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More documentation related to this discussion can be found at:
www.oecd.org/daf/competition/non-price-effects-of-mergers.htm

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Considering non-price effects in merger control[*]

In a competitive market, firms and consumers make decisions based on several aspects of the product involved. While price is a fundamental aspect, it is not the only one: in many markets, innovation, quality, variety or even privacy may play at least some role in the competition between firms.

This paper will introduce these characteristics, and the merger theories of harm associated with them. It will also describe some of the practical challenges involved in considering non-price dimensions of competition, namely identifying when they are important, and considering price and non-price effects together.

Although the theoretical basis for the non-price effects of mergers is mixed, the consideration of these effects will be unavoidable in at least some cases. Competition authorities will therefore need to conduct a case-by-case, evidence intensive analysis when considering merger effects for markets with competition on non-price dimensions. Risks of introducing subjectivity to the process can be minimised with a focus on concrete evidence and an assessment of the probabilities of impact.

[*] This paper was prepared by James Mancini of the OECD Competition Division.

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1. Introduction

1. When firms compete, they make a range of decisions about the characteristics of their products. Consumers make purchasing decisions based on at least some of these characteristics, which determine the value they obtain from the product. Price is one such characteristic, but quality and innovation can also play a fundamental role in many markets.

2. Mergers that alleviate the competitive pressure on firms may therefore worsen both the price and the non-price characteristics of products offered to consumers. The precise effect on each characteristic, or dimension of competition, will depend on the nature of the markets involved. For example, a merger may have a substantial effect on product quality but relatively little effect on price as a result of consumer preferences and willingness to pay.

3. The merger guidelines of many competition authorities contain references to non-price effects[1], and there are certainly some merger cases that mention non-price effects. However, examples of such effects playing a central role, and the availability of structured analytical tools to assess non-price effects, are limited.

4. This may be due to several factors. With respect to innovation, the conclusions of research on its relationship with competition are mixed, and a challenging dynamic analysis is required to consider its impact on future product markets. There is therefore some controversy regarding theories of innovation harm, and methodologies proposed to examine these effects. In the case of quality, analysis can be complicated due to the variety of characteristics that could be considered, and the need to determine their relationship with each other as well as with price.

5. However, these questions cannot simply be avoided. There are markets for which non-price competition is of fundamental importance, including markets for products provided to consumers at no charge. And the proportion of cases dealing with some non-price effects, for example innovation, is growing (see, for example, Kern et al, 2016).

6. This paper sets out the theories of harm, and evidence considered, with respect to the two primary dimensions of non-price competition, innovation **(Section 2)** and quality **(Section 3)**, as well as proposals for the incorporation of a third dimension: privacy **(Section 4)**. It will also set out the practical challenges associated with incorporating these dimensions into merger control **(Section 5)**, namely identifying when they play a central role, considering trade-offs with prices, and determining at what stage in the merger review process they should be considered.

2. Innovation

7. Innovation plays a fundamental role in the strategy of many firms. While the consideration of innovation in merger reviews is not new, competition authorities may find that innovation issues arise in a greater proportion of mergers, as digitalisation affects a widening range of markets. At the same time, increased policymaker attention to concerns about innovation and competition may require competition authorities to provide a clear explanation of the role of innovation in merger review.

8. This section will review the potential merger theories of harm regarding innovation, and the evidence considered in merger cases to test those theories. The focus

will be on unilateral effects, since innovation activities are not generally subject to co-ordination concerns (see, for example, Katz and Shelanski, 2007).

2.1. Conceptual understanding for the impact of competition on innovation

9. The studies investigating the effect of competition on innovation are numerous, and generally do not support a simple, unidirectional relationship. Rather, as is often the case with antitrust theories of harm, the literature suggests that innovation effects depend on the particular characteristics of a market.

10. At their core, the various studies of innovation and competition, which will not be exhaustively summarised here[2], build on two broad conceptions of innovation incentives. On one hand, there is the view often associated with Joseph Schumpeter (1942) that firms will take the risk of attempting to develop innovations if they are not constrained by highly aggressive competition, which would limit the resources available for R&D spending, and limit the potential gains of such investments.

11. On the other hand, a somewhat more common view, associated for example with Kenneth Arrow (1962), maintains that a firm will only have an incentive to innovate if spurred to do so by competition, and that firms able to charge supra-competitive prices will seek to preserve those prices rather than engage in risky innovation efforts. Thus, firms with market power may be able to exert that power by limiting innovation spending.

12. The outcome in actual markets could, in fact, be consistent with both of these theories. Depending on the specific characteristics of the market, a given level of market concentration could either limit or enable innovation (Shapiro, 2012; Jullien and Lefouili, 2018).

13. Translating these insights into merger review, however, may not be straightforward. For instance, observing that a certain level of market share may be required for firms to be able to fund innovation is not equivalent to finding that mergers between large entities would have a positive impact on their innovation activities.

14. In a study of merger ex-post assessments, Ormosi et al (2015) examined 14 mergers for which innovation was a central rationale of the transaction. The assessments found that innovation benefits materialised in 12 of those cases, suggesting that positive innovation impacts cannot be dismissed off-hand. The competitive pressure from post-merger entry by new firms, which occurred in 7 of those cases, cannot be discounted either.

15. More fundamentally, Carlton and Gertner (2003) question whether merger review should even seek to address transactions that reduce innovation competition. They note that intellectual property policy seeks to incentivise innovation by granting successful innovators monopoly power over their innovations. Thus, concerns about the competition dynamics in innovation efforts may be more appropriately addressed through the lens of intellectual property policy.

16. In any event, a broad-brush conclusion on the impact of mergers on innovation may not be advisable. Research on the subject can be categorised into a series of distinct effects.

2.1.1. The cannibalisation effect

17. The introduction of innovative new products can divert sales from existing products. When an innovating firm merges with a rival, it may internalise the effects that

this diversion has on its rival. In other words, the post-merger firm will take into account the degree to which its innovations cannibalise its own sales.

18. According to the model of Federico et al. (2017), the negative impact of the cannibalisation effect on innovation incentives dominates any other innovation effect, and will generally reduce post-merger firms' innovation efforts. However, some critiques suggest that this effect will only be strong enough to reduce overall innovation in the case of a merger to monopoly (RBB, 2017).

19. To minimise the cannibalisation effect, the merged firm could in some cases co-ordinate the introduction of new products alongside the established product lines of the pre-merger firms. For example, a firm's new and existing products could be repositioned to minimise any sales cannibalisation between them. This could allow a post-merger firm to protect its margins in a manner that would not have been possible prior to the merger (Shelanski, 2013). Thus, a firm's innovation incentives would be preserved, but the overall impact on consumer welfare would depend on the effects of the product repositioning.

2.1.2. The product market rivalry effect

20. Innovation efforts, particularly those aimed at developing new products, represent an effort on the part of a firm to either capture a greater share of an existing market, or create an entirely new market in which they will have market power. The incentive and ability of firms to undertake these efforts will depend on the rivalry they face in current product markets.

21. Some research posits that innovation efforts exhibit a specific, if not unidirectional, pattern that depends on the structure of the product market. Aghion et al. (2005) find that the relationship between industry mark-up and innovation (measured by citation-weighted patent counts) takes the shape of an "inverted U" – that is, patent development increases with competition up until a certain point, after which it decreases. Aghion et al. conclude that laggard firms with small market shares, and dominant firms with large market shares, may have less of an incentive to innovate than firms with a substantial market share and several close rivals.

22. The precise interpretation of these insights has been contested, and Federico et al (2017) find that the outcomes of mergers do not reflect this relationship – i.e., mergers do not increase innovation activities below a specific mark-up level.

23. However, a merger's impact on innovation may be at least partially determined by its effect on product market competition. Merging firms' incentives to innovate may be affected by higher post-merger margins and lower post-merger volumes (Jullien and Lefouili, 2018). For example, a merger that results in higher margins through market power may allow firms to earn profits that they would have otherwise sought to obtain through innovation.

24. Shapiro (2012) advocates considering the degree to which a firm's innovation efforts would make a market contestable, i.e. cause consumers to switch their purchases to the innovating firm, or continue purchasing from the innovating firm. This question turns less on current concentration or market share in a sector, since both large and small firms would have an incentive to make investments in contestable markets to maintain or gain market share, respectively. Rather, the question of contestability relates more to the nature of consumer preferences, the innovation at stake, and other transaction characteristics (such as switching costs). It will also depend on the capacity of firms in

other markets with innovation capacity to redirect it to the market in question – a challenging dynamic analysis.

Box 1. The implications of rapid market changes in *Google/AdMob*

In 2010, the United States Federal Trade Commission reviewed the acquisition by Google of AdMob, a firm that provides advertising services for mobile devices. These transactions raised preliminary concerns given that Google and AdMob were the two leading firms in the market and were observed to have been aggressively competing – particularly in the year prior to the merger. This competition was especially close in one segment of the market, which involved the sale via auction of ad space priced on a "per-click" basis.

Innovation is an important dimension of competition in the mobile advertising network market, since firms must keep pace with developments in new mobile applications and the operating systems that support them, while finding ways to improve ad performance and increase functionality (such as targeting and providing consumer data services).

During the Commission's review of the transaction, Apple acquired the third largest firm in the mobile advertising market, Quattro Wireless. Apple's size and relationships with mobile application developers meant that this transaction would significantly change the nature of competition in the market.

The Commission opted to close its investigation, after observing that AdMob's past market share in mobile advertising on applications running on Apple's operating system would likely not predict its future position. The intensity of competition between Google and Apple on operating systems was viewed as likely to maintain competition in the mobile advertising markets. Finally, the Commission noted the potential for competing smartphone operating systems to be introduced, potentially with their own mobile advertising network services.

Source: Federal Trade Commission Statement, File No. 101-0031, 21 May 2010.

2.1.3. The innovation rivalry effect

25. The degree to which firms in a market conduct innovation efforts, and whether those efforts overlap, will also determine the impact of a merger on innovation in a market. There may, for example, be barriers to innovation (e.g. research lab costs) that limit the number of firms actively engaged in innovation efforts, making the merger between two innovating firms a particular source of concern. Evaluating the existence of such barriers can be challenging for competition authorities, since disruptive innovations may appear without warning, from completely new market players, and assessing whether a market is ripe for such disruption is not straightforward.

26. On the other hand, firms may choose to focus their innovation efforts on different areas, or opt not to undertake innovation at all, preferring for example to free ride off their rivals' efforts. Thus, product market competition may not always correlate with competition to develop a given innovation, and mergers between product market competitors may have a limited impact on innovation incentives (e.g. if one of the merging firms had a purely free riding strategy for innovation).

27. In the event that the merging firms do exert competitive constraints on one another through their innovation activities, a theory of harm similar to a standard

unilateral effects theory of harm could be identified. Specifically, the threat of rival innovation may spur firms to engage in innovation, and so with the elimination of a rival, a merged firm may have fewer incentives to innovate than before, as well as the ability to reduce its innovation efforts without fear of consequences.

28. From the perspective of the merging firm's rivals, the impact of the merger on innovation incentives may be negative or positive, and depends on the precise nature of competition in the market. These rivals could respond to the merger by reducing their innovation spending – for example if one of the acquired firms was small and inefficient, and was therefore a target for its rivals' innovation efforts prior to the merger (Haucap and Stiebale, 2016). Other models suggest a merged firm's competitors will increase their innovation efforts in response to the amplified competitive threat from the merged firm, although Federico et al.'s model finds that this increase would not offset the merged firm's reduction in innovation activities.

2.1.4. The process improvement effect

29. Process innovations, aimed at improving production or distribution processes, involve different investment considerations compared to innovations that introduce new or better products. A large dominant player may benefit more from investing in process innovations than its smaller competitors, since a given level of fixed innovation spending could benefit a larger sales volume. In addition, a larger scale may provide a firm with the resources to undertake such process innovations. Thus, mergers may incentivise process improvement, provided sufficient competition remains in the market.

2.1.5. The rationalisation effect

30. Mergers may eliminate duplicative innovation spending, allowing it to be redirected and potentially increase the overall output of innovation efforts (see, for example, Denicolò and Polo, 2017, who adapt Federico et al's model). This could be particularly beneficial in the case of process innovations.

31. However, the reduction of duplicative innovation efforts may not always be positive for consumers. In the case of innovations to develop new products, simultaneous efforts could increase the likelihood that an innovation will materialise, and may be preferable from a consumer welfare perspective (see, for example, Katz and Shelanski, 2007).

2.1.6. The appropriability effect

32. The ability to appropriate the benefits of an innovation is also emphasised by Shapiro as an important determinant of post-merger investment incentives. A firm will be less likely to invest in innovation if its competitors could free-ride off that investment by mimicking it – particularly if those competitors are close rivals. For example, innovation knowledge may spill over to competitors due to informal interactions, or job changes, among researchers (see, for example, Jullien and Lefouili, 2018). Conversely, innovations that are protected by exclusive rights, such as patents, and that cannot be easily replicated, are more appropriable and thus potentially more attractive investments on the part of firms.

33. The extent to which a merger affects appropriability could also be considered. For example, by allowing a firm to minimise the outside interactions of its researchers, a merger could improve the ability of the firm to keep gains to innovation to itself. It is not clear when the reverse would be true, but the model of Federico et al. (2017) finds that

only mergers that somehow reduce appropriability would generate an overall increase in innovation activity in the market in question.

34. In sum, the importance of market- and innovation-specific characteristics, and the current state of research on the subject of mergers and innovation, creates an ambiguous conceptual picture for competition authorities.

2.2. Analytical approaches to determining the impact of mergers on innovation

35. Available research on the impact of competition on innovation is mixed and continually developing. To apply these insights to merger assessment, three broad approaches have been identified.

36. The first involves **defining "innovation markets"**, separately from product markets, when conducting merger reviews in markets for which innovation is important. Specifically, an innovation market would be defined with reference to potential future products. The insight behind this approach, introduced by Gilbert and Sunshine (1995), is that a firm's competitors in the product market may not exactly overlap with the firms with which it competes to introduce innovations. In fact, product market definitions may completely miss firms that provide competitive constraints through their innovation activities. In such cases, mergers between innovation competitors that are not product market competitors could nonetheless cause competition harm. Alternatively, a firm may have fewer innovation competitors than product market competitors, and so a product market definition could underestimate concentration in terms of innovation activity.

37. Specifically, the approach outlined by Gilbert and Sunshine (1995) to define innovation markets involves:

- determining where the merging firms' innovation efforts overlap
- identifying competing innovation efforts (including R&D substitution by firms with relevant R&D capacity that does not currently overlap with the R&D efforts of the merging firms)
- evaluating competition (including potential competition) in the product market associated with the innovation efforts
- defining a market using a small but significant non-transitory reduction in innovation efforts, and determining whether the merged firm would be able to reduce overall innovation effort in the market by virtue of its position
- assessing merger efficiencies that benefit innovation efforts.

38. However, the innovation markets approach has been criticised for its subjectivity in defining innovation activities, its practical challenges, and the implicit assumption that concentration in innovation markets is always harmful, which may not necessarily be supported by the research cited above. In addition, focusing on research and development expenditure, rather than outputs, may lead to incorrect conclusions, confusing the reduction of R&D overhead and administrative costs with reductions in innovation effectiveness, for example (Carlton and Gertner, 2003).

39. The related approach of "technology markets" introduced by Katz and Shelanski (2007) addresses some these criticisms. It involves focusing on the development of technologies that could be easily identified, either as a product itself (a future product market), or as an input to the production process of a certain market.

40. The second approach is an **assessment of whether a merger would constitute a "significant impediment to industry innovation" ("SIII")**, a term coined by Petit

(2017). This analysis aims to capture the impact of a merger on the incentives of both the merged firms, and their competitors, to innovate (per Haucap and Stiebale, 2016). Like the innovation markets approach, this method emphasises that innovation competition may not be associated with a current product market. However, SIII analysis takes a further step in foregoing the definition of specific innovation pipelines, and instead examines the intensity of innovation competition generally (see, for example, Petit, 2017). This could be measured, for example, by innovation spending per unit of revenue. Some have criticised this approach for taking the competitive assessment too far from product markets, and for inferring that concentration equates to lower investment in innovation. Further, like the innovation markets approach, it can also involve considering innovation inputs rather than outputs.

41. The third distinct approach that has been advanced is to consider a merger's **impact on both the innovation incentives of firms and on their ability to innovate** (per Shapiro, 2012, for example). In other words, the potential harm from the alleviation of the pressure to innovate from rivals should be put into context of whether the merger also enables a certain level of innovation that was not possible or attractive before. The latter effects are essentially innovation-based efficiencies, such as synergies in research and development teams, obtaining sufficient capacity to make large investments, obtaining economies of scope in the application of innovations (see, for instance, Motta and Tarantino, 2016), and removing double marginalisation in the case of vertical mergers.

42. The third approach is in line with warnings against developing a presumption that concentration harms innovation alongside a sceptical approach to efficiencies, since the evidence may be more mixed than that regarding prices (see, for example, Haucap, 2017). For example, Katz and Shelanski propose a presumption that a merger's effect on innovation would be neutral, except in cases of a merger to monopoly (Shelanski and Katz, 2007, p.77). Thus, this approach would require simultaneous consideration of both innovation impacts and efficiency impacts. Shapiro offers a similarly narrow presumption of competitive harm: "a merger between the only two firms [pursuing] a specific line of research to serve a particular need is likely to diminish innovation rivalry, absent a showing that the merger will increase appropriability or generate R&D synergies that will enhance the incentive or ability of the merged firm to innovate" (Shapiro, 2012, 368).

43. Proposals to adopt a neutral presumption about the harm from a merger on innovation emphasise a greater openness to the efficiencies than is current practice with respect to price-based effects (further discussed in Section 3.2 below). Specifically, it involves placing an evidentiary burden on both competition authorities and merging parties to prove effects that depart from the neutral assumption. The proponents of this approach suggest that it is reasonable to consider efficiencies that are likely to occur after a merger to offset speculative claims about potential harm from reduced innovation incentives. However, assessing whether efficiencies that make unidentified future innovations easier would be sufficient to offset a reduced incentive to innovate could be a challenging exercise – particularly due to the uncertainty involved in the R&D process.

Box 2. Analysis of innovation competition by the European Commission in *Dow/Du Pont*

In its 2017 decision regarding the merger of Dow Chemical Company and E.I. du Pont de Nemours and Company, the European Commission extensively analysed the degree of innovation rivalry in the relevant markets (especially related to pesticides and petrochemical products).

The Commission analysed recent trends in research and development in the crop protection industry. It found that, with increased concentration and expanded regulatory requirements, overall R&D spending as a proportion of revenue, and overall R&D output, had fallen.

Specific concerns about the transaction were identified by the Commission with respect to the elimination of overlapping research efforts, and a reduction in overall innovation competition in an already concentrated industry.

To assess these concerns, the Commission did not undertake a separate market definition exercise for innovation efforts, noting that "innovation should not be understood as a market in its own right, but as an input activity for both the upstream technology markets and the downstream [product] markets" (¶ 348). The former "technology markets" referred to the sale or licensing of technology developed by companies conducting research and development.

Rather, the Commission sought to understand (1) which firms had the ability to compete in the development of new products, and (2) identify the "innovation spaces" in the industry, since R&D efforts were increasingly targeted at a given subset of current or future product markets within the industry.

Concentration was analysed within each "innovation space" based on the share of patents held by each firm, weighted according to citations as a measure of patent quality (based on data from the merging parties on their patents and their competitive intelligence on competitors' patents, as well as third-party data on patent citations). The Commission found that there was a concentrated innovation market, with 5 players on a global level – a higher level of concentration than in the product market.

In addition, the Commission analysed innovation competition with respect to its importance in driving innovation effort, the degree of overlaps between Dow and DuPont, and barriers to entry (for example in terms of R&D lab capacity).

Based on these results, the Commission concluded that: the merging parties would likely discontinue overlapping innovation efforts; the transaction would reduce their incentives to innovate; cost-cutting would reduce total innovation capacity; and that there were not likely to be countervailing action from remaining rivals. Specific R&D asset divestiture remedies were therefore developed.

Source: European Commission Decision C(2015) 6179, Case M.7278 – General Electric/Alstom, 8 September 2015.

2.3. Evidence considered in merger cases regarding innovation

44. The broader message to be taken from the discussion above is that an analysis of the particular conditions of a market is required to understand the likely impact of a merger on innovation. Regardless of the specific approach taken, evidence in four broad categories can help to obtain such an understanding:

2.3.1. How important is innovation to the activities of the merging firms and to consumers?

45. Prior to engaging in an in-depth assessment of the impact of a merger on innovation, competition authorities generally seek to assess the importance of innovation to the merging firms. The vast majority of firms engage in at least some activities that can be called "innovation", developing new processes or products, in the normal course of business. However, only a minority of merger reviews focus on innovation theories of harm with respect to current or future markets, albeit a significant one: one study of challenged mergers between 1995 and 2008 in the United States found that a third of these challenges involved concerns about innovation (Kern et al, 2016). Innovation concerns in merger review tend to focus on innovation activities that require investments in research and development ("R&D"), and which significantly change the range or characteristics of the products on offer.

46. Broad industry classifications can serve as a helpful starting point for assessing the importance of innovation in a merger review. For example, Galindo-Rueda and Verger (2016) provide a classification of industries according to their R&D intensity (the ratio of R&D spending to total value added). These measures should not have a determinative impact on a merger review, since they do not correspond to antitrust markets, and R&D spending is a somewhat crude measure of innovation activities (as described further below), but they can provide an initial indication about the potential for innovation issues to arise.

47. A preliminary review of background materials, including merger filings, news articles, industry publications, investment analyst reports, firm strategy documents and even firm marketing documents can also provide initial indications about the importance of innovation to the merging firms, both in terms of how they make decisions and how they present their products to consumers.

48. Discussions with consumers may also provide valuable information at this stage. Surveys or interviews can help establish the importance of innovation to their purchase decision.

49. It should also be recognised that within an economic sector, and even within a narrow antitrust product market, the importance of innovation to individual firms varies. Some firms will seek to free-ride off of a rival's innovation efforts, or to sign licensing agreements with intellectual property owners with which they may compete.

50. Thus, in addition to the importance of innovation in a sector, merger reviews must also consider the importance of innovation to the merging firms specifically. This evidence-gathering process can begin with a review of the product offering of the merging firms. Specifically, an authority can identify the rate at which new products, or new product features, have been introduced in the past. While subjective thresholds of the rate of new product introduction should be avoided, the susceptibility of the relevant markets to change spurred by innovation can be a helpful data point.

51. The differences between current products and their predecessors can then be assessed to understand what type of innovation they embody, for example new features, higher quality, lower cost, or opening of functionality to a new group of consumers. Process innovations may not necessarily appear as changes to product offerings (e.g. as a lower cost product line), and so further internal firm documents will be required to understand whether substantial changes in the product manufacturing, distribution or sales process have occurred. Process innovations may also show up as step changes in margins that cannot be attributable to changes in demand or input markets.

Box 3. Evidence regarding the importance of innovation in an industry considered by the European Commission in *Bayer/Monsanto*

The European Commission's review of Bayer's acquisition of Monsanto involved an examination of the importance of innovation in various markets, including pesticides, seeds and plant trait development.

For example, innovation plays an important role in pesticide and herbicide development due to the adaptation of certain weeds or insects to existing products. Thus, in addition to improving quality, innovation may be needed in these markets to simply maintain a given degree of effectiveness.

More generally, evidence associated with the importance of innovation in the relevant markets included the extent of investments in R&D and the importance of licensing in some cases. In addition, the Commission noted that Monsanto produced a pesticide that had a majority market share with few current alternatives, underlining the importance of Bayer's ongoing R&D efforts to develop substitutes (which could be discontinued following the merger).

Source: European Commission Press Release, Case M.8084 – Bayer/Monsanto, 21 March 2018.

2.3.2. Which firms are currently undertaking, or could undertake, relevant innovation efforts?

52. If there are initial indications that innovation activities are important to the merging firms, either by virtue of the broad economic sector to which they belong, background information highlighting R&D, or substantial changes in product offerings, a merger review can proceed by collecting evidence on potential innovation rivals. The identification of specific assets used for innovation activities, such as R&D labs, can be particularly helpful in establishing the key players.

53. While access to rivals' internal documents may be limited in a merger review, the background documents mentioned above (e.g. industry analyst reports, merging firm strategy documents) should provide a set of firms that innovate in the same area as the merging firms. The merging firms may also be asked for the set of firms they consider to be innovation competitors, however this should be validated with alternative sources. Once again, innovation competitors may not include all rivals in product markets, and may in fact include potential innovators with relevant R&D capacities currently not present in the merging firms' product markets.

54. For example, in its review in *Dow/Dupont*[3], the European Commission obtained evidence to identify the key innovation players in the relevant markets. In

VTech/LeapFrog[4], the UK Competition and Markets Authority observed that future innovation in learning toys could come from a wide range of competitors, including non-toy manufacturers.

Box 4. Evidence regarding current and potential innovators considered by the UK Competition and Markets Authority in *VTech/LeapFrog*

The UK Competition and Markets Authority evaluated whether competition between VTech and LeapFrog was the "main driver" for their innovation efforts. It surveyed the product offering in several markets and identified key competitors in each. The analysis showed that (1) innovation is an important feature of the relevant toy markets, given high product turnover and rapid market evolution and (2) pressure to innovate came from numerous other actual or potential competitors in the market, including well-resourced competitors from outside of the toy industry.

Source: Competition and Markets Authority, A report on the completed acquisition by VTech Holdings Limited of LeapFrog Enterprises, Inc. 12 January 2017.

2.3.3. What is the nature of rivalry among firms undertaking relevant innovation efforts? How does it relate to rivalry in current product markets?

55. Once the set of firms engaging in relevant innovation, or with potentially relevant innovation capacity, have been identified, evidence regarding the nature of innovation rivalry affecting the merging firms can be collected. An understanding can be sought of where the various firms' innovation efforts overlap, and whether they exert competitive pressure on the merging firms. If evidence establishes that competition is an important driver of innovation decisions, innovation theories of harm may be explored.

56. First, the degree of overlap in innovation efforts can be assessed based on any available research strategy documents. The closeness of innovation rivalry will in part be determined based on whether firms are seeking to develop close substitute products, or if innovation efforts are taking the firms towards focusing on different consumer segments (and potentially different antitrust markets). In *Intel/McAfee*[5], for example, the European Commission found that the merging firms' innovation efforts exhibited more complementarity than overlap.

57. The past record of innovation for each firm may be indicative of future innovation paths as well, although careful review will be required to identify any recent changes in strategy. When the precise nature of the products being developed is not known, the nature of each firm's R&D infrastructure can at least be examined for overlap, in terms of equipment and expertise.

58. Finding evidence that determines the degree to which various firms represent a competitive constraint on the merging firms via innovation can be challenging. Product market shares can be misleading, for example, and so it may be preferable to calculate an equivalent in terms of innovation capacity, for example in terms of R&D headcount, the number of research labs or R&D spending. These variables were considered for example by the European Commission in *GE/Alstom*[6], in the context of identifying firms with sufficient ability to compete at the cutting edge of certain product markets.

59. There are several limitations to take into account when seeking to use quantitative measures of innovation capacity, generally based on either inputs (e.g. spending or employees) or outputs (e.g. patent count).

60. Total spending on R&D is an attractive approach in terms of data availability and ease of comparison. It can also be put in the context of the size of the firm with the calculation of R&D intensity, or total R&D spending per unit of revenue. This can help separate firms with similar levels of sales based on the effort they put into R&D.

61. However, the data obtained from firm financial statements may reflect a wide range of accounting and tax rules, for example with respect to the capitalisation of costs, that may pose challenges for economic analysis. Further, R&D spending will generally not be categorised according to current or future antitrust markets, making comparisons among firms within a given market difficult. Formal R&D spending may also fail to capture the range of informal innovation activities that occur within a firm, and so considering spending in conjunction with some output measures may be necessary (Lhuillery et al, 2016). A sole focus on R&D would also punish firms that find productive efficiencies (e.g. reducing some duplicative R&D overhead) without affecting the likelihood of innovation success.

62. Several analyses make reference to the patents held by various firms in an industry. While patents can be an indicator of innovation capacity, and may be required to conduct further R&D, they can also be misleading. Not all patents hold the same importance for a firm, and there may be substitutes for a given patented process. In addition, not all useful innovations are patented. Thus, an analysis that relies on the number of patents held by various firms should be put in context of the value of each patent to the firm that holds it, for example based on the number of citations that a patent has.

63. These challenges in quantitative measures of innovation capacity and intensity (further discussed in OECD, 2007) suggest that context with qualitative evidence may be needed. Several merger decisions make explicit references to internal firm strategy documents, discussions with consumers, and industry analyst reports, all of which help to create an understanding for the intensity of innovation competition among firms. For example:

- In *Genzyme/Novazyme*[7], the US Federal Trade Commission considered whether the firms "would have engaged in a 'race to market'" absent the merger, and found this was not the case.
- Conversely, the closeness of rivalry between merging firms without substantial remaining competitors was observed by the US Department of Justice in *Bazaarvoice/PowerReviews*[8] (referencing "feature driven one-upmanship" reflected in the comments of company executives) as well as in *T-Mobile/AT&T*[9]. The UK Competition and Markets Authority reached similar conclusions based on market participant observations in *Deutsche Börse/London Stock Exchange Group*[10].
- The fierce innovation-based rivalry of the merging firms in *Halliburton/Baker Hughes*[11] was recognised by both the European Commission and US Department of Justice, again based on internal documents and customer observations regarding the availability of alternative competing innovators.

64. The cases noted above generally focused on innovations that would impact established product markets. Understanding the nature of rivalry in potential future product markets can be significantly more speculative, and evidence more limited. This has been a focus in some pharmaceutical sector cases, for example (De Coninck, 2016), given the uncertain and lengthy product pipeline for new drugs. Particular challenges include assessing whether a merger would improve or reduce the odds of success of an innovation, and understanding whether competing drug companies would begin innovating in response to any reduction in merging firms' R&D activities.

65. These challenges can be at least partially addressed as they would in the product market – by determining whether there are substantial barriers to the ability of new firms to begin innovating in a manner that places competitive pressure on the merging firms. Significant barriers to innovation, in terms of the availability of expertise and the capital required, were observed by the European Commission for example in *Bayer/Monsanto*[12] and *Baker Hughes/Halliburton*[13].

66. Innovation rivalry among firms should also be considered in the context of rivalry in current product markets – even if the set of firms active in innovation and current markets is different. For example, when assessing a merger between an incumbent and potential innovative entrant into a market in *Thoratec/HeartWare*[14], the US Federal Trade Commission examined whether the merger would retain the incentives of the innovator to enter the market. Specifically, the margins of both incumbent and new products, and the diversion ratio for these products, were considered to determine whether it would be profitable for the merged firm to introduce the new product. The Commission concluded that the merger would disincentivise introduction of the new product.

67. In *Dow/Dupont*[15], the European Commission analysed the relationship between innovation and product market competition. It found evidence that product market concentration may have led to lower innovation spending and output, as well as higher margins. In addition, the Commission identified competition between the merging firms as a primary driver of innovation, alongside regulation, declines in product effectiveness over time, and generic product competition, per company documents.

Box 5. Evidence of innovation rivalry considered by the European Commission in *GE/Alstom*

Innovation rivalry was an important theme in the European Commission's review of General Electric's acquisition of the energy businesses of Alstom, and shaped structural remedies required for approval of the transaction.

The Commission's concerns centred on the heavy duty gas turbine market. Since consumers in this market were relatively few and exhibited a high degree of knowledge, their observations were an important part of the assessment of rivalry between the firms.

In particular, customers indicated that the importance of Alstom's innovation output was understated by its market share. This was confirmed by an analysis of Alstom's R&D spending, headcount and testing infrastructure, which were proportionately greater than its market share. Several Alstom innovations were observed by customers to have driven their rivals to introduce their own innovations. Internal GE assessments of Alstom technology were also examined.

The unique nature of the market also had an effect on Alstom's innovation capacity. In particular, Alstom had a large installed base, which was crucial for innovation efforts. According to internal documents, this base and the flexibility of its designs allowed Alstom to introduce a range of improvements and modifications as they were developed. Further, the installed base provided Alstom with knowledge that could be applied to future product development.

The R&D pipeline of Alstom was also assessed. Given the capital intensive nature of the R&D process, the Commission determined that (1) there are high barriers to entry to innovation in the industry and (2) the cancellation of overlapping pipeline products in certain segments was likely as a result of the transaction.

Several customers also expressed the expectation that overlapping products would likely be withdrawn from the market following the merger. The Commission suggested that incentives to develop upgrades for Alstom's installed base would be reduced as a result of such withdrawals.

Source: European Commission Decision C(2015) 6179, Case M.7278 – General Electric/Alstom, 8 September 2015.

2.3.4. What is the rationale for the merger, and its impact on innovation capacity?

68. Finally, a merger review can benefit from evidence obtained regarding the rationale of a merger. This evidence can provide context for the claimed efficiencies of a transaction, and help surmount the challenge identified above regarding the impact of a merger on the success of innovation efforts.

69. Mergers that are intended to improve the likelihood of success of innovation efforts, or improve R&D efficiency without a corresponding reduction in overall research effort, may be identified by the way they are framed internally by firm management. They can be contrasted with mergers that are proposed primarily on the grounds of cost reductions, or reducing the duplication of innovation efforts post-integration, both of which may signal potential harm to innovation. Again, it should be noted that duplicative

research efforts may be beneficial for consumers provided they are efficient, as they may increase the overall odds of success of an innovation effort.

70. In *Google/AdMob*[16], this type of qualitative evidence was considered, as it revealed that a technology to rival AdMob's would have been developed by Google but-for the transaction (see Shelanski, 2013). The European Commission similarly found that the *GE/Alstom*[17] merger would involve the cancellation of certain lines of research, and that overall innovation spending would decline in *Dow/Dupont*[18].

Box 6. Evidence of transaction motivation considered by the US Department of Justice in *Bazaarvoice/PowerReviews*

The intensity of innovation rivalry was a primary source of concern in the US Department of Justice's complaint regarding the merger between Bazaarvoice, a product rating and review platform, with its only significant rival, PowerReviews. In this case, a substantial volume of internal firm documents helped establish (1) the degree to which competition with PowerReviews was the main driver behind innovation by Bazaarvoice, and (2) the fact that the transaction was primarily conceived as a way to alleviate this competitive pressure.

For example, the closeness of feature-based rivalry between the two firms was evidenced from a PowerReview executive's email to a large potential customer, which indicated "…there are a lot of similarities between Bazaarvoice and PowerReviews when it comes to features ... we have constantly traded places in terms of who leads and who fast follows." In an email to board members, Bazaarvoice's CEO characterised the merger as an opportunity to remove the company's "only competitor" from the market.

In addition, the Department of Justice observed that the strength of network effects in the market could limit the degree to which new entrants could exert competitive innovation pressure on the merged firm.

This extreme example demonstrates the importance of understanding the transaction rationale when assessing the impact of a merger on innovation.

Source: United States Department of Justice Press Release, "Justice Department Files Antitrust Lawsuit Against Bazaarvoice Inc. Regarding the Company's Acquisition of PowerReviews Inc.", 10 January 2013.

Summary of considerations regarding innovation effects of mergers

- Innovation can play a fundamental role in competition between firms, both in terms of developing new product markets and improving products on offer in existing markets.
- The extensive research regarding the impact of mergers, and competition generally, on innovation has somewhat mixed conclusions. It is possible for mergers to either improve market innovation, through improvements in scale and the combination of complementary assets, or to harm market innovation, by affecting incentives and generating unilateral effects.
- The overall effect of the merger will depend on: the type of innovation activity being undertaken; the structure of associated product markets; the nature of innovation rivalry in the market; and the ability of firms to appropriate the benefits of innovation.
- Potential analytical approaches to assessing innovation effects include defining innovation markets, considering whether a merger would constitute a significant impediment to industry innovation, and analysing the impact of the merger on firms' incentives and ability to innovate.
- Regardless of the precise analytical approach, evidence gathering can help understand innovation conditions in the market; namely: the importance of innovation to the activities of the merging firms and consumers, their current and potential innovation competitors, and the nature of innovation rivalry. Internal firm strategy documents, including those relating to the rationale for the merger, can play a particularly important evidentiary role.

3. Quality

71. Quality often plays a central role in consumer decisions, and therefore the competitive dynamics of markets. The term "quality" can be defined as the range of product characteristics, other than price, which affect the value of the product to consumers. These characteristics can include functionality, durability, reliability, convenience of purchasing locations, design or aesthetic appeal, performance and safety (see, for instance, OECD, 2013).

72. Products offered by different firms, or different products offered by the same firm, may differ on characteristics that could be considered elements of quality. Thus, variety in a market can enhance consumer welfare in cases where there is heterogeneity in consumer tastes. In other words, consumers with differing preferences benefit when they are able to find a product within a market that better reflects these preferences. Product differentiation can take two forms: vertical and horizontal.

- **Vertical differentiation** refers to product characteristics that can be objectively ranked, such as some simple elements of quality (including durability or efficiency). Markets with vertical differentiation can constitute a spectrum in which products at one end offer to consumers high quality products at a high price, and at the other end offer low quality products at a lower price. Thus,

consumers will chose a point in the spectrum based on their preferences and willingness to pay.

- **Horizontal differentiation** involves product characteristics that cannot be ranked, since their desirability depends on the specific preferences of a consumer. For example, a product may offer a given functionality that is valued only by some consumers and not others.

73. As with prices, firms may decide on the level or range of quality to offer consumers based on the competitive pressures they face. Thus, a merger that alleviates competitive pressures could diminish quality in the same way it would enable price increases. However, whether a merger will have a harmful effect on quality, and the likely magnitude of this effect relative to price effects, will depend on the specific characteristics of the market.

3.1. Conceptual understanding for the impact of competition on quality

74. There are two primary quality effects of mergers that can be assessed from a competition perspective. First, an anticompetitive merger may permit a firm to unilaterally decrease the quality of all of the products it offers in the relevant market (relevant particularly in cases of vertical differentiation). Second, the merger may permit a merged firm to co-ordinate the characteristics of its expanded product line, and reposition products to its benefit (relevant for both vertical and horizontal differentiation). Each of these effects will be described below.

3.1.1. Unilateral reductions in product quality

75. Concerns about the effect of a merger on a firm's ability to unilaterally worsen the quality of its product are conceptually similar to those regarding price (unless they relate to the repositioning of multiple differentiated products, as discussed below). Specifically, an anticompetitive merger could allow a firm to profitably worsen quality at a given price.

76. To isolate the effect of competition on quality, several studies have considered markets in which prices are regulated (see OECD, 2013). White (1972) found that, in such a market, a monopolist will always offer worse quality than firms with competitors. This intuitive conclusion becomes more ambiguous in a market with prices that vary.

77. When firms compete on quality, they will make decisions regarding quality in conjunction with pricing decisions, requiring an understanding of the relationship between the two. Firms may adopt several different strategies regarding product quality, depending on the competitive environment. For example, they may introduce low price and low quality products, or high price and high quality products, to cater to a particular segment of consumers in a market, or to serve different consumer segments with different product offerings. When price competition is intense, and consumers exhibit a high price elasticity, firms may also choose to improve quality at a given price level to gain a competitive advantage. Indeed, pursuing product differentiation is a strategy to gain market power and charge higher prices by escaping from aggressive price competition, which is not always optimal for consumer welfare.[19]

78. Thus, competition may spur firms to either lower or increase quality in a manner that is beneficial to consumers. It does so by opening up lower cost options to consumers

that may have otherwise been shut out of the market, or by improving the value obtained by consumers in other segments.

79. These possibilities have implications for merger review. A merger to a monopoly could be assumed to result in both price increases and quality deterioration. However, the impact of most other mergers may not be immediately obvious (see, for example, Gilbert and Sunshine, 1995). This is because a merger may change a product's price and quality, or just one of these factors, in ambiguous ways.

80. Market-specific characteristics play an important role in determining the effect on overall consumer welfare of a merger that impacts quality. In particular, the precise levels of price elasticity of demand and quality elasticity of demand, together with merger efficiencies, may determine the overall effect on welfare (Pinto and Sibley, 2016). In many sectors, product quality can have more than one element, which may also complicate analysis. For example, a study of merger impacts on quality in a newspaper market by Fan (2013) examined local news content, content quality and content.

81. A merger assessment that focuses solely on quantifying price effects may fail to take into account the full impact of a firm's plans to save costs by reducing quality to the detriment of consumers. Similarly, a merger that increases prices may provide sufficient scale to invest in quality-improvements to their production processes, which could generate offsetting consumer-welfare efficiencies (see, for example, Brekke et al). In addition, a merger that results in greater product differentiation, for example through the introduction of a low-cost variety, could improve consumer welfare even if it reduces average product quality. It may therefore be difficult in some cases to determine whether, holding all else (including prices) equal, a merger would reduce product quality.

82. In addition, there are some indications that changes in quality and prices may occur over different timelines, which complicates analysis of both dimensions of competition. Ormosi's 2015 review of ex-post evaluations of mergers noted that quality improvements were observed after 5 years in many cases, but in the short-run, results were more mixed.

83. The theoretical ambiguity associated with quality and competition may extend to the quantitative tools used by competition authorities to analyse mergers. For example, the upward pricing pressure index (UPPI) used to examine the unilateral effects of a merger on pricing may be adapted to analyse effects on quality. Some research finds that the UPPI cannot successfully be adapted using pure quality measures (i.e. an "upward quality pressure index") due to an inability to predict whether quality will increase or decrease (Pinto and Sibley, 2016). To avoid these shortfalls, a quality-adjusted price can be used in the calculation of pricing pressure. Nonetheless, the limitations of the UPPI, particularly its inability to account for dynamic effects and product repositioning, should be recognised before being relied upon in merger review (see, for example, Willig, 2011).

84. Despite these challenges, an assessment of a merger's effect on quality could prove vital. Several recent studies highlight potential quality harms from mergers. The airline industry has been a particular focus of such studies. Mergers in the US airline sector were found to have diminished quality with respect to delays (Greenfield, 2014), as well as baggage mishandling, flight cancellations and overbooking (Steven et al, 2016). However, these broad findings may mask a degree of variation in merger impacts that justify a case-by-case approach by competition authorities. Some mergers may permit reorganisations that increase service frequency by reducing overlapping schedules, as well as efficiency improvements. Vaze et al (2017) find that mergers between legacy

carriers in the US may have been increasingly detrimental to service quality. However, they also examined mergers between small and large carriers for their impact on the frequency of non-stop flights on a given route. Consistent with the hub-based business model of large airlines, they found that on routes dominated by large firms, a merger would increase nonstop service frequency, whereas nonstop service frequency decreased on routes previously dominated by the smaller firm.

85. Hospital mergers have also been found in studies to have mixed effects on quality, as measured for example by post-operative infection rates, waiting times or survival rates. In particular, gains due to scale in hospital quality may, depending on the specific circumstances, compensate for an increase in concentration due to a merger (Schmid and Varkevisser, 2016). These improvements tend, however, to be limited to areas in which consumers are aware of quality differences, and do not select hospitals solely on travel time or referrals from health professionals (unless quality sensitivity in one region introduces a competitive discipline which benefits neighbouring regions).

3.1.2. Product repositioning

86. A merger that results in changes to the available variety of differentiated products can have implications for consumer welfare. This effect could either be harmful, neutral, or beneficial to welfare, depending on the specific circumstances.

87. The theory of harm associated with the impact of an anticompetitive merger on product positioning is relatively simple: unilateral effects may arise, allowing firms to reduce variety in a post-merger product offering, and avoid introducing future variety. Thus, a firm could reduce its costs, and prevent the cannibalisation of sales due to within-firm competition, by cutting variety below the competitive level. Vertical mergers could also have an effect on variety by enabling exclusionary conduct.

88. As with innovation, some studies of the link between competition and variety find a non-linear relationship. Specifically, they find that variety is lower at high and low levels of concentration (see Mazzeo et al, 2012 for a summary). The intuition for this result is that aggressive price competition and market power both lead to cost-cutting through reduced variety. Thus, the theoretical predictions of the effect of mergers on variety are somewhat ambiguous.

89. For instance, the incentives of the post-merger firm will depend on the closeness of competition of the pre-merging firms. If the pre-merger firms' products were substantially differentiated from one another, the post-merger firm will have fewer incentives to discontinue one of the products than if they were closely positioned.

90. Depending on the specific conditions of demand, post-merger product repositioning that reduces variety could, if combined with specific cost efficiencies, be accompanied by a price drop that generates a net improvement in consumer welfare. However, this outcome will be very dependent on market-specific factors. A decrease in average price could, for example, involve the elimination of high-quality products that leaves consumers who prefer them worse-off overall.

91. One model of product variety and competition found, for example, that even substantial cost-saving efficiencies would not be sufficient to compensate consumer welfare losses due to reduced variety after a 3 to 2 merger in a market with low product differentiation (Mazzeo et al, 2012). Where differentiation is higher, the overall effect of efficiencies on variety will depend on whether the product cannibalisation effect or lower costs prevail.

92. Another set of studies considers the effect on consumer welfare if the post-merger firm does not discontinue products, but rather repositions them to avoid the sales cannibalisation effect. Some models show that mergers which increase the differentiation of the merging firms' products can lead to increased consumer welfare as well as firm profitability in some cases (Gandhi et al, 2008; Draganska et al, 2009). This effect, similar to the co-ordination of products to avoid innovation-related cannibalisation described in Section 2 above, has not been extensively explored in merger cases but could represent a substantial benefit from a transaction.

93. The media sector has been a particular focus of studies of merger impact on product variety. This may be in part due to the relative importance for consumers of product variety in this sector; potentially in ways that take precedence over cost-saving efficiencies (Stucke and Grunes, 2008). One study found that increased concentration allowed daily newspaper businesses to increase the variety available to consumers, due to product repositioning to avoid the cannibalisation effect (George, 2007). Sweeting (2010) analysed radio station mergers and found they increased the differentiation only of the stations involved in the transaction. In fact, repositioned stations exhibited substantial overlap in terms of characteristics with their competitors, and so the transaction did not improve overall variety in the market. Sweeting posited that this may be due to the importance of positioning as a competitive strategy for radio stations, given limited scope for price competition and the importance of horizontal differentiation.

3.2. Evidence considered in merger cases regarding quality

94. Some of the challenges associated with assessing quality include data availability, the numerous potential dimensions of quality, uncertainty regarding the importance of a given measure of quality, and interrelatedness with other dimensions of competition. An OECD Roundtable on the subject of quality found that quality is "one of the most vexatious – and still unresolved – issues" in merger control (OECD, 2013, p. 9).

95. To permit a case-by-case analysis of a merger's impact on quality, evidence can be gathered that is responsive to three fundamental questions. Much of the evidence required to answer them will generally be available.

3.2.1. What aspects of quality are important consumers, if any?

96. A merger review investigating the impact on quality should determine first the universe of characteristics that consumers consider to be valuable, and which motivate their purchase decision. Evidence that identifies the primary elements of product quality could include details of the product offering among firms in the relevant markets (e.g. whether there are different levels of quality offered to consumers) and the content of advertising as well as information provided to consumers at the point of sale. Not only does this provide an understanding of the type of information used by consumers to make purchase decisions, it also demonstrates the degree to which there is variation in these dimensions across competing firms. If there is no variation in a characteristic among firms, it may be a signal that consumers do not exhibit heterogeneous preferences in relation to the characteristic.

97. Available consumer surveys (including those commissioned by firms for market research purposes) can be used to provide further information on the relative importance of different dimensions of quality, to rule out aspects of quality that would not have an

impact on purchase decisions, and potentially to estimate the elasticity of demand with respect to a given quality aspect.

98. Further, surveys can establish the degree to which consumers exhibit heterogeneous preferences, and therefore whether variety may be an important aspect of competition in the market. Specifically, consumer research can be helpful to determine whether product differentiation is vertical (pointing to the existence of a price/quality spectrum) or horizontal (in which case multiple dimensions of quality and price will need to be considered), and whether consumers can be subcategorised based on their quality preferences.

99. While some studies emphasise the challenge associated with the subjectivity of dimensions of quality in terms of consumer preferences, it should be noted that consumer preferences, even if subjective, define the scope and depth of quality competition. Surveys should however be assessed for their bias before being relied upon. For example, surveys of consumer preferences should generally use ordinal rankings of quality dimensions and specific questions about the impact of quality on purchase decisions to avoid bias.

100. Transaction data can also be helpful in establishing consumer preferences, either via formal demand models or more simple data analysis. When these data can be tied to specific consumer groups (e.g. mass consumer versus corporate consumers), it can help establish differences in quality preferences and elasticity.

101. In addition, transaction-level data can be used to calculate diversion ratios and define markets. For example, event studies regarding changes in a given dimension of quality could be helpful to determine whether it resulted in a change to consumer purchase decisions (see, for example, the UK Competition Commission's analysis in *RBCH/Poole*[20]). However, caution should be used when applying approaches designed for prices, such as upward pricing indices, as they may not properly capture the relationship between prices and quality.

102. A merger team may come across a market in which there are obvious measures of quality that consumers do not appear to consider in making their decision. This has occurred for example in some hospital mergers, where consumers clearly value the quality of care but are not aware of quality differences and the choices available to them (Schmid and Varkevisser, 2016). In such markets, more easily observable dimensions of quality, such as the convenience of the location, may prevail as a dimension of competition.

103. Consumers may also form heuristics about aspects of quality that they cannot observe; for example, they may associate the desirability of a lawyer's office with the quality of the services they provide. These heuristics can be identified using consumer surveys, and used to determine whether firms compete in terms of the heuristic factors, or if there are competition problems limiting the availability of more relevant quality information. For example, Schmid and Varkevisser (2016) find that, where competition on quality exists in the hospital sector, (i.e. there is variation and quality is an explicit element of firm competitive strategy), consumers tend to take it into account when making decisions.

Box 7. Evidence of consumer differentiation considered in *Telefónica Deutschland/E-Plus*

In the European Commission's review of the acquisition of E-Plus by Telefónica Deutschland, quality was an important factor in determining market segments for analysis. Specifically, market segmentations were considered based on how consumers value quality (in terms of network coverage and download speed) relative to price. The merging parties claimed that the market should be segmented into high-value and low-value customers, primarily based on a differing willingness to pay for quality.

While the Commission noted that demand-side substitutability between these two segments was limited, supply-side substitution could be relatively seamless. The Commission found similarly that distinctions between pre-paid plans and post-paid plans were increasingly becoming blurred. Thus, the impact of the transaction on competition was assessed with reference to the overall mobile telephone services market, although the pre-paid and post-paid segments were also analysed individually.

Source: European Commission Decision C(2014) 4443, Case M.7018 - Telefonica Deutschland/E-Plus, 2 July 2014.

3.2.2. What is the nature of quality rivalry among firms? How does it relate to rivalry with respect to prices?

104. Evidence regarding the role of quality in consumer choice can be complimented with an understanding of firm competitive strategy, particularly via internal documents. When firms are aware of the importance of certain aspects of quality to consumers, it can be particularly informative to observe whether they take these aspects into account in their competitive decisions. If firms do not seek to differentiate based on aspects that are important to consumers, it could suggest a situation in which pre-merger competitive constraints are weak.

105. Understanding the degree of differentiation and substitutability between the product offering of the merging firms, and that of their rivals, can be determinative (see Mazzeo et al, 2012, for example). The more differentiated the products, the less of a cannibalisation effect is likely, although the overall effect will depend on whether the merging firm maintains both product lines, as well as whether it increases variety overall or simply repositions products to more directly compete with rivals.

106. The incentive and ability of potential rivals to reposition themselves at different quality levels in response to the merger should also be evaluated (as was the case in the Court's decision on *Oracle/PeopleSoft*[21], for example). Internal firm strategy documents may be particularly helpful here. Evidence to provide such an understanding could include details regarding the production process, and the degree to which it can be modified, as well as the investments necessary to do so. For example, in *Whole Foods/Wild Oats*[22], the US Federal Trade Commission cited, as evidence of quality rivalry, the observation of a Whole Foods executive that when a Whole Foods would enter a market, the local Wild Oats would renovate their store to improve quality, and vice versa.

107. In the (relatively few) cases where quality is easily quantified, for example in raw materials markets with various quality grades, a quality-adjusted price could be calculated to capture both dimensions of competition simultaneously. Quality elasticities could then

be computed, and market definition using a small but significant and non-transitory increase in price (SSNIP) and upward pricing pressure frameworks could be attempted (Pinto and Sibley, 2016).

Box 8. Evidence considered by the European Commission in *AB InBev/SABMiller*

The Commission identified several aspects of product differentiation in assessing the merger between AB InBev and SABMiller, including beer brand recognition and quality. It noted that variation in positioning across countries, and observations from competitors about the repertoire of brands that consumers choose from, suggested that a rigid, narrow segmentation approach would not be appropriate.

The Commission therefore undertook a country-by-country assessment and found that, given the positioning of the merging firms, the merger would in some segments lead to unilateral effects (e.g. the super-premium segment in Italy and the UK). Further, the ability of new brands to enter these segments was found to be limited due to the importance of brand recognition and distribution networks.

Source: European Commission Decision C(2016) 3212, Case M.7881 – AB InBev/SAB Miller, 24 May 2016.

3.2.3. What is the rationale for the merger and its impact on the future quality potential of the merged firm?

108. Finally, the rationale for the merger can be important to assess its impact on quality. A merger can be intended to broaden the scope of quality offerings and serve different segments of a market (or indeed different markets). The merger may also expand variety by enabling the introduction of new products at different quality levels, either by combining certain assets or providing sufficient scale to enable investments in quality improvements (or the introduction of new low-cost low-quality products). The merger could also result in further differentiation of products (possibly without price changes), serving a broader range of consumers and potentially more directly competing with specialised rivals. However, claims of merger benefits should be analysed in the context of internal firm documents substantiating these benefits.

109. Internal firm documents may also substantiate theories of harm regarding the impact of the merger on quality. Specifically, a merger may be intended as a method of removing a rival with a similar level of quality that exerts a competitive constraint on the acquiring firm. Thus, a merger could be aimed at decreasing differentiation to improve firm margins, with consequences for consumer welfare in the form of reduced variety, potentially higher prices or a worsened fit with consumer preferences.

Box 9. The Netherlands Authority for Consumers and Market's analysis of the impact of hospital mergers on quality

The Netherlands Authority for Consumers and Markets conducted a study of 14 merged hospitals to provide an understanding of the impact of mergers on quality in this sector (ACM, 2016). In particular, this insight provided context for hospital mergers, which often involve quality improvement claims from merging parties. The study examined 97 indicators for quality, including waiting times and mortality rates.

The conclusions of the study cast doubt on the effectiveness of mergers in improving quality, and on the transaction rationale sometimes offered by parties. Specifically, the study found that mergers were not associated with quality improvements. In addition, the study asked whether some claimed quality improvements could be achieved with other forms of hospital collaboration, as opposed to mergers.

Summary of considerations regarding quality effects of mergers

- Quality can be as fundamental a determinant of consumer welfare as price, and a key part of firm competitive strategy.
- Anticompetitive mergers may lead to unilateral reductions in quality, all else equal, in the same way they could lead to unilateral increases in price.
- Mergers may also affect product positioning, which can be either beneficial or harmful. In particular, a post-merger firm may seek to differentiate its products, providing better coverage of consumer preferences and minimising the incentive to increase price. Depending on the price effects and the positioning of the merged firm's rivals, this repositioning could be welfare-enhancing. However, product repositioning that includes the discontinuation of products for which there would be a post-merger cannibalisation effect could reduce variety and harm consumer welfare.
- While some conceptual analysis of mergers considers the impact on quality holding price constant, in practice a merger review may need to consider both effects – including when they work in opposing directions (e.g. price increases and beneficial product differentiation). Thus, a merger assessment that focuses solely on price may fail to take into account other effects on consumer welfare. This process can be challenges; however some adapted tools are available, such as calculating quality-adjusted prices.
- In any event, a case-by-case analysis will in general be required to assess the impact of a merger on quality. Evidence gathering can help establish the importance of quality to consumer decisions, the degree of quality rivalry among firms and the rationale for the merger.

4. Privacy and consumer data

110. The rapid growth of online platforms and the advent of big data technology have elicited wide-ranging concerns about consumer privacy (see OECD, 2016). These concerns have been introduced to the competition policy sphere, including in the form of calls for competition authorities to take privacy into account when examining mergers. However, there remain some conceptual and practical questions associated with doing so.

4.1. Conceptual understanding for the impact of competition on privacy

111. Underlying proposals for the consideration of privacy in competition enforcement is the idea that privacy, or more precisely the amount of personal data provided by consumers to firms as well as the associated risks, determine the value consumers obtain from a given product. Consumers can be expected to prefer to provide either the least amount of data, or have the most control over the use of their personal data, holding all other elements of a product or service constant. As such, it may in some cases be considered an element of product quality. In addition, different consumers may prefer different trade-offs between privacy and functionality, suggesting that privacy in at least some markets could form part of a product positioning decision.

112. An alternative perspective holds that privacy issues should be considered in the context of an entirely separate market, rather than as an element of competition in a specific product market. Privacy protection could be considered a good in and of itself, to which consumers can assign a specific value and make decisions about trade-offs in terms of other characteristics However, this approach may only be appropriate when personal data provision is the result of a conscious, well-informed choice on the part of consumers that is genuinely adhered to by firms (Farrell, 2012). Alternatively, the market may be defined more in terms of personal data, for which consumers are in fact the suppliers (Harbour and Koslov, 2010; Costa-Cabral and Lynskey, 2017). Any such approach would need to take into account the two-sidedness of markets involving services that also collect personal data (where the other side would be data purchasers or advertisers). These market definition approaches have not been explicitly applied in any merger case to date.

113. But can privacy be accurately characterised as a dimension of competition, most likely as an element of product quality? The answer is not straightforward. First, consumers may lack easily-digestible information about the amount of personal data they may be providing, or how it will be used. They may not be able to form preferences over a product characteristic that they are not aware of. Consumers may also exhibit various behavioural biases (Acquisti, 2010), lack the ability to monitor whether a firm is upholding their data protection commitments, or they may display "excess pessimism" that causes them to underestimate the privacy protections they could extract from firms (Farrell, 2012). So privacy may not play a primary role in their purchase decision, or their perceptions of the value they obtain form the product.

114. Second, privacy does not appear to be a major differentiator or feature used by firms to obtain an advantage over their competitors (with some exceptions). This may be due, in part at least, to a lack of consumer information on privacy, allowing firms to avoid taking into account what a fully-informed consumer's preferences would be, and even to obscure important information from consumers (Farrell, 2012). Even when substantial amounts of information on privacy protection is available, it may be designed to be complex and difficult for consumers to digest. Rather, the collection of data in some markets plays a more prominent role in competition in markets for which consumer data

is an input. Thus, privacy and the use of personal data are somewhat limited as an element of a product offering, and of a consumer's decision. In this case, privacy may be considered more as a concern for regulation and consumer protection policy than competition.

115. For example, a merger between two firms in different markets with different consumer datasets may create concerns about privacy. The data collected by one firm could be leveraged by the other to improve sales targeting, for example, in ways that consumers may find unexpected and undesirable. Ohlhausen and Okuliar (2015) opine that these concerns are not competition concerns, in that they may relate more closely to unfair or deceptive conduct that is the focus of consumer protection policy. Further, the inclusion of such concerns into merger reviews may inject subjectivity into the process, and result in the selective application of consumer protection-type rules solely to merging firms, in their view. Finally, blocking a merger on these grounds may not even be effective, as data assets could otherwise be combined through a third-party data broker. Others emphasise the fact that privacy legislation, not competition law, is primarily concerned with data protection, and that privacy issues are relevant only to the extent they are a part of the competitive process (see, for example, Gilbert and Pepper, 2015).

116. On the other hand, competition authorities should be wary of precluding any type of assessment of competition in the area of privacy. There are some cases in which a firm that fails to protect consumer data experiences a loss of sales to their competitors (Acquisti, 2010), suggesting data protection quality may have competition effects. And mergers between firms with complimentary datasets could enable price discrimination, potentially increasing prices on some segment of the market identified thanks to the data acquired during the transaction.

117. More fundamentally, prior to discarding privacy theories of harm, an assessment may be needed of the degree to which having sufficient information would change a consumer's decision. Surveys, for example, could gauge the importance of privacy to consumers, including relative to other factors such as price, and the degree of understanding among consumers about the data they provide.

118. If consumers express a clear preference for privacy protection, the lack of a "high privacy quality" offering does not automatically mean it is not a dimension of potential competition. Concentrated digital markets may not exhibit variation in privacy standards simply because they are not currently subject to competitive pressures to do so, and because the main players are currently engaged in other markets that make personal data valuable – thus increasing the costs of competition on privacy. For example, tacit collusion among competitors could enable a lack of differentiation on privacy. In other cases, aggressive competition in other areas, such as price, may be driving a corresponding lack of competition in areas with low consumer visibility, such as personal data protection. So a uniformly low privacy level could in fact be influenced by competition.

119. Thus, privacy may be a relevant dimension of quality competition, even if the current state of competition in the market means that low quality prevails. Anticompetitive mergers could permit quality to drop further, particularly without the likely entry of high privacy quality alternatives.

120. Consumer protection measures to encourage consumer information and, crucially, the engagement of consumers in decisions regarding their personal data could result in privacy emerging as a more important element of competition in some markets. This

would require both full, frank disclosure on the part of firms, and a conscious engagement on the part of consumers in reaching an agreement for the exchange of their personal data (Farrell, 2012). For example, data access rights and rules regarding consumer portability of their data could introduce competition in privacy, which could lead to better outcomes than regulation alone (Costa-Cabral and Lynskey, 2017).

121. Thus, competition authorities may wish to consider conducting advocacy on privacy issues when they identify the market failures described above in merger cases. This advocacy could include efforts to better inform consumers, and proposals for pro-competitive reform that could work in concert with merger reviews that preserve competition on privacy.

122. Another challenge that arises in the consideration of privacy in merger reviews is its interaction with other dimensions of competition. The acquisition of valuable personal data by a firm could enable it to provide services at zero cost, or at least a lower cost than they otherwise would. Thus, data could be considered the "price" that consumers pay in a given transaction. Personal data could also have a corresponding impact on variety, quality and innovation in a market. Gilbert and Pepper (2015) emphasise that these benefits should not be used as automatic evidence of privacy harm, leading to data efficiency defences becoming an "efficiency offence". Digital platforms use data not only as a revenue-generating asset (e.g. by selling it to advertisers), but also to develop new, better and more customised services.

4.2. Evidence considered in merger cases regarding privacy

123. Before incorporating privacy into a merger review, evidence must be gathered to determine whether it is a current, or likely future, dimension of competition in a market. As noted above, markets in which information on personal data use is not widely available, consumers are not aware or engaged with privacy questions in a market, and firms do not offer varying personal data use options to consumers, may be challenging to assess in terms of the role of privacy competition. When there is minimal variation among firms in terms of privacy offering, evidence will be required to understand whether consumers would choose among firms if such an offering were available.

124. To reach such a determination, information regarding the awareness and engagement of consumers (for example assessing the information available to consumers, or available consumer surveys) as well as the competitive strategy of firms (through internal documents identifying privacy as a differentiator relative to competitors) will be needed.

125. There are few examples of merger cases that specifically mention privacy concerns. The European Commission's decision in *Microsoft/LinkedIn*[23] explicitly determined that privacy was a dimension of competition in the market, observing the variation in privacy protection among firms. The US Federal Trade Commission's decision in *Google/DoubleClick*[24] found that the transaction would not have an adverse impact on non-price competition, including privacy. This decision evidenced an approach to merger review that is narrowly focused on competition impacts, rather than considering elements of privacy that may be more related to consumer protection. And in *Facebook/WhatsApp*[25], the Federal Trade Commission, by virtue of its consumer protection role, reminded the parties of their privacy protection responsibilities, without finding adverse competition implications.

Box 10. The treatment of privacy in *Microsoft/LinkedIn*

In reviewing the acquisition of LinkedIn by Microsoft, the European Commission found that privacy is an important dimension of competition and "driver of consumer choice" for professional social networks (p. 77). This finding was based on a questionnaire provided to social networks, and the Commission noted it was consistent with its findings regarding privacy in Facebook/WhatsApp.

The Commission evaluated the privacy effects of potential foreclosure issues, specifically foreclosure of LinkedIn's current competitors who offered more privacy protections than LinkedIn. The Commission expressed concerns that the transaction would have a negative effect on competition and privacy in the market. Specific remedies were identified to prevent these foreclosure effects.

Source: European Commission Decision C(2016) 8404, Case M.8124 – Microsoft/LinkedIn, 6 December 2016.

Summary of considerations regarding privacy effects of mergers

- Privacy, or the amount of personal data provided by consumers to firms, may determine the value that consumers obtain from a given product. As with other quality dimensions of competition, a merger could give rise to unilateral effects that diminish this value.
- However, some have expressed the view that privacy protection is better addressed through consumer protection policy as opposed to merger review. In particular, concerns have been expressed about injecting subjectivity into the merger review process, and the selective application of privacy protection measures to merging firms.
- There may nevertheless be circumstances in which privacy is a valid dimension of quality competition. Identifying these cases may not always be straightforward. Privacy competition should not be ruled out simply because a market does not exhibit differentiation among firms, for example. An understanding of whether limited competition enables such a lack of differentiation, and whether consumers would value products with improved privacy, may therefore be needed.
- Various market failures associated with consumer engagement and awareness may contribute to limited competition in terms of privacy. In such markets, competition authorities could consider the degree to which a merger would allow the firms to worsen, or better take advantage of, these market failures. Parallel efforts to promote consumer awareness or procompetitive regulatory reform could enhance efforts to protect privacy competition via merger control.
- Considering privacy from a consumer perspective involves several complications; specifically: determining trade-offs with other characteristics such as functionality, identifying limitations to consumer information, and taking into account consumer behavioural biases.

5. Practical challenges when considering non-price effects in merger reviews

126. While firms make decisions, and compete on, a variety of dimensions beyond just price, these dimensions may in practice play an ancillary role to price in merger decisions. This may be due to several reasons, including:

- the transaction's overall impact on competitive pressures is considered, rather than specific effects, in terms of either price or non-price characteristics
- non-price effects may not be a primary area of competition for the firms in the markets affected by the merger
- the merger would result in harmful price effects, in which case it is assumed that non-price effects would be similarly harmful
- the price and non-price effects of the merger are likely to work in opposite directions, and so due to the tangible quantitative nature of prices and the

uncertain dynamic nature of non-price effects such as innovation, an emphasis is placed on the former

- due to challenges and ambiguity associated with using non-price effects in market definition, they are relegated to an ancillary role in the competitive assessment, or to the consideration of efficiencies (a stage that may not be reached in a merger review)

127. This section will describe the challenges that give rise to the outcomes above; namely: (1) determining which merger reviews should cover non-price effects, (2) determining how price and non-price effects should be considered together, and (3) determining at what stage to consider non-price effects. Even if it is not certain that the consideration of non-price effects would result in different results in all, or even most, cases, it would be worthwhile to develop methods to overcome these challenges. The growing importance of digital markets in the economy suggests that concerns regarding at least some of these effects, such as innovation, privacy, or even variety, are not going away.

5.1. Determining which merger reviews should cover non-price effects

128. When are innovation or quality dimensions of competition in a market, and when are they sufficiently important for competitive dynamics to play a role in merger review? These questions should be grappled with early on in a merger case.

129. In some markets, there are clear indications that non-price competition should be considered. Markets for **products provided for free to consumers**, as in some online services markets, may exhibit competition on quality, in the form of functionality, or even potentially privacy (and the multi-sided nature of such markets should be taken into account). Similarly, **markets with pricing regulation** may offer firms limited opportunities to compete on price, and so quality or innovation may play a greater role (see, for example Schmid and Varkevisser, 2016). When **consumers' demand exhibits a high degree of price elasticity**, unilateral pricing effects of a merger may be more limited, and manifest themselves in different ways, such as a reduction in quality or innovation (since the loss of consumers that would result from a post-merger price increase may make such an increase unprofitable). Finally, **markets with a high degree of product turnover,** either in terms of product changes, the addition of functionality, or the introduction of new products that constitute completely different markets, likely involve substantial competition on innovation. While the industry in which the firms are situated may provide some initial indications (as described in Section 2.3), product turnover can provide a more concrete indication of the importance of innovation in a market.

130. These characteristics provide some firm, early indications of the importance of non-price competition, based primarily on cases where price competition is limited or the introduction of new products is commonplace. However, many markets will not fit into these categories, and may for example exhibit competition in both price and non-price dimensions.

131. And there are relatively few simple indicators that non-price competition is *not* an important dimension of competition in a market. As introduced in Section 4, the mere fact that a characteristic is not a current marker of differentiation among firms does not automatically suggest that it is not relevant to merger review. A firm with market power even before a merger may not need to offer its customers a better deal in terms of quality,

for example privacy, if it faces no pressure from competitors to do so. Or the firms in a concentrated market may tacitly co-ordinate to avoid introducing competition on privacy. Another possibility is that a lack of competition on privacy simply reflects aggressive competition on price, if the capacity of firms to compete on both is limited (e.g. personal data subsidises the cost of the product), and consumers accept this trade-off. These situations should not therefore be assumed to imply that a merger would have no effect on privacy, since it could insulate, or further insulate, the post-merger firm from competition on privacy.

132. On the other hand, a merger review should not subjectively include characteristics that consumers "should" care about but do not. In other words, dimensions of competition should not be automatically discounted because they are not a current focus of firm differentiation, but should also not be introduced without a sound basis in consumer preferences. Surveys or interviews with consumers about how they value each characteristic, both on its own and in relation to other characteristics, are therefore crucial.

133. Sections 2-4 above highlight other types of evidence that can be particularly helpful in determining the relevance of non-price characteristics to consumers, and to the competitive strategy of firms. This evidence includes product characteristics (and the degree to which they vary), consumer preferences and the information available to them, firm strategy, and the rationale for the transaction (preferably based on internal firm documents). Mergers that should be assessed for non-price effects can be identified using the following questions:

- Do the products offered to consumers vary in terms of their quality characteristics? If so:
    - Do all or some consumers choose among competing products on the basis of these quality characteristics?
    - Do firms adjust the characteristics of their products based on the characteristics of their competitors' products? Or do they adjust other elements of their product offering (e.g. price) by taking into account the non-price characteristics of their competitors?
- Are there indications that a given quality characteristic is important to consumers, and could vary among firms, even if it does not currently (e.g. through consumer surveys, industry analyst publications, internal firm documents)?
- Do firms invest in specific research and development efforts to improve their offering to consumers in existing markets, or to develop new products?

134. Determining the answers to these questions can help separate cases where non-price characteristics are a dimension of competition in the market. Their breadth illustrates the range of cases in which non-price effects warrant consideration. It should be noted that a non-price characteristic failing to qualify for inclusion in a merger review based on these questions does not mean the characteristic is unimportant for consumer welfare; rather it means that the characteristic is not a major driver of competition in the market.

135. Markets exist in which an element of product quality has a significant effect on consumer welfare, but does not generally factor into consumer decisions. Healthy competition in a market could address this on its own, for example if new entrants emphasise a feature of a product about which consumers had relatively little awareness.

136. In other cases, there are fundamental market failures due to limited consumer information, awareness and engagement that cannot be resolved on their own through merger control – although preventing anticompetitive transactions that allow firms to take advantage of, or worsen, these market failures is one piece of the puzzle. For instance, the potential for a merger to enable co-ordination to de-emphasise personal data protection, and thus worsen consumer awareness, should not be ruled out. Beyond this, however, a competition authority uncovering these types of issues may wish to involve consumer protection authorities, or engage in advocacy regarding regulation to better address market failures, in parallel to identifying anticompetitive merger effects.

Box 11. Non-price dimensions of competition identified by the US Department of Justice in *Halliburton/Baker Hughes*

In its complaint regarding the acquisition by Halliburton of Baker Hughes, the Department of Justice expressed concerns about the impact of the transaction on industry competition, including via prices, quality, and innovation. The merging firms were observed to have only one other rival of sufficient scale to exert competitive pressure.

The importance of innovation was established based on Baker Hughes' characterisation of itself as an industry leader in innovation, the magnitude of both firms' R&D spending, and the number of new products being introduced. Examples of specific projects that required both firms to undertake significant R&D expenditure to compete were also identified. Further, it was noted that the transaction would involve the elimination of overlapping research projects.

With respect to quality, the Department of Justice observed that only the three largest firms, including the two merging parties, possessed quality oil reservoir data, for example, which would be crucial for the value proposition offered to consumers in some markets. In addition, substantial barriers to entry were identified, limiting the prospects of potential future competition to the post-merger firm.

Thus, the Department of Justice's complaint addressed the proposed merger's impact both on competition broadly, and on two specific dimensions of non-price competition as well as prices. The parties abandoned the merger after the Department of Justice issued its complaint.

Source: Complaint in United States of America v. Halliburton Co. and Baker Hughes Inc., United States District Court for the District of Delaware, Case no. Case 1:16-cv-00233-UNA.

5.2. Determining how price and non-price dimensions of competition should be considered together

137. If it is determined that quality or innovation play a significant role in competition in a market, then it is unlikely that price analysis alone will be sufficient to understand the effects of a merger. As noted in the US Merger Guidelines, "non-price effects may coexist with price effects, or can arise in their absence" (2010, p.2). In particular, a merger's non-price effects may be worse than its price effects in some cases (e.g. when price elasticity of demand is very high), and they may be presented as welfare-enhancing offsets for potential price effects in others (e.g. when a merger may produce innovation-based efficiencies). In other cases, the changes in product positioning following a merger

may at least mitigate any harm from price effects. So understanding the effect of a merger on each dimension of competition, and their interaction with each other, will be important.

138. A broad approach that considers competition pressures generally, rather than specific non-price effects, may still require an awareness of non-price dimensions of competition to avoid a bias toward price effects. Without a conscious analysis of innovation pressures, for example, a merger analysis may focus on the current product market only, and fail to recognise when innovation competitors are fewer than product market competitors. In addition, an overall consideration of competition pressures may not be able to capture the possibility that product repositioning could deliver more customised offerings for consumers. However, this approach can be helpful in carefully scrutinising certain non-price efficiencies, such as higher quality, which may in fact be super-competitive and result from worsened competition (discussed further in Section 5.3.2 below). Thus, even when a broad analysis of competition pressures is undertaken, an awareness of non-price effects can be important.

139. This task can be particularly evidence-intensive in some cases, because mergers, and competition generally, do not have a simple unidirectional impact on innovation. In other words, a merger assessment of innovation effects may not be able to benefit from the presumptions associated with price, and even quality, effects. While some studies posit that mergers in a concentrated market are always harmful to innovation overall, others identify theoretical circumstances, as well as actual mergers, that exhibit innovation-enhancing efficiencies with a positive net benefit.

140. At the same time, an analysis of non-price effects will require the analysis of short-term "static" effects alongside recurring "dynamic" effects. As OECD (2007) notes, this "…puts investigators in the awkward position of needing to compare different concepts from different time periods" (OECD, 2007, p.10).

141. Considering price and non-price dimensions of competition can therefore require:

- Determining the overall impact of price and non-price effects on consumer welfare, for example by attempting to quantify the value to consumers of a given non-price effect
- Dealing with short- and long-term effects that have opposing impacts on consumer welfare
- Determining the weight to be given to qualitative evidence of a given non-price effect

142. Some practical solutions to these difficulties are available in a limited set of circumstances. Quality-weighted prices can be calculated using for example product grade data (available in some commodity markets), or using estimates of the useable life of products at different levels of quality. Adjusted prices can then be used in price-concentration analyses.

143. When dealing with both short-term and long-term effects, a common approach is to apply a discount factor to future effects (including recurring dynamic ones) to adjust both for the future value of cash flows, and for the uncertainty of a certain event occurring, such as a successful innovation. While the size of the discount factor will be the subject of some judgment, several benchmarks are available from market data providers, specific to the industry being analysed.

144. Other approaches include the definition of completely separate markets for "products" such as privacy protection, or innovation. This approach could avoid the need to pit price and non-price effects against each other, ensure that important non-price effects are fully accounted for, and inform the design of remedies narrowly tailored and addressing non-price harm. However, this approach relies on consumers being well-informed about the precise characteristics on offer. Numerous critiques have been made of the practicality, and impact on market participant certainty, of such a market definition approach (see, for example, Section 2.2).

145. When sufficient time, resources and data is available, merger simulations could also be used to capture the interaction of price and non-price effects following a transaction. Mazzeo et al (2012) propose an approach for variety and price effects, for example, which could potentially be adapted to other non-price effects. Merger simulations have been used, for example, to assess the quality effects of hospital mergers in some jurisdictions.

146. But there are many other cases in which there remains a degree of subjectivity in dealing with non-price effects, leading some to propose caution, including for example refraining from examining privacy at all (Ohlhausen and Okuliar, 2015). Dynamic changes, such as improvements to innovation capacity that increase the rate of introduction of new innovations, are difficult to quantify and involve significant judgment.

147. And there may be cases in which there is an unambiguous trade-off between price and non-price effects. Price decreases could be accomplished through unilateral reductions in quality, for example, which highlights that price effects should not simply take prominence because they are more tangible. In such cases, purported efficiencies delivered in the form of quality improvements may simply mask the fact that a merger leads to higher prices and a super-competitive level of quality (i.e. a level of quality beyond what is desired by consumers, and thus welfare-enhancing for them). Efficiency arguments that essentially boil down to claims that price increases could finance improvements in non-price dimensions of competition, such as innovation efforts will need to be scrutinised carefully (as discussed further in Section 5.3 below).

148. Finally, merger analyses also face the challenge of weighing different non-price effects against each other. Some may take precedence over others due to the ease of quantification, or a more clear-cut theory involving the transaction. For example, Gilbert and Sunshine (1995) opined that consumer benefits from new innovative products are more uniformly positive for consumer welfare (provided predecessor products are not immediately discontinued) than other non-price characteristics.

149. Without a silver bullet to overcome these challenges, competition authorities must approach non-price effects with caution, but should not avoid them. Shelanski (2013) underlines the potential for merger enforcement that takes into account innovation to be welfare-enhancing, although he recognises obtaining sufficient evidence can be challenging. Qualitative evidence may be particularly important – particularly in dynamic analyses of incentives and future innovation, for example. Carefully identifying markets in which non-price competition plays an important role is an essential starting point. Next:

- When price and non-price effects are likely to work in the same direction, non-price effects for which there is significant uncertainty can be relegated to an ancillary role in an assessment

- When price effects are neutral (including when there is not scope for price competition due to, for example, price regulation or the provision of products for free), non-price theories of harm should be thoroughly explored and may take a central role in a merger decision
- When price and non-price effects are contradictory, there are some approaches that can help undertake an analysis of both. In most cases, however, the degree of uncertainty and subjectivity of a given potential effect should be clearly identified, and the risk of an erroneous decision based on uncertain non-price effects should guide competition authority decision making. Analysis should be grounded in an understanding of consumer preferences, and what the differing effects suggest about the nature of competition in the market.

150. The following section will explore at what point, in the latter two scenarios described above, non-price effects can be incorporated into a merger review.

Box 12. Price and non-price effects in *AT&T/T-Mobile*

The US Department of Justice sought to block the acquisition of T-Mobile by AT&T, both of which are wireless telecommunications firms. T-Mobile was positioned in the market as a low-cost alternative to the other three large national telecommunications firms, which included AT&T. The Complaint noted that the acquisition would result in the loss of a low-priced alternative for consumers (including individuals, businesses and governments).

However, the competitive constraint imposed by T-Mobile on AT&T extended well beyond price. T-Mobile marketing and internal documents demonstrated that the firm positioned itself as a "network of firsts" in terms of introducing new products and services. Thus, T-Mobile also competed in terms of quality and variety.

Further, internal firm strategy documents found that a significant amount of customers leaving AT&T became customers of T-Mobile, and vice versa, suggesting that the competition between the two firms was particularly close.

The Complaint also noted that the large firms tended to offer national plans. Thus, while the geographic coverage of T-Mobile was more limited than some others, the effect of its competitive pressure would be felt even in areas where it did not offer services.

Source: Complaint in United States of America vs. AT&T Inc., T-Mobile USA, Inc., and Deutsche Telekom AG, United States District Court for the District of Columbia, Case 1:11-cv-01560, 31 August 2011.

5.3. Determining at what stage in a merger review to consider non-price effects

151. Once it has been determined that non-price effects are likely to play a sufficient role to warrant consideration in a merger review, they must be incorporated into the analysis. The stage at which evidence of non-price competition will be considered must therefore be selected. This can range from inclusion at each stage due to the centrality of a given non-price dimension, or relegation to the consideration of efficiencies at the end of the process in other cases.

5.3.1. Market definition

152. In markets for which non-price competition plays a significant role, a market definition that focuses exclusively on price may introduce bias into a merger assessment. In particular, different dimensions of competition may imply that a different set of firms should be included in a given market. For example, when consumer demand is highly elastic with respect to quality changes but inelastic with respect to prices, a price-based market definition could be overly broad.

153. One method for considering non-price effects in market definition is to adapt the traditional small but significant non-transitory increase in price (SSNIP) test. An increase in price could be replaced with a decrease in quality in this framework (thus constituting a SSNDQ), while holding price constant. Such an approach may be particularly necessary when products are provided to consumers for free or when prices are regulated. However, if different tests provide multiple definitions for the same market, caution may be needed before relying on the narrowest option. Limited data, and the often multi-faceted nature of quality from the perspective of consumers, may raise questions about exclusive reliance on an SSNDQ approach, even if it provides a helpful framework for considering non-price effects.

154. An alternative is to define separate markets based on non-price dimensions of competition that overlap, but do not necessarily match, price-based market definitions. The innovation markets approach, described in Section 2.2, is one example. It involves a focus on R&D activity, and defining a market based on the likely impact of a decrease in innovation effort (SSNDI). Further, this approach seeks to take into account the effect of product market competition on competition in the defined "innovation market". When considering privacy issues, possible approaches include defining a market for personal data (Farrell, 2012), or at least defining separate product markets when consumers exhibit differing levels of personal data awareness (Costa-Cabral and Lynskey, 2017).

155. These formal approaches are rare in practice, due potentially to data limitations, conceptual critiques, and the lack of a specific methodology to follow. In fact, when a range of relevant non-price factors shapes competition in a sector, it may be preferable to avoid any rigid market definition altogether (as was the case in RBCH/Poole[26], described below). Katz and Shelanski (2007) opine that non-price dimensions of competition are one reason for doing away with "bright line" market definition altogether – especially in cases where traditional market shares or price indicators are not meaningful. Schmid and Varkevisser (2015) discuss the approach used in hospital mergers, and specifically the practice of leaving open a geographic market definition in the expectation of increased future competition on quality (as opposed to location, which drives current markets).

156. This does not mean, however, that non-price factors are not considered in market definition in cases. For example, 69% of the defined markets in challenged merger decisions in the United States between 1995 and 2008 mentioned innovation, and this has increased over time (Kern et al, 2016, p. 385). Rather than the use of a particular methodological tool, these market definitions generally built in innovation with a qualitative approach.

157. Fully doing away with market definition may not be an option for some competition authorities, and market definition can sometimes be a helpful framework for analysis (see, for example, OECD, 2012). However, a narrow reliance on rigid market definitions, and the resulting market shares generated from these definitions, is not likely to be meaningful when multiple non-price dimensions of competition exist.

Box 13. Market definition in *RBCH/Poole*

In this hospital merger, the UK Competition Commission observed that while prices were generally regulated, firms in the market did compete on other dimensions of competition, such as quality. The decision noted that the "logic of the hypothetical monopolist test can then be applied with reference to the impact of [a] small but significant reduction in quality on a hypothetical monopolist's profits" (p. 47).

The geographic market definition in this case was developed using travel time-based catchment areas, which the Commission noted may be narrower than the market definition using a hypothetical monopolist test. Thus, to validate the catchment areas and provide context for the competitive assessment, the flow of referrals by general practitioners to specialists in the hospitals was used to approximate the degree of substitutability between hospitals.

Given the possibility for demand substitution beyond the defined geographic market, the Commission also considered in the competitive assessment pressure from hospitals located outside the market. Thus, a somewhat flexible approach to the hypothetical monopolist test was used in this case.

Source: Competition Commission, "A report on the anticipated merger of The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust and Poole Hospital NHS Foundation Trust", 17 October 2013.

5.3.2. Competitive assessment and efficiencies

158. Conducting a competitive assessment when a market exhibits important non-price dimensions of competition involves two primary challenges: assessing dynamic effects, and dealing with efficiencies.

159. Opening up a merger assessment to non-price effects may require looking beyond immediate effects, such as price increases, or reductions in quality or variety. Rather, a dynamic analysis of how firm incentives will change, and the degree to which potential competition will emerge to challenge a post-merger firm, in terms of innovation efforts, quality or variety positioning, and even privacy protection, may be needed. This will be difficult, as described in the sections above, due to the uncertainty of the future, and the likely lack of information about potential future innovation or firm entry, not to mention the challenge of evaluating how realistic potential future competitors' strategies are likely to be.

160. However, the core guiding principles of this process remain unchanged. The effect of a merger on a firm's incentives, and ability to engage in unilateral decisions, will need to be analysed. Weight should be given to evidence that establishes clear, probable harm, and discounting future possibilities is well justified. Entry barriers to innovation will have a determinative effect on potential future competition. And, for vertical mergers, foreclosure concerns should be assessed.

161. Perhaps a more difficult subject is the question of taking into account positive effects and efficiencies associated with non-price effects alongside harm from price or other non-price effects. A merger may enhance a firm's ability to innovate, position products according to consumer preferences, provide products at a given level of quality, offer a varied array of products, or invest in personal data protection. These benefits may,

in fact, be a core rationale for a transaction. However, they should be carefully differentiated from non-price effects resulting from an alleviation of competition, such as increases in quality beyond what is desired by consumers (alongside an increase in price).

162. The normal analytical challenges associated with efficiencies, namely the degree to which they are quantifiable, substantial and timely, are compounded by the dynamic nature of potential non-price efficiencies. An efficiency that increases the rate of new product introduction, for example, is more difficult to assess than a one-time cost reduction – even if it is just as relevant from a consumer welfare perspective.

163. Due to this uncertainty, it appears that there has been a hesitation in at least some jurisdictions to accept dynamic efficiencies associated with non-price characteristics (see, for example, Ormosi 2015). Case law on the subject has not developed significantly since an OECD roundtable discussion found: "it would be desirable – in an ideal world – for dynamic efficiency considerations to feature more frequently and more prominently in merger decisions. The real-world problem is that no one has figured out a robust way to do that yet, and rather than engage in speculation, courts have tended to avoid dynamic efficiency analysis in cases where it could have been relevant" (OECD, 2007, p.10).

164. Some proposals have been made to expand the consideration of efficiencies, specifically those related to innovation, despite the associated challenges. The underlying concept is that, since there is no simple presumption regarding the innovation effects of mergers, there should be no difference in the evidentiary burden between competitive harm and benefits. In other words, there should be no higher bar for considering efficiencies, which could result in them being "mechanically denied" (De Coninck, 2016, p.49). This concept was reflected in a US District Court decision regarding the *Staples/Office Depot* merger[27], which found that an exceedingly high bar for the consideration of efficiencies could require firms to perform the "nearly impossible task of rebutting a possibility with a certainty."

165. To avoid these concerns, one approach (per Katz and Shelanski, 2007) could be to consider both competition harms and efficiencies together, and weight each impact based on their relative likelihood (thus discounting uncertain impacts). Concerns about subjectivity could be avoided by ensuring a focus on available evidence (e.g. internal firm documents that accurately reflect strategy and the rationale for the transaction), and the probability of both harms and efficiencies. Such an approach need not preclude a healthy sense of scepticism for efficiencies, however. Potential harms based on a clear change in firm incentives may have to be balanced by equally likely, or more likely, tangible benefits that meet the test of merger specificity. And these benefits should not come at the expense of other product characteristics that consumers care about, or a higher price.

166. For example, innovation efficiencies can be assessed based on whether they result from the combination of complimentary efforts, which could provide more clear-cut gains for consumer welfare than the combination of overlapping efforts. In the latter case, cost-saving efficiencies could be achieved, but these would have to be assessed in light of (1) potential decreased innovation output and incentives of the merging firms and (2) the likelihood that such savings would be passed on to consumers. This is because any associated cost efficiency could come at the expense of innovation.

167. The parties may also claim that a merger would help overcome the innovation "hold-up" problem, which prevents investments in innovation due to uncertain or insufficient gains. These efficiencies could be relevant if, for example, internal pre-

merger documents suggest that the gains from innovation would be insufficient due to scale and knowledge leakage effects. Such circumstances may be relatively rare.

Box 14. Efficiencies in *Western Digital Irland/Viviti Technologies*

When reviewing the acquisition by Western Digital of Viviti, the European Commission observed the importance of innovation in the relevant markets, which related to the sale of certain types of disk drives. In particular, the Commission expressed concerns that the transaction would withdraw a significant competitor in terms of both price and innovation pressure from the market.

The merging parties claimed that the transaction would in fact generate consumer benefits, including an increased capacity to conduct R&D. They pointed to plans to increase their combined investment in R&D efforts, and to use those efforts to expand product variety.

The European Commission expressed doubts with respect to these efficiency claims, specifically pointing to the frequent use of research co-operation agreements that could generate similar benefits without requiring a merger. More generally, the Commission also called into doubt the verifiability of the claimed R&D efficiencies, given the lack of supporting evidence (for example materials provided by the board to brief them on the transaction).

Source: European Commission Decision C(2011) 8644, Case M.6203 - Western Digital Irland/Viviti Technologies, 23 November 2011.

5.3.3. Remedies

168. The remedies applied to date to rectify concerns about non-price competition are not unique. They include both behavioural and structural measures that have also been used to address price concerns. However, the identification of remedies that adequately address potential non-price harms may be particularly challenging. This is because a remedy focusing on one dimension of competition may have unintended effects on other dimensions. Further, it is not clear that a behavioural commitment could address several aspects of non-price competition, such as innovation incentives.

169. In some cases, innovation concerns have been addressed through the divestiture of research facilities. For example, in *Bayer/Monsanto*[28], the European Commission required the parties to divest certain research assets that would allow a buyer to exert competitive innovation pressure on the post-merger firms. It can be challenging, however, to determine which innovation assets should be divested for such remedies, and to identify whether suitable purchasers exist (Katz and Shelanski, 2007).

170. Other options include behavioural remedies, such as licensing, or the maintenance of certain product lines or features. However, these types of remedies require monitoring on the part of competition authorities, which may be more difficult given the multi-faceted, and difficult to quantify, nature of quality and innovation incentives. Behavioural remedies may be more effective when applied to vertical mergers, or as part of a package with structural remedies (OECD, 2011).

171. As described above, some concerns associated with non-price characteristics may require further action outside the context of merger control. Consumer biases, or short-

sightedness regarding personal data usage that could be taken advantage of by a post-merger firm may require both a merger control and regulatory response. An authority could consider whether consumer-focused remedies, such as measures requiring the provision of consumers with a given set of information, would be sufficient to address competition concerns, or whether divestitures or prohibition are required (as was the case with RBCH/Poole[29], for example, which was prohibited). In parallel, an authority may undertake consumer and regulatory advocacy to address the market problems they observe more generally.

172. The number of specific remedies that have been applied based exclusively on non-price competition concerns are limited. This may reflect caution on the part of competition authorities to base a decision on these effects, the relative rarity of cases without a price dimension, or the difficulty of finding a remedy package that does not produce unintended consequences.

173. More thinking may be required, then, to ensure that competition authorities have effective options to address non-price effects, given the undeniable importance of these effects in some markets. Understanding the broader effects of each remedy would in itself be a demanding dynamic exercise, and require the same fact-intensive, case-by-case analysis of quantitative and qualitative evidence that is required in the competition analysis process for these effects.

Box 15. Remedies in *Bayer/Monsanto*

As described in Section 2.3, the Bayer/Monsanto merger involved markets in which R&D activities played an important role. The European Commission identified particular competition concerns associated with the closeness of rivalry between the merging firms, the degree of concentration in the industry, and barriers to entry, with respect to seeds, plant traits and pesticides.

In order to address these concerns, the parties proposed remedies that were accepted by the Commission, involving divestments of several lines of business. Crucially, in order to maintain the pre-merger competitive pressure in these areas, the divestitures included R&D assets. In particular, Bayer committed to divest its entire vegetable seed and trait businesses, including its R&D infrastructure. In addition, Bayer committed to divesting to a rival several lines of research for alternatives to glyphosate (Monsanto's herbicide, for which there were few alternatives). The Commission determined that this divestiture would enable a rival to replicate the competitive pressure previously imposed on Monsanto by Bayer.

Source: European Commission Press Release, Case M.8084 – Bayer/Monsanto, 21 March 2018.

Box 16. Remedies in *Halliburton/Baker Hughes*

In its complaint regarding the Halliburton/Baker Hughes transaction (described in Box 11 above), the US Department of Justice opined that the remedies proposed by the merging parties were insufficient to replicate pre-merger competitive innovation pressures. In particular, the complexity of the remedy, and the separation of intellectual property from specific lines of business, were viewed as undermining the effectiveness of the remedy. The Department of Justice stated (p. 9):

> *[The proposed remedy] appears to be among the most complex and riskiest remedies ever contemplated in an antitrust case. It would separate business lines and divide facilities, intellectual property, research and development, workforces, contracts, software, data, and other assets across the world between the merged company and the buyer of the divested assets. Many customer contracts would not be transferred. For some of the services for which the transaction is likely to lessen competition substantially, the proposed remedy fails to divest many of the assets used to provide such services (such as tools, facilities, employees, and contracts). The proposed remedy would thus leave the buyer dependent on Halliburton for services that are crucial to the businesses being divested. And the proposed remedy would create a divestiture business that lacks assets in important segments of oilfield services that each of the Big Three possess today, such as fracking, onshore cementing, and onshore fluids.*

Source: Complaint in United States of America v. Halliburton Co. and Baker Hughes Inc., United States District Court for the District of Delaware, Case no. Case 1:16-cv-00233-UNA.

Summary of practical challenges common to considering non-price effects of mergers

- Since non-price dimensions of competition can play an important role in a market, price analysis alone will not be sufficient to understand the effects of a merger. However, there may be concerns about ambiguity and subjectivity associated with non-price effects. Considering three particular questions can help minimise the risks associated with these concerns.
- First, it must be determined whether non-price competition plays an important role in the markets in question. This may be clear in some cases, such as with markets for free products, or markets that exhibit significant innovation-related product turnover. However, there is no simple set of indicators that these effects are *not* relevant in a market. The mere fact that a characteristic is not a current marker of differentiation among firms does not automatically suggest that it is not relevant to merger review. In most instances, an evidence-based examination will be required with respect to importance of quality to consumers and firms' competitive decision-making, as well as the importance of research and development activities undertaken by firms.
- Second, the interaction between price and non-price effects of the merger must be considered. This can be challenging due to the need to compare effects that are short- and long-term, static and dynamic, and which are associated with differing levels of probability. Some analytical techniques, such as discounting for uncertainty, adjusting prices for other dimensions, or merger simulation may be applied. However, in most cases, qualitative evidence will play a particularly important role, especially with respect to consumer preferences and the rationale for the transaction. In cases where there are likely opposing price and non-price effects, consideration should be given as to whether both effects are consistent with a lessening of competition (e.g. quality, and therefore price, being increased beyond the competitive level).
- Third, the precise stage of a merger review during which to build in non-price effects must be determined. A rigid market definition framework will likely not be reliable when multiple non-price effects are involved. The competitive assessment and consideration of efficiencies in a merger review can both incorporate non-price dimensions, and a neutral presumption approach may be relevant when addressing innovation. Remedies associated with non-price effects have not been significantly developed beyond those generally used for price effects.

6. Conclusion

174. This paper has sought to summarise the primary dimensions of non-price competition that have been analysed, or proposed for analysis, in merger cases. Innovation has been a major topic in the antitrust literature, and may well become an increasing focus of competition authority attention. Quality has been assessed in several sectors, and could be affected in a merger through either unilateral quality reductions or

product repositioning. Finally, privacy, or personal data protection, has emerged in some research as a potential dimension of privacy, likely as an element of quality.

175. All these dimensions share certain aspects in common. Failing to consider them may lead to inaccurate conclusions about the effect of a merger on consumer welfare. Clear theories of harm have been identified with respect to each dimension, but so have scenarios in which a merger would generate efficiencies to improve them. The research literature on innovation presents a particularly mixed picture. Thus, a case-by-case analysis, relying on qualitative evidence, as well as data when available, must be conducted.

176. Before advancing too far in a merger review, analysis should be conducted to determine the degree to which a given non-price characteristic is an important dimension of competition in the market. This requires an understanding of how consumers and firms make their decisions. Certain indicators, such as limited price competition due to regulation or zero-priced products, can be helpful. Product characteristics that are valued by consumers, but do not currently vary among competing firms, should not automatically be discounted as dimensions of competition.

177. Where harms to non-price dimensions of competition are likely to materialise from a merger, consideration must also be given to how they fit in with price effects. A particular challenge emerges when considering harm from price increases in the context of non-price efficiencies. Weighing relative effects requires assessing qualitative evidence, potentially adjusting price for quality, and considering the likelihood as well as time period of non-price effects. Where data availability is limited and no simple analytical methods are available, this process may be qualitative only, but unavoidable.

178. The precise stage of a merger review in which non-price effects should play a role will depend on the specific market. However, at least ancillary consideration may be advisable at each stage (market definition, competitive assessment, efficiencies and remedy selection). Care should be taken in pursuing a narrow market definition approach when multiple non-price dimensions of competition exist. Innovation efficiencies may be considered at the same time as innovation harm using a neutral presumption approach. However, non-price efficiencies in general should be carefully examined, and the extent to which they come at the expense of other dimensions of competition should be assessed. There is no easy set of remedies available for non-price concerns, although structural remedies have been applied in some cases, and measures outside of the merger control context may be required to address concerns in others.

179. In sum, non-price effects of mergers are, by their nature, case-specific, qualitative, and challenging to assess, yet central to competition in many markets. The circumstances in which they must be comprehensively examined can be narrowed in some cases, but in most instances, careful consideration will be required to rule them out. Risks of introducing subjectivity to the process can be minimised with a focus on evidence of consumer perceptions and firm strategy, as well as an assessment of probabilities of impact. The importance of innovation, quality, or even privacy for consumer welfare in some markets is substantial, and so this sometimes demanding exercise is a worthwhile one for competition authorities.

Endnotes

[1] The US Horizontal Merger Guidelines indicate: "Enhanced market power can also be manifested in non-price terms and conditions that adversely affect customers, including reduced product quality, reduced product variety, reduced service, or diminished innovation. Such non-price effects may coexist with price effects, or can arise in their absence. When the Agencies investigate whether a merger may lead to a substantial lessening of non-price competition, they employ an approach analogous to that used to evaluate price competition. Enhanced market power may also make it more likely that the merged entity can profitably and effectively engage in exclusionary conduct. Regardless of how enhanced market power likely would be manifested, the Agencies normally evaluate mergers based on their impact on customers. The Agencies examine effects on either or both of the direct customers and the final consumers. The Agencies presume, absent convincing evidence to the contrary, that adverse effects on direct customers also cause adverse effects on final consumers" (p.2). https://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf

The European Commission Horizontal Merger Guidelines indicate: "Through its control of mergers, the Commission prevents mergers that would be likely to deprive customers of these benefits by significantly increasing the market power of firms. By "increased market power" is meant the ability of one or more firms to profitably increase prices, reduce output, choice or quality of goods and services, diminish innovation, or otherwise influence parameters of competition." http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52004XC0205(02)&from=EN

Similarly, the United Kingdom Horizontal Merger Guidelines note: "In formulating theories of harm, the Authorities will consider how rivalry might be affected. They may set out those aspects of the merger firms' competitive offers to customers over which firms compete and which could worsen as a result of the merger, whether in terms of price or non-price aspects such as the quantity sold, service quality, product range, product quality and innovation. The ability of firms to adjust these aspects, and also the time within which they can do so, will depend upon the market concerned" (p. 21). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284449/OFT1254.pdf

[2] See, for example, Shapiro (2012) and Jullien and Lefouili (2018) for a comprehensive discussion of research on the link between competition and innovation.

[3] European Commission Decision C(2015) 6179, Case M.7278 – General Electric/Alstom, 8 September 2015.

[4] Competition and Markets Authority, A report on the completed acquisition by VTech Holdings Limited of LeapFrog Enterprises, Inc. 12 January 2017.

[5] European Commission Decision C(2011) 529, Case M.5984 – Intel/McAfee, 26 January 2011.

[6] European Commission Decision C(2015) 6179, Case M.7278 – General Electric/Alstom, 8 September 2015.

[7] Federal Trade Commission Press Release, "FTC Closes its Investigation of Genzyme Corporation's 2001 Acquisition of Novazyme Pharmaceuticals, Inc.", 13 January 2004.

[8] United States Department of Justice Press Release, "Justice Department Files Antitrust Lawsuit Against Bazaarvoice Inc. Regarding the Company's Acquisition of PowerReviews Inc.", 10 January 2013.

[9] Complaint in United States of America vs. AT&T Inc., T-Mobile USA, Inc., and Deutsche Telekom AG, United States District Court for the District of Columbia, Case 1:11-cv-01560, 31 August 2011.

[10] Deutsche Börse/London Stock Exchange Group: European Commission Decision C(2017) 2006, Case M.7995 - Deutsche Börse/London Stock Exchange Group, 29 March 2017.

[11] Halliburton/Baker Hughes: European Commission Press Release, Case M.7477, 12 January 2016; Complaint in United States of America v. Halliburton Co. and Baker Hughes Inc., United States District Court for the District of Delaware, Case no. Case 1:16-cv-00233-UNA.

[12] European Commission Press Release, Case M.8084 – Bayer/Monsanto, 21 March 2018.

[13] European Commission Decision, supra note 11.

[14] Administrative Complaint in the matter of Thoratec Corporation and HeartWare International, Inc., Federal Trade Commission, Docket No. 9339, 28 July 2009.

[15] European Commission Decision, supra note 12.

[16] Statement of the Commission Concerning Google/AdMob, FTC File No. 101-0031, 21 May 2010.

[17] European Commission Decision, supra note 6.

[18] European Commission Decision, supra note 3.

[19] The welfare implications of "monopolistic competition" due to variety are discussed, for example, by Dixit and Stiglitz (2007), "Monopolistic Competition and Optimum Product Diversity", *The American Economic Review*, Vol. 67(3).

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[22] Complaint in the matter of Whole Foods Market, Inc. and Wild Oats Market, Inc., Federal Trade Commission, Docket No. 9324, 27 June 2007.

[23] European Commission Decision C(2016) 8404, Case M.8124 – Microsoft/LinkedIn, 6 December 2016.

[24] Statement of the Federal Trade Commission Concerning Google/DoubleClick, FTC File No. 071-0170, 20 December 2007.

[25] Federal Trade Commission Press Release, "FTC Notifies Facebook, WhatsApp of Privacy Obligations in Light of Proposed Acquisition", 10 April 2014.

[26] Competition Commission, supra note 25.

[27] Memorandum Opinion in Federal Trade Commission v. Staples, Inc. and Office Depot Inc., United States District Court for the District of Columbia, 970 F. Supp. 1066 (D.D.C. 1997), 30 June 1997.

[28] European Commission Decision, supra note 5.

[29] Competition Commission, supra note 25.

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