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COMPETITION COMMITTEE**

**Market Concentration  
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More documentation related to this discussion can be found at  
[www.oecd.org/daf/competition/market-concentration.htm](http://www.oecd.org/daf/competition/market-concentration.htm)

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## *Market Concentration\**

### **Executive Summary**

1. In recent years, there has been growing concern that a trend has emerged in which markets around the world are becoming more concentrated and less competitive. This is sometimes attributed to the increasingly digital and globalised nature of many markets and the firms that operate within them. In other cases, lax antitrust enforcement or excessive regulation have been blamed for the increase of concentration.
2. The evidence suggests that there has been a moderate increase in those broad measures of concentration that first raised the alarm, at least in the US and Japan, though not in European countries. However, the imprecision of these measures means that, taken in isolation, they tell us little about whether competitive intensity has changed or not.
3. Looking at the evidence on other indicators of competitive intensity, we can see that mark-ups and profits in the US have significantly increased. Data on mark-ups in Europe is unfortunately more limited; however, the picture that is available suggests a more mixed picture on mark-ups across different European countries, though there is a strong trend towards increased profits. Worryingly the rate of churn in the US appears to have fallen, while again in Europe the picture is mixed. Output growth has been weak in both Europe and the US against historic standards, but in the absence of a relevant counterfactual, it is difficult to identify whether or not there has been the reduction in output that would be expected if competitive intensity were falling.
4. Overall, for all their problems, the indicators of concentration may still have picked up on a potential concern, in particular there are a broad range of indicators suggesting that, on average, market power is increasing. This has led even moderate experts to support a move towards stronger merger enforcement and increased vigilance on exclusionary behaviour. However, it remains unclear precisely what is driving the increase in market power. It is perfectly possible that in many markets this is the outcome of healthy competitive forces that allow 'superstar firms' to thrive and to build market power on the back of their recurring success.
5. If this is correct, it is evident that it is not a story that is limited to the technology giants and their digital platform business models. For example financial markets, and healthcare in the US, appear to drive some of the changes in the indicators. Nor is there much sign that the changes are driven by those industries that are most exposed to globalised trade. This suggests that globalisation has not played a big role in these changes, and that we should not focus too much on the market shares of platform firms. Network effects, anticompetitive regulation, and better price discrimination may each also play a role. Nevertheless, if increased market power is a reality, then whatever the source, greater vigilance across the different competition policy fields may be warranted.
6. Practical suggestions include the use of rebuttable presumptions, be they structural or otherwise, making the investigation of exclusionary conduct a higher priority, and the use of market investigations with divestment powers that can be used if harm to consumers is identified. Given the controversy, agencies might also be well advised to consider the practicality of monitoring concentration, profitability, mark-ups,

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\* This issues paper was written by Chris Pike, OECD Competition Division, with comments from Antonio Capobianco and Antonio Gomes, OECD Competition Division

entry and other indicators of competitive intensity at a market level to enable them to quickly respond, and either debunk unwarranted concerns that may arise, or investigate as appropriate.

## 1. Introduction

7. There is a growing contention that big is bad, and that the growth of large firms with high market shares is increasing concentration and weakening competition, driving up profits, damaging innovation and productivity, and increasing inequality. The simplicity of this framing has found supporters across the political spectrum, but does it survive scrutiny?

## 2. What is concentration? Why measure it?

8. Concentration is a way to quantify the structure of a market. It can be a useful tool both for considering the likely effects of a specific conduct or merger, or for considering the effectiveness of competition policy as a whole in protecting and facilitating competition across the economy.

9. In the first case, the concentration of different firms' shares of activity, capacity or value within a market (market concentration) can serve as an imperfect indicator of the competitive intensity of a well-defined market. For example, for a homogenous product it can offer a simple way to describe the impact that a prospective merger might be expected to have on intensity of competition within the relevant market. As a result, it is often used as a screening tool to identify mergers or markets that merit closer scrutiny.

10. In the second case, it can be used to develop imperfect indicators of the competitive intensity of industries and economies. For example, researchers might aggregate measures of market concentration across an industry or an economy, or alternatively calculate shares of activity or value within an industry or economy.

11. Having the ability to accurately measure, track and compare the competitive intensity of an economy or an industry would give an overarching view and hence be extremely valuable for policymakers that are understandably keen to understand how competitive the markets within their economy or industry are. However, this is generally not possible. In order to understand the actual strength of competition within an industry or an economy, we would need to know the strength of the competitive constraints upon each firm within that industry or economy. These constraints largely depend on the degree of substitutability between the firm's product and the products of its rivals, and the existence of any barriers to entry. In a modern competition analysis, market power is therefore assessed by looking at the responsiveness of demand to changes in the value of the firm's offer, and hence the strength of the firm's incentive to compete.

12. Understanding the strength and intensity of competition within a market therefore requires an economic analysis that can be both complex and time-consuming. To form a preliminary assessment of the strength of competition in a given market, competition agencies often rely on market concentration as an imperfect indicator. However, this is

done with caution since there is an ambiguous relationship between the structure of a market and the intensity of competition within that market.<sup>1</sup>

13. Similarly, when measuring the change in strength of competition across an industry or an entire economy it is likely to be impractical to assess the actual intensity of competition. This might justify looking as a starting point, at aggregated market concentration, or industry concentration measures. However, if market concentration is an imperfect indicator of competitive intensity, it is less clear what industry concentration tells us about the competitive intensity within that industry. For example, it may simply tell us about the degree of complementarity between the different markets that have been included within that definition of an industry.

14. Instead, in order to reach any conclusion on whether there has been a change in competitive intensity across an industry or an entire economy requires us to look beyond concentration measures, and to consider whether other imperfect indicators of competitive intensity are telling the same story. For example, in addition to aggregated market concentration, or industry concentration measures, we should also look at changes in output, price, mark-up and profit across firms within the industry or economy, and try to infer to what extent those changes are attributable to changes in competitive intensity (rather than to changes in other factors).

15. In this paper, we first look at how concentration is measured, then whether it is increasing, and if so, whether other indicators (output, prices, mark-ups and profits) are consistent with a story of falling competitive intensity. We ask whether any market power that has been built has endured. We look at what the consequences of a change in competitive intensity might have been, and we consider what might be driving any of the changes that we do see. We finish by asking how competition authorities might respond.

### 3. How is concentration measured?

16. There are a number of different ways to measure concentration. Firstly, in what unit are shares being measured? Secondly, shares of what entity? And thirdly, how is concentration of these shares measured?

17. On the first question of what unit to use to measure shares, the options include activity, capacity and revenue. If market-level concentration measures are to be aggregated up to an industry or economy level then the choice can potentially reflect the nature of competition within each market and need not be the same across markets. If however concentration is to be measured across an industry or economy, then the share of revenue or value should be used as it is when measuring GDP.

18. The second question is what entity researchers should calculate shares in. It would be preferable to have a relevant market as defined through a hypothetical monopolist test. However, even here the relevant market can change depending on the starting point for the test, and this creates asymmetric markets, which means that even if defining hundreds of thousands of relevant markets were practical, which it is not, this would not be always be correct. Nevertheless, the errors from overlooking asymmetries will be minor

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<sup>1</sup> The structure conduct performance hypothesis of Bain (1951) having been successfully challenged by Baumol's contestability theory (1982), Sutton's work on sunk costs (1991), and Demetz's (1973, 1974) arguments on the direction of causality.

compared to those that are generated by over-aggregating markets (See Werden & Froeb, 2018).

19. Calculating shares using administrative definitions of markets might therefore offer a much more practical solution, though it might come with a large error cost if interpreted in isolation. We might label these *administratively defined market concentration measures*. These measures would also suffer the same problems which arise when calculating shares of administratively defined industries, most notably arbitrariness in the definition since it is not based on substitutability. This would further weaken the already tenuous relationship between concentration of market shares within a relevant market and competitive intensity.

20. Finally, as to the methods by which the degree of concentration in shares is measured, the simplest are concentration ratios (CR), which express the market share of the N<sup>th</sup> largest firms in a market, industry, or economy. For instance, CR4 denotes the combined market shares of the four largest firms. However, concentration ratios such as a CR4 inevitably do not distinguish between markets in which there are only five firms and those where there is a long tail of firms with smaller market shares. One way to deal with this problem is to look at say the CR50, however this then fails to distinguish between those markets in which the four largest firms hold shares of 80 percent and those where they hold shares of 20 percent.

21. The Herfindahl-Hirschman index (HHI) solves this problem by calculating the square of the market share of each firm in the market, and summing the resulting numbers. This gives a score of that can range from close to zero to 10,000. In these standard concentration measures ownership is assumed to be binary, and so minority shareholdings in rivals and common shareholdings by institutional investors in rival firms are not reflected.<sup>2</sup> To the extent that common ownership has increased significantly in some industries over the last 20 years, standard concentration measures are therefore likely to underestimate the true degree to which ownership is concentrated. Adjusted HHI measures have been proposed, as discussed in OECD (2017).

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<sup>2</sup> Common ownership here refers to the practice by institutional investors of holding stakes in multiple firms that would otherwise be assumed to be independently competing against one another.

### Questions

- Is it practical for relevant markets to be used to calculate concentration measures to indicate the competitive intensity of industries and economies?
- To what extent should we rely on administratively defined market concentration measures?
  - are the weaknesses of these measures so large that the approach should be entirely discarded?
  - are these measures useful as one of a number of different indicators of competitive intensity
  - or should we put greater emphasis on these measures as an indicator of competitive intensity
- Which methods of measuring concentration are most meaningful?

## 4. Is concentration increasing?

### 4.1. The evidence

22. In October 2015, the paper that lit the fuse of the present debate was published (Furman & Orszag, 2015). It was written by then Chair of the US President’s Council of Economic Advisers (CEA), Jason Furman, with Peter Orszag. The paper identified that an increasingly large fraction of firms in the US were obtaining annual returns to capital of more than 10, 20 and 30 percent, and cautiously suggested that consolidation might be contributing to this increase in the share of firms with apparently supra-normal returns.

23. The measure of concentration cited was the CR50, calculated at the two-digit industry level (giving 13 broad industry groups such as “Retail Trade”) using US Census Bureau data.<sup>3</sup> It identified that in three-quarters of these broad sectors there had been an increase in concentration of revenue between 1997 and 2007. It noted however that this was neither a necessary nor a sufficient condition to indicate an increase in market power had occurred. Nevertheless, it noted that the increase in concentration was consistent with research looking at a specific industry and market level. For example, it noted that rising concentration had been identified in 8 out of 9 agricultural industries that were tracked by the Congressional Research Service; agricultural supply industries; hospitals; railroads; radio; and loan and deposit markets.<sup>4</sup>

24. These findings were consistent with results obtained by Grullon et al. (2015) who used Compustat data on publicly traded firms and three-digit categorisations to look at

<sup>3</sup> This includes private and publicly listed firms and so strengthens the findings of Grullon, Larkin and Michaely (2015) which used Compustat data at the 3 and 4-digit level (99 or 311 sectors) to show that more than 75% of US industries had increased in concentration between 1972 and 2014.

<sup>4</sup> Shields (2010), Fuglie et al. (2012), Vogt and Town (2006), US FCC (2014), Corbae and D’Erasmus (2013).

changes in the HHI.<sup>5</sup> An example of this categorisation was leather and allied product manufacturing (NAICS 316). Within this there were three 4-digit subsectors: Leather and hide tanning and finishing (NAICS 3161), footwear manufacturing (NAICS 3162), and other leather and allied products, such as luggage, handbags, and purses (NAICS 3169). Grullon et al (2015) found that the HHI of publicly listed firms had increased in 75 percent of these 3-digit industries since 2000, and that the average HHI had increased from less than 800 in 1996 to approximately 1200 by 2014. It also found that over the same period there had been a large increase in the average size of publicly listed firms and that there had been a sustained reduction in the number of publicly listed firms.

25. In the spring of 2016, the Economist Magazine published the results of its own investigation, which used Census Bureau data to calculate the CR4 for the four-digit level disaggregation. This categorisation created 893 sector grouping, including scheduled passenger air service, full service restaurants, and general and surgical hospitals. It found that the weighted average CR4 across all sectors had increased from 26% in 1997 to 32% in 2012. It also noted consistency with market level research, for example, the five largest US banks account for 45% of banking assets, up from 25% in 2000.

26. In 2017, Autor et al followed up their ground-breaking work on the changes in the labour share of income caused by “Superstar” firms by looking at changes in concentration across the US economy.<sup>6</sup> This tested their hypothesis that there had been a reallocation of activity towards superstar firms, which they had previously suggested would account for the observed decline in the labour share of income.<sup>7</sup> In contrast to the CEA paper and the Economist Magazine they used 4-digit SIC classifications to look at the evolution of concentration across 676 industries between 1982 and 2012.<sup>8</sup> They found an upward trend in average industry concentration in all six sectors under both CR4 and HHI measures of concentration. The CR4 grew 4% in service industries, 5% in manufacturing industries, 6% in the wholesale sector, 8% in utilities, 11% in financial services, and 15% in retail industries.

27. Froeb & Werden (2018) report that data suitable for investigating trends in market concentration are not available for most of the US economy. They therefore focus on three industries where data is available. Firstly, airlines, where route level HHI slightly decreased. Secondly, banking, where local market concentration had not increased. Finally, Wireless telecoms where the population weighted average HHI had increased from 2423 in 2004 to 3111 in 2015 despite a number of mergers being blocked or withdrawn following challenge.

28. In Japan, Honjo, Doi & Kudo (2014) find a slight increase in concentration in 109 manufacturing products as measured by the CR4 and HHI. Similarly, census data shows the CR3 is increasing in around 60 percent of Japanese industries.

29. In Europe, Valletti et al reported in 2017 that they had identified no increase in the CR4 or HHI measures of concentration across the EU5 between 2010 and 2015.<sup>9</sup> The

<sup>5</sup> Since Compustat data only includes publicly traded companies the paper included private companies using data from the U.S. Census Bureau and Bureau of Labor Statistics.

<sup>6</sup> “Superstar” firms being the most efficient firms in an industry.

<sup>7</sup> This follows from superstar firms having a smaller share of fixed costs due to their greater size, and potentially from their ability to charge higher mark-ups.

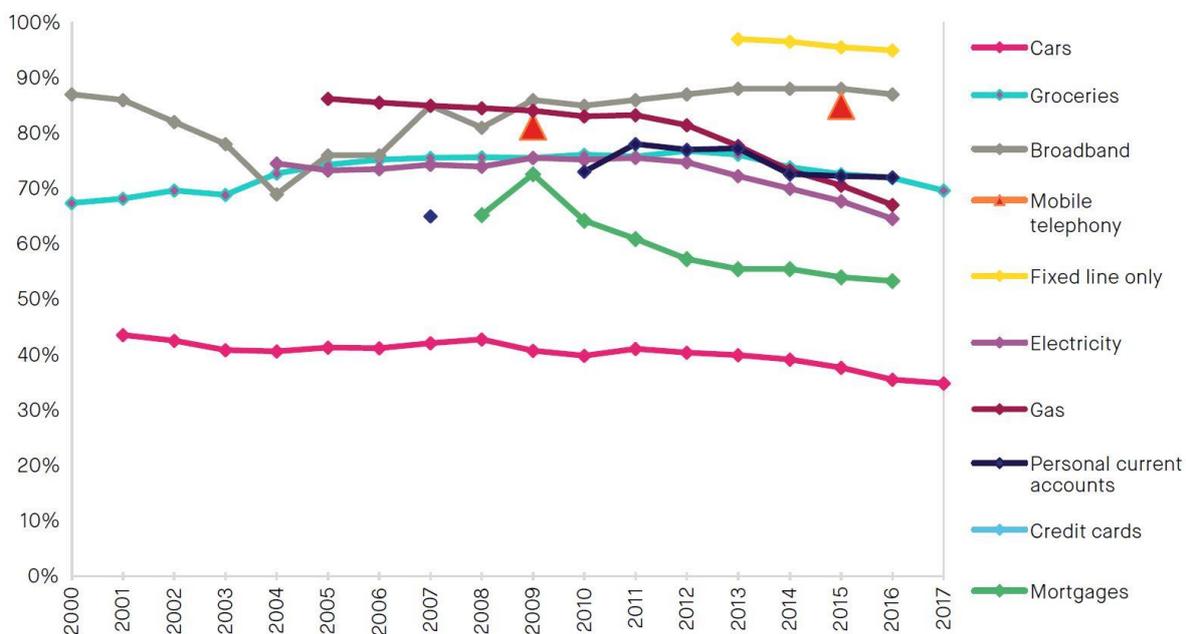
<sup>8</sup> Using SIC categories allowed them to go further back.

<sup>9</sup> The EU5 are Germany, France, UK, Italy and Spain.

sector level increases that they did find were in those sectors that were less concentrated at the start, though they were a small number of exceptions. There was also some variation across countries with Germany and France seeing small increases, while the UK saw a reduction (Spain and Italy showed no change).

30. Consistent with this in the UK, the Social Market Foundation (SMF) in 2017 published a report on the evolution of concentration in 10 consumer markets (see Figure 1).<sup>10</sup> While the product market definitions used reflect those previously used by competition authorities, they were measured at national and not local level and so remain imperfect in cases such as groceries where local constraints are more important than the national picture. Nevertheless, consistent with the research by Valletti et al (2017) they found that there was little sign of increased concentration in most of the markets that they examined.

**Figure 1. CR4 rates over time, UK**



Source: SMF (2017). Data SMF analysis. Time periods are not consistent across consumer markets, reflecting data limitations. 2017 figures reflect currently-available data for groceries and cars.

## 4.2. Discussion

31. In trying to interpret this evidence, it must first be noted that a CR50 measure is too broad, since a high value would be entirely consistent with a highly competitive market. Moreover, the different market categorisations that are used are insufficiently precise, since even at the 4-digit level these group products into markets despite it being unlikely that those products compete with one another (e.g. luggage vs purses). Moreover, even if there is sufficiently precise as a product market definition, it is

<sup>10</sup> Cars, Electricity, Groceries, Gas, Broadband, Personal current accounts, Mobile telephony, Credit cards, Landline-only phone contracts and Mortgages.

nationwide and hence in most cases is too broad as a geographic market definition of what are often local markets.

32. While this imprecision overstate the size of the market, this may overstate or understate the concentration of any symmetric market that might exist.<sup>11</sup> For example, the share of a firm selling non-competing products would be overstated if those products were arbitrarily included within the same market classification. Alternatively, the share of a firm would be understated if the products of non-competing rivals were arbitrarily included within the same market classification.

33. Despite these caveats, when taken alongside the evidence on specific markets, this does appear to suggest that concentration in US markets is more likely to be increasing than decreasing, though the increase is not a dramatic one. For example, as Shapiro (2017) points out, the increase in CR4 identified by the Economist Magazine (2016) would correspond to a HHI of between 300 and 700, suggesting there were 15 or more firms in the ‘typical’ market.

34. This HHI might imply different types of structure of the typical market. To illustrate for example, it might suggest that the largest 4 firms held 32%, the largest individual firm perhaps 10%, and that the other 11 or more firms held the remaining 68% share. Alternatively, there might be one firm with 30% and hundreds of smaller firms sharing the remaining 70%. For an individual market, these would usually be considered to be market structures that could be perfectly consistent with, and indeed indicative of, fairly intense competition. However, since these are for the ‘typical’ market, there would of course be variation from market to market.

35. In contrast, the evidence on concentration in Europe, while subject to the same data problems, does not appear to be moving in the same direction. This divergence is of particular note since the US and EU have (approximately) been through the same digital revolution and the era of the ‘superstar firm’ in parallel. This might therefore, point towards a country specific explanation of the apparent change in concentration.

36. In conclusion, even where there is evidence to suggest an increase in concentration, in the absence of evidence on the movements of other indicators it is extremely difficult to draw any conclusion on whether there has been a change in competitive intensity or not.

#### Questions

- Is there any evidence of a change in concentration in other jurisdictions?
- How big a change in these average concentration figures would be worrying?

### 5. Are other indicators suggesting any change in competitive intensity?

37. Setting aside questions over the definition of the markets in which concentration is measured, and the problems of different concentration measures, there would remain in

<sup>11</sup> Note that markets will often be asymmetric as discussed.

any case a challenge in interpreting what an increase in concentration would tell us about competitive intensity.

38. As Shapiro (2017) points out, the implications of an increase in concentration for competitive intensity are ambiguous. An increase could indicate a decline in competition, for example if it reflected the existence of fewer, weaker rivals to dominant incumbent firms. However, it could equally reflect the forces of competition in action, bringing success and market share to more efficient firms. To attempt to distinguish between these different explanations therefore it is necessary to have information on the movements of other indicators of competitive intensity. These are discussed below.

## 5.1. Output and Prices

39. Where competitive intensity has fallen and market power has increased, theory suggests that output levels should be lower than they otherwise would have been, and prices should be higher than they otherwise would have been.

40. Cowan (2017) identifies that manufacturing output in the US has continued to increase over the last 40 years.<sup>12</sup> He also argues that output in most sectors has increased (as reflected in the GDP growth across the period).<sup>13</sup> However, the relevant indicator here would be a restriction of output against the relevant counterfactual, which may have been a larger increase in output than has been observed. For instance, the increase in output over the last 40 years should not be taken to indicate that there has not been an effect on US manufacturing output from increased competition from China, or indeed from Japan and Korea before that. Equally, to understand whether falling competitive intensity (or its counterpart, increasing market power) has resulted in reduced output and higher prices requires an understanding of the output and prices that would have been seen in the absence of an increase in market power. This is not possible; however, to the extent that we can speculate on these matters, the stagnation in growth relative to historic levels is not inconsistent with the suggestion that there has been a relative output restriction.<sup>14</sup>

41. Counterfactual prices are equally difficult to identify, except through detailed market level analyses. However, it is possible to observe changes in mark-ups and profitability. Changes in these at least provide an indication of whether there has been a change in *the scope* for prices to be lower than observed. We therefore consider indicators of these in the following sections. Where these indicate that the scope for lower prices has increased, this is likely, at least for a normal non-luxury good, to indicate that output has been lower than it would have been.<sup>15</sup>

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<sup>12</sup> See the [time series for manufacturing output](#) from the Federal Reserve.

<sup>13</sup> However, as noted by Summers (2013 and 2016) this growth has stagnated since 2007.

<sup>14</sup> Though of course there are other causal factors behind this stagnation, which is reflected in the fact that the stagnation has not been limited to the US.

<sup>15</sup> In contrast, for a luxury good output might be increasing in price.

## 5.2. Mark-ups<sup>16</sup>

42. Increases in the mark-up mean that the Lerner index by which we measure a firm's market power has increased, and hence provide a much better indication than changes in concentration on whether the competitive constraints upon a firm have weakened. Mark-ups (and hence the Lerner index) will of course differ across markets depending on the fixed costs in those markets (mark-ups will be higher in markets where a larger proportion of costs are fixed). Therefore, comparisons across markets are risky and it is safer to focus on changes within markets. Even then, the size of fixed costs in the market may change over time, or the relative importance of that market within an industry may change.

43. De Loecker and Eeckhout (2017) estimate firm level mark-ups using US data on all publicly listed firms' inputs and outputs and find that there has been a large increase in mark-ups in the last 30 years.<sup>17</sup> They identify that between 1950 and 1980, average mark-ups were around 20 percent above marginal cost. However, these started rising and reached an average of 67 percent above marginal cost in 2014. They report that the increases are not driven by any particular industries (e.g. the IT sector) but rather occur across industries, and that they are driven by an increase in the mark-ups of high mark-up firms, and not a general increase in the mark-up of all firms.<sup>18</sup>

44. Rising mark-ups in the US are also estimated by Gutiérrez & Philippon (2016), Gutiérrez (2017), and Baqaee & Farh (2017) who find that mark-ups in all industries have increased primarily because high-mark-up firms have increased their relative size, not because firms have increased their mark-ups. Traina (2018) also identifies that the mark-ups of non-utility, non-financial US public firms have increased, however using a different accounting measure of mark-up he finds the increase to be smaller (up by half from 10 to 15 percent).

45. Weche & Wambach (2018) use the same technique to estimate changes in mark-ups in 17 European countries over a shorter period, 2007 to 2015.<sup>19</sup> Their data is not limited to publicly listed firms and so they include smaller firms (whom De Loecker and Eeckhout (2017) suggest are likely to have higher mark-ups). They find that between 2007 and 2015 the average estimated mark-up is around 131 percent above marginal cost, and the median is 84 percent above marginal cost, and so are significantly higher than the estimated mark-ups that De Loecker find in the US which suggest average weighted mark-ups in 2014 of 67 percent above marginal cost. They identify the key distinction

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<sup>16</sup> Mark-ups measure the extent to which price exceeds marginal cost (or an approximation of marginal cost).

<sup>17</sup> Their method of estimating mark-ups is described as follows: "A measure of the mark-up is obtained for each producer at a given point in time as the wedge between a variable input's expenditure share in revenue (directly observed in the data) and that input's output elasticity. The latter is obtained by estimating the associated production function." Weche & Wambach (2015) report that the approach identifies mark-ups as the ratio of an input's output elasticity and the revenue share of its costs.

<sup>18</sup> Valletti et al. (2017) note that this increase implies an increase in the economic profit margin from around 20% (1980s) to 30% (2000) to 40% (today).

<sup>19</sup> They suggest that the increase since 2012/2013 is not solely driven by the exit of firms with low mark-ups, and point to fact that a balanced sample shows the same results.

between their dataset and that of De Loecker and Eeckhout (2017) to be the inclusion of non-publicly listed firms.

46. The period of study is much shorter than De Loecker & Eeckhout (1950-2014), however Weche & Wambach (2018) see a similar pattern of a drop in mark-ups during the financial crisis followed by a recovery. However, the recovery in mark-ups in Europe appears to have been slower than in the US, which had recovered by 2011 (after which it continued to increase). Instead, it appears that European mark-ups took until 2015 to recover.

47. However, there are big differences between the trends in the 17 countries. For example, mark-ups have increased in Belgium, the Czech Republic, Finland, Germany and Slovakia, while they have fallen and not recovered in Estonia, Hungary, Romania, Slovenia and Sweden. They also report that in contrast to the US, in Europe the post-crisis increase in mark-ups is driven not only by increases in the mark-ups of high mark-up firms, but also by increases in the median mark-up. Again this suggests a difference in the story in Europe, where there is a general increase in mark-up, and in the US, where it is only the superstar firms that are increasing their mark-up.

48. Calligaris, Criscuolo & Marcolin (2017) estimate mark-ups for 26 countries over the period 2000-2014. They find that on average mark-ups have been increasing by a magnitude of around 4-6% each year. This is comparable to the results of De Loecker & Eeckhout (2017) over the same period. Similar to De Loecker & Eeckhout (2017) they find that the average growth in mark-ups appears to have been driven mainly by those firms that enjoy the highest level of mark-ups. They also find that firms operating in digitally-intensive sectors (including financial services) show a higher average growth in mark-ups than firms operating in less digitally-intensive sectors. Importantly they find that these results hold even when the US is excluded from the analysis. However, they do not provide any further breakdown to allow for comparison with Weche & Wambach's European results.

49. While mark-ups are a good indicator of market power, a mark-up is also required for the efficiency of markets in which fixed cost investments are necessary. Therefore, where there are changes in technology that increase fixed cost investments and reduce variable costs we might see higher mark-ups without a reduction in prices (which need to cover the fixed investment). This type of technological change might therefore mean higher mark-ups but no change in profits. Therefore, as De Loecker & Eeckhout (2017) explain, mark-ups do not necessarily increase alongside profits, and may instead reflect changes in technology. We therefore look next at the evidence on changes in profitability.

### 5.3. Profits<sup>20</sup>

50. Shapiro quotes figures from the Bureau of Economic Analysis (BEA) suggesting that profits in the US have substantially increased since the 1980s.<sup>21</sup> These suggest a shift from profits constituting 7-8% of GDP in 1986 to 11-12% in 2016; that is an increase of approximately 50%. De Loecker & Eeckhout (2017) show an even larger increase,

<sup>20</sup> Profits are usually measured as a proportion of total revenue, in contrast to mark-ups, which are measured as the price-cost mark-up as a proportion of marginal cost.

<sup>21</sup> Bureau of Economic Analysis, Table 1.7.5, "Relationship of Gross Domestic Product, Gross National Product, Net National Product, National Income and Personal Income," Last Revised September 28, 2017.

however this has been criticised by Cowan (2017) for not including foreign sales in profit margins.<sup>22</sup> However, a corrected series from Livermore (2014) using gross value added in the denominator, and one from Barkai (2016) including the cost of capital in the numerator, each show that there has nevertheless been a huge increase in profits since the 1980s. The Economist Magazine (2016) goes back further to show that between the 1960s and 2000, returns on capital excluding goodwill moved between 8 and 12 percent, but these hit 16 percent in 2005 and after a drop during the financial crisis were back there by 2011. Barkai (2016) finds that the profit share of GDP has increased from 2.2 percent in 1984 to 15.7 percent in 2014. However, as noted by Smith (2017), this level of profitability is not entirely unprecedented and was seen both in the late 1940s and again in the mid-1960s just prior to the oil crisis, during a period in which antitrust authorities were highly active.

51. Like concentration and mark-ups, profitability inevitably varies by sector and by firm. Shapiro (2017) looks at a breakdown of the BEA figures by industry. He finds no change in US manufacturing profits as a percentage of GDP over the last 20 years, but that finance and insurance profits have nearly doubled. Healthcare sector profits also increased substantially while Technology and Media profits also grew but not as significantly as might be expected. The Economist Magazine (2016) also looks at profits by sector and attempt to identify in which sectors exceptional profits can be found (they identify these as profit over and above 10% which over the past 50 years has been the average return on capital (excluding goodwill). They suggest that approximately a half of these exceptional profits were to be found in the technology sector while a quarter were in the healthcare sector. The remaining quarter were spread across a range of industries including cable television, railroads and airlines. The CEA paper meanwhile finds that returns on investment in capital at the best performing firms (those above the 90<sup>th</sup> percentile) are now 10 times the median, while this figure was three times the median in the 1990s. They argue that these figures are way above any plausible cost of capital and likely to be pure rent. Those high returns are persistent. More than four-fifths of the firms that made a return of 25% or more in 2003 were still doing so ten years later.

52. In Europe, Valletti et al. (2017) show that net accounting profits in the EU5 increased from 5% of GDP in 1995 to 22% in 2005.<sup>23</sup> They fell back to 15% at the height of the financial crisis but have since increased and converged with US profits with both standing at around 24% in 2016.<sup>24</sup> At a sector level, they identify that the EU has seen particular increases in profitability in agriculture, finance and education sectors while a decline in the Information Technology and Communications sector.

## 5.4. Churn

53. While the changes in concentration, mark-ups and profits discussed above have endured, and according to some measures, appear to be increasing over time, this would not be a concern if there were continual churn in the firms that achieve temporary market

<sup>22</sup> The Economist note that US companies now make a fifth of their profits abroad, however their return-on-equity is 40% higher on US sales.

<sup>23</sup> The EU5 are Germany, France, UK, Italy and Spain.

<sup>24</sup> Note that the measure used by Valletti et al (2017) is different from that used by Shapiro (2017), Barkai (2016), Livermore (2014), and De Loecker & Eeckhout (2017) and is therefore not comparable.

power. As with other indicators, understanding this would require a market level analysis; however, in the absence of a comprehensive assessment, the best that can be done is to look at some broad indicators of churn. For example, one can look at changes in the rate of entry and exit (or churn) of firms across the economy as a whole. More informative still would be the rate of churn within the group of firms that are most likely to hold market power (such as the members of the CR4, or the firms charging higher mark-ups or earning greater profits within a given market).

54. The Economist Magazine (2016) cite work by McKinsey as finding that highly profitable firms in the US in 2003 had an 83% likelihood of remaining highly profitable in 2013.<sup>25</sup> In contrast, in the previous decade, the odds were about 50%, suggesting that the churn in highly profitable firms is deteriorating and the position of these firms is becoming more entrenched. They argue that the high market capitalisation of leading firms demonstrate that high profits are expected to continue to grow.

55. The CEA paper (Furman & Orszag, 2015) also reported that young firms have been declining as a share of the economy since 1980. They identified that in 1982 young firms accounted for about half of all firms, but that this had fallen to about one-third of firms in 2013. They attributed this to a decline in the rate of entry since the late 1970s. Decker et al (2015) reach the same conclusion on the basis of business dynamics statistics that show that the rate of entry has fallen substantially from more than 14 percent to 11 percent prior to the financial crisis and then 8% in 2011. They also find a declining share of young firms and a declining propensity for young firms to be high-growth firms. Data from the Bureau of Labour Statistics confirms this by showing that the number of jobs created by new businesses has fallen by more than 30% since the late 1990s (US BLS, 2018).

56. In Europe, Valletti et al (2017) find no general trend in the degree of churn in the EU5 since 2008, instead finding that entry and exit rates remain broadly stable. At a national level, it can be seen that France has seen both entry and exit decline, suggesting a reduction in churn, however the UK has seen entry increase but without an accompanying change in exit, and Italy has seen small increases in both entry and exit, suggesting a slight increase in churn.

57. In Japan, Honjo, Doi & Kudo (2016) look at manufacturing and information and communications industries and find that between 1991 and 2010, market leaders were more likely to be replaced by competitors in growing and declining industries than in more stable mature markets. They also found that there was a higher rate of turnover of market leaders in R&D-intensive industries, suggesting a healthy churn rate, and hence only temporary market power for many market leaders in these industries.

## 5.5. Other indicators

58. A number of researchers have also argued that a reduction in competitive intensity is the cause of changes in measures such as corporate investment and the labour share of income. To the extent that these measures have changed, and that the level of competition would be expected to influence these measures, these might be taken as further indicators

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<sup>25</sup> These were defined as those with post-tax returns on capital of 15-25%, excluding goodwill. The same was true for firms with returns of over 25%, according to McKinsey (see Economist Magazine 2016).

that are at least consistent with a reduction in competitive intensity, though not conclusively so.

59. For example, Gutierrez & Phillipon (2017) argue that US corporate investment is down, and that reduced competition, as indicated by increased concentration and increased common ownership, is responsible. They use the growth of Chinese imports as a natural experiment and instrumental variables to argue that they have identified a causal relationship. This is consistent with the concerns of Calligaris, Criscuolo & Marcolin (2017) who suggest that reduced competitive intensity might reduce aggregate productivity (growth) by damaging technical efficiency, and worsening the allocation of inputs across firms and industries.

60. Meanwhile Rognlie (2015), Barkai (2016) and Autor et al (2017)<sup>26</sup> take the fall in labour's share of income that Piketty (2014) has documented, and attribute it to a reduction in competition, rather than to an inevitable increase in the share of income going to capital. This would suggest that a reduction in competitive intensity that increased profits was in part responsible for the increase in inequality that has been observed in the US, Germany, the UK, and beyond.<sup>27</sup>

## 5.6. Discussion

61. While there are differences in opinion on the magnitude of the change, there is little debate that mark-ups have increased in the US. The picture in the EU is however more mixed though this may reflect the fact that we currently only have estimates for changes in European mark-ups over the last ten years. In contrast, profits in both the US and the EU appear to have increased substantially over the last 30 years. Churn has also fallen in the US while there is no clear picture in Europe. Output growth has been weak in both Europe and the US against historic standards.

62. Increases in profits would not be possible in the absence of at least temporary market power, and so alongside increased mark-ups, increased concentration, disappointing output growth, and reduced churn would be consistent with a reduction in competitive intensity. Indeed, Summers (2016) considers different explanations for the near record levels of profits. Having discounted alternative logical possibilities, he suggests that increased market power is the likely culprit in the US.<sup>28</sup> In Europe, while concentration might not be increasing and churn is not moving, profits are increasing and mark-ups were already higher than those in the US were. The concerns that have been raised are therefore unsurprising in each case since market power of some form does appear to have increased and to have sustained. However, it remains the case that there

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<sup>26</sup> Autor et al (2017) find that there has been little change in the labour share of income at the unweighted average firm. However, they find that activity had shifted towards those firms with lower labour shares of income and that this had driven a decline in the labour share of income across all industries.

<sup>27</sup> The size of this effect is calibrated in Ennis, Gonzaga & Pike (2017).

<sup>28</sup> Possible explanations of high rates of return that he considers are as follows. Firstly, "that the risk associated with capital investment might have gone up and so higher rates of return could be simply compensating for higher risk rather than implying attractive investments." Secondly "that a heightened demand for liquidity and a shortage of Treasury instruments, perhaps created by quantitative-easing programs, has driven down bond yields, widening the spread between the rate of profit and these yields."

are potential explanations of this economy-wide evidence that are consistent with competitive innovation creating market power, rather than a lack of competition. In the next section we consider some of these explanations.

#### Questions

- Are there measurement concerns in any of these indicators?
- Is the European evidence any less concerning as the US evidence?
- What is the evidence on these indicators in other OECD countries?

## 6. What might be driving these changes?

63. If we accept that there are indications that market power appears to have increased then the question is whether this has been acquired through legitimate or illegitimate means. The potential causes of these changes can therefore broadly be categorised into those in which firms that have gained market power have earned it through greater efficiency, productivity and innovation, and those in which they have not.

### 6.1. Firms earning their market power (the superstar firms hypothesis)

64. The first possible cause is that the firms with market power might be earning that power through successive temporary extensions of their market power due to repeated success in innovating and distinguishing themselves from their rivals and/or cutting costs and improving their productivity. Autor et al (2017) describe this as the superstar firm hypothesis. This extension of temporary market power is, for example, not uncommon in pharmaceutical markets where firms often manage to string together pipelines of new treatments that each give rise to their own period of temporary (protected) market power. The development of such superstar firms might result in an increase in profits, mark-ups and concentration that does not appear to deteriorate over time, and would be perfectly consistent with there having been an ongoing and intense competition to obtain that next extension of market power. Indeed, the creation of these temporary market power positions might be facilitated by the greater scale, and new business models (e.g. platforms) that becomes possible as markets becoming increasingly digitalised and globalised.

65. One way of testing for this has been to assume that these superstar firms' performance is being driven by digitalisation and technology. This allows researchers to look at whether firm or sectors that are more automated or digitally intensive are driving these changes.

66. For instance Autor et al (2017) find that increases in concentration occurred in those industries where the labour share of income fell, which are likely to be the more automated firms. The Economist Magazine (2016) also finds that exceptional profits are concentrated in the technology sector. Similarly, Calligaris, Criscuolo & Marcolin (2017) find that mark-ups are higher in digitally intensive sectors, and work by Bessen (2017) suggests that increased concentration is associated with the extent of IT use within that sector (which might be expected to be associated with greater productivity).

67. However, it is perhaps notable that Calligaris, Criscuolo & Marcolin (2017) include financial services, which Shapiro (2017) found to be a key driver of increases in profitability (alongside healthcare) within their group of digitally intensive sectors. Autor et al. (2017) also find that increases in concentration (i.e. the reallocation of activity) are occurring across industries.

68. Another difficulty is the signs of discrepancy between concentration and mark-ups in the EU and those in the US. For example, Valletti et al. (2017) concludes that concentration is not increasing and Wambach & Weche (2018) conclude that in many European countries mark-ups are not rising in the way that they are in the US. Since the US and Europe have each experienced digitalisation more or less simultaneously, it is unclear why such a discrepancy would exist if digitalisation were driving the changes that have been observed.

69. There are also some apparent inconsistencies that make it difficult to evaluate this story. For example, Calligaris, Criscuolo & Marcolin (2017) find that mark-ups in highly digitalised industries have increased while those in non-digital industries have not. This does not appear to fit with the finding of Wambach & Weche (2018) that European mark-ups have not increased (nor European concentration according to Valletti et al. 2017), and that of Shapiro (2017) that profits in US financial and healthcare markets are increasing by perhaps more than the technology sector. Calligaris, Criscuolo & Marcolin (2017) report that their findings hold for the group of countries in their sample both with and without the US, though they do not provide a European or a country level analysis.

70. Therefore, if the superstar firm story is correct, and the evidence remains unclear, it is not a story that is limited to the technology giants, and their digital platform business models. Nor is there much sign that the changes are driven by those industries that are most exposed to globalised trade (such as manufacturing). This may suggest that globalisation has not played a big role in these changes, and that we should not focus too much on the market shares of platform firms.<sup>29</sup>

## 6.2. Firms not earning their market power

### 6.2.1. Merger and Antitrust Enforcement

71. An alternative explanation, which is not mutually exclusive to that set out above, is that firms are building, protecting and extending positions of market power through anticompetitive mergers, conduct or agreements. There is for example, some support for this in the ex-post-merger remedy assessments summarised by Kwoka (2013, 2015, 2017), and those conducted by the US FTC (2011) and the Dutch ACM in healthcare mergers which is one of the sectors that is identified as driving some of the trends discussed above (Kemp, Kersten & Severijnen, 2010 and Kemp, 2016). Blonigen and Pierce (2016) also find that US mergers had a bigger impact on increasing market power than they did in delivering efficiencies. However, the ex-post assessment of FTC merger remedies by Vita & Osinski (2016) found that 80% were successful in restoring or maintaining competition (though without reference to post-merger price changes).

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<sup>29</sup> Though of course it is likely to have had an impact on inequality through other routes such as the labour market.

### 6.2.2. Network effects

72. It is also possible that past innovations by superstar firms have created temporary market power that has then been perpetuated, not through anticompetitive merger, conduct, or agreement, but by network or cross-platform effects, which reduce the competitive constraints on what might otherwise be largely undifferentiated product. In these cases, the original innovation requires a reward of temporary market power, however the firm does not require an ongoing reward based on the existence of such network effects. Therefore, after a certain period of market power, in the same way as a patent is time limited, it may be proportionate and helpful for dynamic efficiency to introduce demand side remedies to improve competition. For instance, open API standards for data portability to ease switching between platforms.

73. There may also be a need to ensure that platforms are able to freely set prices to optimise demand on the different sides of their platform, and that where the competitive outcome is for one side to subsidise another, that the extraction of rent accumulated on one side of the platform, by users on the other side is not restricted. For example, in the past heavily subsidised smartphone handsets allowed consumers to extract much of the margin that mobile phone platforms earned by charging those outside their network for access to those consumers that were members of its network. Similarly, users of ad-funded platforms should be able to extract (up to the competitive level) the rents that platforms earn from advertisers. This might mean there is a need for a third party to create the systems by which users can receive payments (since platforms naturally have no incentive to invest in developing these). Furthermore, the rents from advertisers might be expected to be driven by externalities across the data of individuals (meaning the value lies in larger collections of data). In that case, to ensure competitive extraction can occur would require that individuals are able to easily coordinate their extraction of rent. For example by signing up to aggregators who are reimbursed for the ongoing provision of larger data collections (thus capturing more of the value of the externality) and who then distribute that amongst their members.

74. However, whether or not these possibilities are sensible it remains the case that the profit and concentration trends that have been identified are not confined entirely to sectors in which these platform/network effects are commonly found. Therefore, such remedies would not in any case be expected to address the wider trends that have been found in non-network industries.

### 6.2.3. Anticompetitive Regulation

75. Another important possibility is that those firms that have built market power, perhaps through innovation or efficiency, have capitalised on this success by engaging successfully in lobbying and rent-seeking for regulatory protection. For example, Bessen (2017) finds some evidence of this by looking at lobbying and the complexity of regulation. He finds these to be associated with greater profitability and suggests that regulation and campaign spending are responsible for an increase in mark-up of 1-2 per cent. Similarly, Égert & Vindics (2018) find evidence that suggests that in some countries, mark-ups in certain sectors are higher where the market is more highly regulated (as measured by OECD's Product Market Regulation indices).

76. A notable example here might be financial markets where, as Hellwig (2017) argued at a recent OECD roundtable, the expectation of bailouts created competitive distortions and large rents that increased profitability. The hypothesis that rents in financial markets play a key role in the observed trends is notably consistent with the

results of Shapiro (2017), Autor et al (2017), Valletti (2017), and Calligaris, Criscuolo and Marcolin (2017), who specify financial markets as a sector that has enjoyed particularly high growth in concentration, mark-ups and profits.

77. Outside of financial services, the CEA paper pointed towards possible anticompetitive effects of regulation of set-top boxes, and the DOJ has recently announced roundtable discussions focusing on the costs of anti-competitive regulations. OECD's own Competition Assessment toolkit has identified numerous examples of such restrictions in Greece (which Wambach & Weche, 2018, find to have particularly high mark-ups), Mexico, Romania and Portugal. Meanwhile countries such as Japan, India and China are now using the toolkit approach to examine their own rules and regulations for anticompetitive restrictions. These are expected to reduce anti-competitive regulatory barriers that protect incumbent firms. Indicators of regulatory barriers across the economy and in network, retail and professional services are provided in the OECD Product Market Regulation index, which show that there has been a general shift towards a reduction in regulatory barriers within OECD countries and key partners since 1998. This might suggest that if there has been a broad increase in market power, this has not coincided with an identified increase in anti-competitive regulation. However, the index does not explore the anticompetitive costs of subsidies and distortionary industrial policies, or other breaches of the principles of competitive neutrality.

#### *6.2.4. Improved Price Discrimination*

78. An additional possibility is that, as Stiglitz (2017) argues, firms may have invested in becoming more effective in exploiting their existing products through more effective price discrimination schemes. For example, digitalisation and the creation of big data might have increased the scope for such discrimination. The better exploitation of a firm's product is in this respect a difficult area. To the extent that it leads to rent-seeking investment in more or better discrimination, it is difficult to see much benefit to consumers who would have purchased in any case. In this sense, it might be compared to investment in advertising to create perceptions of product differentiation. In each case, they may have little welfare benefit in a static analysis, however to the extent that the scope for these profits are factored into investment and innovation decisions they can be expected to create important incentives for dynamic efficiency. Moreover, by serving some consumers who might otherwise not have purchased at all they may also be beneficial in a static analysis. Tackling these as an abuse of dominance therefore would seem unwise (OECD, 2016a). Instead, a more sensible approach would be to undertake market studies that use discrimination as an indicator of a possible underlying problem, and investigate the causes before attempting to remedy it, for example by improving transparency on when pricing discrimination is being used.

### Questions

- Which of these hypotheses appear credible, and which do not?
- What evidence would be useful to substantiate or dismiss these hypotheses?
- How likely is it that there are multiple explanations?

## 7. What might Competition Authorities do?

79. Valletti et al. (2017) suggest that this literature not only tells us something about the past decisions that have been made (some of which is reflected in the Kwoka's 2013 survey of ex-post evaluations), but that it also says something important about future decision-making. Firstly, high mark-ups mean that agencies should rely less on market shares in their decisions (and hence less on market definition), since concentration appears less necessary in order to deliver high profits. Secondly, agencies should make the investigation of exclusionary conduct a higher priority, since high mark-ups increase the incentive and in some cases increase the ability to exclude or raise rivals costs. Valletti & Zenger (2018) also make the point that mergers involving firms with high mark-ups cannibalise more profits and are therefore, all else being equal, more likely to cause competition concerns. They point out that given the increases in mark-ups that have been observed, the competitive effects of a 5-to-4 merger today may well be comparable to the competitive effects that an otherwise identical 4-to-3 merger would have had 30 years ago.

80. Shapiro & Hovenkamp (2018) support proposals that the structural presumption set out in *United States v. Philadelphia National Bank*<sup>30</sup> be strengthened by being codified in a bill that would prevent it from being undermined by the courts. This structural presumption means that a merger which “produces a firm controlling an undue percentage share of the relevant market, and results in a significant increase in the concentration of firms in that market is so inherently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects.” The presumption is therefore rebuttable, but shifts to the merging parties the burden of showing that competition in the market will not be diminished.

81. The undue percentage in the case was 34-36 percent with a HHI of 2000-2100 and so would have been in the “highly concentrated” region of the 1982–1992 Merger Guidelines. However, the 2010 Merger Guidelines raised the concentration level required for applying a rebuttable anticompetitive presumption up to a post-merger HHI level of 2500 and an increase in the HHI of 200.

82. Shapiro & Hovenkamp (2018) identify that a bill might also go further and require ‘clear and convincing evidence’ to rebut the structural presumption, and that the government should be entitled to the structural presumption if the merger causes the requisite increase in concentration in any properly defined relevant market. They go onto express support for: a) reducing the threshold for challenging a merger from a

<sup>30</sup> *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321 (1963)

“substantial” lessening of competition to a “material” lessening of competition; b) requiring post-merger reporting for transactions resolved through a consent decree; and c) establish an “Office of the Competition Advocate” to listen to various interest groups and prepare reports about areas meriting antitrust investigation.

83. Wright & Ginsberg (2016) disagree and argue that the structural presumption is almost the last vestige of pre-modern economics still embedded in the antitrust law. They note that the agencies abandoned the 30 percent presumption in the 2010 Horizontal Merger Guidelines, though they continue to sometimes rely upon it in court. They therefore argue that the presumption “ought to go the way of the agencies’ policy decision to drop reliance upon the discredited antitrust theories approved by the courts in such cases as Brown Shoe, Von’s Grocery, and Utah Pie.”

84. Salop (2015) argues the need for the structural presumption to be supplemented by other rebuttable presumptions that would trump the structural presumption in certain circumstances. For example, he suggests adopting a rebuttable presumption based on GUPPI as well as others based on high mark-ups, the acquisition of a maverick and there being a history of collusion.

85. Salop & Baker (2015) suggest that the adoption of more permissive antitrust rules during the past quarter-century is likely to have increased the prevalence of market power, and hence to have contributed to rising inequality.<sup>31</sup> To address this rising inequality they argue for maintaining the consumer welfare standard for antitrust analysis. but that agencies should receive more resources, prioritise cases of harm to middle and lower income consumers, and design remedies primarily to benefit less advantaged consumers. They also argue that an exploitative abuse of dominance offence should be created in the US to mirror that which applies in Europe, that regulatory impediments to competition should be removed; and that the scope of uncertain intellectual property rights should be clarified by reducing their breadth.

86. One tried and tested approach is that of the UK, where the Competition Commission (predecessor of the CMA) was in 2002, given the ability to conduct market investigations and require divestments or other remedies where it identified that excessive concentration was harming consumers. This has rarely led to divestments, though it did for example result in the break-up of the airports monopoly in 2009 which ex-post assessment suggested had created benefits for consumers of £870 million by 2020 (CMA, 2016).

87. Concentration was also a concern in Israel where an anti-concentration law was passed in 2013. However, rather than addressing the structure of markets, the provisions of the law largely focused on reducing the pyramid structure of Israeli firms. The exceptions are the provisions of the law that require the government to consider market concentration when awarding licences and contracts.

88. Within existing frameworks, a sensible option might be to develop further the market scanning intelligence of authorities so they can monitor concentration levels, profitability, mark-ups and other measures at a market level. This might start with those markets that have been defined during the course of casework, and build out to include other important markets. This would allow the authority to obtain a view on what is happening and hence to identify where there might be problems, or indeed to myth-bust when there is in fact no increase in concentration or profits in well-defined markets.

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<sup>31</sup> See also Ennis, Gonzaga & Pike (2017) on the impact of market power on inequality.

**Questions**

- What other options are there for those competition authorities that wish to address changes in competitive intensity (or in concentration)?
- What are the merits and/or risks of the options set out above?

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