The brave new telework economy

Bowling Green, Ky. (October 30, 2024) - Remote work is changing how capitalism operates. It's changing it a lot, fast, and mostly for the better. Everyone is dimly aware of this by now, but few are even beginning to understand the ramifications. We need to. It's time to start really wrapping our heads around the brave new economy of the teleworking future.

To that end, this essay channels the rich thought and findings of many scholars who assembled in San Francisco from October 9 through 11 for a Hoover Institution conference full of cutting-edge research about remote work, the third of its kind. Their findings mostly showed data (empirics) and efforts to make sense of it (theory), mostly on economics but with some other disciplines like management represented, and mostly focused on developed countries like the United States and large European nations, with some researchers and results from the developing world, notably Latin America.

Some downsides of and misgivings about mass telework came up, but in general, the research findings were positive and optimistic. It's a wakeup call to just how good a thing it is that many of us can now work from anywhere, and how much brighter the future of humanity is because of it.

About one-quarter of workdays are now done remotely. That's down from more than half at the peak of pandemic lockdowns, but it's four times the pre-pandemic level. And the return-to-office movement is largely played out. Mass telework is the new normal.

That's good for the quality of life of the people who do it, and for the economies of places where they settle. But the best part is that telework mitigates geographic constraints on hiring and job seeking, enabling businesses to assemble more productive teams, and more workers to find career paths where they thrive. It also makes the workforce more inclusive, enabling people with physical disabilities to get jobs, and new mothers to stay professionally engaged.

The Stanford remote work conference provides powerful new evidence and argumentation that, as I recently argued, "Telework spreads the wealth and boosts innovation."

Defining terms

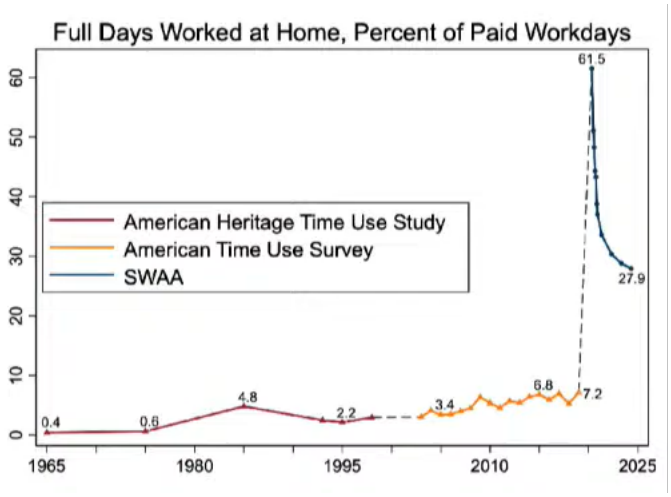
While the researchers mostly talked about "work from home," I'll call it "telework," which captures the way the rise in working from home is enabled by the new technology of broadband connectivity. The phrase "remote work" was also frequently used in the conference and will be used here.

Strictly speaking, working from home, telework, and "room of work" are not the same. You can write books or build furniture at home without using the internet. You can work remotely not just from home, but from a local Starbucks or a hotel room in a vacation paradise. Generally, the data don't allow for such fine-tuned distinctions, so I'll treat them as synonyms. But the word "telework" captures the great change best.

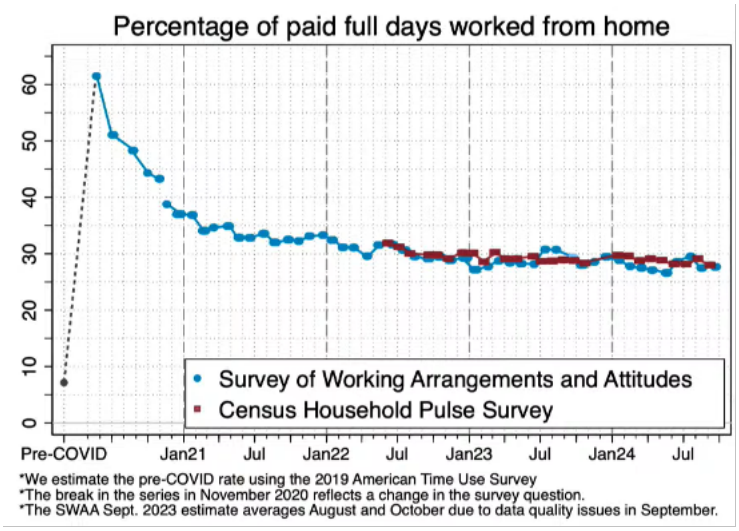
Note that throughout this essay, chart callouts are hyperlinked to the time points in the conference where they were presented. Readers can click through to get more context about them.

Yes, mass telework is the new normal

A major takeaway from the conference is that yes, mass telework really is the new normal. This is nicely illustrated in a chart shown by Mark Ma, based on combining different data series to show the huge surge in working from home that took place in 2020, followed by a partial reversion.



Telework rates have come down a lot from their pandemic peak. But they've stabilized at a level far higher than before. Another chart, presented by researcher Mert Akan, show telework rates converging to a level a little above 25%:

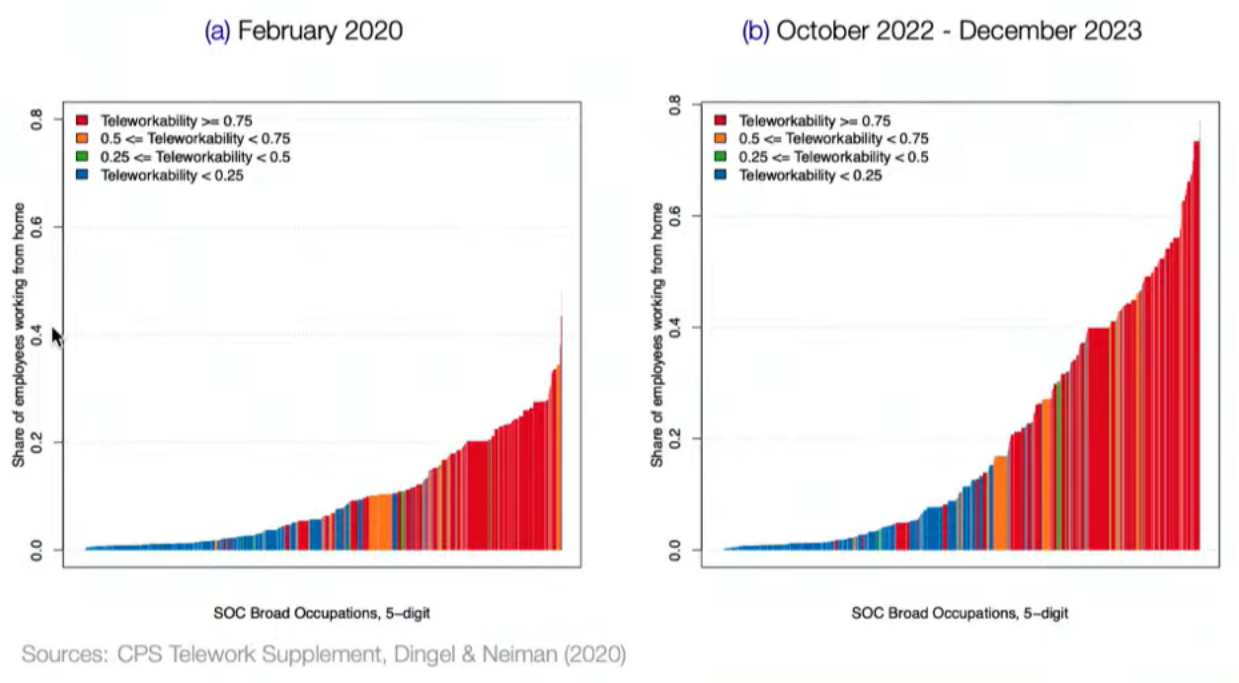


From these and other data presented at the conference, it seems clear that the pandemic caused a step change in telework behavior. Mass telework has been feasible for a long time. But for some reason, adoption stalled for a decade or so and telework remained a niche phenomenon. The data show little or no pre-pandemic trend pointing to so much telework.

But the digital age had already endowed capitalism with a latent capacity to run offices remotely, which came in very handy when the global pandemic compelled us all to engage in maximum social distancing. And remote work proved beneficently habit-forming.

Telework adoption varies greatly, of course, by occupation. Some jobs are inherently high-touch and can't be done online. The chart below, presented at the conference by Lukas Friedrich Mann,

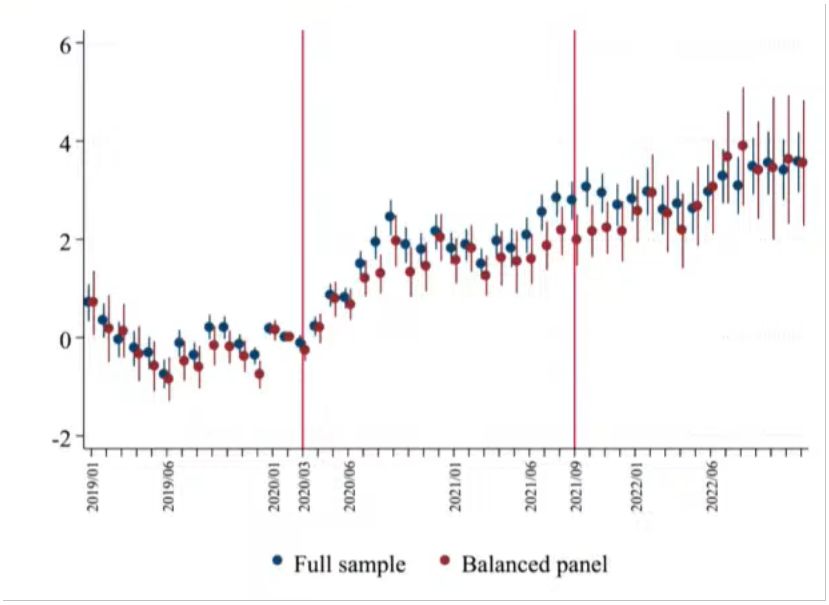
classifies occupation by an indicator of how suitable the job is for telework and compares the last pre-pandemic month of February 2020 with a 15-month average three years later. Telework rates rose across the spectrum, but some occupations still practice little of it, while in the most telework-friendly occupations, more than half of workdays are done remotely.



It's a bit puzzling that a temporary emergency should cause a permanent change in how capitalist economies work. If mass telework is a good idea, why weren't we doing it before? If we had good reason to commute to the office before, why haven't we gone back now that pandemic fears have subsided and most of life has returned to normal?

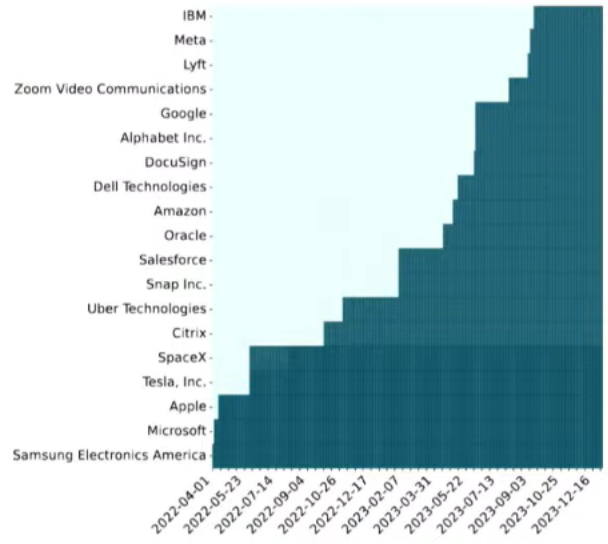
One simple answer is that emergency telework during the pandemic was a learning experience. Maybe firms just didn't know how well telework worked until they tried it. Or maybe they had to do some investment in technology and organizational learning to create telework capability. But by the time the pandemic faded, they were used to it and liked it.

That was the experience of one Turkish call center, detailed at the conference in a paper by Cem Ozguzel, whose key finding is captured in the chart below, which shows the rise in calls per hour as employees went remote.

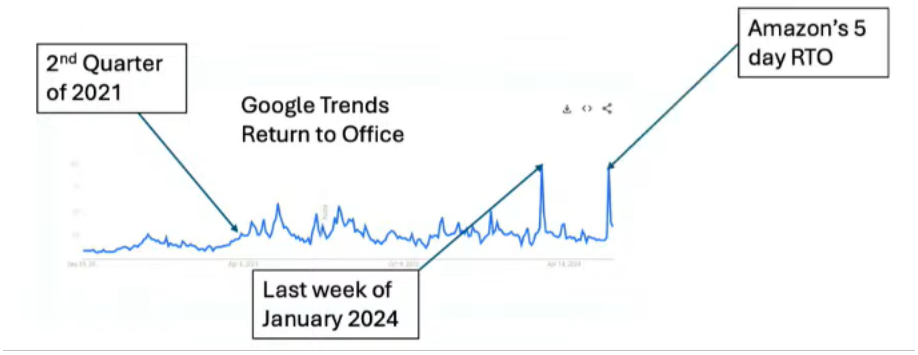


Ozguzel's study showed how, after the call center sent its employees home, it found nuanced but on-the-whole positive changes. The key factor in this case may have been the noisy environment in the office, which inhibited productivity there compared with quieter homes. Whatever the reason, the change worked, so it stuck. Remote work became a permanent part of the call center's modus operandi.

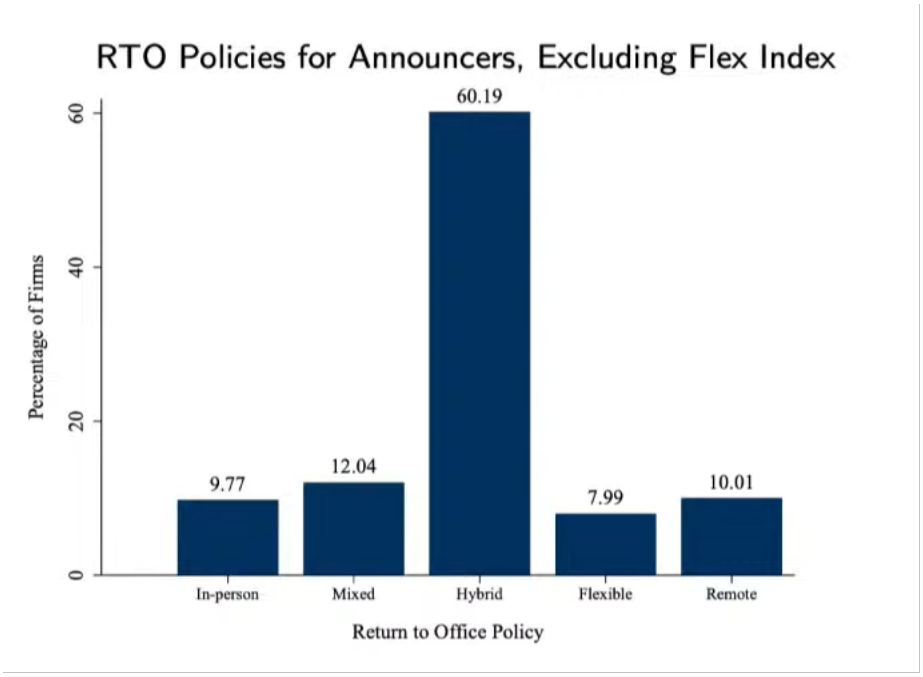
While that call center's experience seems to be representative of many firms, not all bosses like the shift to telework so well, and many have tried to reverse it. The chart below, from David Van Dijcke, shows the timing of "return to office" (RTO) mandates by many famous films.



Relatedly, Google Trends shows ongoing elevated interest in the topic of RTO after 2020, with peaks driven by certain major firm announcements, as reported by researcher Mark Ma.



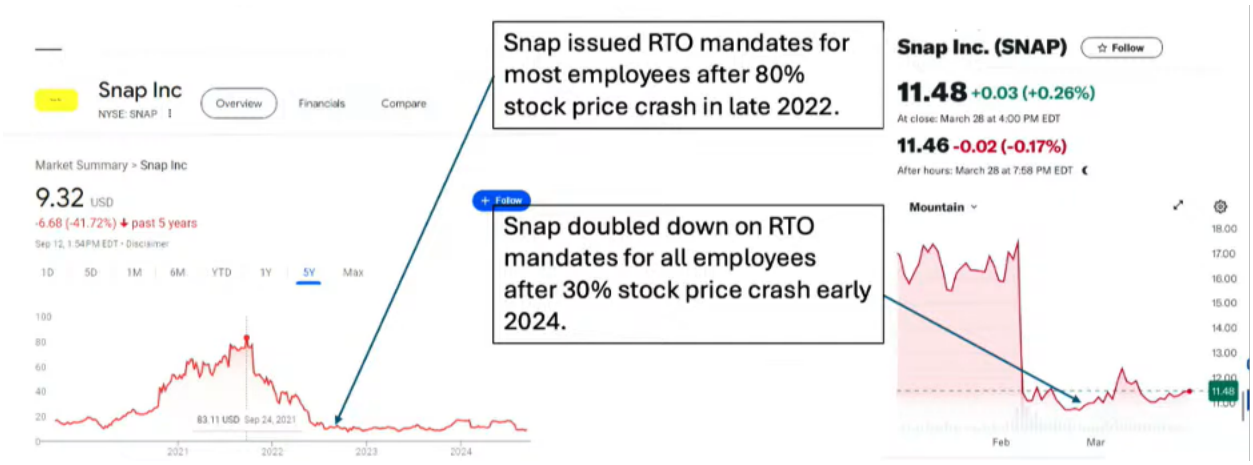
But while thousands of RTO mandates have been issued since the pandemic, they are not all the same, and the strictest kind, which make office attendance mandatory throughout the work week, are quite rare. A large majority are "hybrid," in that they require some structured time in the office but allow for substantial work from home as well, as shown in the below chart from a presentation by researcher Sean Flynn.



Overwhelmingly, even companies that are trying to restore some level of mandatory office attendance rely on remote work more than in the past.

In any case, the evidence presented at the conference doesn't point to RTO mandates having strong business justification. Two papers found that they don't raise the share prices of companies that announce them. They tend to be issued by older CEOs, male CEOs, and more powerful CEOs, less so by younger and female CEOs.

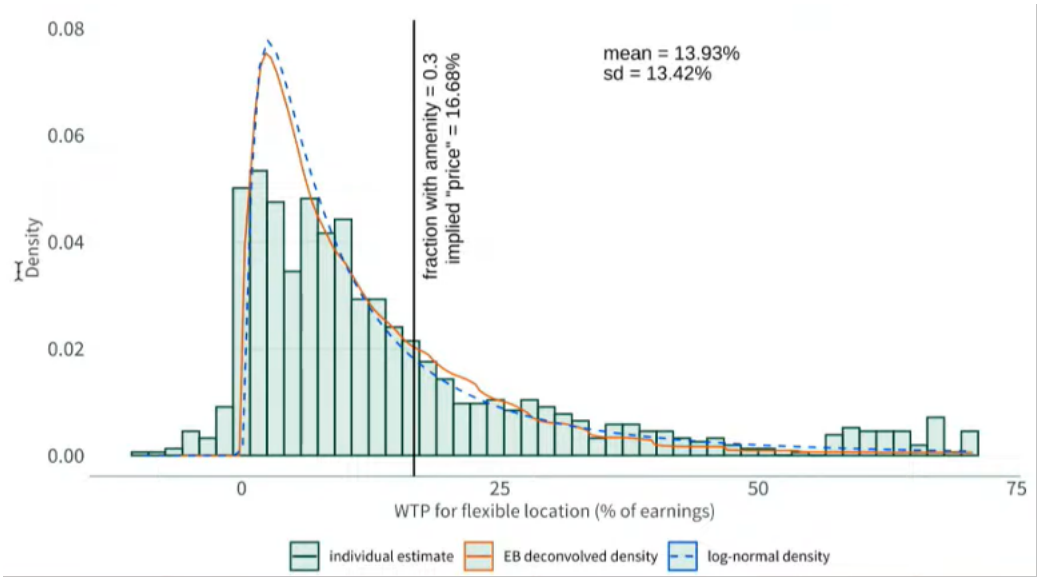
Also, they tend to happen after large share price drops. For example, the chart below, from the presentation by Mark Ma, shows how two RTO mandates by Snap Inc. occurred after two major crashes in the company's share price, in a pattern that Ma's statistical analysis indicates is representative of a common experience.



And David Van Dijcke's paper, using data derived from published résumés, found that RTO mandates by big tech companies led to accelerated exits by senior staff, often in favor of competitors. The finding exemplifies how firms' needs for employee retention helps to keep telework's market share buoyant.

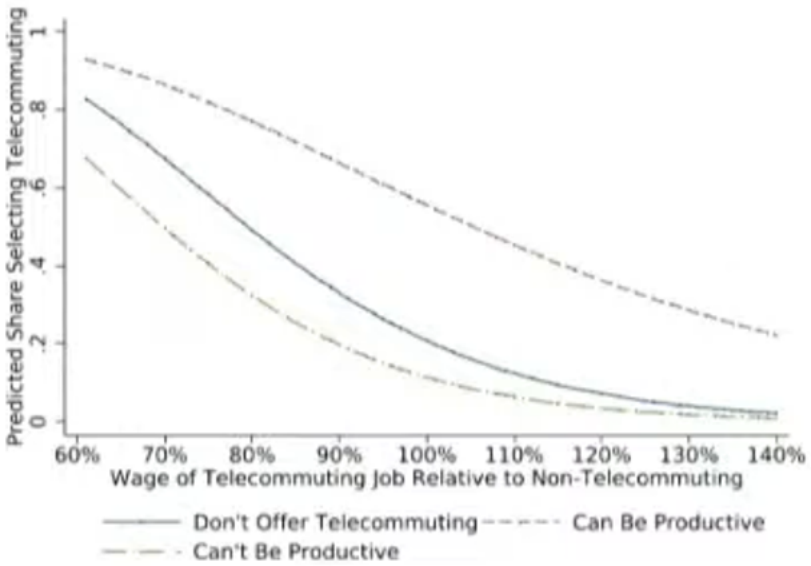
As a very rough generalization, employees like telework more than employers dislike it. This was illustrated most clearly by two papers that probed attitudes of workers and hiring managers through skillfully designed survey research.

Linh To teased out the value attached by workers to the option of working remotely whenever they wanted to and found a mean value of about 14% of wages, with a small minority preferring mandatory office attendance, while a "long tail" of telework lovers valued it much more, in some cases at more than half of their pay.



A similarly designed survey of hiring managers by David Powell found that most current telework employers regard it as a cost saving and might actually pay slightly more to an employee who didn't need to be furnished with an office.

By contrast, employers of non-telecommuting workers would regard accommodating telework as a cost, in varying degrees, or simply as infeasible. But as a share of wages, the median cost to switch a currently non-telecommuting job to telework was estimated at 9.4%:

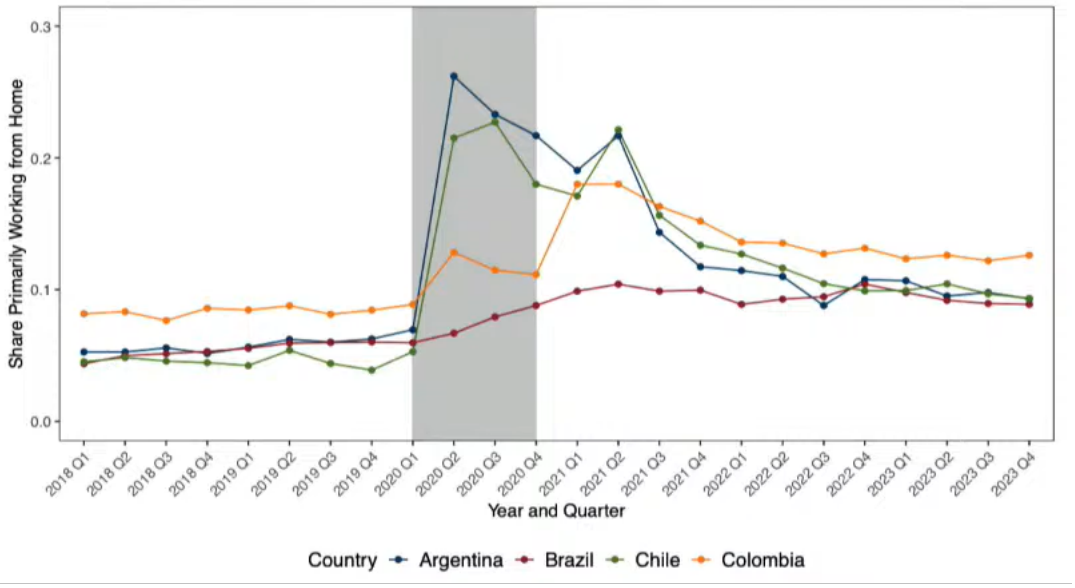


Now, when the value of a job amenity to a worker is less than the cost of providing that job amenity for the employer, there is a mutually advantageous deal to be made, whereby the employer could let the employee telework, in return for which the employee would accept a small pay cut, and both would be better off. But it's hard to negotiate for that directly because direct discussions of pay and job amenities between managers and employees can easily go sideways.

The irony, then, is that the pandemic cloud has a major silver lining, since it forced workplace changes that created a lot of net gains. Afterward, some employers perceived telework as advantageous to themselves and stuck with it, while other employers were skeptical and wanted to go back. But that was limited by the need to be competitive in employee recruitment and retention.

By the way, the rise in telework isn't just in the United States, or the West. It's occurred globally. For example, in Latin America, as

Pablo Zarate showed:



Organizational learning and latent preferences are key to how telework got locked in as the new normal. Over time, as we'll see, telework lock-in is getting deepened by changing economic geography. Since the pandemic caused telework to achieve critical market mass, people are leveraging it to find new and more appealing kinds of work-life balance.

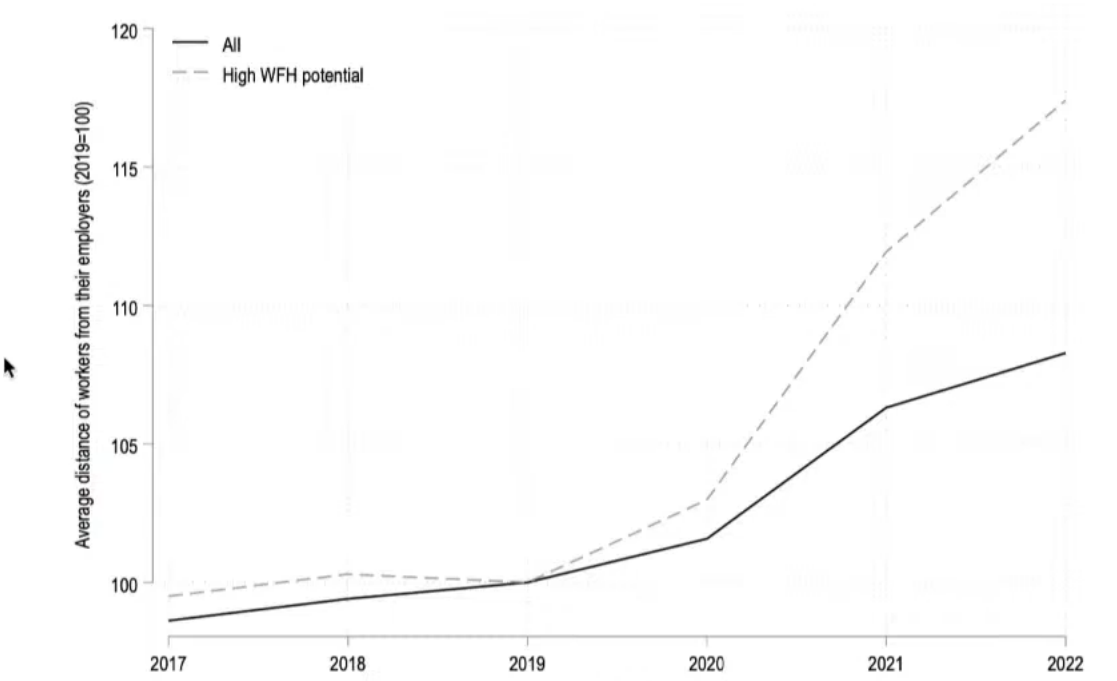
Telework is altering economic geography

One benefit of telework is that people who still live and work in the same place as before can now save time and money on commuting. But there are even more benefits for people who don't. A lot of people have been changing where they live and/or where they work for better quality of life and/or better professional fit, taking advantage of the new locational freedom conferred by an age of telework.

In the case of hybrid jobs, where some on-site work is required but some workdays can be done remotely, it's still important to live within a reasonable commuting distance. But because you don't have to commute into the office every day, the trade-off between commute time and other locational amenities in choosing where to live changes. It's reasonable to live a little further from the office because you don't have to go in as much.

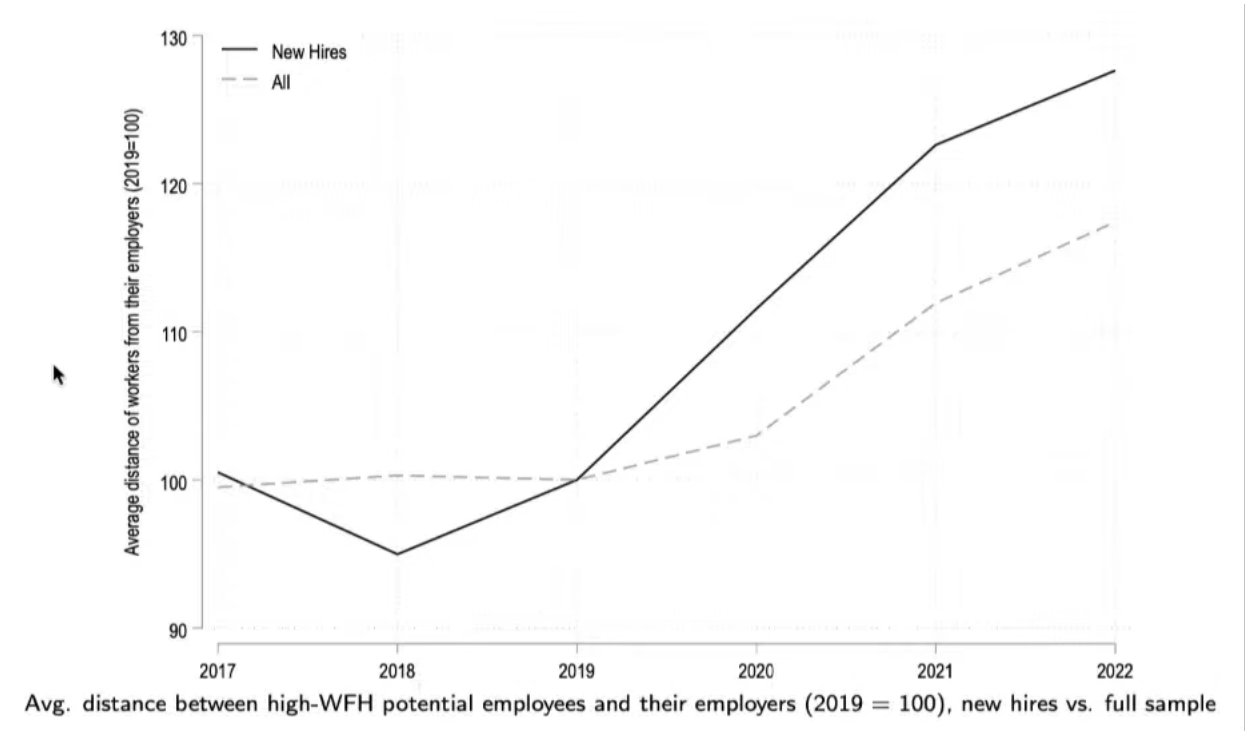
In the case of fully remote jobs, people can, in principle, live anywhere. Colleagues on the other end of a Zoom meeting may not even know, and probably won't care, whether you're in Indiana or Italy or Indonesia.

Three papers at the remote work conference focused on how the distances from people's workplaces to their homes have increased since the pandemic. Filippo Boeri's French data showed a rise of almost 10 km in the average work-home distance, and over 15 km for people working in telework-friendly occupations:



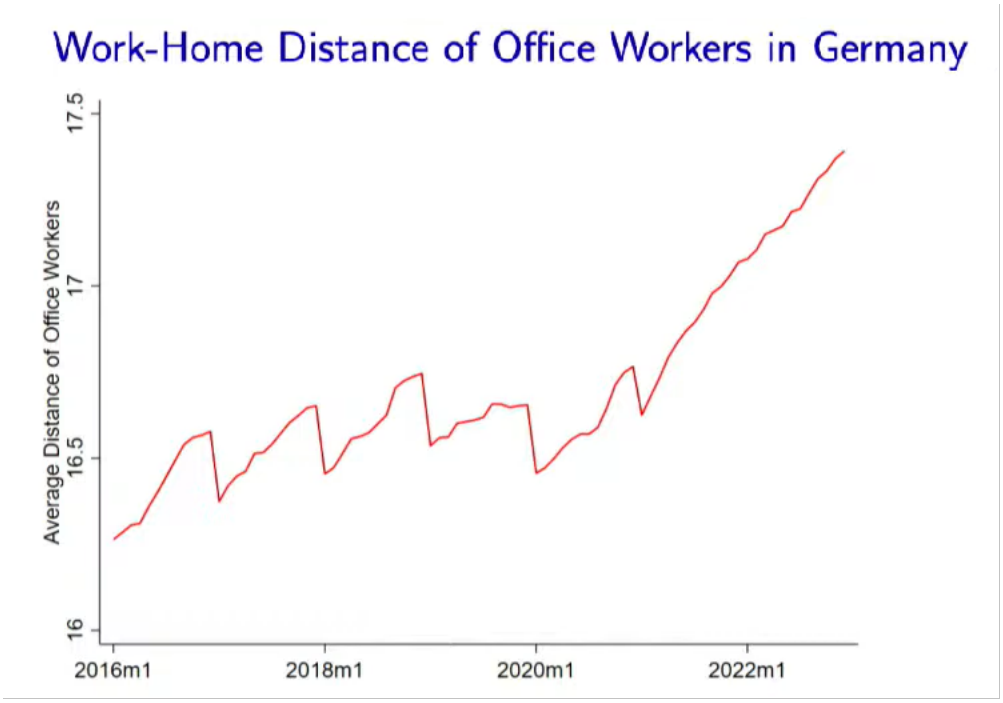
Avg. distance between employees and their employers, high-WFH potential vs. full sample (2019 = 100)

The rise in work-home distances was particularly sharp for new hires since 2020, as Filippo Boeri also shows:

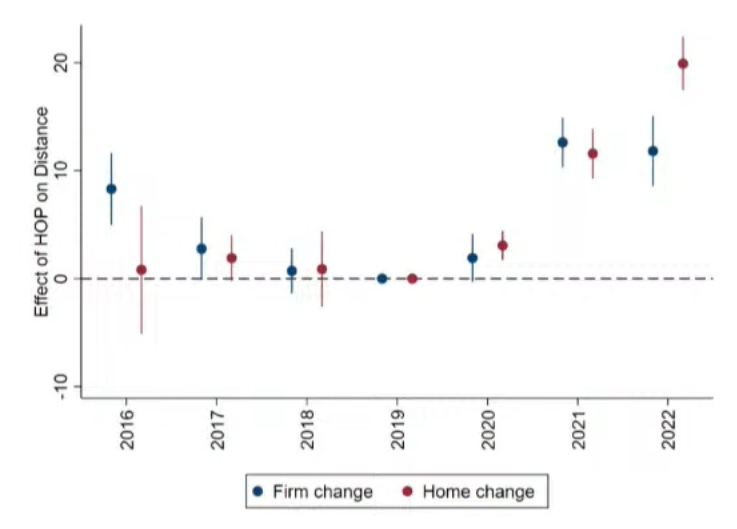


Avg. distance between high-WFH potential employees and their employers (2019 = 100), new hires vs. full sample

Researcher Sena Coskun found a similar pattern in Germany, with work-home distances rising sharply since the pandemic:

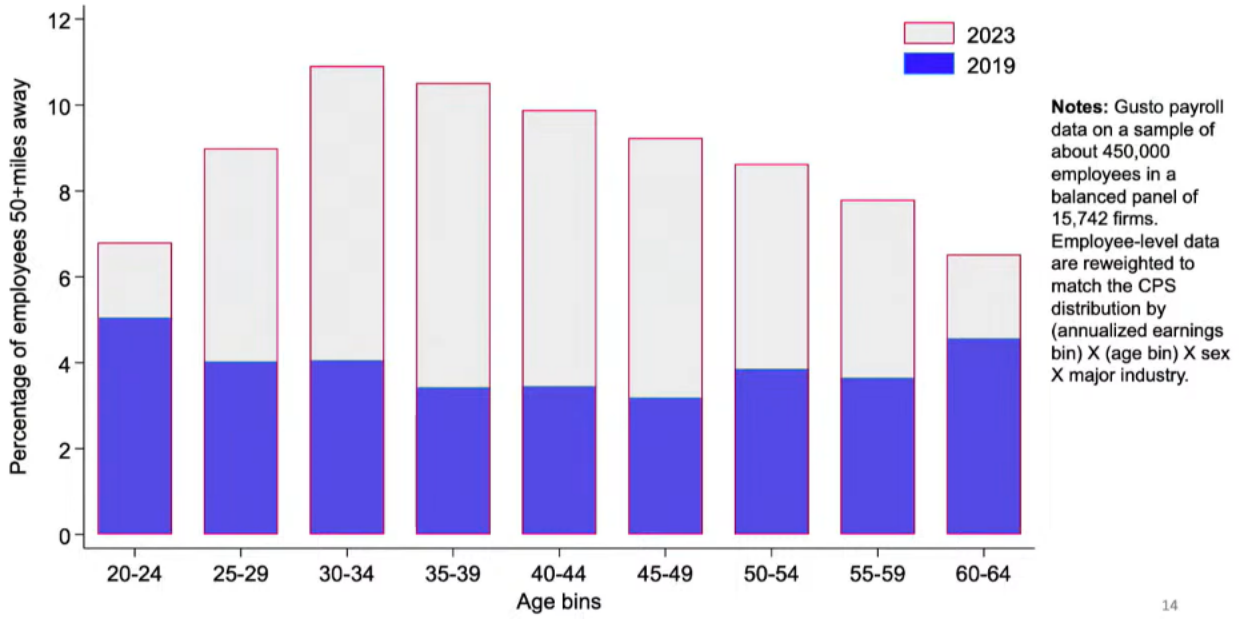


Sena Coskun also had data on the impact on work-home distances of both home changes and firm changes. The chart below shows the patterns for people in telework-friendly occupations, as distinct from the rest of the sample.

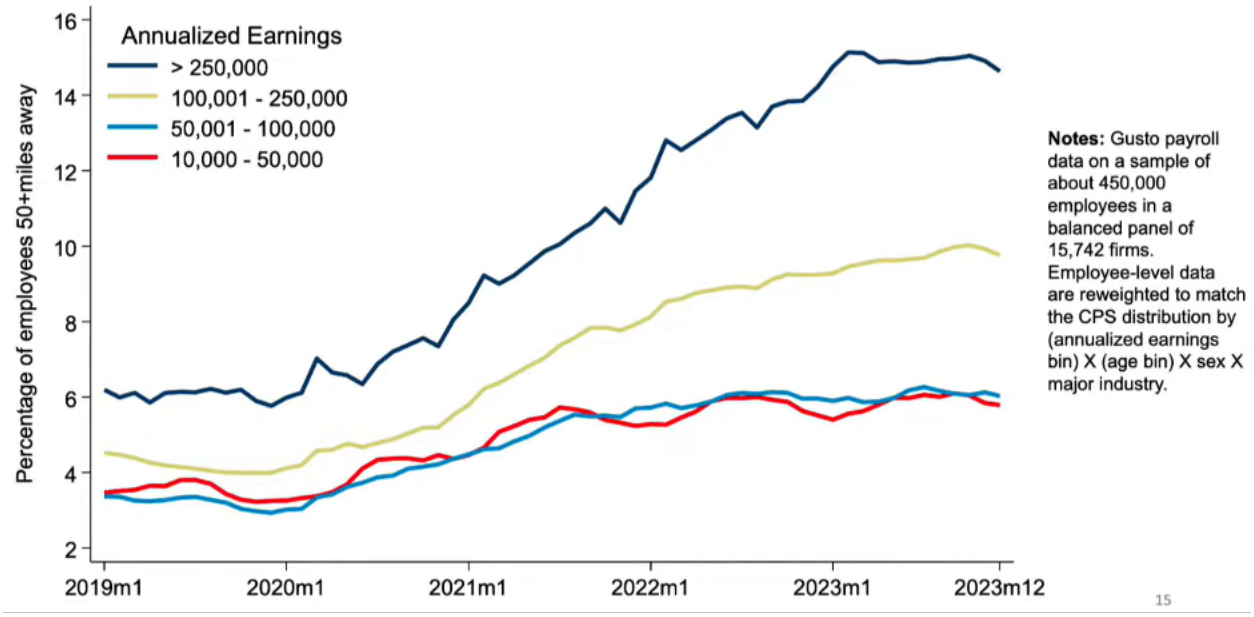


Prior to the pandemic, there was no tendency for people in teleworkable occupations to switch jobs or move houses in ways that increased their distance from their employers. After the pandemic, they began to do so, with the trend, if anything, accelerating.

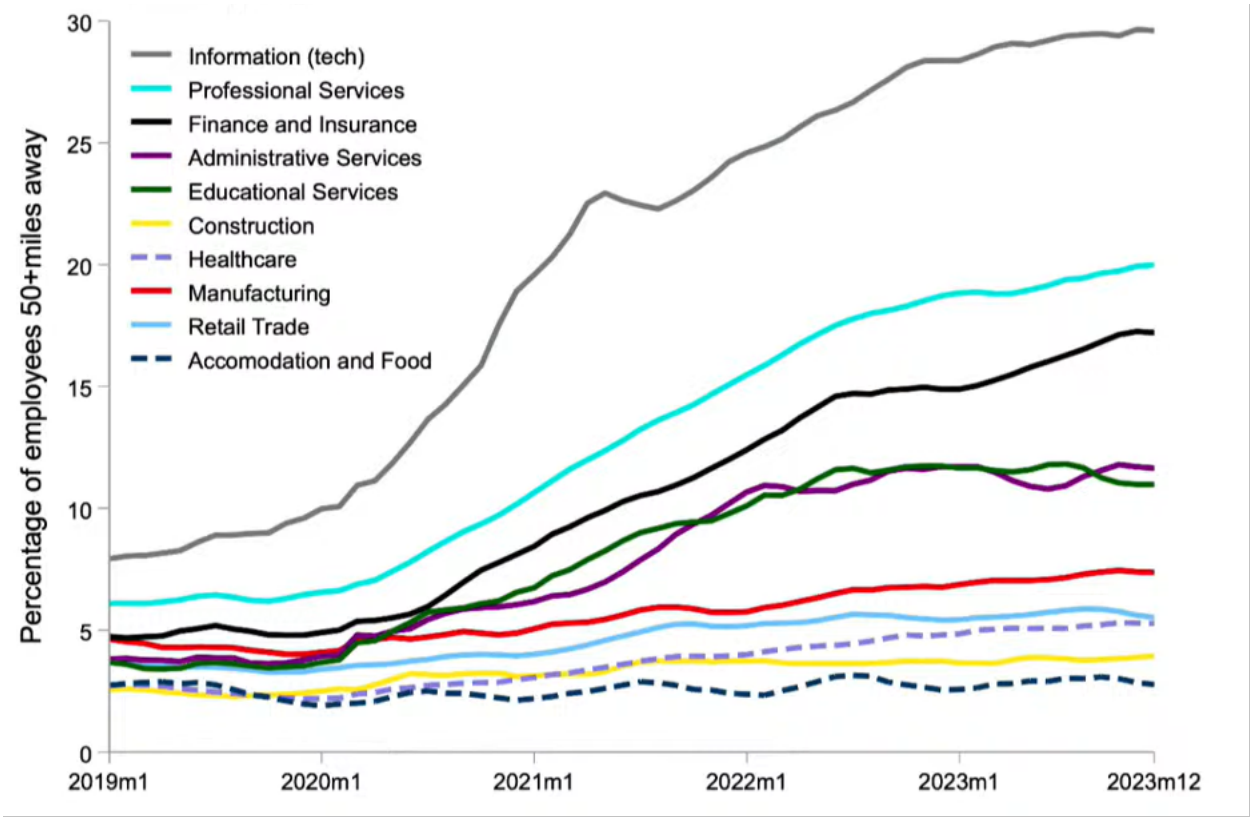
In a paper showing similar patterns in the United States, Mert Akan identified the prime career building years, ages 25 to 50, as the time of life when people are now most likely to have an employer more than 50 miles from their residences, in a reversal of pre-pandemic patterns:



Mert Akan also found that the surge in long work-home distances was most striking among high earners. Note that this doesn't mean teleworking *causes* people to earn more. Much of the difference is explained by the way that cognitively demanding occupations tend to be both better paid and more telework-friendly.

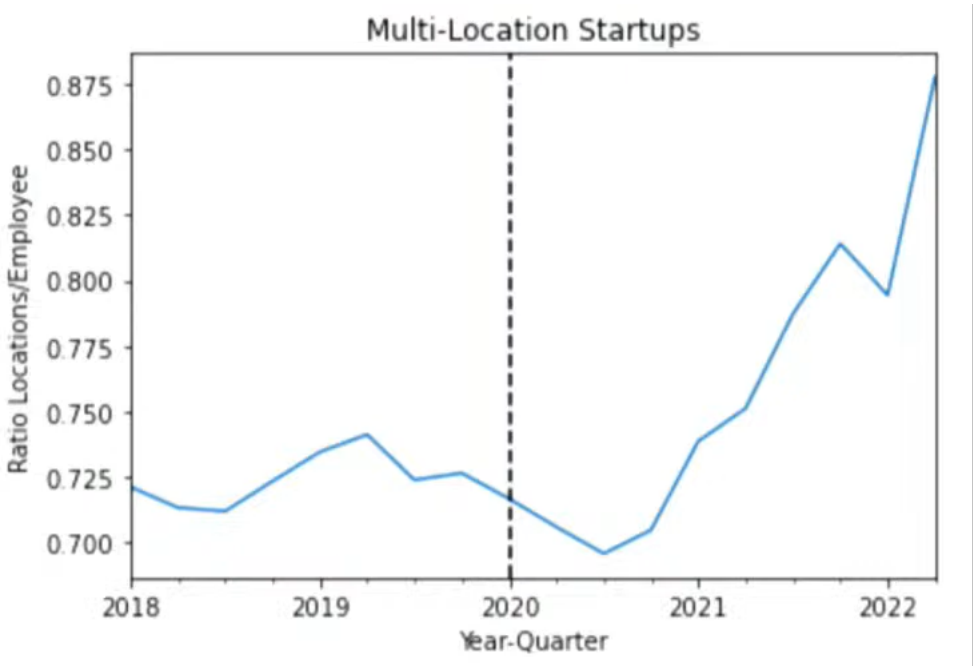


Long work-home distances are much more common in some industries than others. People in construction or accommodation and food services very rarely live more than 50 miles from their work sites, while nearly 1/3 of workers in the information technology industry, nearly 1/5 of those in professional services, and nearly 1/6 of those in finance and insurance, do, as Mert Akan also shows:

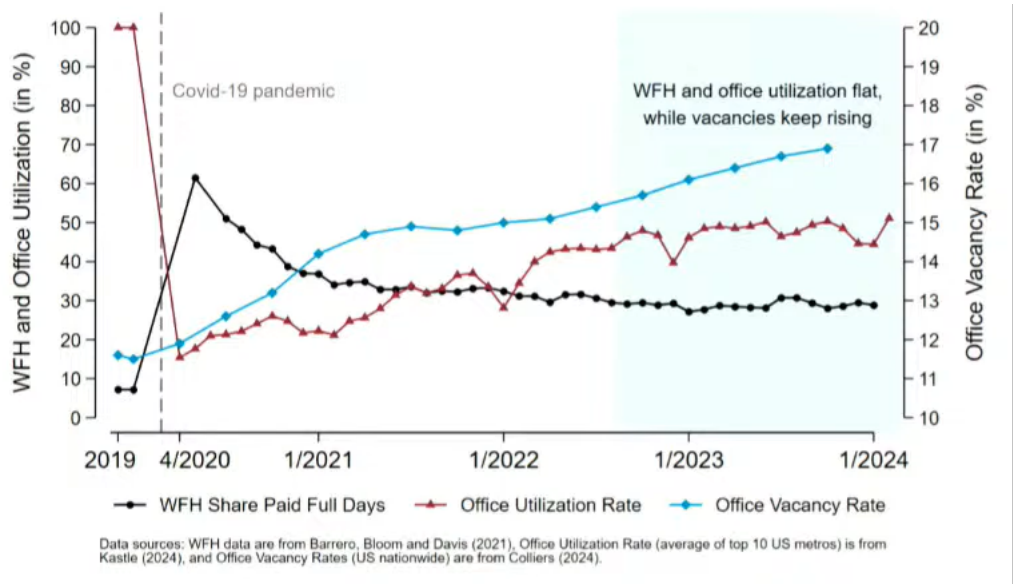


Before the pandemic, industries' ranks on this measure of remote work were similar to what they are now. But then, long work-home distances were rare across the board. Old customs kept people working locally even if digital connectivity could meet all the actual collaboration needs from far away. The pandemic broke the old habits and made some industries very telework-friendly. Other industries have real operational needs for physical presence, so there has been much less change.

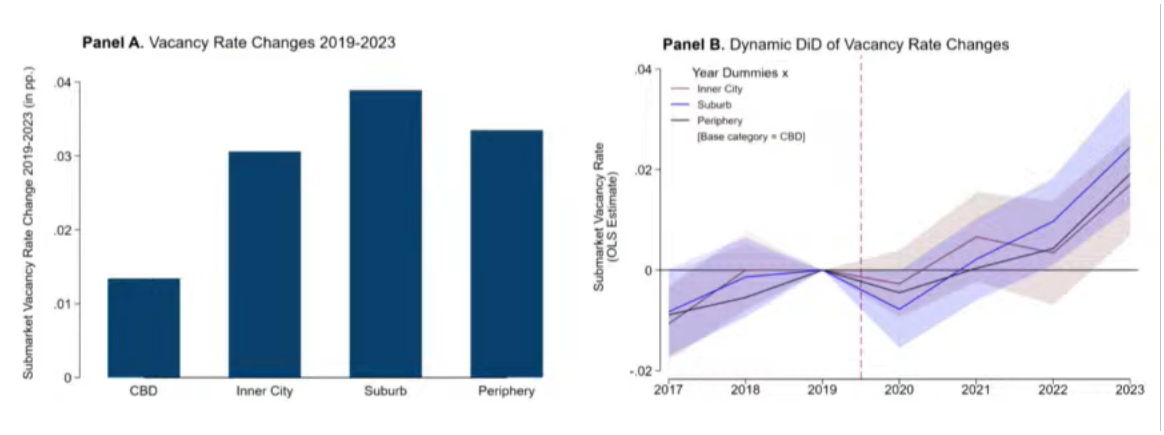
Tech startups are good at using telework, as a paper by Arpit Gupta shows, and a big reason why is that it enables them to recruit nationally, without expensive relocations. Gupta shows a sharp rise in the ratio of locations to employees for new startups.



Telework directly undermines the need for office space, so the period since the pandemic has generally been bad for commercial real estate. The chart below, shown at the conference by Simon Krause, displays how the office vacancy rate has continued to rise, in spite of a slight downward drift in days worked remotely and a modest recovery in office utilization.



The chart suggests that if you still have an office, you're probably spending more time there as pandemic fears subside, but renewing leases on office space when mass telework is the new normal is another question. Interestingly, while some past work has found a trend toward decentralization, turning city centers into “donut holes,” Krause finds the opposite pattern in his German dataset.

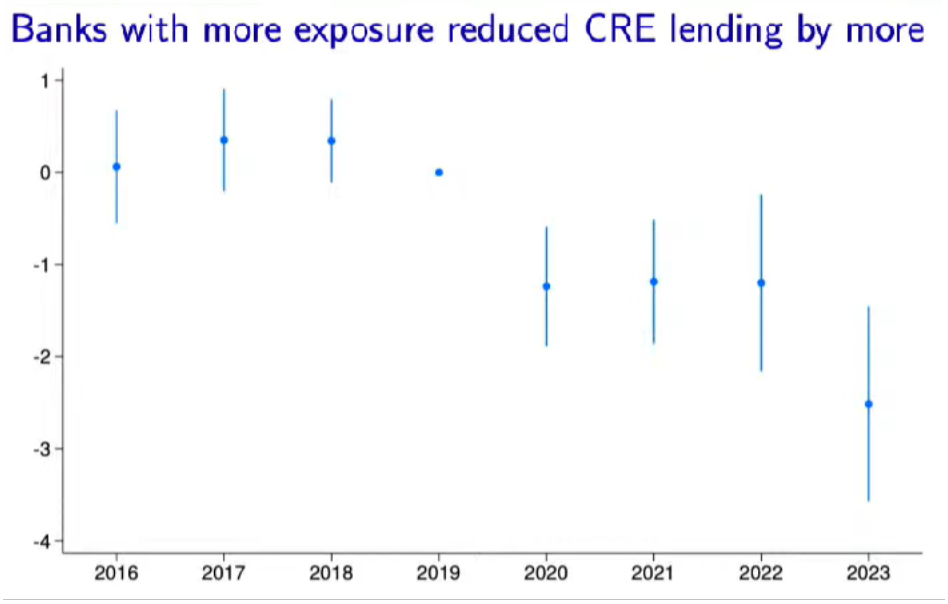


Krause finds that while office vacancy rates have risen everywhere, they've risen much more in the suburbs than in central business districts. It looks like if you're going to have office space at all in the age of telework, it had better be nice office space in a stimulating city center. Joyless cubicles in drab office parks aren't worth it. It's better to just work from home than settle for that.

The “donut hole” patterns of urban hollowing out that were sometimes observed in previous research may reflect the impact of the fear brought on by the pandemic itself more than adaptation to remote work. Cities hollowed out somewhat in the midst of the pandemic because crowds *per se* were suddenly dangerous.

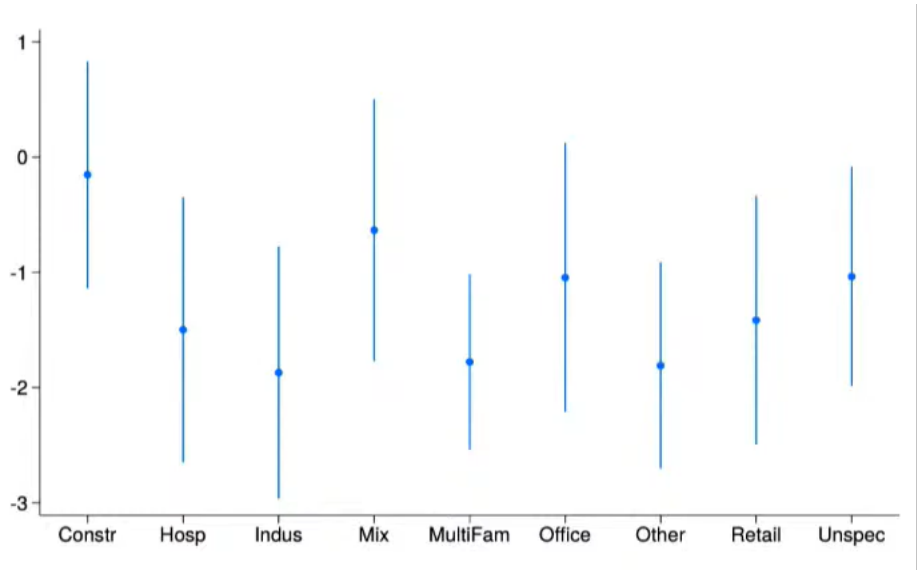
With the pandemic in the rearview mirror, crowds are fun again, and city centers have much to offer. But thanks to remote work, mere office space is no longer an operational necessity, so it takes more appealing locations to compete with the home office option.

Consistent with declining demand for office space, Erica Moszkowski found that banks are reducing their commercial real estate lending, especially when the banks have high exposure to it already:

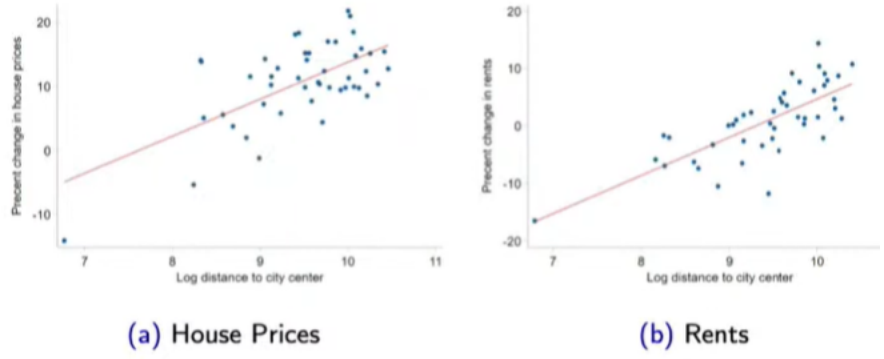


The trend has not reversed but, on the contrary, accelerated as the pandemic recedes, suggesting that banks and businesses are planning for a future of mass telework.

Interestingly, Moszkowski's finding about commercial real estate lending doesn't just affect offices. Rather, in areas where teleworkable occupations are prevalent, all kinds of commercial real estate lending have declined. That makes sense, since a lot of businesses in city centers cater to office workers and business travelers, of whom there are now fewer.

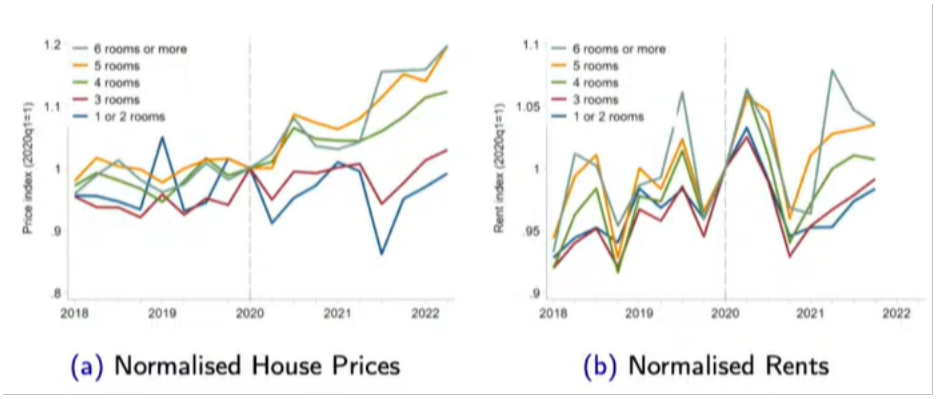


Telework has altered demand for residential real estate as well. Researcher Morgane Richard presented the below chart of the change in house prices and rents in London in the years after the pandemic, compared with before:



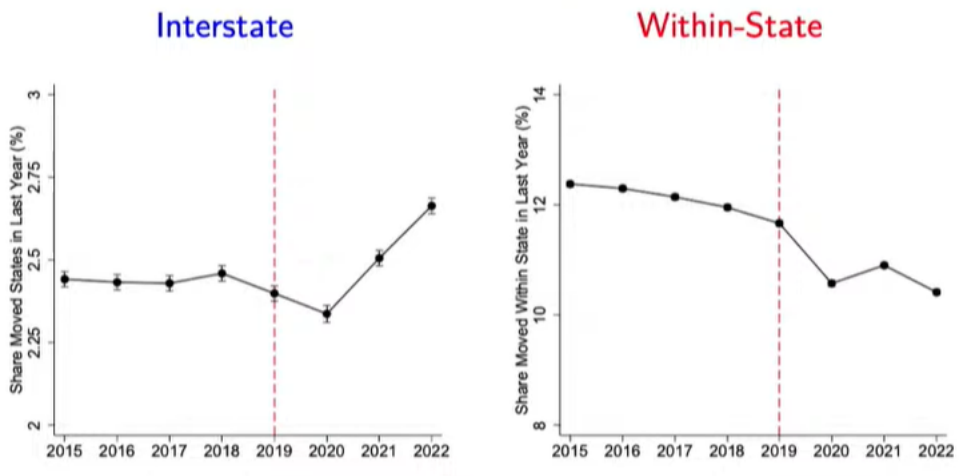
(a) House Prices (b) Rents

Both charts show that, since the pandemic, the further properties in the London area are from the city center, the more they have risen in price. This pattern is consistent with teleworkers moving further out in search of more space when they don't have to commute to an office every day. Richard also finds that price rises have been concentrated on larger residences with four to six bedrooms:

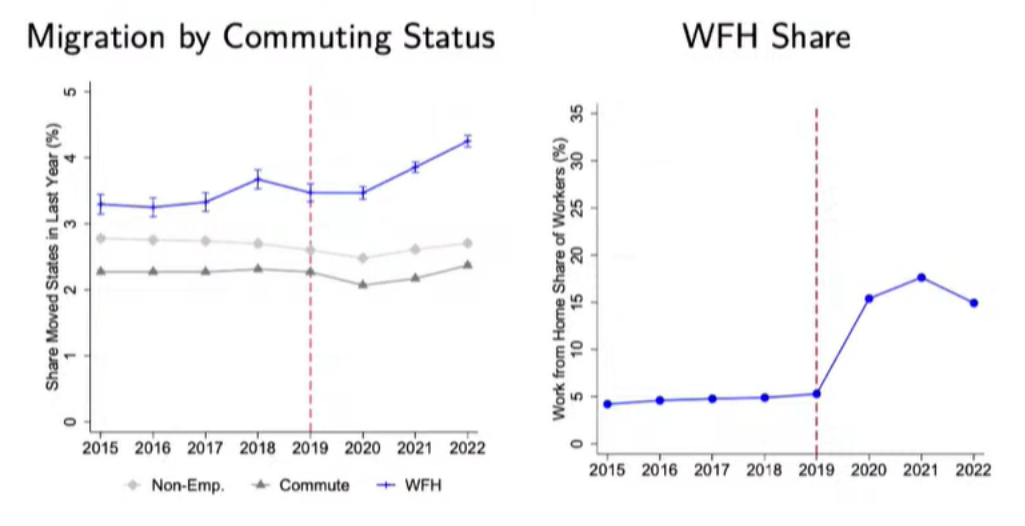


Here, two explanations suggest themselves. Teleworkers moving out of central cities may have more purchasing power to buy larger homes. Or teleworkers may want more space for home offices. Or both.

Sometimes, people move further. Researcher Adam Blandin observed in U.S. data that interstate moves have risen sharply since 2020.



Within-state moves declined, probably because a combination of high housing prices and high interest rates made 2022 a bad time for house shopping. And interstate moves by non-teleworkers are also, if anything, a bit below pre-pandemic levels, as Adam Blandin also shows:



But a sharp net increase in interstate migration was driven both by teleworkers' increased propensity to make interstate moves and by the dramatically increased number of teleworkers.

The new trends in economic geography identified by the remote work researchers who presented at Stanford will take considerable time to play out. Telework will cause some kinds of economic activity to be more decentralized, but expect city centers to find new ways to thrive, too.

Meanwhile, the growing numbers of people who have organized their lives around telework and live far from the office mean that more and more bosses will need to keep accommodating telework on pain of forcing people to quit and breaking up productive teams.

Telework raises productivity through better professional matchmaking

Perhaps the most exciting bit of news that came out of the conference is that telework may be raising productivity by enabling higher-quality job matching.

Academic conferences are mild in tone but sometimes dramatic in substance. Filippo Boeri, whose results on increasing work-home distances were displayed above, went on to do something more ambitious. Reasoning that firms embracing telework benefited from a larger effective labor shed, and should therefore be able to find better matched employees, he ran statistical tests and found this:

	(1) log(GVA)	(2) log(TFP)	(3) log(Wage)	(4) log(Hrs)
log(Distance) × Year=2020	0.163***	0.111**	0.0305**	0.0443*
	(0.0267)	(0.0292)	(0.00840)	(0.0195)
log(Distance) × Year=2021	0.135***	0.106**	0.00415	0.0357
	(0.0271)	(0.0290)	(0.00825)	(0.0196)
Observations	1,971,001	1,971,001	1,971,001	1,971,001
K-Papp F-stat	486.2	486.2	486.2	486.2
Firm-level control variables × Year	✓	✓	✓	✓
Firm fixed effects	✓	✓	✓	✓
4-digit industry fixed effects × Year	✓	✓	✓	✓
Municipality fixed effects × Year	✓	✓	✓	✓

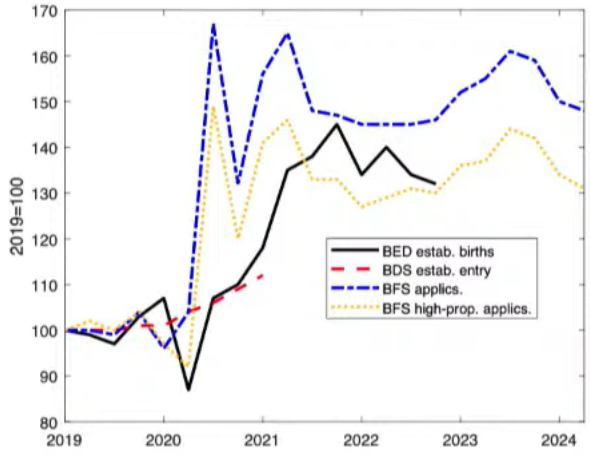
Of course, a table of regression results like this means nothing to non-academics. But it's the primary currency in which social scientists nowadays share evidence about things. The numbers in this kind of table show estimates of how much some factor, which in this case is work-home distances for the years 2020 and 2021, influences some variables of interest, which in this case is firms' output, productivity, wage rates paid and hours worked. The asterisks show "statistical significance," meaning there's good reason to feel confident that the result shows something real and not just statistical noise.

To simplify somewhat, what the chart says is that a firm that doubles its hiring radius pays 3% more in wages, gets 4% more hours worked, produces 16% more product, and has an 11% better ratio of outputs to inputs. Extrapolating to the whole economy, the increase of 10% or so in average work-home distances that seems to have occurred since the pandemic might have raised GDP by about 1%. In the U.S. case, longer work-home distances might already be creating over $250 billion of economic value annually.

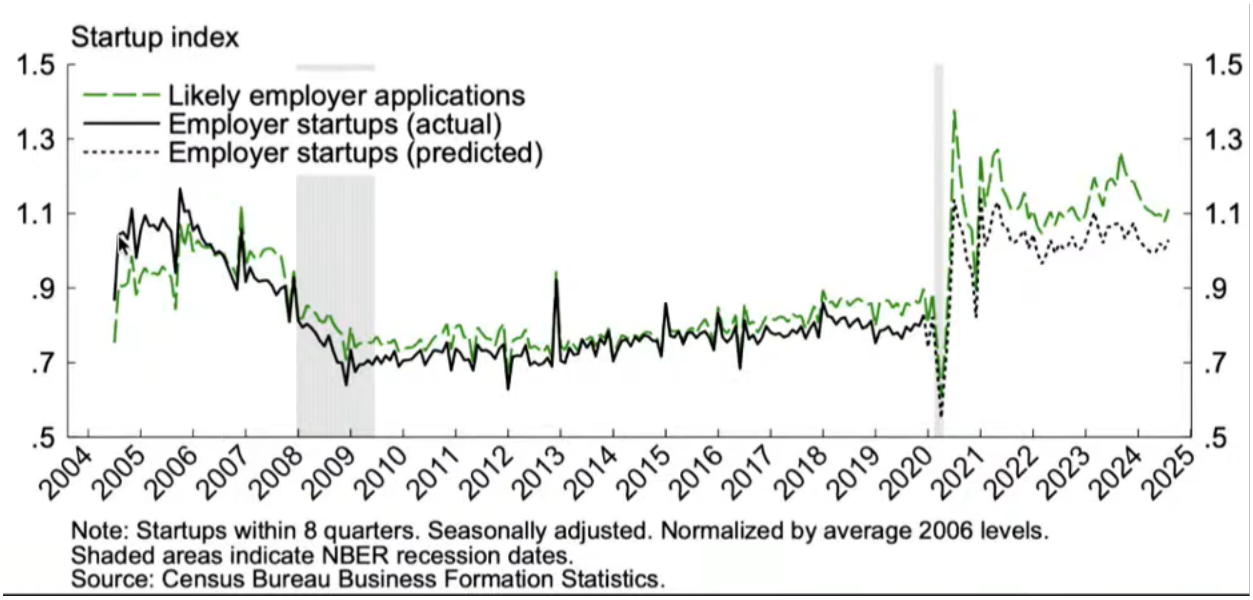
Such estimates are subject to change, and some conference participants voiced skepticism about the magnitude of Boeri's estimates. In any case, extrapolation is perilous. But the underlying theory makes sense and needs to be taken seriously.

The productivity of capitalist companies depends on fine-tuned synergies among well-matched workers. The limitations of a local workforce have always been an important constraint on what firms can do. That's why firms work so hard at site selection, and why so many firms pay high rents to locate in large metro areas. Now, suddenly, firms have far more scope to assemble the right teams for their projects, so they're becoming more productive. Boeri's results are novel, but they shouldn't be substantively surprising.

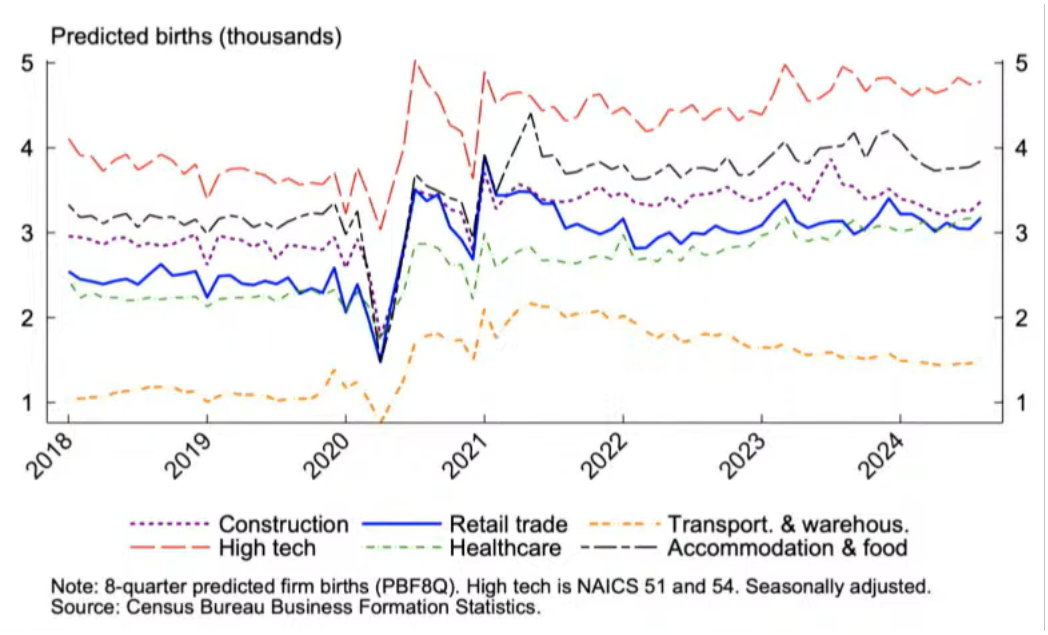
Relatedly, researchers explored whether remote work helps explain the surge of entrepreneurship that has occurred since the pandemic. Researcher Chenchuan Shi shows how several measures of business formation have surged since 2020:



Researcher Arpit Gupta showed the same surge in longer historical context, making it clear that the surge in startup formation since 2020 represented a rapid full reversal of an entrepreneurship slump that had lasted for almost 15 years:



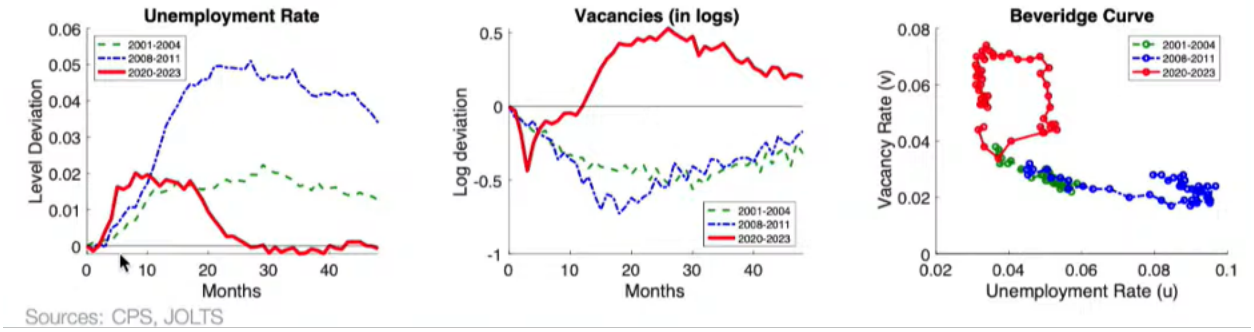
Arpit Gupta further broke down the recent rise in establishment births by industry. While transportation and warehousing entrepreneurship has slipped a bit since its pandemic-era peak, entrepreneurship rates in other industries, especially high tech, have remained elevated.



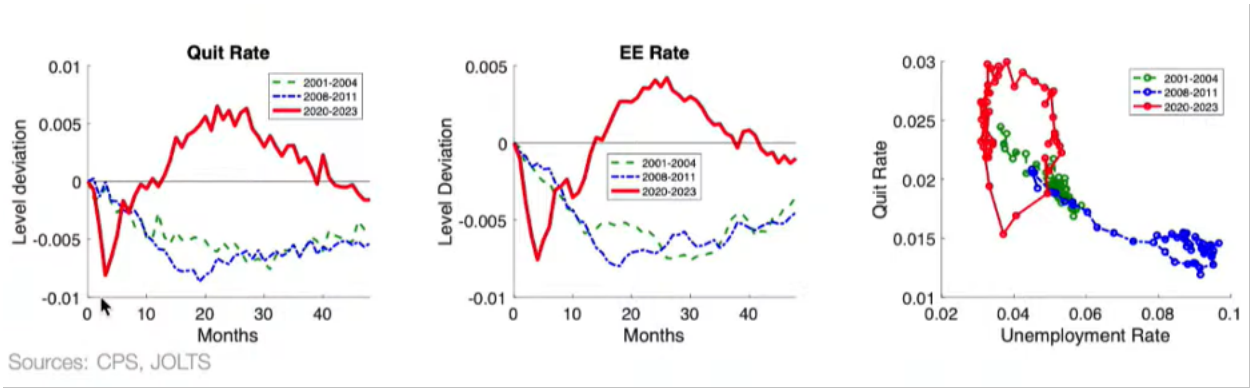
As the pandemic recedes, while both mass telework and elevated entrepreneurship persist, telework looks like an increasingly appealing explanation of the new entrepreneurial dynamism of the post-pandemic economy. In 2020, some people started businesses simply because lockdowns made them unemployed. But unemployment has been low for some time now, and entrepreneurship is still booming.

Shi's paper featured some first theoretical steps in understanding why remote work may be fueling entrepreneurship, and Gupta's paper adds evidence that startups are able to use remote workers more productively than established firms. But the larger point is that rich new opportunities are created by the better professional matchmaking powers of telework, and entrepreneurs are stepping up to seize them.

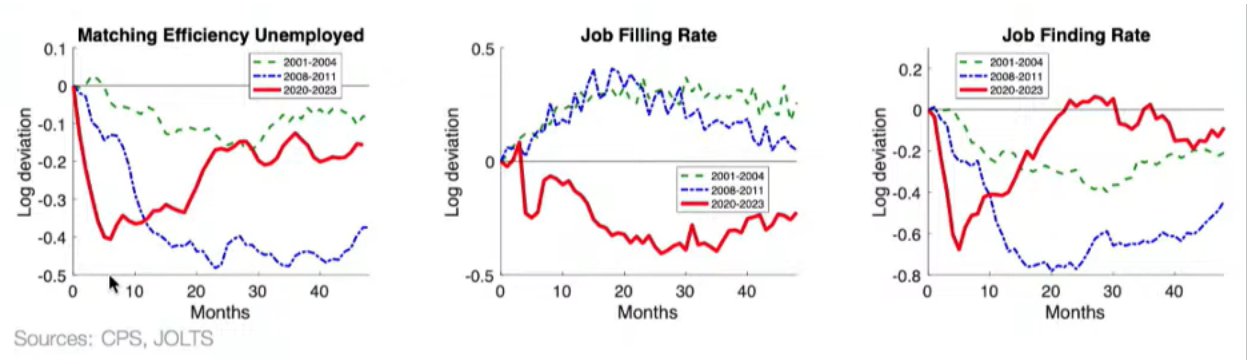
On this process of improvement in professional matchmaking, researcher Lukas Friedrich Mann shed fascinating light by scrutinizing certain peculiarities of the labor market recovery after the pandemic. First, in contrast with the recoveries from the 2001 and 2008 recessions, the post-pandemic recovery saw an early surge in job vacancies, even as unemployment rates remained somewhat elevated.



Also, as Mann's data further showed, there was a surge in quit rates, a phenomenon sometimes called "The Great Resignation," and high rates of entry into and exit from the labor force:



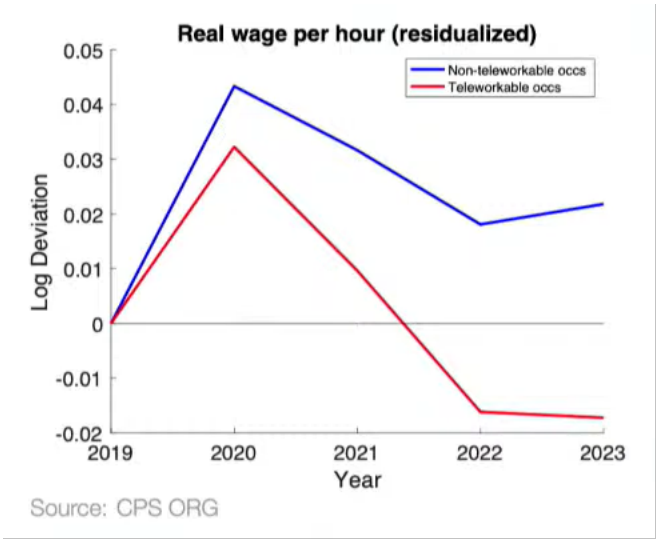
Under these conditions, Mann further shows that, during the recovery, employers found it exceptionally difficult to fill vacant positions. And while unemployed people had somewhat better luck finding jobs, the overall efficiency of labor markets in matching jobs and workers during the post-pandemic recovery was rather low:



Mann argues that the best explanation for these peculiar patterns is that workers began to exhibit a strong preference for remote work. So, while there were a lot of on-site jobs available, they were the wrong jobs, and workers kept looking.

Pre-pandemic survey research suggests that this preference for remote work had long existed already, but it wasn't exhibited in people's labor market choices because remote work wasn't a realistic aspiration for most people before 2020. The new normal of mass telework created a revolution of rising expectations.

On average, as Mann further found, people who got remote work were willing to accept pay cuts, while employers had to pay higher wages for on-site jobs:



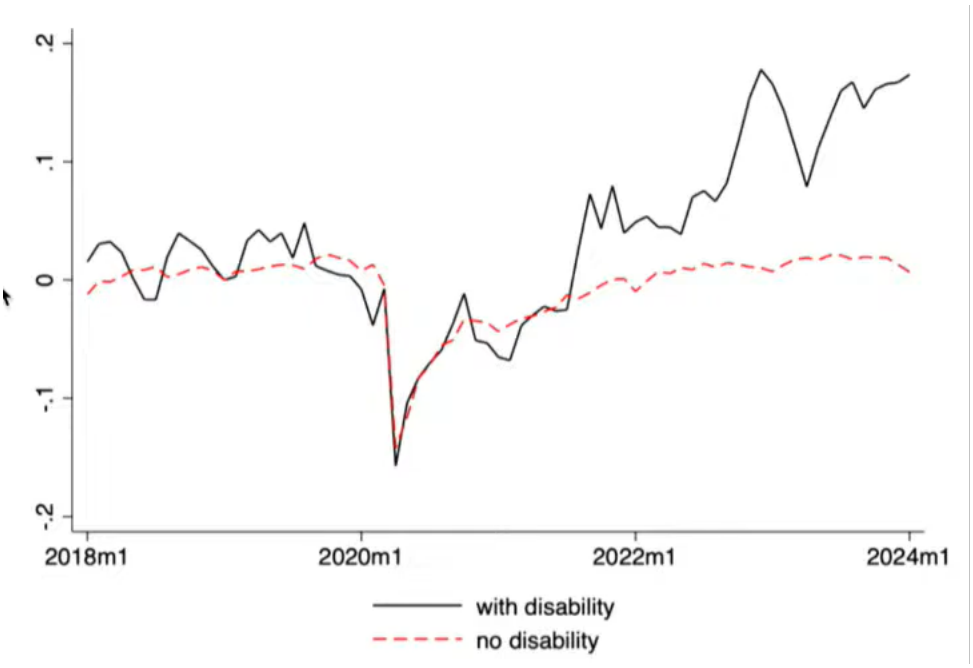
What remains to be seen is the extent to which the rising preference for remote work reflects preferences and personal quality of life, vs. the extent to which it reflects better job matching and prospects for professional growth and productivity. All else equal, transitions to remote work currently seem to involve sacrificing a bit of pay. That might point to a future where telework makes us happier but reduces GDP.

But Boeri's results suggests that teleworkers are more productive even if, for now, they don't capture that productivity boost in higher wages. And the rise in entrepreneurship is very encouraging. There is good reason to think that the brave new telework economy will yield a long harvest of faster economic growth in the years to come.

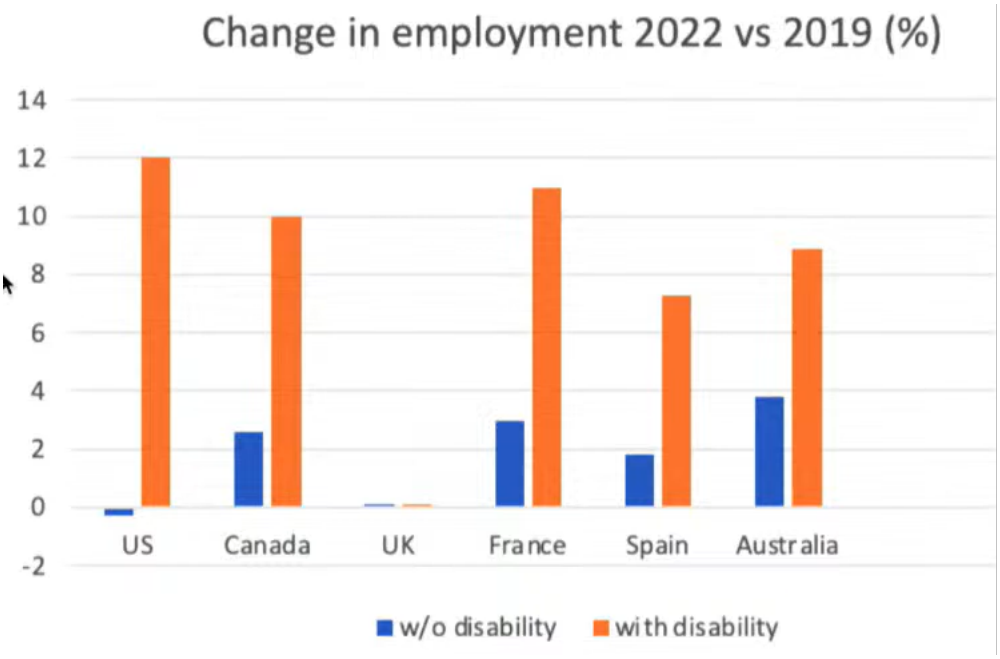
Telework fosters a more inclusive workforce

The good news keeps coming. Another reason for optimism is that telework fosters a more inclusive workforce, improving access to jobs for people with disabilities, women — especially new mothers — and also people in developing countries.

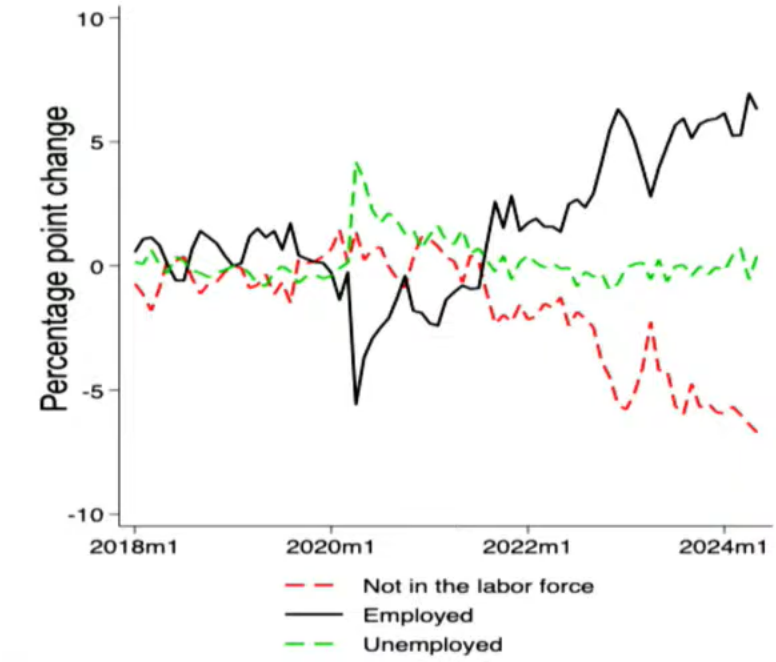
Gordon Dahl's findings on people with physical disabilities were particularly lucid. Their employment rates have risen sharply since the pandemic:



This change has occurred in other countries as well:

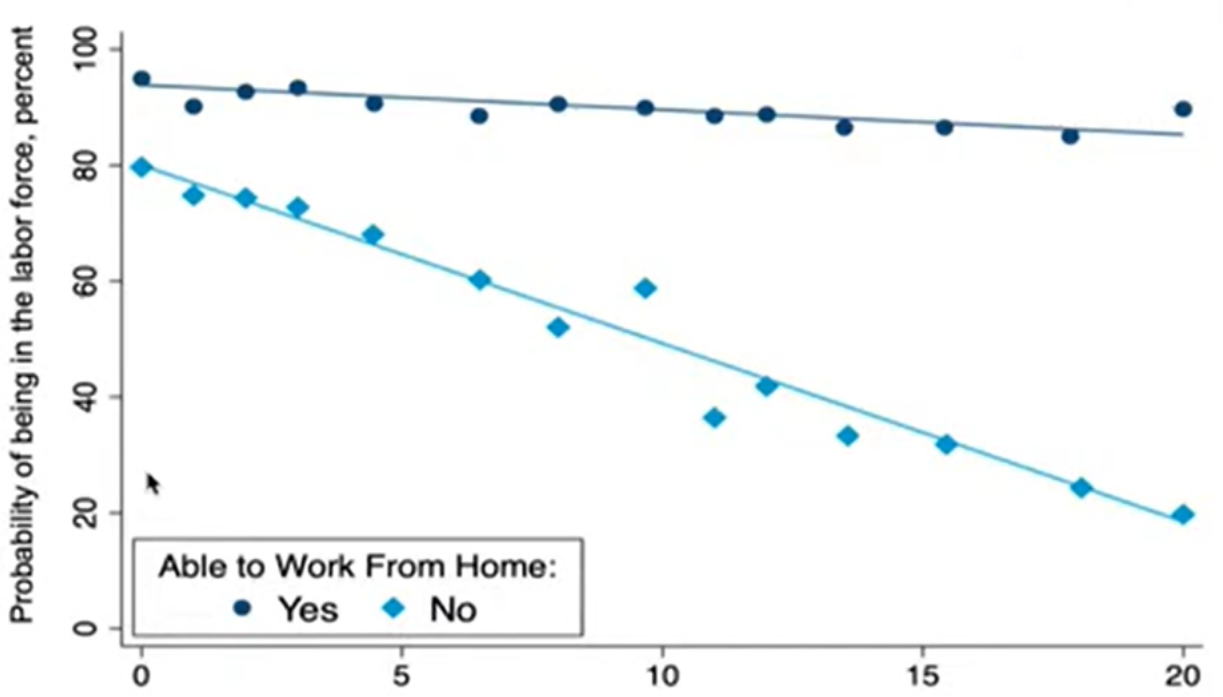


Dahl further shows that rising employment rates for people with disabilities are driven by rising rates of labor force participation. That is, many people with disabilities who weren't even looking for work before the pandemic now are looking for it — and finding it, too.



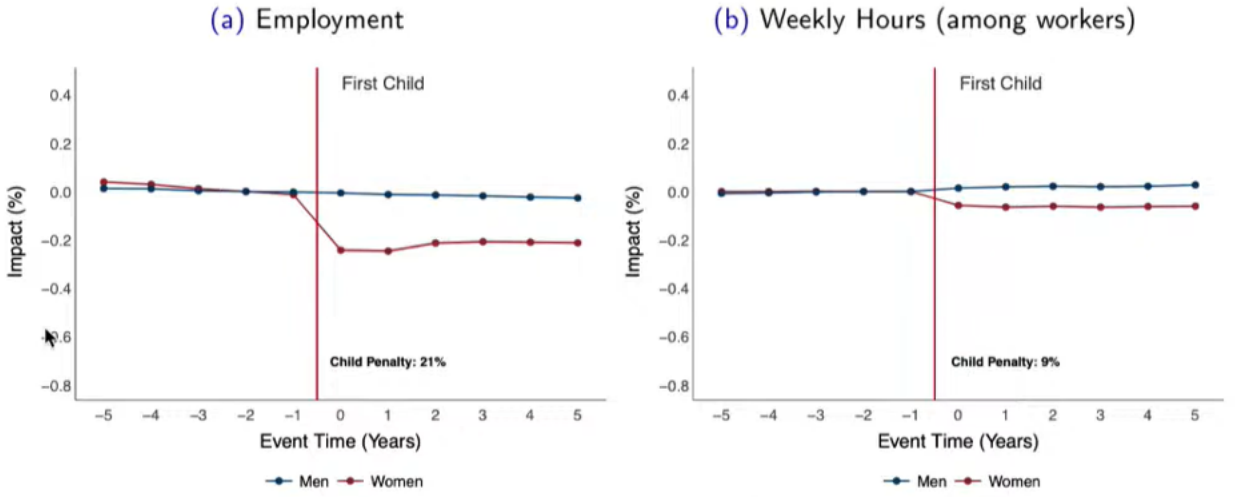
Advocates for people with disabilities have long argued that they could work more, except that employers wouldn't give them the accommodations that they needed. In particular, many couldn't handle a daily commute to an office and would have needed to work remotely. Although in principle, the Americans with Disabilities Act requires employers to make a lot of accommodations, employers have tended to plead, with some deference from courts, that accommodations such as remote work were operationally infeasible.

The new normal of mass telework finally meets the needs of people with physical disabilities. And Dahl shows that among people with disabilities who, because of their occupations, have the ability to work from home, labor force participation rates are high even when physical disabilities are severe:



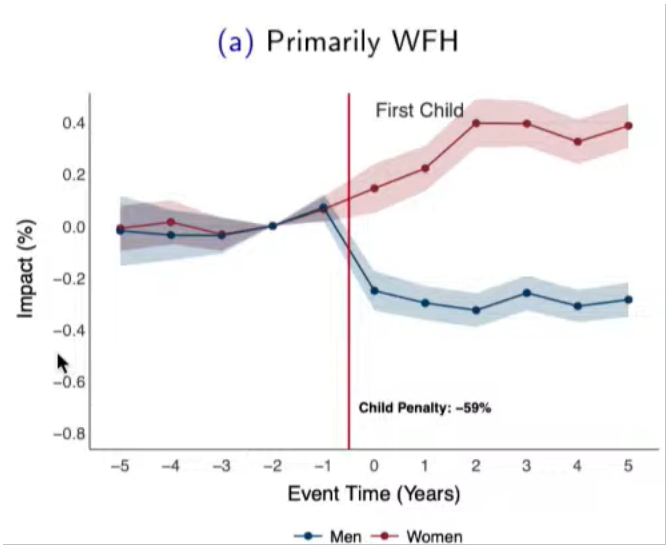
This trend is good news not only for the well-being of people with physical disabilities but also for taxpayers, since when people with disabilities get jobs, they need less public assistance and pay taxes on their earnings.

Another group whose workforce prospects are improved by telework is women, especially mothers of young children. In a paper on the effect of remote work on "child penalties" in workforce participation, Pablo Zarate shows how the birth of a first child (in the Latin American countries he studies, though the pattern applies elsewhere, too) reduces women's workforce participation by 21% and reduces hours worked by 9% even among women who stay employed:

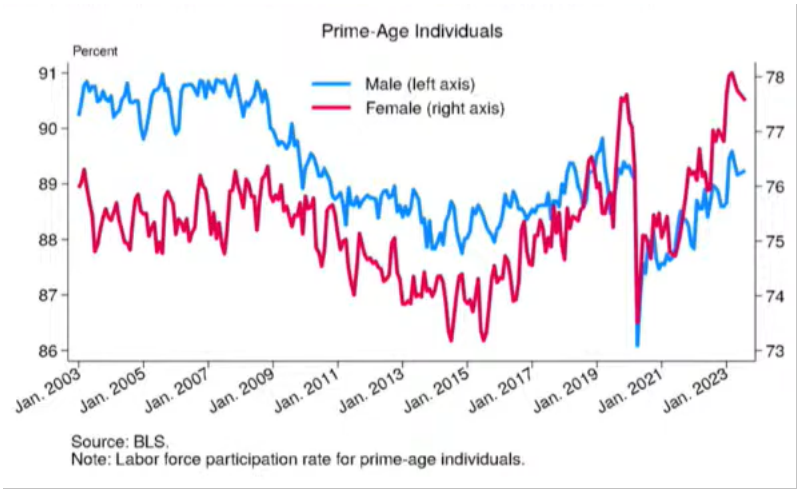


The obvious explanation for this is that mothers want to be close to their babies. But remote work creates at least some room for mothers to do paid work and be close to their babies at the same

time, even if it's probably not possible for most mothers to combine full-time infant care with a full-time remote job. Zarate investigates and sees evidence that new mothers tend to lean into remote work at higher rates:



He also finds that the child penalty in hours worked is a bit less for mothers in remote work occupations. Zarate's findings suggest one reason why women (ages 25 to 54) have disproportionately driven the labor market recovery after 2020, as Maria Tito shows:



Tito went on to provide evidence that remote work helps to sustain labor market attachment among prime-age women, and several other conference papers also highlighted the benefits of remote work for women, in particular.

Lisa Ho, in "Bringing Work Home: Flexible Arrangements as Gateway Jobs for Women in West Bengal," showed how women in a gender-traditionalist culture where prevailing attitudes are unfavorable to women working outside the home, could often do remote jobs, which in turn sometimes served as a "gateway" to other jobs, including outside the home, as households got accustomed to the benefits of women doing paid work.

And Manuela Collis presented suggestive evidence that women benefit from remote work through reduced exposure to "workplace hostility," including sexual harassment.

Downsides of remote work

While the researchers' findings about the impacts of remote work were generally positive, a few downsides were suggested as well.

First, there are challenges in managing people remotely. Denis Sosyura, in "Remotely Productive: The Efficacy of Remote Work for Executives," found that while offering remote work as a perk can help firms recruit more qualified executives, there are penalties, on average, in productivity, financial performance, and morale when executives manage firms from far away. The penalties are mitigated when the firm itself is geographically dispersed.

Relatedly, Megha Patnik, in "Management and Remote Work," sought to measure managerial quality and found that firms with worse management practices particularly struggled with emergency telework during pandemic lockdowns. And Ashley Whillans identified a problem with distraction in remote teams, which come to rely on prompt responses to emails to signal productivity at the expense of focused time and "deep work." She reported on an experiment in which collaborative norm setting mitigated distraction and improved performance.

Again, the many RTOs reported by Sean Flynn, Mark Ma, and David Van Dijcke suggest that many executives perceive remote work as an unwelcome managerial challenge.

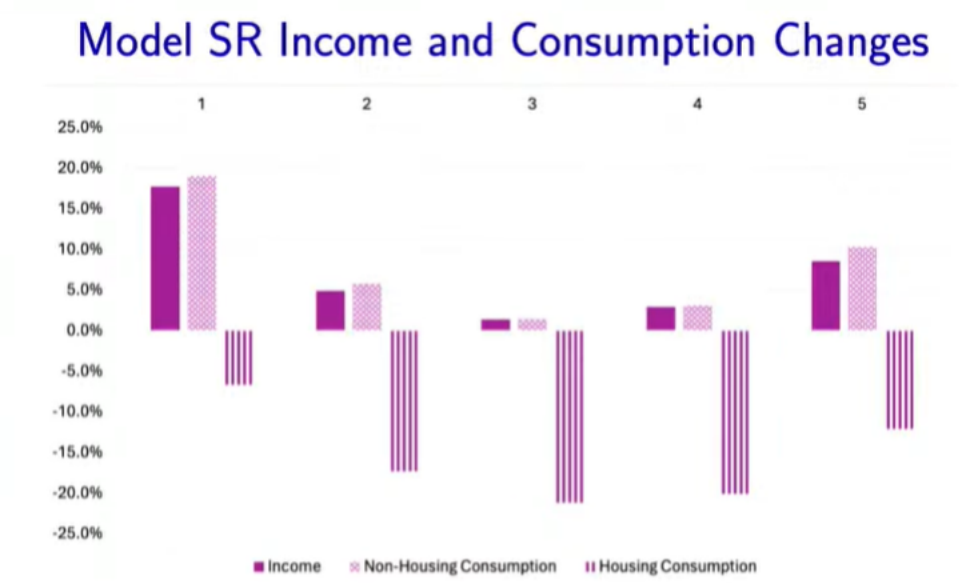
That said, firms appear to be getting better over time at managing remote workers, and that was the starting point for a paper by Andra Ghent on "winners and losers from the work-from-home technology boon." The word "technology" here refers less to the existence of fiber-optic networks and software tools like Zoom and Microsoft Teams than to the organizational adaptations that enable productive teams to incorporate such tools into new and better ways of working.

Ghent identifies a large improvement in this "technology" during and in the immediate aftermath of the pandemic, which benefited the new remote workers themselves, as well as their employers. But the change is harming some.

For the second downside of remote work, at least for some, is that it raises housing demand. House prices in the United States have surged since the pandemic, and while this is driven by many factors, one important cause is that teleworkers want home offices.

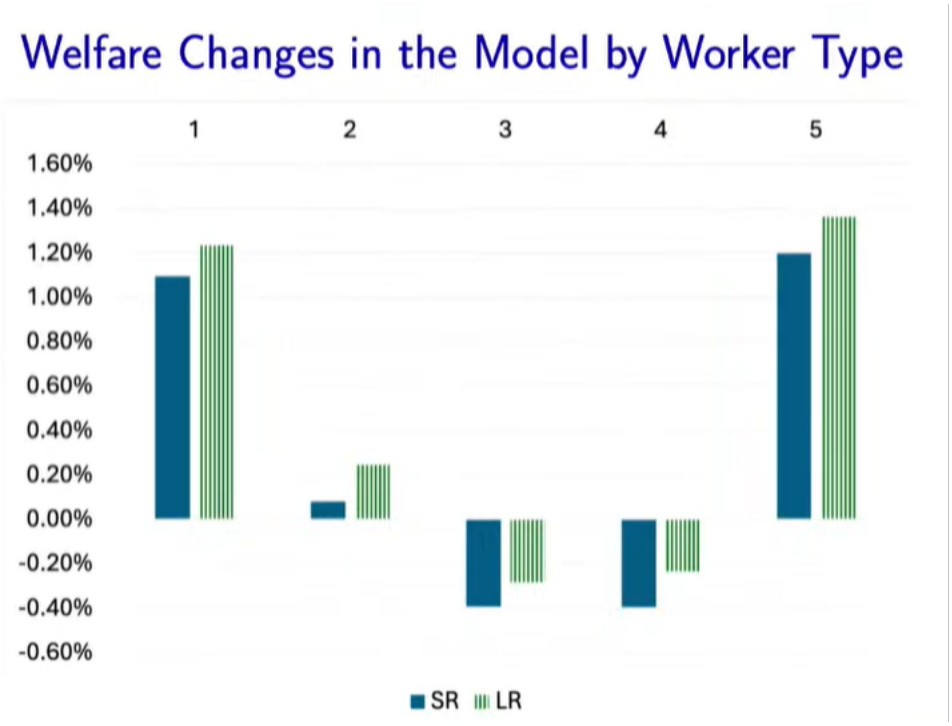
Teleworkers themselves still benefit in various ways, but many people who can't telework find themselves worse off because, while their jobs are the same, they have to pay more in rent as they compete for space with teleworkers' home office ambitions.

Ghent's calibrated model of the macroeconomy shaped by mass telework predicts, for all major groups, more income and more non-housing consumption, but less housing consumption, in varying degrees:



Notes: 1) A type 5 worker is a worker in an IT occupation. 2) Types 1 and 2 are in telecommutable occupations other than IT occupations. 3) Types 3 and 4 are in non-telecommutable occupations. 4) Types 1 and 3 have educational attainment of a four-year degree or greater.

From there, Ghent derives estimates of the average welfare changes by group:



Ghent's takeaway is that remote work has big net benefits for college-educated teleworkers and IT workers, small gains for non-college-educated teleworkers, and net losses for non-telecommuters.

The losses are slightly worse for college-educated non-teleworkers who, in Ghent's model, suffer from the loss of stimulating office neighbors even as rising rents eat up more of their paychecks.

If telework is exacerbating housing scarcity, the obvious solution is to build more housing. Unfortunately, NIBMYism often stands in the way of that.

Finally, in spite of the generally positive tone, some of the comments, research findings and models, in various ways, suggested misgivings about whether some mysterious benefits from face-to-face interaction may somehow be an important ingredient to trust, productivity, or creativity and innovation.

Ghent's model, for example, assumes that cognitive workers are more productive when physically co-located, and plenty of data supports that claim as a generalization about the past.

Is it still true? Is physical co-location still important to innovative collaboration and knowledge transfer? Or has telework now become a near-perfect substitute for face-to-face collaboration?

It's hard to say just what kind of joint cognitive work or mutual learning can be done face to face that can't be done on a Zoom call. But most people do still seem to value face-to-face interaction, so it makes sense to worry, at least a little bit, that a world with less of that will suffer in some way.

Yet, if you think that the wonders of technology have now made the virtual office just as good as the physical office, no data was presented by the researchers at the Stanford remote work conference to discourage that belief.

Keep the research coming

Remote work is very important to the future of capitalism, and we need to understand it better. Fortunately, the researchers who presented all indicated many future research plans. Here are some questions on which I hope that next year's remote work research conference may shed additional light.

1. Telework requires ***infrastructure***, but what kind of infrastructure? What network performance is needed to make telework effective? For example, the federal Broadband Equity Access and Deployment (BEAD) program proposes to build broadband networks capable of delivering 100 Mbps download/20 Mbps upload service to every serviceable location in the United States. Is that good enough? How many people are cut off from opportunities to telework because no adequate internet service is available at their address?
2. How does telework affect the social returns on infrastructure investment? Is telework a good reason to subsidize the buildout of broadband networks to more people and places?
3. What are the minimum digital skills that people need to participate in telework? How many people have those basic digital skills? Is the rise of mass telework causing some people to lose jobs because employers close physical offices and workers lack the skills to do their jobs remotely?
4. What new career path opportunities is the rise of mass telework creating, and how can young people take advantage of them?

5. How should economic developers leverage telework to boost local economies? How can they attract footloose teleworkers to settle in their areas? Is it worth it? Can favorite local industries leverage the new remote workforce to enhance their competitiveness? Does telework change what works for attracting industry to create jobs in an area?
6. People and organizations have gotten better at teleworking, but are they still improving, or is that source of growth tapped out? Can we expect telework's productivity to continue improving, relative to physical office work, over time? Or are physical offices finding new sources of comparative advantage in an age when telework has taken over many of their old functions?
7. How can the telework-induced housing shortage be addressed? Is housing supply responding to the increased need for home offices? And can telework be leveraged to advocate for increased housing supply?

The answers to questions like these will help governments, businesses, educators, workers, communities, and society at large to adapt and flourish in the brave new telework economy.

About the author: Dr. Nathan Smith is Director of Economics and Policy for Connected Nation. In this role, Dr. Smith monitors federal broadband policy, writes public comments for federal agencies that request advice on broadband policy implementation, and helps with business development and proposals.