Data for Decisions Research Brief
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COVID-19 and the Economic Impacts of Working from Home: Is Necessity the Mother of Invention?

The diffusion of high-speed internet access and the development of telecommunications platforms have made it increasingly possible for employees in many fields to do their jobs from home.[1] Despite this, prior to the COVID-19 pandemic, a relatively low 4.5% of Americans reported working from home as their primary mode of "commuting."[2] The global pandemic has changed this, causing a dramatic and rapid shift to home work across the world. Governmental shelter-in-place and stay-at-home orders, which encourage or require employees to stay home unless they work for businesses deemed "essential," mean that most jobs that can be performed from home now are being performed from home in areas affected by the virus.

This massive reorganization of work from shared office spaces to homes will impact employers and employees in a myriad of ways. There are potentially large impacts on employee productivity and wellbeing. In addition, firms will incur new costs as they support employees working from home, and firms will avoid some of the costs of maintaining office spaces. The costs and benefits of the shift to working from home will vary across industries and jobs and also across geographies, as state laws governing telecommuting interact with governmental orders in response to COVID-19.

This report summarizes the latest economic research on working from home and provides new evidence on the costs of supporting employees working from home. Throughout the report, the potential impact of unplanned, short-term remote work, as in response to COVID-19, is compared with impacts of longer-term remote work of the sort taking place prior to the pandemic.

Employee Productivity

It is natural for employers to be concerned about the productivity of employees who are working from home. Employees might be less motivated or more tempted to shirk when they are not in an office with co-workers. If work is collaborative in nature, there may be a loss of productivity when teamwork is carried out through virtual interactions or asynchronous communication. However, it is also possible that employees could be more productive at home. Employees regain hours they would normally spend commuting and may have more time to work. Employees might also take fewer sick days when they work from home. Trading the distractions of a social office environment for home could possibly increase or decrease productivity.

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[1] 29% of all workers and 60% of workers in the occupation "management, business, and financial operations" report that their job could be done from home. https://www.bls.gov/news.release/flex2.t01.htm

2 Authors' tabulations of data from the American Community Survey (ACS), US Census Bureau Public Use Microdata Sample (PUMS), 2018

What can we learn from the economic research on working from home? Most studies suggest employees are *more* productive when they are working from home. Bloom et al. (2014) conducted a work from home experiment on a group of call center workers at a travel agency in China. The employees that worked from home took fewer sick days and fewer breaks and handled calls more quickly – altogether they were 13% more productive. Angelici and Profeta (2020) conducted a work-from-home experiment on workers at an Italian multi-utility company and found that the workers who were given more flexibility put more effort into their job and were more productive. Dutcher (2012) conducted a lab experiment, randomly assigning subjects to perform a task in the lab or in a home-like environment. Participants were more productive working at "home" when performing creative tasks, but less productive when performing dull tasks.

The absence of co-workers may be partially responsible for the effects of working from home. There are two papers that inform as to the nature of peer effects on productivity. Mas & Moretti (2009) studied check-out clerks in a supermarket chain and find that the presence of productive peers increases the productivity of other clerks. Falk & Ichino (2006) conducted a laboratory experiment and find that participants stuff envelopes more quickly if they are paired with a productive peer. Employers therefore need to think about productivity in the absence of peers or develop means of remotely engaging peers working from home.

Most of the studies suggest the potential for a productivity 'bump' as employees shift to home work, but productivity at home will depend on the nature of the job. It may not be possible for jobs that require more than a laptop and internet connection to be done from home at all. Among jobs that can shift to the home, those that involve creative tasks and those that do not rely on social interaction or social pressure are likely to fare well during the shift. It is also important to note that the conditions of working from home during the pandemic might not mimic those under study. The experimental groups in the studies were aware that they were being observed and may therefore have modified their behavior. In addition, they worked from home 4 days a week (the call center) or 1 day a week (the multi-utility); it might be harder to maintain productivity working from home 5 days a week. Employers and employees who have quickly shifted to working from home may not have had time to invest in setting up home offices and establishing procedures for remote work. Perhaps more importantly, during the pandemic employees have new sources of stress and anxiety, including health concerns and the fear of being laid off given the economic climate. These will likely have their own impact on productivity.

Employee Wellbeing

The shift to working from home will also affect the wellbeing and job satisfaction of employees. Pre-pandemic studies of working from home reveal that the flexibility to work from home increases job satisfaction and retention. The Italian multi-utility workers who were given more flexibility were more satisfied with their work-life balance. In surveys, employees report that they value the ability to work from home

(Gallup, 2017) and workers who work from home report high rates of job satisfaction (Golden & Shockley, 2015).

Workers also like that working from home allows them to avoid the cost of commuting, which is estimated to be $4,000 per year for the average commuter.[3] However, working from home 4 or 5 days per week can lead to feelings of loneliness and social isolation. Bloom et al. (2012) note that many individuals assigned to the experimental work-from-home group asked to come back to the office at the end of the experiment, citing feelings of loneliness.

Employer Costs

The shift to working from home will also impact employer costs. Employers will incur costs to support workers working from home, while avoiding some office costs, such as catering expenses and electricity. Some of the costs of supporting workers in home work will be shifted from the office setting, that is, they are costs the firm would normally incur to support office workers, such as the purchase of printer paper and other office supplies. Other costs will be new, like the cost of telecommunications software and laptop computers.

Legally, the extent to which companies must reimburse employees for the costs of working from home differs depending on the state. Federal law only requires that employees are reimbursed if expenditures on work-related items cause the employee's wage to fall below minimum wage. However, over half of all states and some local jurisdictions have additional reimbursement requirements. For example, California requires employers to reimburse "all necessary expenditures employees incur in direct consequence of the discharge of their duties."[4] This has been interpreted to mean that employers should reimburse employees for all the supplies they need to do their job, including laptops, computer accessories, printers, paper, and pens. In addition, if employees use their personal internet connection and cell phone service to conduct work, employers are expected to reimburse employees for a reasonable amount of the cost of each. In contrast, Massachusetts only requires employers to reimburse for mileage when employees travel in the course of their jobs.[5]

How can employers plan for these costs? It depends on how much consumers spend on cell phone service, internet access, and other office supplies. Data for Decisions has conducted an analysis of the Consumer Expenditure Survey, the largest representative survey of American consumer behavior, conducted each year by the Bureau of Labor Statistics. With over 6,900 Americans interviewed each quarter, this survey allows us to accurately measure American spending on key categories of interest to employers.

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[3] 2017 State of Telecommuting in the U.S. Employee Workforce, Flexjobs and Global Workplace Analytics.

[4] See California Labor Code §2802

[5] See 455 Code Mass. Regs. § 2.03

The Table below shows the average annual expenditure on categories relevant to home office reimbursement. The average American who has cell phone service spends $794 per year on their service. The amount varies from $770 in the Western region of the U.S. to $833 in the South. Spending on phones and accessories averages $677 per year at the individual level. Since households typically share internet access, we will focus on the household figures for this category of spending. Households with internet access spend an average of $736 per year, and this varies from $716 in the Midwest to $770 in the Northeast. In addition, individuals spend $185 per year on computer accessories and $242 per year on business equipment.

Average Yearly Spending on Potential WFH Business Expenses from Consumer Expenditure Survey (CEX)					
Average Spending	**Region**				
	Northeast	**Midwest**	**South**	**West**	**Overall**
Cell Phone Services	$791	$777	$833	$770	**$794**
Phones and Accessories	$759	$622	$685	$659	**$677**
Computer Information Services (Internet Access)	$770	$716	$735	$735	**$736**
Computer Accessories	$229	$174	$189	$168	**$185**
Business Equipment for Home Use	$227	$282	$236	$236	**$242**
Table shows average spending for individuals excluding non-buyers, except for computer information services (internet access) where average spending is for households excluding non-buyers.					

Conclusion

As employers and employees navigate uncertain waters in the face of the global pandemic, data and evidence can help facilitate planning. This report aids in anticipating changes in productivity, employee wellbeing, and the costs of supporting employees working from home as work arrangements shift.

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