

Resolution Foundation

BRIEFING

Is everybody concentrating?

*Recent trends in product and labour market
concentration in the UK*

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Summary

Worries about the state of modern capitalism abound from politicians across the political spectrum, from Michael Gove and Jesse Norman to John McDonnell and Ed Miliband. This should be no surprise, with the UK still emerging from one of the deepest recessions and squeezes on living standards in modern history. At least part of the story told by the many of the critics of our economy is that it has become more dominated by a few big firms at the expense of other businesses, consumers and workers.

This concern is in part a response to the notable rise of (American) tech giants, as well as some high-profile international takeovers of UK firms. It also reflects an extensive literature in the United States which records a move towards greater market concentration, with links to higher profits and lower wages. But there is very little evidence of whether the concern is an accurate reflection of our wider economy here in the UK, with the last detailed whole-economy study of market concentration published in the mid-2000s. Yes, tech giants are becoming an increasing part of our lives – and finding themselves on the front pages (sometime for the wrong reasons) – but it is a different question whether the UK has shifted towards having a more concentrated or a less competitive economy.

The lack of UK research is in part a result of data availability, but may also reflect the fact that much of our competition regime's policy and enforcement work is managed by the EU. Brexit may very well change this, adding to the imperative for an up to date understanding of how concentrated the UK economy is.

This paper aims to provide that understanding via a thorough analysis of trends in concentration across our economy. It first asks how concentrated our product markets are in terms of the revenue share of the most significant UK firms, before turning to an area that has recently gained more emphasis in discussions – the concentration of employment among the biggest employers.

We find that the Britain's 100 biggest firms now account for nearly a quarter (23 per cent) of total revenue across British business, up by 25 per cent since 2003-04. We also analyse concentration at a lower level, looking across around 600 sub-sectors of the UK economy, and find that on average bigger firms account for a larger share of sub-sector revenue now than in the early 2000s – although the increase at the sub-sector level has been smaller, and is more clearly tied to the impact of the financial crisis. We find that, on average, the five biggest firms within each sub-sector accounted for 39 per cent of sub-sector revenue in 2003-04 and now account for closer to 43 per cent – a smaller increase, at 9 per cent, than the change in the CR100. A rise in concentration is also visible when measured by the Herfindahl–Hirschman Index, a statistic that focuses on the changing market share of all businesses in each sub-sector instead of just the very biggest businesses.

Behind these headline results of higher concentration today compared to early 2000s levels, there are distinct phases: concentration in the UK rose by a small amount in the 2000s, increased sharply during the financial crisis and fell back more recently. Whether more recent falls are a one off post-crisis effect or a trend remains to be seen.

As well as variation over time, there has been very significant variation across sectors (for detail of the change in every sub-sector see Annex); concentration has fallen in parts of the economy but has increased in the majority of sub-sectors (accounting for the majority of revenue) in the UK economy. Some sectors with particularly large concentration increases include general retail (i.e. our super-markets) within which the top five businesses accounted for 74 per cent of revenue in 2015-16, up from 62 per cent in 2003-04. Similarly, in gambling and betting activities the largest 5 businesses accounted for 68 per cent of sub-sector revenue in 2003-04 and accounted for a notably larger 85

per cent in 2015-16.

Higher average concentration has been driven not just by sub-sectors becoming more concentrated but also by highly concentrated sub-sectors, such as ‘distribution of electricity’, accounting for a larger share of the overall economy.

Our research also sheds new light on how labour market concentration has evolved since the early 2000s. It might be expected that as product market concentration has increased, so will have labour market concentration as the biggest firms increase market share and employ a larger proportion of workers. However our results show that the opposite has happened, with employees slightly less concentrated among the biggest employers now than in 2003-04. The average share of employees working for the top five firms in each sub-sector has fallen from 31 per cent then to 28.5 per cent in 2015-16. This fall in labour market concentration undermines speculation that growing labour market power of a few firms could be part of the cause of recent weak wage growth in the UK, although it remains concerning that labour market concentration is much higher for low-paid workers and in low-paying sectors such as retail.

The divergence between product markets becoming more concentrated and labour markets becoming less so presents something of a paradox. More recently the trends have been moving in-line with one another, but over the time period as a whole they have not. There are a range of possible explanations for this paradox, including the prospect that larger firms have become more likely to outsource some of their functions than smaller firms or that greater global trade may have changed the relative size of the largest UK firms by offering more opportunities to realise economies of scale to globally competitive firms.

We provide new analysis suggesting that part of the reason for these divergent trends is that as big firms have gained market share they have done so by making use of a relatively small amount of labour. More specifically, we find that the big firms in sub-sectors that have become more concentrated have pulled away from their smaller rivals with relatively high growth in ‘turnover per employee’. It does not follow automatically that these firms have higher profit levels than other firms, although that would be consistent with other recent research from the IMF showing that margins have risen for the biggest firms in the UK and other advanced economies.

In these sectors, if revenue has become more concentrated in firms with higher revenue per employee ratios that raises the prospect that either labour share within that sector may fall or (if workers in the leading firms are able to secure higher wages than in smaller firms) wage inequality may rise within a sector as it becomes more concentrated. Either possibility would be relevant to policy makers, and the former would be consistent with David Autor and colleagues’ so called “superstar firms” thesis which showed that the US trend of low labour share firms accounting for an increasing share of output is most pronounced in those industries in which large increases in concentration have taken place.^[1]

[1] D Autor et al., The Fall of the Labor Share and the Rise of Superstar Firms, Centre for Economic Performance, May 2017

The results of this analysis have several concrete lessons for policy makers:

- » *The increase in product market concentration, albeit with falls in recent years, should encourage a renewed focus on competition policy in the UK, even without the further imperative of Brexit. These trends are not principally about tech companies that dominate the headlines but wider shifts. These might be more structural in nature (and linked, for example, to the increasing complexity of being a leading firm in a globalised economy) or more cyclical (with post-crisis effects that will continue to unwind in the years ahead). Monitoring and investigating these trends further to determine the balance between longer-term or crisis-related effects will be important.*
- » *Worries about growing monopsony or labour market power of a few big firms driving recent weak pay growth in the UK appear misplaced, although its level may still be a concern and the lack of employment options is more of an issue in low paying sectors.*
- » *The fact that labour market concentration did not increase alongside the rise in product market concentration should be a subject of further study, potentially making it matter more which firms workers work for and/or putting pressure on the labour share within sectors within which revenue became more concentrated.*

Debates about the state of 21st Century British capitalism have grown, with worries about the power of a few big firms at their core

It is not hard to be anxious about the state of capitalism in the UK today. The economy is growing and employment at record highs but the country is still emerging from a prolonged living standards squeeze. Earnings remain significantly below their pre-crisis peak and incomes have only just returned to their late 2000s high. Living standards in the UK are just 2 per cent higher today than they were at the onset of the 2008 recession, in comparison almost 10 years on from the 1990s and 1980s recessions living standards were around 30 per cent higher than when the respective downturns first began.^[2]

Both Labour and Conservative politicians have found reason to discuss the ‘failed’ model of UK capitalism of late;

The engine of growth appears to be malfunctioning. The transmission mechanism from increasing GDP to rising living standards appears to have broken down... The machine is broken, and everyone knows it.
John McDonnell, speech, IPPR conference, November 2017

I want to turn to one of the greatest challenges of our times ... a challenge the Prime Minister has so clearly identified and taken on – and that challenge is the failure of our current model of capitalism to deliver the progress we all aspire to.
Michael Gove, speech, Policy Exchange, June 2018

The nature of any failure of our capitalism is obviously hotly contested, but a common focus in many such discussions is on questions of corporate power and the extent of it. Very visible innovation has meant that new, and huge, tech companies becoming integral parts of our lives in ways that are almost revolutionary in a relatively short space of time – Facebook had just 1.4 million active users in the UK in 2007^[3] and is now estimated to have almost 35 million.^[4] The dominance, and influence, of these technology companies matters in of itself but also drives wider changes, including being part of the justification for the recently proposed merger between Sainsbury’s and Asda.^[5] The scale of some of these tech firms sits alongside wider concerns about whether other technological shifts, such as AI, may benefit a small number of firms at the expense of the many.

Added to this, international takeovers of UK firms, from Cadbury to GSK, have also featured prominently in the public debate about whether there is a move towards more dominant businesses and who the winners and losers might be from such a shift.

These trends have meant that as well as worries about stagnant living standards, a somewhat shared narrative across party lines has grown up, identifying a key problem with 21st Century capitalism as being the increased power of a few big firms at the expense of consumers, workers and smaller firms. This is not totally new from the left of British politics, but is now a significant part of some Conservative thinking:

“The market system from which global prosperity has emerged over two centuries is now under attack from all sides, its basic legitimacy assailed

[2] Real Household Disposable Income (RHDl) per capita

[3] Jemima Kiss, Facebook users soar to 3.5m, Guardian, 23 May 2007

[4] More Than Half of UK Population Will Log on to Facebook This Year, www.emarketer.com, 25 February 2016

[5] N Berg, Sainsbury’s-Asda merger shows ‘Amazon effect’ in action, The Grocer, May 2018

from the right by critics of unfair competition and crony capitalism”
 Jesse Norman MP, How Adam Smith would fix capitalism, Financial Times,
 June 2018

Yet rarely, however, in the UK do worries about the dominance of some larger firms and the competitiveness of our capitalism extend to an analysis of it. Such an analysis is key, not only to knowing whether the popular narrative reflects the reality of our economy but also, if it does, to deciding where that might take us. It is this analysis that this paper aims to contribute to.

One way into an understanding of competition in the UK is through analysis of concentration.^[6] Markets that are more concentrated in the hands of a smaller number of firms will often, though by no means always, be those markets in which competition is weakest.^[7] Just as competition can affect living standards through a variety of channels, so can concentration. Potential impacts would include:

- » *Prices.* All else equal, prices should be lower in markets that are less concentrated and where firms lack price setting power.
- » *Wages.* Concentration can effect supplier as well as final consumption markets. While this is normally discussed in the context of input products (such as the prices supermarkets pay farmers) it is also relevant to how much firms pay for labour. Where a small number of employers dominate a labour market they are able to exercise monopsony power to pay lower wages. In contrast in labour markets with low levels of labour market concentration, employees have relatively more power over the level of wages that they can demand as their options for alternative employment are greater.
- » *Productivity.* These static potential effects of concentration may, in some circumstances, be reinforced by dynamic effects. In markets with lower concentration businesses should have a greater incentive to innovate in the face of pressure from rival firms – leading to a combination of lower prices and higher wages. More widely, the efficient allocation of resources between industries is also a key driver of productivity growth and, as HM Treasury have argued, effective allocation “depends on competitive, dynamic markets which push firms to make the best use of resources”.^[8]

Discussion of international evidence has not been matched by analysis of the UK position

Despite a clear theoretical link between concentration and economic outcomes, there has been very little research over the past decade looking in detail at concentration across the UK economy. While politicians say power is too concentrated in a handful of firms it is not even clear if anyone knows the answer to the most basic of questions: has concentration in the UK increased?

Political rhetoric here in the UK and the thoroughly investigated experience across the Atlantic (see Box 1) might lead many to conclude that big firms have become more dominant here in the UK too.

[6] Theoretically the best way into whether a market is competitive (i.e. whether firms are able to exercise market power or not) would be to see if a firm can maintain prices above marginal cost of production. But such an assessment would require data on both marginal costs and market prices for individual firms, which is not available in an economy wide form.

[7] Although a highly concentrated industry need not be an uncompetitive one. For example, a market with a small number of very large businesses would be highly concentrated, but it could also be competitive if consumers are able to easily switch between providers of goods and new entrants are able to enter the market at low cost.

[8] HM Treasury, Managing fiscal risks: government response to the 2017 Fiscal risks report, July 2018

i Box 1: Research into product market concentration, and its effects, in the US

Recent research in the US has provided a rich analysis of shifts in concentration and the links to the kinds of outcomes mentioned above. We know that there has been a broad-based increase in concentration in the US over recent decades. The White House Council of Economic Advisers found that concentration had increased in 10 of 13 high-level sectors of the US economy between 1997 and 2012, with particularly large increases in retail trade and transportation & warehousing sectors.^[1]

In a similar vein, in a 2016 study Gustavo Grullon et al find that three quarters of US industries have become more concentrated since the mid-1990s, and show that firms in these industries have enjoyed higher profit margins – suggesting that rising concentration has led to declines in competitive pressure.^[2] This finding of increased mark ups has been reinforced by recent work by IMF researchers, which looks at trends across developed economies.^[3]

Further still, not only has the evidence of increased concentration been made clear but a feed-through from

higher concentration to poor outcomes for workers has also been explored. The IMF work noted above finds a relationship between higher mark-ups and lower labour share within firms. David Autor et al have argued that falls in the labour share in the US can, in part, be explained by low labour share firms accounting for an increasing share of output and that this shift is most pronounced in those industries in which large increases in concentration have taken place.^[4]

Related to this, and to the heated US debate around increases in the minimum wage, has been the publication of a growing number of studies that have shown how concentrated labour markets at a geographical level (where a few large firms dominate hiring in an area) are associated with lower pay levels for workers.^[5] This challenge of monopsony, where buyers have a relatively powerful position in a market, has been shown to be linked to various labour market outcomes in the US.^[6]

[1] Council of Economic Advisers, Benefits of competition and indicators of market power, April 2016

[2] G Grullon et al, Are U.S. industries becoming more concentrated, June 2016

[3] Díez, F, D Leigh, and S Tambunlertchai (2018), “Global Market Power and its Macroeconomic Implications”, IMF working paper 18/137.

[4] D Autor et al., The Fall of the Labor Share and the Rise of Superstar Firms, Centre for Economic Performance, May 2017

[5] J Azar et al., Labor Market Concentration, The National Bureau of Economic Research, December 2017

[6] Council of Economic Advisers, *Labor market monopsony: Trends, consequences, and policy responses*, October 2016

In contrast to the US experience, in the UK the last detailed and economy-wide study of concentration uses data from 2004.^[9] Over a decade has passed since then, a decade that includes the financial crisis. It is highly likely that a lot has changed in the meantime.^[10]

That academics and policy analysts were not focused on this area of research in recent years may be understandable, reflecting the fact that research on concentration across the whole economy may feel less urgent in a world with a settled competition policy regime. When mergers happen, or when markets that are concentrated look to be getting more so, authorities can and do carry out narrowly focused and in-depth analyses of particular markets. For example, the Competition and Markets Authority recently carried out an investigation into the UK’s energy market, its findings providing some underpinning for the government’s recent energy price cap.^[11]

[9] S Mahajan, Concentration ratios for businesses by industry in 2004, Office for National Statistics, October 2006

[10] The Department for Business, Energy and Industrial Strategy have published high level statistics on concentration covering the early post-crisis period which can be found at: www.gov.uk/government/collections/beis-occasional-statistics

[11] Competition and Markets Authority, Energy market investigation final report, June 2016

But, not only has the UK's economy experienced a large, painful, shock in the form of the financial crisis in recent years it is also heading for another significant change, in the form of our exit from the European Union. Depending on the end-state agreed as part of the negotiations between the UK and the EU, the UK's law makers and regulators may find themselves taking back control of significant parts of our competition policy.

Our exit from the EU means it's more important than it has been for a long time that policy makers understand the context within which any reformed competition policy regime will sit. Providing some of this context and important information about the concentration of power in British capitalism is the task of the remainder of this briefing note. In addition to a detailed study of changes in product market concentration that are the most traditional focus of work in this area, we also detail trends in labour market concentration and investigate how these two measures of market power interact.

There are a range of ways of approaching the measurement of concentration

Analysis of concentration, both of product markets or labour markets, can be carried out using a variety of metrics and at different levels. Here we look across the economy as well as at the lowest level possible in the data – the sub-sector.^[12] In this note we use five different metrics, with each providing an answer to a slightly different question.

First, we use the combined revenue share of the largest 100 firms in the economy to answer the question: **do big firms dominate the economy as a whole?** This metric, which we call here the Concentration Ratio 100 (CR100) is used as a summary statistic to show the extent to which the very biggest firms have or have not come to represent a bigger or smaller share of our economy over time.

Second, we also ask: **do big firms dominate sub-sectors?** In answering this question we use three different Concentration Ratios (CRs), the CR5, CR10 and CR20. These are the sum of the turnover shares of the largest 5, 10 or 20 businesses in a sub-sector.

Finally, we seek to answer a related, but slightly broader question: **how concentrated are sub-sectors?** For this we use the Herfindahl-Hirschman Index, often referred to as the HHI. This is the sum of the squared market share of all businesses in a sub-sector and has a minimum value of almost 0 and a maximum value of 10,000 – possible only if a market is entirely composed of one business. This takes account of the distribution of business size across sub-sectors rather than simply focusing on the very largest businesses.

As well as calculating the HHI and CRs at a sub-sector level we also calculate higher-level summary statistics by calculating a weighted average for industries (such as manufacturing or construction) and the economy as a whole. In order to avoid disclosing information about individual businesses we have excluded from any sub-sectoral analysis those sub-sectors with 20 or fewer businesses. These will be some of the most concentrated sub-sectors – and so it is likely that the 'true' value of concentration is even higher than that presented here.

In our economy-wide measures we also exclude all businesses in finance related sub-sectors or related to the wholesale of fuels. Revenue in these sub-sectors suffers from measurement issues (in the case of finance), is highly volatile (in the case of fuels) and has outsized effect on our

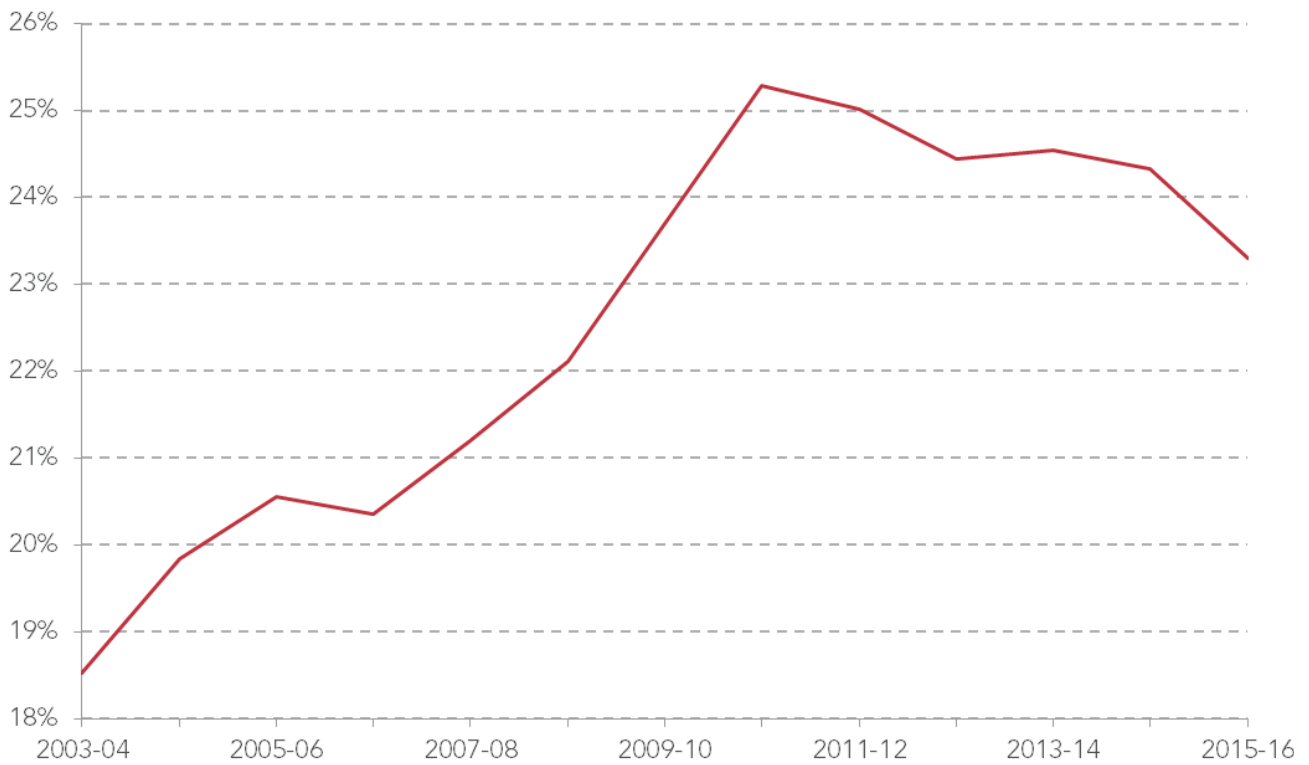
[12] A sub-sector of businesses is defined here as those businesses operating with the same Standard Industry Classification (SIC) code, at the 5-digit level. This will not fully map on to the markets within which businesses operate, but will provide a close approximation. Some markets may stretch across multiple SIC codes and others may be smaller than a SIC code. Further still, some businesses that are competing in the same market may be assigned different SIC codes to one another and some big businesses may compete in multiple markets but only with one SIC code.

headline measures.^[13] Removing all of these sub-sectors acts to reduce the level, and change in, concentration.

There is evidence of increasing concentration before and during the financial crisis

The combined revenue share of the largest businesses is shown in Figure 1.^[14] Over the past 12 years there has been a significant increase in the CR100, from 18.5 per cent in 2003-04 to 23 per cent in 2015-16, an increase of a quarter. The share of the top 100 firms has been declining in recent years, but at a much slower rate than it increased in the years around the financial crisis – between 2003-04 and 2010-11 the CR100 increased by 36 per cent.

Figure 1: CR100, combined revenue share of the largest 100 businesses across the economy, 2003-04 to 2015-16



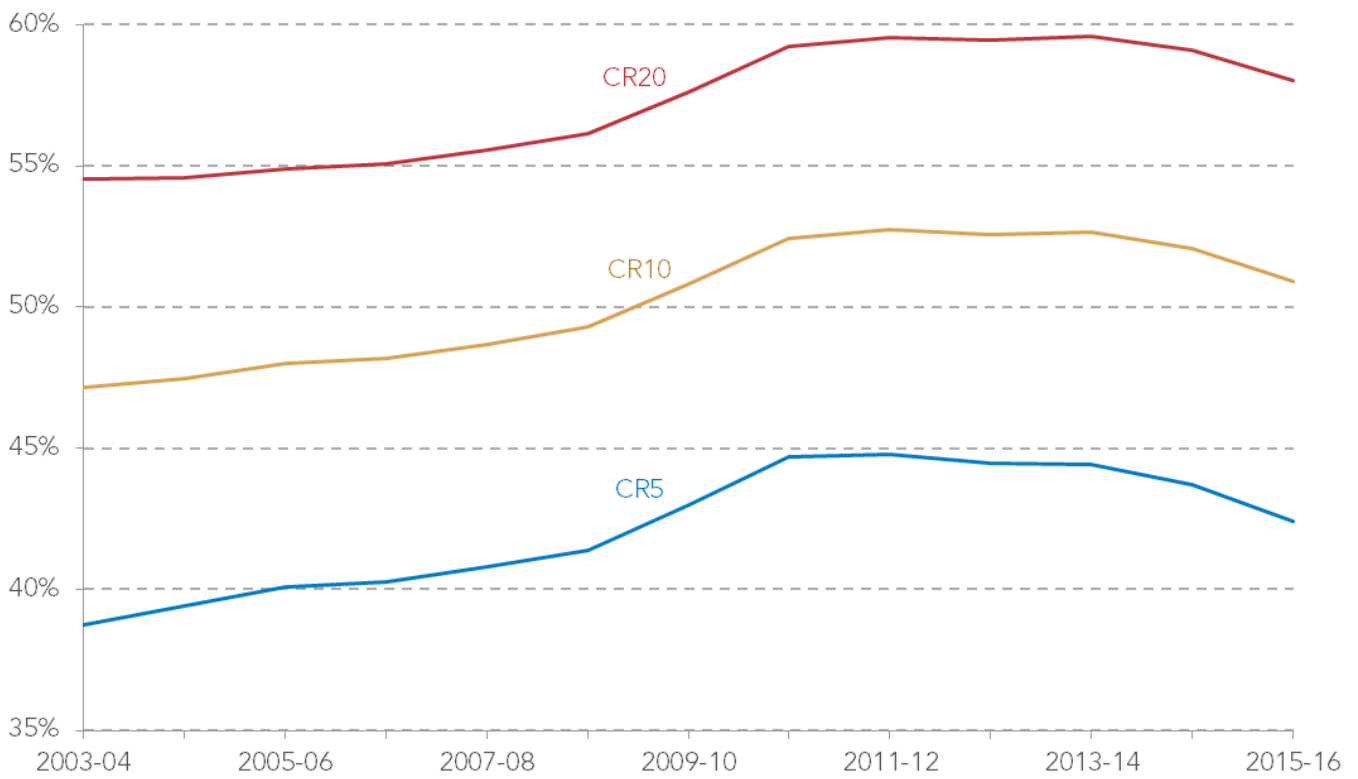
Notes: Two-year averages of CRs across all non-finance and non-majority public sector employment sub-sectors of the UK economy
 Source: RF analysis, Business Structure Database, ONS

The trend towards big businesses accounting for a larger share of revenue is reflected in changes at the sub-sector level too. Figure 2 shows the weighted averages of the CR5, CR10 and CR20 across an average of 608 sub-sectors of the economy.

[13] We have also excluded businesses working in sub-sectors dominated by public sector employment. These sub-sectors have very different competition and wage dynamics than the private sector as a whole.

[14] The measures presented in this report are, with the exception of those in Box 3, constructed from analysis of the Business Structure Database (BSD), this is a snapshot of the government’s database of all businesses in the UK – the Inter-Departmental Business Register (IDBR). Turnover data on the IDBR come from a variety of sources, including ONS surveys and VAT data, they are not updated annually. For this reason there is a lag in the data extracted from the IDBR. We don’t correct for this lag here but instead show data by extraction dates.

Figure 2: Weighted average of sub-sector product market concentration ratios, 2003-04 to 2015-16

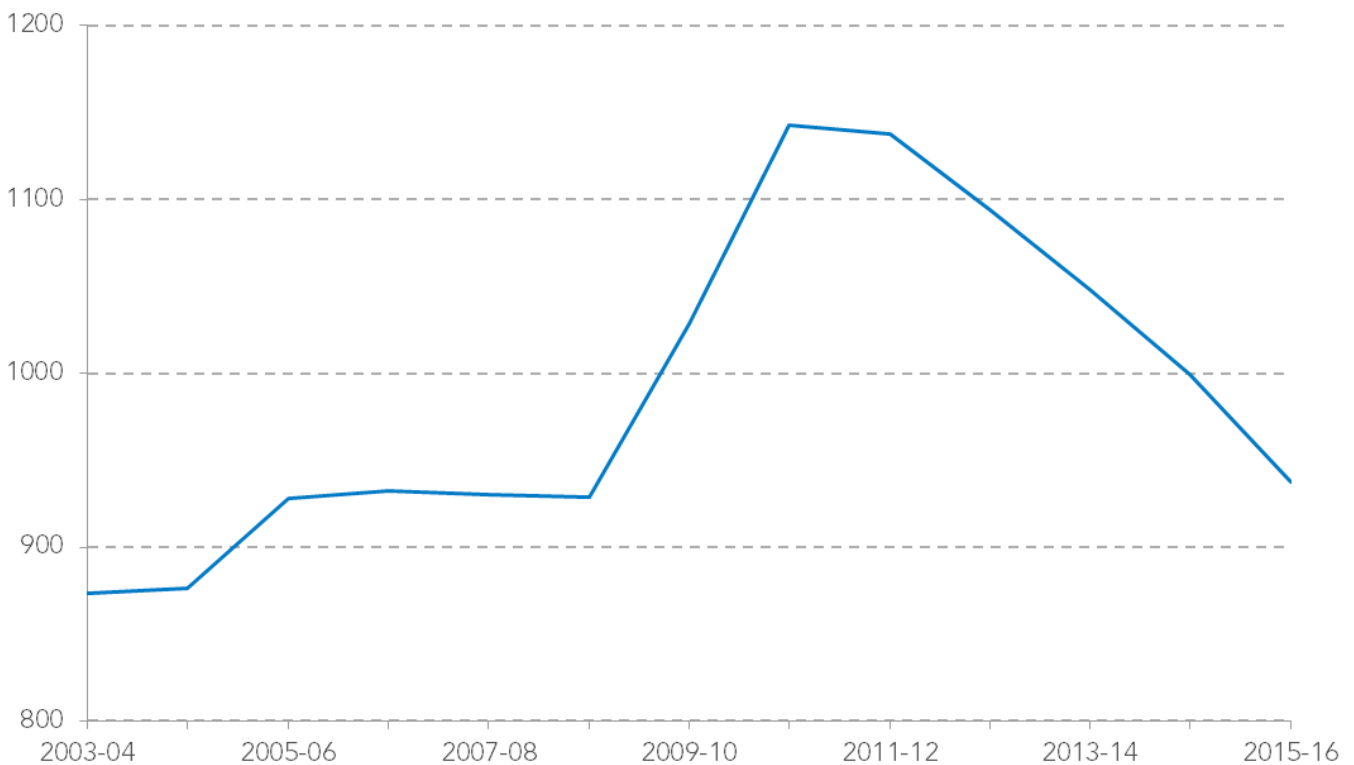


Notes: Two-year averages of CRs across all non-finance and non-majority public sector employment sub-sectors of the UK economy
 Source: RF analysis, Business Structure Database, ONS

Although a similar shape as the CR100, the magnitude of the change in these weighted averages is smaller. The CR5, for example, has increased from 39 per cent in 2003-04 to 42 per cent in 2015-16. If we include more firms, and look instead at the CR20, it has risen from under 55 per cent in the mid-2000s to an average of 58 per cent in 2015-16.

The HHI measure of concentration also rose slowly pre-crisis, increased sharply during the crisis years, but has fallen back quickly too. Though still higher than in the early 2000s, the increase in the HHI over the whole time period is significantly smaller than other measures of concentration. The average value of the HHI between 2003-04 and 2015-16 is shown in Figure 3.

Figure 3: Weighted average of sub-sector product market HHIs, 2003-04 to 2015-16



Source: RF analysis, Business Structure Database, ONS

Notes: Two-year averages of HHIs across all non-finance and non-majority public sector employment sub-sectors of the UK economy

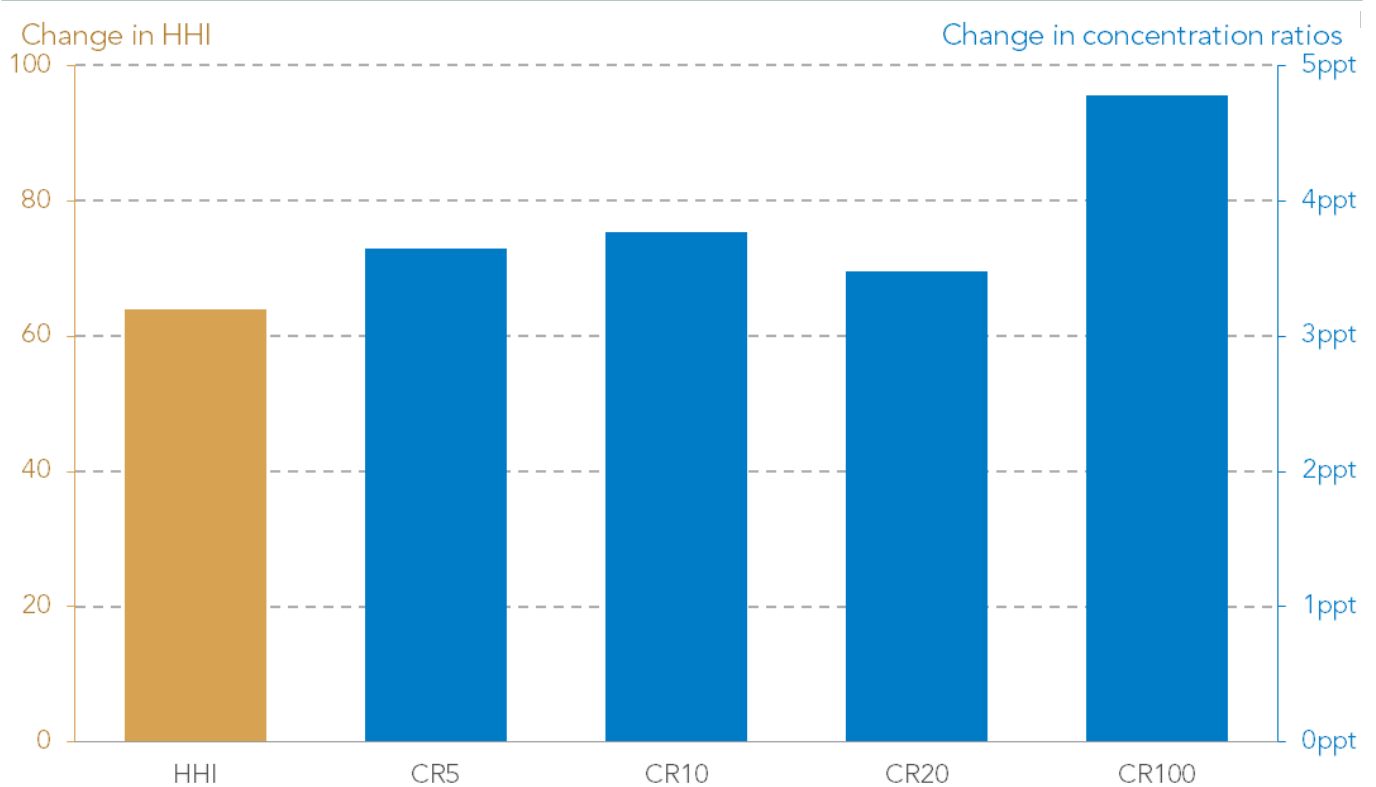
The HHI is clearly more volatile in the crisis years than CRs, for example the HHI increased by 24 per cent between 2010 and 2011, at the same time as the CR5 increased by 6 per cent. In part, this is a result of the HHI measuring trends across the whole of each sub-sector and not just how the dominance of the biggest businesses has changed.

But, these large differences are also a product of the way in which rising concentration is not only driven by sub-sectors becoming more concentrated, but can also result from already highly concentrated sub-sectors growing in size.

Any change in the size of concentrated sub-sectors has a much larger effect on the overall average of the HHI than the CR5 due to the HHI increasing exponentially in contrast to CRs which increase linearly. For example, the HHI for the sub-sector at the 90th percentile (when sub-sectors are ranked in ascending order according to concentration) is 240 per cent higher than the HHI recorded at the 60th percentile. In contrast, the CR5 of the sub-sector at the 90th percentile is just 45 per cent higher than that of the sub-sector at the 60th percentile. So, as concentrated sub-sectors grew and shrank in size in recent years their impact on the movement in the average HHI was greater than their impact on average CRs.

Overall, however, despite the differences in magnitude of trends in the years around the financial crisis the evidence at this headline level points in one direction: concentration has increased since the early 2000s, and in fact as detailed in Box 1 these increases are even larger if the sub-sectors relating to the wholesale of fuels are not excluded. Figure 4 summarises the changes in our five key metrics between 2003-04 and 2015-16.

Figure 4: Change in HHI and concentration ratios, 2003-04 to 2015-16



i Box 2: The outsized impact of wholesale of fuels sub-sectors

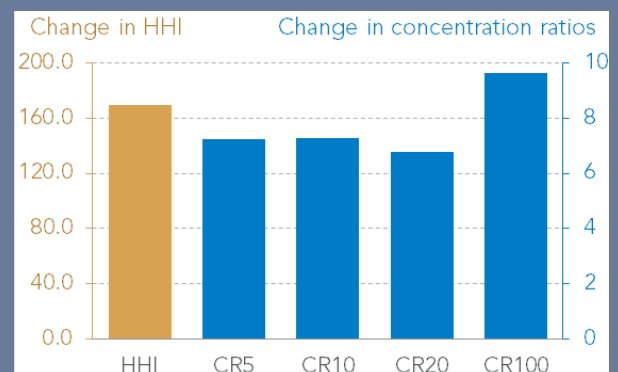
In order to present as accurate a picture as possible of concentration trends across the whole economy we have, as outlined at the start of this paper, excluded businesses from certain sub-sectors of the economy from the analysis.

Along with sub-sectors in which public-sector employment is dominant and those in the finance industry, we have also excluded any businesses that operate in the two 'wholesale of fuels' sub-sectors. The CR5 across these two sub-sectors was 84 in 2015-16 compared to an average among all other sub-sectors of 42, so their inclusion would act to significantly increase the level of concentration.

Including 'wholesale of fuels' would also have the effect of increasing the change in concentration over this time period as these highly-concentrated sub-sectors grew substantially between 2003-04 and 2015-16. Driven by increases in the oil price, their share of total revenue increased from 3 per cent to 11 per cent. This very large compositional change acts to more than double the increases in concentration over the same time period when these sub-sectors are included, this is depicted in Figure 5.

This very large effect is the reason for exclusion of these sub-sectors. Although there are other sub-sectors in the economy with revenue closely linked to fluctuations in the oil price, none are as big – or have grown as much – as those associated with the wholesale of fuels.

Figure 5: Changes in HHI and concentration ratios with wholesale of fuels included, 2003-04 to 2015-16



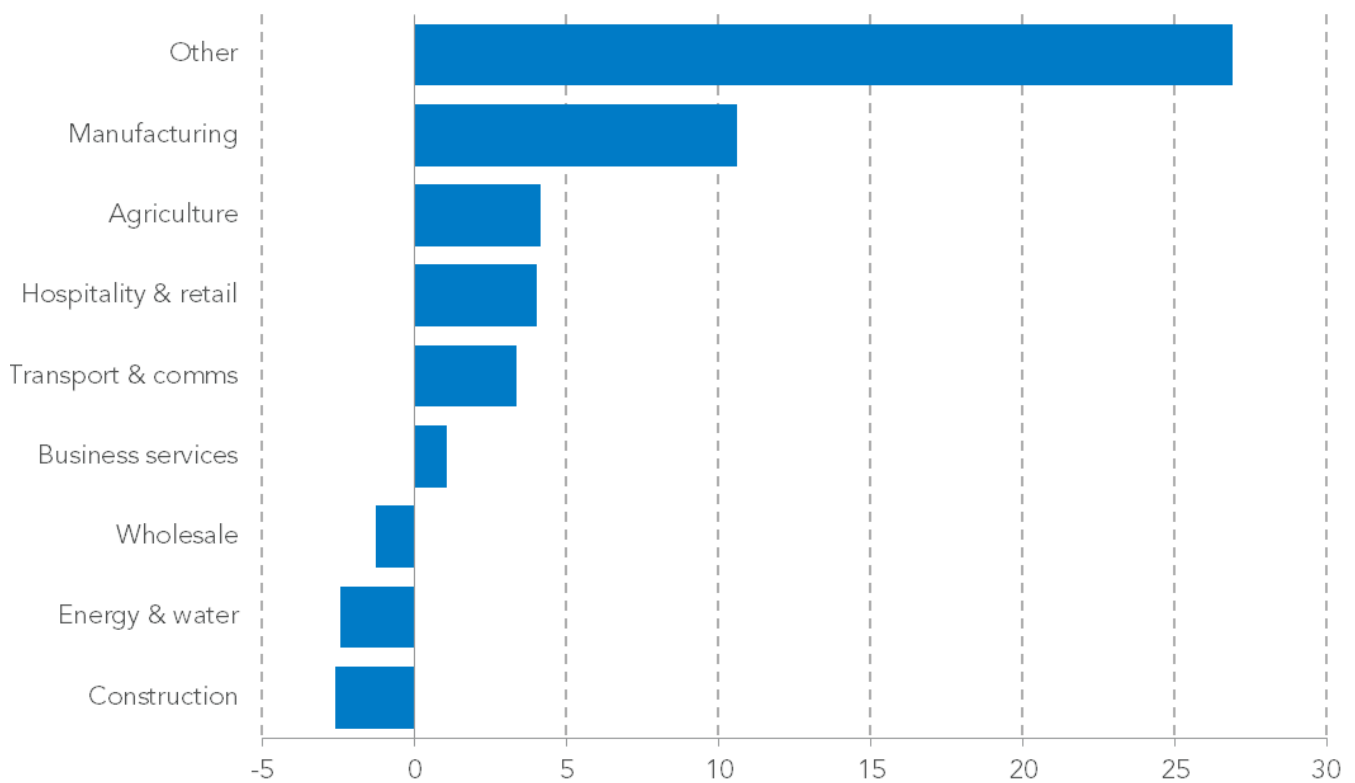
Source: RF analysis, Business Structure Database, ONS

Behind these economy wide measures, though, is a lot of change – and a lot of variation, with some sectors driving a lot more of the overall changes than other; it is to these effects that this report now turns.

The increase in concentration is broad based across sectors of the economy, but averages mask wide variation for sub-sectors

We can look one level lower than our economy wide measures by analysing how concentration has changed within each industry. In doing so, we find that concentration has increased in two-thirds of industries, as Figure 6 shows.^[15]

Figure 6: Change in product market CR5, by industry, 2003-04 to 2015-16



Source: RF analysis, Business Structure Database, ONS

The increase in ‘Other’ is much larger than in other industries, this is driven by the gambling sub-sector, a highly concentrated sub-sector that has become even more concentrated at the same time as growing substantially; compositional effects such as this – where changes in revenue share *between* rather than simply *within* industries have a large effect on concentration – are an important driver of the overall increase.

[15] As previously noted businesses in the finance and wholesale of fuels sub-sectors as well as those where the majority of people are employed in the public sector are excluded.

Highly concentrated sub-sectors are growing in size

Over the decade and a half covered by the analysis in this note some sub-sectors have grown significantly, while others have shrunk. Changes to the relative size of sub-sectors matters for any aggregated measure of concentration, as the example in Table 1 below makes clear.

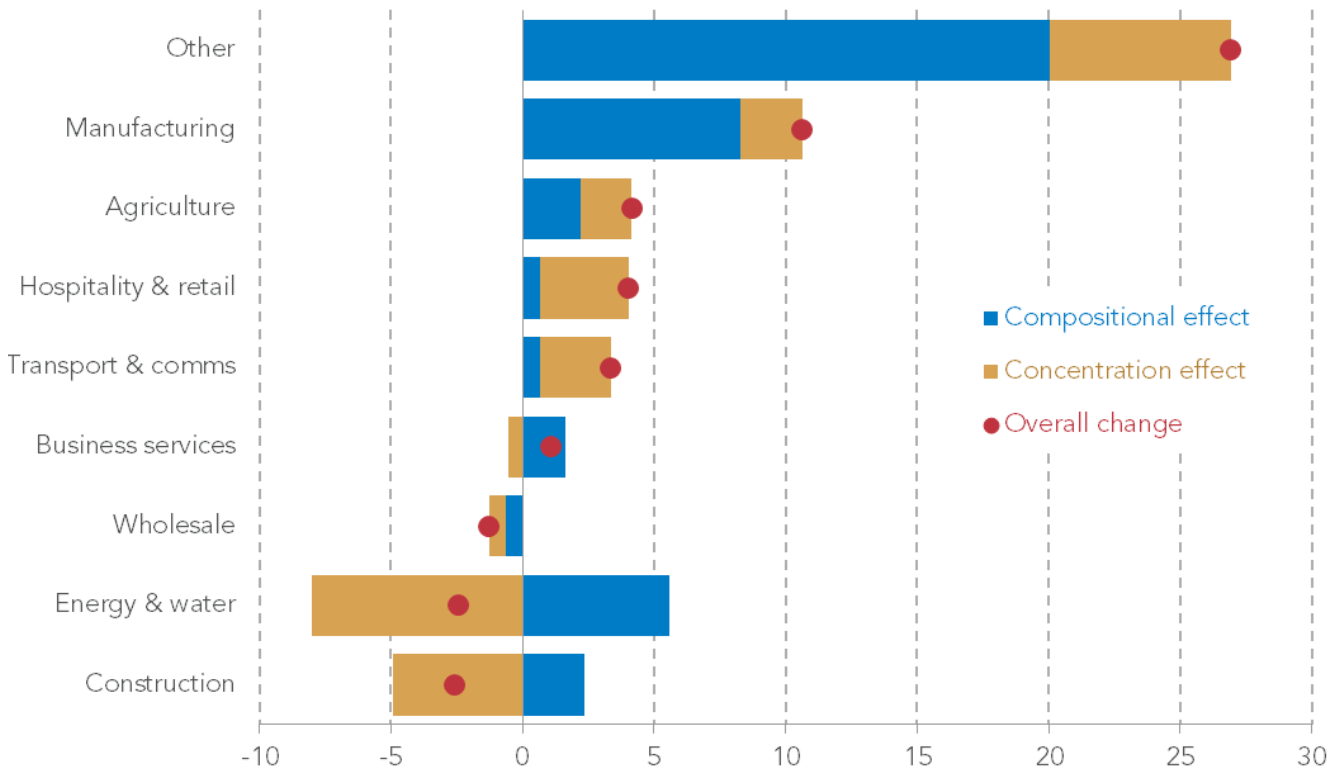
In this example concentration has increased from 43 per cent to 53 percent between Year 1 and Year 2, and yet the concentration ratios of every sub-sector have remained static. What has changed is that the highly concentrated sub-sector (sub-sector 3) has increased dramatically in size – accounting for 50 percent of revenue in Year 2, compared to 33 per cent in Year 1.

Table 1: Examples of drivers of changing industry concentration ratios

	Year 1		Year 2	
	Concentration ratio	Revenue share	Concentration ratio	Revenue share
Sub-sector 1	20	33%	20	25%
Sub-sector 2	30	33%	30	25%
Sub-sector 3	80	33%	80	50%
Industry average	43		53	

In some industries this compositional change, shown by the blue parts of the bars in Figure 7 below, has been the biggest driver of rising concentration at the industry level. So we should recognise that highly concentrated sub-sectors make up a larger share of the economy today than they did in the early 2000s, alongside the fact that individual product markets have become more concentrated (the yellow bars).

Figure 7: Contributions to change in CR5, by industry, 2003-04 to 2015-16



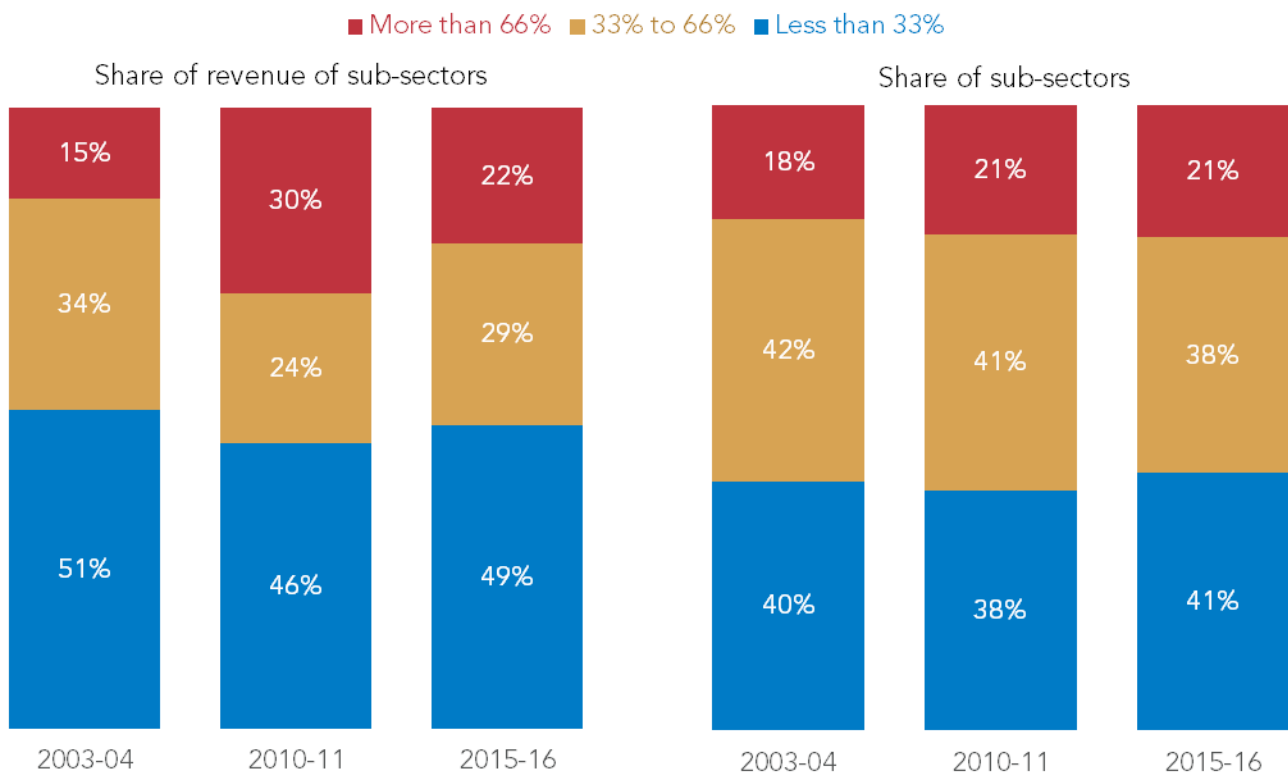
Source: RF analysis, Business Structure Database, ONS

In some industries, changes in just a small number of sub-sectors matter a lot. For example, as mentioned, the gambling and betting activities sub-sector is the overwhelming factor behind such a large increase in product market concentration in the ‘other’ industry. Gambling and betting activities are highly, and increasingly, concentrated (with CR5 of 68 in 2003-04, increasing to 85 in 2015-16) and, more consequentially, its share of revenue within ‘Other’ increased from 23 per cent to 55 per cent over the same time period.

The growth of the highly concentrated distribution of electricity and gas sub-sectors lies behind the compositional change in energy and water. At the same time declining concentration in the production and distribution of electricity, from 79 to 63 in the case of the former and 94 to 87 in the case of the latter, provides the main reason for the negative concentration effect shown in Figure 7.

This dynamic – highly concentrated sectors accounting for a larger share of the economy – has had a sizeable impact on measures of overall concentration. Figure 8 demonstrates this in showing how the share of the revenue of sub-sectors where the CR5 is greater than 66 per cent has increased substantially more than the share of sub-sectors that fall into this category. Yes, more sub-sectors have high levels of concentration (up from 18 per cent in 2003-04 to 21 per cent in 2015-16) but the combined revenue of these sub-sectors has grown by a larger amount – in fact it doubled between 2003-04 and 2010-11 and is still 46 per cent higher than in 2003-04.

Figure 8: Share of revenue of sub-sectors (LHS) and share of sub-sectors (RHS) with low, middle or high concentration (CR5)



Source: RF analysis, Business Structure Database, ONS

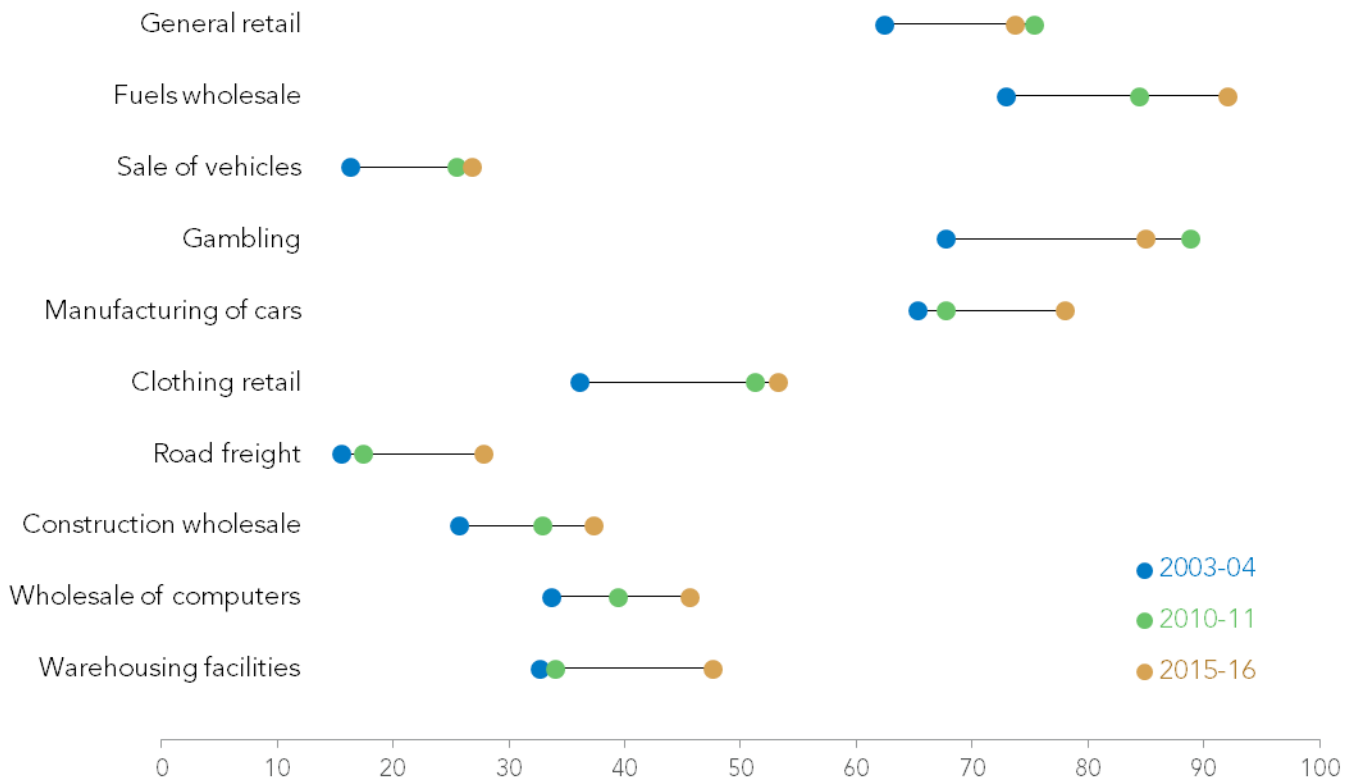
There has also been a slight increase in the share of sub-sectors with low CRs, as Figure 8 shows. This is a good reminder that despite overall increases, there is significant variation in both levels and changes in concentration at the sub-sector level (see Annex). The CR5 has increased in the majority of sub-sectors, but by no means all. 55 per cent of sub-sectors have higher concentration in 2015-16 than 2003-04, and together these account for 57 per cent of total turnover.

In some sub-sectors concentration increase have been particularly marked

Despite large variation, it is worth focusing in on those sub-sectors that have experienced large increases in concentration in recent years. These are mainly found in the retail, wholesale and transport industries; as shown above higher concentration is the main driver of changes at the industry level in these parts of the economy. Figure 9 shows largest sub-sectors for which the CR5 has increased by more than 10 percentage points between 2003-04 and 2015-16.

The largest of these sub-sectors is general retail, this includes the big grocery retailers (our supermarkets) and here the CR5 has increased from 62 in 2003-04 to 74 in 2015-16. This sharp increase has not yet caused regulators to worry about the consumer, in part because this is clearly one of the most competitive product markets in the UK – despite high concentration, competition is high and margins and prices are low. Anxiety with regard to market power in this sector instead relates to its supply chains.

Figure 9: Changes in product market concentration, 10 largest sub-sectors with increases bigger than 10ppts



Source: RF analysis, Business Structure Database, ONS

Clothing retail has also become significantly more concentrated since the early 2000s, its CR5 has increased from 36 to 53. At the same time as this has taken place the CR5 has fallen sharply, from 38 to 23, in the internet retail sale sub-sector as it has been transformed from having just 3,000 businesses in 2003-04 to over 20,000 in 2015-16. Linked with the rise of online shopping, it is interesting to note that warehousing facilities has also become much more concentrated but only since the start of this decade.

Labour market concentration has, somewhat surprisingly, been steadily falling since the mid-2000s

Just as product market concentration might affect the prices consumers pay or suppliers receive, so might labour market concentration (where the distribution of employees, as opposed to turnover, between firms is analysed) affect workers' wages. A highly concentrated labour market will all else equal mean greater employer power vs employees, with less opportunity for workers to move to other firms or use the threat of moving to push for higher wages. Here we analyse labour market concentration by looking at the average concentration at the same sub-sector level as above, seeking to understand the extent to which big employers account for a high share of employees.

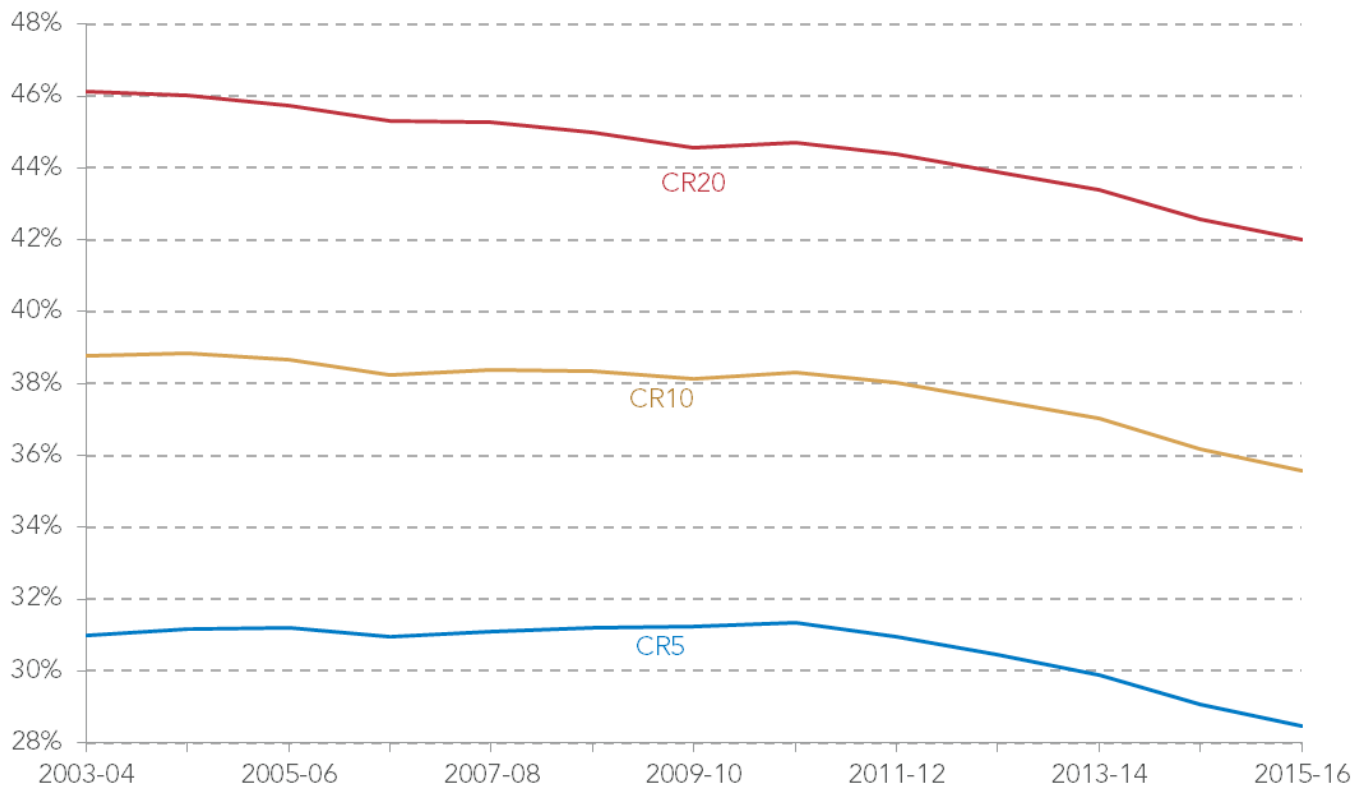
This differs from other work which has taken a geographical approach to measures of labour market concentration.^[16] This means we will not explore a crucial issue, the degree of monopsony power firms are able to exercise in specific local labour markets. Instead we aim to judge the extent to which the trends in product markets have been replicated in labour markets – and the implications of this for how the national economy has changed in recent decades.

Somewhat surprisingly, labour market concentration has in fact been flat or falling since the early 2000s, with larger falls in recent years, as Figure 10 shows. It is also noteworthy that falls are more pronounced, particularly in the 2000s, for measures of concentration that include more firms than just the very biggest. So the average CR20 has declined by 4 percentage points while the average CR5 has fallen by 2.5 percentage points over the same time period. Previous Resolution Foundation research has also evidenced a fall in labour market concentration since the 2000s^[17] and, although not shown below, the HHI for industry employment has also fallen over this time period, by 119 points (20 per cent) from 617 to 498. The CR100 for employees is also lower in 2015-16 than in 2003-04.

[16] See, for example, I Marinescu & H Hovenkamp, Anticompetitive mergers in labor markets, Washington Center for Equitable Growth, June 2018

[17] C D'Arcy, Low Pay Britain 2018, Resolution Foundation, May 2018

Figure 10: Weighted average of sub-sector labour market concentration ratios, 2003-04 to 2015-16



Source: RF analysis, Business Structure Database, ONS

This downward shift in labour market concentration means that arguments that growing monopsony or labour market power of a few big firms have driven recent weak pay growth in the UK appear misplaced. It is of course an open question, and one worthy of further research, as to whether or not the *level* of concentration should be of concern. On average, in 2015-16 the 5 biggest firms in each sub-sector accounted for almost 3 in 10 employee jobs within that sub-sector.

Arguably, given that consumers can more easily switch the businesses from which they buy products than workers can switch employers, the level at which labour market concentration becomes a sign of an unhealthy lack of competition is lower than in product markets. Monopsony power, it would seem reasonable to suggest, will start to exert itself at lower levels of labour market concentration than monopoly power would in product markets.

We also know, from previous Resolution Foundation research, that labour market concentration is higher among lower-paid employees than higher-paid ones, and is also elevated in sectors like retail and geographies with a high incidences of low pay. For example, the CR5 is 3 times higher for low-paid employees working in retail than it is on average across all low paid employees.^[18] There is certainly scope for further research, at the market and local level, into the effects of labour market concentration on wages – particularly for those in the lowest paying parts of the economy. Box 3 provides details on the similarity of changes in labour and product market concentration in other datasets.

[18] C D'Arcy, Low Pay Britain 2018, Resolution Foundation, May 2018

i Box 3: Comparisons of product and labour market trends with other data sources

Throughout this paper concentration statistics have been calculated using the ONS's Business Structure Database (BSD). This, as mentioned above, is a snapshot of the Inter-Departmental Business Register (IDBR) – which is a live dataset containing information about every business in the UK.

However, there are other sources available from which concentration indices can be calculated and in order to corroborate the original findings in this paper we have also made use of the Annual Respondents Database X (ARDx) and the Annual Survey of Hours and Earnings (ASHE).

The ARDx is a dataset constructed by the ONS to allow business data to be analysed on a consistent basis over the last two decades. It has two turnover variables, one is simply the turnover that can be found on the IDBR and the other is the response given by those businesses who were surveyed by the ONS as part of the Annual Business Survey (ABS) or its forerunner the Annual Business Enquiry (ABI). The crucial difference between the datasets is the ARDx does not include every business in the country but a sample of businesses – the turnover (or employment) of which need to be weighted up in order to derive aggregate figures.

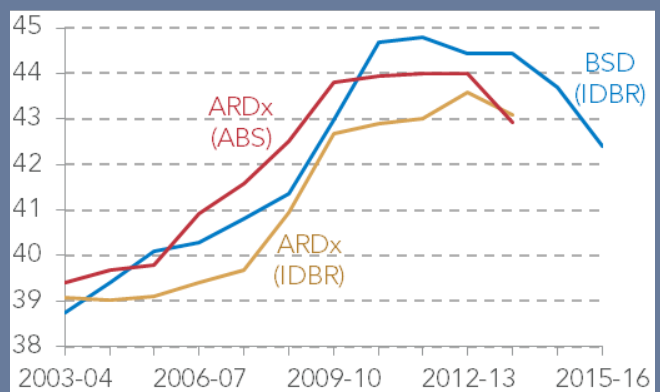
Broadly speaking, the trends identified using the BSD are replicated in the ARDx. As Figure 11 shows the increase in the product market CR5 is similar across three different measures – increasing from around 39 per cent in the early 2000s to around 43 per cent in the most recent year for which data is available.

The increase in the CR100 is similar too, for example between 2005-06 and 2013-14 the CR100 increased by 19 per cent in the BSD (from 20.6 to 24.5) and by 16 per cent

in the ARDx (from 20.7 to 24.1). However, the CR100 did increase by a larger amount in the early 2000s in the BSD than the ARDx.

Employment concentration also falls slightly in the ARDx – the CR5 fell by 3 per cent between 2003-04 and 2013-14 in the ARDx, compared to a fall of 4 per cent in the BSD. We have also compared the trends in the CR100 for employment using ASHE, which although data is only available since 2009-10, suggests a similar downward trend.

Figure 11: Product market concentration as measured by the CR5, 2003-04 to 2015-16, various sources



Source: RF analysis, Business Structure Database and Annual Respondents Database, ONS. Notes: Data labels show data source and, in brackets, the source for turnover data.

Regardless of the level, falling labour market concentration of late does have some advantages for employees. It implies that moving between employers in the same sub-sector should be relatively easier and – all else equal – imply bigger pay rises too.

This flat lining or decline presents somewhat of a paradox in light of the rising product market concentration evidenced above, particularly during the 2000s and financial crisis. It might be expected that as product markets become more concentrated so too will labour markets; that where large firms account for a larger share of sub-sector revenue they will also account for a larger share of employees. Instead the opposite has happened in the UK since the early 2000s, with the two moving in opposite directions (except in recent years).

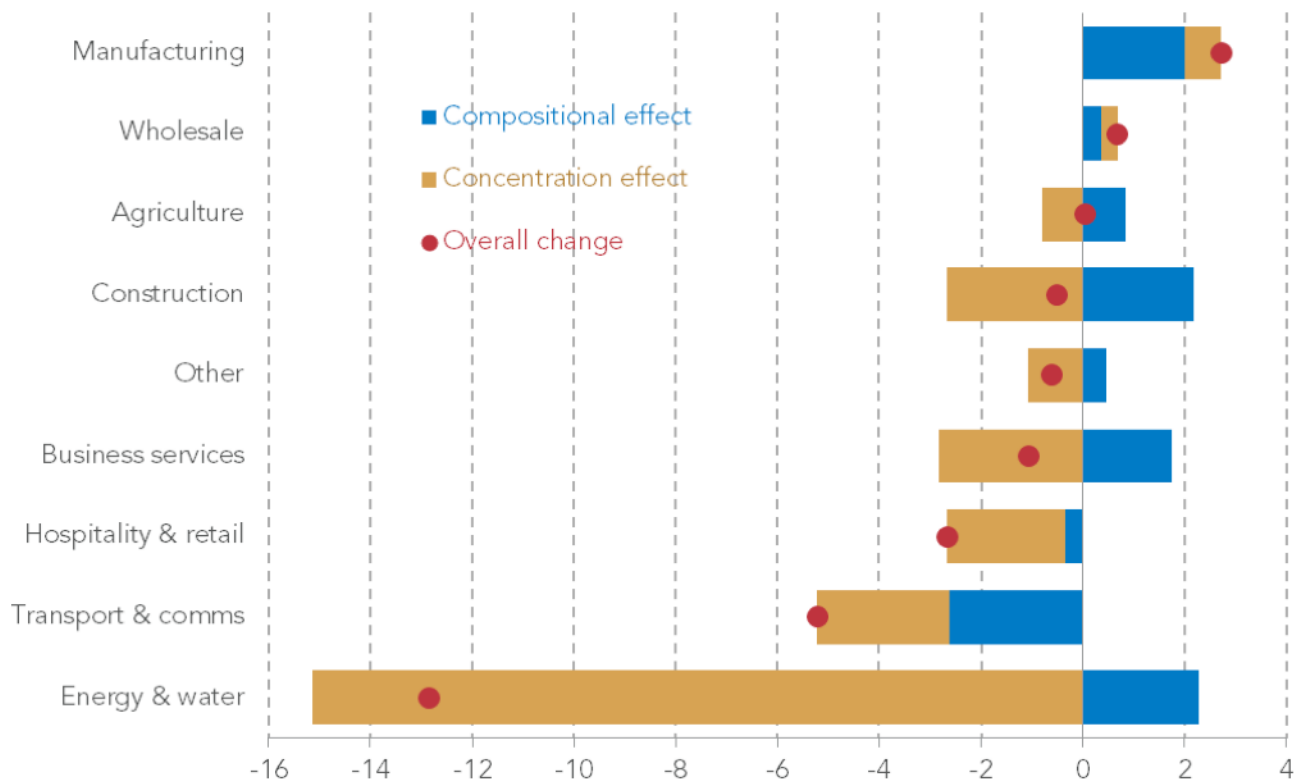
The first step to picking apart these divergent trends is to understand the drivers of industry level trends in labour market concentration, and compare how these match with the trends in product market concentration already identified.

Declines in labour market concentration have been driven by falling concentration within sectors, not changes between sectors

As detailed in Table 1 above, changes in aggregated measures of concentration need not simply be a result of sub-sectors becoming more or less concentrated – the changing size of these sub-sectors matters too.

We saw in the case of product market concentration that recent changes at the industry level have in several cases been driven by increases in size of highly concentrated sub-sectors – the compositional effect was big and positive. This effect is also positive for labour market concentration, although in this case it is outweighed by declines in concentration within sub-sectors. The contributions of these two determinants for each industry are shown in Figure 12.

Figure 12: Contributions to percentage point change in labour market CR5, 2003-04 to 2015-16



Source: RF analysis, Business Structure Database, ONS

The most notable change is within energy and water for which a concentration effect of -15 percentage points is recorded. This large fall is a result of a sharp decline in the concentration of employees in the water collection, treatment and supply sub-sector. This is a large sub-sector, accounting for 20 per cent of employees in 'Energy & water'^[19] within which the CR5 declined from 78 to 55 per cent between 2003-04 and 2015-16.

In general, Figure 12 demonstrates that not only are product and labour market trends moving in opposite directions but also they are doing so for different reasons. This leaves a paradox – the largest firms are accounting for a greater share of revenue while the biggest employers are employing a smaller share of employees.

[19] Average share of employees in energy and water across 2003-04 and 2015-16.

It's not clear exactly what's caused these divergent trends, although we can offer some likely explanations

Picking apart exactly how product market concentration has increased at the same time as labour market concentration has fallen since the early 2000s is a task beyond the scope of this paper. Rather than seek to provide a definitive account of this divergence we offer some explanations for this somewhat paradoxical outcome. There are a range of potential causes, for example it could be the case that – on average – larger firms have become more likely to outsource some of their functions leaving their total revenue unchanged even as the number of staff employed in-house to generate this revenue has fallen. Or maybe the increasing importance of intangible investment in the modern economy is making it easier for bigger firms to scale, as argued by Haskel and Westlake, and at the same time intangibles are more likely to be 'labour-light' than tangible investments.^[20]

More broadly, it's highly likely that globalisation will have affected the results presented here in a number of ways – we discuss just two here. First, increasing international trade will have affected concentration in ways that the data used in this note will not have picked up, which could imply that the 'true' increase in product market concentration is smaller than presented here. Second we provide evidence below suggesting that where the largest firms have increased their revenue shares they have done so without needing to maintain the same numbers of employees relative to smaller competitors. We speculate that part of the reason for this change could be that trends including globalisation are acting together to increase the complexity of modern economies – in ways that benefit large firms at the expense of smaller ones.

UK data does not account for importers' market shares, but does account for the exports of UK businesses

An ideal measure of product market concentration in the UK would include the revenue generated by overseas firms from imports of goods or services to the UK market, and exclude the revenue generated by UK firms from exports into overseas markets. The relevant consideration being different firms' share of UK sales revenue.

However, the data used in this note *includes* revenue from UK firms' exports and *excludes* the revenue from overseas firms' imports to the UK. The impact of this at a time when we know that UK trade was increasing pre-crisis may well have been to boost our measures of product market concentration while having less effect on labour market concentration. For example, the increases in concentration reported here *could* have been driven by large UK firms generating proportionally more revenue overseas than their smaller competitors. Inversely, to the extent that importers have a relatively small revenue share in UK markets, their exclusion from this data will have acted to increase the reported level, and possibly change, in product market concentration.^[21]

Crucially this is also not just about data challenges – globalisation itself may have changed the relative size of the largest UK firms compared to their smaller domestic competitors. In particular this may be the case in product markets within which a more open global economy offers new opportunities to realise economies of scale to globally competitive firms.

[20] J Haskel & S Westlake, *Capitalism without capital: the rise of the intangible economy*, Princeton University Press, October 2017

[21] Imports accounted for a greater share of domestic demand in 2015-16 (14 per cent) than in 2003-04 (12.6 per cent).

The biggest firms have pulled away from the rest, and have done so with relatively few employees

An additional, although again by no means definitive, explanation of divergent product and labour market trends is that the largest revenue firms have been able to grow by using a relatively limited amount of labour. Here we present evidence that suggests this has been the case in the UK, implying that the ‘superstar firms’ trend identified in the US by David Autor and his co-authors may also be taking place here, at least in those sectors that have become more concentrated.^[22]

Autor et al argue that the fall in the labour share that has taken place in the US can be explained by the increasing importance of superstar firms. These are large firms with high productivity and profits, and therefore a low labour share, which have come to dominate a greater share of the US economy over recent decades. Although tech giants like Google and Apple are undoubtedly superstars, much of the increase in product market concentration documented in the US took place in the 1990s and early 2000s – when today’s dominant tech firms were in their infancy or did not exist at all.

Although the UK experience is different from the US in so far as the labour share here has been broadly flat (despite ups and downs) in recent decades, it could still very well be the case that the growth of high revenue/low labour share firms has coincided with increases in concentration, with implications for the employees that work in these firms and sub-sectors where this has taken place.

The dataset at our disposal does not have a long time series of employment or profits available for analysis and so rather than derive firm level labour shares we analyse a related but distinct measure: turnover per employee (TPE).

We calculate the average TPE among the five largest firms (by revenue) in each sub-sector, and the average across all other firms. Unsurprisingly, the largest firms have a significantly higher TPE than others; in 2015-16 the average TPE for the biggest five firms in each sub-sector was 25 times higher than the average across all remaining firms in each sub-sector.

In line with the relatively static labour share in the UK, we also find that on average this ratio between the TPE of large firms and all other firms in each sub-sector is little changed since the early 2000s. The median change the TPE ratio is just 0.7, and the mean change is -5.

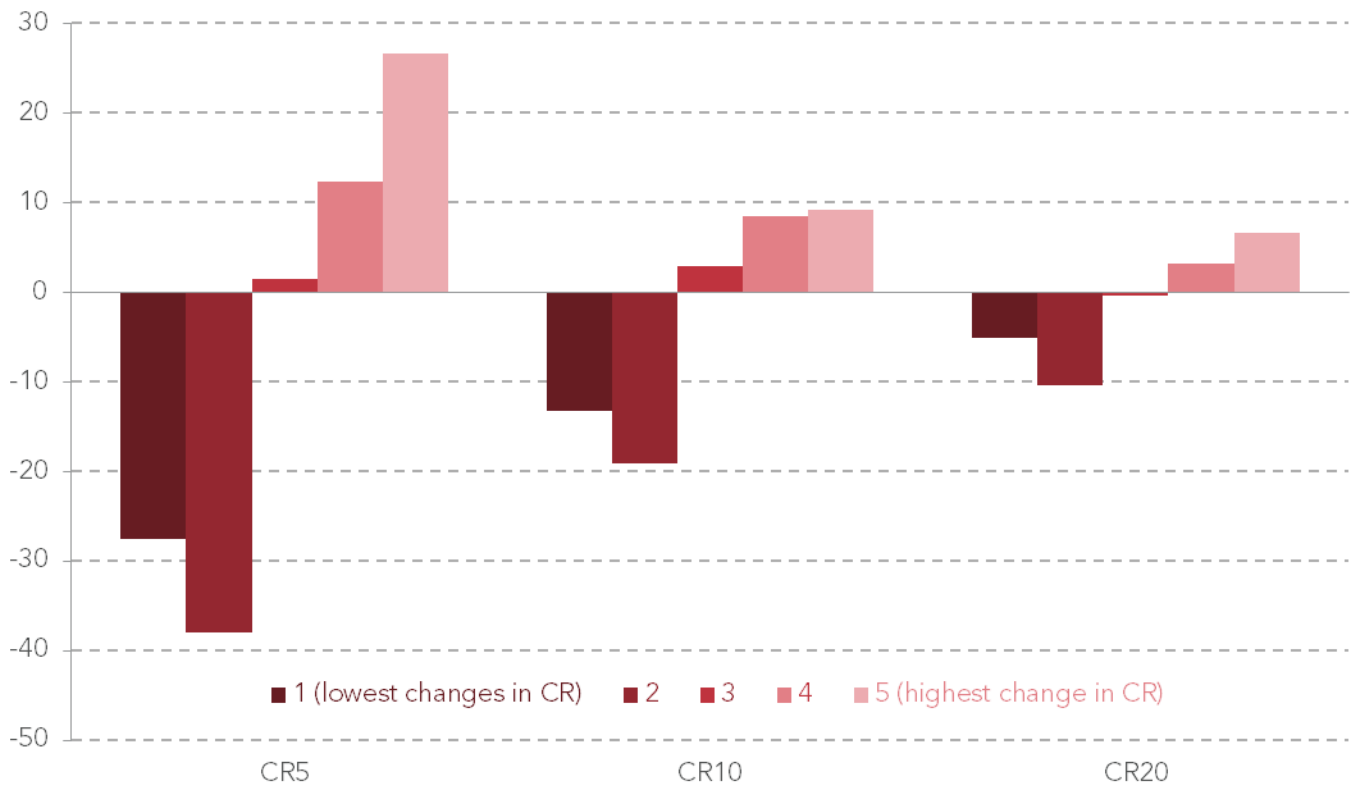
This average change, of course, hides significant variation across sub-sectors and says little about the extent to which changes in the TPE ratio (between the biggest and remaining firms) are linked with changes in concentration.

To understand this link, we have ranked every sub-sector in ascending order by its change in CR5 between 2003-04 and 2015-16 and then split sub-sectors into five quintiles. For example, the 20 per cent of sub-sectors with the biggest falls in CR5 are placed in the 1st quintile and the 20 per cent with the biggest increases in the 5th quintile.

As a final step, we then average the changes in TPE ratios across each of these quintiles. We find that these have increased faster in sub-sectors where concentration increases are larger. For example, as shown in Figure 13, the 20 per cent of sub-sectors with the largest increases in product market CR5 were also the sub-sectors with the largest increase in TPE ratios; on average the TPE ratio increased by 27 points among these sub-sectors. In contrast, it fell by 27 points among the sub-sectors with the biggest falls in concentration.

[22] D Autor, L Katz and J V Reenan, The Fall of the Labor Share and the Rise of Superstar Firms, CEP Discussion Paper No 1482, Centre for Economic Performance, May 2017

Figure 13: Average change in ratio of turnover per employee (TPE) for the biggest firms 2003-04 to 2015-16, quintiles of change in product market concentration ratio



Source: RF analysis, Business Structure Database, ONS

These results confirm the intuition that as big firms have pulled away from the rest in sectors with rising product market concentration they have not needed to increase their labour inputs by the same relative amount. Big, and faster growing, firms in the modern economy it seems do not need to rely on as many people for their marginal output as they may have once done (relative to their domestic competitor firms).

In these sectors, if revenue has become more concentrated in firms with higher revenue per employee ratios that raises the prospect that labour share (although a different measure from the TPE) within that sector may have fallen. This would replicate the effect found in the US at the sector level, even if the labour share has not declined in the UK in aggregate.

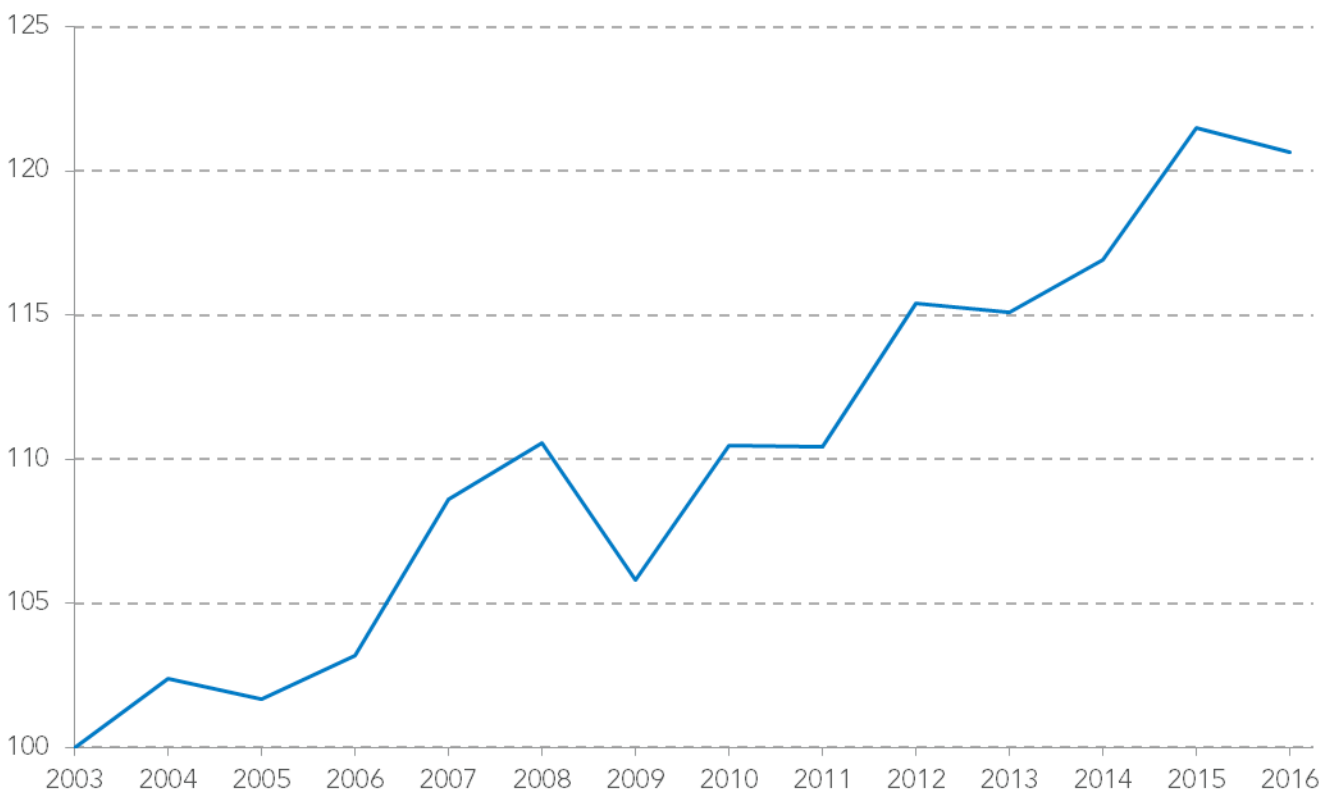
An alternative outcome, if workers in the leading firms are able to secure higher wages than in smaller firms because of rent sharing, is that wage inequality may rise within a sector as it becomes more concentrated. This would mean that which firm you work for in a sector would become more important. Distinguishing between these different potential outcomes conclusively will require further work, but some indications are available.

There is evidence that the biggest firms are generating more profit today than in the past

If the labour share is falling among the top firms in sectors that become more concentrated then this could show itself in the form of greater profit margins. A recent IMF paper has calculated the average mark-up (price relative to marginal costs) for publicly listed firms in a range of countries, including the UK. In perfectly competitive markets prices should equal marginal costs and mark-ups (above a standard rate of return on capital) would equal zero. In general, the less competitive a market is the higher we would expect mark-ups to be.

The IMF data includes 859 publicly listed firms in the UK in 2016, and shows that – on average – mark-ups have increased by 20 per cent since 2003. Although, other research has found that estimates of the growth in mark-ups are considerably lower when the increasing share of costs going to marketing and management are accounted for.^[23] This health warning aside, Figure 14 shows how only in 2009 did the average mark-up fall by more than a nominal amount, only to rebound in 2010 and continue to increase since.

Figure 14: Mark-ups of publicly listed firms, UK, 2002-2016



Source: F Diez, D Leigh & S Tambunlertchai, Global Market Power and its Macroeconomic Implications, IMF Working Paper 18/137, June 2018

[23] J Traina, Is aggregate market power increasing? Production trends using financial statements, Booth School of Business, University of Chicago, February 2018

This does not necessarily imply that mark-ups have increased by this amount across the rest of the economy – there were over 1.3 million businesses with employees in 2016 in the UK, with less than 900 (of the biggest of these) included here.^[24] But all the same, it is certainly revealing that as our analysis of the largest businesses found that their growth over recent years has been achieved with relatively fewer employees so has this separate piece of work found that large businesses are enjoying mark-ups 20 per cent higher than in the early 2000s.

What does being a market leader mean today? And what does this imply for the UK economy and where policy makers' focus ought to be?

Overall, the findings presented here suggest that:

- » the biggest businesses in 21st century Britain have got bigger, and taken a larger share of the economy;
- » more generally there is evidence of greater product market concentration across our economy on a range of measures since the early 2000s, although with some recent declines;
- » in sub-sectors that have become more concentrated, the biggest firms are increasing their use of labour more slowly relative to their smaller competitors; and,
- » some of the largest publicly listed businesses have enjoyed over a decade of uninterrupted increases in their mark-ups.

So, why might this be the case? One possible explanation is that both globalisation and technological change have shaped the economy in ways that are favourable to big firms. Both trends have undoubtedly made the economy more difficult to navigate. Worldwide supply chains, cutting edge software and network effects all increase the complexity of operating at the productivity frontier in many sectors. This complexity may simply be too much for many smaller firms to get to grips with. In other words, barriers to scale for smaller firms might have increased at the same time as economies of scale for bigger firms have expanded too – limiting the competitive pressures on big firms at the same time as enabling them to grow faster than before.

To the extent that this is the case, regulators and policy makers may need to take new approaches. Yes, barriers to entry will still matter – but barriers to scale from complexity may also need to be better understood; and keeping a close eye on the ability of medium sized firms to grow into big firms might be more important today than it once was. This implies that takeovers and mergers involving market leaders should be very closely scrutinised, not just for their impact on prices today but also for their potential impacts on concentration in years to come. For example it would not be desirable for a big firm to buy up a new entrant that was the only firm in the sector that showed itself to be able to overcome complexity barriers that might in time allow it to challenge incumbents.

[24] Business population estimates for the UK and regions 2016, Department for Business, Energy and Industrial Strategy, October 2017

Conclusion

This research adds weight to the sense that big firms have become more powerful over time in the UK. It shows that product market concentration is higher today than it was in the early 2000s across a range of measures. Most strikingly, the revenue share of the largest 100 firms in the UK economy has increased by a quarter since the early 2000s.

This increase in product market concentration should encourage a renewed focus on competition policy in the UK, not least because of the further imperative of Brexit. Even if the crisis-related rise in concentration entirely unwinds, as it looks to have begun doing so, the increases in the early 2000s mean that the level may well remain elevated.

We have also shown that concentration has increased in the majority of sub-sectors, and across most industries. So, it's not the case that these trends are just about tech companies that dominate the headlines but rather that wider shifts look to have taken place, possibly connected to the complexity of being a leading firm in a globalised economy, with international supply chains and more advanced technology.

At the same time as product market concentration has risen, labour market concentration has declined; although its level (particularly in low paying parts of the economy) may still be of concern. Worries about growing monopsony or labour market power of a few big firms driving recent weak pay growth in the UK therefore appear misplaced.

The paradox of these two divergent trends in product and labour market concentration may, in part, be explained by the impact of globalisation and growing international trade in the 2000s. This is true for both substantive (increased economies of scale) and data (the inclusion of the revenue of UK exporters and the exclusion of the revenue of overseas importers) reasons.

Another possible explanation could be that as big firms have taken a greater share of revenue in sectors that have become more concentrated, they are employing relatively fewer people. This trend merits further study, but may suggest that the 'superstar firms' phenomenon has also been a feature of the UK economy in those sectors that have become more concentrated. Alternatively wage shifts may mean it matters more which firms employees work for.

Overall, our research puts the claims about capitalism's failings into context. Concentration has risen. Big firms matter more than they used to, but not in the simple sense of just employing more people. The UK economy is complex, perhaps more than ever. So that the answer to the question of whether it's working as well as it should be isn't a simple one should not be a surprise.

Annex

Table A: Product market CR5, sub-sectors with increasing CR5 between 2003-04 and 2015-16

5-digit SIC code	Name	2003-04	2015-16	Change
47630	Retail sale of music and video recordings in specialised stores	27	83	55
42210	Construction of utility projects for fluids	45	94	48
58210	Publishing of computer games	39	84	46
63120	Web portals	34	77	43
69203	Tax consultancy	29	69	40
46120	Agents involved in the sale of fuels, ores, metals and industrial chemicals	27	64	37
28250	Manufacture of non-domestic cooling and ventilation equipment	24	60	36
03210	Marine aquaculture	48	84	36
86220	Specialists medical practice activities	7	42	35
01210	Growing of grapes	17	51	34
59131	Motion picture distribution activities	44	78	34
13960	Manufacture of other technical and industrial textiles	24	58	34
08110	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate	44	78	33
13939	Manufacture of other carpets and rugs	53	86	33
28940	Manufacture of machinery for textile, apparel and leather production	25	57	32
55300	Recreational vehicle parks, trailer parks and camping grounds	14	46	32
47610	Retail sale of books in specialised stores	30	61	31
13910	Manufacture of knitted and crocheted fabrics	40	71	30
10120	Processing and preserving of poultry meat	49	79	30
01440	Raising of camels and camelids	37	67	30
13100	Preparation and spinning of textile fibres	29	58	29
93130	Fitness facilities	33	61	28
77342	Renting and leasing of freight water transport equipment	48	76	27
84250	Fire service activities	55	82	27
47410	Retail sale of computers, peripheral units and software in specialised stores	49	76	27
13923	Manufacture of household textiles	25	52	27
23120	Shaping and processing of flat glass	34	60	27
25500	Forging, pressing, stamping and roll-forming of metal; powder metallurgy	15	42	26
32401	Manufacture of professional and arcade games and toys	57	83	26
23320	Manufacture of bricks, tiles and construction products, in baked clay	65	92	26
24440	Copper production	52	78	26
79901	Activities of tourist guides	31	56	26
28110	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	65	90	25
47722	Retail sale of leather goods in specialised stores	21	46	25
46240	Wholesale of hides, skins and leather	26	51	25
28150	Manufacture of bearings, gears, gearing and driving elements	38	62	24
95110	Repair of computers and peripheral equipment	32	55	24
70100	Activities of head offices	35	59	23
46439	Wholesale of radios and televisions; wholesale of electrical	23	46	23
23490	Manufacture of other ceramic products n.e.c.	57	80	23
49319	Other urban, suburban or metropolitan area passenger land transport (not incl. underground, metro and the like)	48	70	22
52242	Cargo handling for air transport activities of division 51	55	77	22
33110	Repair of fabricated metal products	49	70	21

27520	Manufacture of non-electric domestic appliances	49	70	21
14310	Manufacture of knitted and crocheted hosiery	64	85	21
24510	Casting of iron	38	59	21
29203	Manufacture of caravans	55	76	21
14141	Manufacture of men's underwear	45	66	21
47791	Retail sale of antiques, including antique books, in stores	10	31	21
20150	Manufacture of fertilizers and nitrogen compounds	68	88	21
32409	Manufacture of other games and toys, n.e.c.	36	55	20
52219	Other service activities incidental to land transportation	58	78	20
50100	Sea and coastal passenger water transport	56	75	19
46750	Wholesale of chemical products	21	40	19
27200	Manufacture of batteries and accumulators	62	81	19
46719	Wholesale of other fuels and related products	73	92	19
85422	Post-graduate level higher education	53	71	19
77352	Renting and leasing of freight air transport equipment	64	83	19
58141	Publishing of learned journals	74	92	18
95250	Repair of watches, clocks and jewellery	17	35	18
62090	Other information technology and computer service activities	16	34	18
94920	Activities of political organizations	12	30	18
03120	Freshwater fishing	46	64	18
81291	Disinfecting and exterminating services	53	71	18
23910	Production of abrasive products	52	70	18
23310	Manufacture of ceramic tiles and flags	64	81	17
92000	Gambling and betting activities	68	85	17
47710	Retail sale of clothing in specialised stores	36	53	17
59200	Sound recording and music publishing activities	42	59	17
47730	Dispensing chemist in specialised stores	30	46	17
28131	Manufacture of pumps	33	50	17
42130	Construction of bridges and tunnels	74	91	17
84130	Regulation of and contribution to more efficient operation of businesses	81	97	16
01470	Raising of poultry	25	41	16
46210	Wholesale of grain, unmanufactured tobacco, seeds and animal feeds	21	37	16
14190	Manufacture of other wearing apparel and accessories n.e.c.	11	27	16
05102	Open cast coal working	72	88	16
20302	Manufacture of printing ink	66	82	16
18202	Reproduction of video recording	77	93	16
28923	Manufacture of equipment for concrete crushing and screening and roadworks	48	64	16
23690	Manufacture of other articles of concrete, plaster and cement	44	60	16
10850	Manufacture of prepared meals and dishes	68	84	16
81222	Specialised cleaning services	21	37	16
20590	Manufacture of other chemical products n.e.c.	47	63	15
46370	Wholesale of coffee, tea, cocoa and spices	45	60	15
47799	Retail sale of other second-hand goods in stores (not incl. antiques)	12	27	15
52103	Operation of warehousing and storage facilities for land transport activities of division 49	33	48	15
24200	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel	34	49	15
20160	Manufacture of plastics in primary forms	35	50	15
26514	Manufacture of non-electronic industrial process control equipment	60	75	15
82200	Activities of call centres	68	83	15
17290	Manufacture of other articles of paper and paperboard n.e.c.	29	43	15
81100	Combined facilities support activities	35	49	15
24340	Cold drawing of wire	68	82	15

28990	Manufacture of other special-purpose machinery n.e.c.	28	42	14
58110	Book publishing	26	40	14
87100	Residential nursing care facilities	15	29	14
56290	Other food services	52	66	14
94990	Activities of other membership organizations n.e.c.	28	42	14
23130	Manufacture of hollow glass	79	93	14
28410	Manufacture of metal forming machinery	39	53	14
13931	Manufacture of woven or tufted carpets and rugs	50	64	14
45400	Sale, maintenance and repair of motorcycles and related parts and accessories	15	29	14
63910	News agency activities	78	92	14
01240	Growing of pome fruits and stone fruits	18	32	14
46450	Wholesale of perfume and cosmetics	25	38	14
25210	Manufacture of central heating radiators and boilers	68	82	14
15110	Tanning and dressing of leather; dressing and dyeing of fur	63	77	14
16100	Sawmilling and planing of wood	23	36	13
10822	Manufacture of sugar confectionery	63	76	13
23140	Manufacture of glass fibres	60	73	13
42220	Construction of utility projects for electricity and telecommunications	60	73	13
29201	Manufacture of bodies (coachwork) for motor vehicles (except caravans)	41	54	13
68100	Buying and selling of own real estate	21	34	13
74203	Film processing	32	45	13
79120	Tour operator activities	34	47	13
29100	Manufacture of motor vehicles	65	78	13
30910	Manufacture of motorcycles	80	93	13
29202	Manufacture of trailers and semi-trailers	27	40	13
93210	Activities of amusement parks and theme parks	54	67	13
25940	Manufacture of fasteners and screw machine products	31	43	13
25720	Manufacture of locks and hinges	26	38	13
47421	Retail sale of mobile telephones	77	89	12
59140	Motion picture projection activities	69	82	12
77400	Leasing of intellectual property and similar products, except copyrighted works	48	60	12
49410	Freight transport by road	16	28	12
20520	Manufacture of glues	55	67	12
46510	Wholesale of computers, computer peripheral equipment and software	34	46	12
14142	Manufacture of women's underwear	58	70	12
52212	Operation of rail passenger facilities at railway stations	87	99	12
26513	Manufacture of non-electronic instruments and appliances for measuring, checking, testing, navigation and other purposes, except process control equipment	37	48	12
28290	Manufacture of other general-purpose machinery n.e.c.	18	29	12
33130	Repair of electronic and optical equipment	60	72	12
46730	Wholesale of wood, construction materials and sanitary equipment	26	37	12
58290	Other software publishing	29	41	12
93120	Activities of sport clubs	13	25	11
47110	Retail sale in non-specialised stores with food, beverages or tobacco predominating	62	74	11
55202	Youth hostels	55	66	11
94200	Activities of trade unions	47	58	11
31090	Manufacture of other furniture	15	25	11
23410	Manufacture of ceramic household and ornamental articles	56	67	11
26701	Manufacture of optical precision instruments	45	55	11
24420	Aluminium production	54	65	11

45111	Sale of new cars and light motor vehicles	16	27	10
14390	Manufacture of other knitted and crocheted apparel	31	42	10
61200	Wireless telecommunications activities	81	92	10
16210	Manufacture of veneer sheets and wood-based panels	57	68	10
37000	Sewerage	62	72	10
10511	Liquid milk and cream production	79	89	10
18110	Printing of newspapers	82	92	10
10110	Processing and preserving of meat	40	50	10
77220	Renting of video tapes and disks	79	89	10
46480	Wholesale of watches and jewellery	19	29	10
18130	Pre-press and pre-media services	14	24	10
47749	Retail sale of medical and orthopaedic goods in specialised stores (not incl. hearing aids) n.e.c.	20	29	10
15120	Manufacture of luggage, handbags and the like, saddlery and	55	65	10
91040	Botanical and zoological gardens and nature reserves activities	34	44	10
85410	Post-secondary non-tertiary education	12	21	10
25400	Manufacture of weapons and ammunition	80	89	10
46420	Wholesale of clothing and footwear	11	21	10
29320	Manufacture of other parts and accessories for motor vehicles and their engines	15	25	10
28210	Manufacture of ovens, furnaces and furnace burners	29	39	9
28960	Manufacture of plastics and rubber machinery	22	31	9
10200	Processing and preserving of fish, crustaceans and molluscs	33	42	9
58190	Other publishing activities	22	32	9
18121	Manufacture of printed labels	34	43	9
17120	Manufacture of paper and paperboard	42	51	9
13200	Weaving of textiles	24	33	9
30120	Building of pleasure and sporting boats	61	70	9
13921	Manufacture of soft furnishings	22	31	9
32130	Manufacture of imitation jewellery and related articles	34	43	9
25730	Manufacture of tools	21	30	9
11070	Manufacture of soft drinks; production of mineral waters and other bottled waters	72	81	9
91011	Library activities	39	48	9
01621	Farm animal boarding and care	20	29	9
01610	Support activities for crop production	19	28	9
74902	Quantity surveying activities	22	31	9
61900	Other telecommunications activities	55	64	9
47240	Retail sale of bread, cakes, flour confectionery and sugar confectionery in specialised stores	39	48	9
30110	Building of ships and floating structures	72	81	9
46110	Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods	37	46	9
13990	Manufacture of other textiles n.e.c.	31	40	9
91012	Archives activities	61	70	8
17219	Manufacture of other paper and paperboard containers	38	46	8
79909	Other reservation service activities n.e.c.	43	52	8
13940	Manufacture of cordage, rope, twine and netting	50	59	8
10519	Manufacture of other milk products	75	84	8
28490	Manufacture of other machine tools n.e.c.	20	28	8
82190	Photocopying, document preparation and other specialised office support activities	20	28	8
46390	Non-specialised wholesale of food, beverages and tobacco	35	43	8
46620	Wholesale of machine tools	23	31	8
10611	Grain milling	50	58	8
55900	Other accommodation	31	39	8
26200	Manufacture of computers and peripheral equipment	43	51	8

86900	Other human health activities	10	17	8
51101	Scheduled passenger air transport	66	74	7
95210	Repair of consumer electronics	13	20	7
24530	Casting of light metals	43	50	7
27110	Manufacture of electric motors, generators and transformers	52	60	7
82920	Packaging activities	20	28	7
18129	Printing n.e.c.	7	14	7
13300	Finishing of textiles	26	33	7
03220	Freshwater aquaculture	62	69	7
45320	Retail trade of motor vehicle parts and accessories	26	33	7
28922	Manufacture of earthmoving equipment	89	96	7
46320	Wholesale of meat and meat products	10	17	7
95290	Repair of other personal and household goods	18	25	7
46770	Wholesale of waste and scrap	14	21	7
72190	Other research and experimental development on natural sciences and engineering	44	51	7
77110	Renting and leasing of cars and light motor vehicles	47	54	7
53202	Other postal and courier activities: Unlicensed carriers	39	45	7
46380	Wholesale of other food, including fish, crustaceans and molluscs	14	20	7
56302	Public houses and bars	22	29	6
75000	Veterinary activities	5	12	6
01629	Support activities for animal production (other than farm animal boarding and care) n.e.c.	29	35	6
25930	Manufacture of wire products, chain and springs	28	34	6
87300	Residential care activities for the elderly and disabled	8	14	6
24330	Cold forming or folding	79	85	6
86230	Dental practice activities	3	9	6
24520	Casting of steel	36	42	6
01290	Growing of other perennial crops	66	72	6
46410	Wholesale of textiles	10	15	6
72200	Research and experimental development on social sciences and humanities	35	40	6
23200	Manufacture of refractory products	47	53	6
49100	Passenger rail transport, interurban	44	50	6
10512	Butter and cheese production	54	60	6
16240	Manufacture of wooden containers	23	28	6
46220	Wholesale of flowers and plants	26	31	5
77390	Renting and leasing of other machinery, equipment and tangible goods n.e.c.	19	24	5
38110	Collection of non-hazardous waste	51	57	5
16290	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	25	31	5
47760	Retail sale of flowers, plants, seeds, fertilizers, pet animals and pet food in specialised stores	22	27	5
28132	Manufacture of compressors	68	73	5
27400	Manufacture of electric lighting equipment	24	29	5
43310	Plastering	5	10	5
52220	Service activities incidental to water transportation	34	38	5
42910	Construction of water projects	38	43	5
32120	Manufacture of jewellery and related articles	15	20	5
01460	Raising of swine/pigs	28	33	5
47599	Retail sale of furniture, lighting equipment and household articles (not incl. musical instruments and scores) n.e.c. in specialised stores	30	34	5
73120	Media representation services	59	64	5
42120	Construction of railways and underground railways	63	67	4
10890	Manufacture of other food products n.e.c.	53	58	4

23630	Manufacture of ready-mixed concrete	86	91	4
43320	Joinery installation	4	9	4
58142	Publishing of consumer and business journals and periodicals	25	30	4
13922	manufacture of canvas goods, sacks, etc.	24	29	4
11010	Distilling, rectifying and blending of spirits	77	81	4
45112	Sale of used cars and light motor vehicles	6	11	4
22210	Manufacture of plastic plates, sheets, tubes and profiles	21	25	4
28220	Manufacture of lifting and handling equipment	24	28	4
25620	Machining	3	7	4
02100	Silviculture and other forestry activities	30	34	4
47890	Retail sale via stalls and markets of other goods	10	14	4
45200	Maintenance and repair of motor vehicles	9	13	4
17220	Manufacture of household and sanitary goods and of toilet requisites	81	85	4
71129	Other engineering activities	12	16	4
22290	Manufacture of other plastic products	16	20	4
03110	Marine fishing	8	11	4
43341	Painting	8	11	4
49390	Other passenger land transport	25	28	3
46130	Agents involved in the sale of timber and building materials	9	12	3
47620	Retail sale of newspapers and stationery in specialised stores	51	55	3
20301	Manufacture of paints, varnishes and similar coatings, mastics and sealants	50	53	3
47540	Retail sale of electrical household appliances in specialised stores	71	74	3
84240	Public order and safety activities	68	71	3
20420	Manufacture of perfumes and toilet preparations	48	51	3
52230	Service activities incidental to air transportation	57	60	3
69202	Bookkeeping activities	24	27	3
26600	Manufacture of irradiation, electromedical and electrotherapeutic equipment	75	78	3
31020	Manufacture of kitchen furniture	31	34	3
70229	Management consultancy activities other than financial management	12	15	3
49320	Taxi operation	14	16	3
41100	Development of building projects	5	7	3
56103	Take-away food shops and mobile food stands	8	10	2
01500	Mixed farming	2	4	2
16230	Manufacture of other builders' carpentry and joinery	15	17	2
42990	Construction of other civil engineering projects n.e.c.	14	16	2
69201	Accounting and auditing activities	40	42	2
47230	Retail sale of fish, crustaceans and molluscs in specialised stores	11	13	2
22230	Manufacture of builders' ware of plastic	15	17	2
86101	Hospital activities	7	9	2
01130	Growing of vegetables and melons, roots and tubers	10	12	2
23620	Manufacture of plaster products for construction purposes	97	99	2
47810	Retail sale via stalls and markets of food, beverages and tobacco products	12	14	2
79110	Travel agency activities	33	35	2
73200	Market research and public opinion polling	18	20	2
50400	Inland freight water transport	49	51	2
62011	Ready-made interactive leisure and entertainment software development	55	57	2
01190	Growing of other non-perennial crops	26	27	2
26512	Manufacture of electronic industrial process control equipment	55	57	2
23990	Manufacture of other non-metallic mineral products n.e.c.	40	41	1

10710	Manufacture of bread; manufacture of fresh pastry goods and cakes	46	47	1
94110	Activities of business and employers membership organizations	15	16	1
55209	Other holiday and other collective accommodation	17	18	1
47260	Retail sale of tobacco products in specialised stores	5	6	1
25910	Manufacture of steel drums and similar containers	72	73	1
78200	Temporary employment agency activities	13	14	1
86210	General medical practice activities	3	5	1
21200	Manufacture of pharmaceutical preparations	60	61	1
91030	Operation of historical sites and buildings and similar visitor attractions	39	40	1
47721	Retail sale of footwear in specialised stores	39	40	1
28930	Manufacture of machinery for food, beverage and tobacco processing	40	41	1
26511	Manufacture of electronic instruments and appliances for measuring, checking, testing, navigation and other purposes, except industrial process control equipment	41	42	1
96010	Washing and (dry-)cleaning of textile and fur products	35	36	1
22110	Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres	92	93	1
77210	Renting and leasing of recreational and sports goods	16	17	1
20411	Manufacture of soap and detergents	70	71	1
20530	Manufacture of essential oils	64	65	1
32990	Other manufacturing n.e.c.	18	18	1
46711	Wholesale of petroleum and petroleum products	81	81	1
96040	Physical well-being activities	46	46	1
93191	Activities of racehorse owners	20	21	1
73110	Advertising agencies	14	15	1
20412	Manufacture of cleaning and polishing preparations	55	55	1
22220	Manufacture of plastic packing goods	23	24	1
47290	Other retail sale of food in specialised stores	27	28	1
38320	Recovery of sorted materials	38	38	1
32300	Manufacture of sports goods	36	36	1
82912	Activities of credit bureaus	87	87	0
32910	Manufacture of brooms and brushes	47	47	0
90010	Performing arts	13	14	0
28140	Manufacture of taps and valves	32	33	0
46630	Wholesale of mining, construction and civil engineering machinery	38	38	0
46520	Wholesale of electronic and telecommunications equipment and parts	24	24	0
01250	Growing of other tree and bush fruit and nuts	47	47	0
02200	Logging	49	50	0
46640	Wholesale of machinery for the textile industry and of sewing and knitting machines	42	42	0
46740	Wholesale of hardware, plumbing and heating equipment and supplies	29	29	0
71122	Engineering related scientific and technical consulting activities	34	34	0
94910	Activities of religious organizations	10	10	0
94120	Activities of professional membership organizations	22	22	0
96030	Funeral and related activities	26	26	0
46310	Wholesale of fruit and vegetables (except preparing cut, peeled vegetables, mixed salads, packed)	15	15	0
10821	Manufacture of cocoa and chocolate confectionery	94	94	0
50200	Sea and coastal freight water transport	43	43	0

Source: RF analysis of Business Structure Database, ONS

Table B: Product market CR5, sub-sectors with decreasing CR5 between 2003-04 and 2015-16

5-digit SIC code	Name	2003-04	2015-16	Change
56210	Event catering activities	67	8	-59
43220	Plumbing, heat and air-conditioning installation	54	3	-50
61100	Wired telecommunications activities	76	32	-44
18201	Reproduction of sound recording	56	13	-42
77291	Renting and leasing of media entertainment equipment	89	49	-40
38210	Treatment and disposal of non-hazardous waste	68	29	-39
62030	Computer facilities management activities	67	28	-39
46650	Wholesale of office furniture	64	27	-37
52243	Cargo handling for land transport activities of division 49	81	44	-37
85100	Pre-primary education	39	3	-37
46720	Wholesale of metals and metal ores	61	25	-36
59133	Television programme distribution activities	97	62	-36
85510	Sports and recreation education	39	4	-34
74901	Environmental consulting activities	53	19	-34
26309	Manufacture of communication equipment other than telegraph, and telephone apparatus and equipment	92	58	-34
77351	Renting and leasing of passenger air transport equipment	63	30	-33
25710	Manufacture of cutlery	97	65	-32
39000	Remediation activities and other waste management services	62	29	-32
85600	Educational support services	60	28	-32
51102	Non-scheduled passenger air transport	72	42	-30
95230	Repair of footwear and leather goods	47	17	-29
10832	Production of coffee and coffee substitutes	96	67	-28
02400	Support services to forestry	42	15	-27
50300	Inland passenger water transport	74	47	-26
87200	Residential care activities for learning difficulties, mental health and substance abuse	51	25	-26
46330	Wholesale of dairy products, eggs and edible oils and fats	51	25	-26
43110	Demolition	47	22	-25
49420	Removal services	45	20	-25
25300	Manufacture of steam generators, except central heating hot water boilers	78	53	-25
26110	Manufacture of electronic components	61	36	-25
46180	Agents specialized in the sale of other particular products	41	16	-25
82301	Activities of exhibition and fair organisers	51	26	-24
63110	Data processing, hosting and related activities	80	55	-24
21100	Manufacture of basic pharmaceutical products	79	55	-24
33150	Repair and maintenance of ships and boats	56	32	-24
59112	Video production activities	36	12	-23
46140	Agents involved in the sale of machinery, industrial equipment, ships and aircraft	39	16	-23
47300	Retail sale of automotive fuel in specialised stores	71	48	-23
33160	Repair and maintenance of aircraft and spacecraft	65	42	-23
47741	Retail sale of hearing aids	81	59	-22
56301	Licensed clubs	29	7	-21
68201	Renting and operating of Housing Association real estate	33	12	-21
55201	Holiday centres and villages	67	46	-21
47650	Retail sale of games and toys in specialised stores	88	68	-20
78300	Human resources provision and management of human resources functions	36	16	-20
26120	Manufacture of loaded electronic boards	54	34	-20
47430	Retail sale of audio and video equipment in specialised stores	63	43	-20
52241	Cargo handling for water transport activities of division 50	77	58	-20

46431	Wholesale of gramophone records, audio tapes, compact discs and video tapes and of the equipment on which these are played	71	52	-20
80300	Investigation activities	47	28	-19
95240	Repair of furniture and home furnishings	44	25	-19
78101	Motion picture, television and other theatrical casting activities	71	52	-19
43120	Site preparation	30	11	-19
85200	Primary education	41	22	-19
01300	Plant propagation	48	29	-19
81221	Window cleaning services	31	13	-18
93199	Other sports activities	44	26	-18
82911	Activities of collection agencies	69	51	-18
47250	Retail sale of beverages in specialised stores	42	24	-18
85310	General secondary education	30	13	-17
32200	Manufacture of musical instruments	40	22	-17
82110	Combined office administrative service activities	40	22	-17
23190	Manufacture and processing of other glass, including technical glassware	50	33	-17
59120	Motion picture, video and television programme post-production activities	41	24	-17
74201	Portrait photographic activities	52	35	-17
68202	Letting and operating of conference and exhibition centres	66	50	-17
90040	Operation of arts facilities	35	18	-16
28120	Manufacture of fluid power equipment	62	46	-16
35110	Production of electricity	79	63	-16
46760	Wholesale of other intermediate products	52	36	-16
80200	Security systems service activities	49	33	-16
59113	Television programme production activities	57	41	-16
01160	Growing of fibre crops	33	17	-16
26702	Manufacture of photographic and cinematographic equipment	82	66	-15
06100	Extraction of crude petroleum	69	54	-15
46342	Wholesale of wine, beer, spirits and other alcoholic beverages	38	23	-15
77120	Renting and leasing of trucks	52	37	-15
47910	Retail sale via mail order houses or via Internet	38	23	-15
10860	Manufacture of homogenized food preparations and dietetic food	85	70	-15
01700	Hunting, trapping and related service activities	39	24	-14
42110	Construction of roads and motorways	38	24	-14
10840	Manufacture of condiments and seasonings	68	54	-13
46160	Agents involved in the sale of textiles, clothing, fur, footwear and leather goods	41	28	-13
46470	Wholesale of furniture, carpets and lighting equipment	28	15	-13
14120	Manufacture of workwear	43	30	-13
46660	Wholesale of other office machinery and equipment	49	36	-13
63990	Other information service activities n.e.c.	51	38	-13
30920	Manufacture of bicycles and invalid carriages	66	53	-13
91020	Museums activities	43	30	-13
11030	Manufacture of cider and other fruit wines	97	84	-13
72110	Research and experimental development on biotechnology	70	57	-13
62020	Computer consultancy activities	29	16	-13
26520	Manufacture of watches and clocks	59	46	-13
74300	Translation and interpretation activities	49	36	-12
95220	Repair of household appliances and home and garden equipment	29	17	-12
26800	Manufacture of magnetic and optical media	92	80	-12
71112	Urban planning and landscape architectural activities	26	14	-12
81210	General cleaning of buildings	39	27	-12
70221	Financial management	62	51	-11
47190	Other retail sale in non-specialised stores	67	56	-11
93110	Operation of sports facilities	30	19	-11
46190	Agents involved in the sale of a variety of goods	34	22	-11

95120	Repair of communication equipment	81	70	-11
43390	Other building completion and finishing	18	7	-11
46460	Wholesale of pharmaceutical goods	34	23	-11
88910	Child day-care activities	16	5	-11
78109	Other activities of employment placement agencies	23	12	-11
69101	Barristers at law	16	5	-11
27310	Manufacture of fibre optic cables	76	65	-11
31030	Manufacture of mattresses	51	41	-11
47820	Retail sale via stalls and markets of textiles, clothing and footwear	22	12	-10
33200	Installation of industrial machinery and equipment	56	46	-10
14131	Manufacture of other men's outerwear	42	32	-10
25920	Manufacture of light metal packaging	76	66	-10
36000	Water collection, treatment and supply	69	59	-10
70210	Public relations and communications activities	31	21	-10
10520	Manufacture of ice cream	70	60	-10
27330	Manufacture of wiring devices	48	38	-10
71121	Engineering design activities for industrial process and production	39	30	-10
47530	Retail sale of carpets, rugs, wall and floor coverings in specialised stores	32	22	-9
88990	Other social work activities without accommodation n.e.c.	16	6	-9
60100	Radio broadcasting	64	55	-9
27900	Manufacture of other electrical equipment	35	26	-9
20200	Manufacture of pesticides and other agrochemical products	86	77	-9
82302	Activities of conference organisers	30	21	-9
08990	Other mining and quarrying n.e.c.	61	52	-9
47750	Retail sale of cosmetic and toilet articles in specialised stores	79	70	-9
19209	Other treatment of petroleum products (excluding petrochemicals manufacture)	65	57	-9
20130	Manufacture of other inorganic basic chemicals	75	66	-9
84110	General public administration activities	53	45	-9
46491	Wholesale of musical instruments	61	52	-9
81229	Other building and industrial cleaning activities	40	31	-8
46341	Wholesale of fruit and vegetable juices, mineral water and soft drinks	47	39	-8
74100	specialised design activities	20	11	-8
20120	Manufacture of dyes and pigments	74	66	-8
41202	Construction of domestic buildings	31	22	-8
90030	Artistic creation	16	8	-8
23610	Manufacture of concrete products for construction purposes	46	38	-8
28230	Manufacture of office machinery and equipment (except computers and peripheral equipment)	80	72	-8
93290	Other amusement and recreation activities n.e.c.	21	13	-8
33190	Repair of other equipment	21	13	-8
32500	Manufacture of medical and dental instruments and supplies	27	19	-8
46150	Agents involved in the sale of furniture, household goods, hardware and ironmongery	22	15	-8
77330	Renting and leasing of office machinery and equipment (including computers)	60	52	-8
18140	Binding and related services	29	22	-8
56102	Unlicensed restaurants and cafes	43	36	-7
20140	Manufacture of other organic basic chemicals	61	53	-7
71200	Technical testing and analysis	26	18	-7
61300	Satellite telecommunications activities	96	89	-7
96020	Hairdressing and other beauty treatment	10	3	-7
88100	Social work activities without accommodation for the elderly and disabled	22	15	-7
35130	Distribution of electricity	94	87	-7
14132	Manufacture of other women's outerwear	32	25	-7

46350	Wholesale of tobacco products	94	88	-7
46440	Wholesale of china and glassware and cleaning materials	34	28	-7
47770	Retail sale of watches and jewellery in specialised stores	33	26	-7
27120	Manufacture of electricity distribution and control apparatus	35	28	-7
33120	Repair of machinery	36	30	-7
10410	Manufacture of oils and fats	91	85	-7
30990	Manufacture of other transport equipment n.e.c.	59	52	-7
47782	Retail sale by opticians	20	14	-6
90020	Support activities to performing arts	34	28	-6
69102	Solicitors	16	10	-6
27510	Manufacture of electric domestic appliances	58	52	-6
59111	Motion picture production activities	16	10	-6
47591	Retail sale of musical instruments and scores	34	28	-6
85590	Other education n.e.c.	17	11	-6
82990	Other business support service activities n.e.c.	18	13	-6
43342	Glazing	14	8	-6
51210	Freight air transport	61	56	-5
25110	Manufacture of metal structures and parts of structures	16	11	-5
58120	Publishing of directories and mailing lists	58	53	-5
25120	Manufacture of doors and windows of metal	14	9	-5
58130	Publishing of newspapers	65	60	-5
10920	Manufacture of prepared pet foods	68	63	-5
28921	Manufacture of machinery for mining	80	75	-5
47640	Retail sale of sports goods, fishing gear, camping goods, boats and bicycles	58	53	-5
68310	Real estate agencies	19	14	-5
28302	Manufacture of agricultural and forestry machinery other than tractors	45	41	-5
60200	Television programming and broadcasting activities	85	80	-4
68209	Other letting and operating of own or leased real estate	13	8	-4
01490	Raising of other animals	22	17	-4
85320	Technical and vocational secondary education	14	10	-4
96090	Other personal service activities n.e.c.	10	6	-4
87900	Other residential care activities n.e.c.	11	7	-4
45190	Sale of other new motor vehicles	34	30	-4
24450	Other non-ferrous metal production	83	79	-4
74209	Photographic activities not elsewhere classified	18	14	-4
14110	Manufacture of leather clothes	55	51	-4
33140	Repair of electrical equipment	43	39	-4
80100	Private security activities	30	26	-4
85520	Cultural education	19	15	-4
46230	Wholesale of live animals	50	46	-4
43290	Other construction installation	20	16	-4
18203	Reproduction of computer media	59	55	-4
46900	Non-specialised wholesale trade	21	17	-4
19201	Mineral oil refining	98	94	-4
86102	Medical nursing home activities	9	6	-3
08120	Operation of gravel and sand pits; mining of clays and kaolin	62	59	-3
11020	Manufacture of wine from grape	96	93	-3
43330	Floor and wall covering	9	6	-3
47510	Retail sale of textiles in specialised stores	36	33	-3
69109	Activities of patent and copyright agents; other legal activities n.e.c.	22	19	-3
53100	Postal activities under universal service obligation	98	94	-3
81299	Other cleaning services	36	33	-3
10130	Production of meat and poultry meat products	53	50	-3

77320	Renting and leasing of construction and civil engineering machinery and equipment	20	17	-3
43210	Electrical installation	11	8	-3
74909	Other professional, scientific and technical activities n.e.c.	24	21	-3
47990	Other retail sale not in stores, stalls or markets	20	17	-3
85530	Driving school activities	49	46	-3
47520	Retail sale of hardware, paints and glass in specialised stores	65	62	-3
30300	Manufacture of air and spacecraft and related machinery	76	73	-3
22190	Manufacture of other rubber products	26	23	-3
17230	Manufacture of paper stationery	34	31	-3
01430	Raising of horses and other equines	8	5	-3
17211	Manufacture of corrugated paper and paperboard, sacks and bags	50	47	-3
46499	Wholesale of household goods (other than musical instruments) n.e.c.	28	26	-3
41201	Construction of commercial buildings	20	17	-3
27320	Manufacture of other electronic and electric wires and cables	60	58	-3
24100	Manufacture of basic iron and steel and of ferro-alloys	89	86	-3
10612	Manufacture of breakfast cereals and cereals-based food	91	89	-3
56101	Licensed restaurants	24	22	-3
55100	Hotels and similar accommodation	14	11	-3
09100	Support activities for petroleum and natural gas mining	44	41	-3
46610	Wholesale of agricultural machinery, equipment and supplies	24	22	-2
15200	Manufacture of footwear	52	49	-2
10310	Processing and preserving of potatoes	88	86	-2
25290	Manufacture of other tanks, reservoirs and containers of metal	32	30	-2
77310	Renting and leasing of agricultural machinery and equipment	38	35	-2
24410	Precious metals production	82	80	-2
52290	Other transportation support activities	17	15	-2
10320	Manufacture of fruit and vegetable juice	96	94	-2
33170	Repair and maintenance of other transport equipment	69	67	-2
71111	Architectural activities	18	15	-2
47789	Other retail sale of new goods in specialised stores (not incl. commercial art galleries and opticians) n.e.c.	12	10	-2
62012	Business and domestic software development	30	28	-2
10390	Processing and preserving of fruit and vegetables n.e.c.	56	54	-2
26400	Manufacture of consumer electronics	72	70	-2
81300	Landscape service activities	7	5	-2
84120	Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security	52	50	-2
43991	Scaffold erection	20	18	-2
11050	Manufacture of beer	89	88	-2
25610	Treatment and coating of metals	17	15	-2
01110	Growing of cereals (except rice), leguminous crops and oil seeds	5	3	-2
01450	Raising of sheep and goats	13	11	-2
68320	Management of real estate on a fee or contract basis	17	15	-2
45310	Wholesale trade of motor vehicle parts and accessories	39	37	-2
74202	Other specialist photography (not including portrait photography)	24	23	-1
24540	Casting of other non-ferrous metals	44	43	-1
47210	Retail sale of fruit and vegetables in specialised stores	7	5	-1
43999	Other specialised construction activities n.e.c.	8	7	-1
43910	Roofing activities	10	8	-1
85421	First-degree level higher education	15	14	-1
53201	Other postal and courier activities: Licensed carriers	35	34	-1
26301	Manufacture of telegraph, and telephone apparatus and equipment	37	36	-1
23700	Cutting, shaping and finishing of stone	11	10	-1

01410	Raising of dairy cattle	2	1	-1
46360	Wholesale of sugar and chocolate and sugar confectionery	68	67	-1
28950	Manufacture of machinery for paper and paperboard production	64	63	-1
35220	Distribution of gaseous fuels through mains	91	90	-1
29310	Manufacture of electrical and electronic equipment for motor vehicles	70	69	-1
46690	Wholesale of other machinery and equipment	17	17	-1
10910	Manufacture of prepared feeds for farm animals	47	46	0
77341	Renting and leasing of passenger water transport equipment	29	29	0
31010	Manufacture of office and shop furniture	19	19	0
47781	Retail sale in commercial art galleries	21	21	0
46170	Agents involved in the sale of food, beverages and tobacco	37	37	0
77299	Renting and leasing of other personal and household goods	51	50	0
59132	Video distribution activities	86	85	0
10720	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	69	69	0
25990	Manufacture of other fabricated metal products n.e.c.	8	7	0
43130	Test drilling and boring	26	26	0
01420	Raising of other cattle and buffaloes	4	3	0
47220	Retail sale of meat and meat products in specialised stores	5	5	0

Source: RF analysis of Business Structure Database, ONS

Resolution Foundation

Resolution Foundation is an independent research and policy organisation. Our goal is to improve the lives of people with low to middle incomes by delivering change in areas where they are currently disadvantaged. We do this by:

- » *undertaking research and economic analysis to understand the challenges facing people on a low to middle income;*
- » *developing practical and effective policy proposals; and*
- » *engaging with policy makers and stakeholders to influence decision-making and bring about change.*

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