

Statistical bulletin

# Trends in UK business dynamism and productivity: 2023

Experimental statistics on firm-level productivity, business dynamism and business markup estimates, showing how the economy has changed from 1997 to 2022.

Contact:  
Tom Wickersham  
productivity@ons.gov.uk  
+44 3000 682612

Release date:  
11 December 2023

Next release:  
To be announced

## Table of contents

1. [Main points](#)
2. [Firm-level labour productivity](#)
3. [Business dynamism](#)
4. [Market power](#)
5. [Trends in UK business dynamism and productivity data](#)
6. [Glossary](#)
7. [Measuring the data](#)
8. [Strengths and limitations](#)
9. [Related links](#)
10. [Cite this statistical bulletin](#)

# 1 . Main points

- In 2021, 70.6% of workers in the UK worked in firms with labour productivity below the mean.
- The dispersion of firm-level productivity across firms has increased; in 2021, workers in firms at the 90th percentile produced around 3.7 times as much output compared with workers in firms at the median of the distribution.
- Business dynamism has slowed compared with the period before the 2008 economic downturn; the total reallocation rate has fallen from 30.7% in 2001 to 20.6% in 2022.
- The responsiveness of firm-level employment growth to productivity has fallen since the 2008 downturn, leading to overall lower productivity growth as relatively more productive businesses expand more slowly.
- Measures of market power have increased; the average markup on intermediate consumption increased from 111% in 1997 to 127% in 2021.

Estimates of productivity, business dynamism and market power in 2020 and 2021 should be treated with some caution because of the impact of the coronavirus (COVID-19) pandemic on businesses and data collection.

## 2 . Firm-level labour productivity

The "productivity puzzle", explained in our [Productivity measurement article](#), refers to why labour productivity growth in the years following the 2008 economic downturn has remained below that in the years leading up to 2008.

Our [UK productivity overview article](#) shows that labour productivity, measured as Gross Value Added (GVA) per hour worked, grew at an average rate of 2.2% a year between 1971 and 2007. However, between 2011 and 2022 this growth rate has averaged 0.6% a year.

The Office for National Statistics has developed firm-level estimates of labour productivity, measured as approximate gross value added (aGVA) per worker. An advantage of using firm-level data is that we can see the contribution of different groups of firms to overall labour productivity growth.

Figure 1 breaks down labour productivity growth in different time periods by the contribution of "frontier" firms, "middle" firms and "laggard" firms. Frontier firms are those with labour productivity in the top 10% of the labour productivity distribution, weighted by the number of people they employ. Middle firms are those with labour productivity between the 50th and 90th percentile of the distribution, while laggard firms are those with labour productivity levels in the bottom half of the distribution.

This decomposition of labour productivity growth shows that frontier firms contributed 0.78 percentage points to the 1.59% annual growth in labour productivity between 1998 and 2007 (49% of the growth), and 0.75 percentage points to the 1.19% annual growth between 2011 and 2019 (63%). The contribution of middle firms fell from 0.62 percentage points between 1998 and 2007 to 0.34 percentage points between 2011 and 2019. This means that labour productivity in the run-up to the coronavirus (COVID-19) pandemic was more dependent on frontier firms than before the 2008 economic downturn.

Figure 1 also shows strong labour productivity growth in the period 2020 to 2021. This reflects a 10% fall in labour productivity in 2020 and a 14% increase in 2021.

**Figure 1: Labour productivity growth following the 2008 economic downturn has been more reliant on frontier firms**

Firm-level percentiles contribution to total growth in mean annual aGVA per worker, grouped time periods between 1998 and 2021, non-financial business sector, 2019 constant prices, UK

Figure 1: Labour productivity growth following the 2008 economic downturn has been more reliant on frontier firms

Firm-level percentiles contribution to total growth in mean annual aGVA per worker, grouped time periods between 1998 and 2021, non-financial business sector, 2019 constant prices, UK



Source: Annual Business Survey from the Office for National Statistics and Northern Ireland Annual Business Inquiry from the Northern Ireland Statistics and Research Agency

Notes:

1. Time period growth rates represent the average of the annual growth rates across the period.
2. Firms are weighted by the number of people they employ. See Section 8: Strengths and limitations for further details.

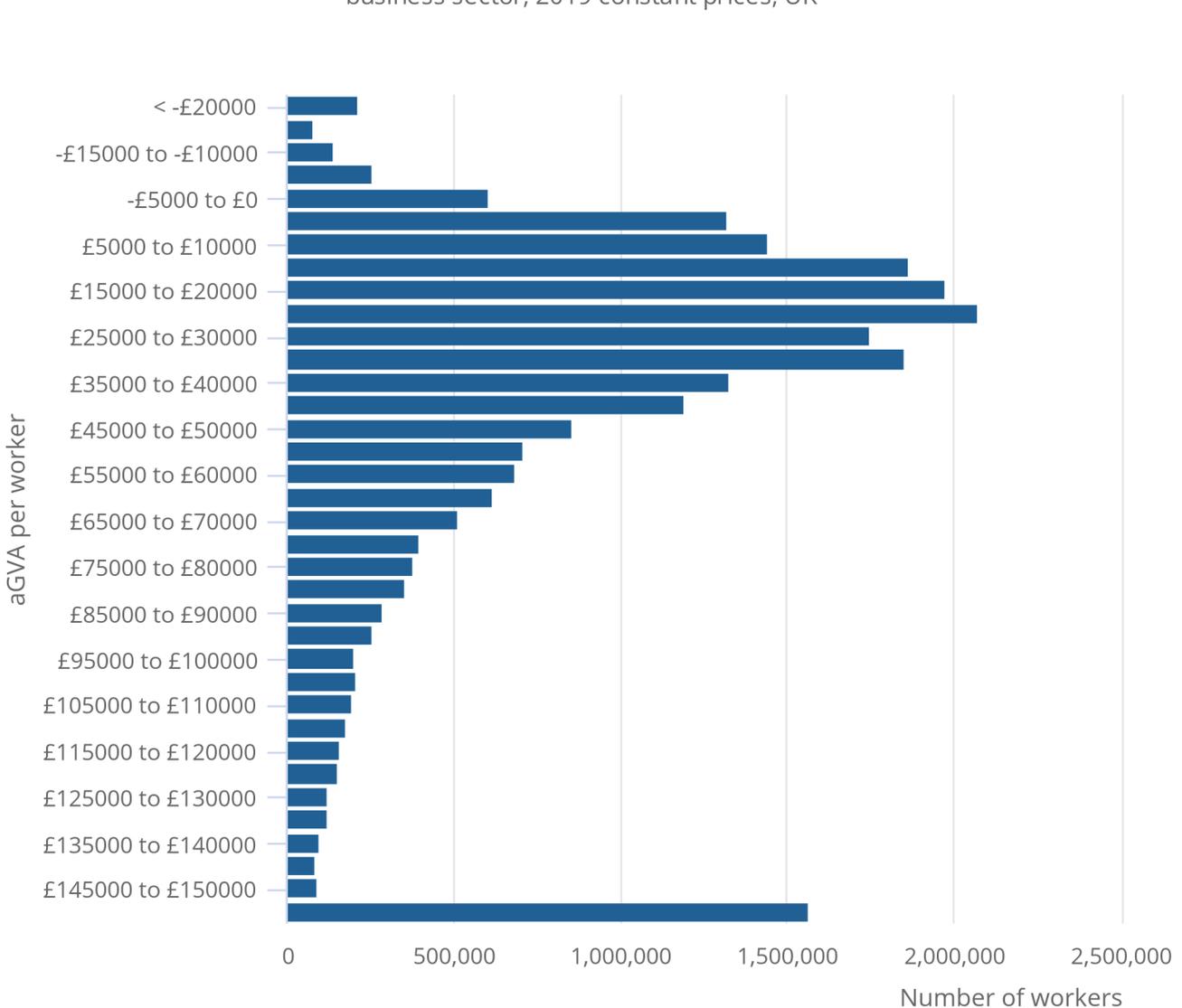
Labour productivity is not distributed evenly across all workers and firms in the economy. Figure 2 shows that most workers in the UK (70.6%) work in firms with labour productivity below the mean. This appears as a short tail of the distribution below the average where most workers are clustered. However, there is also a long tail of workers in firms with very high labour productivity. This long tail is shown in the final column of Figure 2, which shows 1.5 million people employed in firms with productivity of over £150,000 aGVA per worker.

**Figure 2: Most workers are in firms around the median productivity, but there are also many workers in a long tail of highly productive businesses**

Number of workers by aGVA per worker of the workers' business in 2021, non-financial business sector, 2019 constant prices, UK

Figure 2: Most workers are in firms around the median productivity, but there are also many workers in a long tail of highly productive businesses

Number of workers by aGVA per worker of the workers' business in 2021, non-financial business sector, 2019 constant prices, UK



Source: Annual Business Survey from the Office for National Statistics and Northern Ireland Annual Business Inquiry from the Northern Ireland Statistics and Research Agency

Over the period 1997 to 2021, mean labour productivity increased by 23.5%, from £42,500 to £52,500 aGVA per worker. Meanwhile, the median has grown more slowly, increasing 8.8% from £28,500 to £31,000 aGVA per worker.

This shows that there has been faster growth in productivity by frontier firms, which has led to an increase in dispersion of productivity across the workforce. Figure 3 shows that this dispersion, measured by the ratio between the 90th percentile and the 50th percentile of the productivity distribution, increased from 3.16 in 1997 to 3.68 in 2021. This means that workers in firms at the 90th percentile produce almost four times as much output compared with workers in firms at the median of the distribution in 2021.

However, there are different trends between the services and manufacturing sector. In 2021, workers in non-financial market services at the 90th percentile produced 3.69 times as much output compared with workers in non-financial market services firms at the median of the distribution, whereas this ratio was 2.47 in the manufacturing sector.

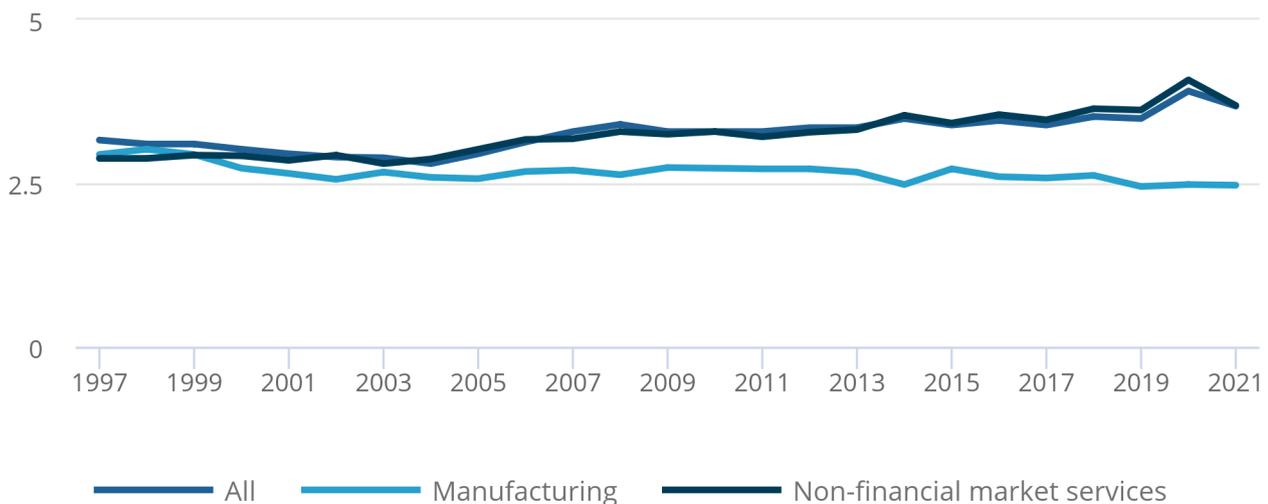
Dispersion between the 50th and 10th percentile of the productivity distribution decreased between 1997 and 2019 from 6.33 to 4.69, suggesting that laggard firms were catching up to the median firm. However, this measure increased to 7.75 in 2021 because of the greater impact of the coronavirus pandemic on lower productivity businesses.

**Figure 3: The dispersion of firm-level productivity across service firms has increased since 1997, while for manufacturing it has fallen**

Ratio of aGVA per worker in the 90th percentile of firms to the 50th percentile of firms, non-financial business sector, 2019 constant prices, UK, 1997 to 2021

Figure 3: The dispersion of firm-level productivity across service firms has increased since 1997, while for manufacturing it has fallen

Ratio of aGVA per worker in the 90th percentile of firms to the 50th percentile of firms, non-financial business sector, 2019 constant prices, UK, 1997 to 2021



Source: Annual Business Survey from the Office for National Statistics and Northern Ireland Annual Business Inquiry from the Northern Ireland Statistics and Research Agency

### 3 . Business dynamism

Business dynamism is typically measured as the rate at which jobs are created and destroyed. Job creation comes from incumbent businesses growing and new businesses opening, while jobs are destroyed by incumbent businesses shrinking and by businesses closing. High rates of business dynamism can support productivity growth if new and growing businesses have higher productivity than shrinking and closing businesses.

A wide literature has documented a decline in business dynamism over recent decades in the US (see Akcigit and Ates's paper, [Ten Facts on Declining Business Dynamism and Lessons from Endogenous Growth Theory](#)), Europe (see the [Declining Business Dynamism in Europe paper \(PDF, 1.8MB\)](#) from Biondi and others) and globally (Calvino and others' [Declining business dynamism paper](#)).

Figure 4 measures the contribution of new businesses, growing incumbents, closing businesses, and shrinking incumbents to total employment growth over the period 2001 to 2022. Both job creation and job destruction rates were lower in the period following the 2008 economic downturn than the period before. Between 2001 and 2007, the annual average job creation and destruction rates stood at 13.7% and 12.3%, respectively, but between 2011 and 2019, job creation averaged 11.1% and job destruction averaged 9.6%.

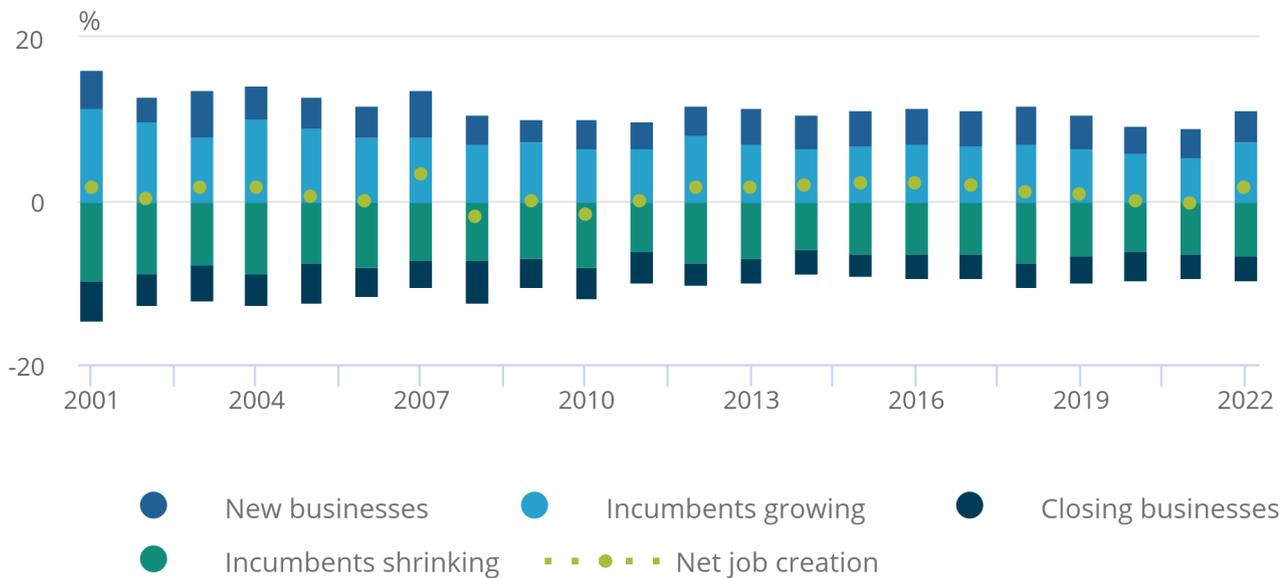
A decline in job creation during the coronavirus (COVID-19) pandemic caused net job creation to stall again, with job creation and destruction rates averaging 9.9% and 9.5%, respectively, in the period 2020 to 2022. These annual figures may be masking sharper within-year changes in employment and business entries and exits during 2020 and 2021.

**Figure 4: Job creation and destruction rates have been lower since the 2008 economic downturn**

Annual contributions to rate of net job creation by different groups of businesses, whole economy, UK, 2001 to 2022

Figure 4: Job creation and destruction rates have been lower since the 2008 economic downturn

Annual contributions to rate of net job creation by different groups of businesses, whole economy, UK, 2001 to 2022



Source: Longitudinal Business Database from the Office for National Statistics

Notes:

1. The job creation (or destruction) rate is calculated as the ratio of jobs created (or destroyed) in period T over total employment in period T minus one.

Overall business dynamism can be measured by the reallocation rate, which is the sum of the job creation and job destruction rates. The job reallocation rate fell from 30.7% in 2001 to 20.6% in 2022. Figure 5 breaks down job reallocations into the intensive margin (incumbents growing and shrinking) and the extensive margin (new and closing businesses).

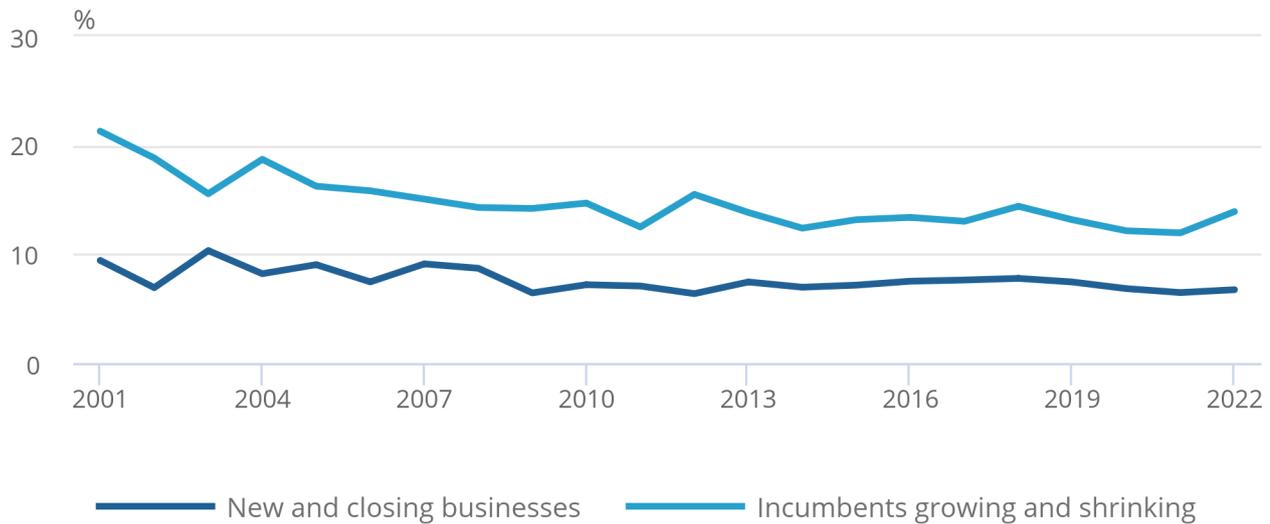
Job reallocation was lower in the period following the 2008 economic downturn. The decline in reallocation happened through both the intensive and extensive margins but there was a larger reduction in the rate of incumbents growing and shrinking. Reallocation rates continued to fall during the coronavirus pandemic but increased again in 2022.

**Figure 5: Most job creation and destruction occurs through incumbent firms, with fewer jobs created or destroyed by new and closing businesses**

Annual reallocation rates, whole economy, UK, 2001 to 2022

Figure 5: Most job creation and destruction occurs through incumbent firms, with fewer jobs created or destroyed by new and closing businesses

Annual reallocation rates, whole economy, UK, 2001 to 2022



Source: Longitudinal Business Database from the Office for National Statistics

Recent academic literature has looked at the association between slowing business dynamism and declining productivity growth. In our previous [Estimates of markups, market power and business dynamism article](#), we used Annual Business Survey (ABS) data to look at the relationship between firm-level labour productivity and firm-level employment growth, a proxy for business dynamism. We update the specification to cover data up until 2021 and find that firm-level employment growth over the following three years was 40% less responsive to changes in firm-level productivity in the period 2011 to 2018 when compared with the period 1999 to 2005.

This implies that there has been slower reallocation of workers from low to high productivity firms, which helps explain slower overall productivity growth. A similar fall in the responsiveness of employment growth to productivity has been found in the US by Ryan A. Decker and others in their [Changing Business Dynamism and Productivity paper](#).

## 4 . Market power

Market power refers to the ability of businesses to influence the price of the goods and services they sell. Typically, when businesses have high market power, they choose to maximise profits by setting high prices and selling less produce. This has implications for business dynamism, as market power makes it difficult for new businesses to enter the market successfully.

Market power can be measured by estimating markups. A markup measures the difference between the price at which a unit is sold and the cost of producing it. If a market is perfectly competitive and there are no fixed costs, firms have no price setting ability and must set their output price equal to the marginal cost of producing the last unit of output – that is, markups are zero. Therefore, markups above zero are evidence of market power.

Markups are measured here on intermediate consumption costs (goods and services used up during production). These markups represent where a business could afford to purchase more intermediate inputs, to produce more output at a reduced profit but not at a loss.

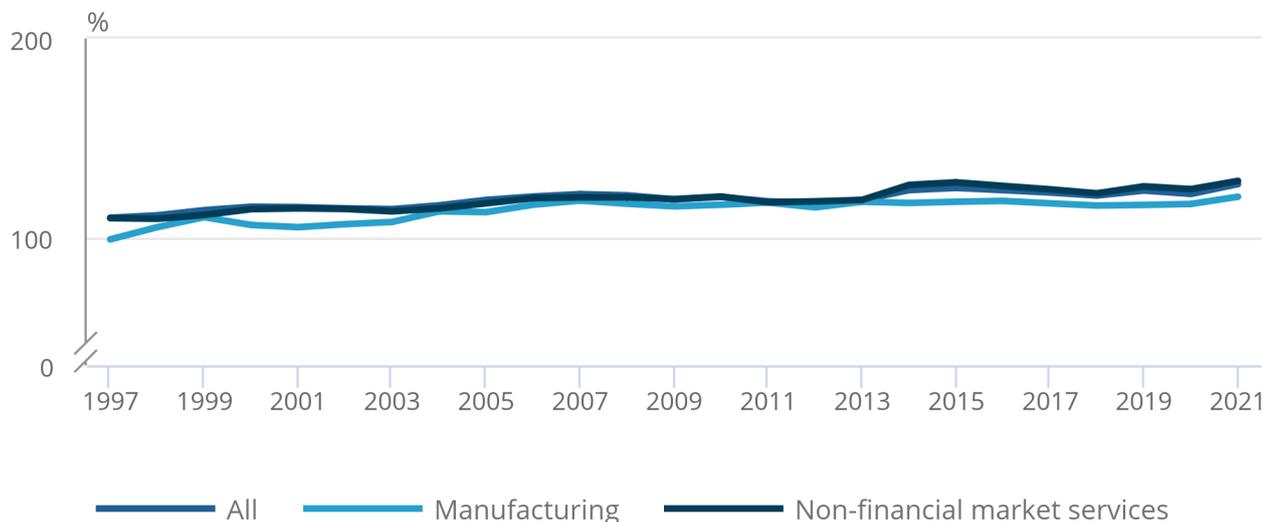
Figure 6 shows that the average intermediate consumption markup in the non-financial business sector has increased from 111% in 1997 to 127% in 2021. This is true for both services and manufacturing sectors, which have seen increases in average markups since 1997.

### Figure 6: Intermediate consumption markups have increased in the last 20 years

Mean markups on intermediate consumption, non-financial business sector, UK, 1997 to 2021

#### Figure 6: Intermediate consumption markups have increased in the last 20 years

Mean markups on intermediate consumption, non-financial business sector, UK, 1997 to 2021



Source: Annual Business Survey from the Office for National Statistics and Northern Ireland Annual Business Inquiry from the Northern Ireland Statistics and Research Agency

#### Notes:

1. Markups refer to the ratio of a firm's unit price of output to a firm's unit cost of its intermediate consumption.

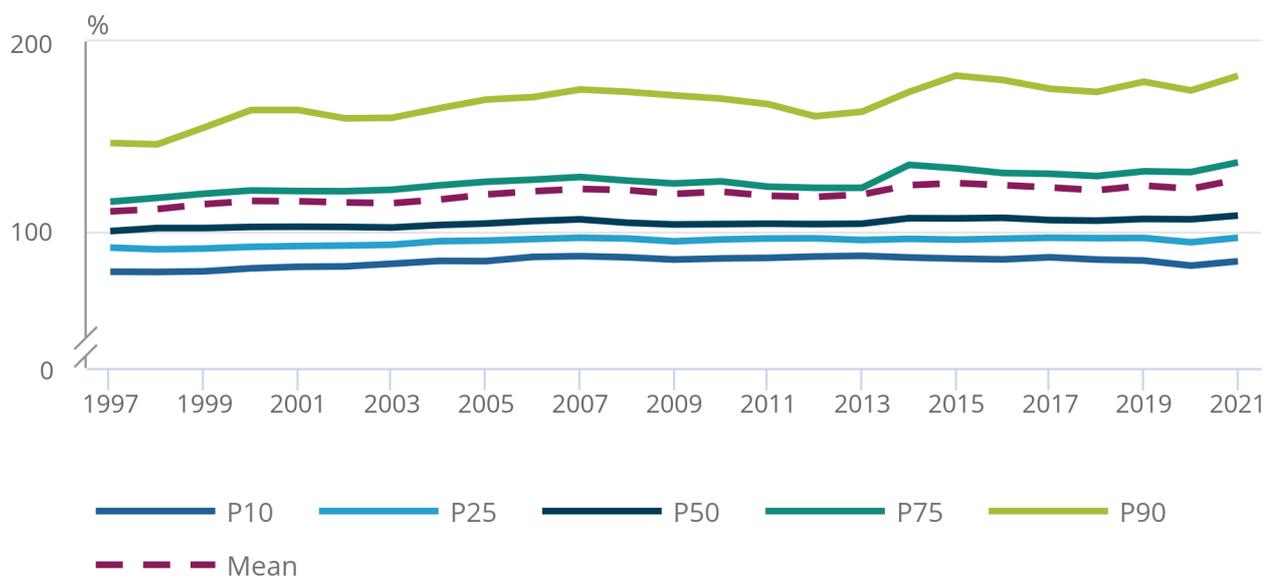
Figure 7 shows that across sectors markup growth has been concentrated at the top of the markup distribution. Between 1997 and 2021 the markup of a firm in the 90th percentile of the markup distribution increased from 147% to 182%. The ratio between the 90th percentile and the 50th percentile intermediate consumption markup was 1.46 in 1997 and increased to 1.68 in 2021.

**Figure 7: Average intermediate consumption markup changes are caused by changes at the top of the distribution**

Distribution of markups on intermediate consumption, non-financial business sector, UK, 1997 to 2021

Figure 7: Average intermediate consumption markup changes are caused by changes at the top of the distribution

Distribution of markups on intermediate consumption, non-financial business sector, UK, 1997 to 2021



Source: Annual Business Survey from the Office for National Statistics and Northern Ireland Annual Business Inquiry from the Northern Ireland Statistics and Research Agency

The profit margin is an alternative to markups as an indicator of market power and is measured as profits divided by gross output. It follows largely similar trends to the markup data. Figure 8 shows that the average profit margin increased from 12.9% in 1997 to 14.9% in 2021, with this increase also skewed heavily towards the top of the distribution.

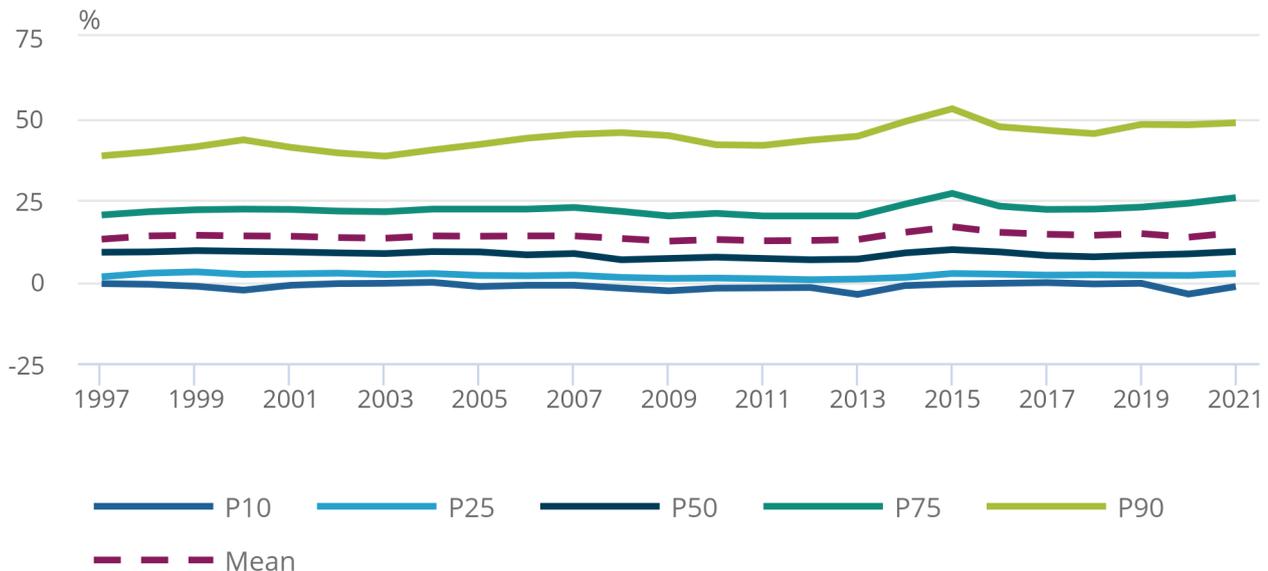
Whereas the median profit margin did not change over the same period, the profit margins at the 90th percentile increased from 38% in 1997 to 49% in 2021. This generated an increase in the 90 to 50 ratio from 4.31 to 5.33 over this period.

## Figure 8: The mean profit share has risen slightly, mostly because of changes at the top of the distribution

Mean and percentiles of the approximate profit share, non-financial business sector, UK, 1997 to 2021

### Figure 8: The mean profit share has risen slightly, mostly because of changes at the top of the distribution

Mean and percentiles of the approximate profit share, non-financial business sector, UK, 1997 to 2021



Source: Annual Business Survey from the Office for National Statistics and Northern Ireland Annual Business Inquiry from the Northern Ireland Statistics and Research Agency

## 5. Trends in UK business dynamism and productivity data

[Estimates of markups, market power, productivity growth and business dynamism from the Annual Business Survey](#)

Dataset | Released 26 August 2022

Experimental statistics on the profitability, markups and market power of businesses, plus contributions to productivity growth from productivity growth within businesses and reallocations across businesses.

[Firm-level business dynamism estimates from the Longitudinal Business Database: summary statistics, UK](#)

Dataset | Released 11 December 2023

Summary statistics of business dynamism taken from the Longitudinal Business Database (LBD), UK.

[Firm-level labour productivity estimates from the Annual Business Survey: summary statistics, Great Britain](#)

Dataset | Released 7 March 2021

Summary statistics of labour productivity as measured by the Annual Business Survey (ABS) by different breakdowns of firm characteristics, Great Britain.

## 6 . Glossary

### Approximate gross value added

Our [Annual Business Survey \(ABS\)](#) provides information on turnover and intermediate purchases, which can be used to estimate businesses' approximate gross value added (aGVA). It is a measure of the income generated by those surveyed, less their intermediate consumption of goods and services used up in order to produce their output.

### Business dynamism

Business dynamism refers to a collection of statistical concepts to measure how quickly an economy reallocates resources from less productive to more productive firms. Business dynamism can, for instance, be measured as the entry and exit rates of new firms or establishments, or as the contribution to job creation and destruction from the entry and exit of firms. In this article, we use the latter concept.

### Job creation

Job creation refers to the employment created when firms enter, re-enter after a period of inactivity lasting at least a year, or when existing firms expand. Job destruction refers to the employment destroyed when existing firms contract, exit the market or become inactive for a period of at least a year.

The sum of job creation and destruction is the reallocation rate or “churn”. This turnover measure gives an indication of the labour reallocation that is occurring at a point in time.

### Labour productivity

Labour productivity is calculated by dividing output by labour input. For this bulletin, we measure output by aGVA and the labour input by number of workers in the firm.

### Markup

A markup is defined as the difference between price and the marginal cost (often expressed as a proportion of price or marginal cost). Markups can provide a measure of the market power of a firm. In a perfectly competitive market, markups are zero, while monopolists and oligopolists will charge positive markups.

However, since markups can also be the result of up-front investments (firms may need to charge mark-ups to cover fixed costs) or input market frictions, markups need to be evaluated together with other measures to establish changes in market power.

### Profit margin

The profit margin is an accounting measure of the profitability of the firm. It is computed by dividing a firm's pre- or post-tax profit by its revenue. In this article, we use pre-tax figures when we describe profit margins.

## 7 . Measuring the data

Estimates for firm-level labour productivity and market power are derived from the Annual Business Survey (ABS). The ABS combines data from the Annual Business Inquiry (1998 to 2008), Annual Business Survey (2008 to 2019) and Northern Ireland Annual Business Inquiry (1998 to 2019). This represents the largest Office for National Statistics (ONS) business survey in terms of the number of respondents and variables it covers. The ABS covers the non-financial business sector only, which excludes businesses from the following industries:

- farms in section A (agriculture)
- all of section K (finance and insurance)
- section O (public administration and defence)
- the government components of section P (education) and Q (health)

Prior to the coronavirus (COVID-19) pandemic, the average response rate was 75%. In 2020, this fell to 58.8% because of the increased difficulty in contacting respondents. In 2021, 67.5% of sampled businesses were included in the final ABS results.

Business dynamism results are derived from the Longitudinal Business Database (LBD), which is an experimental data spine constructed using the Inter-departmental Business Register (IDBR). The LBD provides longitudinal business microdata at a quarterly frequency. The business dynamism results presented in this bulletin are based on the annual LBD. The annual LBD is derived from the quarterly LBD by selecting Quarter 3 (July to Sept) IDBR data for most years, apart from 2002, which uses Quarter 4 (Oct to Dec). This is done to capture the annual updates in firm employment.

[Further information about the ABS can be found in our](#) [ABS Quality and Methodology Information \(QMI\)](#).

Further information about the LBD can be found in the [UK Longitudinal Business Database technical report](#).

The measures presented in this bulletin have previously been published as analytical articles. More detail on the background and methodology for these measures can be found in these articles, which can be accessed in [Section 9: Related links](#).

## 8 . Strengths and limitations

### Firm-level labour productivity

Estimates are weighted to be representative of workers in the non-financial business sector. First, the sample is weighted to be representative of the whole population of UK businesses, using survey design weights based on the Inter-departmental Business Register (IDBR). Then, each business is additionally weighted by its workforce size. For example, a factory with 1,000 workers has 200 times more weight than a small workshop with five workers. In our dataset in 2021, approximately half of workers were in firms with 250 workers or more, even though there were only 8,500 firms of this size out of approximately 2.5 million businesses in total.

Results are also presented on a constant price basis, with a base year of 2019. Following the implementation of double deflation we use implicit price deflators calculated from the gross domestic product (GDP) output accounts (see our [Double deflation in the UK National Accounts methodology](#) for more information). The price deflators were calculated at the lowest level of industry aggregation used in the national accounts, which is mostly the two-digit Standard Industrial Classification (SIC) level.

### Business dynamism

The annual Longitudinal Business Database (LBD), derived from the quarterly LBD, uses two consecutive annual snapshots to establish true longitudinality. In addition, like the quarterly LBD, the annual version uses unit-specific filters to build a clearer picture of the active business population for all units of the business structure.

The UK Business Register and Employment Survey (BRES) is the primary source of employment in the IDBR. Though BRES captures the annual employment dynamics, its use introduces a one-year lag, as the updated employment is reflected in the following year in the IDBR. The BRES also does not survey all firms every year; for firms that are not surveyed on an annual basis, the employment is not updated every year.

Furthermore, since the present version of the LBD only takes the IDBR as its input, not all businesses are included. Nonetheless, businesses on the IDBR represent roughly 97% of turnover and 88% of employment (see [Business population estimates 2022 from the Department for Business, Energy and Industrial Strategy](#)).

## Market power

Capital stocks are not available at the firm level. Therefore, they are constructed through the Perpetual Inventory Method based on deflated capital expenditure values in the Annual Business Survey (ABS), and starting capital stocks from the National Accounts, apportioned to the firm based on employment. Missing investment values are imputed based on a firm's own average investment, and where this is not possible based on that of similar firms.

To be able to compare quantities across years in real terms, we apply GDP implicit price deflators. These deflators are calculated at the lowest level of industry aggregation in the National Accounts. Typically, this is the two-digit SIC level. As a result, estimates in this paper are given in constant price terms, with 2019 as the base year.

We apply the frequency weights that are computed as part of the construction of the ABS and ABI. This ensures that the sample is representative of the business population at large. Additionally, we weigh firm-level markups by employment: this gives the markup at the representative employee.

## 9 . Related links

[Firm-level labour productivity measures from the Annual Business Survey, UK: 1998 to 2019](#)

Article | Released 7 March 2022

Labour productivity firm-level experimental statistics using the Annual Business Survey. Covering non-financial business economy for the UK, 1998 to 2019.

[Estimates of markups, market power and business dynamism from the Annual Business Survey, Great Britain: 1997 to 2019](#)

Article | Released 26 August 2022

Experimental statistics on profitability, business markup estimates, market power and business dynamism based on firm-level business survey data, showing how the economy has changed over the period 1997 to 2019.

[Business dynamism in the UK economy: Quarter 1 \(Jan to Mar\) 1999 to Quarter 4 \(Oct to Dec\) 2019](#)

Bulletin | Released 15 October 2020

Experimental Statistics on business dynamism at a firm level using the Inter-Departmental Business Register (IDBR). The analysis includes changes in quarterly job creation and destruction rates by different firm characteristics since 1999 to 2019 for the UK.

## 10 . Cite this statistical bulletin

Office for National Statistics (ONS), released 11 December 2023, ONS website, statistical bulletin, [Trends in UK business dynamism and productivity: 2023](#)