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Productive places: evidence review of effect of remote working on productivity

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Executive Summary

There is much current debate about the merits or drawbacks of working from home. Much of this is described by media that offers either a single polarised view or determinedly opposite opinions, which makes drawing any conclusion difficult. Several studies and surveys, however, offer evidence of how our work productivity is affected by where we work and the conditions under which we work.

This report reviews the available evidence of remote versus central working, focussed working, and of environmental conditions on work productivity. Key findings are:

- Remote working typically leads to over 20% productivity increases, reduced staff turnover, and reduced absenteeism.
- There are enormous benefits to productivity through having a workspace free of distractions and with an ideal physical environment. These improvements are measured to be 9 – 14% for CO₂ levels, 5 – 16% for thermal comfort, and up to 60% for distractions.
- Productivity gains of remote working are likely to result from knowledge workers being more able to focus, being more able to organise and schedule their work effectively, and from their improved wellbeing.
- The positive effect of remote working upon productivity is widely recognised, although employees are more in favour of remote or hybrid working than employers.
- Judging the benefits of working from home is best performed on the balance of an individual's activities and not as a simple binary consideration based on their overall job role.
- A thought worker will probably work most effectively in an organisation through a balance of remote and central working.
- The importance of engaging workers in deciding the terms of remote working to realise the greatest productivity gains and improve worker job satisfaction.

Overall, the evidence shows the strong link between providing workers with greater agency, flexibility, and ability to focus to get their work done, and their work productivity. The highest productivity gains from remote working occur when undertaken willingly in a dedicated workspace with an optimal work environment in terms of thermal comfort, air quality, and lighting.

Many employers are now working creatively to maximise the benefit to their organisation and their workers through hybrid work models, where remote working is supported and central space reconfigured to focus on fostering collaboration and interaction. This approach realises the productivity gains of focussed individual work while addressing concerns about collaborative creative thinking.



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Remote working productivity: survey evidence

There have been many surveys produced over the COVID-19 pandemic period of the opinion of business leaders and workers on the effect of remote working on productivity. The sheer number of surveys give confidence that remote working is, at the very least, not detrimental for most job roles but also suggests that remote working leads to happier workers and productivity gains.

Pre-pandemic evidence showed that there was an unmet desire for remote working among British workers, with 81% believing remote working, whether full- or part-time, would improve productivity but only 30% of companies offering it (HSBC 2017). A 2015 survey of 350 US workers reported 77% believed they were more productive when remote working (Wright 2015), while a similar 2020 survey showed 94% of 800 workers reported productivity when remote working being as good or higher than working in an office setting (Maurer 2020).

People's impressions of the effects of enforced remote working through the COVID-19 pandemic upon productivity seem to have changed over time. For example, a survey of employers found an improved view of the positive effects of remote working between the summers of 2020 and 2021 (33% compared to 28%) and a reduction in those who believe it had affected productivity negatively (23% compared to 28%) (CIPD 2021). Furthermore, a survey of 30,000 US workers in Spring 2021 showed almost 60% reporting higher productivity from remote working than expected (Barrero, Bloom, and Davis 2021). This survey also showed approximately 40% of respondents believe remote working to be more efficient than office working, and 45% about the same level of efficiency.

Other surveys continue to support the picture being created. 63% of 2,000 European business leaders in early 2021 believed that hybrid working was more profitable than office-work only (Owl Labs 2021a). In another 2021 survey of over 2,000 US workers, 83% said productivity was the same or higher than pre-pandemic (Owl Labs 2021b), while a study of the productivity and wellbeing of over 250 US knowledge workers during the COVID-19 pandemic (George et al. 2021) noted strong support that remote working was a positive transformation (56% agreed, 20% disagreed) and resulted in improved productivity (50% agreed, 27% disagreed).

These are examples of many surveys of the effects of remote working on working practise. They are helpful in creating an impression of the effect of remote working but are difficult to draw firm conclusions from as they generally use qualitative comparisons only, e.g., 'better', 'the same', or 'worse'.

Remote working productivity: quantitative evidence

Producing productivity data to determine the effects of remote working has required designed studies, rather than opinion surveys. The evidence base is, therefore, much reduced but very clear, nonetheless.

Call centres or telesales work often provide the controlled conditions for evaluating the effect of remote working. A landmark study in 2015 reported on over 1,000 workers in a Chinese call centre (Bloom et al. 2015). For the period of the designed experiment, half of the staff were required to work remotely full time, while the other half remained office based, with workers being chosen at random for each group. Those working remotely were 13% more productive and reported improved work satisfaction, while the staff attrition rate halved. Once the experiment had finished, workers

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returned to the office and productivity returned to its normal levels. The employer then offered any workers the option of remote working. **Those who voluntarily took up the offer to work remotely delivered a 22% increase in productivity.** This resulted in a 20 – 30% financial gain to the company due to the combined effects of increased productivity and reduced central office costs.

There are other pre-pandemic sources that show very significant productivity benefits of remote working. One summary of evidence by the Telework Research Network (Lister 2010) modelled the employer benefit of remote working days as a 27% increase in productivity based on a range of industry research. This was based upon:

- Fewer interruptions
- More effective time management
- Workers feeling trusted
- Flexible working and working some of the commuting time

This summary also highlights studies by various companies that remote working leads to increases in productivity of:

- 35% (Best Bug)
- 20% (British Telecom)
- 32.5% (Dow Chemical)
- Up to 50% (IBM)
- 15–45% (Compaq)

The summary also reported that Alpine Access saw remote working lead to a 30% increase in sales and 90% reduction in customer complaints, where the customers were derived from remote workers. Finally, absenteeism per employee is reported to reduce by 3.7 days/year.

Other measures also suggest an increased connection with work and degree of activity for remote workers. A 2020 survey of 1,000 US remote workers during the initial period of the COVID-19 lockdown (Malek 2021) showed an increase in phone calls (up 230%), customer relationship management (CRM) systems (up 176%) and email (up 57%), while document access and calendar appointments reduced (by 26%). This suggests fewer large meetings, which are often regarded as unhelpful interruptions by most team members (Perlow 1997), and helps explain the productivity benefit to organisations over and above those to individuals. A recent paper (Yang et al. 2021) showed similar evidence; the authors suggested this behavioural shift to electronic communication and away from face-to-face meetings would reduce future innovation and productivity, although this appears to be based upon an assumption of full-time remote working.

Although there are few quantitative studies of the effects of remote working on productivity, they point unambiguously to substantial benefits of, conservatively, at least 20% improvements.

Environmental conditions

Several studies have addressed the impact of environmental conditions on worker productivity.

Air quality has a major but, often, unrecognised influence on our working effectiveness. It is a shorthand for various components in the air we breathe but is usually most concerned with levels of CO₂, volatile organic compounds (VOCs) and particulates. Increased levels of CO₂ lead to drowsiness

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and can reduce productivity in workplaces by up to a 14% (WorldGBC 2014). Alleviating the build up of CO₂ (and other unwanted gases) is most easily achieved with ventilation systems. The productivity of call centre workers was measured to increase by up to 9% with appropriate levels of natural air flow (Schiavon and Zecchin 2008), as well as this leading to a 35% reduction in short-term illnesses. A study of school classrooms found levels of CO₂ up to 5,000 ppm, much higher than the recommended maximum of 1,000 ppm, and that decision-making tasks could be completed up to 15% faster with appropriate levels of ventilation to reduce CO₂ levels (Clements-Croome et al. 2008). It is worth bearing in mind, however, that even a level of 1,000 ppm CO₂ has been measured to have a strongly detrimental effect upon decision making, with outcomes being up to 23% worse than when conducted in an environment of 600 ppm CO₂ (WorldGBC 2014).

Thermal comfort is also enormously helpful in creating an environment conducive to productive work. Various studies have shown a 5 – 15% effect on worker performance, stretching to a 16% reduction in productivity for temperatures above 26°C, and productivity increasing almost 5% at a temperature of 22.5°C compared to 24.5°C (Schiavon and Zecchin 2008).

Lighting has a profound effect on our hormone levels and natural lighting in a work environment was measured to increase, on average, each worker's night's sleep by 46 minutes (WorldGBC 2014); the benefits to productivity were not measured but are implicit in the data.

Finally, distracting noise can be debilitating for workers, with reported reductions in performance of well over 60% (WorldGBC 2014).

These observations make clear that careful attention to the environmental conditions of work offers huge benefits to the productivity and alertness of workers. There are also numerous studies that examine the beneficial impact of these same conditions on worker health.

The home-working environment

The pandemic lockdown brought focus on remote working from home. This is often the context of the studies above, particularly those conducted during the COVID-19 lockdown.

Organisations that report on the attitude of workers and the effectiveness of working approaches have adjusted their data collection to take account of the different conditions of remote working.

The US organisation Prodoscore reports that 93% of remote workers believe that having a dedicated home office benefits worker happiness and increases productivity (Malek 2021).

Greater detail has been created by Leesman and their analysis of over 187,000 home workers across over 1,700 workplaces and 94 countries ((Leesman) 2021). Leesman have developed an index (from 0 – 100) that self-reported overall effectiveness of a workplace environment for an employee to conduct their work activities. For those working from home, their surveys show that a dedicated work room (index: 78.4) is the most effective space, followed by a dedicated work area that is not in a separate room (index: 74.1) and, least effective, a 'non-work specific area', e.g. a shared table (index: 66.1).

This need for an environment free of distractions is also reported in two studies of the COVID-19 lockdown, with home office constraints being identified as one of the key disadvantages to working from home (Ipsen et al. 2021), and 'visual and acoustic distractions' from working at home causing



an increase in family-work conflict and a decrease in work engagement, which results in reduced work productivity (Galanti et al. 2021).

WFH productivity: types of work

A 2020 analysis by McKinsey (Lund et al. 2020) argued that the likelihood of a job benefitting from remote working depends upon proportion of time spent on tasks that benefit from remote working. The authors considered 800 jobs and 2,000 tasks and found that Finance & Insurance sectors have the highest potential to benefit from remote working, with 75% of tasks well-suited to remote working. Management, Business Services, and IT were the job types next most likely to benefit. The report also highlighted that Business & Financial Services have a large share of the UK economy and could perform one-third of their work remotely with no loss of productivity. In fact, given other evidence, it is likely that this would see an increase in productivity.

This is borne out by sectoral surveys. In early Apr 2021, 80% of UK Information & Communications workers worked remotely, as did over 70% of those in Professional, Scientific and Technical (PST) roles (Office for National Statistics 2021). These sectors also had the highest proportion of companies expecting to continue to use remote working (49% Info & Comms, 43% PST). Elsewhere, 88.4% of PST workers reported an equivalent or increased productivity during the Mar-Jul 2020 lockdown compared to pre-pandemic, the largest proportion by job type (Parry et al. 2021).

Why is remote working beneficial?

An obvious reason for increased productivity from remote working is a reduced commute time, something which is borne out by studies (Barrero, Bloom, and Davis 2021), (Lister 2010). There is, however, a significant improvement in productivity over and above that due to working part of the time that would otherwise be spent travelling to or from work.

Pre-pandemic evidence showed that workers who are motivated and engaged by their work are 17 – 21% more productive than other workers, and 21 – 22% more profitable (Gallup 2013)(Gallup 2017), while ‘happy workers’ at BT call centres were found to be 24% more productive than others (Bellet, De Neve, and Ward 2019). A more recent study identified three key advantages of working from home to be improved work-life balance, improved work efficiency, and greater work control (Ipsen et al. 2021). Elsewhere, the increased agency and trust given to knowledge workers working remotely have been given as drivers of improved productivity (Lister 2010).

A survey from the UK’s *Office for National Statistics* conducted across Apr – May 2021 (Office for National Statistics 2021) showed respondents believe that remote working resulting from the COVID-19 pandemic produced a better work-life balance, made completing work quicker, improved wellbeing, and led to fewer distractions, although there was a balanced opinion on whether remote working allowed thinking of new ideas and, overall, an impression that remote working made working with others harder. This survey, however, showed differences in attitudes among different age groups, with younger workers (aged 16 to 29 years old) having a less positive view of remote working leading to improved work-life balance and regarding remote working as offering more distractions, less creativity, and making it substantially harder to work with others than working in a central office. Similar conclusions over young people’s experience have been reported elsewhere, although remote working is regarded, on balance, as positive by most people in all age groups (Ipsen et al. 2021). A substantial survey of US workers in 2021 reported 70% found remote working was less

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stressful (than office-only work), 74% that remote working post-pandemic would make them happier, and 38% were even willing to take a 5% pay cut to work remotely at least part of the time (Owl Labs 2021b).

This improvement in employee wellbeing driving productivity increases has several roots. One likely source is the increased sense of worker autonomy. A five-year empirical study of data from 15,000 German companies concluded that organisations that allowed 'self-managed work time' typically saw 9% increased productivity (Beckmann 2016).

Another driver of remote working productivity is the powerful dynamic of focussed work time. Leslie Perlow's seminal book *Finding Time* (Perlow 1997) examined the effect of introducing 'quiet times' to the standard working practice of a team of software engineers within a large technology company. The engineers agreed upon the approach of creating quiet times on three days per week, during which engineers couldn't be disturbed until noon, except for emergencies. The results were unexpected but clear: the quiet times led to the team reporting increased productivity, reduced stress, increased happiness, and a greater awareness of each other's work. The latter was seen by the team as helping them to engage with the overall purpose of their work and to respect others' abilities and goals to a greater degree. At the end of the experiment, the employer tried to re-establish the quiet time pattern but by imposition rather than consultation; this did not give the benefits seen previously and created a sense among the engineers that the employer had no interest in them, only in improving productivity.

Perlow also reported that one engineer built a more effective team by using her flexible remote working to give greater responsibility to her team members, i.e. self-management of work time grew the team's engagement and productivity.

Of course, one of the consequences of effective remote working is the ability to focus, like the 'quiet times' in Perlow's experiment. Distractions are a major source of loss of productivity, and are certainly perceived that way by workers (Udemy 2018). Employees in an office setting routinely report 40 – 60% of working time being lost to interruptions, which is equivalent to 3 – 5 hours per day (Brown 2015). Distractions also disrupt our ability to maintain the 'flow' state of being lost in deep work (Csikszentmihalyi 2002) (Newport 2016). There is also a pernicious 'lag time' when we move from one activity to another before being able to focus on the new task (Newport 2016); unfortunately, this also occurs when we return to a task from a distraction.

The COVID-19 pandemic has certainly caused greater attention to be given to how we work and the effects of this. Despite the impression that remote working will necessarily reduce creativity, there is survey evidence that knowledge workers felt greater freedom (71% agreed, 14% disagreed), found greater opportunities to innovate and improve working (66% agreed, 16% disagreed), and explore new ways of working (60% agreed, 17% disagreed) (George et al. 2021). Similarly, the most productive remote working results from knowledge workers being able to focus on one task at a time, display self-leadership, and decide on their work schedule (Parry et al. 2021)(Galanti et al. 2021).

Daniel Pink identified the keys to motivation at work as autonomy, mastery, and purpose (Pink 2018). The evidence above agrees with this analysis, with able workers being given the time, tools, and flexibility to tackle their work leading to their improved wellbeing and productivity.



The future of remote working

The first discussions of the future of where work would take place often seemed to consider full-time remote working versus full-time office work. There is now growing understanding that a hybrid model for thought workers can outperform single-location working, whether in a central office or at home.

Leesman’s survey approach (Leesman 2021) divides work into 21 activities and gives insight into those that workers regard as benefitting most from remote working and those that are impacted negatively. Individual focussed work and planned meetings are regarded as two of the most important activities and are seen as being extremely well supported by remote working, with 90.5% and 94.1% of respondents saying remote working supports these; these are approximately 12% better scores than views on office-based work. Across the range of activities, remote working outperformed office working in 17 categories. Office-based work was seen as more effective for hosting others, informal social interactions, and learning from others.

A hybrid model would allow workers to manage their different activities so that they are conducted in the most suitable, and most effective, location: broadly, focussed work in a dedicated home-working environment and interactive work at a central office.

There appears, however, to be greater enthusiasm among workers than employers for hybrid or remote working. For example, one 2021 US survey showed 39% of employers were intending to require workers to be in a central office full time but only 29% wanted to be (Owl Labs 2021b), while another (by PwC) showed over 53% of employees wanted at least 3 days/week of home-working but 68% of employers wanted workers in the central office at least 3 days/week (Caglar et al. 2021). Attitudes in Europe may be more closely aligned, with 89% of companies expecting to keep hybrid working beyond the pandemic lockdown (Owl Labs 2021a). This compares with a survey of UK workers’ desires for remote working (Taneja, Mizen, and Bloom 2021), shown in Table 1. This shows a relatively even spread of preferences for working remotely 0 – 5 days / week but, overall, 80% of workers reported a preference for at least 1 day/week of remote working.

Days working remotely	Proportion of workers
0	20%
1	10%
2	20%
3	20%
4	9%
5	19%

Table 1. Preferences of UK workers for number of days working remotely, Mar 2021 (Taneja, Mizen, and Bloom 2021).

Employers are now embracing the positive prospects of hybrid work by thinking through how to optimise central space for interactive work, given that focussed tasks will more likely be performed at home. A recent McKinsey report (Dadlani et al. 2021) states that the majority (52%) of companies are reconfiguring their central space, with an other 39% planning to within a year. And across Europe, 92% of companies expect to have ‘more progressive’ central offices that support core hours, hybrid working or even 4-day full-time working weeks (Owl Labs 2021a).

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One approach to understanding the benefit of hybrid working on productivity is to factor in the productivity benefit only for remote working days. This will give a conservative estimate of the gain as it will overlook any efforts to optimise interactive space in a central office but, nevertheless, provides a helpful platform to start working from. This approach has been used elsewhere for many years (Lister 2010) but has fresh purpose with the widespread adoption of hybrid working today.

Conclusion

Remote working is now embedded into our working culture, whether on a full-time basis or as part of a hybrid working model. The considerable scepticism over the effectiveness of remote working that existed among employers at the start of the COVID-19 lockdown has gradually subsided, while the popularity of flexibility on the place of work among employees has become stronger through the experience of the past two years.

The reasons given by employees and employers for promoting remote working are often around employee wellbeing, and there is good evidence to support this outcome. There is also clear evidence of a direct benefit to business activity of remote working, with substantial increases in productivity and sales, and reduced employee absenteeism and turnover. Various studies reinforce the benefit of consulting employees over remote- or hybrid-working arrangements, with the agency given to staff resulting in an improved engagement with their work and substantial improvements in productivity, e.g. from 13% productivity gain for enforced remote working to 22% gain when undertaken voluntarily.

The reasons for the productivity gains are manifold. Distractions in a central office and their removal through appropriate remote-working space gives a substantial benefit by allowing workers to focus on a single task. This makes it more likely for workers to operate in a state of 'flow', which also supports deep thought and brings to bear more of an individual's skill and attention. A dedicated work room is the most effective remote workspace. Environmental factors such as CO₂ levels and thermal comfort also have a strong effect on the productivity of workers, while good levels of natural light during work help promote sleep at night. These effects have been known for many years but building design can still overlook their importance. This is seen in many designs of home office pods that become incredibly cold in winter or unbearably hot in summer and are abandoned during these times. Suitable design, materials, and technologies are available to ensure a high-quality environment, but these must be deployed appropriately.

There is concern over the isolating effects of remote working over the longer term, particularly upon collaboration and generation of new ideas. The management of hybrid working models is itself something that currently requires innovative thought and action. Many organisations are seeing this as a catalyst for change by developing central office facilities that are optimised for collaborative work while also allowing workers sufficient remote work time to tackle focussed work efficiently.

This evidence shows that appropriate support of remote or hybrid working promises to improve the productivity of 'knowledge workers' very significantly, at least by 20% if undertaken willingly and potentially far higher given an ideal workspace free of distractions and with a managed air, thermal, and light environment. The great news is that this is accompanied by improved wellbeing and job satisfaction for workers.

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