Estimates of hours worked and labour productivity for the UK using a component method

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Disclaimer

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This work uses ONS datasets but does not represent ONS endorsement.

Outputs may not exactly reproduce National Statistics aggregates.

This research is still a **work in progress**, so results and methods should be taken as indicative rather than final.

Thank you to Joey Tobitt for assistance with slides

Background and Motivation

Background: Current “direct” approach

- At the whole economy level, hours worked (for productivity purposes) are based purely on reported total *actual* hours worked from the Labour Force Survey
  - Including standard imputation and weighting
- These are then broken down into industries, using jobs data from the same sources as WorkForce Jobs (WFJ), and average hours per job from LFS. But these industry data are all constrained to the total from LFS

Motivation: Current “direct” approach

What are the issues with the “direct” approach?

Hours data

- LFS is known to have an upwards bias in its *actual* hours data, due to the collection methodology

Industry data

- National Accounts data base their industry on the “Reporting Unit” of a company. LFS collects self-reported industry

Coverage

- Border workers: LFS includes UK residents working abroad, excludes non-residents working in UK.
- Territorial enclaves: Workers in embassies, bases, etc., not captured by LFS but should be included.
- Unobserved economy: Informal or illegal work under-reported in LFS but included in output measures.
- Other groups: Some countries include working students, prisoners, own-account production – UK does not.

Motivation: What's the alternative?

A component approach

- Based on an accounting approach to hours work (akin to National Accounts & Labour Accounts)
- Constructs total actual hours worked rather than measures it directly

Advantages

- Can use the best data source available for each component
- Can achieve better consistency with national accounts, e.g. by accounting for cross border flows

Disadvantages

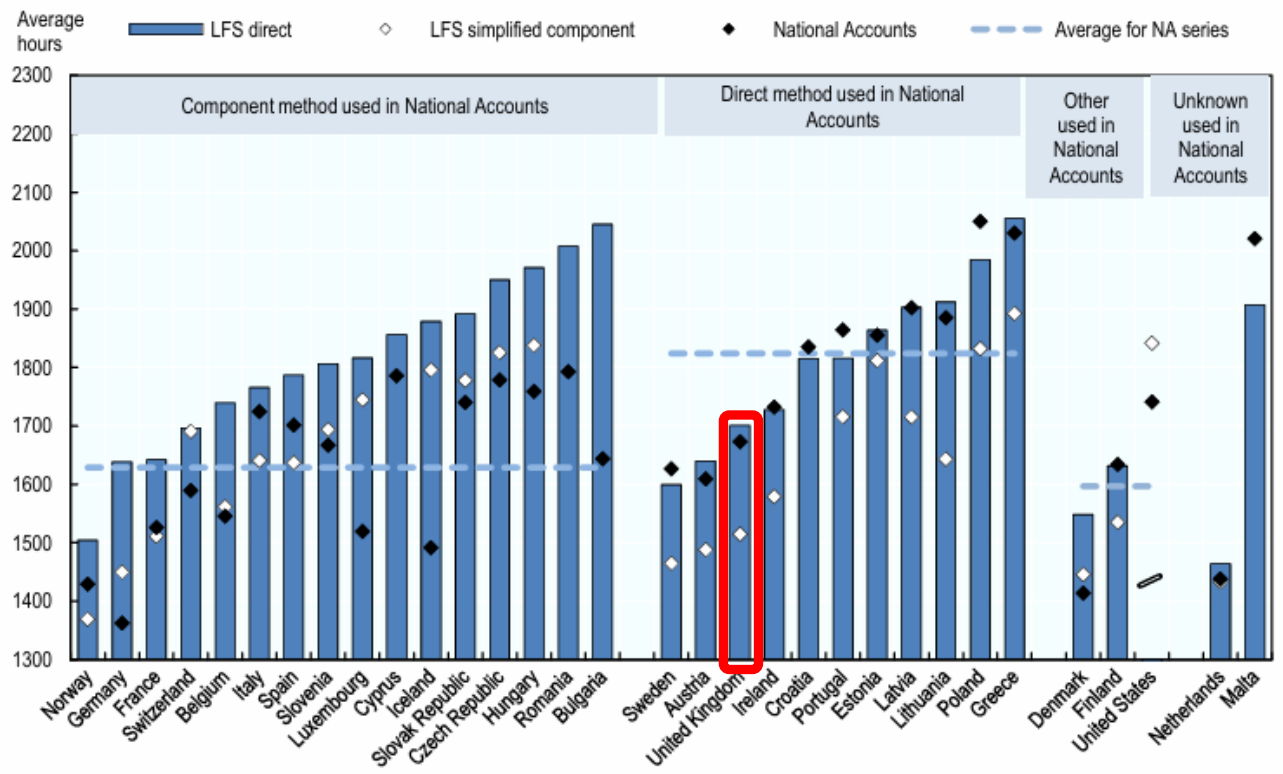
- More complicated to calculate and understand
- Not all components may be available, or some may be low quality
- Resulting statistics will not be consistent with statistics from LFS

Motivation: 2018 OECD Study

- Most countries used component approach
- Countries which used a “direct approach” tended to have higher average hours worked
- These higher hours resulted from the collection methodology for LFS – non responses often use a “carry forward” of previous data, which can lead to bias when non-response is more likely due to leave/holiday
- OECD recommended countries use a component approach for measuring hours worked.

Figure 4.1. Average hours worked per person, 2016

LFS-based direct method, LFS based simplified component method and official national accounts



Note: Data for all countries is for 2016, apart from Germany which presents data for 2013.
The Netherlands did not respond to the 2018 survey, hence the method used by this country is reported as ‘unknown’ in this chart.
Source: OECD National Accounts Statistics (database), April 2018. Unpublished OECD estimates based on European Labour Force Surveys results and Eurofound (2015) for statutory leave for European countries, and the Current Population Survey (CPS) microdata and an estimated 15 days of annual paid annual leave and public holidays (Ray et al., 2007) for the United States. Estimates first presented in OECD (2004).

Methodology

Office for National Statistics

Methodology: Overview

Stage 1 – Calculation of adjusted productivity jobs

Stage 2 – Estimation of mean actual hours worked, derived from paid usual hours and adjustments using higher/lower hours than usual.

Stage 3 – Calculation of productivity hours, using both productivity jobs and mean actual hours worked.

Jobs x Average hours per job = Total hours worked

Methodology: Productivity Jobs

Summary

- Use Workforce Jobs
- Minor Adjustments for the data to be based on Reporting Unit and to move from a 3rd-month-of-quarter data point to a quarterly average

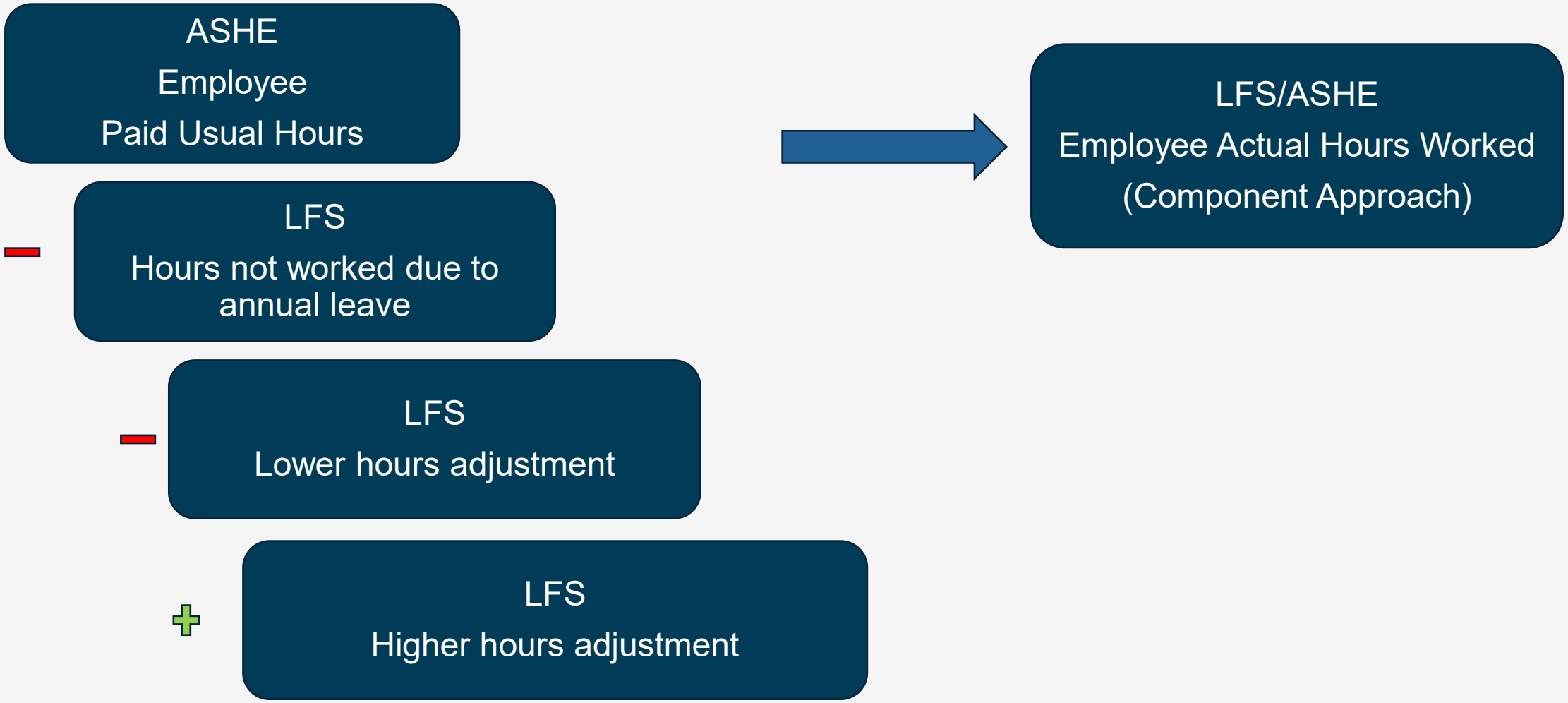
Methodology: Mean Actual Hours Worked

Summary

By industry division (2 digit SIC) and full-time part-time split:

- Use the **Annual Survey of Hours and Earnings** as the main source of **average usual *paid* hours**
- Add in a specific component for time off due to **annual leave** (using reported **annual allowance in LFS**)
- Add in general components for all other reasons actual hours would be (1) below and (2) above paid hours (using LFS)

Methodology: Actual hours worked



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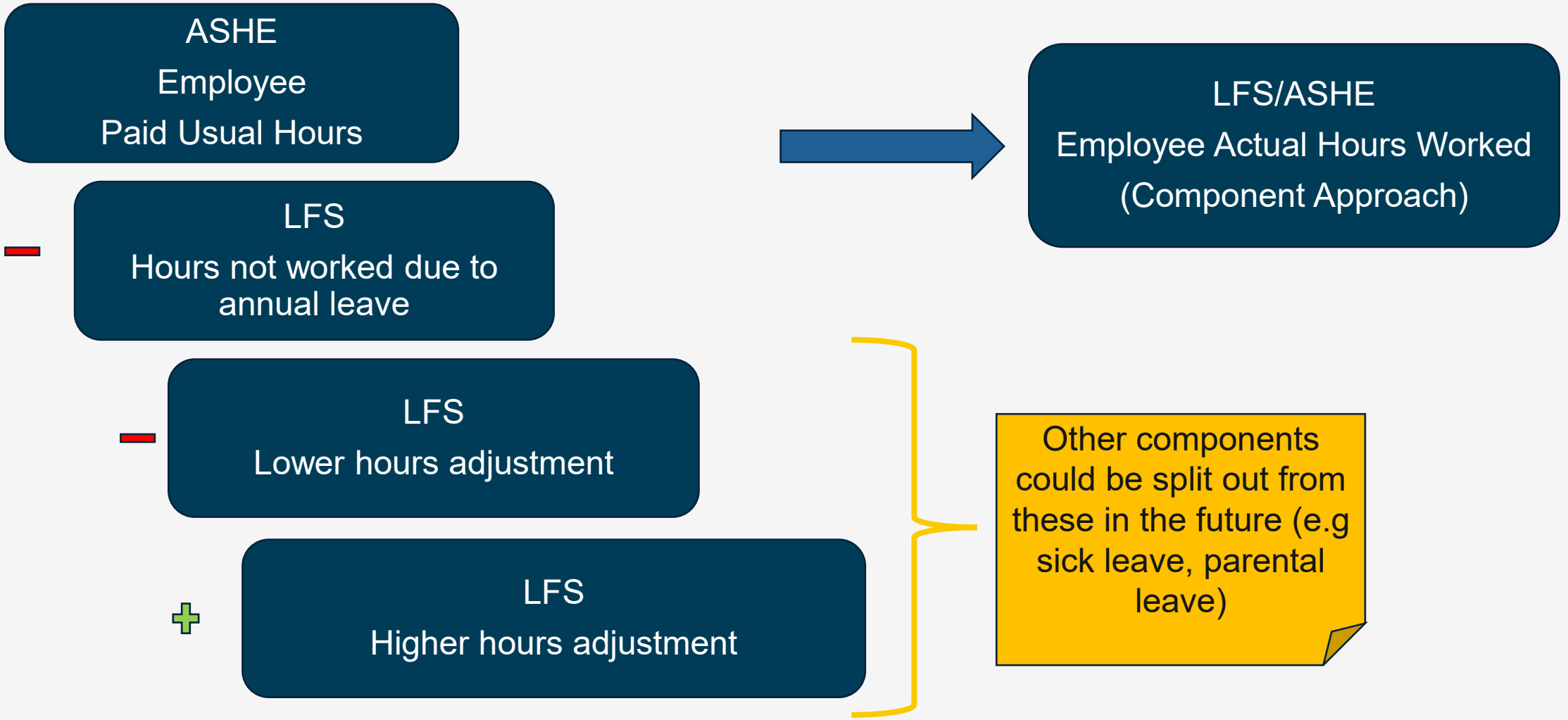

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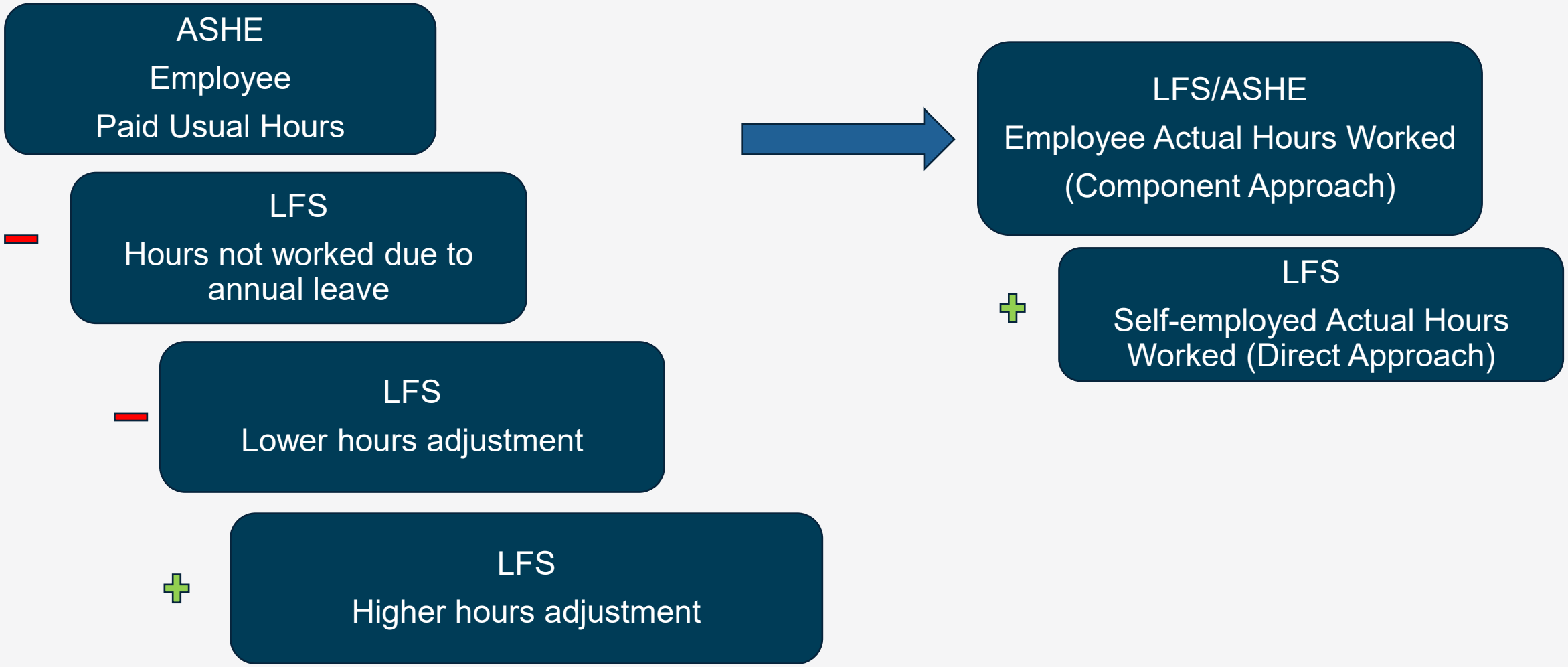
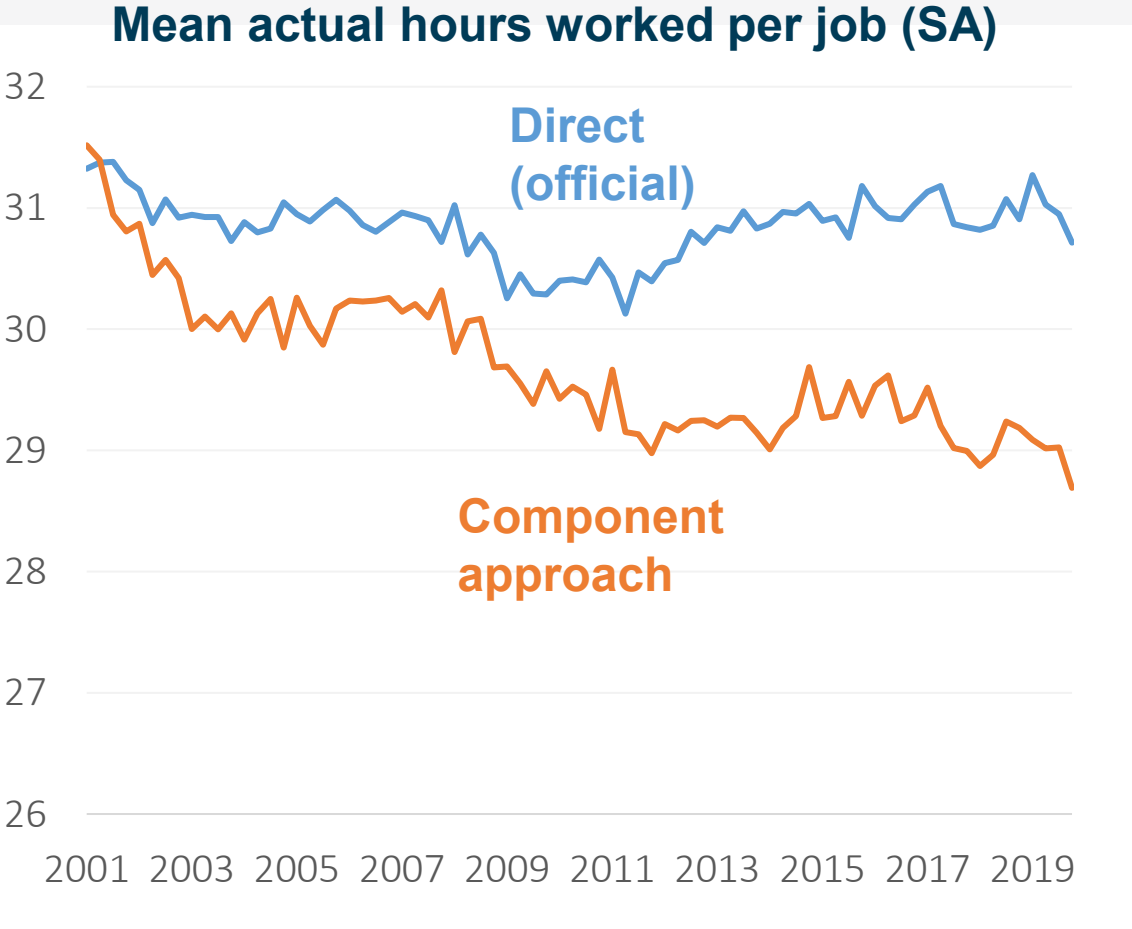


Results

Average Hours Worked: Whole Economy

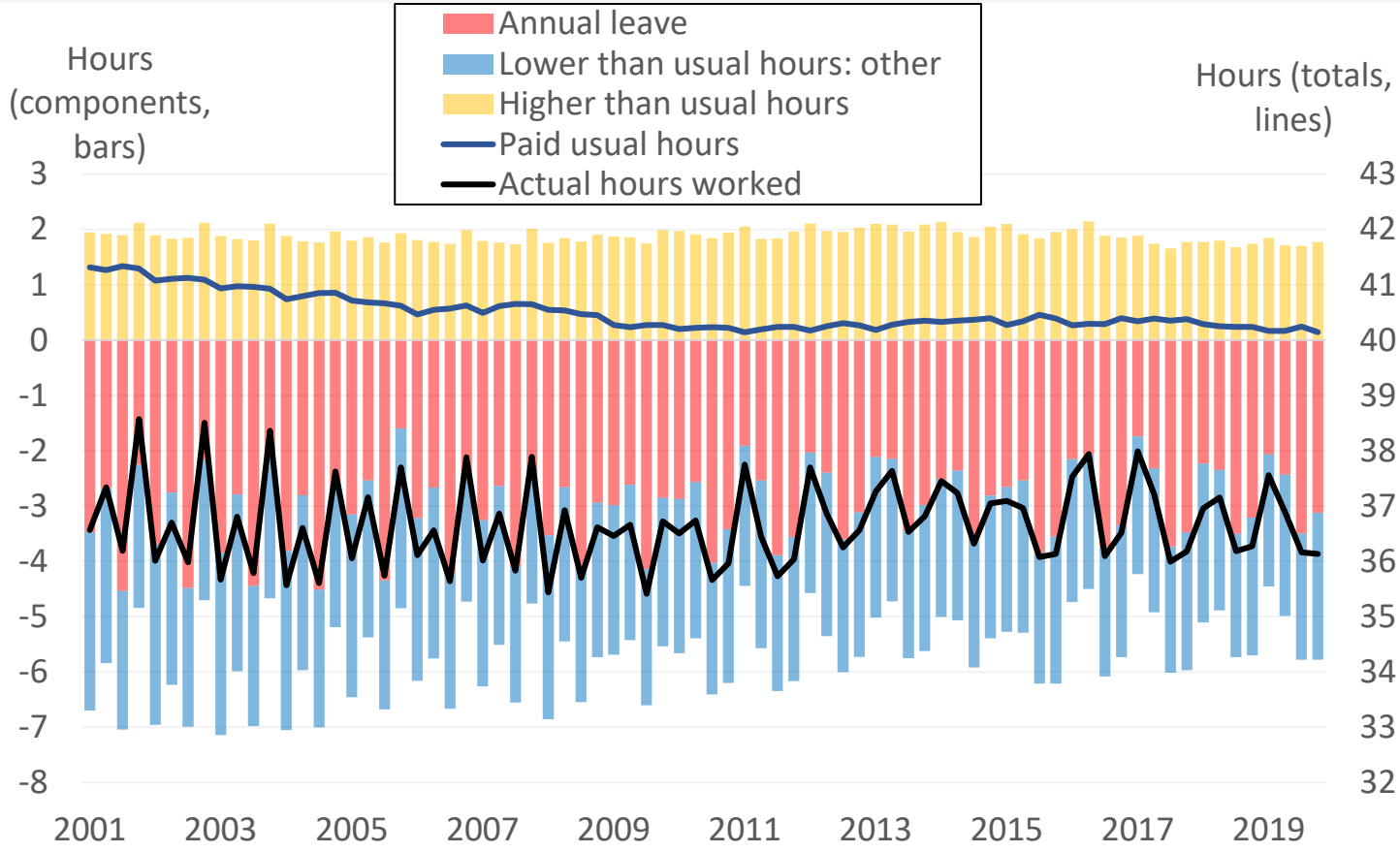


- Overall effect of the component approach on average hours is to **lower average hours** over the past 20 years
- While official (direct) estimates of average hours actually worked per job remained broadly similar between 2001 and 2019, a component approach suggests a **long term downwards trend**
- As such, the difference between estimates from the two approaches has grown over time; this will largely reflect the change in hours not worked due to annual leave

Note: Includes employees and self-employed

Decomposition into “components”: Direct approach

Direct Approach: Mean actual and paid usual hours per week, and components of the difference between the two

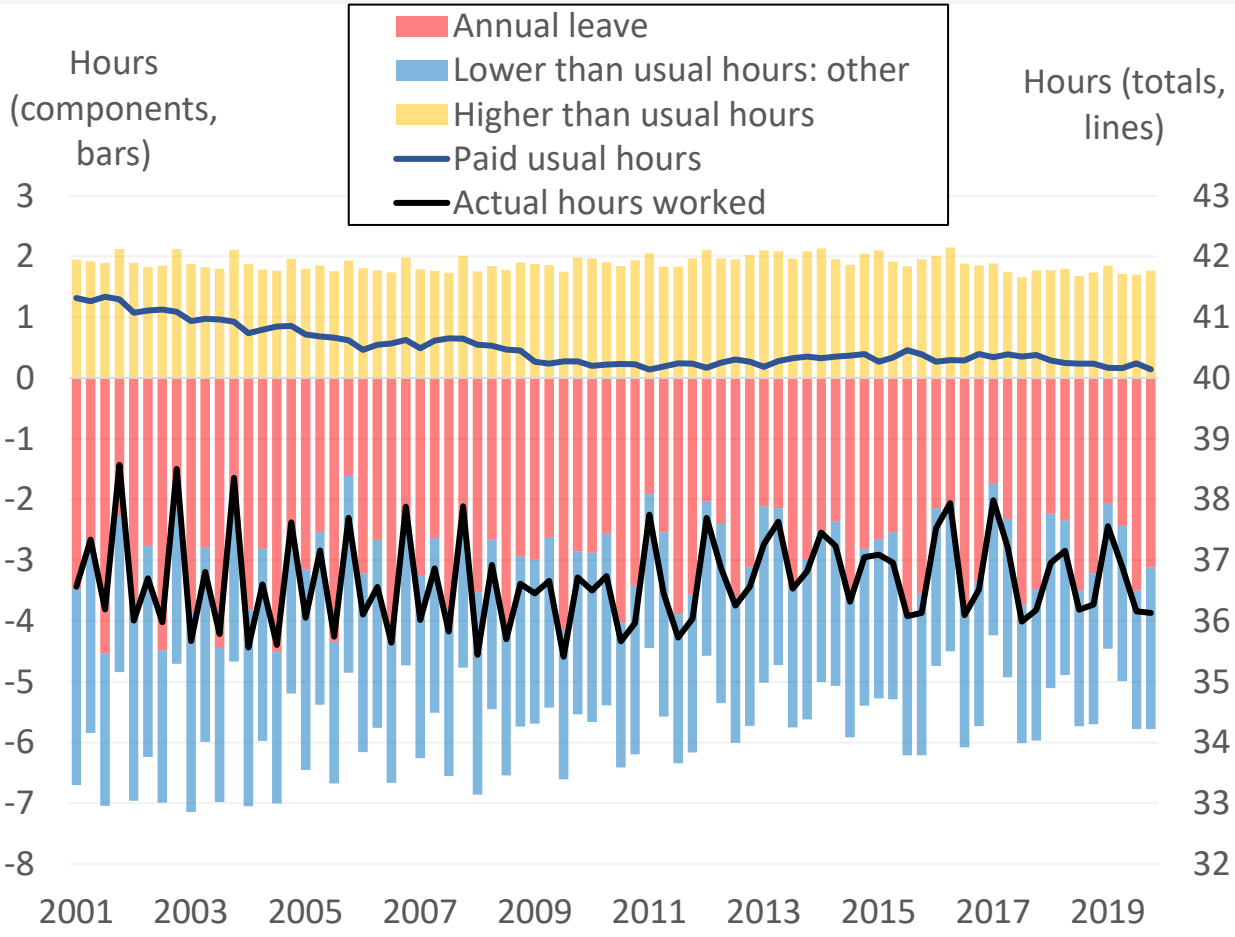


- The “direct” approach can be decomposed into implicit ‘components’ (even though not constructed as such)
- This is based solely on the LFS (as is the current “direct” approach) and uses LFS variables on responses for why actual hours differ from usual (*YLESS, YMORE*)
- The next slide compares these *implicit* components, to our *explicit* components in the “component approach”, to understand the cause of the deviations

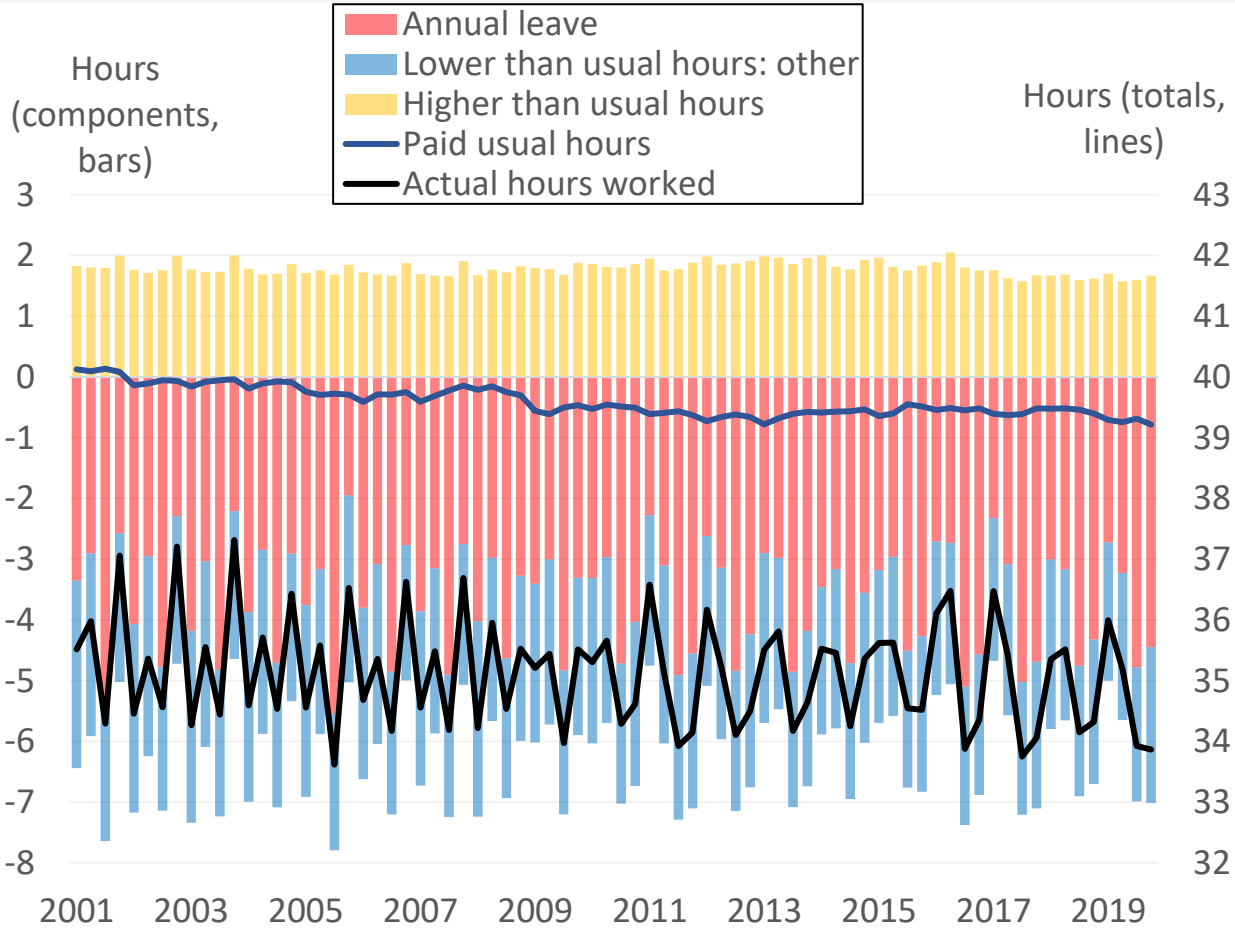
Note: Full-time employees only, non-seasonally adjusted

Decomposition into “components”: Comparison

Direct method



Component method



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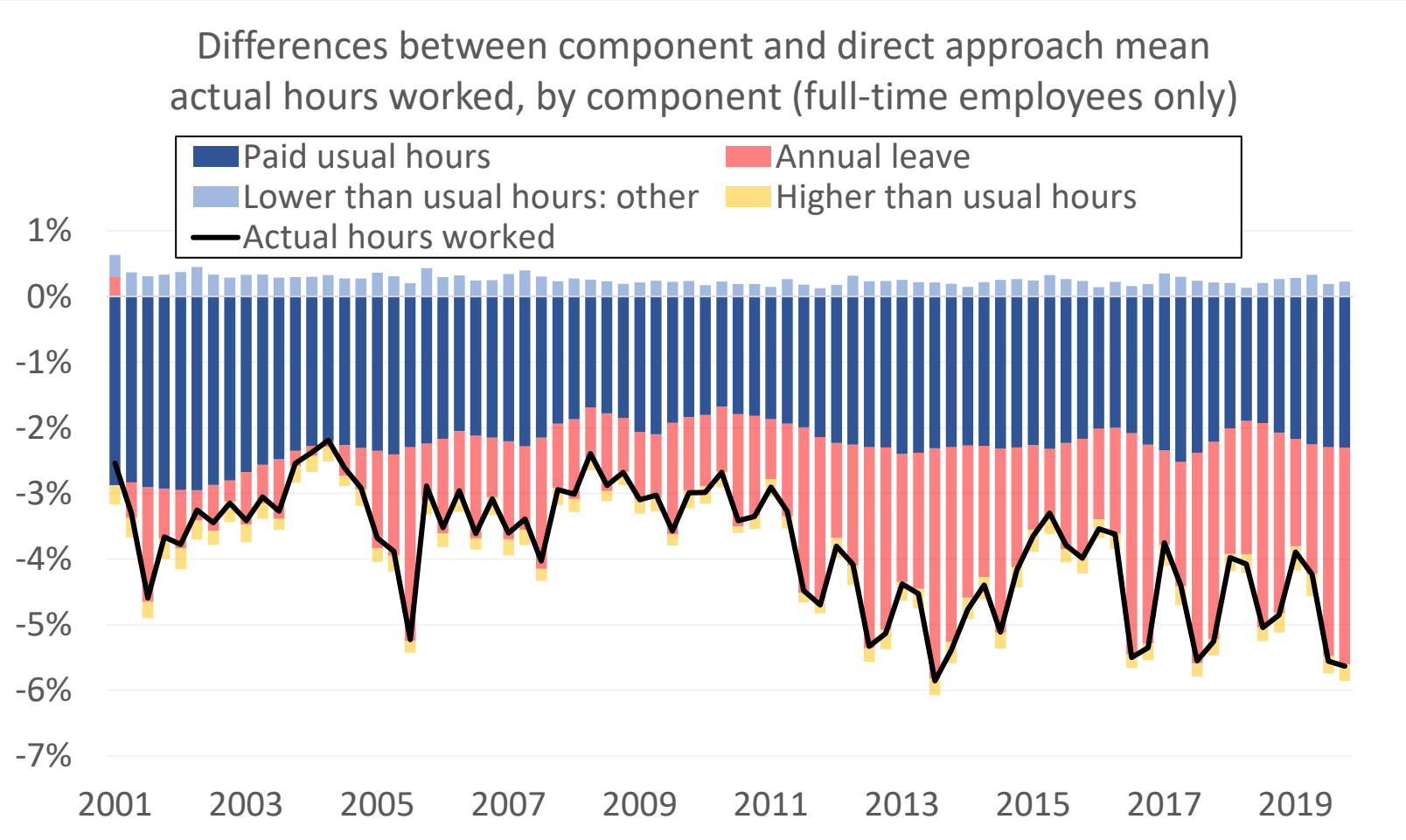
Components

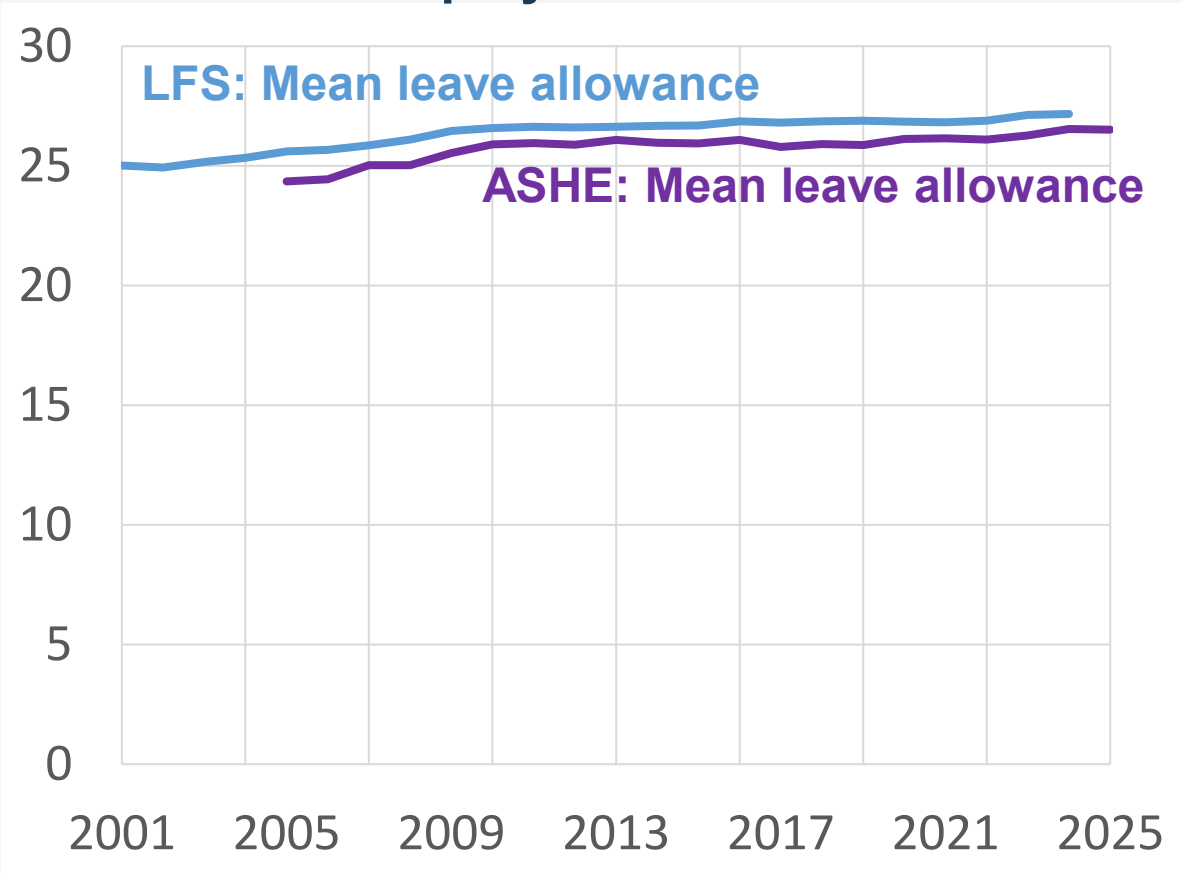


- Lower actual hours in the component approach is a combination of **both lower paid usual hours** as well as **higher hours not worked due to annual leave**
- Difference in actual hours is growing over time
- This reflects an increase over time in the effect of hours not worked due to leave

Note: Full-time employees only, non-seasonally adjusted

Annual Leave

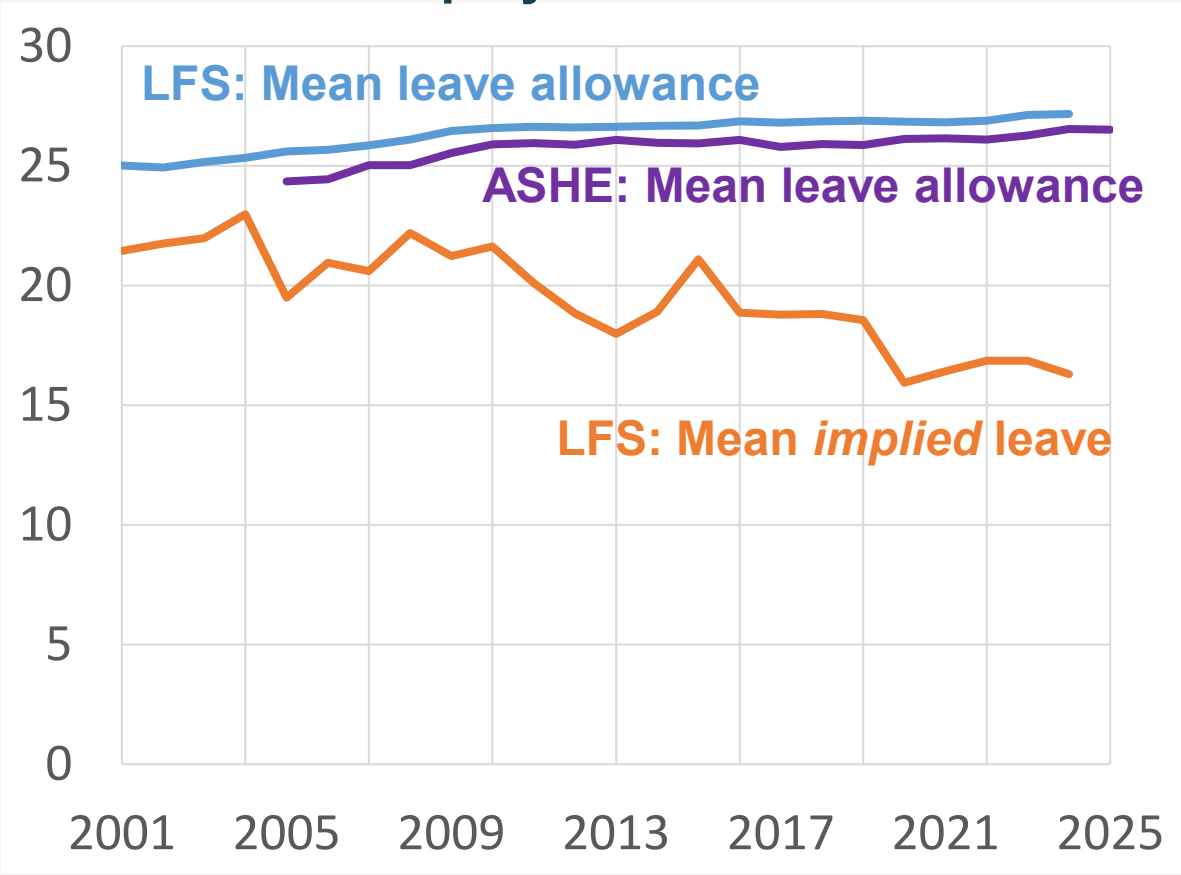
Mean days annual leave per year: Full-time employees



- Following basic data cleaning, **LFS and ASHE give very similar levels of leave allowance** for full-time employees
  - 2024 LFS: Mean 27.2, Median 26.0
  - 2024 ASHE: Mean 26.5, Median 26.0

Annual Leave

Mean days annual leave per year: Full-time employees



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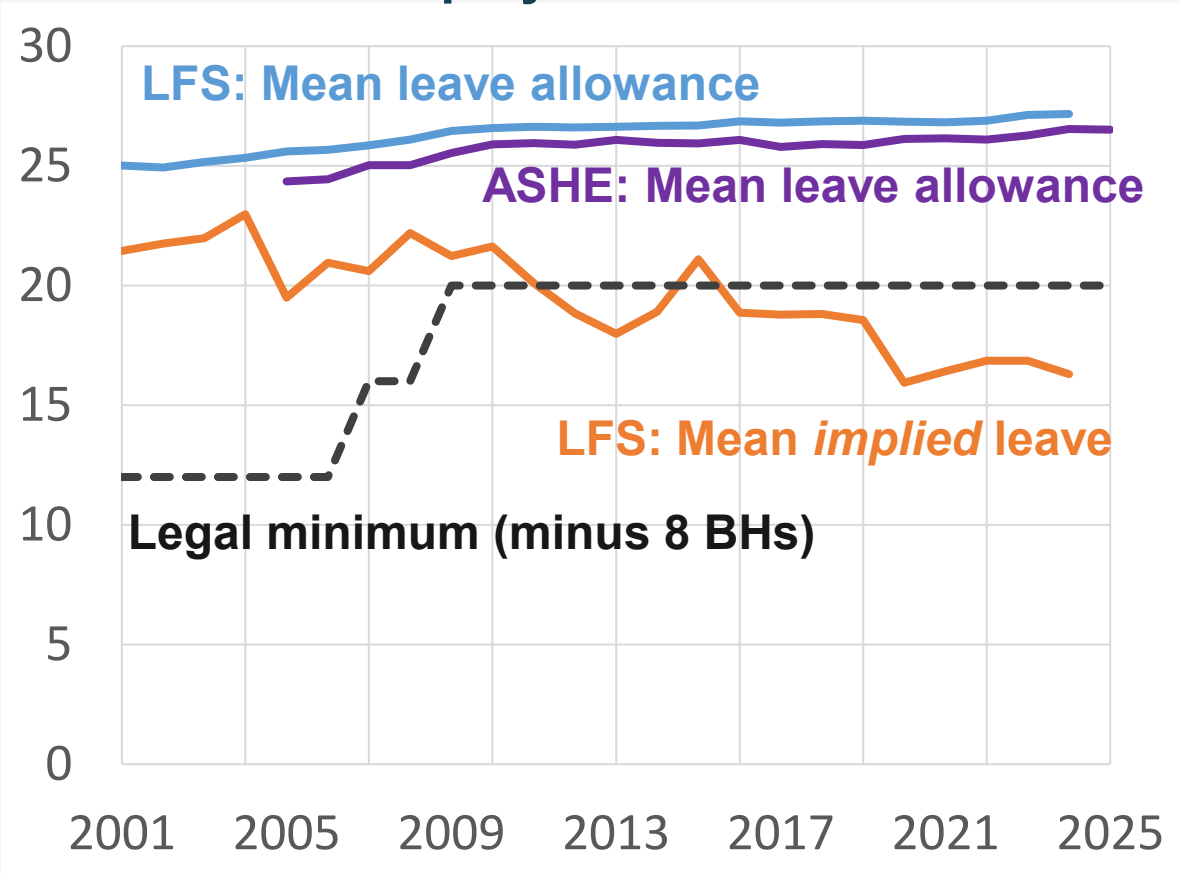
- In contrast, the **implied actual leave taken from LFS would imply a much lower mean** figure (mean 16.3),

"Implied" LFS series calculated by looking at total difference between usual and actual hours due to annual leave, divided by average usual hours worked per day

Annual Leave

Mean days annual leave per year: Full-time employees



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Statutory minimum = 5.6 weeks = 28 days for most full-time workers (past-time = pro-rata). This can include Bank holidays (8), but LFS question asks for annual leave allowance excluding BHs, so we subtract 8 from 28 = 20 days.

Annual Leave

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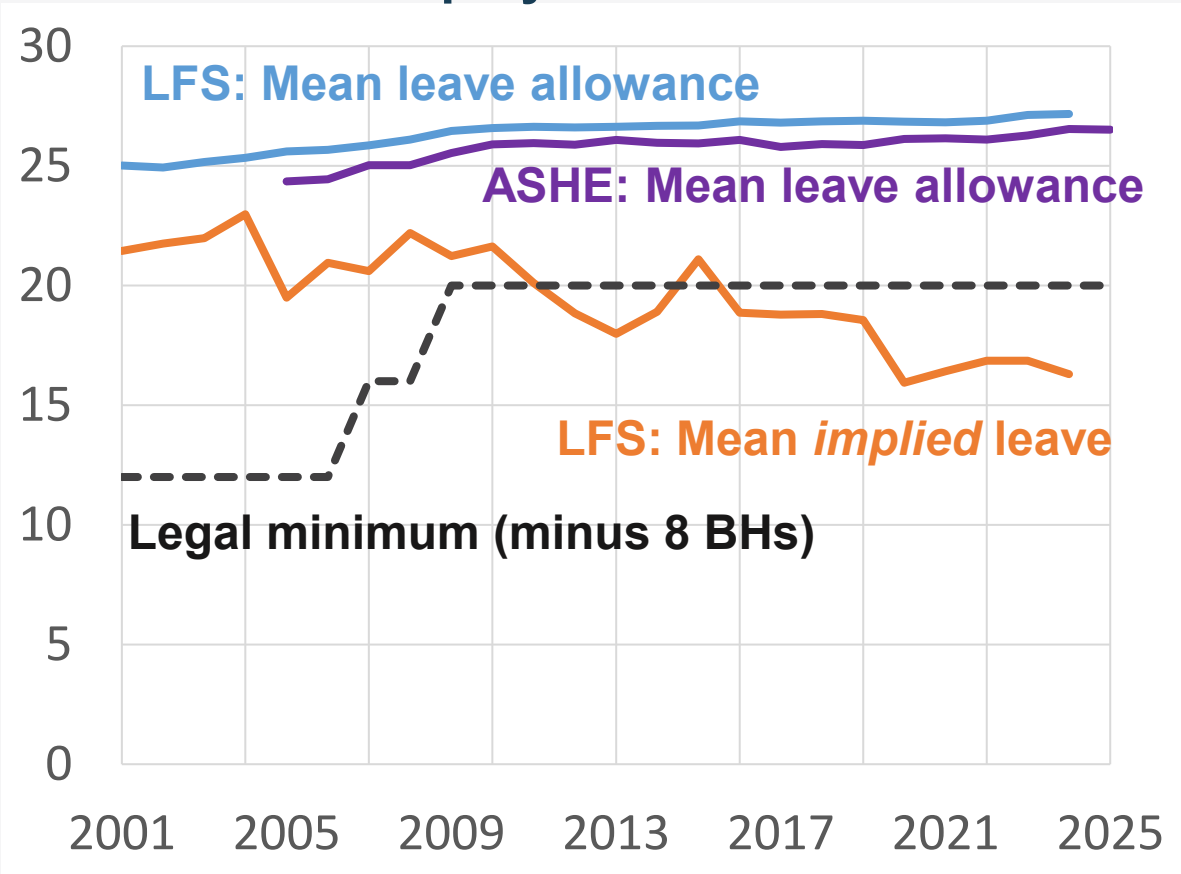

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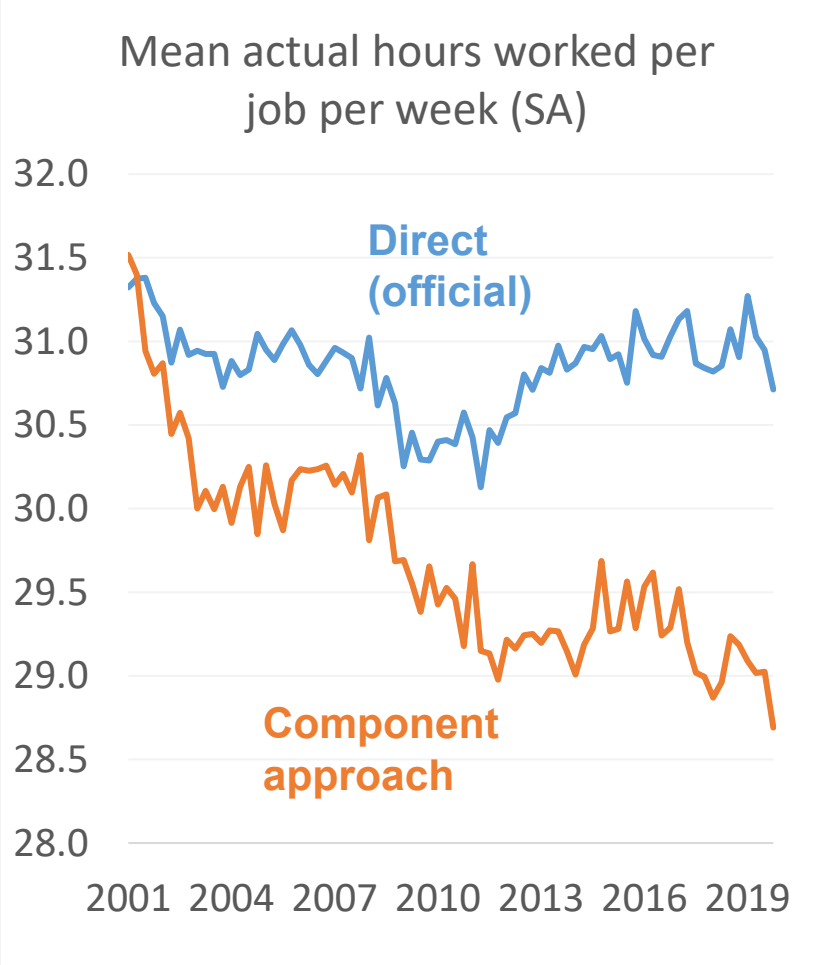
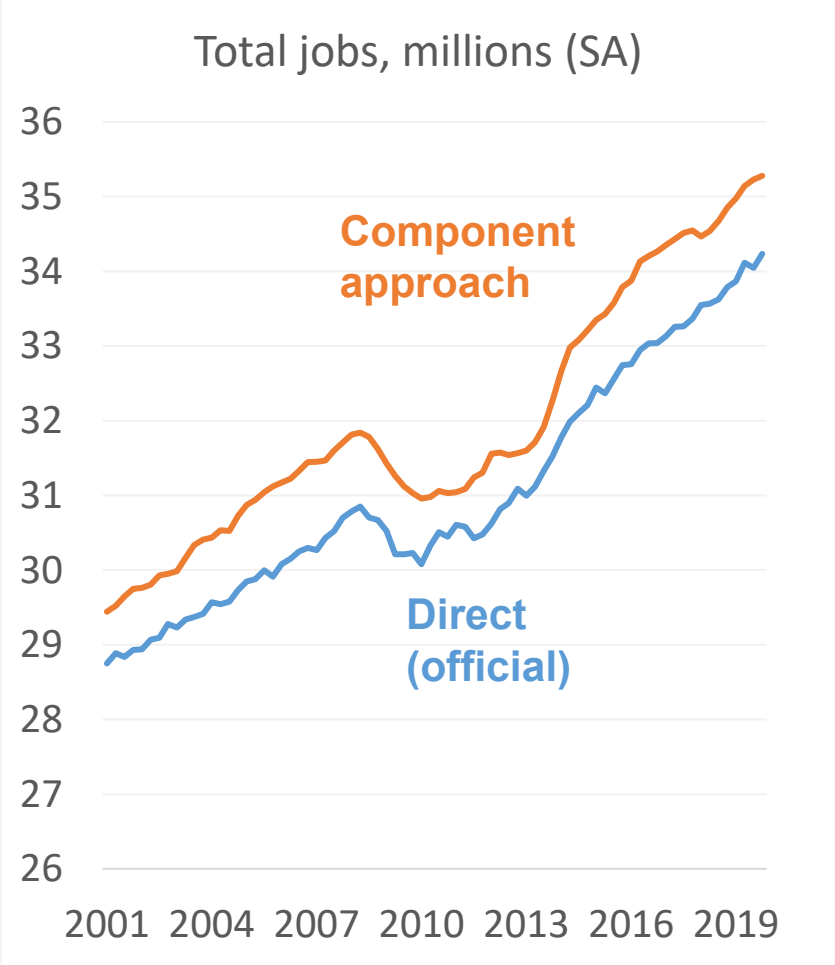
- In contrast, the **implied actual leave taken from LFS would imply a much lower mean** figure (mean 16.3), well **below the legal minimum** (20 days)
- While both LFS and ASHE indicate that leave **allowances have increased over the long term**, the implied leave taken from LFS has decreased substantially
- This both corroborates the OECD finding that labour force surveys may under cover people taking annual leave, and indicates this issue may have grown over time

Statutory minimum = 5.6 weeks = 28 days for most full-time workers (past-time = pro-rata). This can include Bank holidays (8), but LFS question asks for annual leave allowance excluding BHs, so we subtract 8 from 28 = 20 days.

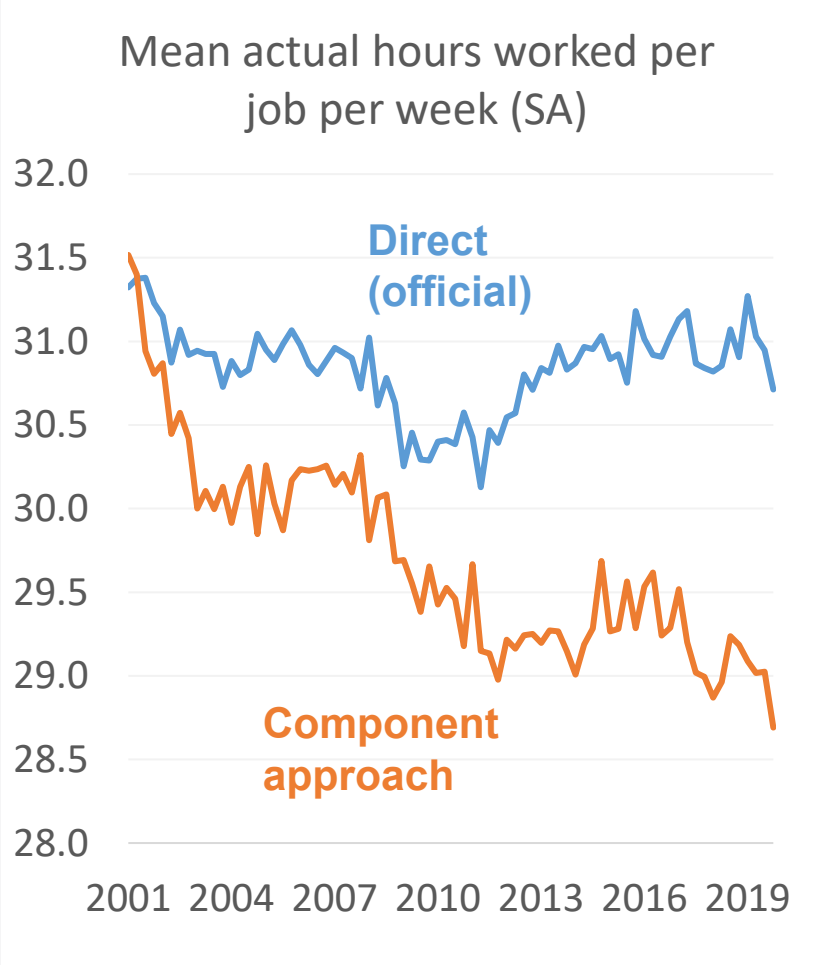
Total Hours Worked: Whole Economy

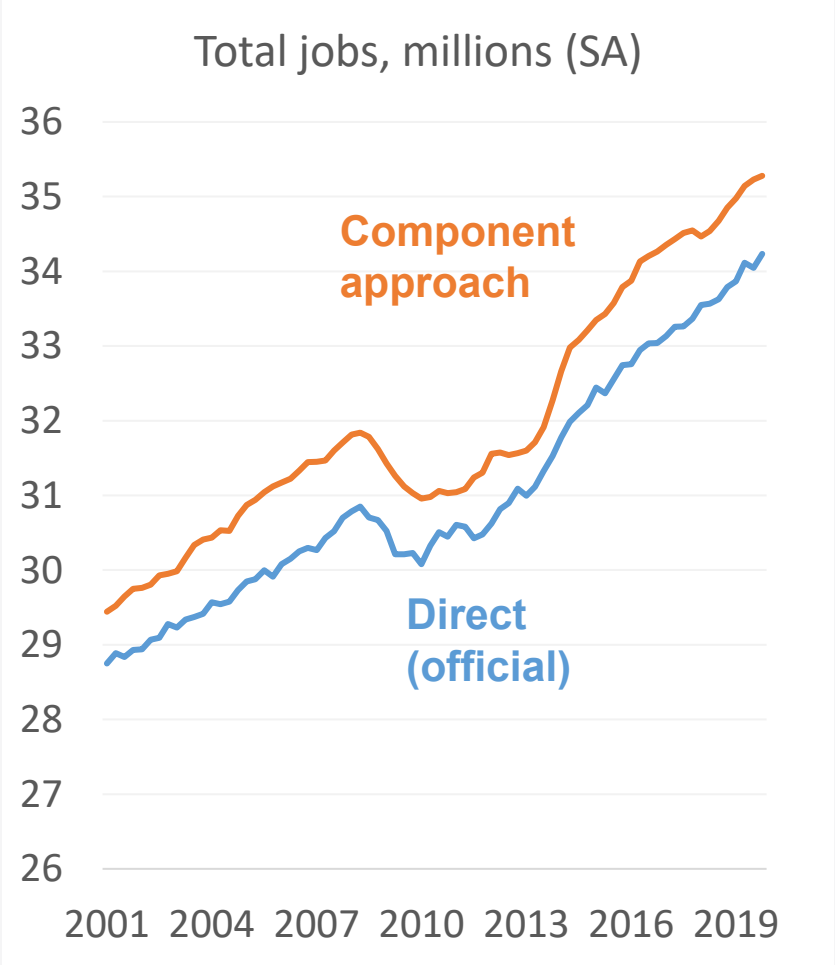


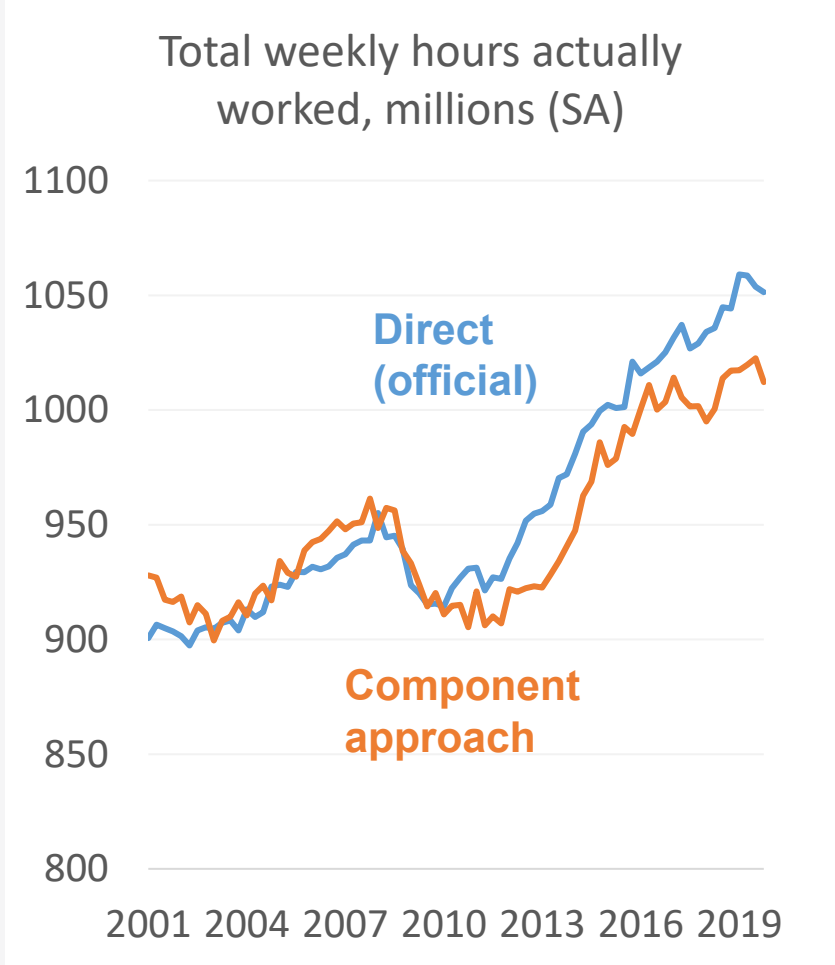


- Total hours worked will be calculated by multiplying average actual hours (per job) by total jobs
- Total jobs using a component approach are higher than LFS-based productivity jobs
- This difference in jobs reflects the existing difference between Workforce Jobs and LFS

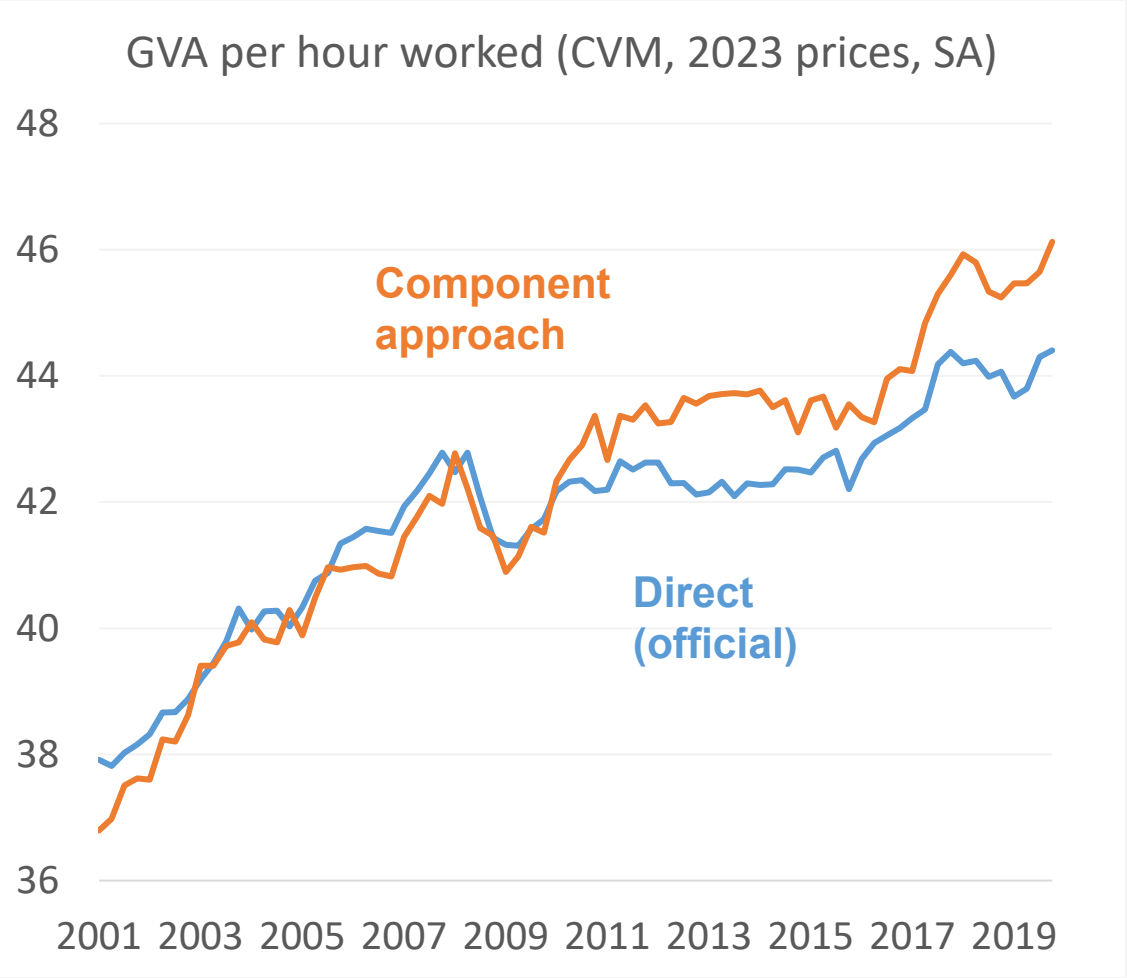
Total Hours Worked: Whole Economy







GVA per Hour Worked: Whole Economy



- Both measures use the same GVA data, so any differences reflect changes due to total hours worked from the component approach
- Growth in both series was similar pre-financial crisis
  - 1.83% CAGR for direct vs. 1.96% for component between 2001 and 2007
- Following the 2008 global financial crisis, the component approach indicates a stronger initial recovery in labour productivity
  - 0.60% CAGR for direct vs. 1.02% for component between 2009 and 2019
- Over the longer term, the component approach suggests the slowdown in productivity growth post the financial crisis may be smaller than previously estimated

Conclusions and Next Steps

Conclusions

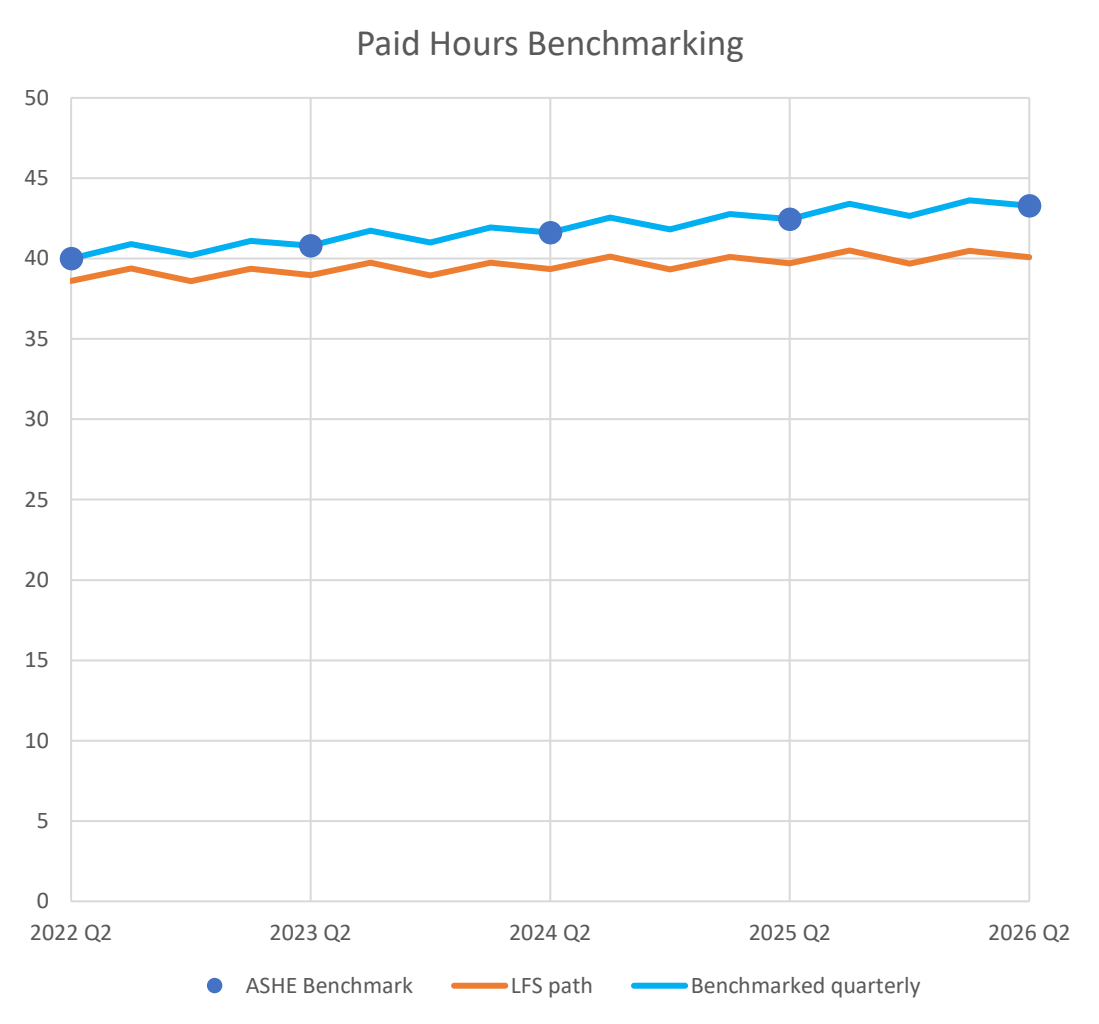
- Under-coverage of workers working fewer hours due to annual leave may cause upwards bias in direct measures of average hours worked, and that bias may be increasing over time
- A component approach to measuring average hours suggests a long-term downwards trend in average hours worked not captured in the official direct approach measures
- While there was still a substantial slowdown in UK labour productivity growth with a component approach, the extent of this slowdown may be smaller than is indicated by official measures

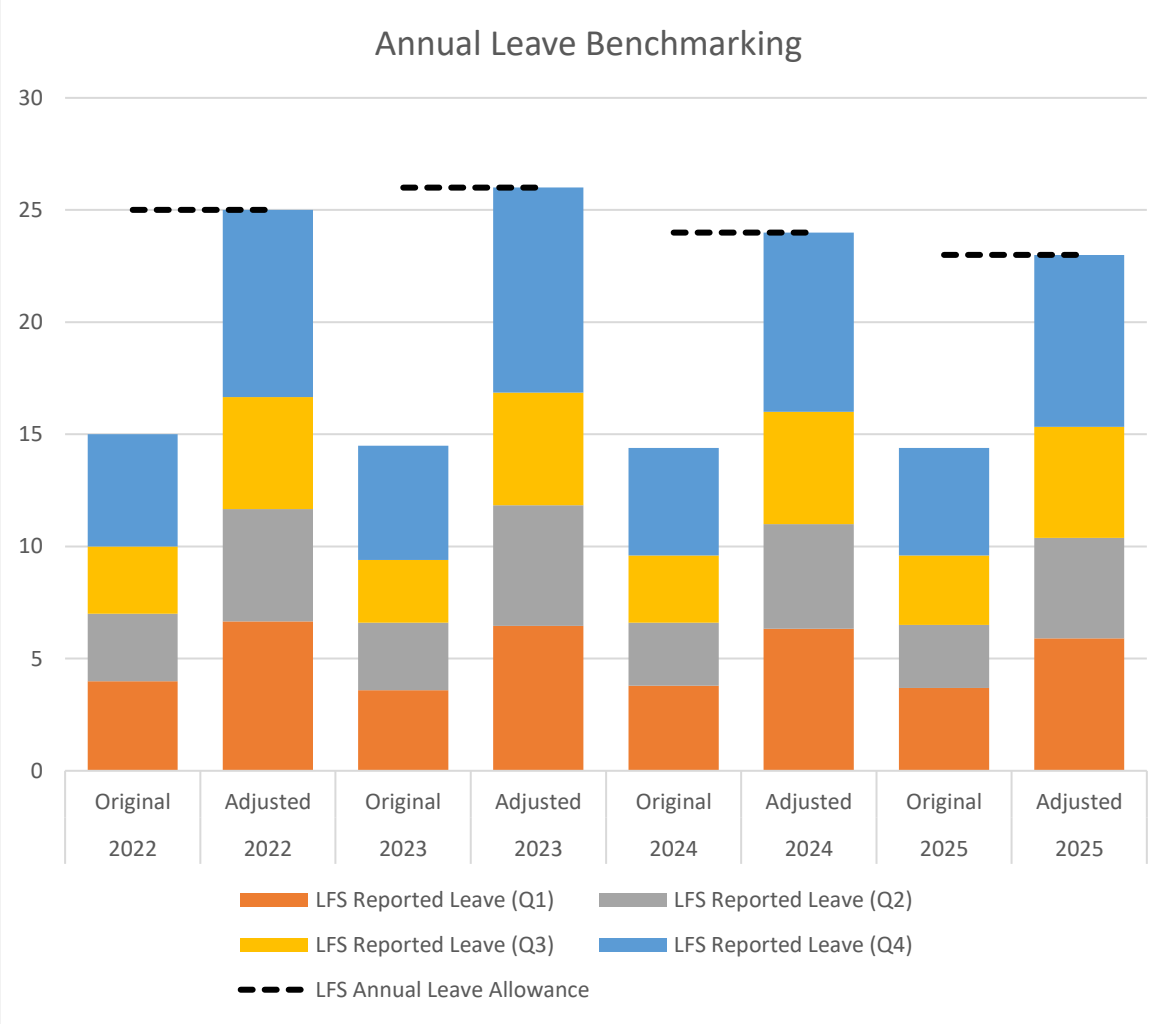
Next Steps

- Investigating further developments, such as:
  - Processing with a male-female split
  - Using ASHE annual leave allowance to complement LFS data
- Further analysis of the results:
  - Impact of the industry drivers of the UK's productivity slowdown
- Separately, ONS will be considering the results of this research, and feedback to it, as part of its development of a component methodology for its productivity statistics

Annex

Methodology: Benchmarking

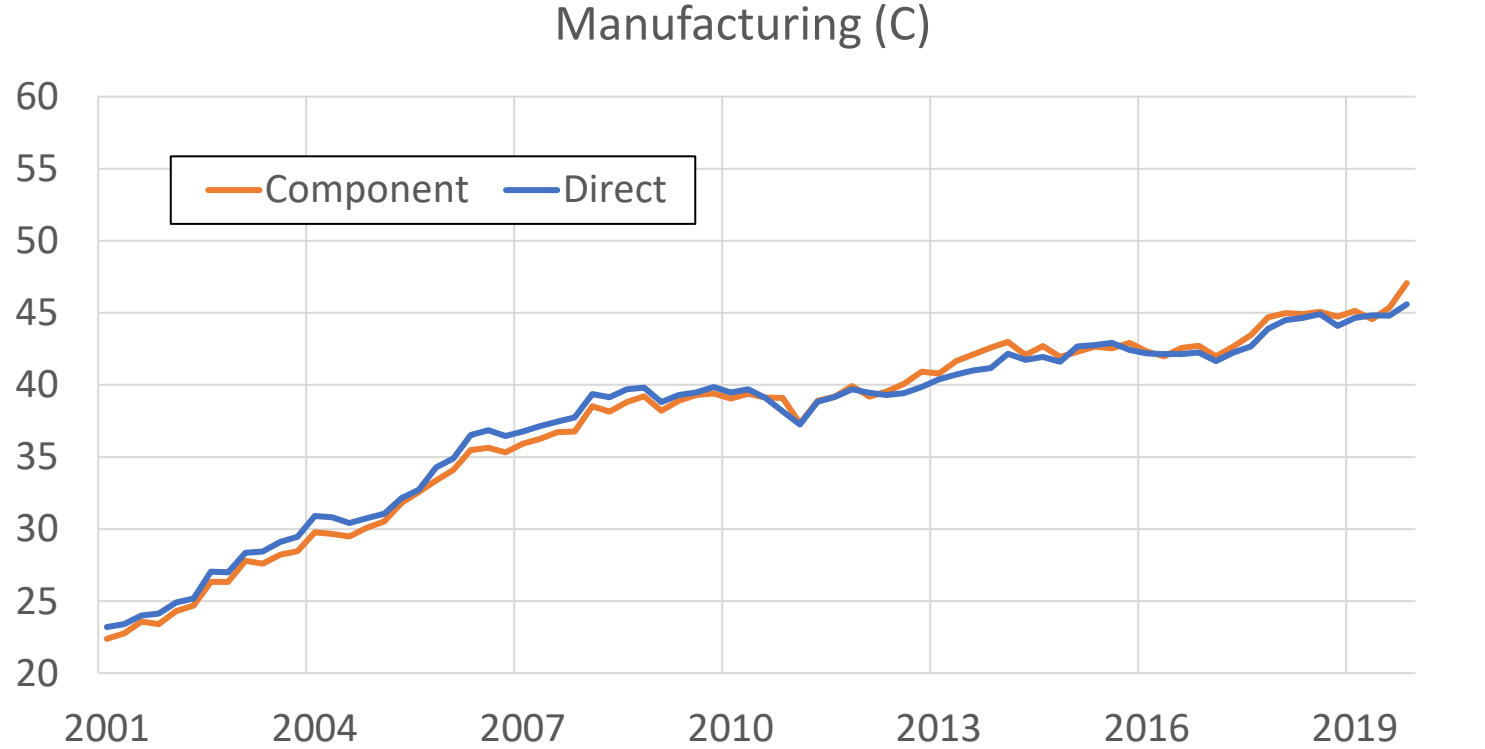




(Illustrative examples)

GVA per Hour Worked by Industry

£2023 per hour



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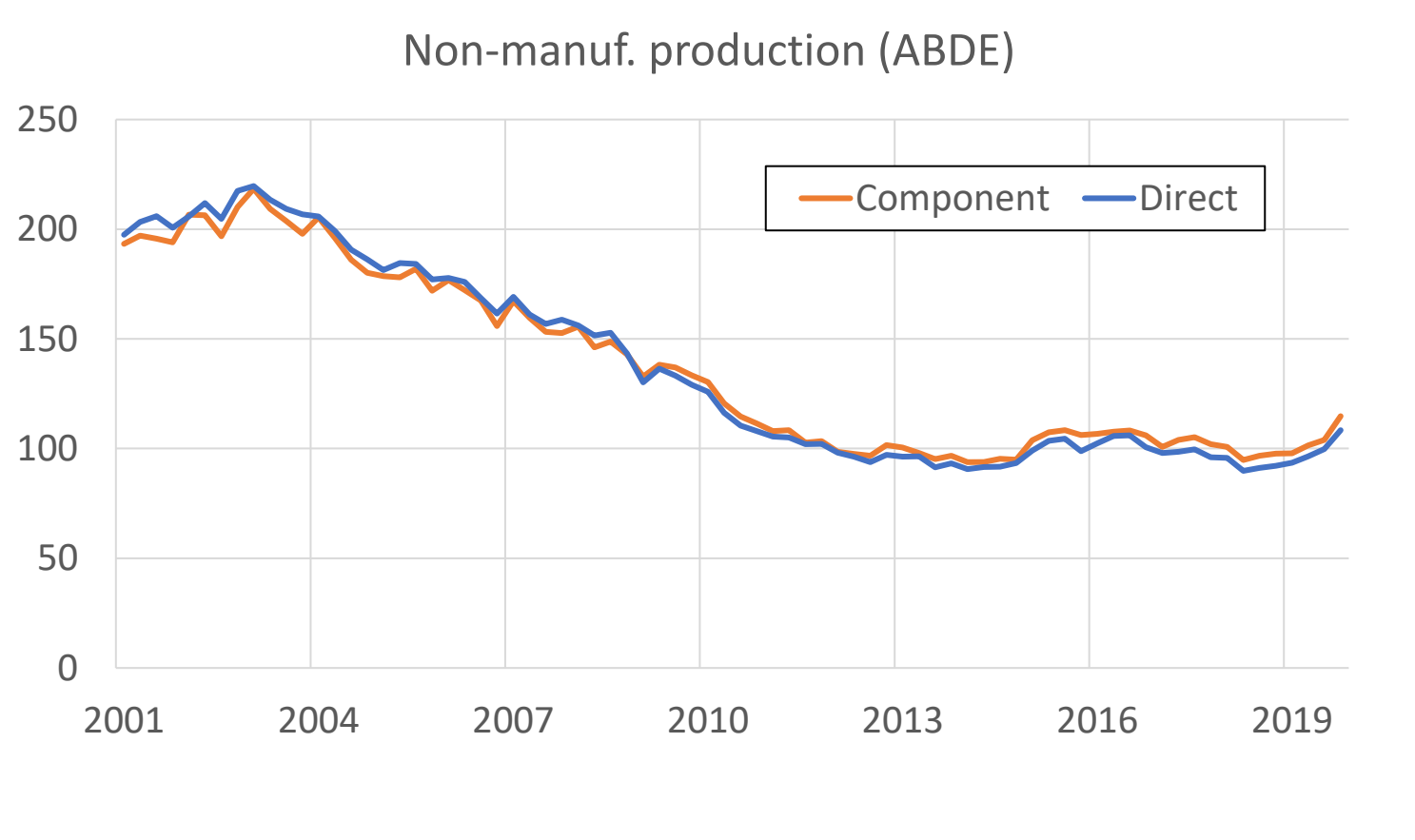

GVA per Hour Worked by Industry

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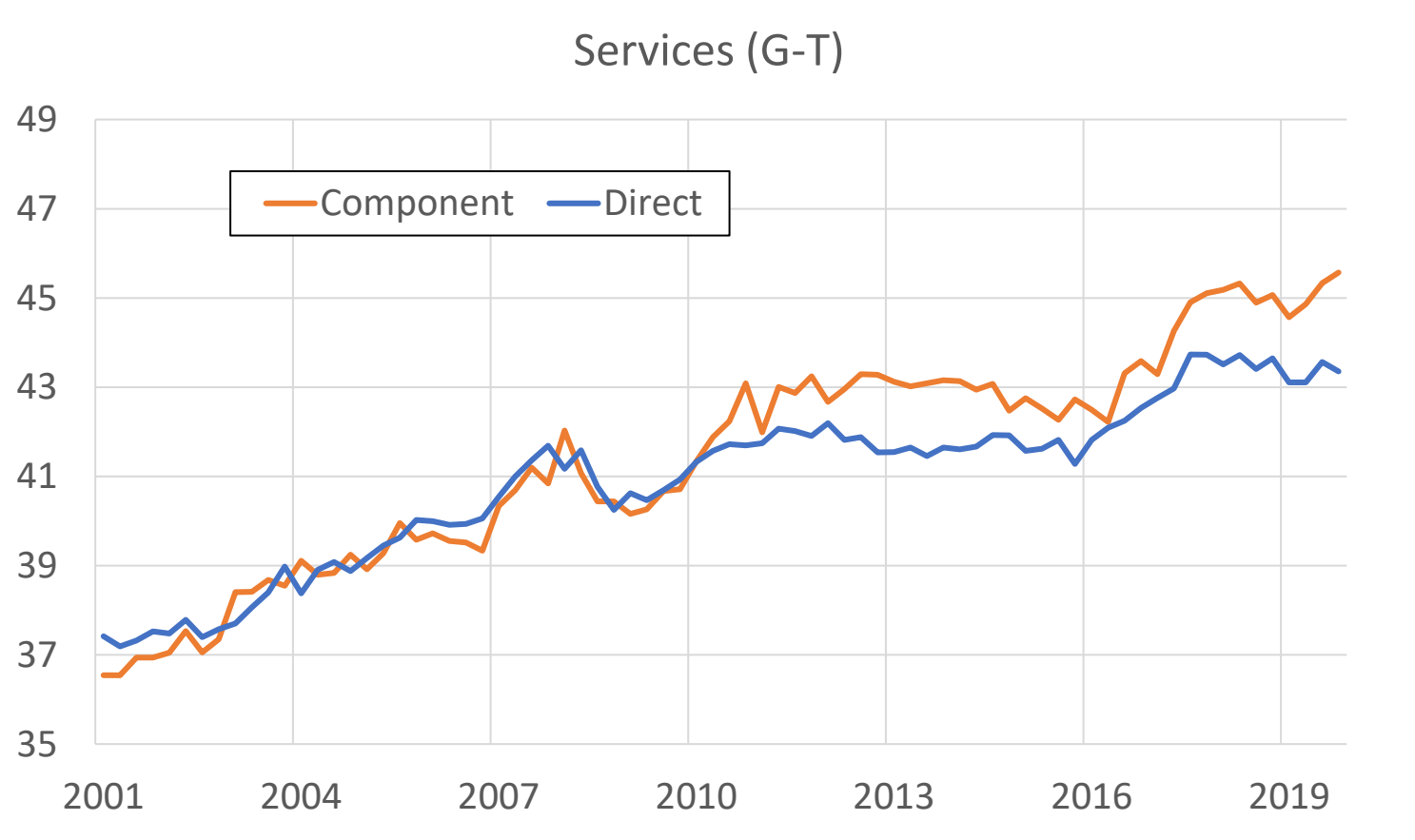

GVA per Hour Worked by Industry

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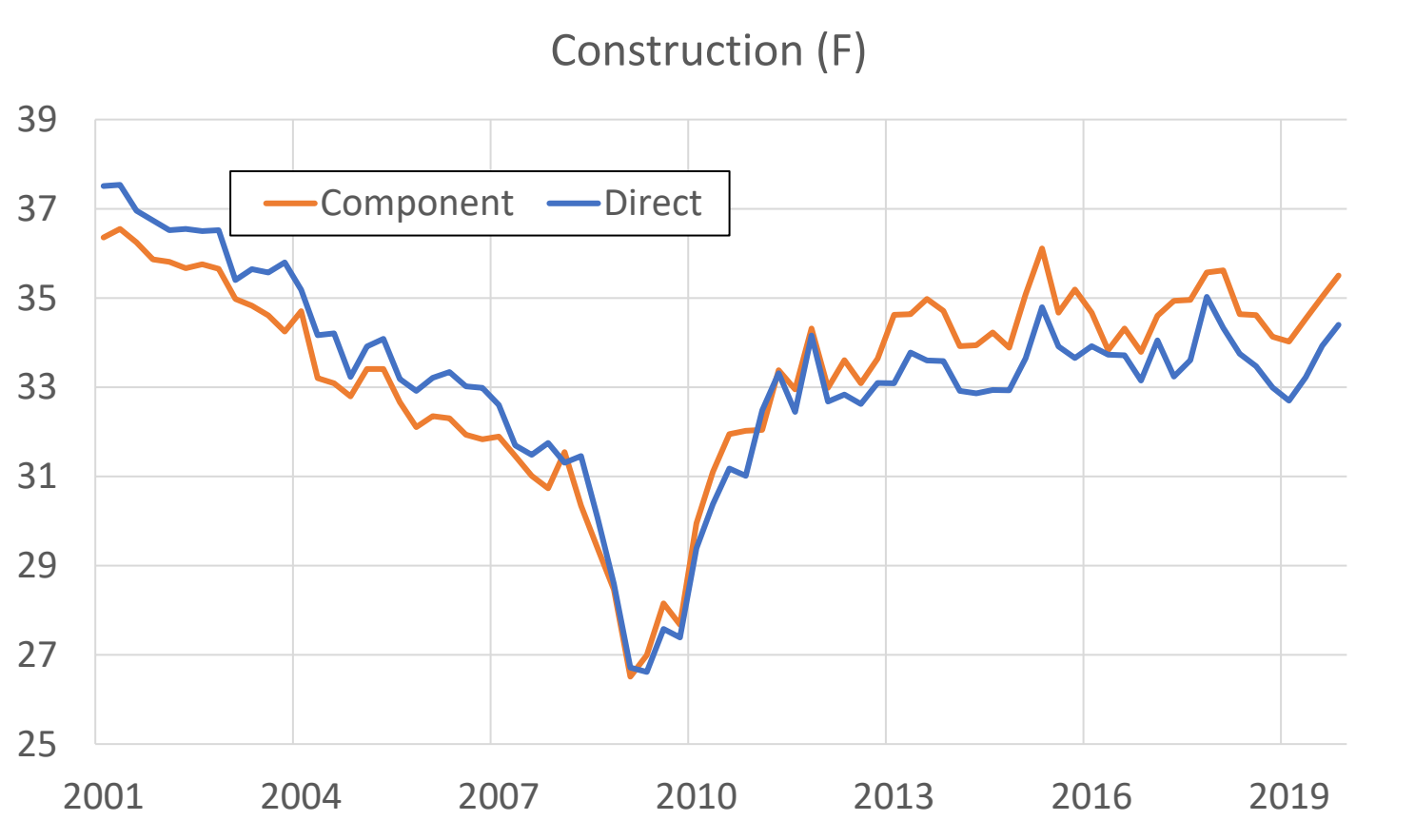

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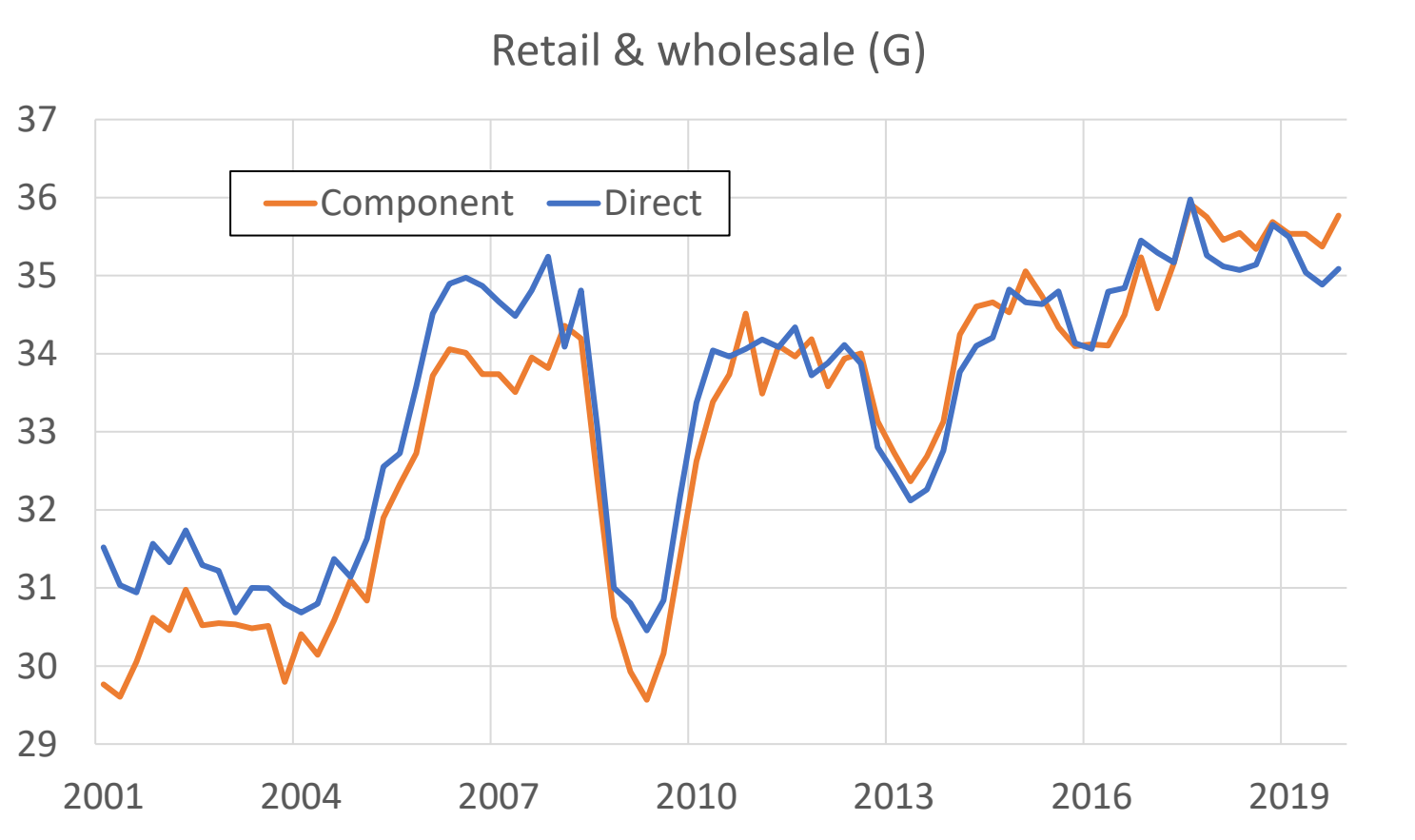

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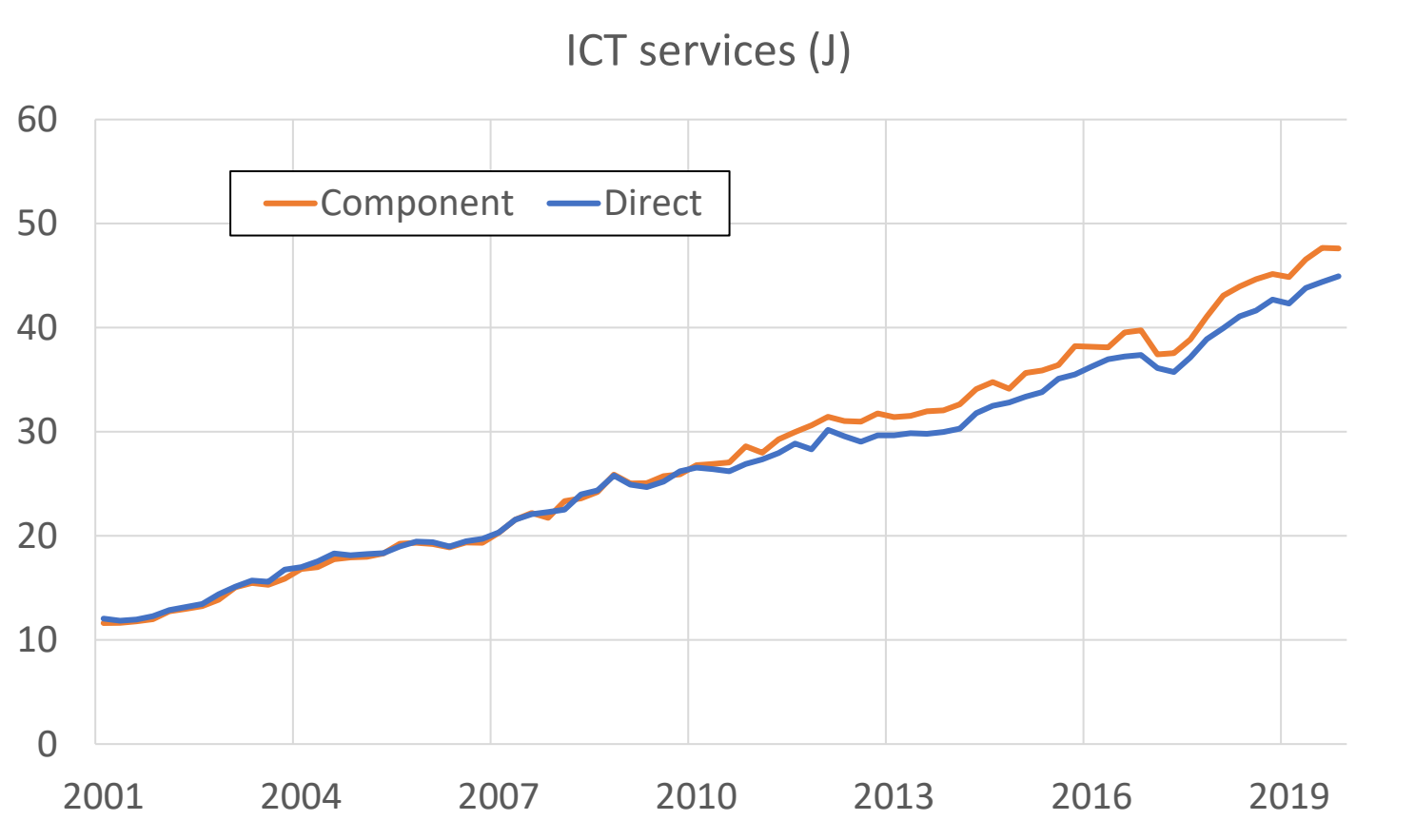

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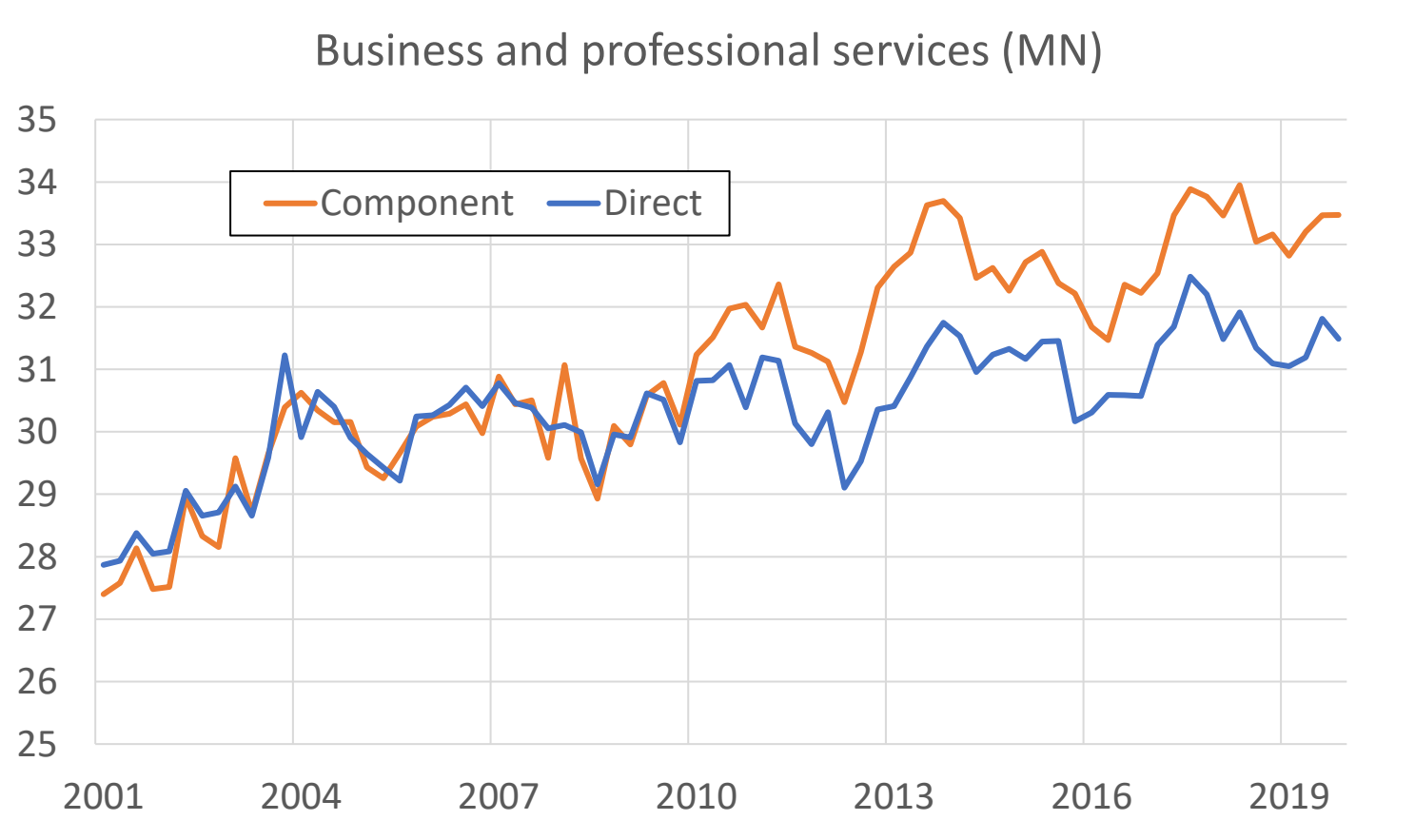

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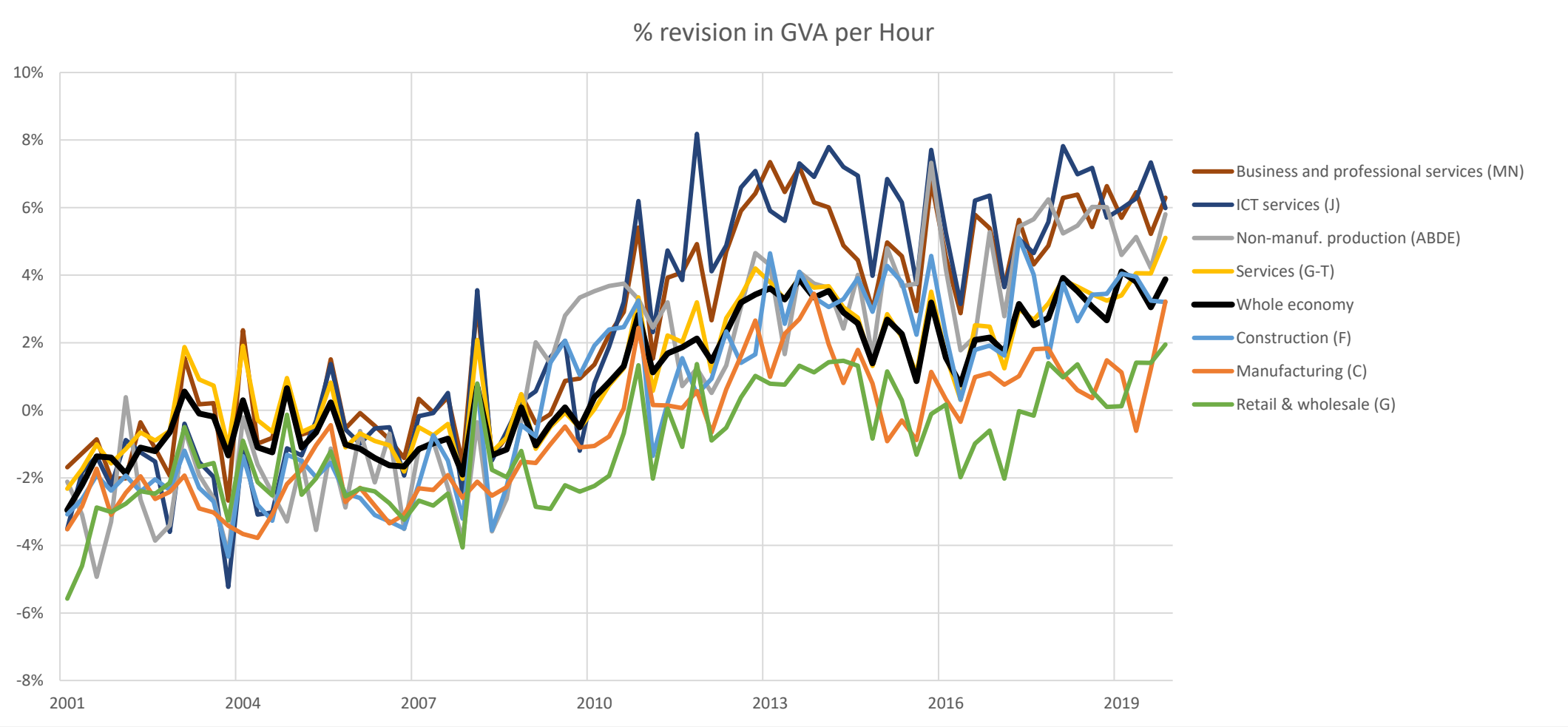
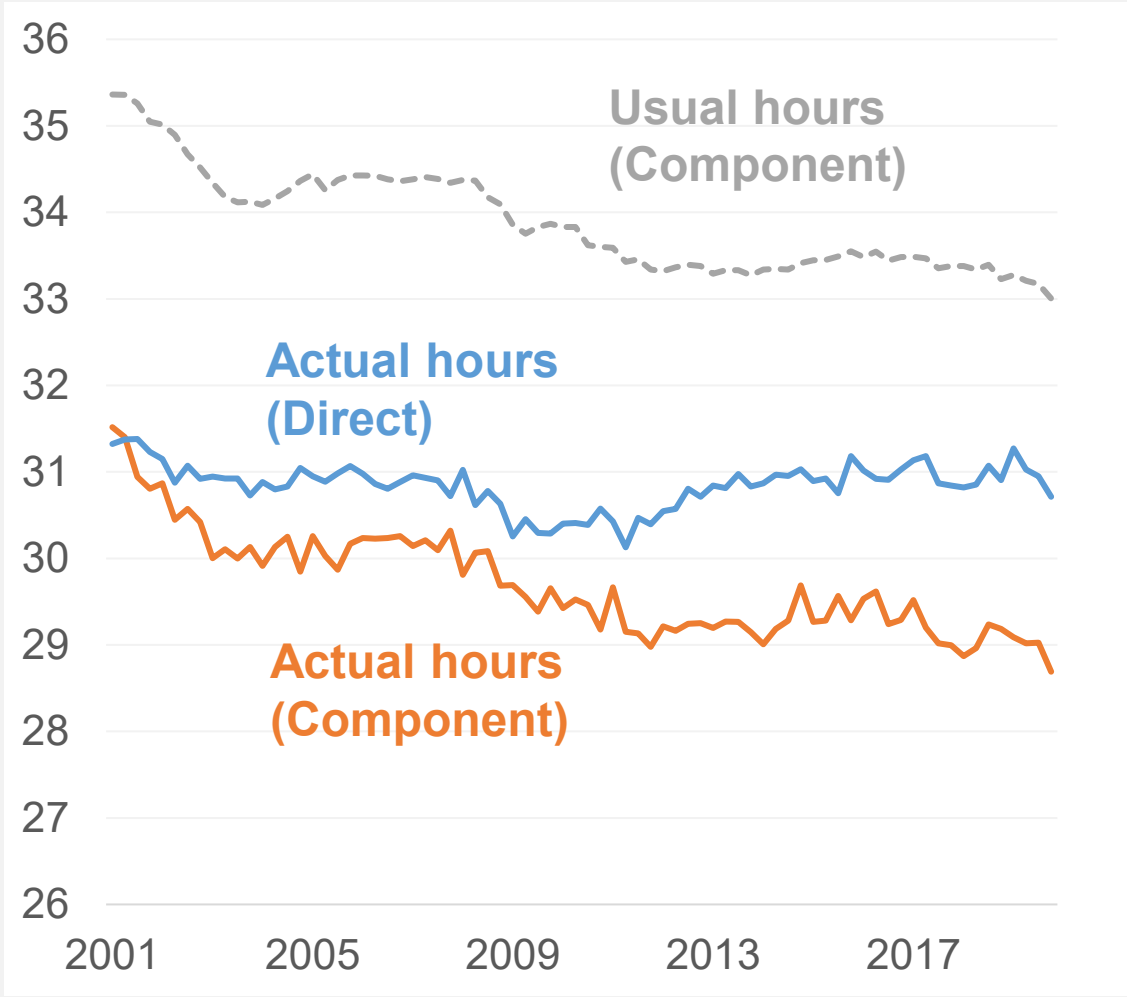
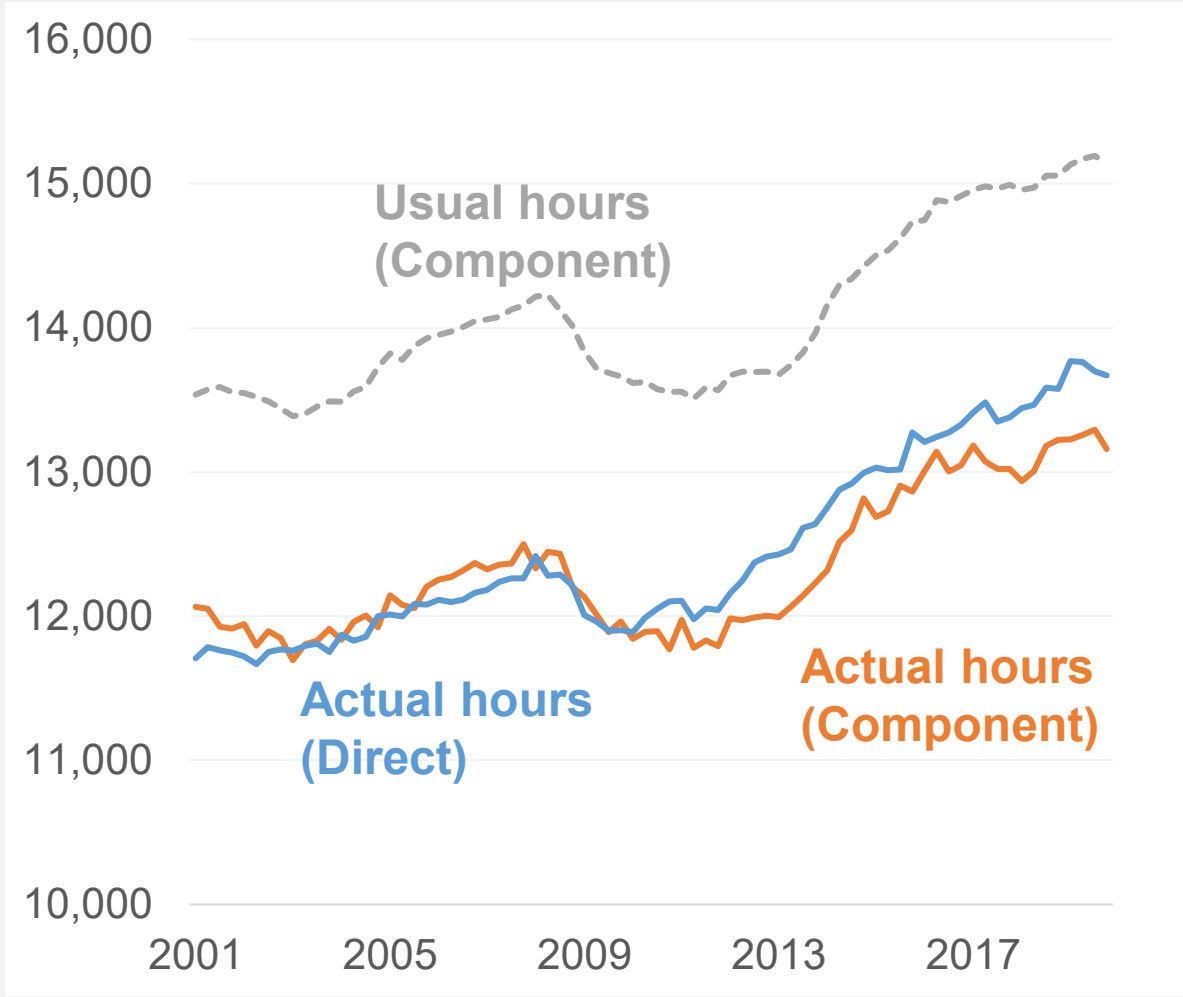


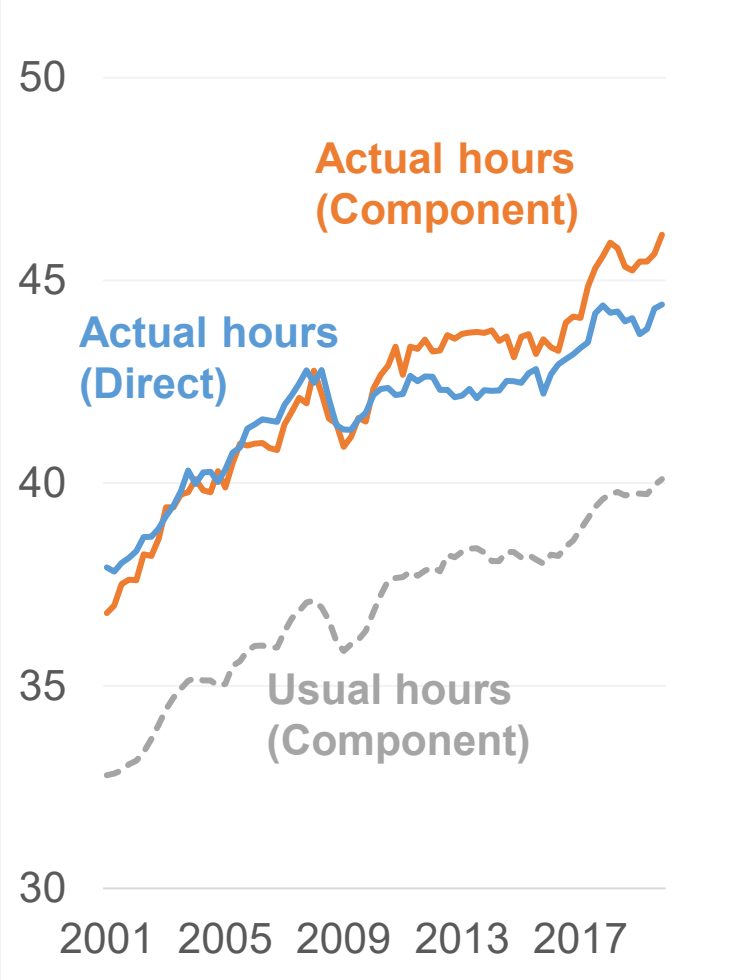
Average hours worked per job per week, seasonally adjusted



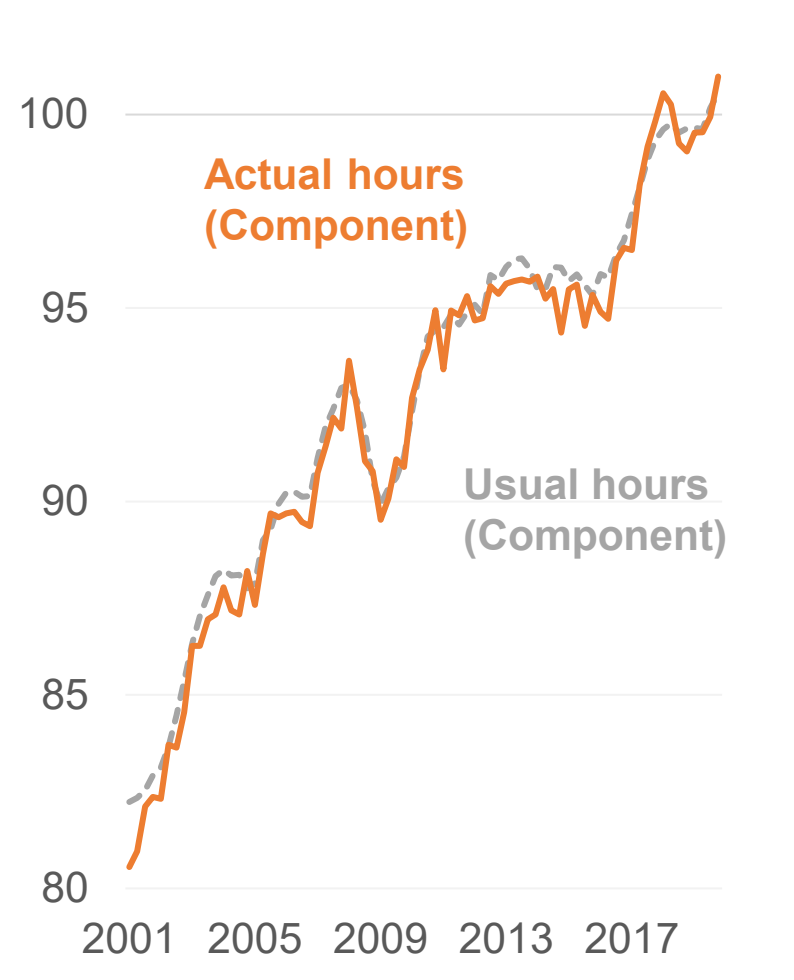
Total hours worked per quarter (millions), seasonally adjusted



GVA per hour worked, seasonally adjusted



GVA per hour worked (index 2019=100), seasonally adjusted



GVA per hour worked annual growth (%), seasonally adjusted