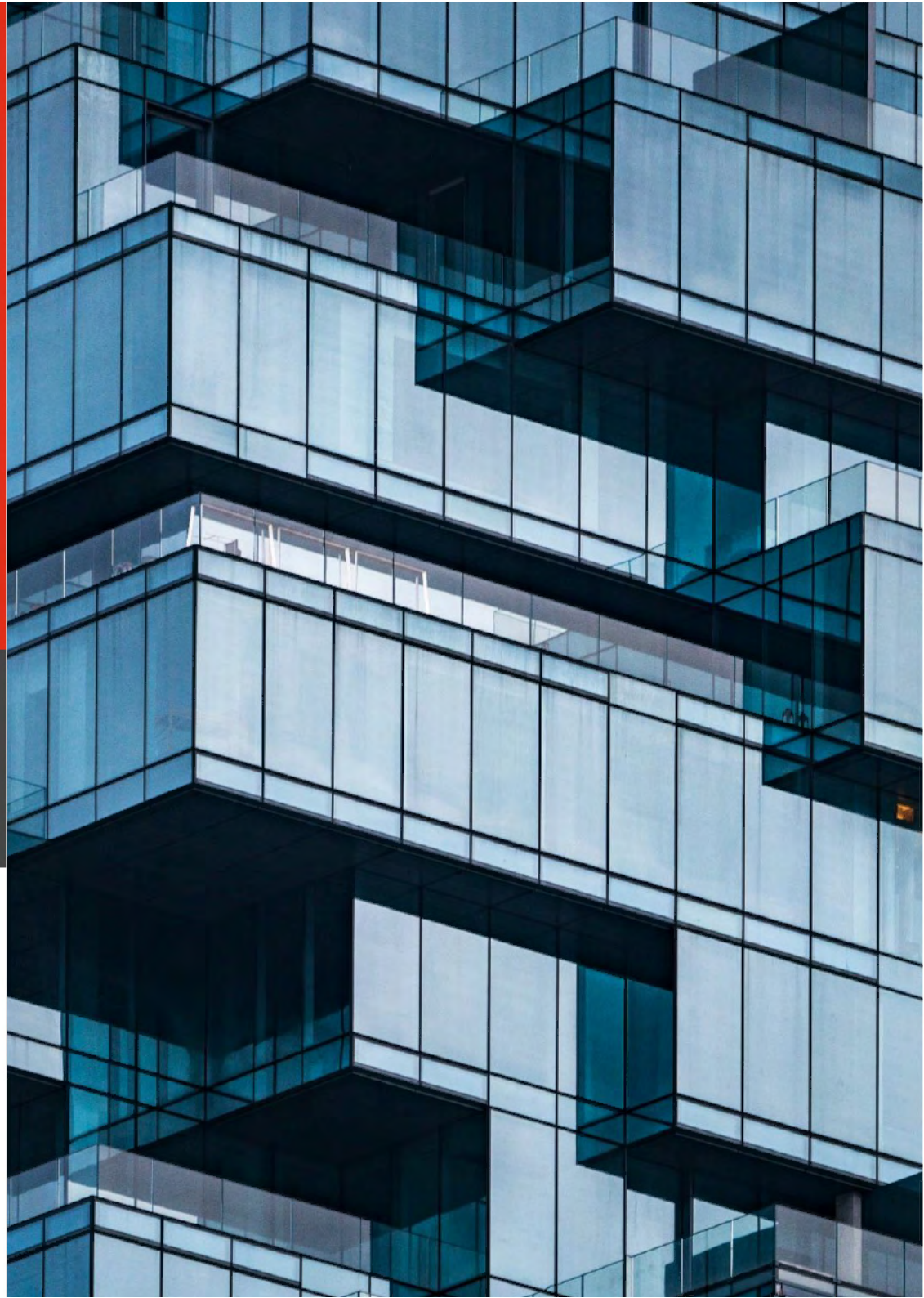
The economic impact of returning to the office

September 2020

pwc



Contents

Foreword

A lot has happened since the Government's announcement in March that the country would go into lockdown. In the months that followed the coronavirus (COVID-19) pandemic has had a significant human cost and has touched the lives of every person across the country. Almost six months on, like all organisations we are still dealing with the implications.

As we now know, one of the impacts of managing the effects of COVID-19 is deserted streets and shuttered shops. The transformation of vibrant city centres to ghost towns is one of the poignant images that has defined the lockdown. Yet while the Government has given the green light for people to return, some of the UK's largest financial and business districts remain devoid of people. The big questions are whether things will ever be the same again or whether the pandemic has been a catalyst for lasting change, and if so, whether this matters to our country.

My view is that it does matter. At PwC I see first-hand the benefits of people coming together face-to-face, learning from each other and sharing ideas. Speaking to our people, the average age of whom is 31, I know it's something they value too – not just in terms of the business but also in supporting their mental health and well-being.

Beyond our own organisation, I believe that there are huge benefits to businesses coming together and interacting, creating positive contributions and impacts that are critical not just to the economy but to broader society.

This isn't about pitting home and office workers against each other, or trying to preserve the status quo. While the pandemic created a need for change in the way we worked overnight, the world of work has long been moving to more flexible and varied models. While this is the case I do not believe that this was ever leading to the demise of the office entirely. To adapt to the future, and capture the best of different forms of work, we need to understand and quantify the impact – and unintended consequences – of so many office workers continuing to work from home.

I hope this research contributes some helpful analysis as policy makers, businesses and other organisations adapt and work together to forge a recovery that delivers better for everyone. PwC has supported a range of organisations as they have responded to the pandemic. I believe there are grounds to be optimistic that the spirit of collaboration and cooperation will continue.

Kevin Ellis

PwC UK Chairman and Senior Partner

1

Executive summary

Introduction

COVID-19 has uprooted workers from the office to their homes

- **Almost overnight, COVID-19 transformed the working patterns of UK workers,** with almost half of all people in employment in the UK doing some work from home in April 2020.[1]
- **The service sector, which accounts for approximately 80% of UK GDP,[2] had to suddenly adapt** to empty offices with nearly four out of five employees working from home in powerhouse sectors, such as professional services.[3]
- **Our research estimates the impact of this sudden shock in working patterns.** Our analysis aims to move the discussion from the costs and benefits of home working to providing a review to enable businesses and policymakers to best take advantage of this shift.

What is the economic impact of returning to the office now?

As offices gradually reopen, workers, employers and policymakers are rightly asking what the benefit is of returning to the office.

In this report, we assess the impact to the UK economy of office workers continuing to work from home (WFH), versus if they were to return to their pre-COVID-19 offices for their regular working hours. We do so by examining three key channels of economic impact: **consumption, agglomeration effects and productivity.**

Universal working from home would have a negative impact on both productivity and employment in the UK

Key findings

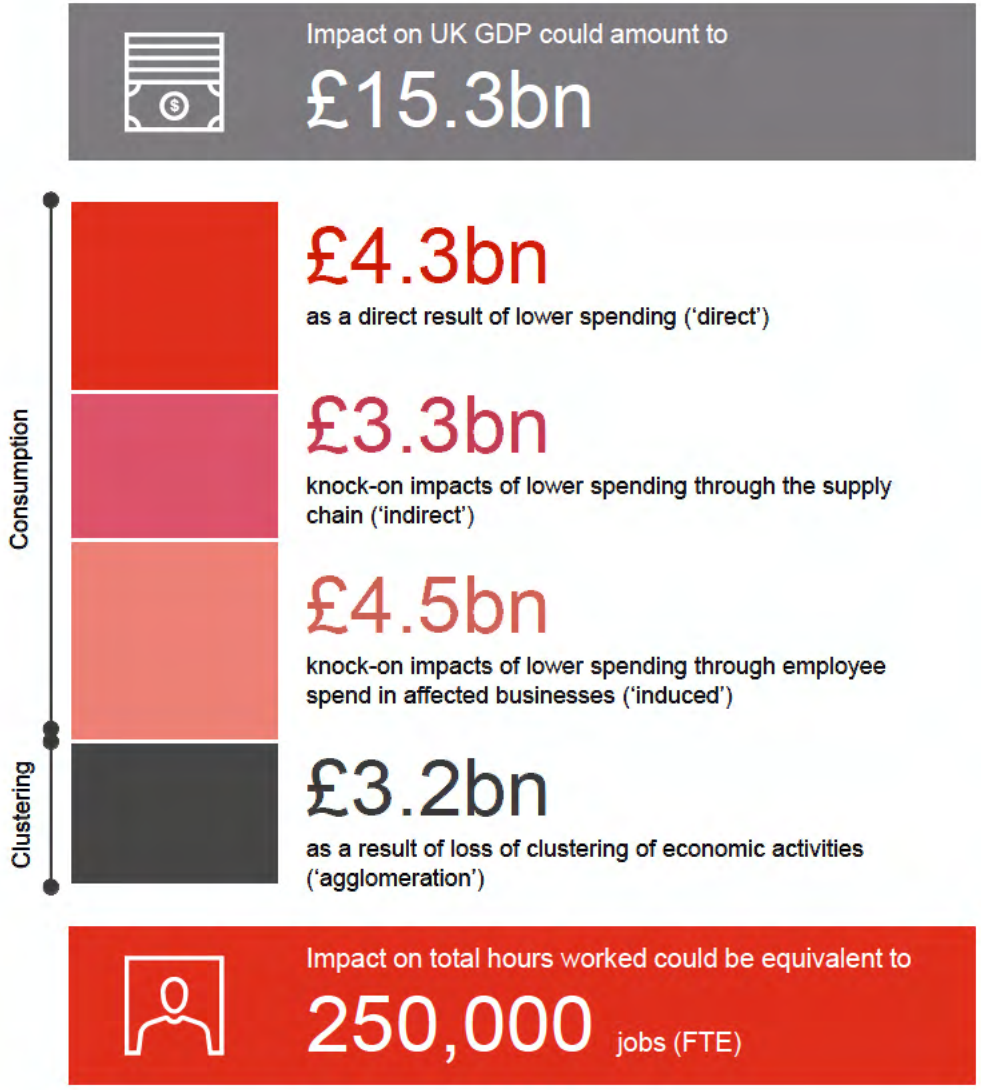
- Compared to a scenario in which office-based workers eventually return to working in the office (WIO), a scenario in which they continue to be universally advised to work from home (WFH) could see the UK's GDP being **£15.3bn lower per year.** This could be attributed to:
  - **lower spending** on goods and services when working from home both directly, through supply chains ('indirect impact') and through lower incomes for workers in affected sectors ('induced impact')
  - **loss of clustering benefits** between businesses and between workers.*
- We also estimate that the negative impact on hours worked is equivalent to **250,000 jobs per year** in full time equivalent (FTE) terms.
- However, **the shift to WFH could have positive implications for labour productivity and the 'levelling up' agenda.** Workers who used to work in inner-city offices can bring more economic activities to the suburbs and rural areas. Cities that heavily rely on office workers may need to diversify and adapt.
- **Flexible working is important.** Existing research suggests that workers and firms are most productive when they are given flexibility to choose the most suitable working style that meets their individual needs given critical factors such as home-working environment, children, privacy, age and job seniority.

What should you bear in mind when reading this study?

While we found that mandatory WFH has a negative impact on the UK economy, we recognise some studies in specific sectors and workplaces show that having the option of WFH could boost overall productivity.

We also observe that some workers, having experienced WFH, favour the greater flexibility and improved work-life balance it offers.[4] But some others have struggled with loneliness from the lack of social interaction with colleagues.[5] In the long term, a flexible model would also allow businesses to benefit from lower operating costs, though at the expense of any gains from employees being on-site.

* The £15bn fall in GDP is broken down into 'direct' impacts of lower spending by office workers (e.g. lunchtime cafes or after work drinks),'indirect' impacts of knock-on supply chain (e.g. redundancies in cafes and bars) and 'induced' impacts in affected businesses (e.g. reduced spending of cafe and bar workers)



Our approach

Methodology

To measure the effect of WFH on spending, PwC carried out an online survey of around 500 UK office-based and ancillary workers at the end of July 2020 to understand their spending patterns and intentions before, during, and after lockdown. Using this data, we then used an input-output model to estimate the size of the work in office (WIO) value chain, the number of jobs supported within this chain and the associated impact on GDP.

To estimate the agglomeration effects in England and in Wales from a shift from WIO to WFH, we used our bespoke agglomeration model based on ONS data on employment and journey times. We then applied agglomeration parameters from Graham et al (2009)[6] to derive the overall impact on productivity for office-based industries. This is in turn applied to the relevant segment of the UK economy to derive an estimate for the impact on GDP.

In the interest of completeness, we have also carried out a qualitative analysis on the effect of universal WFH on office-based workers' productivity. We are not aware of any empirical quantitative research on this topic.

Time period

As shown in Figure 1, our analysis mirrors the three time periods of Government lockdown measures:

Before lockdown: February 1st – March 23rd 2020

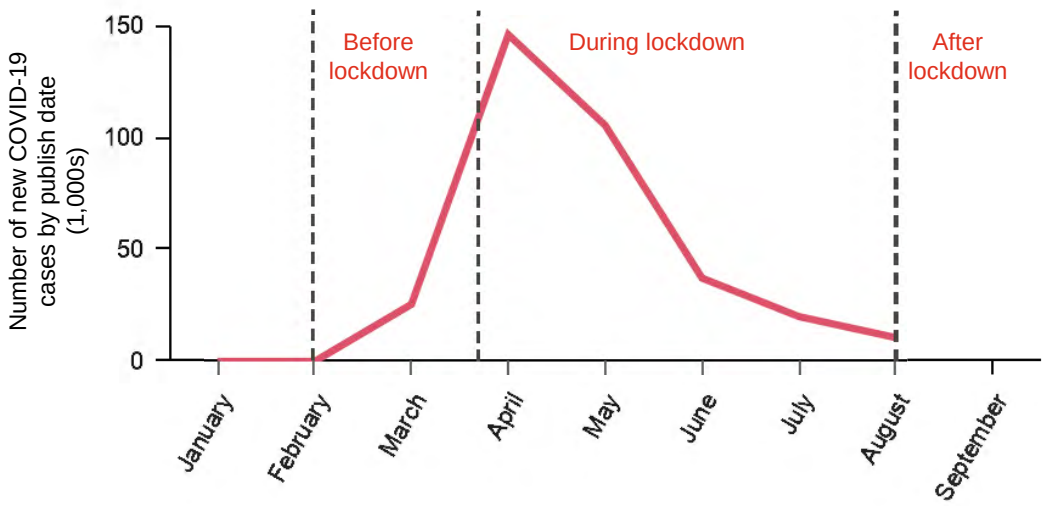
During lockdown: March 23rd – July 31st 2020

After lockdown: August and September 2020

Limitations of our analysis

- Beyond the time period we set out, we do not consider the effect of any subsequent local restrictions imposed in various parts of the UK.
- We did not account for the effects of one-off government measures such as the 'Eat out to Help Out' scheme.
- Our analysis has not been weighed against the potential health implications of WFH vs WIO, such as a change in COVID-19's transmission rate or a 'second wave' of cases.
- We also have not explicitly taken into consideration workers' personal preferences to WFH, or their home working environment.
- Our analysis also does not consider the full knock-on effects to the UK supply-chain, for example, at the sectoral level.

Figure 1: Before, during and after lockdown periods, and UK monthly new COVID-19 cases, 1st January to 12th August 2020



2

Consumption behaviour and economy-wide impacts

In a universal WFH scenario, the negative impact from lower spending could amount to 250,000 jobs in FTE terms, equivalent to around £12bn each year

To measure the effect of WFH on spending, PwC conducted an online survey of ~500 office and ancillary UK workers at the end of July 2020. Using their reported and anticipated spending, we modelled the effects of their spending behaviour on the UK economy and on employment. In doing so, we capture the direct, indirect and induced effects of office workers shifting to WFH.

Office workers lower their spending when working from home

Office workers reported that their weekly spending is lower when WFH compared to their own estimates under WIO. This matters for ancillary workers (such as cleaners, security guards and restaurant workers), whose jobs rely on office workers being physically present in the office. We found that lower spending that is associated with a persistent shift to WFH could have a negative impact on UK GDP of around **£12bn** and on hours worked that is equivalent to **250,000 jobs (FTE)** per year.

Note on calculation basis

In this analysis, we based our calculation on the differential between pre-lockdown spending levels and expected post-lockdown spending levels as they were reported by our survey respondents. We recognise that 'post-lockdown' could include some degree of WFH in the perception of some respondents. If we assume 'during lockdown' level spending on transport services, the economic impact from lower spending could be up to £20bn – but we consider this to be a much less likely scenario, in which even leisure travel would return to 'during lockdown' levels.

Office workers plan to reduce their spending most in the sectors that have the largest impact on UK jobs and GDP

Retail, hospitality and leisure are the sectors that are expected to see the greatest reduction in spending compared to February. For instance, annualised spending on retail trade is expected to be £2.2bn less in August and September than it was in February. Retail has a very UK-based value chain and labour force: if this situation is projected over a longer term, UK GDP could be £2.6bn lower per year. Lower retail spending could also put the equivalent of 64,000 jobs (FTE) at risk.

Both WFH and COVID-19 uncertainties can account for lower consumer spending

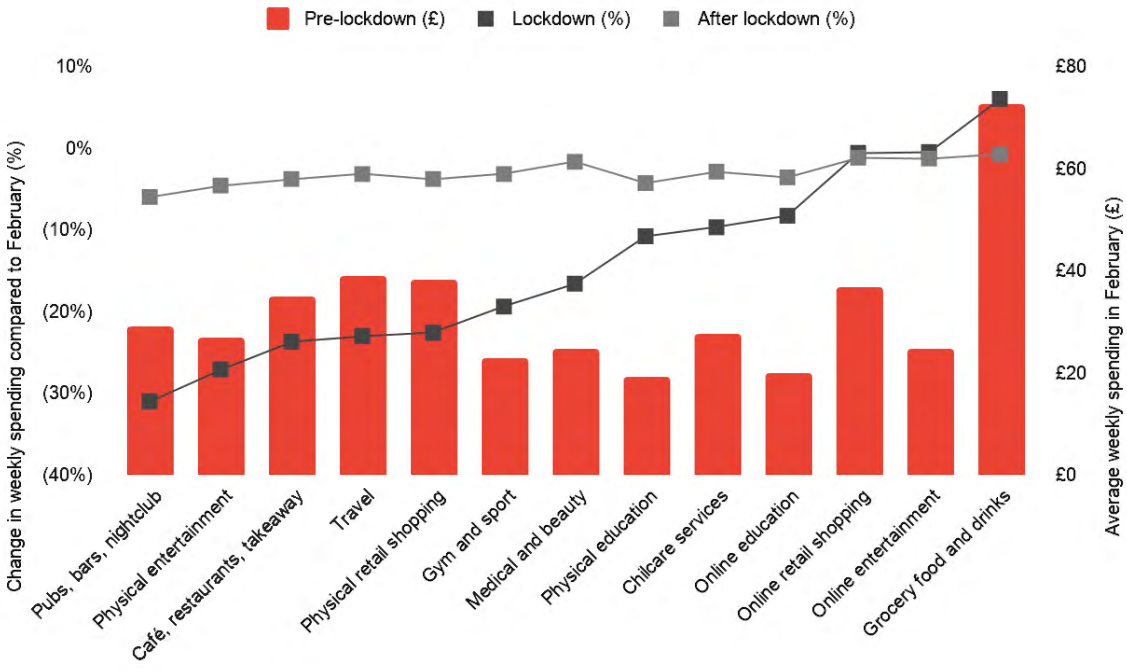
An important distinction is the reduction in spending driven by WFH and the reduction in spending caused by lower incomes and greater uncertainty. While we have asked our respondents to estimate their spending in a scenario of returning to WIO, it is likely that their answers will be coloured by the economic uncertainty as well.

So the equivalent of 250,000 jobs (FTE) and £12bn per year represents the maximum likely impact of working from home on the economy. But there may well have been a permanent shift to lower WFH spending that will last even when COVID-19-related uncertainty abates.

Consumers plan to hold back less on their spending in the coming months, particularly for entertainment and eating out

The average weekly spend by an office worker is expected to fall from £416 in February to £404 in August and September. But continued WFH will disproportionately impact sectors that rely on office workers being present in the office. Of these, spending in retail, leisure and hospitality is expected to be around 5% lower in August and September than it was in February.

Figure 2: Most spending is returning to pre-lockdown levels, but discretionary spending remains the most subdued



Source: PwC Research

Sectors that saw the **largest fall in spending between March and July will continue to see the lowest demand in the coming months.** As shown in Figure 2, spending on entertainment and eating out fell by over a quarter between March and July compared to February. While spending in these areas have recovered the most, spending will likely remain between 4% and 6% below February levels in August and September.

The fall in physical retail shopping and travel is reflected in the value of credit card spending halving in April this year compared to April 2019. Spending on online retail and online entertainment has remained almost unchanged since February. But the switch from physical to online spending was likely offset by households reducing their overall expenditure.

The fall in discretionary online spending could be further explained by consumers substituting paid online products for free online alternatives. For example, in March on LinkedIn Learning, there was a 46% increase in time spent learning by enterprise learners compared to the time they spent learning in February, amounting to an additional 750,000 learning hours.

Source: UK Finance

Women and higher income earners plan to reduce their weekly expenditure the most in the coming months, albeit in different categories

Women plan to reduce their weekly expenditure more than men in the short to medium term

In February, women spent on average £385 each working week, while men spent £452. Women intend to reduce their spending most on physical entertainment and eating out, whereas men plan to cut back more on spending such as online education and childcare.

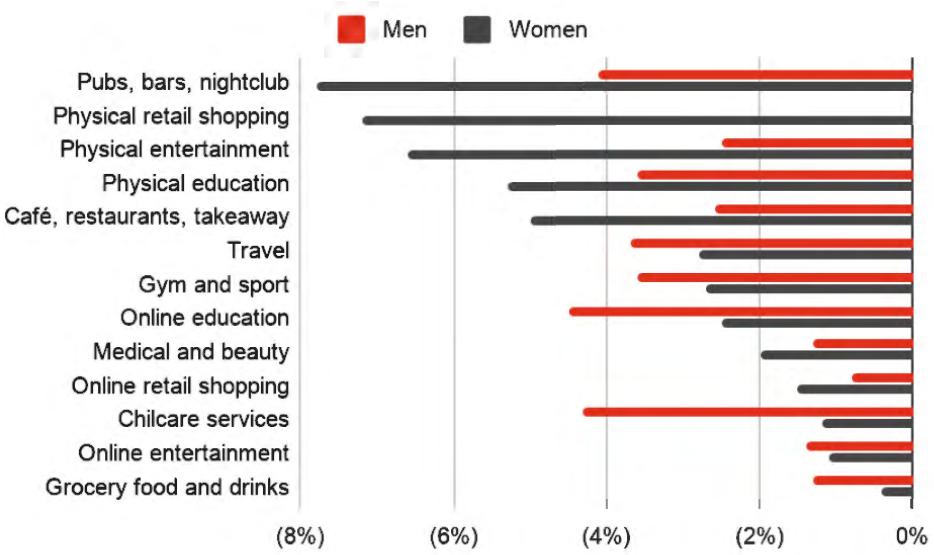
The fall in spending on physical entertainment and eating out may **reflect the intentions of office workers, and especially women, to shift to a more permanent pattern of remote working.** Reductions in discretionary spending may also indicate that consumers will be more cautious with respect to non-essential spending in the coming months.

The largest reductions in spending will likely come from higher income groups

All income groups anticipate a reduction in their expenditure on childcare, gym and sport, pubs and on physical entertainment. Ancillary workers who earn less than £20,000 are the only income group that plan to increase their spending on cafes, restaurants and physical retail.

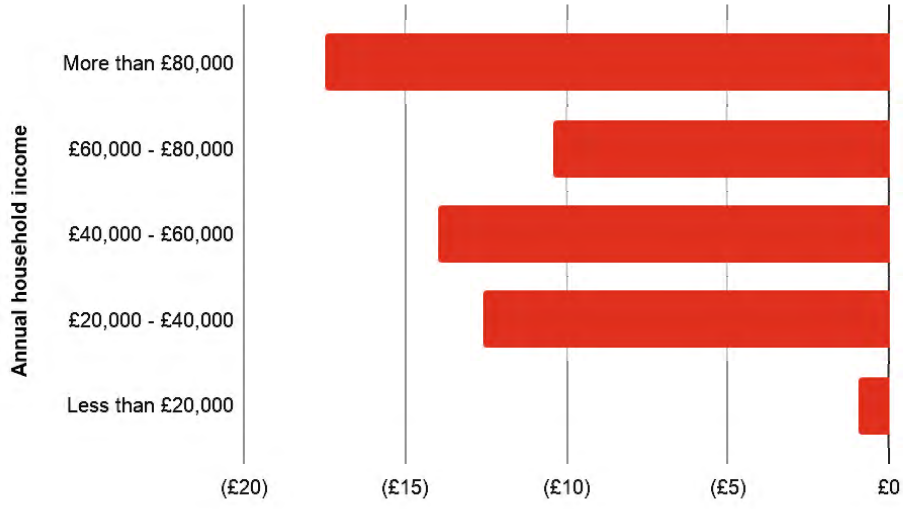
The largest reduction in anticipated spending among middle and higher income groups is on physical entertainment and on eating/drinking out. This is an equivalent of £5 less per week for those earning £40,000 or more. **These sectors are large employers, so there would likely be a sizeable knock-on effect on employment if spending in these areas below pre-lockdown levels persists.**

Figure 3: Percentage change in anticipated weekly spending by gender, post-lockdown vs pre-COVID-19



Source: PwC Research

Figure 4: Change in anticipated weekly spending, post-lockdown vs pre-COVID-19, by income group (£)



Source: PwC Research

3

Regional impacts

Agglomeration effects show us which regions have the most to gain and lose from increased WFH

Workers bring a variety of economic benefits to the places where they work. They spend money in local shops, collaborate with local businesses and attract investment. This clustering of economic activity in certain geographical areas is known as agglomeration.

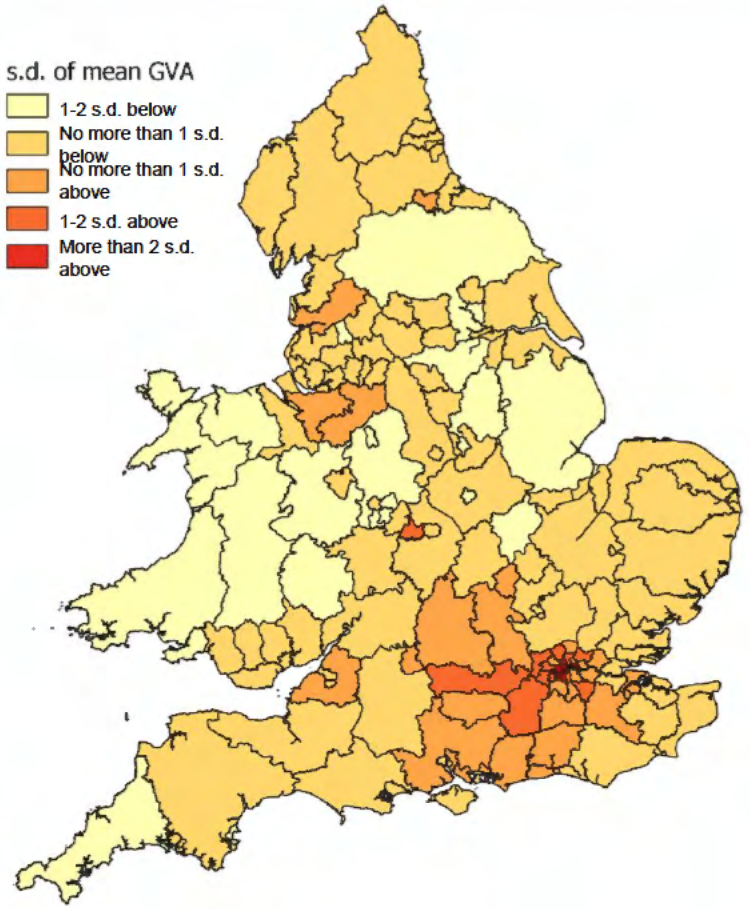
An increase in home working is likely to be accompanied by a shift in economic activity from higher-to lower-agglomerated areas. Workers that used to work in inner-city offices will instead work in more suburban and rural areas. This dispersion of economic activity has important implications for labour productivity and regional levelling up.

The total value of agglomeration can rise or fall as economic activity moves from one place to another. Workers who used to purchase lunch in a city centre might instead buy locally in their suburban or rural home. While the value of spending is the same, agglomeration may be lower if the supply chain in the city is larger. The fall in value of a worker no longer collaborating in a city may also be greater than the gain to a suburban or rural area of that worker sharing ideas there.

Many of the regions that have most to gain from WFH have very low levels of agglomeration. Furthermore, many of these regions are also those that the government are seeking to 'level up.' But while regions such as Wales, the South West and the North could see agglomeration increase by over 30%, the absolute value of the agglomeration benefit to these regions could be very low if they are starting from a lower base level of productivity (see Figure 5 for map on labour productivity dispersion).

The areas that would be worst affected by a shift to WFH would be those that rely most on workers being in offices. These are typically well-connected commuter cities, such as Birmingham and London. They also have more integrated supply chains. So a reduction in spending in these cities will have a larger knock-on effect than a similar increase in spending in a rural area.

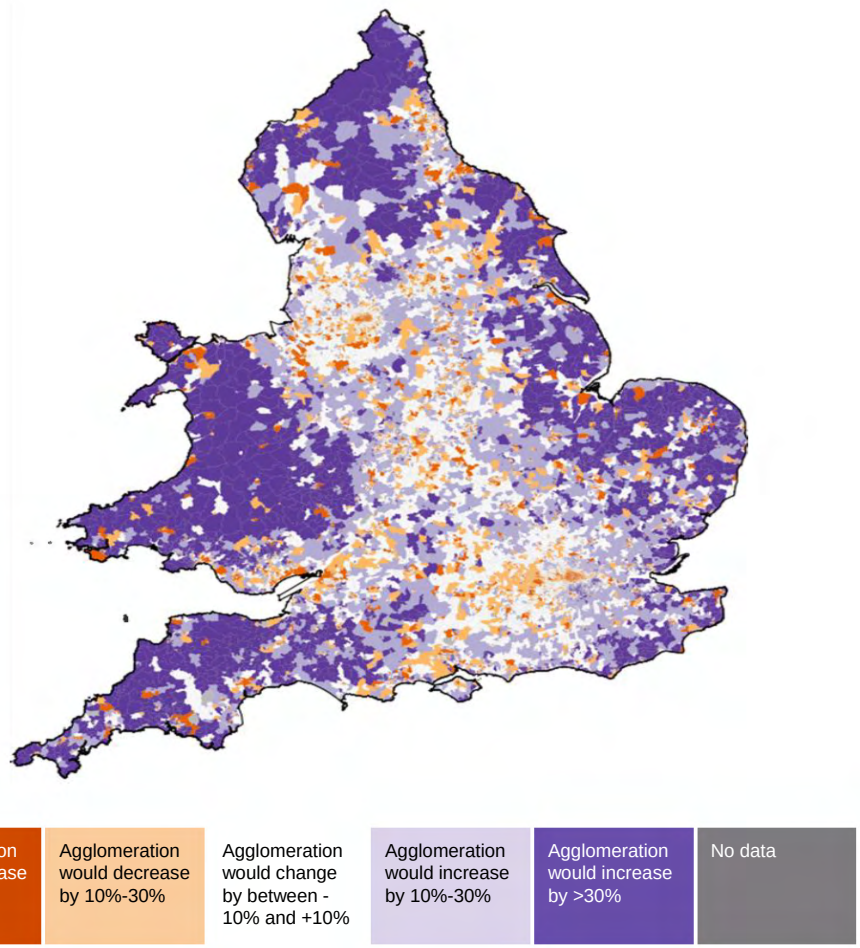
Figure 5: Labour productivity distribution in England & Wales (GVA per hour worked), 2017



Source: ONS licensed under the Open Government Licence
Note: in 2017, mean GVA per hour across the UK is £31.7, while the standard deviation (s.d.) across NUTS3 regions is £6.2.

Sustained and full-time WFH could decrease agglomeration by over 4% with a net cost of around £3.2bn to UK GDP…

Figure 6: Agglomeration effects for England and Wales by LSOA if office workers continue to WFH universally



We found that if office workers continue to WFH rather than return to their pre-COVID-19 workplace on a full-time basis, **total agglomeration, i.e. benefits from clustering of economic activities, could decrease by 4.3%** across England and Wales. Using a elasticity parameter from Graham et al (2009)[6] for financial business services, we derive that labour productivity could be 0.36% lower.

Projecting this over the proportion of the UK's employed workers who have switched to WFH as a result of COVID-19, we estimate the corresponding impact on the UK's GDP could amount to **£3.2bn.**

Although there is considerable local variation between regions, our calculations suggest that the reduced connection between clusters of economic activity would, **in net terms, have a negative effect on average labour productivity nationwide**.

However, there are potential benefits from the increased dispersion of economic activity away from cities to suburban and rural areas due to WFH. For example, increased spending in local shops, increased collaboration at the local level and increased transfer of knowledge and skills between local residents, producers and businesses could have **significant positive wins for local economies.**

In this way, a continued shift to WFH could help to level up economic activity and outcomes across the regions of the UK. Nonetheless, **an increase in clustering benefits in less central areas is unlikely to fully offset the losses in city centres,** which are where economic activities and workers have chosen to congregate to maximise their productivities in the first place.

… with negative agglomeration effects being more pronounced in commuter belts and inner cities

Figure 7: Change in agglomeration in the South East, by LSOA

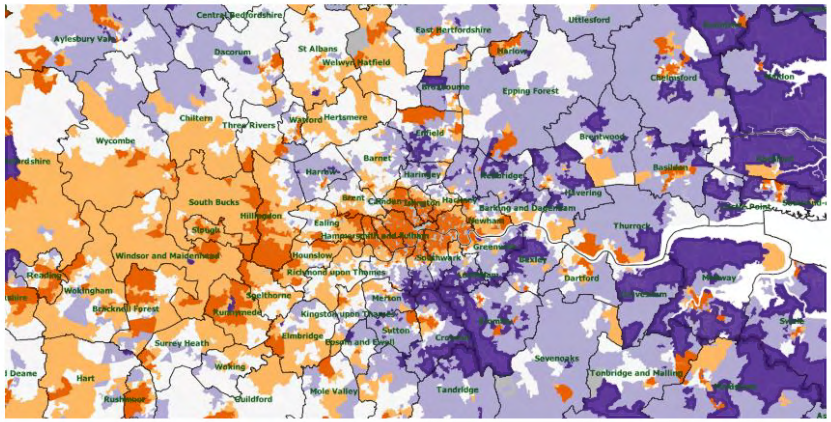
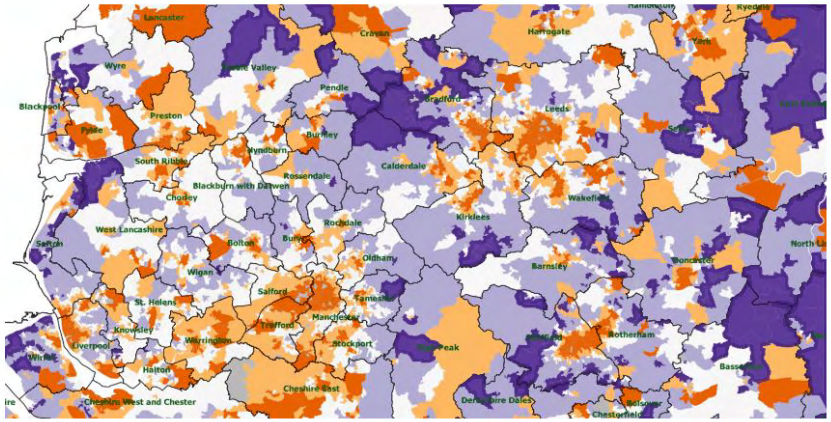


Figure 8: Change in agglomeration in the North of England, by LSOA



Agglomeration would decrease by >30%	Agglomeration would decrease by 10%-30%	Agglomeration would change by between -10% and +10%	Agglomeration would increase by 10%-30%	Agglomeration would increase by >30%	No data

London and the South East

Whilst the net economic impact of agglomeration channels due to office workers continuing to WFH is estimated to be negative nationally, there are significant local variations within broad regions.

Central and West London would see a fall in agglomeration if office workers were to WFH. We expect the agglomeration to be between 10% and 30% lower in a belt spanning from Central London through to Hammersmith, Heathrow and Slough.

In contrast, other parts of outer London are expected to benefit. In a wide horse-shoed area spanning from South London, through to East London and North London, we expect agglomeration to increase. The likely cause would be through higher economic activity as consumers increase spending in the local economy.

The North of England

The centre of large cities such as Liverpool, Manchester, Sheffield, Leeds and York would all experience large falls in agglomeration if office workers work from home.

Smaller cities would not be expected to see such a large fall in agglomeration.
More residential towns such as Blackpool, Wigan and Bradford could benefit from increased WFH. They could see a net gain in the amount of spending in the city if more office workers commute to nearby cities than have their offices in these cities.

As with the South East, the areas that would benefit the most from home working are rural areas that surround major cities. Yet any increase in agglomeration is likely to be small if these areas currently have much lower density of economic activities.

4

Productivity impacts

The impact of working from home on productivity is inconclusive…

Empirical research on the productivity impacts of WFH is currently limited and existing studies tend to focus on specific sectors (e.g. call centre employees at a travel agency in China) and/or cases in which employees are given the option to WFH, rather than being universally mandated to do so, as was the case during the COVID-19 pandemic. Therefore, recognising the inconclusivity of WFH productivity impacts, below we set out both the potential positive and negative impacts of WFH on productivity.

Potential productivity benefits from WFH

WFH removes the need for employees to travel to the workplace which not only reduces travel costs, but can increase the number of hours employees work if they spend the time they would have otherwise spent on travelling, on work. A number of studies have also found that employees report getting more work done from home.[7]

According to a 2014 report by the Centre for Economics and Business Research (Cebr), a shift to a flexible working environment could potentially add an extra £11.5bn per year to the UK economy through the more productive use of available working hours, the equivalent of 0.7% of GDP.[8]

WFH and flexible working cultures may also have the potential to encourage economically inactive or unemployed individuals to return to employment, which could potentially **boost GDP by up to 4.7%**, according to Cebr.[9]

There are potential indirect impacts on productivity from WFH. A number of surveys have found that at least **40% of respondents feel that WFH has allowed them to achieve a good work-life balance and be more flexible with their time**.[10] This can have knock-on effects on productivity with research showing that higher employee wellbeing is associated with higher productivity.[11]

Similarly, the lifestyle benefits that can stem from WFH and a flexible working culture can increase job satisfaction and employee engagement which, in turn, can improve performance at work and reduce attrition.[12]

Potential negative productivity impacts from WFH

WFH can have a negative impact on productivity, particularly when in-person collaboration and face-to-face communication are necessary to facilitate creativity and innovation, and to produce output efficiently and effectively. [13]

In addition, WFH can limit the ability for employees to meet new people, build their network and learn new skills from others (learning by doing)[14], all of which can have an adverse effect on productivity.

Research has shown that the co-location of employees can deliver better performance and stimulate knowledge creation and faster and more precise flows of knowledge through increased unplanned face-to-face communication.[15]

It is also not always the case that WFH leads to employees working longer hours and/or more productively. For some employees, **the presence of dependents at home, childcare responsibilities** (particularly due to COVID-19 school closures) **and unsuitable work spaces** can mean it is more difficult for them to work at home compared to in the office.[16] Respondents in several surveys also reported feelings of loneliness when WFH [17] which could have negative impacts on employees mental health, job satisfaction, engagement and performance at work.[18]

Furthermore, any time gained from WFH (e.g. due to the absence of needing to travel to the workplace) may not necessarily be spent on work.

ONS data from April 2020 shows that, of those working from home, 34.4% worked fewer hours than usual, 35.2% worked the same hours as usual, while 30.3% worked more hours than usual.[19]

… although the scale of its impact is underpinned by critical factors

Home-working environment

An employee's home working environment can have a significant impact on their productivity when WFH compared to in the office.

Dependents

School closures have increased the childcare burden on working parents, forcing many to take on teaching responsibilities in addition to managing demands of their paid work. This is likely to reduce time available to work and increase distractions, leading to lower productivity compared to working in an office.[20] According to Nicholas Bloom, at Stanford University, one major requirement for a successful work-from-home program for any business is the requirement that children are in school or daycare.[21]

Space, privacy and technology

The lack of the physical space, privacy and inadequate technology in employee's home-working environment could hinder their work and result in lower productivity. A study conducted by Bloom found that WFH during a nine-month period led to a 13% increase in performance of Ctrip employees, a Chinese travel company, given that employees were only allowed to WFH if they had a home office. Moreover, adequate privacy was key to productivity [23] – the working space could not be a bedroom, and nobody was allowed in during the workday except for the employee.[22]

Age and seniority

Age and seniority have implications for the ability, preference and productivity of an employee with regard to WFH.

Early learning

For young, new or junior employees who tend to have a less developed network and skill set, and would benefit from in-person collaboration and face-to-face communication to build both of these, WFH is likely to have a more adverse effect on productivity than for older, more experienced and senior employees, who already have a well established network and skill set to draw from.[24]

Space and privacy for younger staff

In addition, younger, more junior employees are likely to have less space, privacy and lower quality technology in their home-working environment than their older, more senior counterparts[25], which may result in the former being less productive when WFH. Although, the latter are also more likely to have children at home which could have a negative impact on their productivity. [26]

A recent survey found that a higher proportion of younger workers than older workers reported difficulties in WFH, including feeling less connected to colleagues and regarding themselves as less informed about what was going on within their company since they started to WFH.[27]

Choice

Personal choice, in which an employee decides how frequently they WFH (if at all), is likely to be essential in determining their productivity WFH in comparison to WIO.

Absence of choice during the pandemic

For the majority of office workers, choice has been absent during the COVID-19 pandemic, with many organisations closing their offices and mandating employees to WFH full-time for the foreseeable future. As a result, the involuntary WFH situation that many office workers find themselves in may have a negative impact on productivity as workers are unable to choose their optimal WFH – WIO balance which takes into account the requirements of their job and home-working environment.

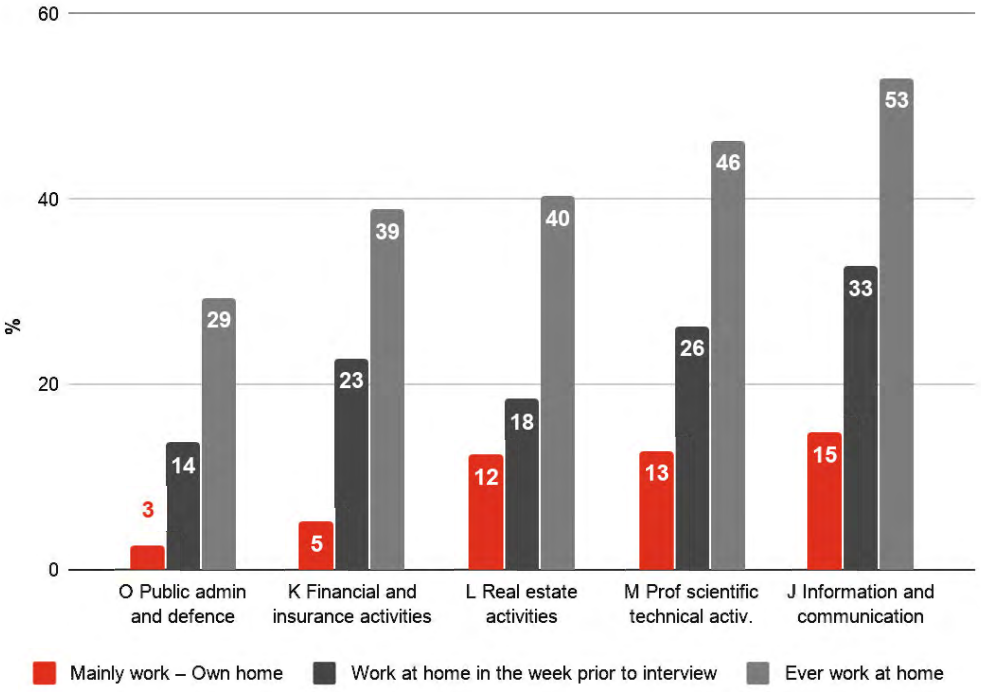
Changes in preference over time

In the Ctrip experiment, half of the original 500 who volunteered to WFH, chose to return to the office after nine months[29], demonstrating that an individual's preference for WFH may differ over time and thus choice must be a consistent option for employees and their working arrangements.

Productivity impacts from working from home may also vary by sector

Amongst office workers, the extent to which an employee can WFH and do so productively, can differ markedly across sectors, depending on whether a particular physical environment, access to specific technology, or in-person interactions with other people are required for them to carry out their role.

Figure 9: Percentage of UK workforce working from home in office-based industrial sectors, January to December 2019



Source: ONS Annual Population Survey 2019

Data from the ONS Annual Population Survey[30] presented in Figure 9, shows that from January to December 2019 employees in the information and communication sector **were significantly more likely to work from home than employees in other office-based sectors, such as public admin and defence.**

Potential reasons for this are that information and communication employees may be more likely to have **the skills to use, and access to, the technology needed for their job at home.** They are also likely to be **less reliant on being in a specific physical environment** to carry out their work compared to other types of office workers.

For example, office workers in the public sector and legal and scientific professionals may need **physical access to public institutions, courts and laboratories** respectively, as well as **in-person communication with colleagues and clients** in order to be able to carry out their work. In contrast, tech professionals may be able to work just as well with colleagues and clients virtually, as in-person. As a result, it may be the case that **information and communication employees may be able to WFH more productively and frequently than office workers in other sectors.**

5

Looking to the future

Businesses will need to be agile to maximise the benefits from both home and office working

COVID-19 has ushered in new and permanent ways of working. Capitalising on the benefits of any shift to WFH will involve putting employees at the heart of business plans. Moving to new ways of working will be disruptive for regions that rely on office workers being physically present. But there are likewise substantial gains to be made from returning to the office. Understanding the benefits of both home and office working will allow policymakers and businesses to make informed decisions about the future of work.

WFH flexibility is here to stay

One of the lasting effects of COVID-19 is that **working patterns will become more flexible, particularly for office workers.** Seven in ten professionals would prefer to work at most two days a week in the office going forward [31], but only a quarter would want to do so full time.[32] Employees will expect businesses to allow for continued home working as well as the option to work in an office.

WFH will increase productivity if it's what employees want

One of the biggest gains to employees of working from home is the time saved commuting. The average commuter would save 47 days per year from WFH, of which they would work on average an extra 21 days.[33] As well as having extra time to work, employees are more productive if they have a **good work-life balance.** But employers should be aware of newer employees who have the most to gain from being physically present in an office.

WFH will spread business activity around the country

The shift to greater WFH has the potential to redistribute economic activity away from cities and suburban and rural areas. **Regions that are targets of the government's levelling up agenda** have the most to gain, albeit though they start from very low levels of agglomeration. **Cities that heavily rely on office workers will need to diversify and adapt to more remote working patterns.**

Returning to the office has its own economic benefits

Compared to a complete shift to WFH, our analysis estimates that returning to the office has the potential to increase hours worked in the economy by the equivalent of 250,000 jobs (FTE) and save up to £12bn in GVA. Cities that rely most on office workers would be the largest beneficiaries of a return to the office. **The future is likely to involve a hybrid mix of both office and home working, mitigating the cost to cities of a complete transition to WFH.**

6

Methodology

Methodological approach

Consumption

PwC Research conducted an online survey using a representative sample of 1,000 individuals from across the UK to understand their spending patterns and intentions before, during, and after lockdown. The sample for the survey was selected to be statistically representative of individuals aged 18 and over who live in the UK. The survey was conducted at the end of July 2020.

As well questions on the respondents' demographics, employment and income, the survey also asked:

- Is your job primarily office/desk-based?
- Does your job rely on office workers being physically back in the office (e.g. working in the cafe just outside an office, security guard)?
- Thinking about a typical working week before lockdown, how much did you spend on the following categories?
- Thinking about a typical working week, how much did your spending change during lockdown compared to before lockdown?
- Thinking about a typical working week, how much do you anticipate your spending to change after lockdown compared to before lockdown?
- What proportion of your working hours do you intend to spend in the office in future?

We identified 463 respondents as either office or ancillary workers. Using ONS employment data by occupation, we scaled the spending behaviour of these respondents to approximate that of all UK office and ancillary workers. We then applied this national spending behaviour to the ONS input-output model. The results are our estimate of the net economic impact on jobs and GVA of the change in the spending intentions of office and ancillary workers.

Agglomeration

We used ONS data on employment by dwelling place to model the impact of all workers working from home rather than at their normal place of work. We used commute time as a proxy for the cost of travel, and in line with Graham et al. (2009), we applied a distance decay factor of 1.746. This gives us the estimated change in agglomeration for each LSOA in England and Wales.

To understand the effect on the steady state productivity for office workers, we applied an agglomeration elasticity of 0.083 for business services from Graham et al. (2009).

Productivity

Empirical research on the productivity impacts of WFH is currently limited and existing studies tend to focus on specific sectors and/or cases in which employees are given the option to WFH, rather than being universally mandated to do so, as was the case during the COVID-19 pandemic. Therefore, it would be unreliable to generalise the findings of these studies to all WFH home settings and hence, our analysis of the effect of WFH on productivity is largely qualitative.

Key assumptions

Consumption assumptions

Our analysis focuses solely on the economic implications of office workers continuing to work from home versus in the office. For the consumption analysis we assume that the reduction in anticipated spending and GVA would be primarily driven by increased WFH. We also allow for COVID-related uncertainty to contribute to the spending forecasts, such as in a greater propensity to save.

Our analysis of the economic impact on consumption is derived from consumer's spending preferences across 13 categories: childcare services, grocery food and drinks, gym and sporting activities, travel services, cafes/restaurants, pubs and bars, retail shopping (physical and online), educational classes (retail and online), medical and beauty services, entertainment and attractions (physical and online).

Our analysis only considers the first wave of COVID-19 restrictions when analysing the 'during lockdown' effects. We did not consider any subsequent local restrictions imposed in the various parts of the UK. The analysis also does not consider the potential epidemiological and health implications of WFH vs WIO, such as an change in the transmission rate of COVID-19 and/or a 'second wave' of COVID-19 cases.

Agglomeration assumptions

We assume that all workers who work in an office instead work from home. As such, the estimated reduction in hours worked and foregone GVA are the likely maximum impact of any shift to more permanent working from home.

We assume a decay factor of 1.746 and an agglomeration elasticity of 0.083 for business services, both in line with Graham et al. (2009). [6]

Endnotes

1. ONS. (2020). Coronavirus and homeworking in the UK: April 2020.
2. ONS. (2019). Services sector: 2008 to 2018. Available at: https://www.ons.gov.uk/economy/economicoutputandproductivity/output/articles/servicessectoruk/2008to2018
3. CBI. (2020). How businesses are planning to return to their offices. https://www.cbi.org.uk/articles/how-businesses-are-planning-to-return-to-their-offices/?utm_campaign=20200813_Coronavirus%20Bulletin_Non%20Members_Unopens&utm_medium=email&utm_source=Eloqua
4. Cartridge People.com. (2020). The Small Office Home Office Workers Report 2020: Homeworking Statistics Revealed. https://www.cartridgepeople.com/info/blog/homeworking-statistics; Buffer. (2019). The State or Remote Work. https://buffer.com/state-of-remote-work-2019; Owl Labs. (2019). State of Remote Work. https://www.owllabs.com/hubfs/Owl%20Labs%202019%20State%20of%20Remote%20Work%20Report%20PDF.pdf
5. O2. (2020). A flexible future: Brits expected to call time on office life after lockdown. https://news.o2.co.uk/press-release/a-flexible-future-brits-expected-to-call-time-on-office-life-after-lockdown/; Computer Weekly.com. (2020). Coronavirus: Young employees struggle with remote working. https://www.computerweekly.com/news/252482375/Coronavirus-young-employees-struggle-with-remote-working; Stanford University Communications. (2020). The productivity pitfalls of working from home in the age of COVID-19. https://news.stanford.edu/2020/03/30/productivity-pitfalls-working-home-age-covid-19/
6. Graham, D., Gibbons, S., Martin, R. (2009). Transport Investment and the Distance Decay of Agglomeration Benefits.
7. Cartridge People.com. (2020). The Small Office Home Office Workers Report 2020: Homeworking Statistics Revealed. https://www.cartridgepeople.com/info/blog/homeworking-statistics; Owl Labs. (2019). State of Remote Work. https://www.owllabs.com/hubfs/Owl%20Labs%202019%20State%20of%20Remote%20Work%20Report%20PDF.pdf
8. Cebr. (2014). The productive value of the untapped workforce: A study into the potential economic impacts of a flexible working culture. https://www.cebr.com/wp-content/uploads/2014/12/UK-Citrix-Report.pdf
9. Cebr. (2014). The productive value of the untapped workforce: A study into the potential economic impacts of a flexible working culture. https://www.cebr.com/wp-content/uploads/2014/12/UK-Citrix-Report.pdf
10. Cartridge People.com. (2020). The Small Office Home Office Workers Report 2020: Homeworking Statistics Revealed. https://www.cartridgepeople.com/info/blog/homeworking-statistics; Buffer. (2019). The State or Remote Work. https://buffer.com/state-of-remote-work-2019; Owl Labs. (2019). State of Remote Work. https://www.owllabs.com/hubfs/Owl%20Labs%202019%20State%20of%20Remote%20Work%20Report%20PDF.pdf
11. World Economic Forum. (2019). It's official: happy employee mean healthy firms. https://www.weforum.org/agenda/2019/07/happy-employees-and-their-impact-on-firm-performance/; Oswald, A., Proto, E., Sgroi, D. (2015). Happiness and Productivity. Journal of Labor Economics, Vol. 33, No. 4, pp.789-822.
12. Bloom, N., Liang, J., Roberts, J., Ying, Z., (2015). Does Working From Home Work? Evidence From A Chinese Experiment. The Quarterly Journal of Economics, Vol. 130, Issue 1, pp. 165–218; Owl Labs. (2019). State of Remote Work. https://www.owllabs.com/hubfs/Owl%20Labs%202019%20State%20of%20Remote%20Work%20Report%20PDF.pdf; Steelcase. (x). The Privacy Crisis. https://www.steelcase.com/research/articles/privacy-crisis/
13. Organisation for Economic Co-operation and Development. (2020). Productivity gains from teleworking in the post COVID-19 era: How can public policies make it happen?. http://www.oecd.org/coronavirus/policy-responses/productivity-gains-from-teleworking-in-the-post-covid-19-era-a5d52e99/
14. Business Insider. (2020). Work from home is here to stay, but it may put younger workers at a disadvantage. https://www.businessinsider.com/remote-work-pros-cons-younger-workers-gen-z-millennials-2020-5?r=US&IR=T; The Telegraph. (2020). Are you a WFH winner or loser? https://www.telegraph.co.uk/education-and-careers/2020/07/17/wfh-winner-loser/
15. Zenun, M., Loureiro, G., Araujo, C., (2007). The Effects of Teams' Co-location on Project Performance.; Coradi, A., Heinzen, M., Boutellier, R. (2015). Designing workspaces for cross-functional knowledge-sharing in R&D: the 'co-location pilot' of Novartis. Journal of Knowledge Management, Vol. 19, No. 2, pp. 236-256.
16. Stanford University Communications. (2020). The productivity pitfalls of working from home in the age of COVID-19. https://news.stanford.edu/2020/03/30/productivity-pitfalls-working-home-age-covid-19/; City AM. (2020). For young Londoners, working from home is a cramped and dismal experience. https://www.cityam.com/for-young-londoners-working-from-home-is-a-cramped-and-dismal-experience/

Endnotes (cont'd)

17. Cartridge People.com. (2020). The Small Office Home Office Workers Report 2020: Homeworking Statistics Revealed. https://www.cartridgepeople.com/info/blog/homeworking-statistics; Buffer. (2019). The State or Remote Work. https://buffer.com/state-of-remote-work-2019; O2. (2020). A flexible future: Brits expected to call time on office life after lockdown. https://news.o2.co.uk/press-release/a-flexible-future-brits-expected-to-call-time-on-office-life-after-lockdown/

18. Stanford University Communications. (2020). The productivity pitfalls of working from home in the age of COVID-19. https://news.stanford.edu/2020/03/30/productivity-pitfalls-working-home-age-covid-19/

19. ONS. (2020). Coronavirus and homeworking in the UK labour market: 2019. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/coronavirusandhomeworkingintheuklabourmarket/2019

20. Stanford University Communications. (2020). The productivity pitfalls of working from home in the age of COVID-19. https://news.stanford.edu/2020/03/30/productivity-pitfalls-working-home-age-covid-19/

21. Stanford University Communications. (2020). The productivity pitfalls of working from home in the age of COVID-19. https://news.stanford.edu/2020/03/30/productivity-pitfalls-working-home-age-covid-19/

22. Bloom, N., Liang, J., Roberts, J., Ying, Z., (2015). Does Working From Home Work? Evidence From A Chinese Experiment. The Quarterly Journal of Economics, Vol. 130, Issue 1, pp. 165–218.

23. Yunus, E.N., Ernawati, E. (2018). Productivity paradox? The impact of office redesign on employee productivity. International Journal of Productivity and Performance Management, Vol. 67, No. 9, pp. 1918-1939.; Steelcase. (x). The Privacy Crisis. https://www.steelcase.com/research/articles/privacy-crisis/

24. Business Insider. (2020). Work from home is here to stay, but it may put younger workers at a disadvantage. https://www.businessinsider.com/remote-work-pros-cons-younger-workers-gen-z-millennials-2020-5?r=US&IR=T

25. The Telegraph. (2020). Are you a WFH winner or loser? https://www.telegraph.co.uk/education-and-careers/2020/07/17/wfh-winner-loser/; City AM. (2020). For young Londoners, working from home is a cramped and dismal experience. https://www.cityam.com/for-young-londoners-working-from-home-is-a-cramped-and-dismal-experience/

26. Stanford University Communications. (2020). The productivity pitfalls of working from home in the age of COVID-19. https://news.stanford.edu/2020/03/30/productivity-pitfalls-working-home-age-covid-19/

27. Computer Weekly.com. (2020). Coronavirus: Young employees struggle with remote working. https://www.computerweekly.com/news/252482375/Coronavirus-young-employees-struggle-with-remote-working

28. ONS. (2020). Coronavirus and homeworking in the UK labour market: 2019. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/coronavirusandhomeworkingintheuklabourmarket/2019

29. Bloom, N., Liang, J., Roberts, J., Ying, Z., (2015). Does Working From Home Work? Evidence From A Chinese Experiment. The Quarterly Journal of Economics, Vol. 130, Issue 1, pp. 165–218.

30. ONS. (2020). Coronavirus and homeworking in the UK labour market: 2019.

31. Stanton House poll 21st July https://www.stantonhouse.com/blogs/2020-7/will-the-office-exist-in-a-post-covid-19-world#

32. Atlas Cloud study – https://www.thetimes.co.uk/edition/business/youll-work-a-month-more-if-you-wfh-tfvw9r5np

33. Atlas Cloud study – https://www.thetimes.co.uk/edition/business/youll-work-a-month-more-if-you-wfh-tfvw9r5np

For more information about this report, please contact members of our team

Our Economics practice in the UK offers a wide range of services covering: market reform in a range of industry sectors (including energy, water, media and telecoms, financial services, health and government services); competition policy, disputes and other investigations; economic, social and environmental impact analysis; financial economics; fiscal policy and macroeconomics. This practice forms part of Strategy&, PwC's strategy consulting business.

For more information about our Economics services please visit: www.pwc.co.uk/economics

This report is one of a number of PwC publications on COVID-19. Please take a look at our other publications at the links below:

UK Economic Update: COVID-19

https://www.pwc.co.uk/services/economics/insights/uk-economic-update-covid-19.html

COVID-19 UK Industry Focus

https://www.strategyand.pwc.com/uk/en/covid-19-industry-focus.html

Jonathan Gillham
Chief Economist
jonathan.gillham@pwc.com

Eduardo Rodriguez Montemayor
Senior Economist
eduardo.rodriguez.montemayor@pwc.com

Edmond Lee
Senior Economist
edmond.sp.lee@pwc.com

Shreya Pillai
Economist
shreya.pillai@pwc.com

Tara Shrestha Carney
Economist
tara.shrestha.x.carney@pwc.com

Hugh Myers
Economist
hugh.myers@pwc.com

pwc.com

RITM3630410