The working-from-home revolution and the performance of cities

EXECUTIVE SUMMARY

COVID-19 and rise of working-from-home and hybrid working has the potential to fundamentally reshape people's interaction with workplaces, commuting patterns, and the economic geography of cities and regions.

This research has examined the effects of the new working landscape on the spatial structures and performance of cities by:

- Examining evidence on the kinds of changes cities are facing
- Outlining what that means in reality, in particular how the choice of commuting frequency affects where people live and where businesses are based

Taken together, the results imply enhanced productivity of larger cities over smaller cities. Rather than allowing work from anywhere, the work from home revolution generates greater forces to live within a commutable distance of ever-larger cities.

The authors have developed mathematical models to explain how the choice of optimal commuting frequency is related to where firms are located in relation to the city centre and if they are onsite or hybrid workplaces.

These models take into account the:

- Length of commuting distance
- Frequency of commuting
- Saved commuting costs
- Firm's total pecuniary and opportunity costs. In other words, what financial benefits a business may have to give up when choosing one alternative over another.

Zoomshock

The onset of the COVID-19 pandemic in 2020 made working-from-home a central feature of the working routines of hundreds and millions of workers. The rise in the use of platforms used to facilitate online meetings has been labelled 'Zoomshock' and has rapidly changed how both workers and organisations consider their employment roles.

There's widespread evidence that suggests WFH has favoured workers with higher skills and earning higher incomes, especially in high value service industries, and those in managerial, professional or financial occupations.

Zoomshock-induced hybrid working opportunities have forced workers and organisations to reconsider the efficiency and effectiveness of their spatial relationships – where they live, work and how often they commute. Time in the workplace is now a key decision-making variable.

Optimising commuting behaviour

The authors have created a series of equations to determine optimal commuting behaviour, considering the opportunity costs of in-person interactions, the cost of travel and the time it takes.

They suggest workers will undertake hybrid working if the overall reduction in productivity per day due to working from home is less than the overall cost of commuting, generating a productivity improvement overall.

UK evidence suggests that large cities could potentially double or even triple their commuting hinterlands if workers cut down their commuting on average from five to three days per week, while spending the same overall time commuting per week.

In some circumstances, the new hybrid working practices may offer large and prosperous cities even greater advantages over smaller cities. This is because larger cities could draw their workers from a wider hinterland, including that of nearby smaller cities.

This also implies an increase in economic activity in larger metropolitan areas and their hinterlands, where utility and wages have increased by a greater amount than in smaller cities, since commuting is less burdensome. It also implies potential shadow effects on smaller cities that are too far away to host commuting hybrid workers as residents.

To read more about the research synthesised in this Executive Summary and for a full list of sources, please read *The work-from-home revolution and the performance of cities* by Professor Steven Bond-Smith (The University of Hawai'i) and Professor Philip McCann (The University of Manchester), Working Paper No. 026 from The Productivity Institute.

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How new working patterns are reshaping cities

Within cities (Intra city)

- Workers who choose to live further from the Central Business District (CBD) of a city will bear a greater share of the opportunity cost to productivity per day working from home, but not the entire cost, and commute less frequently.
- Firms with offices located further from the CBD will have workers who commute less frequently and will bear a greater share of the opportunity cost to productivity per day working from home but will be able to save on rent of office space.

These both imply that workers will tend to live further from the city centre and offices will tend to locate further from the centre, because workers now commute less frequently. This also means:

- People will tend to move further out within the city they live and work in because commuting is less burdensome, allowing them to have larger homes in places where building space is cheaper.
- Businesses will also tend to move further out because their share of commuting is less costly when commuting occurs less frequently, allowing them to have offices further from the city centre.

Allowing for existing buildings and houses, initially this would imply a decline in the prices and rents of inner city building space, and an increase in the suburbs, prosperous areas outside the suburbs and other hinterland communities within commuting distance.

Between cities (Inter city)

The frequency of commuting will be lower for workers with a longer commuting distance, both from homes or to offices. But the impact on wages is only proportional to the worker's share of overall commuting costs. In other words, there is a bigger reduction in frequency when working from home for workers in larger cities, and a bigger welfare gain from reducing frequency in larger cities than smaller cities.

Bid rent curve

A geographical economic theory that refers to how the price and demand for real estate change as the distance from the central business district increases. It states that different land users will compete with one another for land close to the city centre.

Spatial organisation

This examines how to recognise and organise the geographic space in which human activities occur, which gives rise to spatial structures. The term 'urban spatial structure' is used to discuss the distribution of activity within a metropolitan area. Spatial relationships refer to the way objects, in this case business and homes, are arranged in relation to one another in a particular space.

Donut effect

When there is greater growth in the suburbs and hinterlands around large cities. Evidence in the United States using real estate pricing has indicated a growth of suburban real estate markets relative to city centre markets. Counterintuitively, the reduction in the frequency of commuting makes larger cities and their hinterlands more desirable places, despite longer commuting distances. Hinterlands are outlying areas beyond major metropolitan cities and suburbs.

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Key results

In response to Zoomshock, the intra-urban rent gradient has flattened, giving rise to the 'donut' effect which favours larger cities. This also gives rise to the inter-urban shadow, which is a theory that smaller places close to larger cities don't benefit from their location.

This result appears to be counterintuitive to the idea of a post-COVD economic development boost for smaller and more remote places.

Instead, this research implies that falls in commuting frequency favour larger places where commuting distances are longer.

It also implies that hybrid working will tend to move economic activity from more rural and remote places to larger metropolitan areas that extend their hinterlands. Before the pandemic, these were activities that were deterred from a metropolitan location by the exorbitant commute.

Spatial sorting – what is based where?

The hybrid work revolution is affecting where businesses are based, and where their workers live.

- Firms that find hybrid particularly costly to their productivity because they rely on more face-to-face interaction are likely to choose more central locations where it is easier to commute. They may even be able to shift into the centre in the largest cities due to a decline in rent in these places. Their employees could be live in more central residential locations if they spend more time in the workplace, since wages will be less impacted by commuting more frequently.
- Firms that require less working on site would be based further from the city centre, into more distant locations where rent is cheaper. These more remote workers could shift further into the metro-hinterland, because the burden of commuting is now a smaller deterrent for firms to locate in the biggest cities.

These potential long-term sorting effects would all appear to favour both city centres and larger cities, which in the long run, are likely to benefit from even greater concentrations of face-to-face knowledge intensive activities.

Effects on communities

If higher-skilled workers living in smaller cities are more able to switch employment to the larger more distant cities, this will imply that their incomes will increase. This also implies that they would spend their money in their local area, providing possible new opportunities for local entrepreneurs.

But workers choosing to work further away may also create a negative effect on the economic activity in their place of residence if they don't spend their money locally.

The overall effects on the smaller cities will therefore depend on the balance between these two opposing effects. As yet, there is no empirical evidence on these issues.
Remote working

Only fully-remote work will shift activity away from the larger cities and their hinterlands. And this type of work may be gradually outsourced overseas in much the same way that it already is.

Nonetheless, the largest cities also offer amenities, so the reduced burden of commuting would still imply that even fully-remote workers face a greater increase in the attractiveness of the hinterlands of large cities than rural areas. This means that the only rural areas that would truly benefit from fully-remote work would be those places with significant natural amenities that could not previously host those activities.

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Conclusion

The research does not directly model migration between cities, but the results imply migration of both workers and firms from smaller towns to larger metropolitan areas because of the reduction in the burden of commuting.

It means that commuting is now less of a deterrent to locating in a large city, so both firms and workers face a stronger attraction to relocate to larger cities, or at least their hinterlands, which used to have a costly commute.

This result is true whether work is entirely remote or hybrid. Essentially, commuting is a significant burden of living in large metro areas and the shift to fully- or partially- remote work reduces that burden by a greater amount in places with longer commutes resulting in a greater welfare gain in large cities and for people who relocate to large cities.

Arguably, this force could be counteracted if some of the productivity benefits of agglomeration economies are now shared more widely by smaller cities able to access remote work tools. But only to the extent that the decrease in relative productivity between small and large cities is greater than the savings from reduced commuting by working remotely in the larger city. However, given these technologies are designed for working at home, rather than the workplace in smaller cities, it is also not at all clear that this will be the case.

As yet, there is no evidence that the Zoomshock revolution has spurred innovation and productivity growth in general, however our analysis implies that the returns to productivity growth will be reconfigured spatially, and this reconfiguring is likely to benefit larger and more prosperous cities than smaller or less prosperous places.

Future research questions

- Could the new working landscape level the playing field and narrow inter-regional inequalities? Or could it cause the opposite?
- Is it only places on the urban fringe that will benefit from a permanent switch to hybrid working?
- Does the working-from-home revolution actually favour certain types of cities over others?
- Are there any new types of hinterland effects which may alter the pre-existing urban hierarchy?

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