Component approach to measuring labour productivity, UK: 1997 to 2024

An assessment of the methods and impacts of the new component approach to labour productivity measurement in the UK. These are not official statistics.

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18. Cite this methodology

1 . Overview

- We are improving how UK labour productivity is measured by building labour input from separate measures of hours worked, jobs and workers, using household surveys, business surveys and administrative data, in line with the latest international norms and standards.

- The new “component” approach introduces explicit adjustments for annual leave, sickness, bank holidays, furlough and overtime, while benchmarking hours worked to employer-reported data; it will replace existing UK labour productivity statistics.

- The new approach leads to relatively small changes in long-run growth in output per job and output per worker, while bringing worker-based measures closer to administrative data in recent years; output per job growth averaged 1.9% a year under the current approach and 1.7% under the component approach between 1997 and 2007, before both slowed to around 1.0% a year between 2009 and 2019.

- Following the coronavirus (COVID-19) pandemic, output per worker under the component approach tracks estimates derived from Pay As You Earn Real Time Information (PAYE RTI) more closely than the current Labour Force Survey (LFS)-based measure in recent years; by 2024, output per worker was around 1.9% above its 2019 level under the component approach, compared with 2.4% under the current approach, and 1.5% under PAYE RTI.

- While the downturn in output per job and output per worker growth following the 2008 global financial crisis (GFC) is similar under both approaches, the component approach provides a different account of total-actual-hours growth post-GFC.

- Under the current approach, growth in total actual hours worked post-GFC was driven almost entirely by increases in jobs, with average hours worked contributing little to overall growth, while the component approach suggests that the pre-GFC downward trend in average hours worked continued, partly offsetting growth in jobs; as a result, total actual hours worked in 2024 were 11.1% above their 1997 to 2007 pre-GFC average under the component approach, compared with 18.5% under the current methodology.

- Consequently, by 2024, output per hour is estimated to be 40.7% higher than in 1997 under the component approach, compared with 34.0% under the current LFS-based methodology; over the 1997 to 2024 period, this implies annual productivity growth of 1.3% compared with 1.1% under the current approach.

- Output per hour growth averaged 2.1% a year under the current approach and 2.0% a year under the component approach between 1997 and 2007; between 2009 and 2019, growth slowed to 0.7% a year under the current approach but 1.3% a year under the component approach, suggesting that slower growth in total actual hours post-GFC resulted in stronger growth in output per hour than previously estimated.

2 . About the component approach

This article explains how we have developed the new “component” approach to measuring labour productivity statistics. This breaks down labour input measurement into its main components:

- workers
- filled jobs
- total actual hours worked

It combines household survey, business survey and administrative data sources to estimate these, using each source where it has comparative strength. The aim is to deliver more robust estimates in line with the latest international statistical standards and guidance, with improved coherence between labour input and output produced, and better comparability with the estimates produced by other countries.

As this new method does not affect the measurement of gross value added (GVA), differences from previously published productivity estimates reflect the updated labour input estimates, not changes in output. However, this article does reflect the Blue Book 2026 dataset.

This article presents the indicative impacts of these methodological improvements before their implementation into UK productivity statistics. They will be implemented for the whole economy in our November 2026 quarterly Productivity flash estimate and overview, UK release. Full implementation of the new approach, including industry estimates, is scheduled for the February 2027 quarterly Productivity flash estimate and overview, UK release. These will replace existing labour productivity statistics. Methods and data impacts presented in this article are indicative and intended for user engagement before their implementation.

Forthcoming independent research undertaken by Cliodhna Taylor (Office for National Statistics) and Josh Martin (Bank of England), presented at the ESCoE Conference in May 2026 (PDF, 519KB) and being developed as an ESCoE paper, has informed many of the methodological choices described in this article. Development of ONS's component approach has progressed in parallel, drawing on the same conceptual framework and principles, as well as several of the lessons learnt from Martin and Taylor, while being implemented and tested within the productivity statistics system.

3 . Measuring labour for productivity statistics

Labour productivity matters: it is an important long-term driver of living standards and is central to macroeconomic policy making. It represents how much economic output is produced for each unit of labour input, such as an hour worked, a filled job or a worker.

Productivity therefore depends on robust, high-quality measures of output and labour inputs. We draw output estimates from the Quarterly National Accounts, revised annually with the publication of Blue Book, explained in our Blue Book 2026: impact on GDP and main components article. This revision of method makes no change in this regard. Instead, it focuses on the measurement of labour inputs.

Two important approaches

There are two broad approaches to estimating total hours worked. The current approach used is known as the “direct approach”, which starts from a household survey, the Labour Force Survey (LFS), to measure average hours worked, and then multiplies this by the number of filled jobs to produce an estimate of total hours worked. Total productivity hours are calculated by multiplying employee jobs and self-employment jobs from workforce jobs by LFS average actual hours at industry level, with supplementary adjustments for His Majesty’s Forces, government-supported trainees and unpaid family workers, before being constrained to aggregate to the LFS total for actual hours worked.

In the current method, “productivity jobs”, which measure the number of filled jobs used in labour productivity statistics, are based on workforce jobs (WFJ) estimates for industry detail, together with supplementary coverage adjustments, but are constrained to the aggregate LFS estimate. Consequently, whole-economy estimates of actual hours worked, jobs and workers are taken directly from the LFS.

Research by the Organisation for Economic Co-operation and Development (OECD) on labour input measurement and international productivity gaps (PDF, 3.3MB) found that the direct approach can be subject to bias. Households can inaccurately report leave and overtime, particularly where one member of the household reports for others. Another issue is non-response; households away on holiday are less likely to reply, so imputing their hours from historic responses may overestimate the hours actually worked.

Data exist within the statistical system that allow us to better observe these factors. Rather than taking a single integrated estimate of actual hours from one survey, the new methodology – named the “component approach” – aims to benefit from a wider range of data sources available within the Government Statistical System. It uses these to build labour input upwards from separate parts, using different sources for hours, jobs and workers where they provide stronger evidence. The component approach also more closely aligns to the main concept for productivity: the labour input into the production process. Importantly, the majority of major comparator countries use this approach, as surveyed by the OECD in the link above.

By estimating the important concepts separately and using the most appropriate source for each, the component approach should better reflect the wider data picture. It also means that individual components can be improved as better evidence becomes available, without needing to rebuild the whole framework.

4 . Component approach methodology

The proposed framework produces three estimates at the SIC 2007 division level, combining different methods and data sources to utilise the most reliable source available for each component, rather than depending primarily on a single survey-based measure.

A full summary of data sources used throughout the component approach methodology can be found in Section 13: Data sources.

Jobs

Total filled jobs, primarily from workforce jobs (WFJ). Employee jobs are estimated using the employee component of WFJ, which draws mainly on employer surveys including the Quarterly Business Survey (QBS), and is benchmarked annually to the Business Register and Employment Survey (BRES), while self-employment jobs are measured using the Labour Force Survey (LFS). Total filled jobs are the labour input used to calculate output per job.

Hours

Average actual hours worked per job, built from a paid usual weekly hours baseline from the Annual Survey of Hours and Earnings (ASHE) with adjustments for overtime, annual leave, sickness, parental and other absence, and furlough, weighted by full-time and part-time jobs. Average actual hours per job multiplied by filled jobs gives total actual hours worked by industry, which pairs with industry gross value added (GVA) to give output per hour.

Workers

Total workers are the labour input used to calculate output per worker. They are estimated by applying worker-to-job ratios that are derived from ASHE and LFS to filled jobs estimates. These ratios capture the prevalence of people holding multiple jobs and are used to convert filled jobs into estimates of unique workers.

5 . Indicative impacts

In this subsection, we provide indicative impacts from introducing the components method into labour productivity statistics, covering the period from 1997 to 2024. The November 2026 quarterly labour productivity bulletin will extend these estimates up to the latest quarter at the whole-economy level.

Across output per hour, output per job and output per worker, productivity was higher in 2024 than in 1997, but most of the improvement occurred before the 2008 global financial crisis (GFC). Growth slowed markedly after 2008, which is the central feature of the UK's productivity puzzle: the economy continued to expand employment, but output produced for each unit of labour input rose much more slowly than before. The coronavirus (COVID-19) pandemic then produced large but different movements across the three measures, particularly because hours worked fell more sharply than jobs or workers.

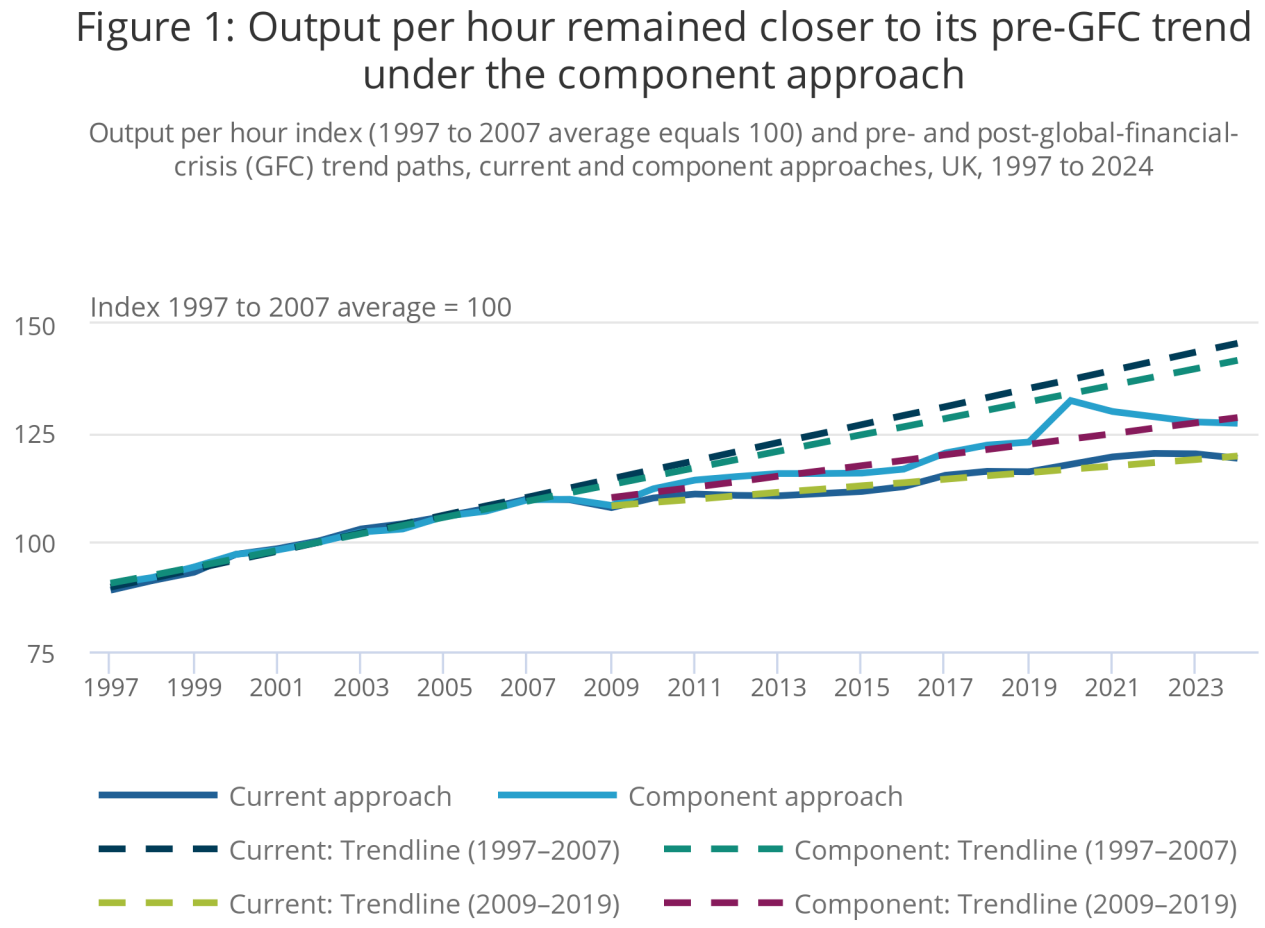
All productivity estimates presented in the following sections use gross value added data consistent with the forthcoming 2026 Blue Book.

Output per hour worked

Output per hour is the headline and preferred measure of labour productivity because it relates output to the amount of labour time actually used in production.

Figure 1: Output per hour remained closer to its pre-GFC trend under the component approach

Output per hour index (1997 to 2007 average equals 100) and pre- and post-global-financial-crisis (GFC) trend paths, current and component approaches, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Figure 1 compares output per hour with pre-GFC and post-GFC linear trend paths. The pre-GFC trend is based on growth between 1997 and 2007. Under the current approach, extending this earlier trend forward produces a counterfactual path that sits well above the observed series after the financial downturn. This illustrates the productivity puzzle: output per hour continued to grow after 2008, but at a much slower rate than would have been expected from the pre-GFC trend.

The post-GFC trend fits the observed series currently used in labour productivity statistics much more closely. This suggests that the financial downturn marked a structural break in productivity growth, after which a lower-growth period persisted.

For the current approach, output per hour grew by 2.1% a year between 1997 and 2007, but by only 0.7% a year between 2009 and 2019.

Under the component approach, the distinction between the pre- and post-GFC trends are less pronounced. Growth still slows after the financial downturn, but the post-GFC trend lies closer to the earlier trajectory than under the current approach. Component output per hour also shows stronger post-crisis growth, increasing by 1.3% a year between 2009 and 2019, compared with 2.0% a year between 1997 and 2007.

This difference reflects the labour input. The component approach produces increasingly lower total actual hours than the current approach because average actual hours per job are decreasing over time, mainly through the explicit treatment of annual leave, bank holidays, paid usual hours benchmarking, sickness, furlough and other lower-hours adjustments, reflecting increasing minimum values and changing working patterns. Section 10: Decomposition of total actual hours worked decomposes these differences in total actual hours worked and quantifies the contribution of each factor to the divergence between the approaches.

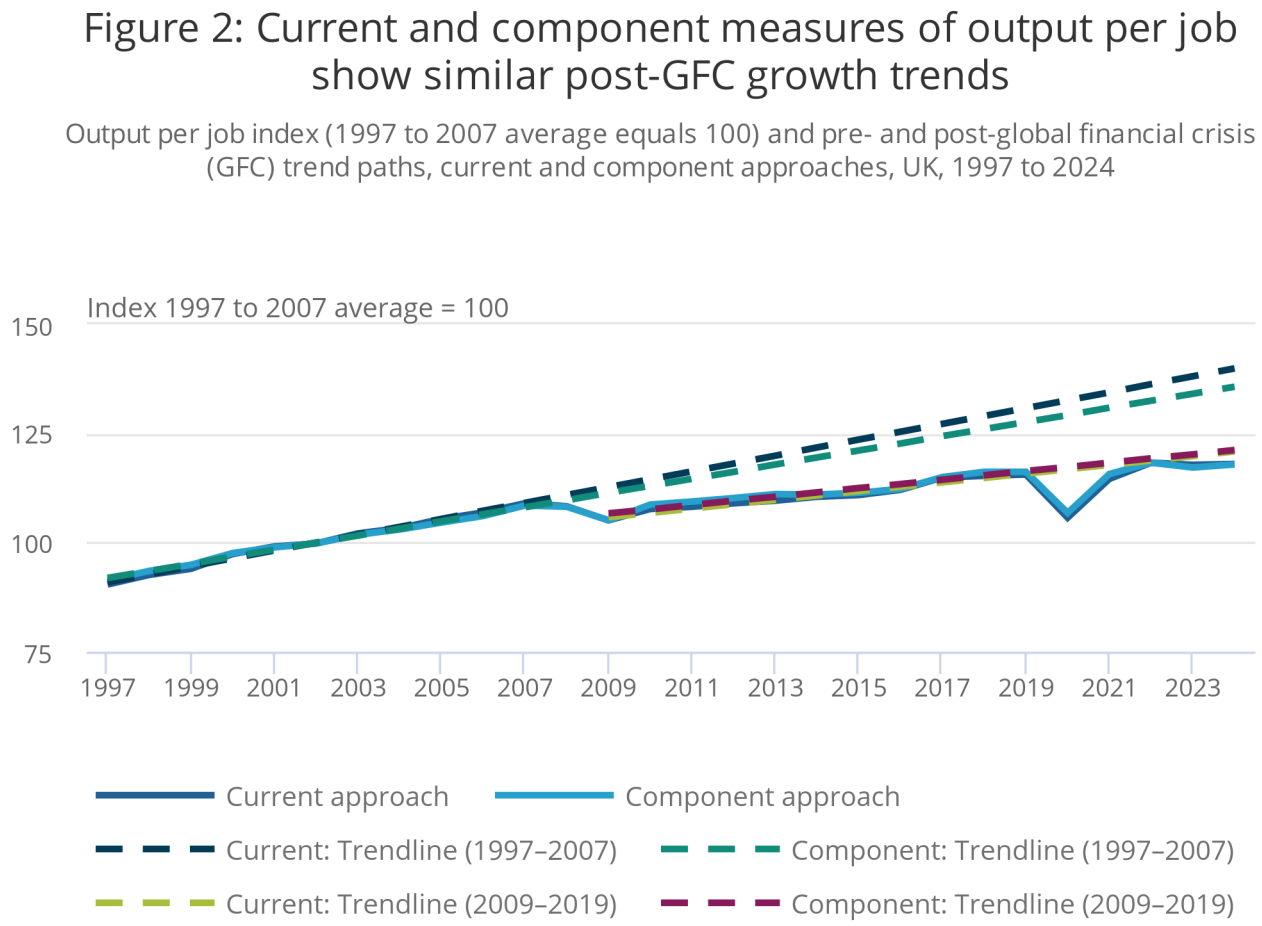
Importantly, during the COVID-19 pandemic, during which furlough was disproportionately applied to lower productivity industries, the productivity level of the residual population approached the pre-2008 projected trend level. While this cannot be a true comparator, as the trend is derived from all industries, it suggests that the causes of the slowdown are complex, even given the improved data.

Under the component approach, improvements to actual hours worked can explain half of the productivity slowdown. The “productivity puzzle” therefore remains under both approaches, but it is smaller under the component approach framework. The component approach does not remove the post-GFC slowdown, but it suggests that part of the measured shortfall reflects labour input measurement, particularly the treatment of average actual hours worked. Relative to 1997, output per hour recorded the strongest long-term improvement of the three productivity measures. By 2024, output per hour was about 34.0% higher than in 1997, whereas the component approach indicates growth of 40.7%.

Output per job

Figure 2: Current and component measures of output per job show similar post-GFC growth trends

Output per job index (1997 to 2007 average equals 100) and pre- and post-global financial crisis (GFC) trend paths, current and component approaches, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Between 1997 and 2007, output per job grew by 1.9% a year under the current approach and 1.7% under the component approach. Between 2009 and 2019, growth slowed to 1.0% a year under both approaches.

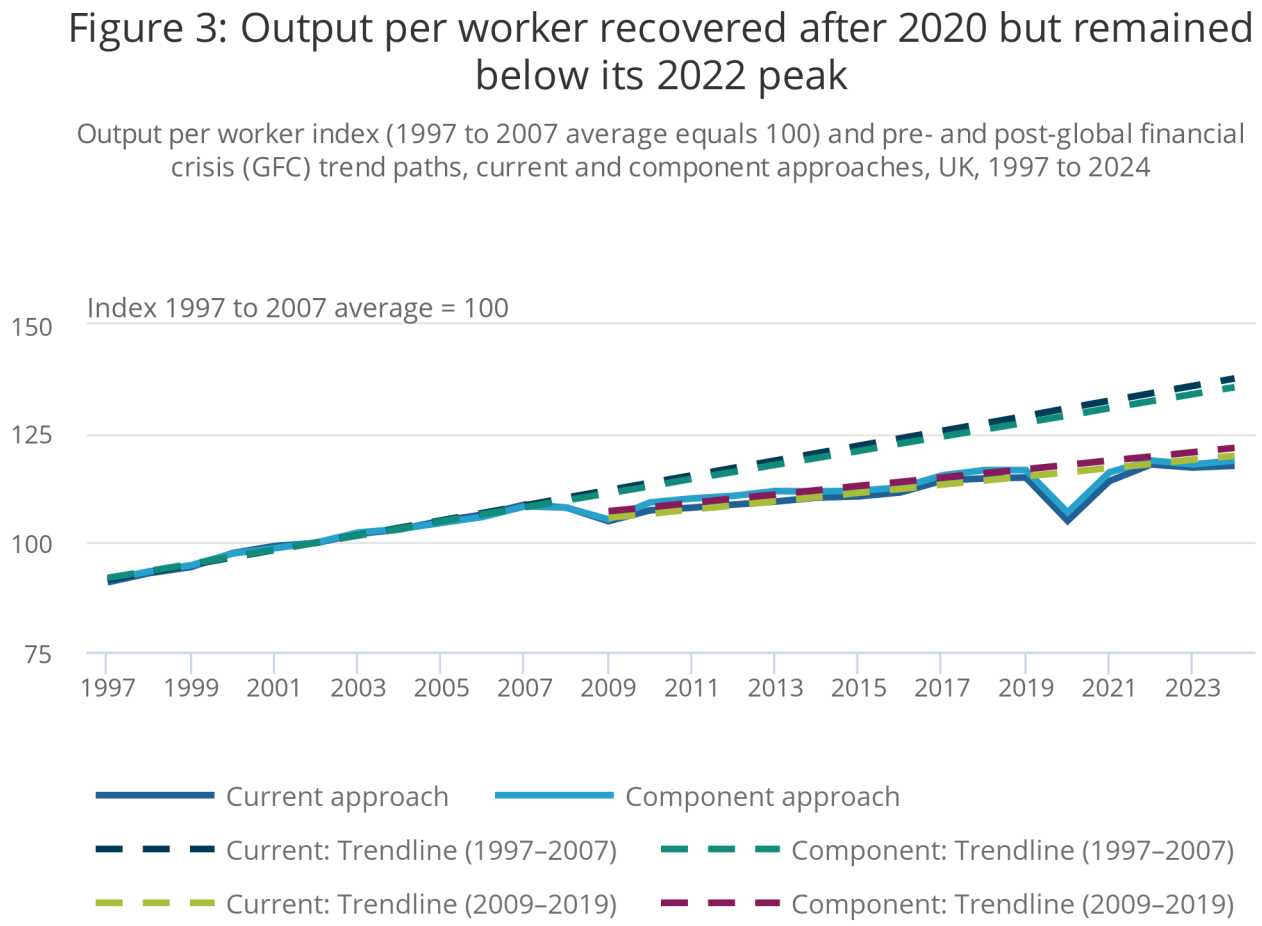
The pandemic caused a pronounced fall in output per job because output fell while jobs were partly supported by the labour market response to the shock through the Coronavirus Job Retention Scheme (CJRS) and the Self-Employment Income Support Scheme. Both the current and component measures recovered strongly in 2021 and 2022, reaching recent highs, but progress then weakened. By 2024, output per job was above its 2019 level under both approaches but remained below its 2022 peak.

Relative to 1997, current approach output per job grew by 30.6% in 2024, while the component approach grew by 28.9%.

Output per worker

Figure 3: Output per worker recovered after 2020 but remained below its 2022 peak

Output per worker index (1997 to 2007 average equals 100) and pre- and post-global financial crisis (GFC) trend paths, current and component approaches, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

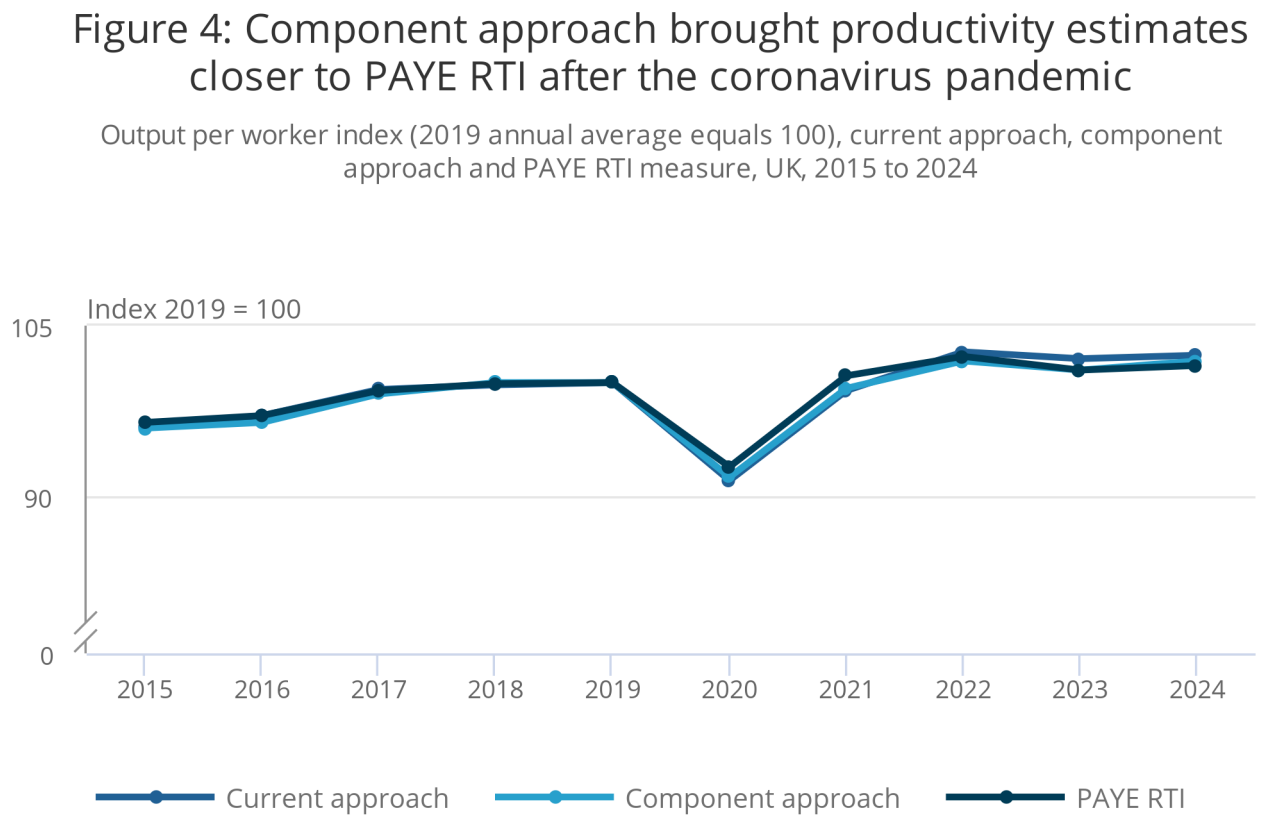
Between 1997 and 2007, output per worker grew by 1.8% a year under the current approach and 1.7% under the component approach. Between 2009 and 2019, annual growth slowed to 0.9% and 1.0%, respectively.

Output per worker fell sharply in 2020 during the pandemic. Both current and component measures then recovered and reached recent highs in 2022, before weakening in 2023 and recovering only partially in 2024.

Output per worker increased substantially over the period from 1997 to 2024. Relative to 1997, the component approach output per worker has grown by 29.9%, whereas the current approach has grown by 29.4% in 2024.

Figure 4: Component approach brought productivity estimates closer to PAYE RTI after the coronavirus pandemic

Output per worker index (2019 annual average equals 100), current approach, component approach and PAYE RTI measure, UK, 2015 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Compared with the 2019 annual average, all three series follow a similar trend prior to the coronavirus (COVID-19) pandemic. In 2020, output per worker fell across all measures, although the Pay As You Earn Real Time Information (PAYE RTI) series shows a smaller decline than both the current and proposed estimates. During the subsequent recovery, the proposed measure tracks PAYE RTI more closely than the current measure.

By 2024, output per worker is around 1.9% above its 2019 level under the component approach, compared with around 2.4% under the current approach and around 1.5% under PAYE RTI. This suggests that the component approach brings productivity trends closer to productivity constructed using administrative data in more recent years, while maintaining a similar post-pandemic recovery.

Comparing output per hour, job and worker

The results show that output per hour has grown more strongly than output per job or output per worker, especially under the component approach. This suggests that changes in working hours have played an important role in measured hourly productivity.

Overall, all three measures point to the same conclusion. Productivity is higher than in 1997 and the pandemic losses have largely been recovered, but growth was concentrated before 2008. The component approach changes the interpretation of labour input and the productivity puzzle, particularly for output per hour, but it does not overturn the wider evidence of weak productivity growth since the financial crisis.

6 . Why comparing multiple data sources should improve our estimates

Household survey-based measures remain central to labour input statistics, particularly for information on actual hours, working patterns and individual behaviour. However, there are known limitations when a household survey is used as the main source for labour input for productivity purposes.

These relate to:

- how people report hours worked
- the population covered by the survey
- how the surveyed population aligns with the National Accounts production boundary

Recall and reporting bias in actual hours

Recall bias can affect self-reported actual hours in two ways. Firstly, respondents may find it difficult to remember exactly how many hours they (or household members they are reporting for) worked in the reference week, particularly when accounting for breaks, overtime, leave, sickness or changes to their usual pattern. Secondly, responses can be influenced by what people consider to be a normal or expected working week. Reported hours may therefore be closer to contracted hours, usual hours, or socially typical working patterns, than to the hours actually worked in that week.

This matters most for workers with long or variable hours and periods when actual hours differ substantially from usual hours because of public holidays, leave or sickness. In these circumstances, recall and reporting bias may have a greater effect. A related issue is underreporting of time away from work. This can affect low hours, irregular hours and informal workers. It is particularly important for annual leave. As response rates in LFS have fallen, roll-forward imputation has had a greater impact through its wider application to complete missing returns. Where a household cannot be contacted, the previous wave's response can be carried forward. People away on annual leave are more likely to be uncontactable, so a positive-hours value from a normal working week may be carried forward in place of a period of leave. This creates a positive bias in measured hours, concentrated in periods when leave is highest, such as summer and Christmas holidays. The scale of this bias is likely to change in proportion to changes in the response rate to the Labour Force Survey (LFS).

Coverage, classification and national accounts alignment

The LFS is designed around international labour market concepts, primarily those set by the International Labour Organization (ILO). They are intended to produce internationally comparable estimates by applying consistent definitions of employment, unemployment and inactivity, for individuals resident in the UK. However, productivity measurement also needs labour input to align as closely as possible with the domestic production boundary used for gross value added (GVA), including the net flow of workers between countries (for example between Northern Ireland and the Republic of Ireland).

This creates a difference between the household survey concept and the National Accounts concept. The LFS captures labour from resident households and measures it from the worker's perspective. GVA measures output produced within the UK economic territory, regardless of where workers live. As a result, some labour contributing to UK production may be missing or not fully captured in a household survey, including:

- non-resident, frontier and seasonal workers
- jobs beyond a respondent's second job
- informal economy activity
- activity imputed in the National Accounts

LFS self-reported industry classification may also differ from what the employer has reported in alternative data collections. This can cause self-reported estimates to differ from the concepts used in the production accounts, where output is allocated to businesses and reporting units, which are defined consistently across surveys and outputs from the Inter-departmental Business Register (IDBR).

7 . International guidance

International statistical guidance provides the starting point for the development of an internationally consistent approach to the component method. The OECD's Measuring Productivity manual (2001) (PDF, 933KB), Compendium of Productivity Indicators (PDF, 2.2MB), and Sources and Methods: Labour Force Statistics recommend measuring labour input for productivity statistics using actual hours worked, rather than headcounts or contracted hours. They also support constructing actual hours from usual hours through explicit adjustments for overtime, short-time working, public holidays, annual and sick leave, and other absences.

The same guidance identifies the value of combining business and household survey information, using the most reliable features of each source. This is important because labour inputs that are used to estimate productivity need both individual-level information on hours and working patterns, and source concepts that are coherent with production-side measures of output.

The OECD's 2018 review of international productivity comparisons (the International productivity gaps working paper (PDF, 3.3MB) identified differences in national hours estimates as a leading source of cross-country non-comparability. The review highlighted:

- inconsistent use of survey and administrative sources
- recall and response bias in household surveys
- different treatment of paid but not worked time
- incomplete reconciliation with the System of National Accounts production boundary

The review also identified the UK as part of a minority of countries still using the direct approach.

We began reviewing our labour input methodology following the OECD review on the international comparability of productivity statistics. Research published in our Improving estimates of labour productivity and international comparisons article (2019) and in our International comparisons of productivity article (2021) examined differences in how countries measure hours worked and developed a simplified UK-tailored component approach. This approach moved away from direct survey estimates of hours worked by applying explicit adjustments for paid but not worked time, including annual leave, sickness absence and maternity leave. Drawing on recommendations from the OECD's work on labour input measurement, annual leave was estimated using standardised adjustments based on entitlement information derived from the European Union Labour Force Survey (EU-LFS), alongside other internationally comparable absence adjustments. Building on this, we proceeded to investigate how UK-specific data sources could be used to produce the highest quality measure of average hours for use in UK labour productivity, which culminated in the average hours component methodology presented in this article.

More recently, work has expanded beyond hours measurement to consider the employment inputs used within labour productivity statistics. During 2024 and 2025, in response to a fall in the response rate to LFS causing differences between its employment measure and those from business sources, the Office for National Statistics (ONS) began research into the merits of different data sources on jobs and workers for productivity measurement. This research led to the development of interim experimental measures, first published in August 2024, based on Pay As You Earn Real Time Information (PAYE RTI) alongside the LFS-based productivity statistics to provide a comparator incorporating administrative data. This further highlighted coverage and population estimation as an additional area requiring investigation alongside the earlier work on average hours measurement. Our final assessment of the best approach to measurement of jobs and workers is presented in this article.

This work has demonstrated that methodological choices around labour input measurement have a material effect on productivity comparisons and provides the foundations for the wider component framework presented in this article. The result of this research is a consistent set of hours worked, filled jobs, and worker statistics designed to best meet the needs of productivity measurement.

8 . Measuring filled jobs

This section explains how quarterly division-level employee and self-employment job estimates are constructed. The main change is the move from the Labour Force Survey (LFS) constrained jobs framework to a bottom-up estimate derived from the employee jobs (EJ) component of workforce jobs (WFJ).

This improves coherence between labour inputs and gross value added (GVA), ensuring that productivity measures are based on labour inputs more closely aligned with the output they are intended to explain.

Why the jobs framework has changed

Under the current approach, the whole-economy jobs estimate was primarily derived from the LFS total. This introduced limitations for productivity analysis. As a household survey, the LFS does not fully capture some parts of labour input, including cross-border workers, multiple jobholders beyond a second job, and workers in communal establishments. It also allocates workers to industries using respondents' self-reported workplace information, while workforce jobs and the National Accounts use the Inter-departmental Business Register (IDBR) reporting unit classification. In large multi-site or multi-activity employers, these approaches can allocate jobs to different industry divisions.

We therefore use the pattern at the industry level from workforce jobs (WFJ), which reflects these reporting units. However, constraining WFJ to the LFS aggregate reduces the value of the more accurate industry classification in WFJ. It forced a reporting unit source, which is more closely aligned with industry gross value added (GVA), to inherit the coverage and classification differences of the household survey. For productivity analysis, this is not ideal because the estimate of jobs should be as coherent as possible with the production-side framework used for output.

WFJ employee jobs provide a point-in-time estimate, collected on the second Friday of the third month in each quarter. Productivity analysis requires a quarterly average consistent with quarterly GVA, so the point-in-time estimate needs to be converted into a measure of jobs across the whole quarter.

The component approach addresses both issues. It removes the aggregate constraint to the LFS and builds jobs bottom-up from WFJ. HM Revenue and Customs (HMRC) Real Time Information (RTI) is then used to shape a monthly path where available so that a quarterly average can be calculated, resulting in a quarterly jobs estimate, which is better aligned with quarterly GVA. The private sector employee jobs component of WFJ, measured through the Quarterly Business Survey (QBS) are benchmarked annually to the Business Register and Employment Survey (BRES). This exercise is completed annually in December, benchmarking to Quarter 3 (July to Sept) each year. This improves coherence with the business register, but it also means the jobs series can revise when new BRES benchmarks are incorporated.

The WFJ employee jobs measure provides a stronger foundation for productivity measurement because it is derived primarily from business surveys and administrative sources, benchmarked to the Business Register and Employment Survey (BRES), and classified to industries using IDBR reporting units. This improves alignment with the industry framework used in the National Accounts and gross value added (GVA), reducing reliance on self-reported industry classifications from household surveys.

WFJ also provides broader coverage of productive activity than the LFS and measures jobs directly from the employer perspective. This makes it a more suitable foundation for productivity jobs, providing improved coverage of workers in communal establishments, some cross-border workers and multiple jobholding, including third and subsequent jobs not captured within the LFS.

The same benefits extend to filled-worker estimates. In the component approach, workers are derived by applying worker-to-job ratios to the underlying jobs framework. As a result, improvements in the coverage, industry allocation and coherence of WFJ are carried through to the worker measures, providing a more consistent basis for productivity analysis.

More information, including the benchmarking and revisions policy can be found in our Workforce jobs in the UK quality and methods guide.

Creating quarterly average jobs from workforce jobs and RTI

Workforce jobs give a point-in-time estimate for the final month of each quarter. The two earlier months are estimated, and the three months are then averaged to create flow-consistent measures on the same quarterly basis as GVA.

These differences have a material effect on labour input measurement. By 2024, the productivity jobs series derived from workforce jobs was around 4.7% higher than the whole-economy LFS jobs total previously used in productivity statistics. This reflects the broader coverage and employer-based measurement of workforce jobs, which is more closely aligned with the domestic production boundary used in the National Accounts.

A linear baseline is drawn between the level at the end of the previous quarter, and an RTI adjustment is then applied. Each baseline month is scaled by how far actual RTI deviated from the path RTI would have shown had it followed the same straight line as the baseline. RTI therefore shapes the path within the quarter without pulling the level towards RTI's own scale.

The three adjusted monthly values are averaged. Industries with employment rising through the quarter show a quarterly average below the end-month level; falling-employment industries show the reverse. This is the flow-consistent measure that pairs correctly with quarterly GVA.

For periods before Quarter 3 2014, when RTI data are not available, the method uses linear interpolation between the WFJ end-quarter estimate for the third month of each quarter. This provides a smooth monthly path between quarterly endpoints so that the three months can be averaged into a quarterly jobs estimate.

Differences between the LFS and workforce jobs

The LFS and workforce jobs are not expected to produce the same total because they were designed for different purposes and measure labour market activity from different perspectives. Our Reconciliation of estimates of employment and jobs dataset explains how these concepts are brought together and decomposes the gap between them.

Further analysis of definitional and methodological differences between labour market data sources can be found in our Comparison of labour market data sources methodology.

The LFS remains essential within the component approach. It provides individual-level information on actual hours, working-pattern splits within divisions, demographic breakdowns, worker-to-job ratios and the self-employment jobs and workers series where no stronger alternative is currently available.

Supplementary coverage and final jobs panel

Several supplementary series are added to the employee jobs base to improve coverage and maintain consistency with National Accounts conventions: His Majesty’s Forces, government-supported trainees and unpaid family workers. Sole directors are removed from self-employment jobs to prevent double counting. This results in a single quarterly total jobs dataset consistent with the paid usual hours and actual hours worked time series on a division-by-quarter basis.

HM Forces jobs

These are taken from Ministry of Defence statistics, published as part of the public sector employment release, and allocated in full to public administration and defence.

Government-supported trainees

These are taken from workforce jobs headline statistics and allocated across divisions in proportion to each division's share of total employee jobs.

The self-employment jobs series derived from the LFS provides quarterly division-level estimates.

Unpaid family workers

These are added at the job-count stage and allocated across industries in proportion to each division's share of self-employment jobs.

Sole directors and working owners paid through PAYE

These appear in the business survey inputs to workforce jobs because they draw a salary. In the LFS they may report themselves as self-employed. Sole directors are identified within the LFS and removed from self-employment jobs to prevent double counting when combining with the employee component of workforce jobs.

However, this identification is only available for main-job self-employed individuals from 1999 Quarter 1 onwards and for second-job self-employed individuals from 2012 Quarter 2 onwards. To create a consistent time series, sole-director jobs are back-cast prior to these collection points by holding the sole-director share of self-employment jobs constant at the earliest available observation and applying this proportion to historical self-employment job counts. This approach provides a continuous series of sole-director estimates, which are then netted out of self-employment jobs, and therefore self-employed actual hours worked, throughout the full period.

9 . Measuring average actual hours worked per job

This section describes how average actual hours worked per job are constructed. This measure has four stages:

- preparing the Labour Force Survey (LFS) data so they are consistent with the Annual Survey of Hours and Earnings (ASHE) and with calendar quarters
- benchmarking the level of LFS paid usual hours to ASHE
- applying each adjustment that moves paid usual hours to actual hours worked
- recombining the results into a single division-level time series

Preparing the LFS data

The baseline measure for employees is paid usual hours per week in the main job, inclusive of paid usual overtime, derived from LFS responses. Three preparatory steps are applied, shown under the following headings.

Aligning working-pattern definitions

Because ASHE sets the level of paid usual hours, LFS respondents are reclassified between full-time and part-time using the definitions applied in ASHE, rather than their own self-description. Under these rules, jobs with more than 30 paid usual hours per week are classified as full-time, while jobs with 30 hours or less are classified as part-time. Teaching occupations are an exception, where jobs are classified as full-time from 25 hours per week or more. The LFS working-pattern variable is self-classified by the respondent, so applying these ASHE-based rules ensures the composition of full-time and part-time employment is on the same definitional basis as the ASHE benchmark and workforce jobs.

Reclassifying sole directors

Sole directors who draw a salary are identified and reclassified as employees because they are included in ASHE. This improves consistency between the employee population captured in the LFS and the employer-reported hours data used to benchmark hours worked. Their usual weekly hours are brought into the employee sample and are subsequently adjusted in line with the actual hours worked methodology.

Re-apportioning reference weeks

The LFS is delivered quarterly, but each respondent is linked to a one-week reference period ending on a Sunday, and these weeks do not always fall precisely within calendar quarters. This matters because public holidays and other calendar effects can fall close to quarter boundaries and create genuine short-term changes in hours. Where a reference week spans two quarters, the observation is split between the two quarters and the survey weight in each new observation is adjusted for the proportion of days falling in each quarter. A reduction in hours associated with a public holiday is therefore better allocated to the calendar quarter in which it occurred, rather than assigned entirely to the LFS survey quarter in which the response was received.

Treatment of missing or zero paid usual hours

Employees with zero or missing paid usual hours are removed from the sample used to estimate average paid usual hours in both the LFS and ASHE. In the LFS, this accounts for 0.02% of employees in their main job in 2024. Many of these observations report no salary or wage income from the job and are therefore unlikely to be represented within the employee jobs population measured through the Quarterly Business Survey (QBS) and benchmarked to the Business Register and Employment Survey (BRES). Removing these observations improves consistency between the hours and jobs components of the productivity framework.

Together, these steps improve the coherence of LFS data with the ASHE benchmark and with the timing and conceptual requirements of national accounts-based productivity measurement.

Benchmarking LFS paid usual hours to ASHE

Paid usual hours per week, including paid overtime, are used as the starting point, reflecting normal or expected working patterns and providing a consistent base to which adjustments can be applied.

The LFS collects paid usual hours for the respondent's main job only. As a result, this requires an assumption that the relationship between paid usual hours and actual hours worked is broadly similar for main and second jobs within the same working pattern and in the same industry division. This means, for example, that when comparing a full-time main job with a full-time second job in a particular industry division, the framework assumes that overtime, sickness and other forms of absence affect the relationship between paid usual and actual hours in a similar way. This allows patterns observed in main jobs to proxy for second jobs, for which paid usual hours are not collected.

For employees, LFS estimates of paid usual hours are benchmarked to ASHE data by industry division and working pattern. Benchmarking improves the level and industry alignment of the LFS measure by anchoring it to employer-reported paid usual hours, including paid overtime, while retaining the quarterly movements observed in the LFS. However, it does not remove self-reported differences in individual working behaviour captured by the LFS, such as variations in absence or overtime worked.

ASHE is used as the level benchmark because it is an employer-based survey drawn from HM Revenue and Customs (HMRC) pay as you earn (PAYE) records. This makes ASHE a stronger source than the LFS for setting the annual level of paid usual hours by division and working pattern. Each observation is a job spell (a single period of uninterrupted employment with a particular employer), with employer-reported paid hours per job, including paid overtime, employee job counts, and industry classification based on reporting unit. These are collected for the pay period including the ASHE reference date in April; the vast majority of employees are paid monthly, meaning the data will relate to the month of April as a whole rather than any particular week in April. As a result, these data are treated as representing paid usual weekly hours.

ASHE data are collected in April every year, falling in Quarter 2 (Apr to June) and therefore serving as a Quarter 2 benchmark. Between these benchmarks, the quarterly path is interpolated using LFS. Before the earliest ASHE benchmark, and beyond the latest available benchmark, the LFS data are used to create a quarterly path from the last available ASHE benchmark.

ASHE is published annually, usually in the October following the April reference period. As new benchmark data become available, they can introduce retrospective revisions when taken on in the benchmark. These revisions are expected to primarily affect the latest two to three years and reflect the incorporation of higher quality employer-reported data.

The resulting output is a set of quarterly time series of paid usual hours, including paid overtime, for every division and working pattern. ASHE determines the annual level at the Quarter 2 benchmark, while the LFS provides quarterly movement for Quarter 1 (Jan to Mar), Quarter 3 (July to Sept) and Quarter 4 (Oct to Dec), as well as tails for the series in the period since the most recent ASHE benchmark.

Applying adjustments proportionately

We then apply further adjustments to these paid usual hours time series to arrive at estimates of average actual hours worked; these adjustments are calculated as a percentage of LFS paid usual hours and are calculated separately by division and by working pattern.

Overtime

Respondents whose actual hours worked exceed their paid usual hours including paid overtime are identified. Their excess hours are averaged using survey weights and expressed as a proportion of total paid usual hours including paid overtime across the whole cell, not only those working overtime. This captures both the intensity of overtime among those who work it and its prevalence across the cell.

The ASHE benchmark is specified on paid usual hours inclusive of paid usual overtime. The overtime component must therefore capture only hours worked above that usual pattern, together with unpaid overtime, which administrative payroll sources cannot observe.

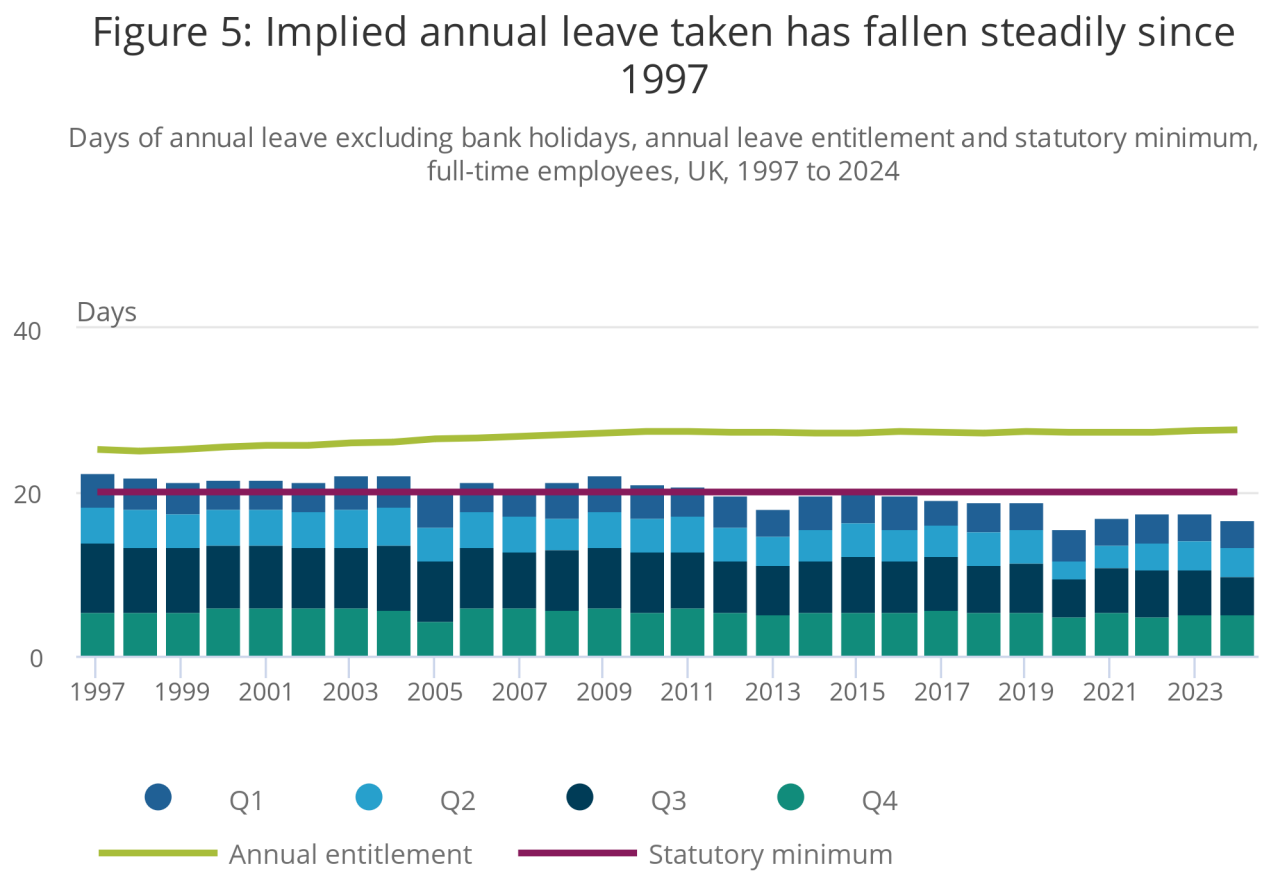
Annual leave

Annual leave is calculated from the LFS to provide the seasonal pattern within the year, while an external benchmark sets the annual level. This preserves the timing of leave-taking across quarters while reducing reliance on whether respondents report leave in a specific survey reference week.

The benchmark is based on LFS-reported paid leave entitlement, collected annually in the fourth quarter. This is converted from days of annual entitlement to total hours of entitlement using LFS reported paid usual hours per week divided by LFS reported usual days worked per week.

Figure 5: Implied annual leave taken has fallen steadily since 1997

Days of annual leave excluding bank holidays, annual leave entitlement and statutory minimum, full-time employees, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Implied annual leave taken in the LFS has fallen steadily over time. In the late 1990s and early 2000s, full-time employees were estimated to take around 21 to 22 days of annual leave per year, broadly consistent with employer-reported entitlement levels. However, the implied leave estimate has declined progressively, falling below 20 days from around 2012 onwards and reaching approximately 16 to 17 days by 2024.

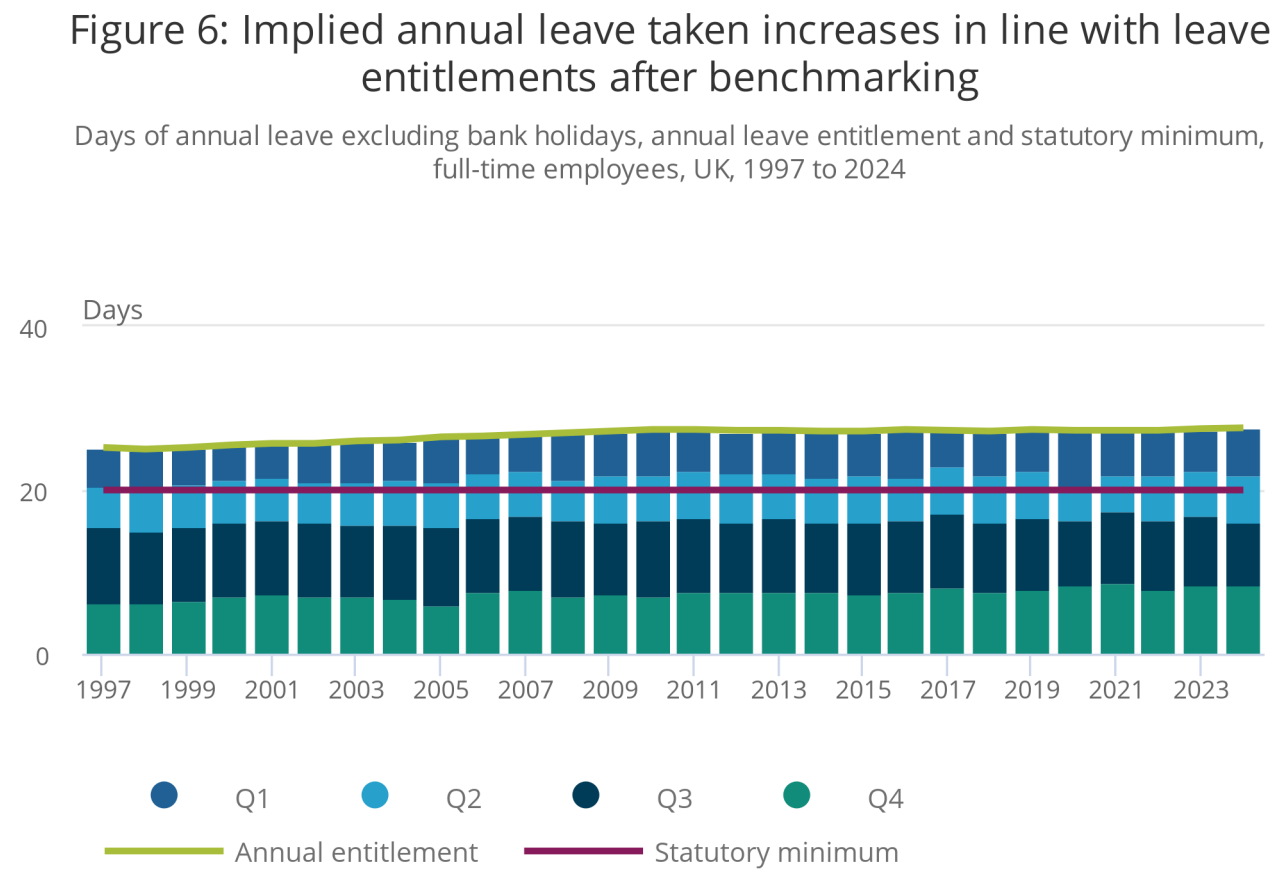
This trend appears increasingly implausible when compared with statutory and contractual leave entitlements. Statutory annual leave for a full-time employee has been at least 20 days per year (excluding public holidays) since the implementation of the Working Time Regulations 1998 legislation. By contrast, average annual leave entitlement reported in the LFS has remained broadly stable at around 25 to 28 days per year over the period. The growing gap between entitlement and implied leave taken suggests that the LFS-based estimate increasingly understates annual leave taken.

The implication that the average full-time employee takes fewer than 20 days of annual leave per year is difficult to reconcile with statutory requirements. While some employees may not take their full entitlement in a given year, it is unlikely that such behaviour could explain a sustained whole-economy average below the statutory minimum. This suggests that relying solely on differences between usual and actual hours in the LFS may lead to an increasing understatement of annual leave captured within actual hours worked.

For this reason, the component approach constrains annual leave estimates using information on leave entitlement rather than relying exclusively on implied leave taken in the LFS. This produces estimates that are more consistent with employment legislation, employer-reported entitlements, and the expectation that most employees take a substantial proportion of their annual leave allowance each year.

Figure 6: Implied annual leave taken increases in line with leave entitlements after benchmarking

Days of annual leave excluding bank holidays, annual leave entitlement and statutory minimum, full-time employees, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

The benchmark adjustment addresses the divergence observed in the implied LFS measure by anchoring annual leave to reported entitlement levels. Consequently, annual leave estimates increase gradually over time in line with changes in employee leave entitlements rather than exhibiting sustained decline implied by the unadjusted LFS measure. This produces a more coherent long-run series while preserving quarterly variation in the timing of leave taken.

Bank holidays

Bank holidays are treated separately from annual leave because they vary across the countries of the UK. The implicit bank holiday effect in the LFS can be replaced with an explicit bank holiday adjustment by division, weighted by the employment composition of England and Wales, Scotland and Northern Ireland. This reflects differences in bank holiday dates and the number of bank holidays across the UK, and the differential distribution of industries by geography.

For full-time employees, usual hours worked per day provide the basis for estimating the number of hours lost to bank holidays in each division. The adjustment therefore depends on both the number of bank holidays in each country and the division's employment composition across the UK.

For part-time employees, the approach assumes that 20% of weekly paid usual hours are not worked, where a bank holiday falls in the reference week. This provides a simple proportional adjustment without the assumption that part-time employees can take off bank holidays.

The adjustment also accounts for the fact that not all employees are absent from work on bank holidays. The LFS collects information on whether respondents worked on bank holidays, allowing for bank holiday working rates to be estimated and applied by division by working pattern. These rates are used to adjust the estimated hours lost to bank holidays by adding back hours worked by employees who continued working during these periods. These data are available every other year, collected in Quarter 4 for periods from Quarter 4 of the previous year to Quarter 3 of the current year. Bank holiday working rates for intervening years are interpolated between surrounding observations.

Civil Service sickness

Civil Service sickness is treated separately from general sickness absence because an administrative source with higher accuracy and response rates is available. It applies only to part of public administration and defence and uses Cabinet Office records of average working days lost. These records cover the Civil Service workforce and are converted to hours using the same per-day measure applied in the annual leave adjustment. Consistent with the annual leave methodology, quarterly implied LFS sickness in the Civil Service is benchmarked to the annual estimate of average working days lost, sourced from the Cabinet Office.

The derived administrative sickness absence rate is applied only to the Civil Service share of Division 84 (Public Administration and Defence) within Section O, which accounts for around 30% of employment in the division. This Civil Service proportion is calculated using Civil Service employment totals from public sector employment statistics as a proportion of total jobs in Division 84, published in workforce jobs statistics. Sickness absence for the remaining non-Civil Service share of Division 84 is left unadjusted and continues to follow the general LFS-based sickness absence treatment.

The LFS contributes only the within-year seasonal pattern. The level is determined by the administrative source. For years before 2015, where Cabinet Office figures are unavailable, benchmarked Civil Service sickness hours are back-cast using the seasonal path of LFS-measured Civil Service sickness.

Where a new year of Cabinet Office absence data has not yet been published, the previous year's benchmark adjustment for each quarter is carried forward until updated annual data become available, typically in December.

NHS sickness

For Division 86 (Human health activities) within section Q (Human health and social work activities), sickness absence rates are derived using National Health Service (NHS) administrative data in place of LFS data. As with the Civil Service adjustment, the NHS-employed share of the division is estimated using NHS employment totals from public sector employment statistics as a proportion of total jobs in Division 86 from workforce jobs statistics. This accounts for around 70% of employment within the division. The published NHS sickness absence rate is applied to this share of paid usual hours, while non-NHS employment remains covered by the general LFS-based sickness absence methodology.

The approach applies from Quarter 3 2009 onwards. Earlier periods are back-cast using the seasonal path of LFS-measured NHS sickness. Where NHS sickness data are not yet available for recent quarters, the most recent values are forecast using implied NHS sickness trends.

Furlough

The HMRC Coronavirus Job Retention Scheme (CJRS) applied from 1 March 2020 to 30 September 2021. This covers Quarter 1 2020 to Quarter 3 2021, with Quarter 1 2020 treated as partial because the scheme began in March. This is referred to below as the CJRS period. Flexible furlough applied from 1 July 2020, the start of Quarter 3 2020, when furloughed employees could return to work for some of their usual hours while remaining furloughed for the remainder.

Furloughed employees remained in paid employment but contributed zero, or a reduced number of, actual hours worked. Furlough is treated separately from other absence adjustments because it was a distinct policy intervention, and because administrative data provide stronger evidence on its prevalence and timing than survey responses. The LFS contains an implicit furlough effect, where respondents reported zero or reduced actual hours during the period. In the component approach, that implicit effect is removed from the general lower-hours adjustment and replaced with a dedicated CJRS-based adjustment, and affected workers are excluded from other absence categories to prevent double counting.

Read more information about this historical adjustment in Section 14: Furlough methodology.

Other lower-hours adjustments

For all divisions other than public administration and human health, and outside the CJRS furlough period from 1 March 2020 to 30 September 2021, covering Quarter 1 2020 to Quarter 3 2021, the remaining reductions in hours, including non-administrative sickness, parental leave, and other personal or family reasons, are estimated directly from LFS microdata using reason-for-fewer-hours responses.

The adjustment applies to employees only, separately by division and working pattern, on a main-job basis. Only respondents whose actual hours worked fall below their paid usual hours are included.

For each cell, the adjustment captures both the size of the hours shortfall and how common it is among workers in that cell. The resulting adjustment is applied to the benchmarked level.

Combining full-time and part-time estimates

Full-time and part-time estimates are combined within each division using job-weighted averages, so division-level hours reflect both the relative size and the changing composition of full-time and part-time employment over time.

The weights are built from two complementary sources: ASHE provides the annual anchor at the April reference point used as a Quarter 2 estimate, and the LFS supplies the quarterly path between anchors. Weights are interpolated across quarters and revised retrospectively when new ASHE benchmarks become available.

This benchmarking affects both the level of hours and the composition of employment used in the weighting structure through the relative contribution of full-time and part-time jobs being anchored to an employer-reported source. This reduces sensitivity to self-reported working-pattern classifications in the LFS and improves the industrial weighting of average actual hours worked.

The resulting quarterly division-level time series, combined across working patterns, is the average actual weekly hours input to the productivity framework.

Self-employed actual hours

Self-employed actual hours are derived directly from the LFS, without the benchmarking and absence-adjustment framework applied to employees. Consistent with the treatment of self-employment jobs, sole directors paid through PAYE are excluded where they have been reclassified to employee status to maintain alignment between the employee and self-employed estimates and avoid double counting.

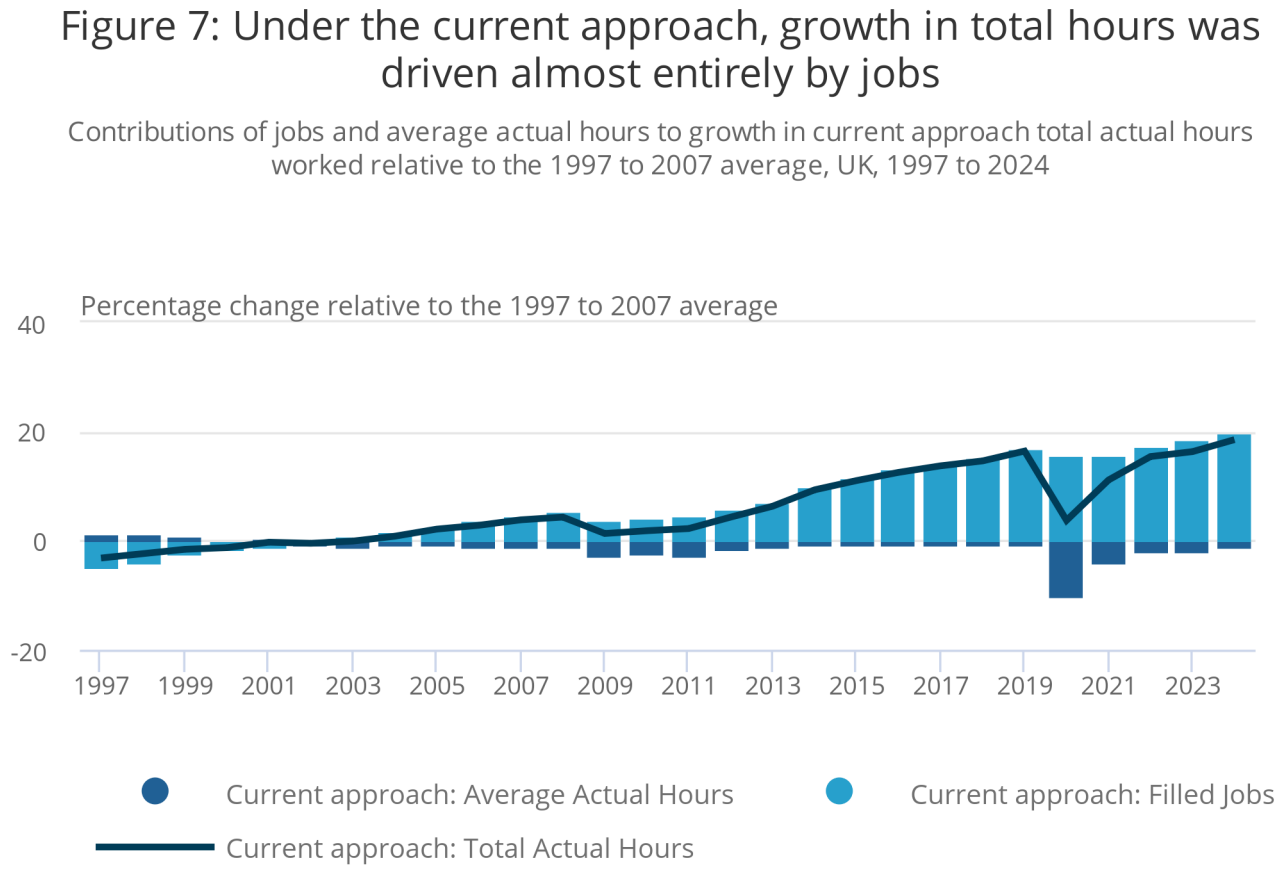
ASHE covers employees only, and there is no employer-reported source of paid usual hours for the self-employed. The LFS actual hours variable is the most suitable direct measure currently available for this population.

10 . Decomposition of total actual hours worked

Total actual hours worked are the labour input to output per hour. They are estimated by multiplying employee and self-employed average actual hours worked by their respective filled jobs estimates and combining the resulting hours measures.

Figure 7: Under the current approach, growth in total hours was driven almost entirely by jobs

Contributions of jobs and average actual hours to growth in current approach total actual hours worked relative to the 1997 to 2007 average, UK, 1997 to 2024



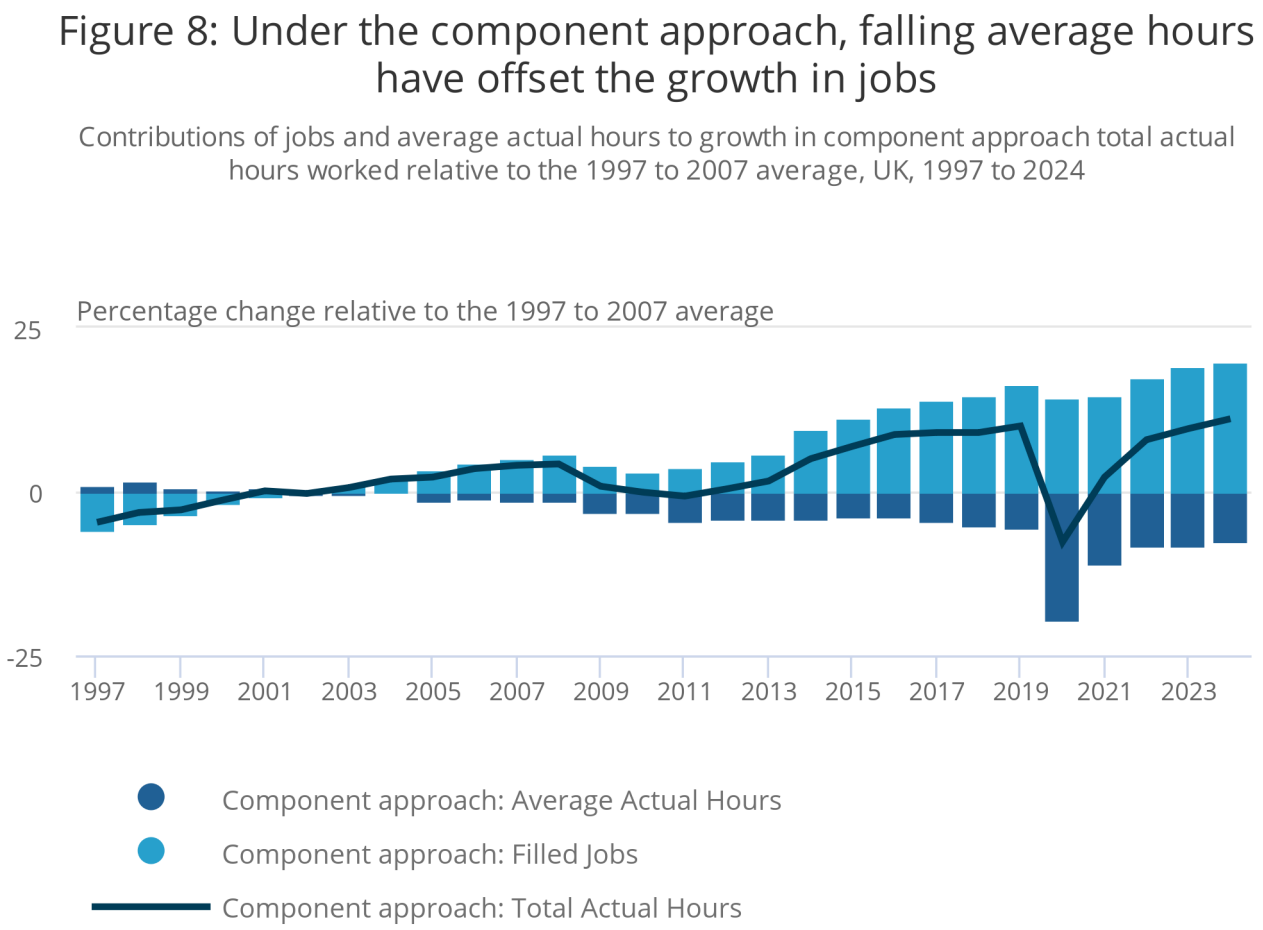
Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Figure 7 compares growth in total actual hours worked, average actual hours worked and jobs under the current approach from 1997 to 2024, relative to the pre-global financial crisis (GFC) average (1997 to 2007). Under this approach, growth in total hours is driven almost entirely by jobs.

By 2024, total actual hours worked were 18.5% above the pre-GFC average, with jobs growing by 19.7% and average hours decreasing by 1.1%. Average hours therefore make little net contribution after the financial downturn; the increase in labour input is mainly the result of more jobs rather than longer average hours worked per job.

Figure 8: Under the component approach, falling average hours have offset the growth in jobs

Contributions of jobs and average actual hours to growth in component approach total actual hours worked relative to the 1997 to 2007 average, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

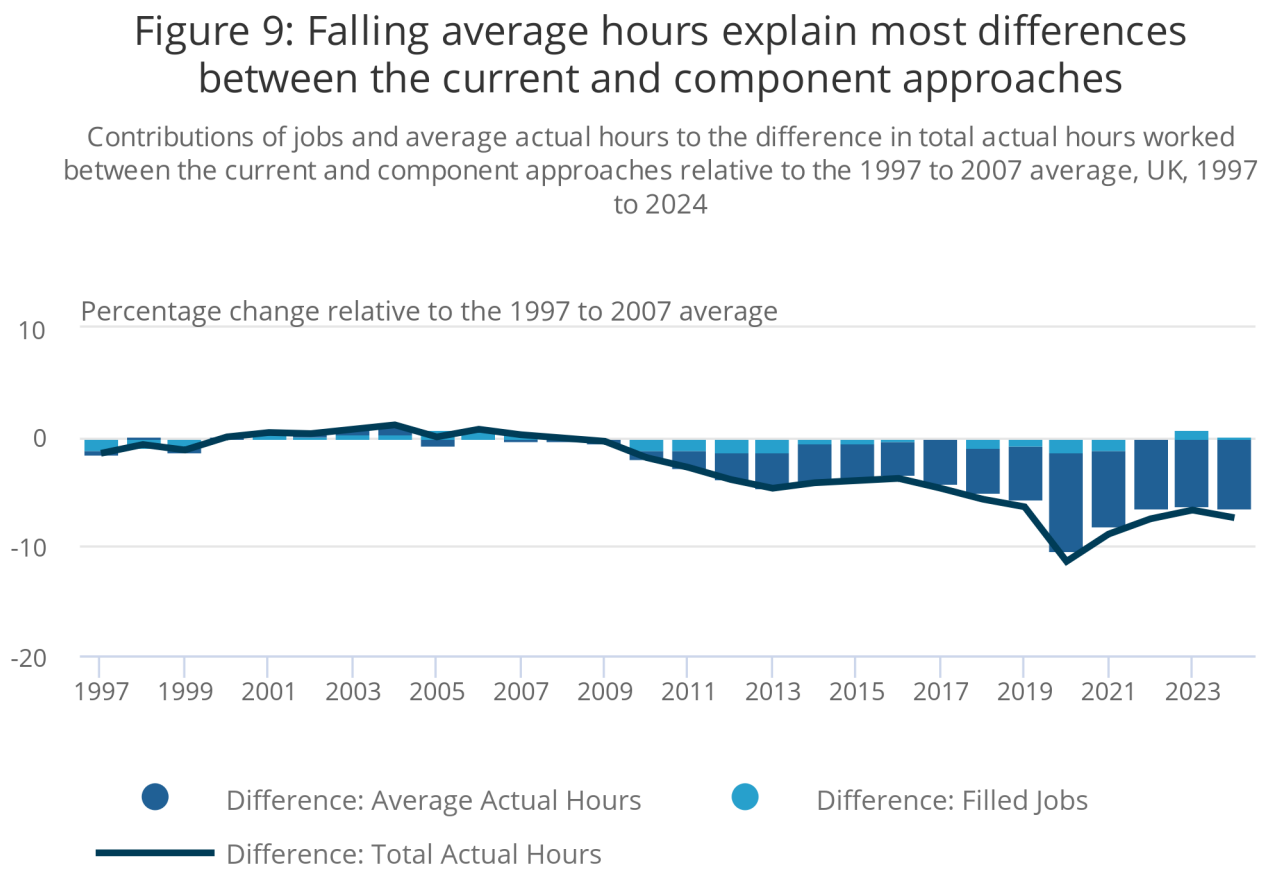
In contrast, Figure 8 shows that average actual hours worked make a persistently negative contribution under the component approach. Rather than stabilising after the 2008 financial downturn, average actual hours continue to exert a downward contribution to total hours throughout the recovery and into recent years.

By 2024, total actual hours worked were 11.1% above the pre-GFC average. This was driven by a 19.9% growth in jobs, partly offset by a negative 7.4% growth in average hours.

This implies that, under the new framework, a substantial share of the employment-driven increase in labour input has been cancelled out by reductions in actual hours worked per job.

Figure 9: Falling average hours explain most differences between the current and component approaches

Contributions of jobs and average actual hours to the difference in total actual hours worked between the current and component approaches relative to the 1997 to 2007 average, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

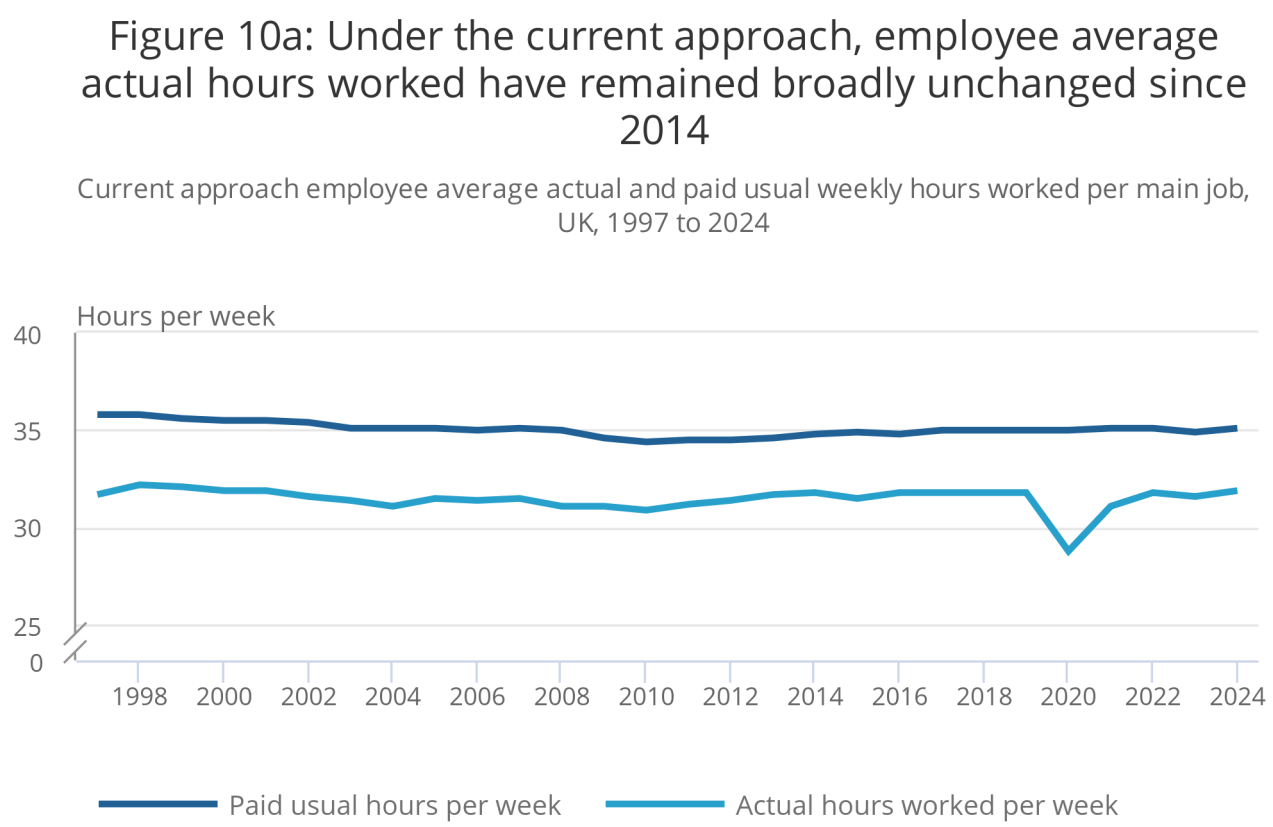
Figure 9, a decomposition of the difference in growth contributions between the current and component approaches, shows that the divergence is driven primarily by average actual hours worked, rather than by differences in jobs.

Specifically, downward adjustments to average hours in the component approach, arising from explicit modelling of annual leave, benchmarking to entitlement, lower-hours adjustments, and related factors, accumulate over time (to compensate for underreporting) and increasingly subtract from total hours growth.

By contrast, in the current approach, average actual hours appear broadly neutral over the post crisis period, meaning that these structural reductions in working time are not reflected in the contributions to growth, leading to a stronger headline increase in total actual hours worked.

Figure 10a: Under the current approach, employee average actual hours worked have remained broadly unchanged since 2014

Current approach employee average actual and paid usual weekly hours worked per main job, UK, 1997 to 2024



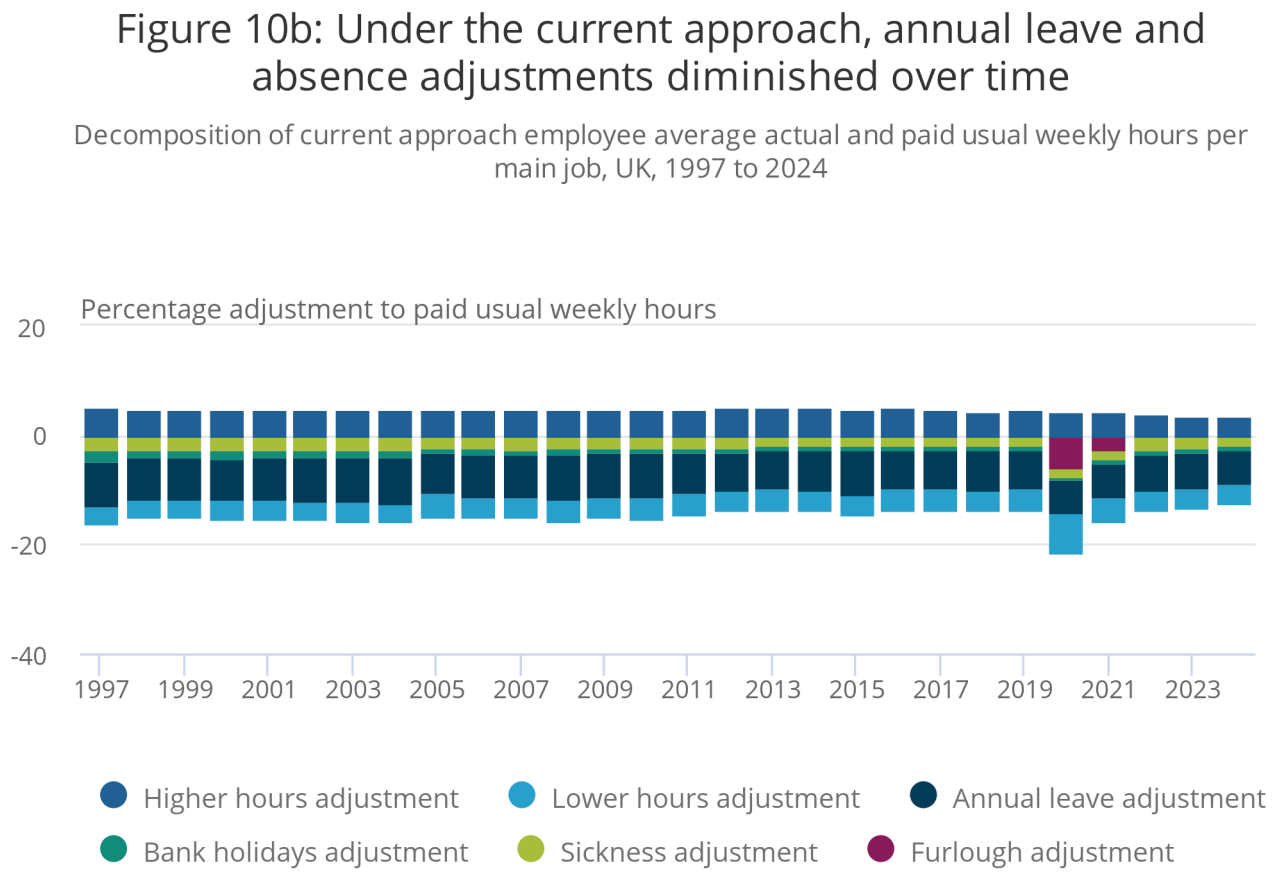
Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Notes:

1. Employee main jobs only, as LFS paid usual hours and working-pattern information are collected for respondents' main jobs only.

Figure 10b: Under the current approach, annual leave and absence adjustments diminished over time

Decomposition of current approach employee average actual and paid usual weekly hours per main job, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Notes:

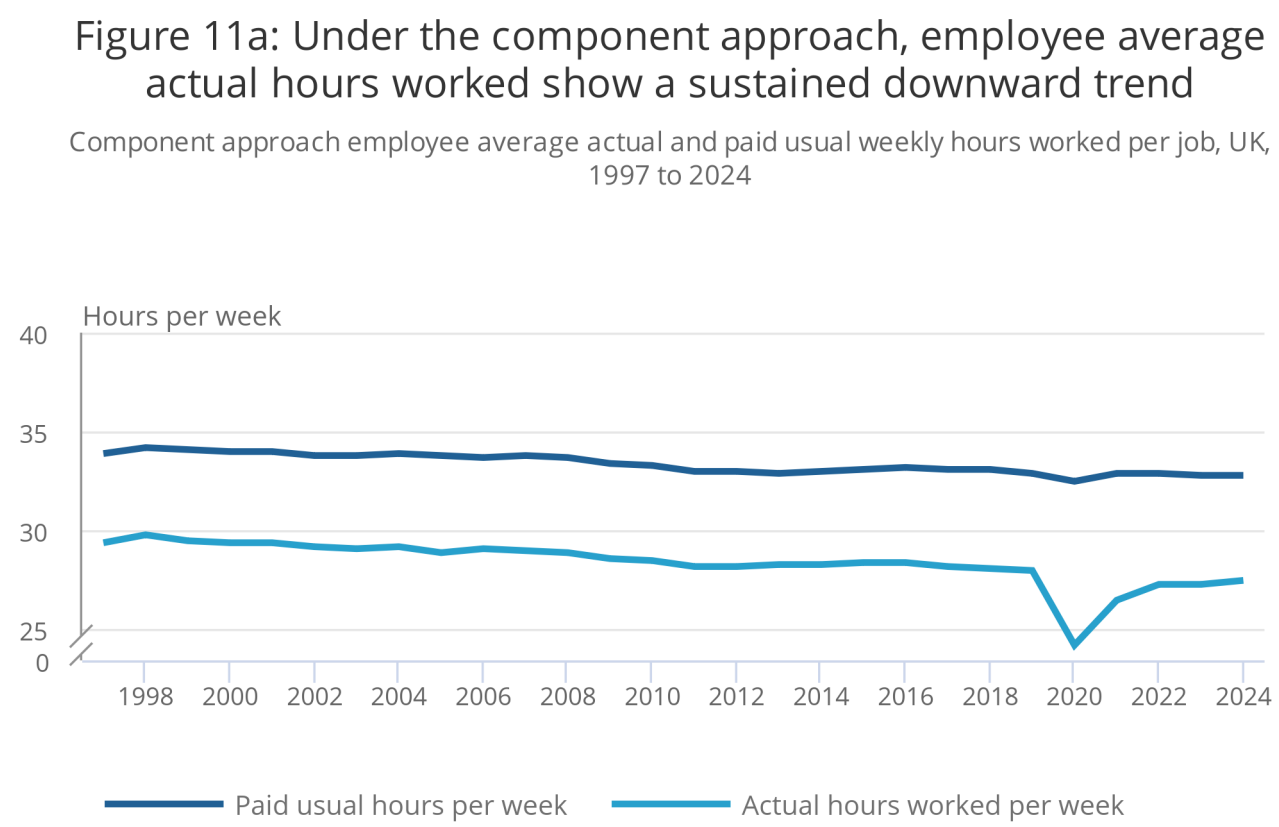
1. Employee main jobs only, as LFS paid usual hours and working-pattern information are collected for respondents' main jobs only.

Figures 10a and 10b show an annual decomposition of employee average actual weekly hours worked from employee paid usual weekly hours worked under the current approach. This decomposition is constructed for employee main jobs only because paid usual hours worked and the working-pattern information used to derive annual leave, sickness, bank holiday, furlough, higher-hours and lower-hours adjustments are collected for respondents' main jobs only. The decomposition therefore does not include second jobs. Employee second jobs account for around 3.6% of total employee jobs in the LFS and are therefore expected to have only a small effect on comparisons with the component approach described in Figures 11a and 11b, which is constructed using all employee jobs.

The decomposition shows how the current approach moves from the paid usual hours baseline to actual hours by applying implicit adjustments for annual leave, sickness, furlough and other factors. Over the period of 1997 to 2024, the negative adjustments to paid usual hours decrease. This suggests that the direct Labour Force Survey (LFS) measure is capturing fewer reductions for paid but not worked time, reflecting the increasing impact of roll-forward imputation on absence treatment such as annual leave.

Figure 11a: Under the component approach, employee average actual hours worked show a sustained downward trend

Component approach employee average actual and paid usual weekly hours worked per job, UK, 1997 to 2024



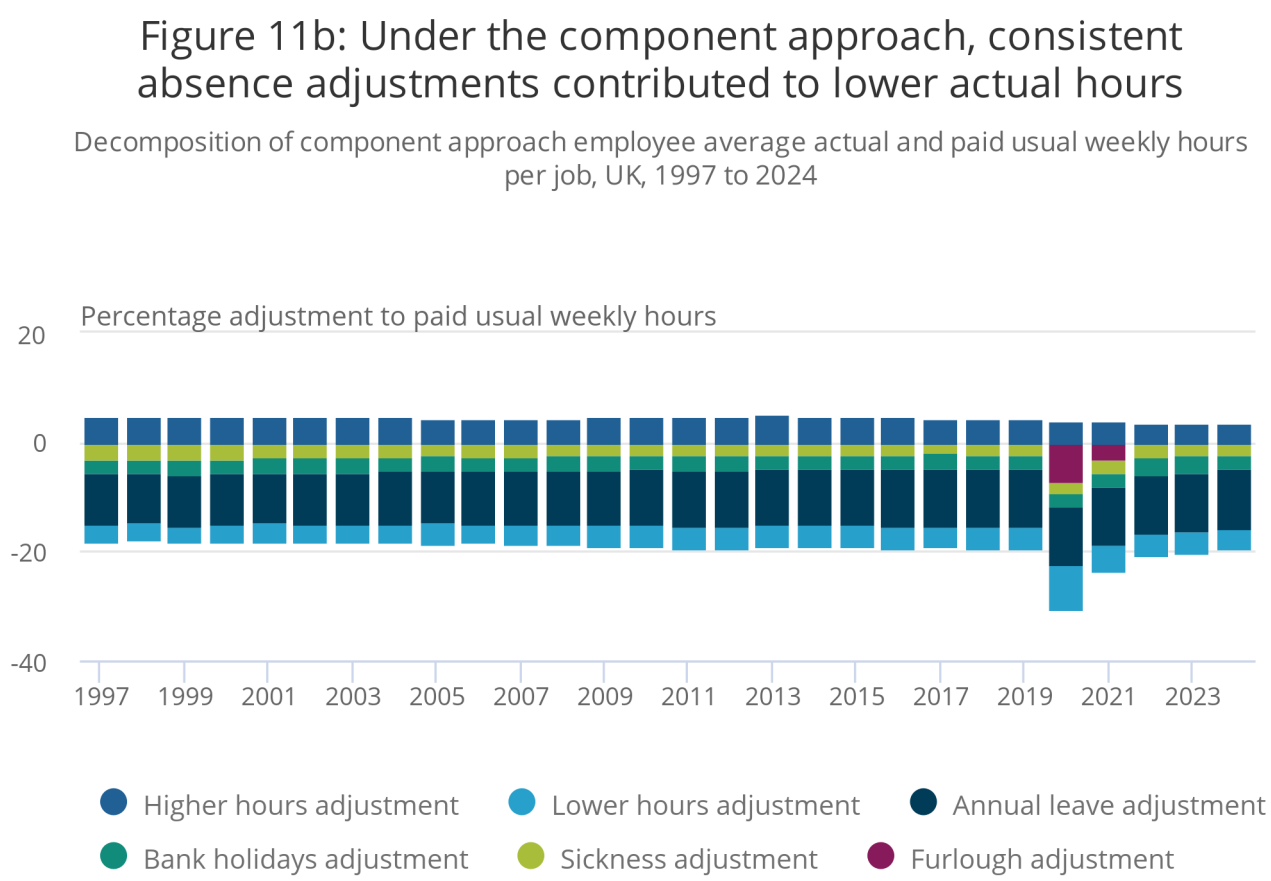
Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Notes:

1. Includes all employee jobs; the component approach estimates these components for all jobs rather than main jobs only.

Figure 11b: Under the component approach, consistent absence adjustments contributed to lower actual hours

Decomposition of component approach employee average actual and paid usual weekly hours per job, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Notes:

1. Includes all employee jobs; the component approach estimates these components for all jobs rather than main jobs only.

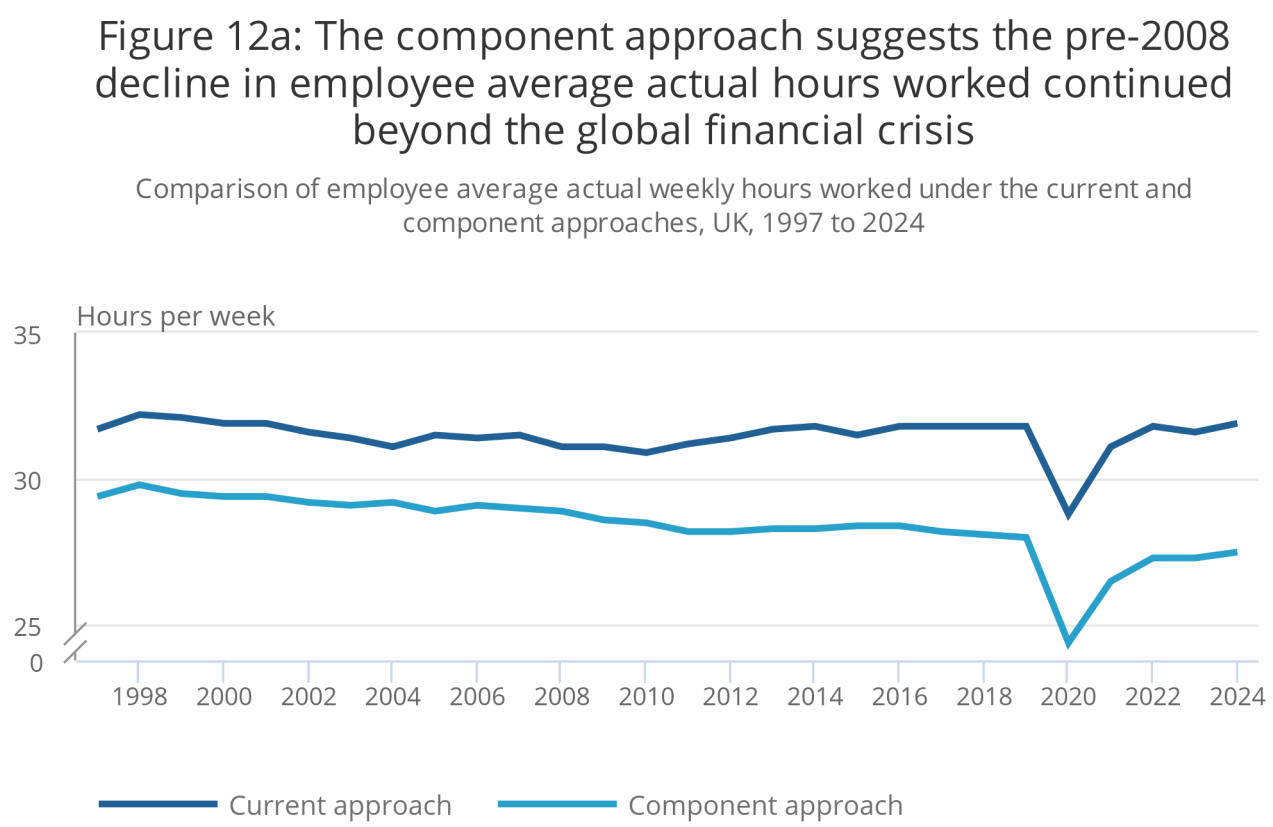
Figures 11a and 11b show the component approach decomposition of employee average actual weekly hours worked from employee paid usual weekly hours worked. Unlike the current approach analysis shown in Figures 10a and 10b, which could only be calculated for employee main jobs, the analysis in Figures 11a and 11b on the component approach uses all employee jobs; main, second, third, and so on. This can be done as the component approach calculates these components for all employee jobs, as discussed in Section 9: Measuring average actual hours worked per job.

In contrast to the current approach, the component approach applies adjustments on a consistent basis through time. The annual leave adjustment slowly increases, reflecting changes in leave entitlement and minima over the period, while sickness and bank holiday adjustments remain relatively stable. No single adjustment appears to create a structural break in the series.

This means the fall in average actual hours per employee job is not driven by an abrupt methodological shift, but by the combined effect of a downward trend in paid usual hours after Annual Survey of Hours and Earnings (ASHE) benchmarking and a consistent set of lower-hours adjustments. As paid usual hours fall, and deductions for annual leave, bank holidays, sickness and other absence are applied on a stable basis, actual hours per employee job naturally decrease over the period from 1997.

Figure 12a: The component approach suggests the pre-2008 decline in employee average actual hours worked continued beyond the global financial crisis

Comparison of employee average actual weekly hours worked under the current and component approaches, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

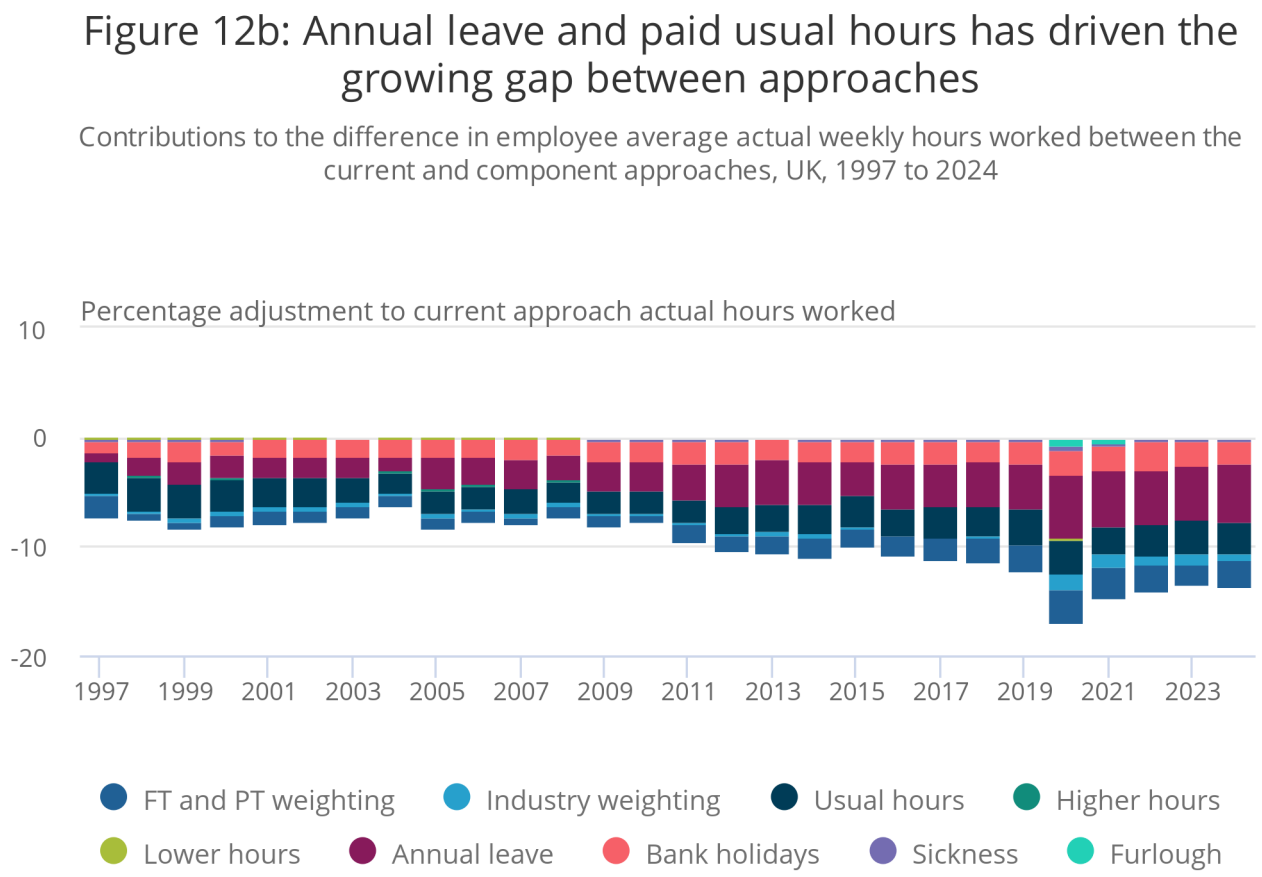
Notes:

1. The current approach comparison uses employee main jobs only, while the component approach includes all employee jobs.

2. Despite small differences in job coverage, the comparison remains indicative of long-term trends in employee actual hours estimates.

Figure 12b: Annual leave and paid usual hours has driven the growing gap between approaches

Contributions to the difference in employee average actual weekly hours worked between the current and component approaches, UK, 1997 to 2024



Source: Component approach to measuring labour productivity, UK: 1997 to 2024 from the Office for National Statistics

Notes:

1. The current approach comparison uses employee main jobs only, while the component approach includes all employee jobs.

2. Despite small differences in job coverage, the comparison remains indicative of the factors driving differences in employee actual hours estimates.

Figures 12a and 12b bring together the main differences between the current and component approaches as a percentage of the current approach employee average actual weekly hours worked. While there are slight differences in approach because of the direct approach analysis in Figures 10a and 10b including only main jobs, and the component approach analysis in Figures 11a and 11b including all jobs, comparing the difference between these two decompositions gives a relatively robust estimation of what factors are driving differences between direct and component estimates of employee actual hours.

Figure 12b shows that paid usual hours and annual leave are two of the largest components of the difference, and that while both grow in contribution to the difference over time, annual leave stands out as the most substantial cause of the difference growing. The paid usual hours contribution reflects the benchmarking of LFS paid usual hours to ASHE, while the annual leave contribution reflects the explicit annual leave adjustment applied in the component approach.

ASHE affects the full-time and part-time composition of employment within each industry by benchmarking employee jobs by division and employment status. This changes the weighting applied to average actual weekly hours and associated adjustments within industries. Industry mix effects arise separately when industry-level average actual hours multiplied and aggregated using productivity employee jobs. Differences between WFJ and LFS industry structures therefore change the contribution of each industry to the whole-economy average.

The downward trend observed in the component approach is broadly consistent with the direction of change seen in the current approach before the 2008 global financial crisis (GFC). Rather than stabilising after 2008, employee average actual hours worked continue to decline gradually under the component approach. This suggests that the divergence between the two approaches reflects the continuation of longer-term trends in actual hours worked, rather than the emergence of a new post-GFC pattern.

11 . Measuring worker numbers

Filled jobs and workers measure different things. A jobs measure counts employment spells, so a person holding more than one job contributes more than once. A worker, or employment measure counts people, so each individual is counted once regardless of how many jobs they hold.

The distinction matters because labour input can be presented per job, per worker or per hour, and each answers a different question. Workers support productivity per person employed and comparison with international measures built on headcount labour input.

Worker to job ratios are derived from the Annual Survey of Hours and Earnings (ASHE) for employees, and the Labour Force Survey (LFS) for self-employed workers. Both are then applied to their respective filled jobs estimates to produce an estimate of unique workers. Supplementary series are apportioned across jobs using the same methodology as used in filled jobs and converted to workers using their respective industry worker to job ratio.

Employee worker-to-job ratios

For employees, worker-to-job ratios are derived from ASHE. Because ASHE is built from PAYE job-spell records, the same person can appear in more than one employee job record. This allows multiple employee jobholding to be identified and the number of unique employee workers behind a given number of employee jobs to be estimated.

The LFS is then used to resolve a potential double count between employee and self-employed workers. An individual may report an employee main job in the LFS, with a secondary role as self-employed, but they will only be reported as an employee job in ASHE because ASHE collects information on employee jobs only and is not linked to the LFS.

To balance the employee and self-employed estimates, the LFS is used to estimate, by industry, the proportion of people who have an employee main job and a self-employed second job. This adjustment is necessary because the employee and self-employed sources cannot observe one another. Without adjustment, the same individual would be counted once in the employee estimate through ASHE and again in the self-employed estimate through the LFS, even though they represent a single worker. The LFS is therefore used to identify and split these workers between the employee and self-employed components, ensuring that when the two components are added together, each individual contributes only once to the total worker count, and the combined estimate remains consistent with the concept of unique workers.

Conversely, individuals whose main job is self-employed and whose second job is employee cannot be adjusted separately because sample sizes become sparse when estimated at detailed industry level. This may lead to a small degree of residual double counting between the employee and self-employed worker estimates. However, evidence from the LFS suggests this population is relatively small, 0.3% of total jobs in 2024, so the impact on the aggregate worker series is expected to be limited.

Workers are apportioned across their jobs fractionally, by hours share, so the worker contribution is allocated across industries in proportion to where the labour is supplied rather than assigned wholly to one industry.

ASHE is collected around April every year, providing an annual anchor, with ratios for other quarters interpolated between annual observations. This is appropriate because the relationship between workers and jobs reflects gradual change in multiple jobholding and industrial structure rather than short-term quarterly movement.

Employee worker counts are derived by applying the adjusted worker-to-job ratio to the employee jobs component of workforce jobs. The resulting third-month point-in-time estimate of employee workers is interpolated to create a quarterly average using the same approach as the filled-jobs methodology described in Section 8: Measuring filled jobs.

Self-employed worker-to-job ratios

Self-employed worker-to-job ratios are derived from the LFS, since ASHE covers employees only.

The limitations are material. The LFS records main and second jobs but not third or further jobs, so it is less complete than ASHE for multiple jobholding. Self-employment status is self-reported, introducing classification error, but the LFS remains the most suitable available source.

Sole directors require the same treatment here as in the filled jobs methodology. Because those paid through PAYE are already captured in employee jobs sources, they are excluded from both sides of the self-employed worker-to-job ratio, keeping it calibrated to the adjusted self-employment jobs series.

Self-employed worker-to-job ratios are applied directly to LFS self-employment jobs to derive a headcount by industry division.

12 . Future developments

Future development priorities

- Developing a component approach using the Transformed Labour Force Survey (TLFS).
- Developing a stronger benchmark for self-employed jobs, potentially using administrative sources, such as self-assessment or data from Making Tax Digital.
- Developing full-time and part-time splits for employee jobs, so hours weighting can come directly from the job’s source.
- Exploring a PAYE-based furlough denominator, since the Coronavirus Job Retention Scheme population was PAYE-derived.
- Scoping wider coverage adjustments with labour accounts work, including informal and illicit economy adjustments, inclusion of those aged under 16 years, and self-employment in communal establishments.
- Continuing international engagement, because a UK-tailored method improves the UK estimate but does not, by itself, deliver full international comparability.

13 . Data sources

Productivity estimates draw on a range of underlying data sources, each of which is subject to its own revisions cycle. To maintain coherence across the framework and ensure the estimates reflect the best available information, revisions are incorporated whenever updated source data become available. Consequently, revisions may affect the full time series, rather than being restricted to a defined revision period.

Current data sources used by the component approach

Component: paid usual weekly hours, including overtime

Primary sources:

- Labour Force Survey (LFS) (quarterly)
- Annual Survey of Hours and Earnings (ASHE) (annual)

Role:

- baseline hours measure
- ASHE provides the level anchor

Component: Annual leave

Primary sources:

- LFS leave entitlement (quarterly)

Role:

- subtract leave taken, benchmarked to annual entitlement

Component: Bank holidays

Primary sources:

- explicit calendar adjustment (weekly)

Role:

- adjusts for number of bank holidays, including the proportion of bank holidays typically worked

Component: Sickness, public administration and defence

Primary sources:

- Cabinet Office civil service sickness absence statistics (annual, applied quarterly)
- public sector employment data (monthly, applied quarterly)

Role:

- administrative benchmark for the civil service employed share

Component: Sickness, human health activities

Primary sources:

- NHS sickness absence rates (monthly, applied quarterly)
- public sector employment data (monthly, applied quarterly)

Role:

- administrative adjustment for the NHS-employed share

Component: Furlough

Primary sources:

- Coronavirus Job Retention Scheme (CJRS) administrative data (quarterly)
- Business Register and Employment Survey (annual, applied quarterly)
- workforce jobs (quarterly)
- Labour Force Survey (quarterly)

Role

- adjust for furloughed hours during the CJRS window

Component: Other lower-hours absence

Primary sources:

- LFS microdata (quarterly)

Role:

- non-administrative sickness
- parental leave
- other reasons

Component: Overtime

Primary sources:

- LFS microdata (quarterly)

Role:

- add hours worked above paid usual

Component: Employee jobs

Primary sources:

- workforce jobs point-in-time (quarterly)
- RTI interpolation (monthly through RTI)

Role:

- industry and whole-economy job counts

Component: Self-employment jobs

Primary sources:

- Self-employment jobs series from workforce jobs (quarterly)

Role:

- self-employment job counts by industry

Component: Employee workers

Primary sources:

- ASHE worker-to-job ratios (quarterly, interpolated)
- workforce employee jobs (EJ) (quarterly, interpolated)

Role:

- employee headcounts by industry

Component: Self-employed workers

Primary sources:

- LFS worker-to-job ratios (quarterly)
- Self-employment jobs (quarterly)

Role:

- self-employed headcounts by industry

Component: Supplementary coverage

Primary sources:

- HM Forces (quarterly)
- Government supported trainees from workforce jobs (quarterly)
- Unpaid family workers from LFS (quarterly)

Role:

- coverage completeness

14 . Furlough methodology

Constructing the furlough adjustment using the Coronavirus Job Retention Scheme (CJRS) data requires several sources because no single one is sufficient. Published CJRS data are mainly at section level because:

- division-level shares were published only for a limited period
- workforce jobs (WFJ) do not separately identify all divisions
- flexible furlough is published only as a whole-economy aggregate

Establishing quarterly totals

Daily CJRS employment counts are averaged within each quarter to give stable section-level furloughed employment totals.

Splitting grouped industries

Where CJRS or WFJ publish grouped divisions, annual Business Register and Employment Survey (BRES) employee job counts provide the shares used to split them. These shares are interpolated to quarterly frequency and applied consistently across sources, so all datasets share a common industrial structure.

Allocating to divisions

Standard industrial classification (SIC) 2007 section level totals are allocated to divisions using a blend of the published CJRS division shares and WFJ employment structure. The former provides the furlough-specific signal, the latter a stabilising anchor based on the size of each division. Because division shares were published only towards the end of the scheme, the earliest available shares are carried backwards for earlier quarters, on the assumption that the relative distribution of furlough between divisions within a section was broadly stable. Allocations are then renormalised, so they sum exactly to published section totals.

Estimating furlough probabilities

Allocated division-level CJRS employment is divided by division-level WFJ employment. Because numerator and denominator come from independent sources, the resulting ratio is constrained to lie between zero and one, since a higher value would imply more than the whole workforce of a division was furloughed.

Estimating flexible furlough

Division-level flexible-furlough shares are estimated from the Labour Force Survey (LFS) and then iteratively proportionately fitted so the aggregate matches the published CJRS whole-economy share in each quarter.

Applying the hours effect

Full furlough removes paid usual hours in proportion to the estimated furlough probability. Flexible furlough partially offsets this through an hours-retention rate, estimated from LFS actual hours worked against paid usual hours worked per week among flexible-furlough participants.

Uncertainty in this adjustment is contained by construction. Section-level CJRS totals are treated as fixed administrative inputs and preserved throughout, so uncertainty from the backfilled shares affects only the distribution of furlough between divisions within a section and cannot change the total amount of furlough applied at section level. The adjustment also applies only to the historical CJRS period, so it operates as a fixed historical correction rather than a component requiring routine revision.

15 . Definitions

Actual hours worked

Time engaged in productive activity within the production boundary. It includes paid and unpaid overtime and brief workplace breaks. It excludes paid annual and sick leave, public holidays, commuting and meal breaks.

Benchmarking

The process of anchoring part of an estimate to a stronger source for the level, while using another source to provide movement between benchmark points.

Business Register and Employment Survey (BRES)

An Office for National Statistics (ONS) business survey used to benchmark private sector employee jobs estimates in Great Britain, as part of workforce jobs outputs. New BRES benchmarks can lead to revisions in workforce jobs estimates in December each year.

Component approach

A method that builds labour input from separate components, including paid usual hours, adjustments to actual hours, filled jobs and workers, using the strongest available source for each part.

Coronavirus Job Retention Scheme (CJRS)

A UK government scheme that applied from 1 March 2020 to 30 September 2021 and supported employees who were furloughed.

Direct approach

The current approach in which whole-economy labour input is anchored to Labour Force Survey (LFS) aggregates, with workforce jobs used for industry detail and supplementary coverage adjustments.

Economic territory

The territory within which output is produced, used as the basis for gross value added (GVA) and therefore for labour input, regardless of where workers reside.

Filled jobs

The count of employment spells or employer relationships contributing to production. A person with more than one job is counted once for each job.

Flexible furlough

Arrangements from 1 July 2020 under the CJRS that allowed furloughed employees to work some of their usual hours while remaining furloughed for unworked hours.

Local unit

A local unit is an individual site (for example a factory or shop) within an enterprise.

Paid usual hours

The hours a person is contracted for paid work per week, including paid usual overtime. In the LFS, this measure is collected for the respondent’s main job.

Pay As You Earn (PAYE) Real Time Information (RTI)

HM Revenue and Customs (HMRC) administrative data on payrolled employees. In this article, RTI is used to shape the within-quarter path of employee jobs and to support timely jobs estimates.

Reporting unit

The business unit used for statistical reporting on the business register, and the basis on which output and value added are allocated to industry in the national accounts.

Roll-forward imputation

The practice of carrying a previous wave’s response forward where a household cannot be contacted. This can create bias where the previous response no longer reflects the current reference week.

Worker-to-job ratio

The ratio of unique workers to filled jobs, used to convert a jobs measure into a headcount measure.

Workers

A headcount measure of people in employment, where each person is counted once regardless of how many jobs they hold.

16 . Data on components

Earnings and employment from Pay As You Earn Real Time Information
Dataset | Released 18 August 2026
Earnings and employment statistics from Pay As You Earn (PAYE) Real Time Information (RTI), UK, NUTS 1, 2 and 3 areas and local authorities, monthly, non-seasonally adjusted.

Earnings and hours worked, industry by two-digit SIC: ASHE Table 4
Dataset | Released 23 October 2025
Annual estimates of paid hours worked and earnings for UK employees by sex, and full-time and part-time, by two-digit standard industrial classification 2007.

17 . Related links

Productivity flash estimate and overview, UK: April to June 2026 and January to March 2026
Bulletin | Released 18 August 2026
Productivity flash estimates for Quarter 2 (Apr to Jun) 2026, based on the GDP first quarterly estimate and labour market statistics, and productivity overview for Quarter 1 (Jan to Mar) 2026.

Annual Survey of Hours and Earnings, Low pay and Annual Survey of Hours and Earnings pension results QMI
Methodology | Released 25 October 2018
This quality and methodology report contains information on the quality characteristics of Annual Survey of Hours and Earnings data (including the five European Statistical System Dimensions of Quality) as well as the methods used to create it.

Labour Force Survey (LFS) QMI
Methodology | Released 17 November 2025
Quality and methodology information for the Labour Force Survey (LFS) detailing strengths and limitations of the data, methods, and data uses and users.

Workforce jobs in the UK quality and methods guide
Methodology | Released 19 March 2026
What the workforce jobs statistics cover, how we produce them, and their quality and comparability. Includes definitions and latest, past and upcoming changes.

Blue Book 2026: impact on GDP and main components
Article | Released 20 August 2026
Annual and quarterly impacts on the 2026 UK National Accounts from recent methodological improvements and new survey and administrative information.

International productivity gaps: Are labour input measures comparable? (PDF, 3.3 MB)
Article | Released 10 Dec 2018
Organisation for Economic Co-operation and Development (OECD) working paper exploring the comparability of labour input measures used internationally. It uses a simplified component method to illustrate an upward bias in estimates using the direct method.

18 . Cite this methodology

Office for National Statistics (ONS), released 17 September 2026, ONS website, supporting methodology article, Component approach to measuring labour productivity, UK: 1997 to 2024