact-based approach. This means that authorities analyse **innovation-driven markets**, relying on the assumption that market players compete in innovation and that innovation is the factor that defines competition, looking at changes in innovation levels and intensity as the drivers of competition as a starting point for the analysis. The assumption behind this approach is that innovation impacts competition as much as competition affects innovation.

This approach implies considering a more dynamic perspective that involves defining markets based on innovation patterns and projects, instead of more traditional parameters such as demand and supply substitutability. It also considers **innovation-specific theories of harm**, where competition authorities take into account factors such as capabilities and specialised skills and assets to assess the effect of a transaction or conduct in the markets. Remedies in these scenarios aim directly at restoring levels of innovation in the market, targeting short but also long-term dynamics, as this seems to be the key feature in these markets to increase the levels of competition and restore or counter-act potential harm to innovation.

There have been cases when competition authorities have considered innovation as the most relevant driver of competition, mostly in a dynamic perspective where innovating today will generate changes in the market structure and therefore impact tomorrow's competition. As opposed to only consider that innovations could be introduced in future product markets that can be well-identified, this approach includes all cases where there are no clear outcomes from the R&D efforts and therefore the look of the marketed product is undefined.

Within those cases where competition authorities consider innovation as the most relevant driver of competition, scenarios where companies perform significant R&D efforts that cannot (yet) be related to specific existing or future products are the most common. In these situations, some behaviours or transactions could lead to reduced R&D activity because innovation competition is restricted and, consequently, this could also impede competition on a future market, even if this market cannot be defined.

In most of these cases, competition authorities argue that while competition encourages innovation for the benefit of consumers, stifling innovation also harms competition.[26] In this sense, issues that will be described in this section are mostly complementary to the ones discussed in the previous one. On top of considerations related to innovation-driven markets, for instance, competition authorities have used the impact-based approach in cases involving competition-driven markets, with the definition of the relevant market being done based on existing or future competition, as discussed above, as well as all the analysis on the ability and incentives of companies to innovate in such markets.

For example, in one of its most recent merger prohibitions, the EC blocked a transaction between two South Korean shipbuilders, based, among other arguments, on the fact that the transaction would contribute to the creation of a dominant position in the market for the construction of large liquified gas carriers, as the merging parties were relevant innovators in a market mainly driven by innovation. The fact that the market was innovation driven was supported by the EC's analysis of all recent patents by the merging parties and its competitors, the type of technologies and innovations used and how those innovations acted as barriers to enter the market.[27]

In this sense, the section reviews scenarios where competition authorities have taken an innovation-based approach, even when complementary to the incentives analysis, and excludes cases where there has been some theoretical discussion by the authority on how innovation may impact competition, but the assessment does not include such considerations.

4.1. Innovation markets

In industries that are prominently driven by innovation, or in scenarios where the innovation dynamics do not relate to identifiable product markets, competition authorities have relied on so-called **innovation markets**. Innovation markets are different from traditional product markets in the sense that they don't identify a specific existing or future market that includes a product or service. Instead, they consider R&D activities as a market themselves. In general, these R&D activities can impact multiple markets or sectors if successful. In these cases, what competition authorities look at is the **capabilities** of firms to innovate.

In this exercise, traditional tools such as the SSNIP test are of little help, as uncertainty on the outcome of innovation makes it impossible to determine whether firms will actually compete in a product market and which one it would be. Defining an innovation market involves considering all the close substitutes for a specific R&D project taking into account efforts, technologies, skills and specialised assets that would constraint the exercise of market power with respect to said relevant R&D. For example, by limiting incentives and abilities of the innovator to slow down its efforts, i.e., the pace of the research and development.[28]

Innovation markets are not new. The concept originated in the United States in 1995 when there were already some reflections on dynamic effects in merger analysis (Gilbert and Sunshine, 1995[16]) and goes in line with the more recent dynamic-capabilities approach (Teece, 2007[17]). According to this approach, when two or more companies have similar capabilities and lines of research, they are likely to be competitors in future innovation efforts, even when they are not competing in a product market or even in a race to develop competing products (Lyra and Pires-Alves, 2022[18]). In these cases, the existence of such capabilities and research lines provides competitive pressure on each other and specific conduct or a transaction involving any of those innovators may delay or interrupt such efforts today or in the future (Kokkoris and Valetti, 2020[19]).

The two competition agencies in the US have applied this concept in merger reviews. Box 4.1 illustrates how they have defined innovation markets. However, the definition of innovation markets in such cases did not extend into an impact-based approach, since in both cases, the authorities still analysed changes in innovation mostly as a consequence of reduced competition, as described in the previous chapter.

Box 4.1. Innovation markets in merger review by the US competition authorities

FTC

In 2013, the FTC analysed the transaction between Nielsen and Arbitron, companies active in the television (Nielsen) and radio (Arbitron) audience measurement (ratings) services. In its complaint, the FTC argued that, while there was not a commercially available national cross-platform audience measurement service at the time of the review, there was an increasing demand for such a service and that the merging parties were in the process of developing one each, with already-produced custom projects and beta tests. According to the complaint, the two companies were the best-positioned firms to develop cross-platform measurement services given their assets, skills, and technological capabilities. The concern raised by the transaction was that it would diminish future competition for the provision of cross-platform measurement services by tending to create a monopoly in an innovative product. The transaction was finally cleared subject to the divestment and licensing of assets and capabilities designed to replicate Arbitron's development.

DOJ

During the same year, the DOJ challenged another transaction, this time involving two global providers of equipment to manufacture semiconductor chips, Applied Materials and Tokyo Electron. For the DOJ, the two merging firms "*possessed the necessary knowhow, resources, and ability to develop and supply high-volume non-lithography semiconductor equipment*" (DOJ Antitrust Div., 2016[20]), considered as next-generation innovation. In the complaint, the DOJ claimed that current competition between the firms in a market, such as the one affected by the transaction characterised by a high degree of innovation, was indicative of future broader competition between the firms. The merging parties abandoned the transaction in 2015 after the DOJ rejected their remedy proposal.

Sources: FTC Complaint in Case No. C-4439 in the matter of Nielsen Holdings N.V. and Arbitron Inc; FTC Decision and Order in Case No. C-4439 in the matter of Nielsen Holdings N.V. and Arbitron INC; (DOJ Antitrust Div., 2016[20]), Congressional Submission: FY 2017 Performance Budget 44 (2016), available at https://www.justice.gov/jmd/file/821001/download; (OECD, 2018[6]), Non-price Effects of Mergers – Note by the United States. Available at: https://one.oecd.org/document/DAF/COMP/WD(2018)45/en/pdf

In Europe, an analogous definition exists. For example, the Guidelines on the application of Article 101 TFEU to horizontal cooperation agreements acknowledge the need to consider innovation markets instead of traditional product markets to assess the effects of R&D agreements on competition. Particularly, the EC, in the context of relevant markets, differentiates between product markets and competition in innovation or R&D efforts. For the EC, the key to assess the agreements is to identify products, technologies or efforts that will act as main constraints to the parties of the agreement. Within this situation, one can identify two more categories: the first one where there are specific R&D poles that target specific products which can already be identified, even if at an early stage of the innovation process. The second refers to those cases where no R&D poles can be identified as the innovation process is not as clearly structured as in the first case. While this was defined in the context of agreements, it has also been applied in merger and abuse of dominance proceedings.

With regards to the first scenario involving products that can be identified even if still in development phases, the EC have analysed cases where the merging parties overlap in the development of innovations which, if successful, would potentially compete in the future.[29] Although none of the innovations were still in the market, meaning that there was uncertainty both in the outcome of the projects and on whether they would compete in the same relevant market, the analysis of the competitive environment in these cases is the same as the one on future markets described in section 3.2.

In relation with the second scenario involving innovation processes that are not necessarily well-structured, the EC has implemented innovation analysis from an impact approach in two agrochemical mergers: Dow/DuPont (2017)[30] and Bayer/Monsanto (2018).[31] An interesting feature of those cases was the focus on what the EC called **innovation spaces**, instead of analysing competition-driven product markets, i.e. the areas at which the parties targeted their R&D activities (which in the particular cases referred to combinations of specific crops and pests) without establishing a direct link to existing or future markets.

When competition authorities contemplate innovation markets, considerations on market power might also change. Firm's market shares do not necessarily provide an indicator of the competitors' significance, with aspects such as incentives and ability to innovate becoming more relevant. The limited relevance of market shares in innovation markets to assess dominance or even market power goes in line with many authorities defining them as not a sufficient condition but only useful first indicators, which normally is explained in merger guidelines. Aspects relevant to the assessment of market power include the strength of future competitors and the likelihood of success of the firms' R&D plans (Solidoro, 2019[12]).

In Brazil, the competition authority (CADE) approved with remedies the transaction between Bayer and Monsanto in 2018 based on concerns of a reduction in the levels of innovation in biotechnology. As part of the market definition exercise, CADE identified as relevant markets, with respect to seeds, the market for R&D and licensing of genetically modified events (biotechnology traits) and the market for R&D of seeds varieties (genetic improvement). To analyse market power and relevance of the merging parties, CADE used estimates of time needed for new players developing R&D projects to enter the market.[32]

In general, very few competition authorities have considered innovation markets in their analyses of transactions, the concept has been rarely used in the context of abuse of dominance investigations, if ever, and decisions still rely on traditional product market definitions, perhaps to overcome some challenges that defining innovation markets bring (see discussion in section 4.4).

4.2. Innovation-specific theories of harm

Defining innovation-driven instead of competition-driven markets may also influence the way in which competition authorities analyse cases. Instead of considering a traditional theory of harm where innovation is one of multiple variables looked at, there have been cases where competition authorities have studied innovation-specific theories of harm. An innovation-specific theory of harm assumes that firms compete through innovation efforts, being product market competitors or not, and where uncertainty regarding future outcomes of innovation efforts is high. In those scenarios, competition authorities directly examined the **impact on innovation** of a behaviour or a transaction and, posteriorly, assessed how increased or decreased innovation could impact competition, mostly in the future, recognising its dynamic nature.

The difference between innovation-specific theories of harm and traditional ones is that in the former, competition authorities see potentially adverse impacts on innovation as the primary motivation instead of a repercussion from the reduction in competition of the latter. This has long been called exclusionary innovation.[33]

One aspect that competition authorities often considered is whether one of the companies analysed is a frequent innovator, as the source of harm from a conduct or transaction could be the removal of such an innovator. For that, historic information on R&D expenditures, patent activity, past and current business plans, and information on financial resources are a relevant source.

One prominent case in the US where the DOJ raised concerns from the loss of innovation and, thus, of dynamic competition between the two merging parties was the Halliburton/Baker Hughes transaction. According to the DOJ, "*Halliburton and Baker Hughes continue to push one another to develop the most advanced technologies for E&P companies. Each company has engaged in competing research efforts to bring what they refer to as "game changing" or "disruptive" new technologies to market first, or to surpass*

each other's existing technology."[34] During the investigation, the defendants stated that "*they plan to eliminate expenditures on overlapping research projects after the proposed acquisition.*"[35] For the DOJ, the imminent reduction on innovation from eliminating overlapping R&D would end competition between the merging parties' versions of emerging technologies (Federico, Scott Morton and Shapiro, 2020[11]).

In both, Dow/DuPont (2017) and Bayer/Monsanto (2018) merger decisions, the EC went beyond market definition, where it looked at the overlapping lines of research and early projects of the parties, as it found that they were important innovators, in the presence of only a limited number of other innovative competitors and high barriers to entry. Box 4.2 presents some details on the innovation-specific theories of harm considered by the EC. The DOJ also examined the Bayer/Monsanto merger[36] and, although the concerns were similar to those found by the EC, innovation considerations were analysed under a traditional unilateral effects theory of harm. The DOJ alleged that the transaction would have suppressed current and dynamic competition, resulting in harm to prices and innovation in a number of existing markets. The DOJ's complaint also identified that only two additional competitors would be able to offer future integrated solutions to farmers.

Box 4.2. Innovation theories of harm in Dow/DuPont and Bayer/Monsanto in the EU

Between 2017 and 2018, the EC approved with conditions two large mergers impacting agricultural markets, mainly pesticides. In 2017, the EC evaluated the merger between Dow and DuPont, which was approved conditionally on the divestiture of major parts of DuPont's global pesticide business, including its R&D organisation. In 2018, it reviewed Bayer's acquisition of Monsanto, which created the largest global integrated seed and pesticide player. The EC approved the transaction with conditions including divesting relevant Bayer businesses and assets to remove existing overlaps in markets where it raised competition concerns. The divestiture package included Bayer's R&D organisation for seeds and traits and Bayer's research activities to develop a product to compete with Monsanto's glyphosate.

The main concern in both cases can be summarised as the parties finding it profitable to reduce overall R&D investments after the transactions, causing a reduction in the availability of innovative products in the future. To reach this conclusion, the EC established two main theories of harm where it recognised the effect that innovation can have on competition, mainly with respect to long-term dynamic effects. The first one related to an incentives-based approach while the second one considered more the impact approach.

The first theory of harm related specifically with innovation competition, particularly with the likely discontinuation, delay or redirection of the R&D activities and pipeline, which could lead to a significant loss of innovation competition in the relevant industry. The idea behind this theory was that the merger could increase firms' incentives to shut down their own R&D projects which target the same innovation spaces out of fear of cannibalisation.

Another innovation-specific theory of harm the EC evaluated in the two mergers related to the incentives of the parties to innovate in the future as well as the incentives of the whole industry to initiate innovation projects. The EC examined this in a context of innovation impacting competition and was deemed particularly important as after the merger, only three players that were globally active throughout the entire R&D process to develop new active ingredients would remain in the pest control industry.

Information on previous market consolidations, previous launches of new products, ongoing developments, active research projects from competitors, shares of the companies in R&D expenditure and the assessment of their portfolios were key to assess the effects of potential reductions in incentives to innovate, mainly of the merging parties.

Sources: EC, Cases No. M. 7932 Dow/Dupont (2017) and M. 8084 Bayer/Monsanto (2018).

The two innovation-specific theories developed by the EC and described in Box 4.2 are part of a four-layer analytical framework developed by the Commission that complement two more traditional theories of harm related to effects on actual products, mostly focused on price competition in existing markets, and potential products with overlaps with existing or forthcoming ones.[37]

From the UK CMA's perspective, analysing losses of competition arising from reduced incentives of companies to innovate is also possible. The CMA established this approach in its Merger Guidelines which consider the possibility of including in the review of mergers aspects related to dynamic competition such as uncertain innovation patterns that could impact dynamic competition. In these guidelines, the CMA also acknowledges that when this is the case, it may assess the effects of the transaction reviewing companies' incentives to continue investing in competing programmes or strategies, including those on R&D, rather than focusing on individual existing or future product overlaps.[38]

For example, in its provisional findings on the merger between Illumina and Pacific Biosciences, the CMA found that, on top of the effects on existing product markets where the parties already competed, there was evidence that the parties were engaged in innovation-driven dynamic competition. Particularly, from internal documents of the merging parties, the CMA concluded that the parties' expenditures on R&D were significant. Further, it found that their efforts were focusing on development innovations that would allow them to dominate in multiple technologies, some of which may be entirely new and were parties had no participation at the moment of the transaction. While the CMA could not identify all the products and services that would be affected by those R&D efforts, as some of them were in early stages, the evidence was sufficient to show: (i) that the market was dynamic, (ii) that Pacific Biosciences was a disruptor innovator, and (iii) that there were clear forecasts that the parties would compete more absent the transaction.[39]

In the past examples, a relevant element that competition authorities took into account to reach their conclusions was whether the companies were part of a very limited number of firms with the necessary **capabilities to innovate** in their areas of research. Aspects reviewed included whether the areas where the companies were investing in innovation presented high barriers to entry for future innovators, and whether their history as well as their research plans, the companies revealed successful attempts to bring new products into the market (likely that the innovation would result in a product).

Innovation-specific theories of harm have also been present in decisions where competition authorities do not establish innovation markets but within traditional product markets, they recognise that innovation is one of the most important, if not the main, driver of competition.

In one of the transactions that the DOJ challenged in 2022, the DOJ's complaint stated that the transaction would stifle innovation in the health insurance markets and that this, in turn, would harm current and future competition. According to the DOJ, the transaction, which had vertical effects as it was between a commercial health insurer and the owner of a technology used by insurers to process health insurance claims would give the merging parties control of critical data that would allow them to tilt the playing field in their favour. For the authority, innovation competition among health insurers would likely decline, because rival insurers would know that the merging parties could identify and appropriate their innovation through their access to the innovator's competitively sensitive edits. This, in the opinion of the DOJ, would harm innovation, resulting in less affordable or lower quality plans. The complaint added that the proposed acquisition would also allow the merging entity to use its control over the technology to disadvantage health insurance rivals by raising their costs and denying or delaying their access to innovations and quality improvements to products and services supplied.[40] This case is just an example of how competition authorities have been able to introduce in their assessment innovation and changes in it as the main driver of changes in competition.

The Australian Competition and Consumer Commission's (ACCC) most recent prohibition decision in the mobile telecommunications industry included considerations on innovation under an impact approach. The ACCC analysed how a proposed network and spectrum sharing between Telstra Corporation Limited and

TPG Telecom Limited, which the authority evaluated as a concentration, reduced the companies' incentives to innovate and improve service and networks, weakening the competitive process. The ACCC recognised that the market was characterised by innovation-driven dynamic competition related to improvements in the services offered to consumers and that changes in investment and innovation decisions would have an impact on competition and future prices. Because the transaction would reduce incentives of merging parties to innovate, the ACCC concluded that it would also impact the way the companies would compete in the future and decided not to grant authorisation for the proposed transaction.[41]

In the EU, one relevant case that shows how, within a traditionally defined competition-driven market which includes market-to-pipeline overlap between the merging parties, the competition authority can also consider an impact-based approach is the Takeda/Shire merger in 2018.[42] In its decision, the relevant market analysed was the market for treatments for inflammatory bowel disease, where one of the parties (Takeda) already offered a biological treatment and the other (Shire) was developing one. The EC concluded that due to high risks of cannibalisation of sales, the transaction had a likely effect of delaying or discontinuing innovation efforts. For the Commission, the disappearance or delay of a new treatment would "*represent a significant loss of innovation competition, leading to a loss of product variety and reduced intensity of future price competition in the product market, to the detriment of consumers*."[43]

Innovation-based analysis is often complemented with a review of barriers to start relevant comparable R&D projects, as potential discontinuation of them would significantly reduce innovation competition in areas that with specialised assets and skills. In the Illumina and Pacific Biosciences, affecting the market for next-generation DNA sequencing systems, the CMA concluded that the development of technologies such as the ones the merging parties already had and were planning on creating involved combining complex skills "*across a wide range of disciplines such as nanofabrication, physics, photonics, optics, molecular biology, engineering, signal processing, high performance computing, and bioinformatics*". For the CMA this would make further innovations more challenging and would also involve lengthy and expensive processes. In its assessment, the CMA also considered protection of intellectual property in the industry, regulatory barriers and other costs to conclude on the existence of high barriers to entry that would be further increased as a result of the proposed transaction.[44]

Some killer-acquisition assessments can also be considered in this subset. Box 4.3 summarises the discussion that applies particularly to this kind of transactions.

Box 4.3. Innovation in killer acquisitions

Within the evaluation of so-called killer acquisitions, competition authorities usually evaluate theories of harm where the acquiring firm's strategy is to discontinue the innovation projects of the target. This task involves considering that these reductions on innovation levels obstruct future competition. The OECD has discussed theories of harm that apply to killer acquisitions and, in particular, to digital markets, in a merger control context.[1] It has concluded that these theories mostly rely on the fact that shutting down the rivals' innovation might be more profitable than competing with it or suffer losses of revenue when the product captures the consumers.

One example is the DOJ's challenge of a proposed acquisition of Plaid by Visa in 2020.[2] In its challenge, the authority complaint recognised that while the market was not traditionally driven by innovation, Plaid could be seen a nascent disruptor that would bring the market players to compete for future innovations. Therefore, for the DOJ, the transaction would result in less innovation and higher entry barriers for future innovators.

Notes:
[1] See OECD background notes on Theories of Harm for Digital Mergers (2023) and Start-ups, Killer Acquisitions and Merger Control (2020).
[2] United States of America DOJ v. Visa Inc. and Plaid Inc. Case 3:20-cv-07810.

While this approach has been more common in merger review, a handful of abuse of dominance investigations have also involved analysing the impact on innovation and its effect on competition, all of them in a complementary way to the more traditional incentives-based approach. In these cases, competition authorities have been interested in determining whether the conduct that potentially had the effect of excluding a rival would end up harming consumers or benefiting them. The source of the harm would be the conduct retarding or deterring innovation from the excluded rival, while the benefit could originate from the behaviour protecting innovation of the dominant firm in the first place.[45] In other words, changes in innovation are seen as the major effect, either as part of the negative effect of the abusive conduct or as part of the positive effects, justifying it (as will be discussed in section 5.3).

In the EU, the EC has used deterrence of innovation as a main argument to establish the anti-competitive nature of abusive practices, although mostly related to well-identified product markets. This has been confirmed by the General Court in appeals in cases such as the Google Android case in 2022, discussed below in Box 4.4, and the AstraZeneca case in 2010,[46] where the Court concluded that AstraZeneca's conduct, that involved maintaining exclusivities in the market for anti-ulcer medicines beyond the period of patent protection, resulted in a misuse of the patent system. Its effect was to reduce incentives to engage in innovation and, therefore, was deemed to be anti-competitive.

The most recent abuse of dominance investigations by the EC against Google are a great example of innovation theories of harm in abuse of dominance investigations. Box 4.4 presents the specific arguments raised in the Android operating system case, but the EC used similar ones to analyse the direct effects of Google's conduct on innovation in the Shopping Service case in 2017,[47] and in the AdSense case in 2019.[48]

Box 4.4. Abusive conduct may stifle innovation: the Google Android case

One of the three big sanctions imposed on Google by the European Commission for abusing its dominant position in general internet search was related to the imposition of illegal restrictions on Android device manufacturers and mobile network operators.

In its decision, the EC emphasised that some of its concerns relied on Google stifling choice and innovation in a range of mobile apps and services, including mobile browsing, by requiring manufacturers to pre-install the Google Search app and browser app (Chrome) as a condition for licensing the Play Store (illegal tying) as well as by imposing anti-fragmentation obligation on its agreements.

When analysing Google's behaviour and its effects, the EC focused on how such a behaviour impacted incentives of competitors to innovate and concluded that the conduct was anti-competitive as it deterred innovation, thus harming consumers. Particularly, the EC established that the tying of Google Search with the Play Store prevented competing general search services from achieving revenues associated with search queries that would have allowed them to deploy innovative solutions for users. By making hard for competitors to gain such revenues, Google's conduct reduced the incentives of them to invest in developing innovative features such as innovation in algorithm and user experience design. One example of this were services focused on targeting a specific group of users not being able to achieve the scale and access to users that would allow them to invest in R&D with respect to innovative features.

Moreover, the EC found that anti-fragmentation obligations also had the potential to deter innovation as fragmentation can be a source of competition in innovative products. To support such an argument, the EC used the example of Google itself, who created Android by breaking compatibility (fragmenting) with Java.

According to the EC, proving how Google's conduct affected innovation was sufficient to prove its anti-competitive effects. While Google claimed that this approach overlooked the innovations made by the company during the period, the EC rejected this claim arguing that on one hand, Google never demonstrated how increasing its innovations did not affect incentives and ability of competitors to innovate and, on the other, Google did not prove that absent its conduct, its products and services would not have improved to a greater degree. For the EC, customers ended up with limited choice, while competitors faced reduced incentives to innovate as Google's conduct limited their access to customers.

The EC decision included a fine of more than EUR 4 billion and an order requiring Google to bring its illegal conduct to an end within 90 days of the decision.

Sources: EC, Case No. AT.40099 – Google Android (2018), (European Commission, 2013[21]) and (Balasingham, 2022[22]).

The Canadian Competition Bureau followed a similar approach in a refusal to supply investigation in the real estate sector in Toronto. Box 4.5 provides an example of how the Canadian Competition Bureau and the Competition Tribunal evaluated the effects on the incentives of competitors to innovate in an abuse of dominance case.

Box 4.5. Refusal to supply in the market for residential real estate brokerage services in Toronto

In May 2011, the Canadian Competition Bureau filed an application with the Competition Tribunal alleging an abuse of a dominant position by the Toronto Real Estate Board (TREB), the largest real estate board in Canada, in the market for residential estate brokerage services.

According to the application, TREB imposed restrictions on the use and online disclosure of important property data in the Multiple Listing Services (MLS), a database containing current and historical data on property listings, including sale prices. While TREB allowed its members to share sales data with clients by hand, email, or fax, it prevented the data from being displayed online through Virtual Office Websites (VOWs), which are secure password-protected online platforms where brokers can provide MLS information to their customers and clients. By excluding sales data from its electronic data feed to its members, TREB was limiting their ability to develop new and sophisticated analytical tools and innovative business models and services that could pose a threat to traditional business models. In April 2016, the Tribunal ruled that TREB had abused its dominant position because:

- TREB controlled the market for MLS-based residential real estate services given its control over the MLS, a key input for the supply of residential real estate services.
- The main purpose of the restrictions was to restrict the emergence of VOW brokerages, considered as innovative agents, due to concerns that VOWs could lead to greater competition among its members. In words of the Tribunal: "*TREB's principal motivation in implementing the VOW Restrictions was to insulate its Members from the disruptive competition that innovative, Internet-based brokerages …. wished to bring to the Relevant Market*."
- The restrictions substantially prevented competition.

For the assessment, the Tribunal relied on the fact that competition between brokerages was dynamic and mainly based on innovation. A central part of the analysis focused on how the anti-competitive conduct restricted innovation and, thus, limited the possibility of greater competition in the market. In finding that TREB's conduct reduced innovation, the Tribunal held that "*dynamic competition, including innovation, is the most important type of competition and consumers are deprived of the benefits of enhanced services when members are shielded from disruptive competition*." Moreover, "but for" TREB's VOW restrictions, there would have been, and likely would be, considerably more innovation in the relevant market, and brokerages operating full information VOWs likely would have an important impact on how dynamic competition unfolds. In such a dynamic context, reduced innovation implied reduced competition in the future.

In addition to assessing the impact of TREB's restrictions on innovation, the Competition Tribunal also found that the conduct had further anti-competitive effects, namely: increased barriers to entry and expansion and reduced range of brokerage service offerings, as well as their quality.

The Tribunal ordered TREB to remove its anti-competitive restrictions. TREB appealed the Tribunal's decision to the Federal Court of Appeal, but the Court dismissed the appeal. TREB also filed an application for leave to appeal to the Supreme Court of Canada, but the Supreme Court dismissed it on 23 August 2018, and the Tribunal's order took effect.

Sources: OECD (2020), Abuse of dominance in digital markets, www.oecd.org/daf/competition/abuse-of-dominance-in-digital-markets-2020.pdf; OECD (2021) A, win for Innovation in Canada, OECD-GVH Regional Centre for Competition, Newsletter No 16. See page 25-27: https://www.oecd.org/daf/competition/oecd-gvh-newsletter16-mar2021-en.pdf; Competition Bureau Canada, Backgrounder: Abuse of dominance by the Toronto Real Estate Board, https://www.canada.ca/en/competition-bureau/news/2018/08/backgrounder-abuse-of-dominance-by-the-toronto-real-estate-board.html; Competition Tribunal, decision summary, https://www.ct-tc.gc.ca/en/cases/decision-summaries/CT-2011-003.html?zoom_highlight=+CT%2D2011%2D003+decision+summary; Tribunal's decision: https://decisions.ct-tc.gc.ca/ct-tc/cdo/en/item/462979/index.do?q=toronto+real+estate+board+reasons

Generally, whenever competition authorities have assessed transactions or conduct within an innovation-specific theory of harm, they have taken a **dynamic perspective** to identify potential sources of harm on innovation, particularly risks of removal of relevant innovators or significant R&D activities. The main assumption is that innovation is one of the most important, if not the main, driver of competition. In these cases, competition authorities conduct an examination on the importance of the companies at risk, the presence of other innovative competitors and the entry barriers, followed by how reduced innovation would impact competition in the future. Key elements of evidence in this assessment have been a review of the skills and capabilities of the innovators, evolution of R&D expenditures, past innovations, and research and business plans. When analysing innovation from a dynamic perspective, competition authorities often look for evidence that allows them to understand the relevance of innovators in the markets, the possibility to replicate their efforts and the likelihood that their innovations would result in products. For that, they have used different types of evidence that captures innovation capabilities of both the merging firms and their competitors. Box 4.6 presents a summary of the type of evidence that the European Commission considered in the Bayer/Monsanto merger to assess innovation capabilities of both the merging parties and their competitors.[49]

Box 4.6. Evidence on dynamic capabilities of innovators in the Bayer/Monsanto merger

In the review of Bayer's acquisition of Monsanto, the European Commission collected multiple evidence to assess innovation capabilities of companies, among other objectives, to determine:

- whether the merging parties were close innovators in several innovation spaces
- whether there were other alternative equally effective innovators, i.e., companies with analogous capabilities available.

The first part of the analysis involved the description of the parties' portfolios of R&D activities, including examination of their R&D spending and a review of their commercial and licensing agreements with other companies. A second exercise was the examination of internal documents including industry reports, strategy documents and presentation. With them, the European Commission demonstrated which alternative innovators posed significant threat to the R&D projects of the merging parties. The internal documents showed the perceived rivalry between specific R&D projects and estimations of likelihoods that such projects became products, frequently presenting market share forecasts. The European Commission found that innovation targets of competitors are usually closely monitored by companies. In this sense, internal documents allowed the Commission to have a clear overview of R&D efforts in the different innovation spaces and even gather information of predictions for timing of product launches and estimations of success rates of such innovations.

The third part of the assessment was an analysis on patents. It involved collecting patent data to measure the innovation strengths of the different firms engaged in R&D in the innovation spaces identified. Based on past innovation, the analysis allowed the Commission to identify capabilities of merging parties and their competitors in innovation spaces where the parties overlapped in terms of R&D. Particularly, the Commission counted the number of times each patent had been cited by subsequent patents aiming at examining the quality of past innovations. The exercise was done for all relevant patents from the biggest five companies in the sector and for any other firms active in the research on any of the innovation spaces between 2007 and 2016.

Other elements of evidence that the Commission used to assess competitors' capabilities included an analysis of entry barriers, the integration of companies' activities at different levels (i.e., whether companies that where active in the discovery and development had also the ability to register and market the products by themselves or required collaboration with third parties) and whether the innovators were active in a single or multiple of the innovation spaces analysed.

As a result of the overall analysis, the European Commission concluded that:

1. the merging parties had been successful innovators in the past, were the leading innovators in many spaces at the moment and were very active in R&D activity that would make them close competitors in several innovation spaces.
2. there were few alternatives available for some of the innovation spaces where parties had overlapping R&D projects with high combined patent shares. More specifically, no other firms outside the group of biggest five companies appeared to be significant innovators.
3. Even within the five biggest companies, for each innovation space, only one or two of them in addition to the merging parties were generally active with good quality patents.

Source: EC, Case No. AT.8084 – Bayer / Monsanto (2018).

4.3. Remedies

Remedies designed or accepted in a context where innovation effects have been considered within an impact-approach have aimed at maintaining innovation competition and are mostly of a structural nature. They involve divestiture of parallel R&D projects to competing firms or suitable buyers that can develop the projects with the same rate of success as their previous owners (Kern, Dewenter and Kerber, 2016[4]). The reasoning behind this is the requirement to divest a broad set of assets that include relevant **innovation capabilities**, in order to replace the loss of an independent innovator.

Considerations at this stage of a merger review include whether the divestitures should involve existing products on the market or pipelines and whether there is need to divest entire R&D projects to guarantee similar levels of innovation competition.

In the EC's decision of the Dow/DuPont merger, the impact approach also influenced the design and assessment of remedies. The EC mandated the parties, among other remedies, to divest some specific assets of Dow's petrochemical business and of DuPont's pesticide business to a suitable buyer, including a big share of DuPont's R&D capacities in both businesses. The aim of the remedies, according to the EC, was to ensure that innovation-driven competition effects of the transaction in the short, medium, and long-run were counter-balanced. Therefore, the sale of the underpinning R&D organisation and pipelines was needed to enable the buyer to become an effective R&D competitor.[50] In Bayer/Monsanto, the remedies included divesting relevant Bayer businesses and assets to remove existing overlaps in markets where concerns were raised, including Bayer's R&D organisation for seeds and traits and Bayer's research activities to develop a product to compete with Monsanto's glyphosate. The package contained only Bayer's assets, rather than mixing assets of both firms, to preserve existing complementarities between R&D projects and product portfolios.[51]

In both cases, the EC required divestiture of almost the entirety of the companies' R&D projects, since, in its view, it was the only way to enable a buyer to sustainably replace the company's competitive pressure in the market and incentives to innovate, i.e., create an independent competitor with sufficient innovation capabilities. In both cases, the remedies included products and pipelines.

The remedy package in the Bayer/Monsanto transaction that the DOJ approved in the US also referred to the divestment of a comprehensive group of assets that included innovation-related assets such as intellectual property, research capabilities and pipeline projects. For the DOJ, the purpose of these elements in the divestiture was to allow the acquirer, BASF, to obtain "*all the assets required to replicate Bayer's legacy of innovation*".[52]

Another relevant example is the Novartis/GSK oncology businesses transaction in 2015, the first transaction conditionally approved by the EC where remedies were designed based on innovation-specific

theories of harm and included divestments involving early pipeline pharmaceuticals.[53] Specifically, the EC concerns related to innovation were that the merger would cause the abandonment of Novartis' clinical trial programme for two treatments for various types of cancer, as well as stopping the launch of a combined treatment for skin cancer. To avoid this, Novartis committed to return its rights over an inhibitor in which the skin cancer treatment was based, as well as to sell, to the same company, one of the clinical trial programmes. The need to keep both assets together was key in the design of the remedy due to complementarities between the two drugs, particularly useful for skin cancer treatment. The remedy package also included transitional support to the acquirer to complete Phase III clinical studies. The EC concluded that these remedies would ensure that the clinical trial would continue to be developed and, if successful, brought to the market, while eliminating competitive overlaps between the merging parties. Assuring the sale of both businesses to the same buyer with sufficient skills and experience in the market was relevant for the EC as this would increase the likelihood of them being viable.

In the acquisition of Shire by Takeda, conditionally approved by the EC in 2018,[54] the EC claimed that the transaction had the potential to reduce innovation in the market for treatments for inflammatory bowel disease and that this, in turn, could affect future competition. Therefore, the EC conditioned its approval to the divestment of a biological treatment under development by Shire. In the assessment and amendments of the commitments proposed by the merging parties, the EC analysed whether the assets to be divested included all the necessary ones to bring the product, if the innovation was successful, to the market. This also included a review of the capabilities of the purchaser to continue the development and potentially bring it to a commercialisation stage, involving the requirement for the purchaser to have a complementary product portfolio.

In the merger between Halliburton and Baker Hughes, where the DOJ raised innovation concerns with respect to multiple product markets essential to the exploration and production of oil and natural gas, the companies proposed a divestiture package that included some assets related to existing products of both companies. The DOJ rejected the remedies as they did not include critical assets, such as personnel, that would restore the robust competition that existed before the transaction.[55] In the DOJ's view, the proposed divestment would not duly replicate the dynamic capabilities and competitive position of Baker Hughes (Federico, Scott Morton and Shapiro, 2020[11]).

In sum, competition authorities design remedies resulting from an impact-based analysis to tackle the main concern of innovation-specific theories of harm: **the loss of a relevant innovator**. In this sense, they design such remedies to replicate the capabilities of the innovator that is being removed in the market, either through an acquisition or through anti-competitive behaviour.

4.4. Challenges of the impact-based approach

There are several challenges that authorities face when following this approach.[56] The most common relate to the ability to foresee and assess long term effects of innovation and predict innovation outcomes in the first place. While this challenge is not unique to competition authorities, it can be particularly relevant when their decision is directly linked to forecasts and expectations in order to meet standards of proof. The key reason why decisions containing innovation-specific theories of harm are scarce is the high risk of such decisions being rejected by courts. The main grounds for such rejections could be related to a lack of certainty in the assessment or inability to meet substantive legal tests that, although different across jurisdictions, usually require that the competition authority proves the significant lessening or impediment of effective competition (OECD, 2023[9]).

One of the main concerns relates to defining relevant markets considering R&D projects instead of tangible products or services. Academics have argued that the tools to accurately forecast the direction and speed of innovation in the long-run are not available and, therefore, it is not possible to predict how R&D projects in their early stages will evolve, let alone if, and how, they might competitively overlap in the future.[57] This

challenge becomes even more significant for competition authorities with inflexible frameworks where a proper market definition is required as part of the examination of a transaction or a conduct.[58] (OECD, 2018[6]) presents some other drawbacks on defining innovation markets such as subjectivity in defining innovation activities and the focus on R&D expenditures rather than outputs. Some proposals are already available in this regard. For instance, (Kerber and Vezzoso, 2021[14]) propose the use of existing well-established approaches to dynamic capabilities that are already used in the context of strategic and innovation management.

Another important challenge of an impact-based approach has to do with the applicable legal frameworks allowing, or not, for the assessment of innovation effects directly. For most authorities, there is a clear legal test in which they need to prove the effects, or potential effects, of the transaction or conduct on competition. This means that any indirect effects, such as those on innovation, can be seen by courts as insufficient to prove impact on competition. To mitigate this, it is fundamental for competition authorities to establish a direct link between innovation and competition. This was the strategy that the EC followed in the Bayer/Monsanto case. For the EC, in cases in which innovation represents as an important part of the state of competition, one of its tasks is to establish whether a transaction would give rise to an impediment to innovation. For the authority it is clear how this, in turn, would impede effective competition. Similarly, competition authorities could argue that they may also consider innovation as one of the benefits of effective competition in certain markets and, thus, as part of the effects of a merger. This allows for the consideration of increased incentives to innovate as part of the efficiencies stemming from a transaction.[59]

In terms of practical applications, a third challenge could also arise when looking for evidence about the innovations or products that would have been offered to consumers in the absence of the conduct.[60] Nevertheless, competition authorities have emphasised that proving which innovations could have been introduced in the market is not required for the purpose of establishing that a conduct is anti-competitive, as potential effects are possible to be recognised as sufficient to meet the legal test. The EU General Court supported this argument, for instance, in the Google Android case.[61] Moreover, Box 4.6 presents some examples on the type of evidence that competition authorities have successfully used to prove the relevance of innovation in the competitive dynamics as well as the innovation capabilities of companies.

In most of the cases, the challenges described above are also the reason why authorities have considered innovation theories of harm in addition to traditional ones. Indeed, critics of giving innovation a leading role in competitive assessment also argue that innovation-specific theories of harm tend to be more abstract. This is because there is no direct link to specific products or services, no analysis on demand substitutability can be made and no proof of an actual or potential restriction of competition on a specific product market. [62] Besides, there have been arguments on how the uncertainty of innovation outcomes could be assessed by competition authorities and, if in its presence, innovation could still be a factor to take into account and to what extent. As discussed above, this debate has particularly referred to standards of proof on how the transaction or conduct would impact future innovation. At the end of the day, these challenges have made competition authorities highly conservative when it comes to the development of speculative theories of harm, as they must ensure that the approach followed, and the evidence relied on to support it, enables them to reach these thresholds and make lawful decisions.

One way competition authorities have mitigated risks related to the market definition, is to consider both incentives and impact-based approaches together. In this sense, they analyse the impact of competition on innovation, of innovation on (future) competition, but keep the analysis linked to a specific product market. In general, this involves leaving the exact market definition open to reflect the uncertainty of products that do not exist yet and to be able to assess the importance of R&D efforts for future markets. This is the methodology that the EC has been following since the early 2000s but cannot necessarily be followed when jurisdictions have market definition as a legal prerequisite.[63]

The UK CMA has also approached this issue and gone one step further. In one of its most recent prohibition decisions, in the case Facebook (now Meta) / Giphy,[64] the authority considered that despite the uncertainty

of innovation outcomes absent the merger, including whether they would ultimately result in products or services available to consumers, this does not preclude the CMA from assessing the impact of the transaction from a dynamic perspective. This, in the CMA's opinion, could be done taking into account the likelihood of those innovations being available in the future based on evidence such as the companies' successes to date, ongoing and existing future plans, internal documents and testimony from third parties.[65] Furthermore, the CMA has recognised that the uncertainty of the outcome of an innovation can be the driving force of dynamic competition.[66] For the authority, this can be captured from evidence including internal documents, business plans and, in general, showing steps taken towards entry or expansion, such as pre-emptive investments in marketing and outreach efforts of staff.[67]

With respect to remedies, challenges that are specific to the nature of innovation arise. Since remedies thought in a dynamic perspective aim at replicate innovation capabilities, there might be some ambiguity between the competition authority attempting at maximising the number of innovators with competing R&D projects and the need to maximise innovation. The latter, it can be argued, can also be accomplished by concentrating efforts in less but more productive R&D activities.

Finally, as a complement to the discussion presented in section 3.5, the uncertainty that comes with the outcome, scope, timeline, and success of the commercialisation of an innovation also impacts the effect of a remedy imposed by a competition authority. Flexibility in the imposition, review and update of remedies is also key in this context. A good illustration on how flexibility could help overcome this challenge is the acquisition of Shire by Takeda, conditionally approved by the EC in 2018 and described above.[68] Given the analysis of the EC, the EC conditioned the transaction to the divestment of a biological treatment under development by Shire. One year after the EC's decision, the parties submitted a request to waive the commitments in their entirety due to unforeseen circumstances significantly affecting the timeline of the development project. This included difficulties to recruit patients for clinical trials and negative results on a Reproductive Toxicity Study, together with the absence of buyers submitting suitable offers and meeting purchaser's criteria defined in the commitments and changes in the competitive environment of the market.

While there is not a one-size-fits-all solution for these challenges, competition authorities should not be disincentivised to follow more speculative approaches when required, particularly to capture the complexity of the relationship between competition and innovation. They should aim to find a balance between using them and obtaining sufficient evidence to meet their legal standards.

5. Inverse relationship: countervailing factors, efficiencies, and justifications

Competition authorities have also considered innovation in the assessment of countervailing factors to reduced competition. Market players have used innovation to present efficiency arguments for their proposed merger or as an attempt to justify potentially anti-competitive conduct. In these cases, agents assume that there is a u-shaped or even negative relationship between competition and innovation, as opposed to a positive linear one, i.e., that increases of innovation could validate or compensate a decrease in competition.

5.1. Innovation as a counterbalance of market power

Competition authorities often consider that in highly innovative, dynamic markets, market power might not be sustainable. This is because the market leader could either be restricted to act independently or will be easily replaceable by one of its competitors due to the innovative activity. For instance, if the latter comes up with an innovation that gives it a competitive advantage. In competition enforcement this translates into authorities considering innovation (and markets where there are low barriers for potential future innovators) as a characteristic that could limit the market power of the players, despite high market shares.

Innovation as a counterbalance of market power is often linked to authorities acknowledging the existence of other drivers of innovation. In practice, such drivers have also been taken into account, although examples are scarcer. Examples of these drivers are the maturity of the market (stage of development), the product life cycles and the existence of network effects.[69]

For example, in the merger between Lanxess and DSM in 2011, where the Bundeskartellamt examined the market of production and sale of erasers, it admitted that in expanding markets such as the one being reviewed, innovations enable quick shifts in market shares. In this sense, the Bundeskartellamt concluded that there was no evidence of actual or potential collective dominance. To reach its conclusions on the likelihood of coordinated conduct, it took into account the degree of anticipated market growth and further innovations expected, as well as the fact that the market was volatile.[70]

Similarly, in markets with strong network effects, there have been considerations on how the success of an innovation can depend on such effects, as they act as structural barriers to entry the market. In these cases, the discussion focuses on how a leading platform's position can still be vulnerable if innovative competitors succeed in quickly attracting a large number of users through their innovations and benefit themselves from the strong network effects (Bundeskartellamt, 2017[8]).

Product life cycle is another aspect that has been relevant to assess market power in innovative markets. In sectors where products have short life cycles, because of the pace of innovations being introduced to the market, those innovations limit the market power of incumbents, despite high market shares. One decision that illustrates this analysis is the EC assessment on the Microsoft/Skype transaction[71], which

affected the market for internet communication, mostly in the segment of video telephony, still developing at the time of the review. For the EC, innovations in communications services, which are the main aspect of competition, have proven to shorten the life cycle of products launched in the market. Therefore, high market shares do not necessarily imply market power. The EC considered aspects such as consumers' attitude towards innovation in the sector, rapid and successful entry of global market players with strong brands, and fast-growing demand for the products offered by the merging parties and their competitors. The parties provided the EC with internal documents revealing innovations of Skype through time to maintain its position as a market player in the market, as well as the decreasing in their market shares when a competitor entered the market with innovative products. The EC cleared the transaction despite the merging parties having a 90% market share.[72]

These are all examples of scenarios where competition authorities recognise that because of some specific characteristics of the markets, innovation can be seen as a counterbalance of market power.

5.2. Innovation as part of an efficiency claim

In merger control, efficiencies can play a key role in the examination of transactions. In practice, in most jurisdictions, merging parties claim the existence of positive effects of their transaction in the market. In such cases, competition authorities evaluate (i) whether the effects exist, (ii) if they are related to the transaction, (iii) if said transaction is indispensable to achieve the claimed efficiency and, (iv) in some cases, whether this results in increases in consumers welfare.

One type of efficiency brought by parties that relates to innovation relies on the transaction increasing the capabilities of the merged company to innovate, as well as the incentives and ability to do so. The increase in capabilities is usually related to voluntary transfer in technology between the merging companies, that results in an increase on the scale, reduction of costs, or strengthening of the skills dedicated to a particular innovation process (Federico, Scott Morton and Shapiro, 2020[11]). Another source of efficiencies that may be claimed is the internalisation of involuntary spillovers that arise in situations where merging firms have nonrival innovations. The significance of these spillovers depends on how R&D is conducted within the firms and on the extent of complementarity of their capabilities. The argument following these efficiencies is that because the market will see new or better products or services, consumers will see an increase in quality or choice, which in turn, increases their welfare. On the side of the producers, innovations have the potential to reduce costs, even more so if innovation also involves process innovation, thus increasing their welfare as well.

Merging parties have raised these types of efficiencies. One relevant case to illustrate this was the merger between Western Digital and Hitachi, assessed by the EC in 2011 which is explained in Box 5.1.[73]

Box 5.1. Efficiency claims in the Western Digital/Hitachi merger

In 2011, the EC approved with remedies the transaction between Western Digital and Viviti Technologies, subsidiary of Hitachi, all of them suppliers of hard-disk drivers (HHDs). The EC was concerned that post-transaction the prices in the 3.5-inch desktop segment of the HDD market would increase.

Although the concerns raised did not directly relate to innovation, the merging parties brought different efficiency claims where innovation played a key role. The efficiencies claimed were:

- The combination of the parties' complementary assets would benefit consumers as the merged entity would be able to compete more rigorously with its main competitors.
- The combination of the parties' R&D resources would lead to greater and faster product development. It also improved the merged entity's ability to initiate and implement larger technology transitions required to continue developing faster and higher capacity HDDs.
- Parties expect to achieve significant cost savings and economies of scale that would lead to price reductions and increased innovation. These costs savings include reduced duplicative factory overhead and capital costs through better utilisation of existing assets.

The companies submitted as a support for their second efficiency claim, a plan to invest significantly in R&D to broaden the product portfolio and to develop next-generation HDD components. However, the EC rejected the claim as it considered that the parties failed to prove that the efficiency was merger-specific and verifiable.

The EC also rejected the third efficiency claim as the companies did not submit evidence to prove the expected effect on innovation or to guarantee that the cost reductions would pass through to consumers. Moreover, the EC concluded that the source and details for costs savings calculations were unclear and inconsistent.

The EC cleared the transaction subject to a divestiture of assets, including transfer or licensing of IP rights and the transfer of R&D personnel. The analysis of the EC of the remedies included whether the assets to be divested ensured the establishment of an independent player with the required capabilities to innovate and remain competitive in future HDDs markets.

Source: EC, Case M. 6203 Western Digital/Viviti Technologies (2011).

The evaluation of innovation efficiencies has not been done only in a merger context. Anti-competitive agreements are sometimes exempted from the prohibition of cartels and other concerted practices when they contribute to promote technical or economic progress when allowing a share of the resulting benefits to consumers.

The clearest example is the evaluation of R&D agreements. Most competition authorities have the possibility to evaluate this type of cooperation, either because they consider the possibility of investigating and declaring them legal *ex post*, or because they have powers to review *ex ante* such agreements and allow them on efficiency grounds. In either of these cases, the analysis seems to follow this sequence:

- First, competition authorities have clearly identified the main competition concerns that R&D agreements can have, such as reducing or slowing down innovation, increasing the likelihood of coordination in the future and foreclosure problems, if the cooperation involves at least one player with a significant degree of market power for a key technology and the exclusive exploitation of the results.[74]

- Second, they have identified extreme scenarios. On one hand, agreements that are restrictive of competition by object, which are the cases where the R&D project only serves as a tool to engage in cartel activity. In the other, R&D agreements that do not give rise to restrictive effects on competition, such as those between non-competitors or between competitors with very small market shares. For instance, the EC established the Block Exemption Regulation[75] for the cases in which the combined market shares of the parties do not exceed 25%, as it is unlikely that with such a share, the agreement impacts the competition levels in the market.
- Third, they have concluded that agreements falling outside exemptions do not necessarily give rise to restrictive effects on competition, mainly if the companies direct R&D at the improvement of existing products or the creation of new ones. In the first case, authorities would then evaluate effects on price, output, quality, variety and product innovation in the existing markets. In the second case, they will review possible restrictions for quality and variety of future products or technologies or the speed of innovation. Up until this point, authorities can perform an incentives-based, an impact-abased analysis or both.
- Fourth, competition authorities have assessed efficiency gains. Mainly, authorities analyse whether the agreement combines complementary or substitute skills and assets, as in the former, it could result in innovations being developed and marketed at a faster pace than in the absence of the agreement. Other efficiencies include a wider dissemination of knowledge, which may trigger further innovation, and cost reductions.

A clear example of this was the review of a proposed joint venture between leading private banks in Germany reviewed in 2017 by the Bundeskartellamt. The agreement had as an objective to introduce a new P2P payment function (transfers of money between mobile phones) to the online payment system *Paydirekt*. The joint venture covered only this development and banks would continue competing in all the other areas. The Bundeskartelamt did not oppose the joint venture since it considered that it would improve the conditions of competition on the market for online payment systems by leading to product innovation, which already existed in the market and was being offered by other global players.[76] In reaching its decision, the Bundeskartellamt reviewed the likelihood of future cooperations between the members of the joint venture, potential restrictions to competition and gains with respect to innovations being developed and marketed faster than in the absence of the agreement. This last element was crucial for the non-objection decision. While there are more examples of these agreements, all of them follow the same logic for the assessment.

The Korean Federal Trade Commission (KFTC) used a similar methodology to sanction German car manufacturers for colluding to avoid competition on the development of emissions cleaning technology (see Box 5.2 for details on the case).

Box 5.2. KFTC sanction to car manufacturers for avoiding competition on R&D

In February 2023, the KFTC imposed significant monetary fines and corrective orders (cease and desist) on four car manufacturers (Mercedes-Benz Group, BMW, Audi, and Volkswagen) for colluding to avoid competition in the research and development of emissions cleaning technology. The companies agreed to introduce a software that reduces the amount of AdBlue dosing[1] in their development of Selective Catalyst Reduction[2] despite their knowledge of the existing problem of excessive gas emissions and the efforts different jurisdictions are doing to reduce them.

The KFTC concluded that the agreement restricted the development and release of new diesel cars that could have shown better gas reduction performance, meaning that it restricted innovation and limited consumer choice. For the KFTC, the conduct aimed at avoiding innovation competition for developing innovative greener technologies. For reaching its decision, the KFTC recognised, for the first time in an enforcement proceeding, that sustainability and innovation are key competition parameters in the relevant market, in addition to product quantities and prices. As the conduct had an anti-competitive purpose, it was illegal by object and the KFTC did not need to examine its effects. The KFTC did not analyse any justifications or efficiency considerations either.

Notes:
[1] AdBlue is a solution designed to help vehicles reduce their emissions. The amount of gas emissions highly depends on the amount of AdBlue injected into the vehicles' exhausts.
[2] SCR is a treatment system that converts poisonous gases, such as nitrogen oxides that form when fuels are combusted within car engines, into water and nitrogen.
Source: KFTC (2023). Press Release Available at: https://www.ftc.go.kr/solution/skin/doc.html?fn=d458a05f8b59bff168e61d09a7bcb680385945bfc3d844bd1b231f6b67553b44&rs=/fileupload/data/result/BBSMSTR_000000002402/

5.3. Innovation as a justification

One last situation where innovation could take relevance is as a justification for anti-competitive conduct brought by the parties in an enforcement proceeding. Particularly within a context of exclusionary conduct, undertakings could argue that their conduct (for instance, a refusal to supply) aims at protecting their investments and innovation in the market that led them to earn their dominant position. In some jurisdictions, such as the EU, companies must prove to a sufficient degree of probability that their practice led to a pro-competitive effect, for instance, increase in innovation from the dominant firm.[77] This was the case in Brazil, where the Brazilian Competition Authority (CADE) assessed three administrative proceedings concerning alleged abuses of dominance by Google, which were dismissed after the authority concluded that there was not enough evidence of the illegality of Google's practices. CADE's conclusions were based on lack of evidence on how the conduct prevented competition jointly with the authority finding objective justifications for such conduct. Box 5.3 summarises the AdWorks case where CADE's Tribunal considered the protection of innovation as a justification for Google's behaviour.

Box 5.3. Google AdWorks abuse of dominance proceeding in Brazil

In 2013, CADE opened an administrative proceeding against Google for an alleged abuse of dominance related to its advertising search tool AdWorks. Particularly, the conduct under review referred to Google enforcing clauses in contracts with advertisers to prevent them from transferring data from its platform to competitors' platforms, thus preventing multi-homing and restricting competition.

In 2019, CADE's Tribunal decided to dismiss the case under two main arguments. The first one, because of a lack of evidence that Google's clauses had actually prevented competition, as it found that such clauses were common in licensing contracts, and they did not necessarily imply the prohibition on multi-homing. The second argument was related to the Tribunal finding a reasonable commercial rationale to some of the clauses in the contracts. The Tribunal concluded that an obligation to withdraw such clauses by declaring them illegal could discourage innovation.

After an extensive market research, which included surveys to advertisers, competitors and customers, CADE reached its decision and decided to dismiss the case.

Sources: CADE Administrative Proceeding 08700.005694/2013-19 and (OECD, 2020[23]).

When innovation is considered as a justification for anti-competitive conduct the analysis usually follows a logic in which reduced competition incentivises the incumbents to innovate as the prospects of earning rents from such innovations increase their incentives to invest in them.

In some cases, the argument comes together with companies pointing to market improvements developed either by them or their competitors as evidence that no exclusionary conduct has taken place (Federico, Scott Morton and Shapiro, 2020[11]). However, competition authorities have recognised for a long time now, that the real question is not whether there have been improvements in the market, but whether they would have been larger absent the conduct. In 1998, the DOJ investigated Microsoft for illegally maintaining its monopoly position in the personal computer market through restrictions to manufacturers and users to use other programs such as Netscape and Java.[78] During its investigation, the DOJ rejected Microsoft's claim that multiple innovations on its software represented how positive its conduct was for consumers. For the authority, regardless of how valuable these improvements were to customers, they did not preclude harm from the anti-competitive conduct.

This was also the case in the Google/Android investigation by the EC, explained in Box 4.4, where the EC rejected Google's claim as it considered that the counterfactual scenario was inaccurate.

6. Conclusions

Competition authorities have considered innovation in their enforcement decisions for a long time. However, in light of market developments such as the expansion of ecosystems and the creation of new models of competition, there has been an increasing interest in understanding how innovation can, and should, be analysed.

The background note reviews merger and enforcement decisions from a variety of jurisdictions and attempts to describe the different ways in which competition authorities have included innovation in their analysis. It concludes that there is not a systematic approach to innovation in competition enforcement and that merger review is the area where competition authorities have assessed innovation the most; yet approaches from case to case differ. Nevertheless, it identifies three different ways in which innovation has been analysed, which differ depending on how the competition authorities perceive the relationship between competition and innovation. Sometimes, assumptions on the relationship between both variables vary within the same decision.

Depending on the approach competition authorities follow to incorporate innovation considerations in their enforcement activities, aspects such as how the markets are defined, which theory of harm to explore, and how to design and impose remedies or commitments differ.

For the definition of relevant markets, authorities have relied on existing product markets, following the usual approach, but have also assessed future markets, as well as innovation markets. Innovation markets are different from traditional product markets in the sense that they don't identify a specific existing or future market that includes a product or service but rather consider R&D activities as a market themselves.

Traditional theories of harm adapted to innovation concerns seem to be the most common, with only a few cases where authorities have considered innovation-specific theories of harm. When competition authorities assess traditional theories of harm, they generally consider how a conduct or a transaction reduces competition and, thus, impacts incentives and ability to innovate. In cases where competition authorities have considered innovation-specific theories of harm, while scarce, they have looked, from a dynamic perspective, if there are risks from removing relevant innovators or R&D activities. More generally, in cases where competition authorities acknowledge that innovation affects competition as much as competition affects innovation, what they end up evaluating are changes in incentives and capabilities to innovate. These evaluations are based on changes in competition levels and how these, in a dynamic way, also impact competition in the long term.

For the design of remedies, competition authorities have followed a similar approach. The main concern seems to be that the assets to be divested include all the necessary elements for the buyer to compete in the market, including those needed to keep competing in the future. When dynamic considerations are taken into account, the remedy package tends to be broader to include relevant innovation capabilities that might not be directly related to existing products, but that would guarantee the replacement of the lost independent innovator.

Innovation has also played a role when companies claim efficiencies or attempt to objectively justify their conduct. Moreover, competition authorities have reviewed innovation when examining countervailing factors to market power or concentration.

Uncertainty plays a key role in the analysis of innovation, especially when the products have not yet entered the market or when potential outcomes from innovation are not clearly identifiable. Moreover, as innovation introduces significant speculation, competition authorities face the possibility that their assessment does not meet the substantive legal test in their jurisdictions. In such scenarios, competition authorities have been cautious and highly relied on internal documents (i.e., business plans, forecasts) and historical information (such as patent activity and R&D expenditures) that help them determine expected outcomes of the innovation. This includes estimates of what the product could be and how future competition may evolve.

While analysing innovation imposes challenges, competition authorities should not be disincentivised to follow more speculative approaches when required. In particular, to capture the complexity of the relationship between competition and innovation, they should aim to find a balance between using them and obtaining sufficient evidence to be able to meet their legal standards.

Endnotes

[1] For instance, the US Department of Justice in 1982 considered innovation arguments in its case against International Business Machines Corp (IBM), arguing that the company had used innovation (and the announcement of future innovations) to disadvantage competitors. More explicitly, already in the 1995 Antitrust Guidelines for the Licensing of Intellectual Property, considerations on how antitrust laws have a purpose of promoting innovation were included.

[2] For example, (Schrepel, 2023[5]) analyses of cases in Europe.

[3] The background note does not seek to cover frameworks for dynamic competition. For a discussion of that topic, see, for instance: https://www.oecd.org/daf/competition/merger-control-in-dynamic-markets.htm

[4] Some merger guidelines, as discussed below, include explicit considerations to innovation while others, for instance, present innovation as one of the multiple references to non-price effects (OECD, 2018[6]).

[5] U.S. Department of Justice and the Federal Trade Commission Merger Guidelines – Draft for Public Comment Purposes. Appendix 2, section E. Available at: https://www.justice.gov/d9/2023-07/2023-draft-merger-guidelines_0.pdf

[6] U.S. Department of Justice and the Federal Trade Commission Merger Guidelines – Draft for Public Comment Purposes. Appendix 3, section B.7. Available at: https://www.justice.gov/d9/2023-07/2023-draft-merger-guidelines_0.pdf

[7] U.S. Department of Justice and the Federal Trade Commission Merger Guidelines – Draft for Public Comment Purposes. Appendix 2, section E. Available at: https://www.justice.gov/d9/2023-07/2023-draft-merger-guidelines_0.pdf

[8] EC Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings, available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52009XC0224%2801%29

[9] CCCS Guidelines on the Section 47 Prohibition (abuse of dominance), available at: https://www.cccs.gov.sg/-/media/custom/ccs/files/legislation/cccs-guidelines-2022-interactive/cccs-guidelines-2022_interactive.ashx

[10] KFTC (2022). Guidelines on Anticompetitive Conduct in the Platform Sector. Main contents summarised in English available at: https://www.ftc.go.kr/solution/skin/doc.html?fn=23f6848cbcadf63a97f87accd6400b8ce5d2b65a537490de4adc0313932e2cc2&rs=/fileupload/data/result/BBSMSTR_000000002402/

[11] For example, Section 6.4. of the 2010 US Horizontal Merger Guidelines claim that competition spurs firms to innovate and that, in this sense, the competition agencies may consider whether a merger is likely to diminish competition in innovation by reducing innovation efforts or incentives.

[12] For a detailed discussion on potential competition, see (OECD, 2021[24]).

[13] This was the case in the General Electric/Alstom merger decision (EC, Case M. 7278 2015) in which the EC defined the product market as the market for heavy-duty gas turbines, where the merging parties were already actively competing with prices and innovation and where technological and financial barriers

were significant. In this case, the EC concluded that the parties accounted for around 30% of spendings in R&D, that catching up with developments in the industry was essential to keep customers, and that other competitors had limited R&D capabilities relative to the merging parties.

[14] Another example is the Sabre/Farelogix merger prohibited by the UK Competition and Markets Authority (CMA) in 2020. Both companies were active in the market for software solutions which help airlines to sell flights via travel agents. Although the concerns of the CMA were based on the transaction resulting in less innovation from both companies, the market affected was defined as the existing market for the IT solutions they already offered, as future innovations would relate to new features (i.e., incremental innovation). Thus, the concern was that the new features were to be released more slowly. CMA (2020). Final Report on the Merger Sabre/Farelogix. Available at: https://assets.publishing.service.gov.uk/media/5e8f17e4d3bf7f4120cb1881/Final_Report_-_Sabre_Farelogix.pdf

[15] US Federal Trade Commission's Complaint for Equitable Relief in Case No. 5:17-cv-00220 (Qualcomm Inc.)

[16] See, for another example, KFTC's sanction of AstraZeneca and Alvogen in 2022 for colluding to suppress competition in the cancer drug market by agreeing that Alvogen would not produce generic drugs for cancer treatment in return for receiving exclusive rights to sell three other drugs in the same market. Summary available at: https://www.ftc.go.kr/solution/skin/doc.html?fn=d7698c862a1a5a2cbaf0f3735a8d8b610ba6901b47152b9e4ad54f20d097620d&rs=/fileupload/data/result/BBSMSTR_000000002402/

[17] FTC (2022). Complaint in the matter of Meta Platforms, Inc., Mark Zuckerberg, and Within Unlimited Inc. Available at: https://www.ftc.gov/system/files/ftc_gov/pdf/D09411MetaWithinComplaintPublic.pdf. The complaint was dismissed after the United States District Court for the Northern District of California denied the motion of the FTC to grant a preliminary injunction blocking the transaction.

[18] This evaluation goes in line with what (Petit, 2017[31]) denominated an assessment of whether the merger would constitute a "significant impediment to industry innovation (SII)".

[19] EC, Case No. M.7275 Novartis/GlaxoSmithKline (2015).

[20] See for instance FTC Complaint in Case No. 9339 Thoratec/Heartware.

[21] EC, Case M.8124 Microsoft/LinkedIn (2016).

[22] See (OECD, 2023[9]).

[23] Throughout this background note, the concepts remedies and commitments would be used as substitutable, both in a context of abuse of dominance enforcement and in merger review. A discussion on their precise meaning and differences can be found in (OECD, 2022[25]).

[24] Exceptions exist where the FTC has required divestitures of pipelines, either because existing products have special characteristics, such as when they are very difficult to manufacture, or when they are monopolies. See, for example, FTC Decision No. C-4650 in the matter of Amneal Holdings and Impax Laboratories.

[25] FTC Decision No. C-4690 in the matter of Bristol-Myers Squibb Company and Celgene Corporation.

[26] EU General Court case No. T-604/18 Against Google and Alphabet (Google Android case).

[27] EC, Case M. 9343 Hyundai Heavy Industries Holdings / Daewoo Shipbuilding & Marine Engineering (2022).

[28] The definition of innovation markets is contained in the 1995 US DOJ/FTC Intellectual Property Guidelines.

[29] For example, in the J&J/Actelion transaction reviewed in 2017 (EC, Case M. 8401 J&J/Actelion), the EC concluded that the parties overlapped in the development of new medicines for insomnia. Both merging parties were pursuing R&D projects that were in Phase II development and already had an expected launching date to the market. To assess the competitive landscape, the EC considered as direct competitors other R&D projects being developed with similar purposes, that were already in Phase II or III of development. Although the EC also reviewed early-stage projects, it concluded that the time difference of the pipelines to enter the market was significant to consider them as closed substitutes.

[30] EC, Case M.7932 Dow/DuPont (2017).

[31] EC, Case M.8084 Bayer/Monsanto (2018).

[32] CADE Case Merger No. 08700.001097/2017-49.

[33] See (Montagnani, 2006[26]).

[34] DOJ Complaint Case 1:16-cv-00233-UNA US v Halliburton Co and Baker Hughes Inc. 6 April 2016.

[35] Ibid.

[36] DOJ Complaint US v Bayer AG and Monsanto Company, 29 May 2018.

[37] See EC, Case M.9294 BMS/Celgene (2019). This four-layer analytical framework was described by Paul Csiszár, Director of basic industries, manufacturing, and agriculture at the EC's Directorate-General for Competition in the Workshop: The Future of Pharmaceuticals: Examining the Analysis of Pharmaceutical Mergers held in June 2022. A summary of the workshop is available at: https://www.ftc.gov/system/files/ftc_gov/pdf/Future%20of%20Pharma%20Workshop%20--%20Summary.pdf

[38] CMA (2021). Merger Assessment Guidelines, Par. 5.20 and 5.21.

[39] CMA (2019). Anticipated acquisition by Illumina, Inc. of Pacific Biosciences of California, Inc.

[40] DOJ, State of Minnesota and State of New York v. UnitedHealth Group Incorporated and Change Healthcare Inc. Case 1:22-cv-00481.

[41] ACCC Merger Authorisation Number: MA 1000021. Determination of 21 December 2022.

[42] EC, Case M. 8955 Takeda/Shire (2018).

[43] *Ibid*. Par. 94.

[44] CMA (2019). Anticipated acquisition by Illumina, Inc. of Pacific Biosciences of California, Inc. Section 9.

[45] (Shapiro, 2012[27]).

[46] Case T-321/05, AstraZeneca v Commission.

[47] EC, Case No. AT.39740 Google Search (Shopping) (2017).

[48] EC, Case AT.40411 Google Search (AdSense) (2019).

[49] A more detailed analysis is presented in (OECD, 2018[6]).

[50] EC, Case M.7932 Dow/DuPont (2017). Press Release available at: https://ec.europa.eu/commission/presscorner/detail/en/IP_17_772

[51] (Federico, Scott Morton and Shapiro, 2020[11])

[52] DOJ Competitive Impact Statement, US v Bayer AG and Monsanto Company, 29 May 2018.

[53] EC, Case M.7275 Novartis / GlaxoSmithKline Oncology Business (2015).

[54] EC, Case M. 8955 Takeda/Shire (2018).

[55] DOJ Press Release: "Halliburton and Baker Hughes Abandon Merger After Department of Justice Sued to Block Deal". Available at: https://www.justice.gov/opa/pr/halliburton-and-baker-hughes-abandon-merger-after-department-justice-sued-block-deal

[56] For a discussion of challenges arising particularly with respect to killer acquisition theories of harm where innovation plays a prominent role, see (OECD, 2020[28]).

[57] See (Stigler Center for the Study of the Economy and the State, 2019, p. 92[29]).

[58] For example, in Germany and Mexico, market definition is a legal prerequisite, while in other jurisdictions such as Chile, the law doesn't establish a requirement to it. For the latter, it is usually conceived as one of the tools available to competition authorities for their competitive assessments.

[59] EC, Case M.8084 Bayer/Monsanto (2018).

[60] *Supra* note 31.

[61] Judgement of the EU General Court in Case T-608/18 of September 14, 2022, par. 82.

[62] See for example (Cabral, 2021[30]) and (Petit, 2019[10]).

[63] See for example EC, Cases M.3354 Sanofi-Synthelabo/Aventis (2004), M.727 Novartis/GSK Oncology (2015) and M.9294 BMS/Celgene (2019).

[64] For a detailed presentation of the case, see (OECD, 2023[9]), Box 3.2.

[65] CMA Final Report on the Completed acquisition by Facebook, Inc (now Meta Platforms, Inc) of Giphy, Inc. 18 October 2022. Available at: https://assets.publishing.service.gov.uk/media/635017428fa8f53463dcb9f2/Final_Report_Meta.GIPHY.pdf

[66] CMA AstraZeneca / Alexion Pharmaceuticals merger inquiry (2021), https://www.gov.uk/cma-cases/astrazeneca-slash-alexion-pharmaceuticals-merger-inquiry#full-publication-updatehistory

[67] CMA, Roche Holdings, Inc / Spark Therapeutics, Inc merger inquiry (2020), https://www.gov.uk/cma-cases/roche-holdings-inc-spark-therapeutics-inc-merger-inquiry

[68] EC, Case M. 8955 Takeda/Shire (2018).

[69] For a detailed discussion on the drivers of innovation, see (OECD, 2023[1]).

[70] Bundeskartellamt, decision in the case No. B3-143/10 of 2011.

[71] EC, Case M.6281 Microsoft/Skype (2011).

[72] Another relevant transaction where product life cycles were relevant to assess market power in innovative markets was the Seagate/Samsung one (EC, Case M. 6214 Seagate/HDD Business of Samsung 2011). In its clearance decision, the EC established that although Seagate would become the

new market leader by market share after the transaction, it would still face competition pressure from two strong competitors, disregarding the concerns of the possible increase of its market power. The conclusion was based on the fact that the industry was characterised by significant advances in technology and rapid product life cycles, where suppliers brought new or improved products to the market every 12 to 18 months.

[73] EC, Case M. 6203 Western Digital Ireland / Viviti Technologies (2011).

[74] See for example the EC Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements.

[75] Commission Regulation (EU) 2023/1066 of 1 June 2023.

[76] Bundeskartellamt (2017). Press release “Bundeskartellamt has no objection to paydirekt's new payment function”. available at: https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2017/12_04_2017_paydirekt.html

[77] See discussion in Case T-168/01 GlaxoSmithKline v Commission.

[78] US v. Microsoft Corporation. Civil Action No. 98-1232 (TPJ).

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