The Changing Nature of Work: What can we learn from Time Use Diaries?

Lynsey Brown[1], Francesca Foliano[2,3,5], Rebecca Riley[4,5], Mechelle Viernes[4,5]

25 March 2024

[1] Office for National Statistics (ONS)
[2] University College London (UCL)
[3] Centre for Time Use Research (CTUR)
[4] King's College London (KCL)
[5] Economic Statistics Centre of Excellence (ESCoE)

Abstract

The world of work is changing. The advancement of digital technologies has led to new business models, gig work and, hastened by the pandemic, the normalisation of remote work. Workers and firms have at their disposal a new set of technologies, with the potential to lead to significant productivity and earnings gains. These phenomena are as yet not fully understood, either in terms of their magnitude or implications for working patterns, the quality of work and worker well-being, and the boundary between work and leisure time.

By collecting information on individuals' activities within a 24-hour window, the location and enjoyment of these activities, use of technology, as well as demographics, Time Use diaries offer the potential to develop better understanding of the changing nature of work. We exploit recent and ongoing investments in Time Use data collection in the UK to study changes in working patterns and the quality of work for different demographic groups. We make recommendations for innovation in Time Use diary collection to enhance the value of these data for understanding the quality of work and productivity from the view of the employee and the employer.

Introduction

Time diaries provide for an extremely wide range of application, perhaps unique in the realm of socio-economic statistics, with multiple potential applications drawing on a single dataset. Their possible uses for socio-economic measurement have been emphasised in both Stiglitz, Sen and Fitoussi (2009) and Bean (2016). And, in the context of the increasing digitalisation of the economy, the potential value of high-quality time use data for productivity and welfare measurement is increasingly recognised (Martin and Riley, 2024).

Novel digital collection tools have in recent years reduced the cost of collecting time diaries. This has enabled more frequent data collection, which has been particularly helpful for policy use and for understanding society during the fast-changing circumstances that arose during the COVID pandemic. In the United Kingdom, the Office for National Statistics (ONS) have put extensive development effort into the Online Time Use Survey (OTUS) instrument, described in East, King, Payne, Vassilev and Wallace (2021). To date seven waves of the survey have been collected since the onset of the pandemic in early 2020. Separately, 'Time Use Research for National Statistics (TURNS)' has been taken forward by the Centre for Time Use Research (CTUR), and has resulted in time use diary information that can be compared before, during and after the pandemic (Sullivan et al., 2021).

Our first contribution is to explore what can be established about working patterns and the quality of work for different demographic groups using these nationally representative Time Use diary collections that span the pandemic years. We exploit information on activities throughout the day, instantaneous enjoyment, device use, location and co-presence. We consider how working patterns (e.g. on-site, WFH, shift work, timing throughout the day, and unpaid work) vary by age, gender, skill, and - where possible - income. We also consider how different working patterns map to the quality of work from the perspective of the respondent and the use of digital technologies. Time diaries including an expanded range of digital assets can provide new insights into the impact of the digital economy on modes of work.

For Time Use diaries to be useful in developing a nuanced understanding of work patterns and the quality of work, it is important that they elicit detailed information about episodes at work as well as instantaneous enjoyment or happiness associated with different activities. Our second contribution is to develop concrete proposals to increase the value of Time Use Surveys (TUS) for understanding working patterns and productivity analysis. We build on a novel Time Use collection by ONS, recording time spent on different tasks (including administrative tasks) at work for public sector workers, alongside instantaneous enjoyment and self-assessed productivity. We explore these data and consider how some of these questions might be developed and included in a nationally representative TUS, covering both private and public sector employees, to develop better understanding of work patterns and the quality of work.

Working Patterns and the Quality of Work (some initial results from nationally representative TUS)

We first consider nationally representative data for the United Kingdom collected before, during and after the COVID-19 pandemic by CTUR. The data are described in Foliano, Tonei and Sevilla (2024). Respondents were selected based on age, gender, socioeconomic status and region quotas that were nationally representative of the 2016 population. Data were collected from seven cross-sectional sample waves 2016 to 2023.

Figures 1 and 2 (from the 2023 wave) illustrate the basic properties of the employment data. The proportion of people in employment working in paid employment at different points in time during the day is shown for weekdays and weekends (Figure 1) and are not surprising. Figure 2 shows the well-known post-pandemic phenomenon of significant home working.

Figure 1. Time in paid work (2023 data collection)

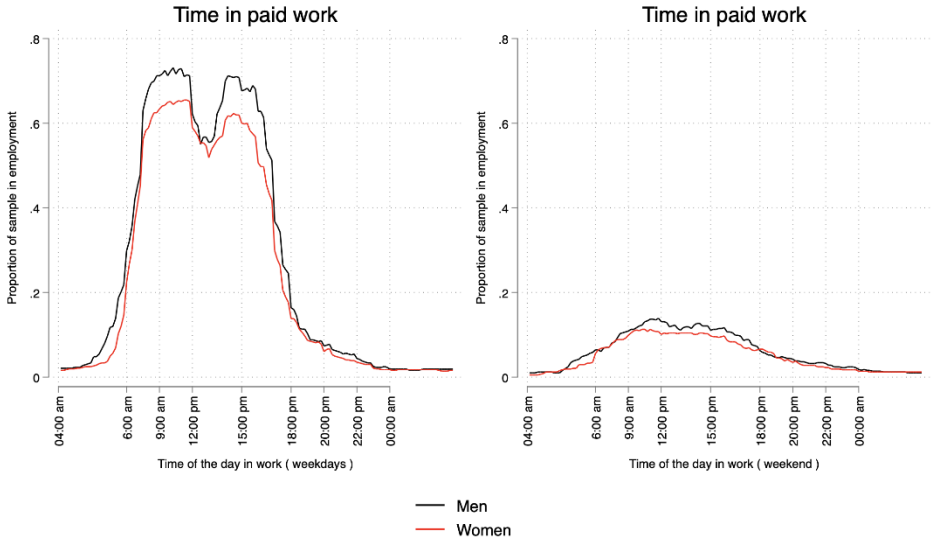
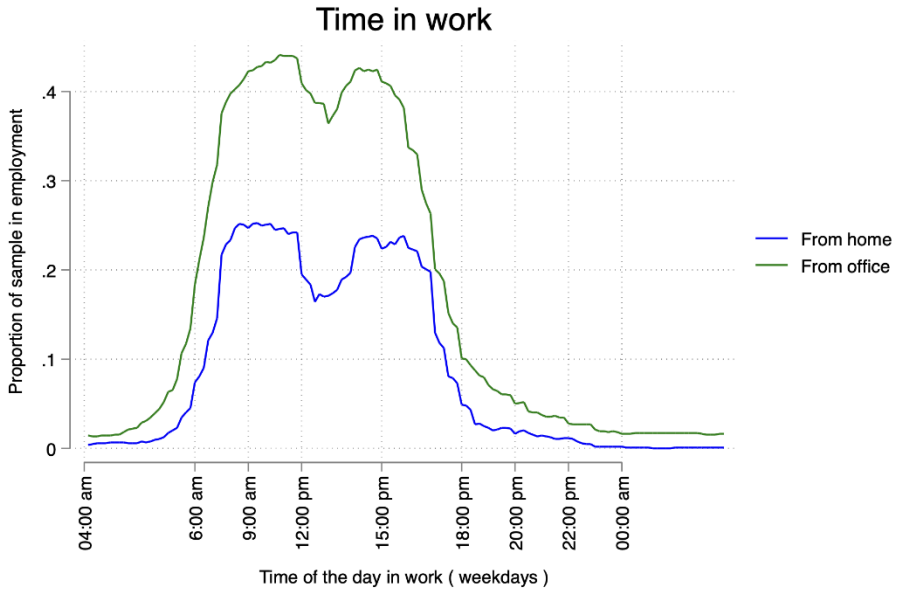


Figure 2. Time in paid work by location (2023 data collection)

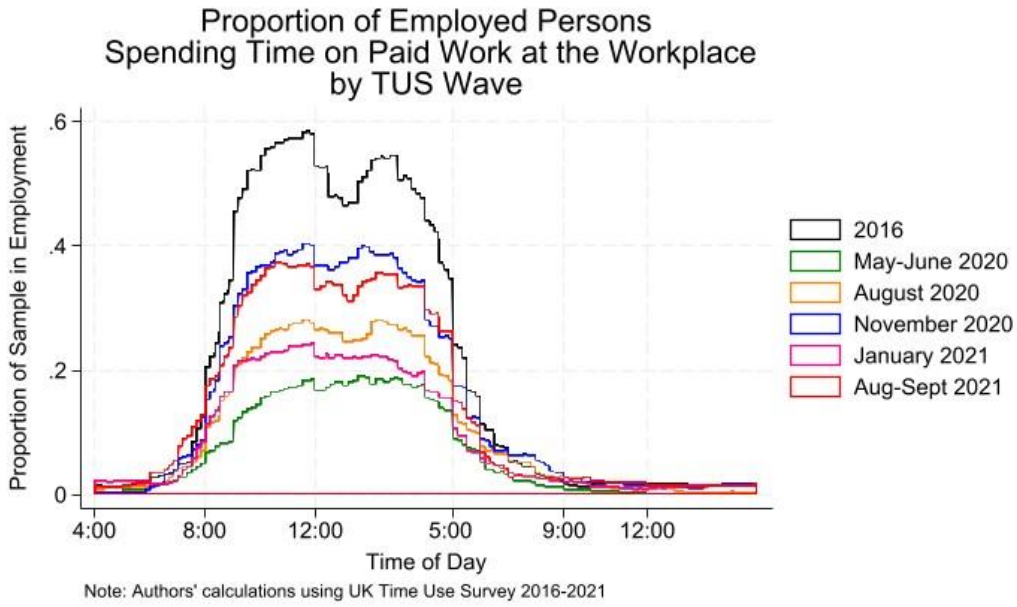


In addition to the recent 2023 data we consider how working patterns have evolved before, during and after the pandemic: May and October 2016 (to reduce single-season effects); May to June 2020 during the first UK lockdown; August 2020 during the post-lockdown summer relaxation of restrictions; November 2020 and January 2021 when the second and third national lockdowns were implemented; and, finally, in August–September 2021, when most restrictions were removed. Figure

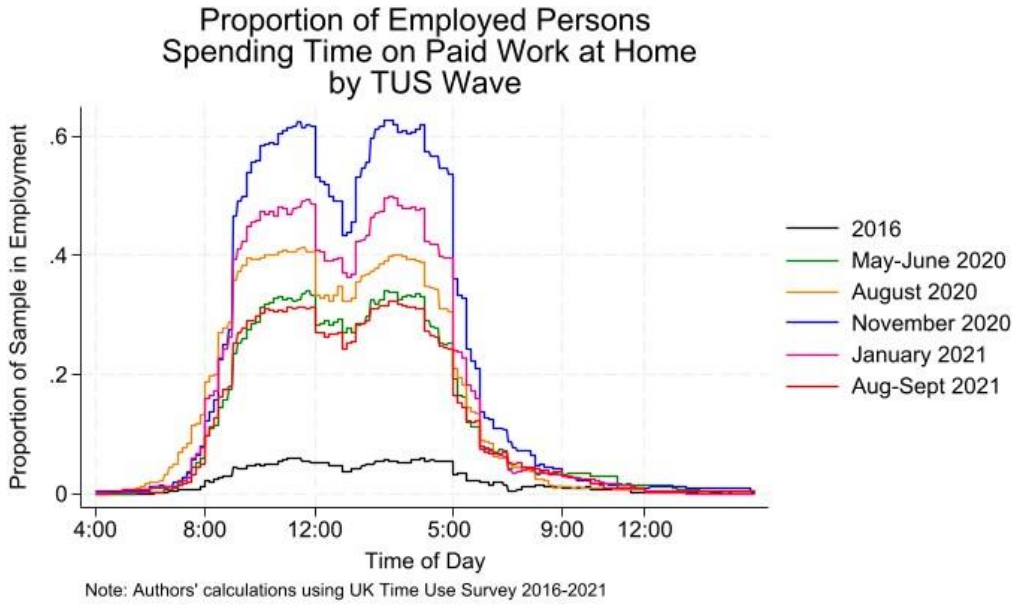
3 illustrates time in paid work at the workplace (Panel A) and at home (Panel B) and illustrates the significant shift towards homeworking during the pandemic, which was subsequently sustained.

Figure 3. Time in paid work by location (2016-2021)

Panel A



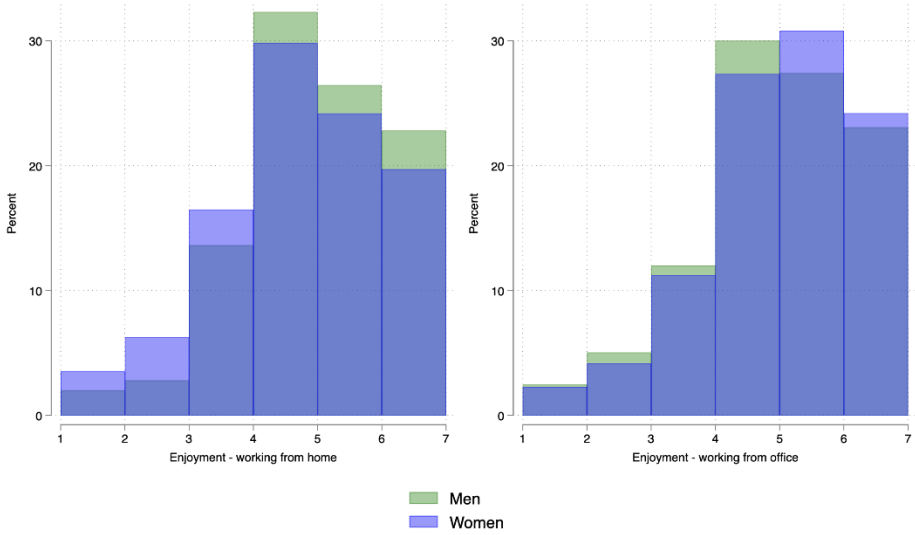
Panel B



We measure the quality of work by capturing the instantaneous enjoyment recorded whilst in work. Respondents rate their life satisfaction on the following seven-point scale: (1) “Completely dissatisfied”, (2) “Mostly dissatisfied”, (3) “Somewhat dissatisfied”, (4) “Neither satisfied or

dissatisfied", (5) "Somewhat satisfied", (6) "Mostly satisfied" and (7) "Completely satisfied". We examine these data for men and women whilst working from home and whilst working from the office. Figure 4 illustrates that men were happier working from home than women. Women were happier working in the office than men. Further analysis of the TUS will explore the sources of these patterns in detail and their evolution over time.

Figure 4. Quality of work by location and sex (2023 data collection)



Work Activities and Perceived Productivity (some initial results from a public sector TUS)

The Public Sector Time Use Survey (PS-TUS) was designed using a modified version of the Online Time Use Survey (OTUS) diary tool used by the ONS since 2020 to collect data for the UK population.[1] The survey specifically targets employees and explores activities at work.

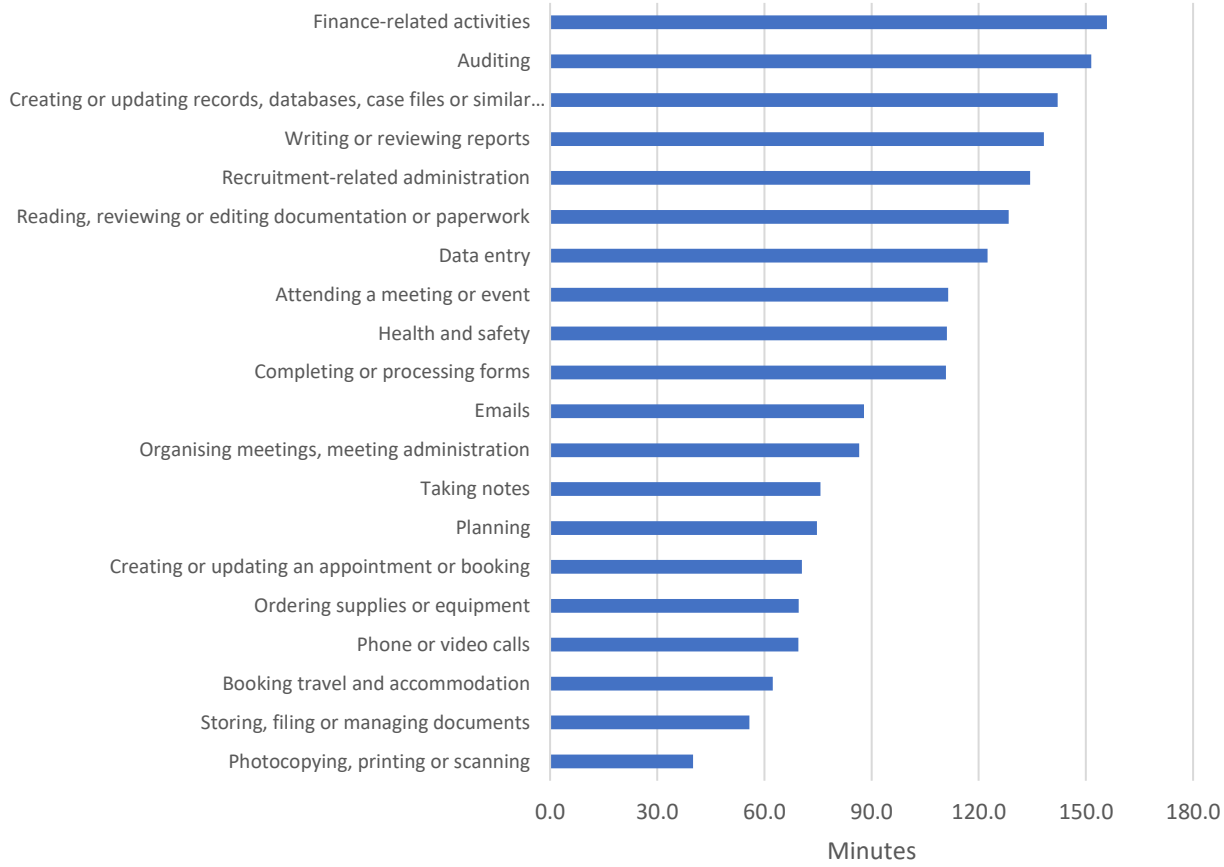
Participants were provided with eight diary days (from 2nd to 9th February 2024) and were asked to complete two 24-hour diaries (from 4:00am to the following 4:00am) for any two days that they worked. Each diary opened at 4:00am on the day itself and had to be completed within 72-hours. Each diary contained a list of nine non-work-related activities (consistent with the aggregated groups in the regular TUS) and 82 work-specific activities that participants could use to record their day. Supplementary information was also collected on the enjoyment level of each activity (on a scale from 1 (not at all) to 7 (very much)), views on how important some of the activities were (from the worker's own perspective), and views on the amount of time spent on them.

The PS-TUS pilot survey was targeted at 4,774 individuals living in Great Britain who had responded to the Opinions and Lifestyle Survey between April and December 2023 and indicated that they were

1 https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/timeuseintheuk/previousReleases

working in a public sector role or organisation (and had agreed to be recontacted to participate in further ONS research), or who volunteered to take part following an invitation through their employer or workplace. In total, 1,915 individuals (40.1%) responded and submitted 3,005 diaries of sufficient quality, which have been weighted to the public sector population (calibrated with controls applied for age and sex groups, geographical regions, workforce sector and gross annual pay) and used to produce initial published estimates. Figure 5 shows the average daily time that public sector workers spent on selected activities (of those who reported doing each activity).

Figure 5. Average daily time (minutes) spent doing specified main activities by public sector workers who reported doing them, Great Britain, February 2024

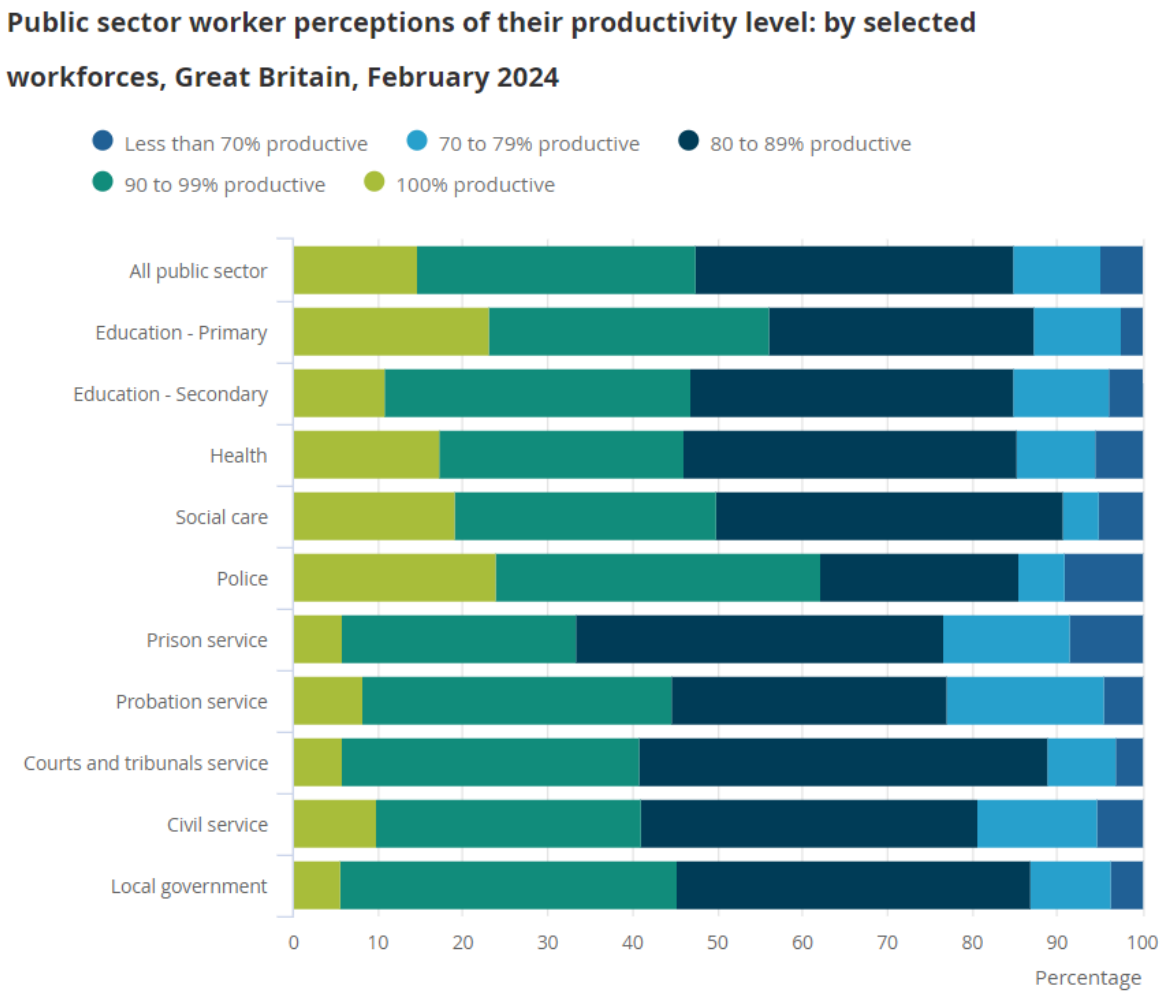


Source: Time Use Survey, Office for National Statistics

Participants were able to record their main activities in 10-minute intervals (10 minutes, 20 minutes, 30 minutes, etc.) and up to five secondary activities in 5-minute intervals (5 minutes, 10 minutes, 15 minutes, etc.). At the end of each diary day, they were asked five final questions to determine where they had worked (at a workplace, at home or elsewhere), how productive they felt that day, and whether they did any tasks or activities that they felt were not an important part of their job. Those who said they did things which they considered not important were then asked open questions to describe what these activities were and to provide suggestions on how they could be changed to

save time. Initial estimates of self-perceived productivity levels for the whole public sector and specific workforces within it are illustrated in Figure 6.

Figure 6.



Source: Time Use Survey, Office for National Statistics

On average, around 85% of all public sector workers perceived themselves to be at least 80% productive, and almost half perceived themselves to be at least 90% productive, on the working day recorded in the online diary. Among respondents who reported undertaking a non-essential task during the day, the most common activities reported across all workforces were associated with the completion of tasks such as photocopying, data entry, arranging resources, booking appointments, emails, and attending meetings.

Further analysis of the PS-TUS data will allow us to explore: differences in time use according to sex, age group and gross annual pay; differences in self-perceived productivity levels by location of work, sex, age and pay; the relationship between personal well-being and self-perceived productivity; and the relationship between time spent on activities and how much workers enjoyed doing them.

Unlike the PS-TUS, the OTUS also includes private sector workers, which will allow us to make different comparisons and to explore broader groups who consider themselves to be more productive than others. This can be split according to whether people worked outside of the home or at home. To this end we have placed new questions in the OTUS collected in March 2024, and will have a further opportunity to develop questions for a similar Time Use collection in September 2024.

References

Bean, C. (2016). *Independent Review of UK Economic Statistics*.

East, S., King, W., Payne, C., Vassilev, G. and Wallace, S. (2021) "The ONS Online Time Use Survey: Creating a Feasible Platform for 21st Century Time Use Data Collection", Conference paper IARIW 2021.

Foliano, F., Tonei, V. and Almudena, . (2024) *Social restrictions, leisure and well-being.* Labour Economics, 87.

Martin, J. and Riley, R. (2024) "Productivity measurement: Reassessing the production function from micro to macro", Journal of Economic Surveys, https://doi.org/10.1111/joes.12615

Stiglitz, J., Sen, A., and Fitoussi, J. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*.

Sullivan, O., Gershuny, J., Sevilla, A., Foliano, F., Vega-Rapun, M., Lamote de Grignona, J., Harms, T., Walthéry, P. (2021) "Using time-use diaries to track changing behavior across successive stages of COVID-19 social restrictions", PNAS Vol. 118 No. 35