# CMA call for information on digital mergers

## Response of KPMG's Economics practice

**July 2019**

# 1   Context to the call for information and our suggestions for the CMA

1.1   KPMG's Economics practice ('we', or 'us') welcomes the opportunity to respond to the CMA's call for information on digital mergers ('the CFI').[1] We advise clients on a range of competition economics matters, including those subject to merger investigations in the UK and worldwide. The opinions expressed in this response are our own, and do not necessarily align with those of our clients.

## Context to the CFI

1.2   The nine years since the UK Merger Assessment Guidelines ('the MAGs') were last revised[2] have seen an increasing prominence of innovative companies that put data at the centre of their business models. Digital technology and data are now core to the products, business models and decision-making of many of the largest businesses in the UK and globally.

1.3   Competition authorities around the world face significant challenges in assessing mergers involving such companies. These stem from a range of factors, including the dynamism and complexity of the markets in which they operate; the existence of atypical market features such as strong network effects and a central role of data and algorithms; and the fact that many such mergers appear to be between providers of complementary services, where efficiency gains may be expected.[3]

1.4   Several recent reports ('the reports')[4] have concluded that whilst the digital economy has benefitted consumers in a range of ways, competition in "digital markets"[5] may not be working as well as it might. A common theme is that there may be under-enforcement of mergers in digital markets ('digital mergers') – in particular of acquisitions by large platform operators of smaller firms that may have become, absent the merger, stronger competitors. The reports have called on competition authorities to adopt new approaches in light of these challenges, including calling on the CMA to make specific amendments to the MAGs.[6]

## Approaches we believe should not be reflected in the MAGs

1.5   In light of the challenges faced by the CMA in assessing digital mergers, and the specific characteristics of some digital markets, we believe there are helpful ways in which the MAGs can be developed and clarified, to aid the assessment of digital mergers. However, we also believe that some of the commentary surrounding digital markets has suggested approaches to the CMA's assessment of digital mergers which in our view are not appropriate. In our view, therefore, the CMA should avoid calls to include in the revised MAGs specific measures that would lead to the following effects:

■   **Measures that are specific to "digital markets"**: In our view there is at this stage little in economic theory or empirical work to support the adoption of special rules for "digital markets" – however defined – and we believe in general that the CMA should refrain from devising measures

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[1] Call for information: Digital mergers, June 2019, CMA

[2] CC2 Revised / OFT1254: Merger Assessment Guidelines

[3] See, for example, Furman Review para 3.48, CMA Ex-post Review p ii, EU Experts Report p111.

[4] Including Unlocking digital competition: Report of the Digital Competition Expert Panel, Furman et al, March 2019 (the 'Furman Review'); Competition policy for the digital era, Crémer et al, April 2019 (the 'EU Experts Report'); Report of the Committee for the Study of Digital Platforms, Stigler Center for the Study of Economy and the State, Scott Morton et al, May 2019 (the 'Stigler Center Report'), Ex-post Assessment of Merger Control Decisions in Digital Markets, Lear, May 2019 ('CMA Ex-post Review') – which we collectively define as 'the reports'. A range of other reports of the OECD and other national competition authorities have further added to this recent literature; see paragraphs 4.1-4.8 of the Furman Review for some further references.

[5] The CFI as well as each of the reports refers to the concept of "digital markets", although none offers a formal definition. In order to engage with the CFI, we use the term "digital markets" in this response along the same lines as the reports, which we interpret to cover a broad and varied range of markets. See paragraph 1.5 of this response for further discussion of this point.

[6] See Furman Review, Box 3.A.

or rules that apply only to one segment of the economy. Instead, we believe the CMA should meet the challenges posed by the characteristics of digital markets by following the same core principles that apply to assessments of mergers in any other market, whilst ensuring that the application of these principles is closely tailored to the market(s) at hand.

In particular we believe that the term "digital markets" is unhelpful since a large and increasing proportion of businesses in the UK are now supported by digital technology, and the term may be interpreted in a way that encapsulates a wide range of diverse markets and businesses which vary significantly in terms of the way competitive processes play out.[7]

■ **Measures aimed specifically at increasing the rate of adverse findings**: There have been a number of suggestions made for changing the assessment of mergers for the digital sector, which appear aimed specifically at increasing the number of mergers where concerns are identified and interventions made by the competition authorities. [8] We believe that at present there is little reliable evidence pointing to a systemic under-enforcement of digital mergers.[9] Therefore in our view, any measures aimed simply at achieving a higher rate of adverse findings on mergers in some segments of the economy would seem, at this stage, unwarranted.

■ **Measures that would lead to an inconsistency in the CMA's approach to digital markets**: The CMA is looking to update the MAGs at a time of wider change to competition policy as applied to digital markets, including the recent launch of its Digital Markets Strategy and a market study into online platforms and digital advertising;[10] the proposed formation of a 'Digital Markets Unit' with a competition remit;[11] and recommendations of the reports around how to investigate alleged anticompetitive conduct in digital markets. In this context we think the CMA should ensure that it avoids establishing a framework for the assessment of digital mergers that is based on principles that are inconsistent with its treatment of digital markets across its other functions.

## Principles we believe should be reflected in the MAGs

1.6    Below we discuss some principles – based on our experience of working with digital companies and our experience in advising merging companies – that we believe the CMA should follow when assessing digital mergers. We then set out some specific suggestions for how these could be introduced in the MAGs. These principles cover three areas, which we discuss in turn below.

### Identifying the key parameters of competition and market features

1.7    When assessing mergers in complex markets, such as many digital markets, we think that a key and necessary step is to be explicit in identifying the way in which firms compete, and the parameters over which they do so. This essentially amounts to identifying what "levers" individual firms can pull to better their financial position, by making their products or services more appealing to customers.

1.8    This is not a new concept, but in our view it is particularly relevant to digital markets given the often novel business models that companies in that sector deploy. It appears not to have been reflected

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[7] The CFI does not define the term "digital markets", and in discussing digital markets the reports focus primarily on their economic features rather than technical features. However the latter is considered to a degree – for example the Furman Review covers "*areas where the intensive use of digital technology is central to the business models of the firms that operate primarily within them*" (para 1.26). We think that such "areas" comprise an increasingly large segment of the UK economy, and we think that to avoid ambiguity, any reference to "digital markets" in the MAGs would need to be accompanied by a tight definition.

[8] For example the Furman Review suggests there may be instances in which the "*empirical evidence required for intervention will be relatively low*" (Box 3.A), whilst others have suggested the CMA could be more speculative (CMA Ex post Review, p xiv); that competition authorities could reverse burdens of proof in some instances (EU Experts Report, p124) or that a (rebuttable) presumption, that dominant platforms' acquisitions are anticompetitive, could be applied (Stigler Center Report, p78).

[9] We are not aware, for example, of any cleared merger in a digital market that is generally accepted to have been harmful to competition. We note that the CMA Ex-post Review "*identified some gaps in the way that the Authorities analysed these cases*", but concluded that "*it is not always clear whether competitive harm has arisen as a result of such gaps*" (p xiii).

[10] See https://www.gov.uk/government/news/cma-launches-digital-markets-strategy.

[11] See Furman Review, Strategic recommendation A.

consistently in past UK merger assessments,[12] nor is it formalised in the MAGs.[13] We think there could be a specific reference in the MAGs to an initial step in the CMA's assessment, prior to assessing the impacts of a merger, where the CMA would have to form a view of the key parameters of competition in the affected market(s), especially where they are considered to be in some way complex.[14]

1.9   In **Section 2** we discuss further how the CMA may assess parameters of competition in digital markets.

### Selecting the right theories of harm

1.10   The CFI suggests several theories of harm (hereafter, 'ToHs') which may be applied to digital markets. We agree that these may well represent plausible ways in which a merger may give rise to unilateral effects, depending on the case-specific facts. However, in our view such ToHs are consistent with the ToHs currently in the MAGs related to horizontal and unilateral effects. As such, and consistent with our discussion above, we do not therefore see a compelling reason at present to spell out in the MAGs any new ToHs that rely on economic principles which are relevant exclusively to digital markets.[15]

1.11   The proportion of the UK economy that is characterised by the existence of platforms and ecosystems is also growing rapidly, and in our view it is likely that disintermediation by platform operators will occur in many more markets in the future. Many of the businesses operating in these markets have strategies and business models that are constantly evolving on the basis of learning about customer preferences through experimentation. We think that in light of this rapid evolution, modelling the way in which firms compete and thus deriving ToHs in a "bottom up" way is a more robust approach, and one that will be more likely to stand the test of time, compared to one that seeks to spell out a number of possible ways in which competition in digital markets might be affected by a merger.

1.12   The CMA also asks if there are circumstances in which efficiency benefits arising from a merger could be considered to give rise to competition concerns (question c(i)). We think the CMA should be very cautious not to find such an "efficiency offence", unless it has robust evidence to suggest that harms (for example, resulting from an increase in market power) are likely to outweigh associated benefits.

1.13   In **Section 3** we discuss further how the CMA may select ToHs when assessing digital mergers.

### Applying the right evidence

1.14   While some aspects of digital mergers can be harder to analyse (such as uncertain counterfactuals, or complex competitive relationships), on the other hand such mergers can also present new and rich analytical opportunities that should be fully exploited by the CMA.

1.15   Firms in digital markets typically have access to large quantities of data which the CMA could look to use as evidence, particularly in relation to the algorithms, datasets and experiments that merger parties may use in determining price and non-price parameters in the normal course of business. The CMA could also look to ask merging parties to conduct merger-specific experiments, and we believe it should consider calling on industry experts as a matter of course when assessing complex digital mergers. Finally, we recognise that a wide array of additional evidence, such as from the parties' internal documents and due diligence, will typically be relevant – although we suggest the CMA is cautious in interpreting metrics relating to transaction values cited in CFI question f.

1.16   In **Section 4** we discuss selected types of evidence that the CMA should consider assessing.

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[12] See for example, CMA Ex-post Review, p vii.

[13] The MAGs note only that the CMA "*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*",(MAGs para 4.2.3, emphasis added).

[14] A similar step is referred to, for example, in the Canadian merger enforcement guidelines. See Merger Enforcement Guidelines, Competition Bureau, 2011, Part 6, paras 6.1-6.9.

[15] We also believe that the conglomerate ToH suggested in Section 6.F of the EU Experts Report is not currently sufficiently clear in its specification to be cited in the MAGs. In our view it is not clear how the concepts of a "market for a digital ecosystem" or "user's space" – which are described in this proposed ToH – would be defined, nor how they may relate to relevant markets. We are further unaware of any empirical work or policy assessment that would justify introducing this ToH at the present time. This position could of course be re-assessed in light of any further research in future.

## Suggested revisions to the MAGs

1.17 The box below summarises our suggested revisions to the MAGs at this time. These and further suggestions for the CMA are discussed in further detail in the remainder of this response.

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### Summary of our suggested revisions to the MAGs

**Introduce explicit step to identify key parameters of competition** (see Section 1): The MAGs could be revised to include a specific reference to an initial step in the CMA's assessment where the CMA should form a view as to the key parameters of competition in the affected market(s) – especially so where those markets are considered to be in some way complex.

**Expand discussion of network effects and their implications** (see paragraph 2.5): The MAGs could state more clearly that the CMA will consider network effects where they exist, and account for different sides of platforms in all aspects of such assessments.

**Recognise interdependencies and trade-offs between efficiencies and harmful effects resulting from mergers** (see paragraphs 2.5, 3.7 and 3.8): The MAGs could note that in certain instances (e.g. where a merger strengthens direct network effects, leads to increased data accumulation or is between providers of complementary products), efficiencies and consumer harm may be closely inter-related, and the impact of a merger on each may need to be assessed simultaneously.

**Remove or downplay references to specific time periods for assessing potential entry** (see paragraph 3.3): The MAGs could remove or downplay references to potential entry being assessed over a one or two year period, which risks missing relevant effects that arise over a longer time horizon.

**Loss of innovation ToH** (see paragraphs 3.4 to 3.6): If this ToH is to be referenced in the MAGs, it could be noted that when assessing the potential for a merger to reduce firms' incentives to innovate, the CMA will consider the process through which innovation takes place, and avoid applying any kind of one-size fits all approach where innovation is treated analogously to prices.

**Reflect limited relevance of transaction values in isolation** (see paragraphs 4.6 to 4.8): Transaction values, either in absolute terms or proportional to revenues or "market value", may be misleading for the assessment of theories of harm such as a loss of potential competition, especially in the context of digital mergers. If the MAGs are to refer to the relevance of transaction values in the context of digital mergers, they could note that such information will not be considered in isolation but alongside other contextual evidence.

**Discuss alternative sources of evidence including algorithms, datasets and input from industry experts** (see paragraphs 4.2 to 4.4 and 4.8). The MAGs could note that the CMA may, where relevant, look to understand the algorithms and datasets that merger parties use to determine key parameters of competition, in addition to experiments conducted in the normal course of business or in a merger-specific context. They could also reflect other sources of evidence, including drawing on input from industry experts in the context of certain assessments.

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# 2 Parameters of competition and market features

2.1 In this section we discuss how the CMA may identify and consider key parameters of competition when assessing digital mergers.

## Identifying parameters of competition

2.2 Identifying how firms compete essentially amounts to identifying what "levers" individual firms can pull to better their financial position, by making their products or services more appealing to customers. These parameters can be highly context and market-specific, for example:

■ In some markets, price is the main driver of competition, and firms compete heavily on reducing prices and cost; whereas in other markets, customers may respond positively to advertising, or high service and quality levels, and firms may compete by seeking to do better than their competitors in those respects.

■ In some markets that are sometimes grouped under the "digital" heading, consumers may respond positively to whether the same service is used by other consumers so they can more easily interact with each other. That is the case with social networks and online platforms. In these instances firms will compete (amongst other things) over the size of their networks.

■ Finally, in many markets, the nature of the product or service can be improved through innovation. This can generate strong incentives to invest in different forms of R&D, and firms therefore compete to innovate.

2.3 These examples show that the way in which consumers respond to changes in firms' offerings is key to determining parameters of competition – in other words they determine how firms compete. These factors in turn give rise to market features that are commonly observed in markets. For example, certain markets where advertising or certain forms of R&D are important parameters of competition may be particularly concentrated, so concentration may be a feature of those markets. Other markets, where externalities between consumers are important, may display network effects as a feature.

2.4 Once the CMA has identified the key parameters over which firms compete, the ToHs relevant to a specific merger would be derived by considering the intensity with which firms compete with respect to each parameter of competition, and the degree to which this is dependent on the behaviour of competitors and of the other merging party specifically.

## Suggestions for the MAGs

2.5 In the context of defining parameters of competition and market features, we believe the following points may be worth noting in the MAGs:

■ Joint determination of competitive parameters: Where indirect network effects are observed, competitive parameters will typically be jointly determined across customer groups,[16] and market power may also be interdependent across groups.[17] The MAGs do not reflect this nuance – instead simply stating (in this context) that network effects make unilateral effects more likely[18] – and we believe they could be more explicit in stating that indirect network effects will be considered in the assessment of both price and non-price effects to customers on different sides of platforms.

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[16] For example, platforms may charge zero prices to consumers, subsidised by commissions from sellers or advertising revenues. For a fuller discussion see Platform Competition in Two-Sided Markets, Rochet & Tirole (2003) Journal of the European Economic Association, Volume 1, Issue 4, Pages 990–1029.

[17] For example if consumers that are particularly valuable to certain advertisers face barriers to multi-homing

[18] References have also been made in the reports (e.g. Furman Review (para 1.123 and Box 3.A)) and in the CMA's Online platforms and digital advertising market study Statement of Scope (para 75) that zero prices to consumers as observed in certain types of digital markets may be supra-competitive. Whether this is the case would depend in part on the nature and size of any indirect network effects.

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- Relevance of data assets for competition: Data assets may be highly relevant for how digital firms compete. Firms that better understand the behaviour of their customers, for example, may be able to leverage this understanding to provide higher quality services or better able to tailor marketing and advertising, all of which may be beneficial to consumers. On the other hand data may represent a means by which dominant companies could exclude rivals. Certain factors may be relevant for this assessment, such as the extent to which datasets are unique, and the CMA would need to understand the relevance of data on a case-by-case basis.

- Possible interdependencies and trade-offs between efficiencies and harms: Several means by which consumer detriment may emerge in digital markets may result from the same underlying processes that also increase consumer welfare. For example, network effects may mean that concentration may generate positive externalities for consumers, but this may also bestow on incumbents greater market power, and increased collection of user data may enable firms to improve the quality of their products and/or to improve the targeting of advertising, but may arguably harm consumers who place value on retaining control of their data or have privacy concerns.[19] We discuss this further in paragraphs 3.6 and 3.7 below.

# 3 Theories of harm

3.1 The CMA asks how relevant market features in digital markets may impact possible ToHs (question b). As we state in Section 1, we see no compelling reasons at present to specify in the MAGs any new ToHs that rely on economic principles which are relevant exclusively to digital markets. However we recognise that the MAGs may benefit from specific revisions in light of specific competitive parameters relevant to digital markets. Below we comment on some of the ToHs raised in the CFI and the reports.[20]

## Theories of harm raised in the CFI and our suggestions

3.2 Here we discuss two ToHs raised in the CFI: a loss of potential competition, and a loss of innovation.

### Loss of potential competition

3.3 This ToH is covered at length in the MAGs and we see no compelling reason to develop this further in the context of digital markets specifically. The CMA could in our view consider downplaying references in the MAGs to specific time horizons, in particular the one or two year time periods referenced in the sections of the MAGs covering potential and actual entry,[21] as in some digital markets (as well as in other markets), such restrictions could risk the CMA missing relevant effects that may arise over a longer time horizon.[22] We think that if doing so, the CMA would need to ensure that it maintains an appropriate balance between its ability to consider such harms in an assessment on the one hand, and ensuring there is sufficient predictability for merging parties on the other hand; and that it reflects the inherent increase in uncertainty associated with making predictions about market evolution over a longer time horizon.[23]

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[19] The Furman Review suggests that "*the misuse of consumer data and harm to privacy is arguably an indicator of low quality caused by a lack of competition*" (para 1.128).

[20] We do not discuss here all possible ToHs, for example unilateral or co-ordinated effects ToHs in horizontal settings; or the suggested ToHs in the CFI concerning alternative buyers (question c(ii)) or non-horizontal effects (question b(iii)), which we consider are already sufficiently covered in the MAGs.

[21] See MAGs paras 5.4.17 (potential entry) and 5.8.11 (entry).

[22] For example, the significance of network effects may lead to young firms tolerating losses for several years whilst investing in scale to surpass the market "tipping point".

[23] For example, if a target's internal documents stated that it intended to begin to compete more closely with the acquirer in three years' time, the CMA would still need to consider the potential entry of other firms over the relevant period, which may be subject to greater uncertainty than the same assessment over a one year period. We note that the EU Experts Report considers such uncertainty around future entry to be sufficient to discount applying potential competition ToHs altogether in certain contexts (p119) (though we do not agree with this as a general rule).

**Loss of innovation**

3.4     The CMA's call for information asks how the particular features of digital markets might impact on the assessment of ToHs involving a loss of innovation. Assessing the effects of a merger on innovation is not a simple matter, and in our view there is no single methodology that would be appropriate in all cases. In some markets, for example, product or service innovation arises out of the work done in research facilities by specialists. This is the case for example in the pharmaceutical or agro-chemical sectors, and may be relevant to certain types of innovation efforts in digital markets. In these circumstances R&D expenditure is typically high,[24] and can be characterised as an endogenous sunk cost.[25]

3.5     The way in which competition affects innovation in this context has been the subject of extensive debate in recent times, for example in the aftermath of the EC's decision on *Dow/Dupont*.[26] The principles that should guide that assessment are still the subject of discussion. Our view is that when assessing mergers where innovation is an important parameter of competition, the CMA should not conduct its analysis of the impact of the merger on innovation in the same way as it would analyse the impact on prices. Specifically, market shares are not in this context a good proxy or *prima facie* indicator of market power pre- or post-merger. In fact, in some markets characterised by high R&D the level of concentration is itself *determined* by the level of R&D spend, such that more competitive markets are also more concentrated. Adopting an approach that mirrors the assessment of price effects could, as a result, lead to significant errors in the assessment.

3.6     In digital markets, however, innovation can also take different forms. It may for example be introduced as gradual product or service improvements in the normal course of business; and the dynamism and complexity of these markets are resulting in firms increasingly looking to reduce the riskiness of their investments by developing and testing prototype products (such as "minimum viable products") on subsets of customers, rolling out later iterations to wider customer bases only of those products meeting minimum criteria, for example of user satisfaction or predicted profitability. In such instances it may be inappropriate to assess the effects of a merger on innovation in a similar way as one would a large merger in the pharmaceutical sector, for example. The general principle, that can be applied across all parameters of competition, however is to seek to understand the extent to which the presence of certain competitors and their behaviour is likely to determine the level of "effort" (for example R&D expenditure or the time dedicated by staff to development) that the merging parties put into innovation, pre- and post-merger.

## Efficiency offences

3.7     The CFI asks whether the CMA can find that efficiency benefits might also be considered to give rise to competitive concerns (question c(i)). The potential benefits and harms associated with mergers between providers of complementary services – or those that leverage network effects – will often both arise as a result of the same process, as we discuss in paragraph 2.5 above.[27] The CMA is most at risk of finding an "efficiency offence" if it places disproportionate weight on the harmful effects. We believe that the CMA should apply caution when considering potential harm that is inextricably linked to factors also leading to consumer welfare gains.

3.8     The CMA could reflect this in the MAGs by stating that where theorised harms are directly linked to consumer benefits (for example the leveraging of direct network effects which may increase platforms' market power but also consumer welfare), the resultant benefits and harms would be assessed simultaneously.

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[24] R&D/Sales ratios are published across sectors and can be a good guide of the relevance of this parameter of competition

[25] For an introduction to this topic, see Sutton, John. Technology and market structure: theory and history. MIT press, 2001. Sutton builds on the empirical observation that markets that are more concentrated tend to be associated with higher levels of R&D expenditure to construct a framework that explains how innovation and market structure are jointly determined.

[26] See for example Federico, Giulio and Langus, Gregor and Valletti, Tommaso M., Horizontal Mergers and Product Innovation (February 26, 2018).

[27] Indeed, several of the reports have concluded that digital mergers typically lead to demonstrable efficiencies. See for example the Furman Review, para 1.110.

# 4 Evidence

4.1 In this section we provide some suggestions as to the types of evidence-gathering and analysis that the CMA could undertake that we believe, based on our experience in this area, may be particularly relevant. We do not comment on differences in approach between Phase 1 and Phase 2, though we note that this may be an important consideration for the MAGs.

## Information concerning firms' algorithms, datasets and experiments

4.2 In our experience, digital companies typically and increasingly determine parameters of competition such as prices, quality of content, product development and marketing, by leveraging large datasets and sophisticated algorithms. Companies are, for example, using predictive machine learning models to determine optimal price discounts or search result rankings, based on large volumes of data on past consumer responses. And they are conducting statistically robust, controlled experiments on their customers, for example to determine whether to launch new products or marketing campaigns, on the basis of predicted impacts on profitability.

4.3 In a merger context, there is potentially a lot of rich information and evidence that can be obtained by understanding and probing merging parties' usage of data and algorithms. For example, it may be possible to obtain information that may help to shed light on whether the acquirer or target respond to each other's pricing or non-price parameters in real-time, or whether a merger that combines firms' datasets could enhance their data-driven feedback loops.

4.4 Absent any time, cost or technological constraints, the CMA could request merging firms to provide source code of key algorithms as well as raw datasets, for example at a snapshot in time or covering a specified period. However, in practice digital firms' algorithms and datasets may be highly complex, and key algorithmic processes such as those determining pricing or content may in fact comprise an entire system of frequently evolving algorithms that together may run into many thousands or even millions of lines of source code. Given the limitations posed by merger review timescales, and the potential costs to the CMA and merging parties, it may thus be expedient for the CMA to consider assessing alternative information and sources of evidence, including the following:

- **Descriptions of data sources used by algorithms**: Sophisticated machine learning algorithms that learn about consumer behaviour (such as neural networks or random forest models) can be difficult to interpret. Their nonlinear nature may mean that it is not simple to explain concisely how competitive parameters are determined. For example, it may not be simple to specify precisely how much weight a price-setting algorithm places on the prices of competitors (as opposed to other relevant factors), as this may vary case-by-case. Our suggestions are that:

  ➢ The CMA could identify the range of data (or "features") that learning algorithms draw on – for example, to identify whether the price of a competitor is an input into the process at all.

  ➢ In the case of some learning algorithms methods that can be applied to shed some light on the relative importance of different data inputs (for example tests for "feature importance" or "permutation importance"). For example it may be possible for firms to report the average relative importance of a competitor's pricing on its own pricing over a particular period of time.

- **Descriptions of algorithm objectives or objective functions**: Different algorithms can be used for very different purposes in a business setting. Some may be relatively simple rule-based approaches, whereas others may specify an objective (for example, to select a price that maximises predicted profit, based on customers' predicted propensities to purchase at different price levels), and instruct the algorithm to meet that objective. Such objectives may technically be referred to as "loss functions" or "objective functions". The CMA could ask merger parties to explain the objective functions of their key algorithms.

- **Outcomes of experiments conducted in a merger-specific context**: The CMA could request merging firms to undertake simulation exercises to understand relevant questions for a competitive assessment, such as customer responses to different choices of competitive parameters. Some considerations include:

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> ➢ The CMA would typically need to be highly prescriptive in its requests. Such experiments may be carried out by technical employees such as developers, who may not be well-versed in the context behind the requests. The CMA may need to ensure it is aware of what data companies store and process, and the names of the features that they use; and because digital companies can often process extremely large volumes of data, the CMA may need to design sampling methodologies to ensure robust outcomes.

> ➢ Companies may typically have no information on their customers' use of other platforms – for example of the platform of the other merging party. The CMA may wish to consider in some instances requesting that firms provide data which can uniquely identify consumers in a consistent manner, so that the CMA could merge datasets resulting from the outcomes of experiments and observe behaviours of consumer that each individual company could not observe unilaterally.

> ➢ Such experiments may naturally have commercial implications for companies (for example, they may be asked to act in ways that may not be profit-maximising). They may also impose extra costs on the part of the merger companies. Therefore the CMA should of course apply caution in ensuring that any requests are proportionate.

■ **Outcomes of experiments conducted in the normal course of business**. In our experience, data is central to many aspects of digital firms' decision-making, and firms may be in a position to provide evidence on their assessments of customer behaviour in relevant contexts (e.g. outcomes of experimentation with different pricing levels to understand residual demand curves). To request such information the CMA would need to recognise that companies may not store all data that they process after the event, and as such the CMA may need to ask firms technical questions around their data warehousing and what data they would be able to retrieve in a timely manner.

## Evidence relevant to counterfactuals

4.5 Here we provide our response to questions e and f of the CFI, which ask how the CMA should assess different evidence relevant to alternative counterfactuals.[28]

### Transaction values

4.6 Question f asks about the relevance of a high transaction value relative to the market value or turnover of the target. While the value of a transaction contains in principle some relevant information, as a standalone piece of evidence we believe that transaction values – or their ratios to the turnover, profitability or market value of a target – are unlikely to be informative of whether an acquisition is likely to lead to an elimination of potential competition, for the following reasons:[29]

■ **Turnover or profitability may be an unreliable benchmark**. Current turnover or profitability, as well as growth rates, may be correlated with firm valuations in certain cases (e.g. where income sources are reasonably stable). In the case of fast-growing companies, run-rates may be more relevant than historical performance over a longer period and firm values may reflect relatively higher growth-adjusted valuation multiples. However in markets characterised by strong network effects, young and fast-growing companies may endure a period of low or zero revenues (and negative profits) as they increase scale e.g. to above the 'tipping point' for that market. Current turnover would be a poor indicator of future revenues and profits in this case. Future profitability may better be assessed by considering, for example, the size of customer bases, customer product usage (e.g. time spent on platforms), the total addressable market or other (non-financial) measures.

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[28] For the purpose of this response we define an alternative counterfactual as one that differs from the "*prevailing conditions of competition (or the pre-merger situation in the case of completed mergers)*" as specified in the MAGs (para 4.3.5).
[29] Whilst beyond the scope of the CFI, we note that a "high" transaction value may be a relevant parameter for case selection, as it may per se give some indication that the target is expected to have significant growth potential.

■ **Market value may be difficult to determine, and even if it is known, there may be competing reasons behind relatively "high" transaction values**. It may be possible to determine a "market value" from companies that are listed, or that have recently raised capital from or been purchased by a non-competitor – although even in such cases there may be reasons why two otherwise identical companies may have different valuations.[30] However this may not be the case for many small digital companies whose equity may be illiquid or untraded. In any case, even if it were accepted that a transaction value was "high" relative to the "market value" of the target, it is hard to see how this alone could represent sufficient evidence of a likely reduction in potential competition. Transaction values may be a function of a number of factors such as the potential to generate cost synergies or quality improvements (e.g. from knowledge spill-overs or dataset consolidation), the value associated with key individuals, and/or the risk tolerance of the acquirer; a reduction in future competition may be only one such potential factor.

4.7 In cases where transaction values appear to be "high", we suggest that the CMA looks to further evidence in order to understand the determinants of (and assumptions behind) the transaction value, such as internal documents and due diligence conducted by the acquirer, as discussed further below.

## Other sources of evidence

4.8 When assessing ToHs with alternative counterfactuals, the CMA could consider a range of evidence (other than or as a complement to transaction values), which may be relevant to the assessment of the potential evolution of the products and innovations of the target. Such evidence could include the following:

■ **Input from industry experts**. Understanding the growth prospects of young and fast-growing companies is likely to be a challenging task, especially in the context of digital companies whose business models may evolve on the basis of a constant cycle of experimentation and learning about customer preferences. The CMA may need to call on industry experts in the context of specific assessments in order to understand these complexities as best as possible, similar to the approach taken by sector-specific regulators in certain instances. The CMA could for example convene a panel of experts on digital platforms, digital advertising or algorithms that it could call on when assessing complex cases.

■ **Commercial and strategic rationale, possibly enlightened by review of past acquisitions**. The MAGs note that the CMA will seek to understand the commercial rationale of transactions. This may be of particular importance when assessing ToHs with alternative counterfactuals such as the loss of a potential competitor, and the MAGs could be clearer that the CMA will always seek to test such ToHs in part by reference to evidence from internal documents. We believe the CMA should also consider whether there may be merit in conducting a review of the commercial and strategic rationales of acquirers in the context of past digital mergers (whether investigated by competition authorities or not), in order to understand whether certain themes emerge which may be relevant. For example, certain types of acquisitions by digital companies may be motivated by the acquisition of datasets, whilst others could be motivated by the ability to realise other efficiencies.

■ **Due diligence and information relating to competitive bid processes**. The CMA typically assesses information prepared by parties to a transaction and we suggest these continue to be prioritised in order to understand transaction values as well as post-merger plans. Of particular relevance – and as the CMA typically recognises – may be documents prepared as part of acquirers' strategic due diligence, which typically provide evidence on the extent to which possible plans of the acquirer are perceived to be achievable. Additional factors such as the structure of the competitive process (such as the number of bidders or post-agreement negotiations) can influence the transaction value and should be considered if the CMA is to assess transaction values in detail.

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[30] Such as liquidity premiums – where the stock of one company is more liquid, or control premiums – where stock representing a controlling stake may command a higher valuation.

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- **Information relating to previous fundraising**. Information from venture capitalists or other equity or debt holders of the target (or acquirer) could reveal further information on their perceptions of companies' prospects for growth and the value of their assets such as datasets.

- **Internal documents revealing acquisition of future competitor**. CFI question f asks about the relevance of internal documents indicating the acquisition of a future competitive threat. Such documents would of course be relevant to an assessment of a potential competition ToH. We would nonetheless caution the CMA to ensure that (i) such documents are not taken out of context; (ii) the (un)certainty of the acquirer is consistent with that of the CMA (for example, an acquirer may determine that there is a very small chance that a target becomes a competitive threat, which may not meet the CMA's "balance of probabilities" test); and (iii) such evidence is still assessed alongside any evidence concerning potential efficiencies.

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.