

2 Remote Work and the New Normality

This chapter examines trends in remote working across regions in G7 countries. It starts by setting the scene on permanent movement patterns with evidence from the US. It then presents how remote work is distributed across regions and territories in G7 countries, and the association between characteristics of rural regions and remote working potential. The analysis concludes by emphasising the role of digital infrastructure and female workforce participation in regions' potential for remote work.

The potential for remote working in transforming the workplace is substantial. In some G-7 countries, the COVID-19 crisis has accelerated pre-existing trends in workplace management. In other countries, COVID-19 has introduced new ways of working whereby individuals in occupations with remote work capacity can continue to operate with limited mobility and peer-to-peer interactions on digital platforms.

However, not all jobs are created equal. Task-based requirements that are often linked to the occupational and sectoral characteristic of jobs determine whether or to what extent jobs can thrive in an environment of low mobility. The distribution of such jobs are not necessarily uniform across territories. This chapter will explore some of the socio-economic determinants of remote working, with today's current technological capacities, in regions with varying degrees of rural characteristics.

The analysis in this chapter uses four main sources of data to provide supporting evidence. The first source is the OECD's Regional Database with data capturing regional employment, socio-economic characteristics and basic economic trends from 2000 to 2019. The second source of data pertains to occupational shares extracted from the European Union's Labour Force Survey, the Canadian labour force survey and the American Community Survey. Using the first two sources of data, the estimation method for remote working is based on the method by Dingel and Neiman (2020^[1]). Critically, the term "remote working" or "teleworkability" captures the degree to which occupations are amenable to remote work.¹ The third source of data is from the *Ookla for Good* initiative. This data source provides average peak speeds from millions of devices' speed tests, aggregated within grid-level units. The data is further aggregated from the spatial grid levels into TL3 units. Finally, it is aggregated with a classification based on each region's access to cities incorporating density and distance in assigning territorial characteristics to regions, as elaborated in Fadic et al. (2019^[2]). The final source of data are monthly counts of permanent official relocations filed at the United States Postal Service for the US case study.²

Permanent movement to non-metropolitan regions

The impact of the territorial dimension of the current COVID-19 crisis, which imposed daily physical barriers to mobility and created incentives to consider moving away from the location of work, is currently being debated. In a recent commentary, Ramani and Bloom (2021^[3]) used data on listed purchasing prices of houses and the rental market to argue that in the US, the COVID-19 crisis has increased the demand for houses outside of large metropolitan areas. However, they find that this effect is limited to major metropolitan areas and does not necessarily apply to all metropolitan areas. Their analysis of housing prices suggests that the trend is long term.

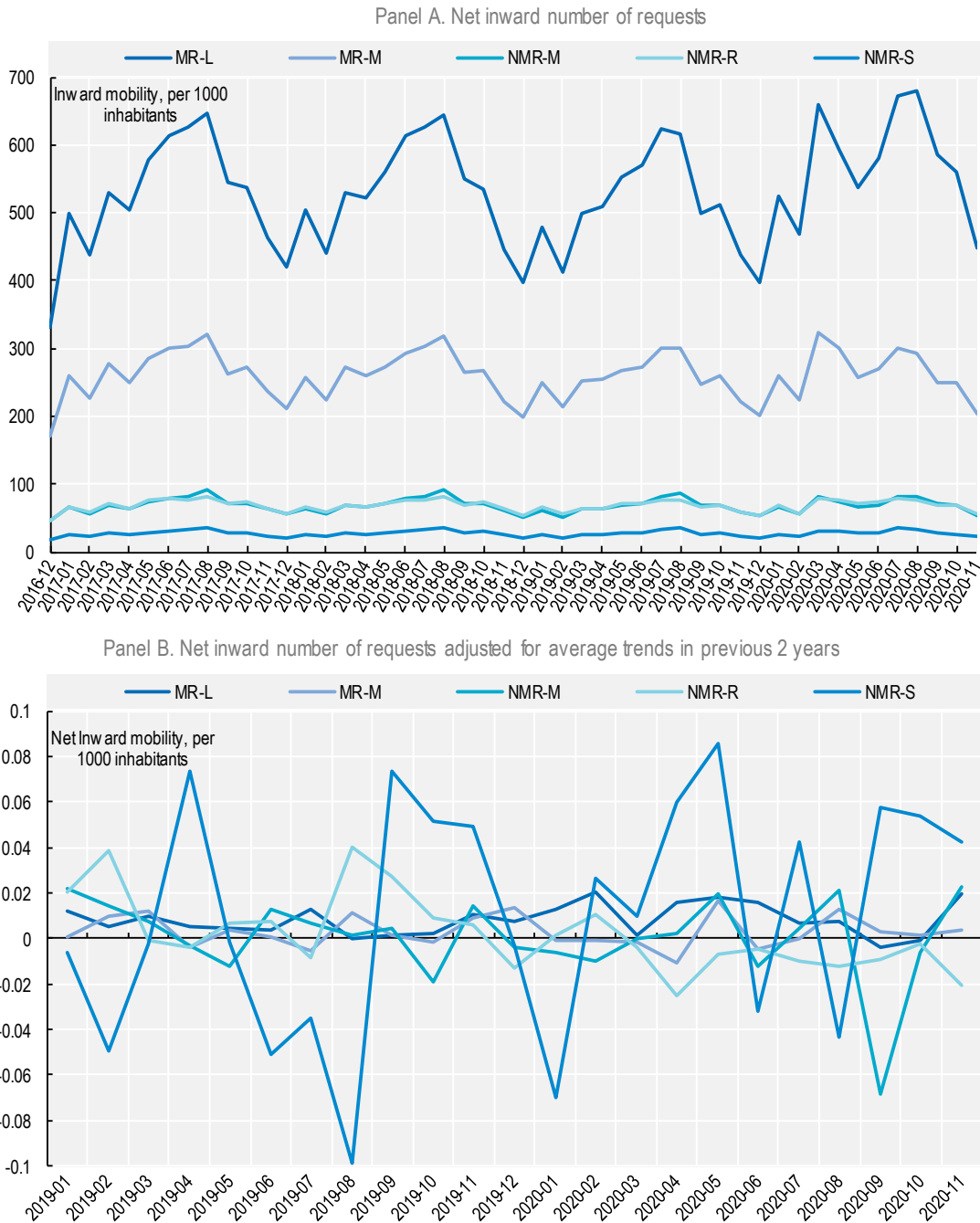
Following lockdown orders and wider remote working practices, people moved into metropolitan regions at a slower pace and relocations to non-metropolitan regions became more volatile (Figure 2.1, Panel A and B). In the immediate months following lockdown orders, net inflow rates dropped in all areas (Panel A). When adjusted for seasonal trends (Panel B), there was relatively higher net inflow to non-metropolitan areas with access to medium- and small-sized cities (April-June). This may have been due to the acceleration of anticipated movement patterns from denser regions, and limited incentives to move to more remote areas or densely-populated regions. However, the trend did not continue to show a clear direction in the following months. Interestingly, we did however observe a marginally lower-than-expected permanent movement to remote regions. As will be discussed in later sections, this may be due to limited framework conditions that are conducive to remote work in the more remote regions.

Whether the change in permanent patterns will fundamentally adjust human settlement patterns remains to be seen. Permanent mobility was impacted following the lockdown orders and the move to remote working. Like in the "doughnut" hypothesis proposed by some researchers (Bloom and Ramani, 2021^[3]), where individuals will expand to the immediate periphery of metropolitan areas, some movement to less populated areas—around the time period when stay-at-home orders were taking effect—is also observable on a more aggregate level. However, at least in the US, permanent settlement patterns in larger functional areas may not be as drastically impacted as is observed in the demand market for housing

(Figure 2.1). Using United States Postal Service data for permanent move requests, we can observe a relative decline in the count of inward mobility in metropolitan areas (Panel A). Once we adjust for monthly (and implicitly, seasonal) trends using average monthly observations for the two prior years, we observe a more normalised trend after the period of the first stay-at-home orders in March (Panel B).

Permanent settlement patterns will continue to evolve as direct impacts and spillover effects on local economies change due to remote working. Currently, there is no clear and dominating consensus of COVID-19's impact on permanent changes to human movement patterns in international policy discourse. However, the current, short-term changes are suggesting that there are direct effects on jobs in occupations that were able to adapt to remote working (Dingel and Neiman, 2020^[1]) and indirect effects on jobs that support and provide services to occupations that are better suited to remote work (Althoff et al., 2020^[4]). Governments should prepare for territorial changes in demographic patterns of workers including, in particular, fiscal place-based policies and property taxes. However, they should keep in mind that the current territorial distribution of populations is unlikely to change dramatically in the short to medium term, in the recovery period.

Figure 2.1. Net Inflow of permanent relocation requests, by access to city



Note: Data reported is the number of registered official requests to move. Adjusted numbers refer to trends adjusted for average movements in previous years.

Source: United States Postal Service

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How is remote work distributed across regions?

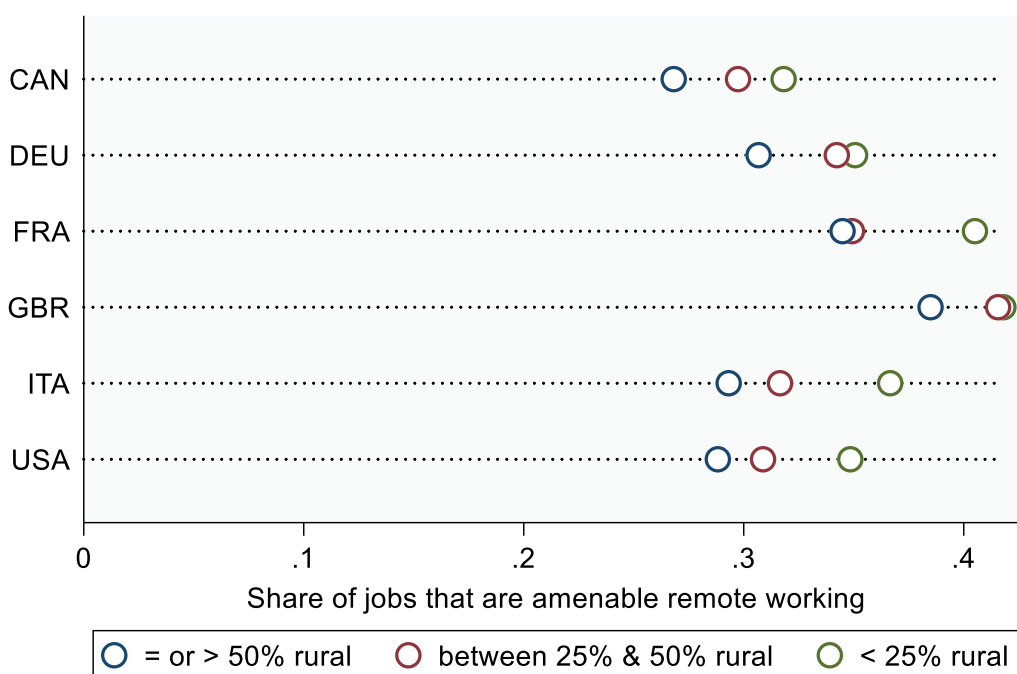
The suitability of jobs to remote working depends on the type of skills required to carry out occupational tasks. Jobs that can be worked from home have occupational and sectoral characteristics that are often associated with office jobs. For example, tasks in offices, in particular, in sectors such as those in the financial sector or professional services, are more easily conducted from a home office than tasks in physical or labour-intensive occupations in sectors such as the personal service sector, paramedical services sector and hospitality sector. The territorial distribution of such occupations and sectors therefore is an important determinant of how well regions can adapt to the new normality with more widespread remote working arrangements.

Rural regions systematically have lower shares of remote working jobs. In Figure 2.2, most G-7 countries have close to one-third of occupations that are considered easily amenable to remote working. The figure reports higher shares of occupations that can be adapted to remote working in regions with more urban characteristics. Among G-7 countries with available data, the UK has the highest share of remote work occupations, while Canada has the lowest share, followed closely behind by the US.³

The disparity between territories within most countries are considerable (Figure 2.2). The disparity between regional remote working rates within each country is the largest in France and Italy, and relatively lower in the United Kingdom and Germany. The two countries with the least regional inequality in remote working also have intermediate regions with similar shares of remote work occupations to urban regions. A combination of low regional inequalities in jobs amenable to remote work and relatively advanced intermediate categories suggests a more equal distribution of occupations across regions in United Kingdom and Germany. With a relatively equal territorial distribution of remote work occupations, we can also expect less territorial variability in potential outcomes associated with initiatives to encourage further adoption of a generalised remote work model of human resource management.

Figure 2.2. Remote working in G-7 Countries (2019)

Share of occupations amenable for remote work in TL2 regions, with varying degrees of rurality.



Note: Remote work or teleworkability is estimated following the method by Dingel and Neiman (2020^[11]) using labour force surveys in Europe, the US and Canada. It captures the relative share of occupations that are amenable to remote work. The degree of rurality is estimated based on the methodology elaborated by Fadic et al. (2019^[22]) using the OECD Regional Database. The methodology for the 5-tiered classification of regions consists in identifying metropolitan and non-metropolitan areas based on percentages of population within each TL3 region that has access to functional urban areas within a 60-minute drive above or below population thresholds of 250 000 and 1.5 million. To accommodate for the fact that regional databases are mostly only representative at the TL2 regions, we generate a continuous variable ranging from 0 to 1 that identifies the percentage of the population within each TL2 region that lives in one of the 3 kinds of TL3 regions identified as non-metropolitan. The first category “= or > 50% rural” refers to TL2 regions that have at least 50% or more of the population identified as living in a TL3 non-metropolitan region. The second category “between 25% & 50% rural” capture regions that have 25% to 50% of the population identified as living in a TL3 non-metropolitan region. The last category “< 25% rural” refer to TL2 regions with less than 25% of the population identified as living in a TL3 non-metropolitan region.

Source: European Labour Forces Survey (2019); American Community Survey (2019); Canadian Labour Force Survey (2020) ; OECD Regional Database

Characteristics of rural regions and remote working

The extent to which an employee can work from home depends on a variety of factors, such as whether a specific physical environment, tools, or physical proximity to colleagues are required for the role. For the rest of the chapter, we only consider the first category of jobs that are suitable to remote working (those whose tasks facilitate it). We also cover other factors such as national regulation and firm management decisions in Chapter 4.

Because most remote work jobs still require collaborative working, the primary factor determining the demand for remote work jobs is access to digital infrastructure. On the other hand, the supply of workers who have skills for occupations where remote working is possible is determined by socio-economic characteristics. The following section analyses access to digital infrastructure, as a key determinant to remote working rates. It follows with sections analysing socio-economic characteristics such as gender, age and education.

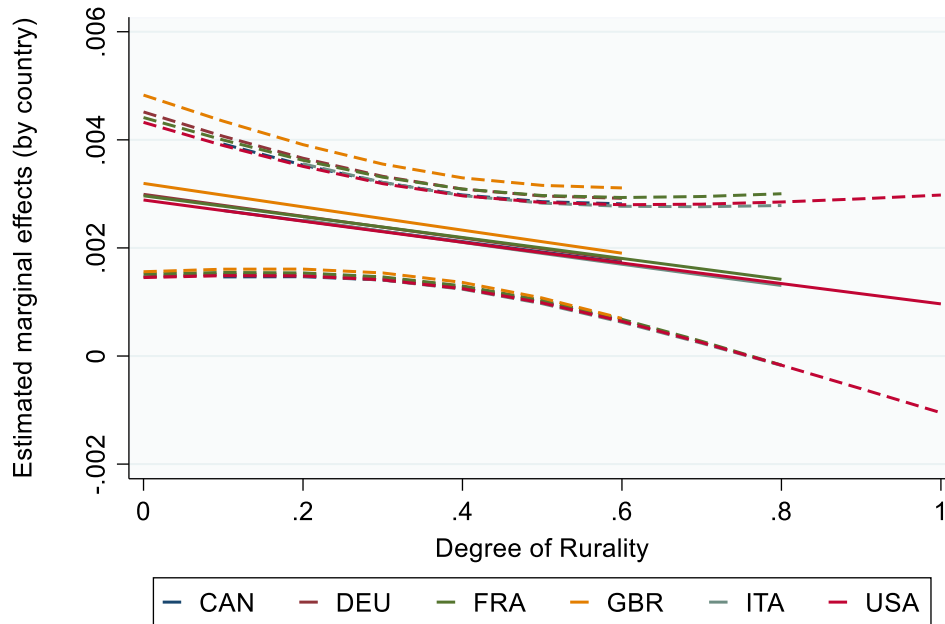
Access to Digital Infrastructure

Equal and ubiquitous access to telecommunications infrastructure is an important precondition for reducing territorial inequalities and ensuring that policies are focused on rural well-being (OECD, 2021^[5]). Equal access to digital (telecommunication) infrastructure is also within the scope of the recently updated *Recommendation of the Council on Broadband Connectivity* (OECD, 2021^[6]), which recommends that Member States take measures to eliminate digital divides and reduce barriers to broadband deployment.

Broadband access is critical for remote working. Figure 2.3 depicts the marginal effects⁴ of broadband access, as measured by the share of households with access to internet. Because of the nature of remote working, household access to internet is of keen interest to policy-makers. The figure shows a positive association between broadband access and remote working across all G-7 countries. The level and range of the marginal effects of broadband access on remote working does not vary substantially, suggesting relative stability in this finding.

Figure 2.3. Digital Infrastructure matters for all regions

Average Marginal Effects of Broadband Access (2019)



Note: The figure depicts the estimated marginal effects of broadband access on remote working rates with varying degrees of rurality for each of the G-7 countries. The solid lines depict estimates. Dotted lines depict 95% confidence intervals.

Source: EULFS (2019), ACS, CLFS, Fadic et al. (2019^[2]), OECD Regional Indicators.

Broadband access matters for all regions, but given the current distribution of occupations, it matters more for urban regions than rural regions. The marginal change associated with one more unit of broadband access in Figure 2.3 is positive across all territories, but downward sloping. This means that broadband access is important for occupations that are amenable to remote work, but as we look to regions with more rural characteristics, we observe that broadband has less explanatory power for explaining trends in remote working potential. For the regions with the highest degree of rurality (over 80%), the marginal effect of broadband access is still positive, but not statistically significant.

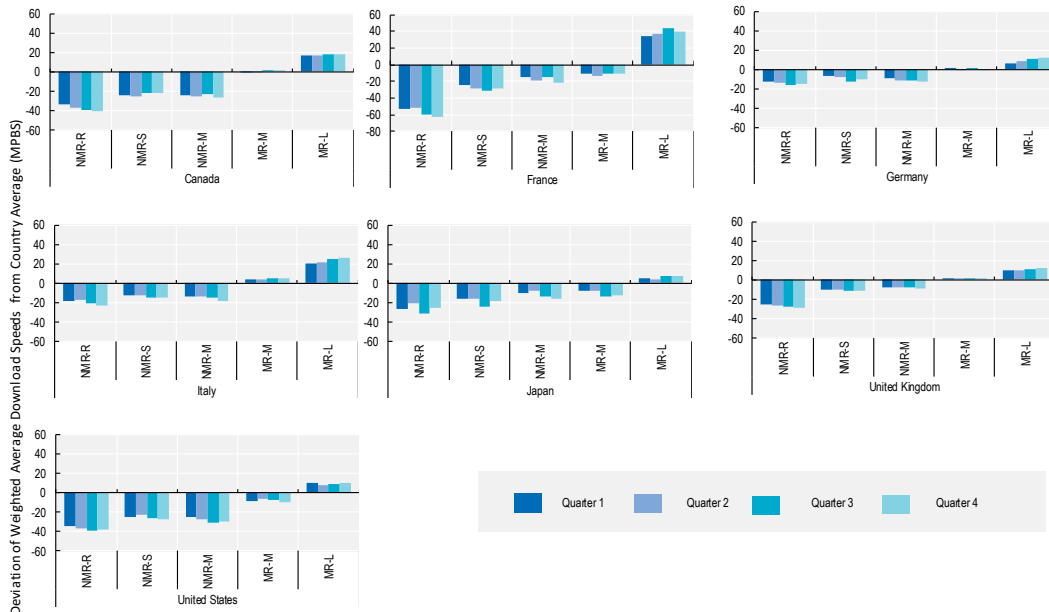
The lack of quality broadband may be limiting remote work opportunities in rural regions. While a first level analysis might conclude that broadband is less relevant for rural areas, this is a naïve interpretation. The pre-existence and demand for broadband access is often associated with positive growth in economic activity. Therefore, it is also possible to say that households' lack of broadband access is one of the reasons that certain areas fail to attract remote workers. Indeed, in Figure 2.4, we observe unequal opportunities for areas with a higher degree of rural characteristics. Internet quality, as measured by average peak download speeds on fixed broadband from Ookla, systematically lags behind in non-metropolitan regions. Fixed broadband access and quality produces network effects that influence the structure of regional economies. If broadband access and quality were the same across regions, and the marginal effects of broadband access was still negative sloping, then we could say that the needs of individuals in rural areas are simply different. However, this is not the case. Internet download speeds are systematically lagging behind in non-metropolitan regions. Although they have risen over the first three quarters of 2020 (prior to generalised lockdown measures) in most countries, the increase have not lead to reductions in the gap between rural and urban regions.

In countries where there is a more equitable distribution (low variance) of internet speeds between territories, there was also a more equitable distribution in the shares of remote working jobs. Both

the UK and Germany have low variance of remote working jobs (Figure 2.2) and more equal internet download speeds across types of territories (Figure 2.4). Countries like France and the US have the highest levels of differences between different types of territories, even if they both also simultaneously have the relatively high speeds in the largest metropolitan regions. This polarity is also reflected in the fact that intermediate territorial categories have lower shares of remote working occupations as compared to metropolitan regions.

Figure 2.4. Fixed Broadband Download Speeds (2020, Q1-Q4)

Deviation of average download speed in fixed broadband (mbps) from country average (weighted mean), 2020



Note: The data for average fixed broadband download Speedtests reported by Ookla measures the sustained peak throughput achieved by users of the network. Measurements are based on self-administered tests by users, carried over iOS and mobile devices. The values capture the average peak speeds, rather than absolute peak speeds and may not align perfectly with sources such as m-labs or steam due to differences in measurement methodology. The figure presents the deviation (in levels) from the average peak speeds observed in the country. Territorial aggregation according to the OECD typology based on access to cities is available from Fadic et al. 2019. The figure presents the deviation of average peak speed tests (weighted by the number of tests) from country means. For further information on the degree of urbanisation, the definition and treatment of the Speedtest data, please see OECD (forthcoming), G-20: Synthesis report on existing digital divides. OECD Publishing : Paris.

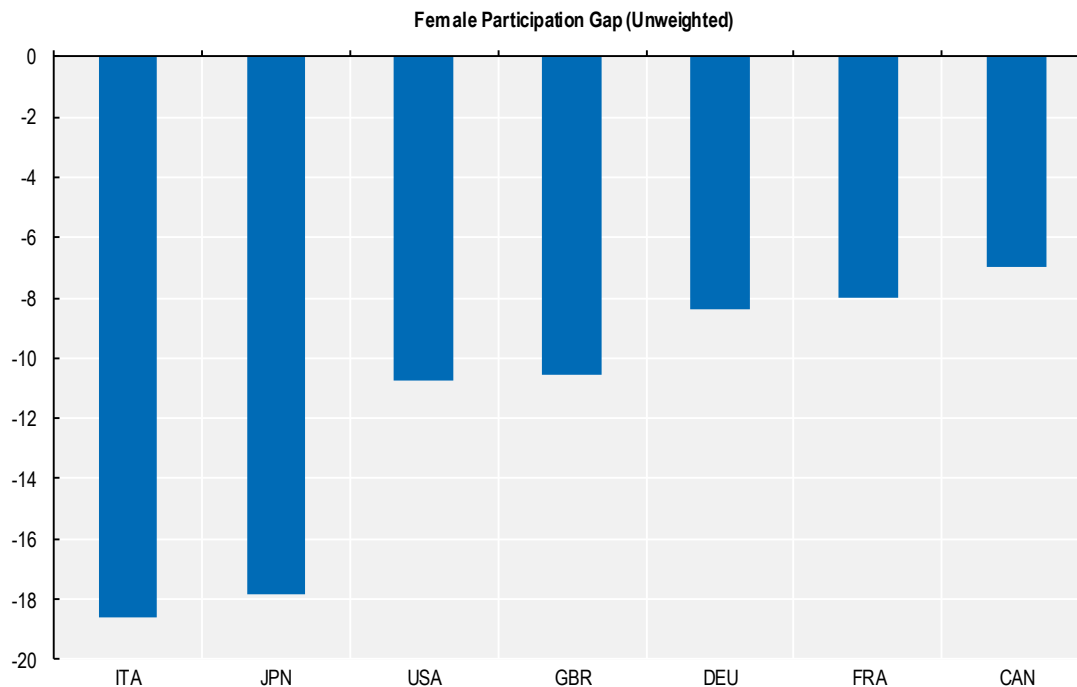
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Female employment and remote work

Women make up 46% of the active labour force⁵ in G-7 countries (OECD, 2020^[7]), with a participation rate systematically lower than that of men in all G-7 countries (Figure 2.5). Within G-7 countries, the largest differences between female and male labour force participation rates are in Italy⁶, while the lowest differences are in Canada. Rurality alone does not determine the rates of female participation, but it is one component of occupational composition that governments need to consider when shaping policy that will facilitate the transition to the new normal. The variation of women in the workforce in regions with different degrees of rurality is an important determinant of the capacity of regional economies to adopt remote work in response to the pandemic.

Figure 2.5. Average gap in female participation rate

Female - Male, 2019



Note: The participation rate is the ratio of the working-age population (15-64) that is active in the labour force (whether they are employed, looking for work, or in training), over the total working-age population. Graph depicts regional averages of the difference between female and male participation rates.

Source: OECD Regional Indicators, ACS, CLFS

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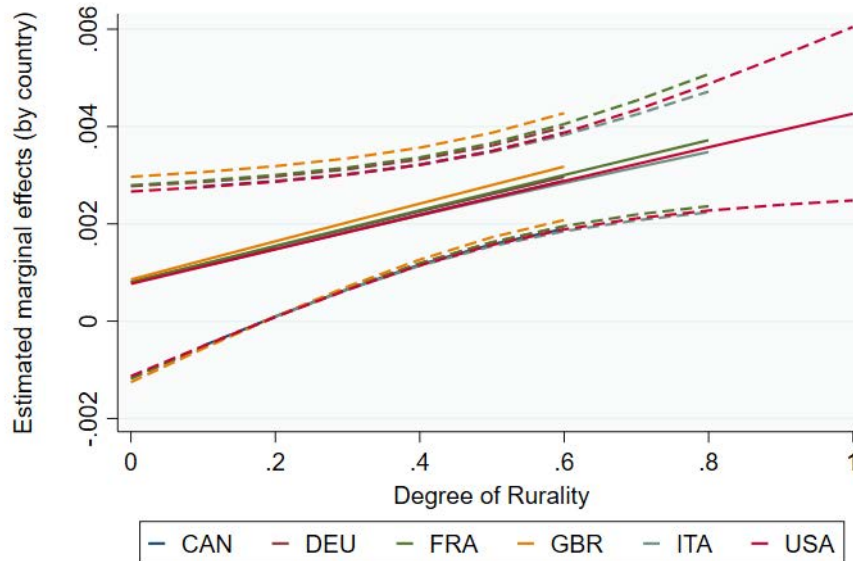
On average, more women tend to have occupations amenable to remote work than men. In Figure 2.6, the marginal effects of a higher level of participation in private sector employment of females on remote work is generally positive and upward sloping across degrees of rurality. However, it is important to note that female participation trends are not the same across all sectors and occupations. For example, women tend to be over-represented in the public sector both in critical, non-general services (e.g., health care sector) that were ill-suited to remote work. However, this was also the case for the education sector, which did have to largely transition to remote work during the crisis (OECD, 2017^[8]; OECD, 2020^[9]). In all G-7 countries, except for Japan, women filled more than 50% of public sector jobs. As such, the spatial clustering of public sector jobs will tend to correlate with both higher levels of female employment and, in some cases, remote working. In addition, while the average woman may have a job that is more amenable to remote work, such positions are likely middle management and secretarial occupations, as women are still under-represented in senior management positions (OECD, 2017^[8]), and more exposed to part-time and precarious work (OECD, 2020^[9]).

In addition, women in rural regions tend to have jobs more amenable to remote working than in denser areas. In fact, regions with higher than 25% of the population living in an area characterised as rural see a statistically significant impact of having higher rates of female employment on remote working. This is a clear avenue for governments looking to attain dual goals of more remote working and equality in the workforce. Encouraging a culture of where remote work is more acceptable for those who need

flexibility, while simultaneously focusing on work-life balance provisions are key recommendations to help reduce gender gaps in the workforce, during and after the COVID-19 crisis. For rural areas, this also means placing more focus on childcare arrangements for women who are less likely to work from home due to the task-based nature of their jobs.

Figure 2.6. Average marginal effects of female labour force participation rate on remote working rates

Female Participation Rate (15-64 years old)



Note: Female participation rate refers to active labour force between the ages of 15 and 64 that are female, within each TL2 region.
Source: EULFS (2019), ACS, CLFS, Fadic et al. (2019^[2]), OECD Regional Indicators

The wider implementation of remote working has the potential to substantially affect intra-household decision-making. Prior to the crisis, remote working arrangements were often considered to be part of work-life balance initiatives, often through labour regulations or collective bargaining that established better working conditions through flexibility around provisions for maternity, paternity, parental leave, as well as childcare, dependent parents or sick family member leave (OECD, 2012^[10]). However, with mandated remote working, and school closures, these measures no longer provide the relief needed for balancing work-life obligations, as they did prior to the crisis. For example, during the pandemic, preliminary findings suggest that due to government measures, households in the UK increased time spent on childcare by about 40 hours, or a whole additional work week, with a larger share of the work conducted by women. The study did however also find that childcare duties were reallocated within the household when men were furloughed or lost employment (Sevilla and Smith, 2020^[11]). Findings were similar in regards to the intra-household share of domestic workloads in the UK (Amuedo-Dorantes et al., 2020^[12]). Going into the new normality, governments should consider how increased remote working may inadvertently create disadvantages for the female labour force. While the pre-existing legal framework for remote working in most OECD countries focused on helping women (and primary care takers) remain in the labour market, the current implementation of a wider, and more generalized remote working scheme may create additional challenges.

A few key recommendations for helping women in adapting to a generalised remote working scenario should include implementing policies such as prioritising public childcare options and subsidising alternatives, direct financial support for female workers who take leave due to childcare responsibilities,

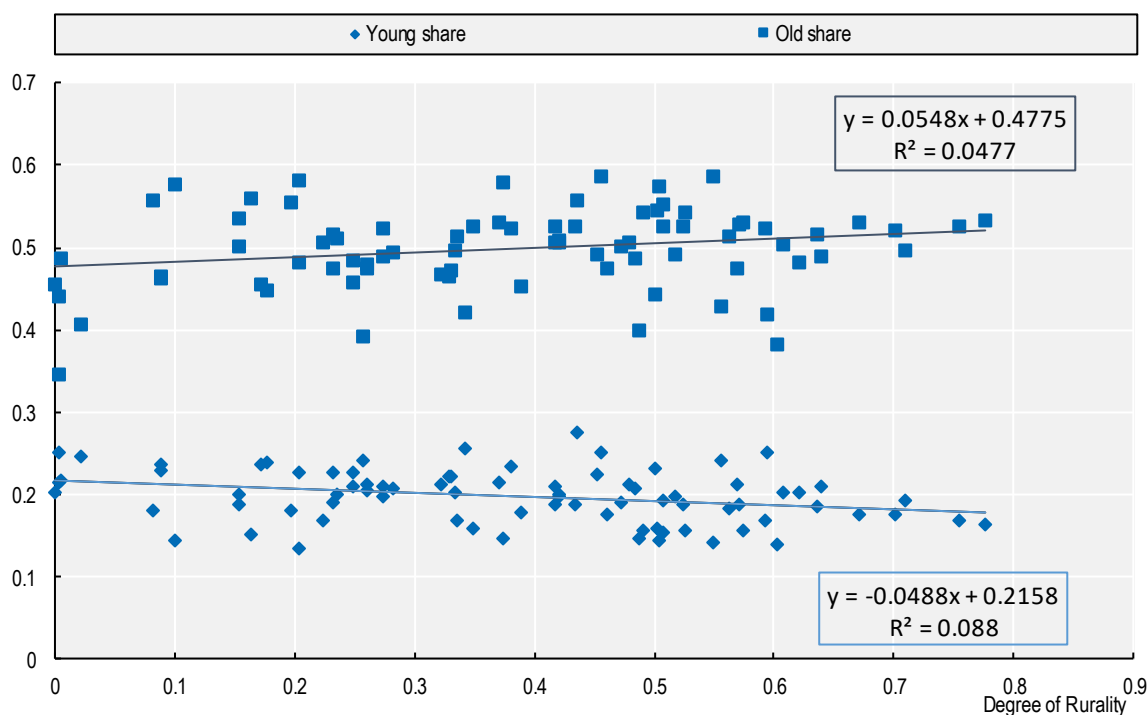
providing financial incentives for employers who provide workers with paid leave, and promoting flexibility in remote working (OECD, 2012^[10]; OECD, 2020^[13]; OECD, 2020^[14]). In addition, because access to public facilities for childcare are often more difficult for women in rural regions, special focus on alternative arrangements and flexibility at the workplace is increasingly important for women in rural regions. Age-based differences in remote working trends

Remote working creates new opportunities for older workers and workers living in rural areas that may prefer (or need) to live closer to nature. The age-based demographic distribution across regions is well documented (OECD, 2021^[5]), and implies that special focus should be placed on policies that focus on age demographics in different territories.

The geographical divide is also a generational divide. On a very basic level, Figure 2.7 demonstrates that as territories become more characterized by rural attributes, the share of older working age population (50-64) increases, while the share of the younger working population (15-29) decreases. In areas with the highest degree of rurality, the older working age population makes up 53% of the population, while the younger share of the population makes up 17% of the population. In the most densely populated areas, the older working age population makes up 49% of the population, while the young working age population makes up to 25% of the total population. The increase in the share of older and younger demographic groups in regions with higher rural characteristics makes the demographic composition of economies important when considering policies and programmes to adjust to a new normality and remote working.

Figure 2.7. The Territorial generational divide among older and younger working age populations

Share of young working age population, and share of older worker age populations in TL2 regions and degree of rurality.



Note: Young share is the share of 15-29 year olds in the population, over individuals 15 years old and older. Old share is the share of 50-64 year olds, over the 15 + population.

Source: OECD Regional Database

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The transition to remote work improves opportunities for youth in rural regions and the attractiveness of rural areas for retaining youth. As depicted in Figure 2.8, there is a positive association between the young working age population and the share of jobs amenable to remote working. Increasing remote work opportunities may help alleviate the depopulation trends in less urbanised areas, and improve the attractiveness of regions to younger residents.

Figure 2.8. Inter-generational dependencies and remote work in 2019

Share of jobs amenable to remote work, young working age to population ratios and elderly dependency ratios in TL2 regions.



Note: Young working age to population ratio is the ratio of working age youth between the ages of 15 and 29 to the population above 15 years of age. The graph excludes the US and Japan due to data availability. The elderly dependency ratio is the ratio of older population (65+) to the working age population (15 – 64). It excludes the US due to data availability. In the graph on young working age to population ratio above, region French Guiana (FRY3) is excluded as an outlier.

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The relationship between remote working and older workers (50-64) depends on how well older workers can adapt to digital communication tools. Currently, the trend between remote working rates and older workers is unclear on an aggregate level. The ratio of older working age population to the rest of the population did not show any conclusive trends (not depicted). One explanation for this could be related to two concurrent and opposing trends in occupational characteristics related to remote work, seniority and technical skills. Over the trajectory of careers, workers increase seniority with age, and find themselves in more managerial positions. Managerial positions, in turn, are among the occupational categories that have the highest rates of potential remote work. In the opposite direction, older workers have had relatively less exposure to digital occupations and skills development than relatively younger workers, making their work less amenable to remote work. Understanding what types of skills are required

for workers in the later stages of their career is an important aspect to consider when designing place-based policies.

Remote work arrangements create more opportunities for providing services to elderly demographics. The adoption of a generalised remote work model has the potential to make work arrangements and services better suited to the needs of older individuals with less mobility. In Figure 2.8, we observe that areas with a relatively high-level of old age dependency ratios (65+) also have low remote work potential, leaving an opportunity for tele-services to improve the quality of life for older demographics. When working-from-home becomes more widespread, elderly populations can gain access to otherwise unavailable services. The variation in remote work is partly due to territorial distribution of occupations. Jobs that focus on the needs and welfare of the elderly are often in the service, health and community sectors. However, many jobs with face-to-face and physical proximity requirements in particular for the health sector, are often incompatible with remote work unless such occupations can harness technologies to adapt and overcome digital privacy and security barriers, and transition to providing *high quality* services via digital platforms. For this purpose, special attention should be paid to continuing to provide basic public services to elderly populations while developing digital solutions that may help the elderly population to continue to receive quality healthcare and community services.

Education and remote work occupations

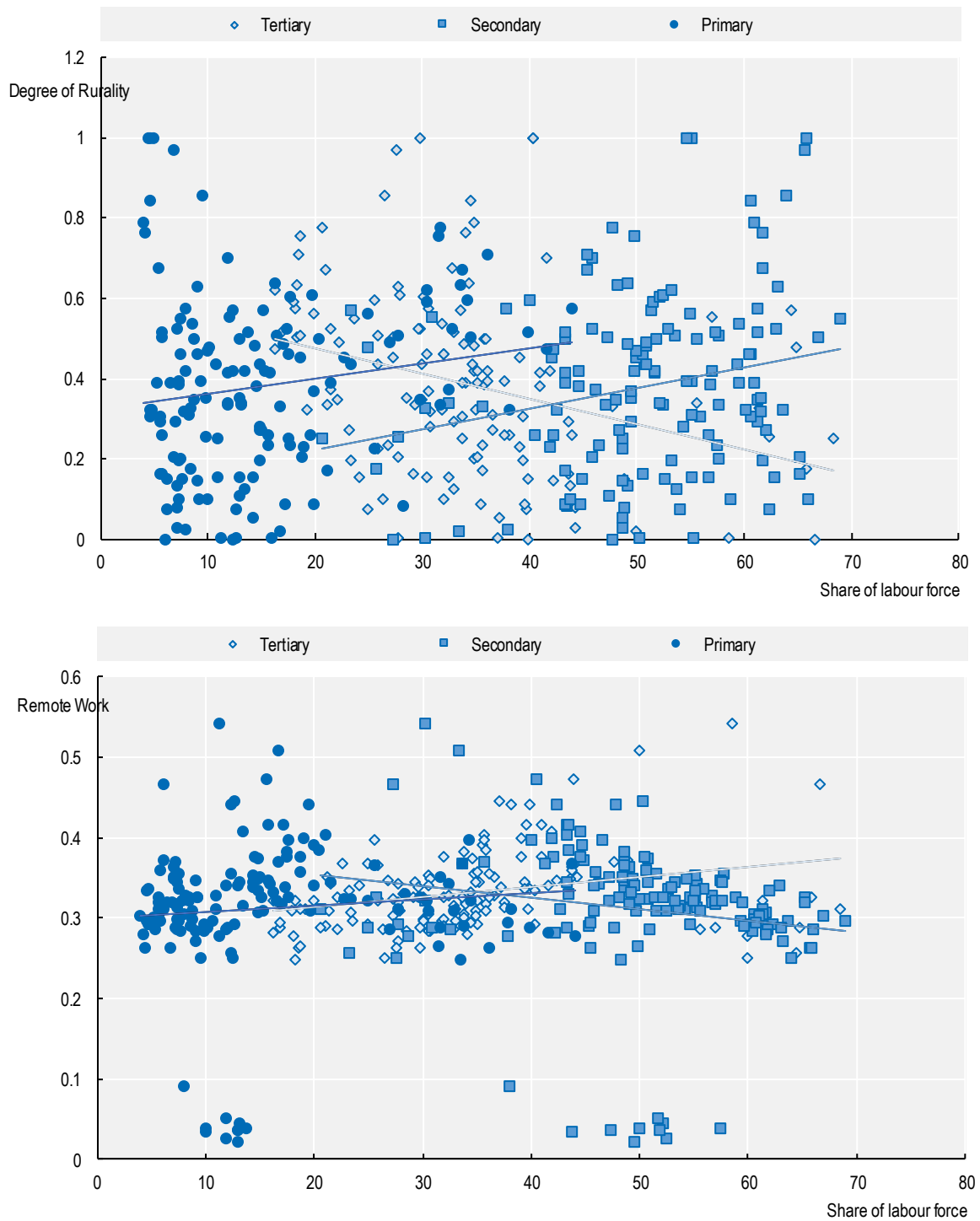
Education plays an important role in preparing workers for occupations that are amenable to remote work. To begin with, education creates a supply of skilled workers who are trained for occupations with remote work aspects. Following this, the opportunity to remote work for these skilled workers means that workers with a preference for living in different regions may now have more liberty to move in a more permanent way.

Rural regions have a lower share of the labour force with tertiary education. The depopulation of many rural regions is, in part, led by the loss of younger workers who leave to pursue higher levels of education, as well as those seeking the amenities and opportunities that arise with agglomeration economies in denser regions. As demonstrated for G-7 countries in Panel A of Figure 2.9, the relationship between education and rurality is not perfectly linear, or precise; however, the trend shows that areas with increasingly rural characteristics also have a relatively larger share of primary and secondary workers, and a relatively lower share of tertiary workers.

Regions with high shares in both tertiary and primary educated workers tend to also have a high share of occupations amenable to remote work (Figure 2.9, Panel B). It is clear that where there are higher shares of tertiary educated workers, regions also tend to have a high share of occupations amenable to remote work in OECD countries (OECD, 2020_[15]). In G-7 countries, the trend for tertiary workers is similar. Simultaneously, regions with high shares of occupations amenable to remote work are often supported by a high-degree of local service sector jobs (e.g. food and delivery services, healthcare). When regional employment consists of a large share of occupations that can be worked remotely, they are often supported by occupations that require less education, that often are at the lower end of the income distribution, creating a dichotomy of occupations within regions. Policies need to concurrently consider how to support an economy with both high-educated, high-paid workers who can work remotely, and the lower-educated, low-wage workers who provide support to these workers.

The new normality is worrisome for middle-skilled workers in rural regions. In Figure 2.9, as regions increasingly have rural characteristics, the share of secondary workers also increases. However, the relationship between the share of middle-educated workers and remote work goes in the opposite direction. Regions that have increasing shares of middle-educated workers tend to have a lower share of remote work occupations. A new normality with mass remote working is not as suitable for workers with a secondary level of education, as it is for highly educated workers, and the increasing share of such secondary educated workers in rural regions is an economic and well-being challenge for governments.

Figure 2.9. G-7 regions with highly educated workers are more often in dense areas



Note: Includes only G-7 countries with available data.
Source: OECD Regional Indicators.

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The remote work potential in regions

Understanding the characteristics of regions with varying degrees of rurality is an important aspect of understanding the COVID-related after-shocks. How policies adapt to the new normality impacts regions differently. Governments wishing to pursue strategies encouraging widespread remote work as part of a new normality need to take into consideration the distribution of workers across regions.

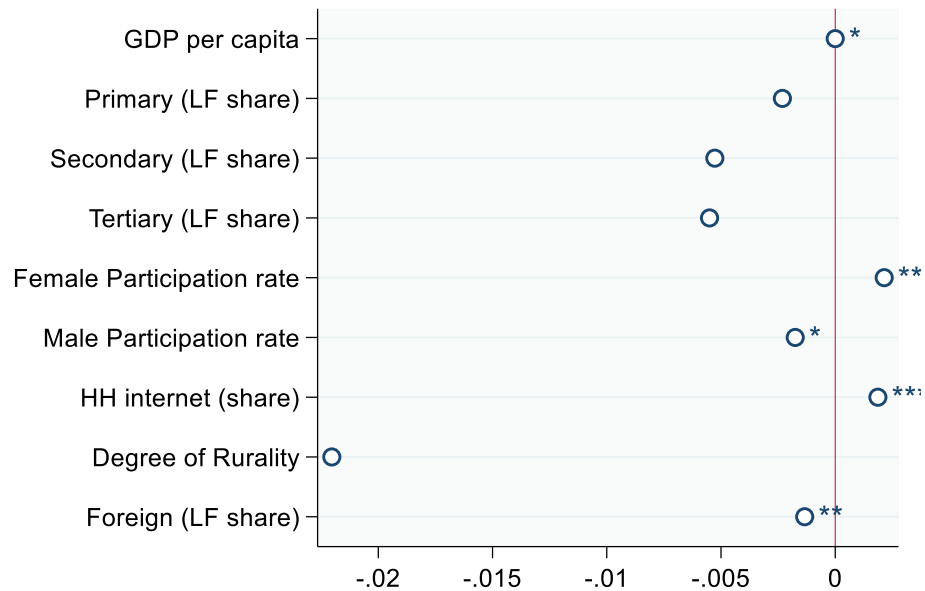
The conclusions from the analysis in the previous sections can be summarised as follows:

- There is no current consensus of the permanence of territorial relocation due to COVID; however, generalised remote working may impact where individuals choose to live in the longer term.
- The distribution of remote work occupations varies across regions. There are fewer jobs that are amenable to remote work in regions that are characterised by higher levels of rurality.
- Access to digital infrastructure is important for remote working arrangements in all regions, but currently it matters more for more densely populated regions with a higher share of remote work occupations. This is likely impacted by lack of access to digital infrastructure.
- Access to high-speed digital infrastructure is systematically lacking in rural regions. The lack of digital infrastructure is likely impacting territorial remote work potential.
- Women's jobs are positively correlated with remote work, but a generalised transition to remote work may also have adverse intra-household impacts depending on the level of support available for working women.
- There is a generational divide across territories in rural regions. Younger workers (15-29) may participate more in remote work, but outcomes for older workers (50-64) depend on whether they are able to transition to jobs that require digital skills, and outcomes for the elderly depend on whether they continue to receive *quality* public services.
- More ubiquitous remote working has the potential to exacerbate inequalities between workers in regions. Non-metropolitan regions (rural regions) have a lower share of tertiary educated workers. Because tertiary workers are more likely to hold positions that are better suited to remote work, this means that rural regions may struggle to attract employment amenable to working from home. On the other hand, there is also a high share of primary educated workers working in support services jobs in metropolitan regions where jobs are highly amenable to remote work.
- The most precarious types of workers in non-metropolitan (rural) regions are those with secondary level of education, who are less likely to have jobs amenable to remote work and more likely to represent the highest share of workers in non-metropolitan (rural) regions.

Taking all of the aforementioned relevant aspects of regional socio-economic characteristics, there are two strong messages that stand out in particular for G-7 countries, the participation rate of females, and access to telecommunications infrastructure (Figure 2.10). Additionally, further analysis is needed to understand occupational trends for men and foreign workers.

Figure 2.10. Access to digital infrastructure and women’s participation in the labour force are key regional indicators of remote work

Regression analysis on the potential for remote work at the TL2 level (2019)



Note: Analysis includes Canada, France, Germany, Italy, the US and UK. Japan was excluded due to limited access to occupational data to provide comparative remote work estimates. The reported estimation is from a linear regression model including additional controls for sectoral gross domestic product and capital regions.

Source: EULFS, CLFS, ACS

Women are more likely to have jobs amenable to remote work, yet in non-metropolitan (rural) regions there is a lower female participation rate than in metropolitan regions. Taking the fact that women tend to have more remote work jobs than men, and the lower rate of female participation in rural areas, generalised remote work arrangements create an implicit opportunity for rural recovery through female employment. The current lag in participation rates in some G-7 countries creates the impetus to both expand practices that incorporate the new normality, while simultaneously improving the labour market outcomes of women. However, governments need to carefully consider how to elaborate regulations and encourage practices in firms that support work-life balance of women entering the workforce, in jobs that have a remote working potential.

Access to quality digital infrastructure is systematically lower in rural areas, creating a primordial challenge for G-7 governments to overcome as they transition to the new normality. The most dominant factor that helps regions encourage remote work is access to telecommunications infrastructure. Investing in telecommunications and understanding policy solutions that provide ubiquitous access to high-speed internet should be the top priority of governments. As we have seen in the past, with regard to regulations related to the expansion of telecommunications infrastructure (OECD, 2021^[5]), and as we have seen more recently in several of the Covid-19 related government interventions further explored in Chapter 4, expanding telecommunications access does not *de facto* lead to equal access to remote jobs across regions. Governments should focus on ensuring quality access, which is an issue that is rarely resolved by competition policy alone.

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Notes

¹ More precisely, the method the authors use is based on text mining for key words associated with advertised occupations. The method captures whether this text reflects work that may be conducted from outside the office or physical location of work.

² In the United States, the Census Bureau uses official registers from the United States Postal Service to update official population statistics, however estimates from the Census Bureau are updated on a yearly basis, whereas the USPS data can be obtained on a more frequent basis.

³ Findings from a preliminary draft report that compared actual remote working to estimated remote working shares found that actual remote working shares were only marginally lower than estimated remote working shares. In the initial stages of government imposed lockdowns, the estimated shares more closely reflected actual remote working rates. As government restrictions were lifted, the shares of individuals that were remote working decreased.

⁴ The term “marginal effects” refers to the change associated with one extra unit of change in a related variable. In Figure 2.3, one extra unit (degree) of broadband access is associated with more remote work. However, as we increase the degree of rurality, this association decreases. As such, regions with very few rural characteristics (0 on the x-axis) have a positive association between broadband access and remote work (.002), whereas those with at least 40% of the population in rural areas, have a positive association, but to a lesser extent than regions with no rural population (.001). The dotted lines represent the intervals around which we are confident that our estimates are different than 0. For regions where at least 70% of the population is rural, the confidence intervals (dotted lines) indicate that we can no longer confidently say that estimates are different than 0.

⁵ This is calculated as the share of females in the working age labour force (15-64 years of age) in all G-7 countries in 2019.

⁶ In the Veneto region, where close to 60% of the population lives outside of a functional urban area, the participation rate of men is much higher than that of women (25.5 point difference). Within the same country, in the Apulia region where close to 50% of the population lives outside of a functional urban area, which is lower than the country average, female participation rates are much lower than those of men (-32 point difference). The unweighted regional average in Italy for the percentage of the labour force living in rural TL3 regions, within TL2 regions is 53%. Overall, regions in Italy have a higher percentage of rural population than other G-7 countries. In comparison, the regional average is 37% in Canada, 43% in France, 23 % in Germany, 32% in Japan, 25% in the UK, and 40% in the US, based on the author’s calculations.



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