OECD Local Economic and Employment Development (LEED) Papers

The future of remote work: Opportunities and policy options for Trentino

Public policy can play an important role in steering the large-scale diffusion of teleworking. Various communities around the world are experimenting with innovative solutions. In Italy, the Autonomous Province of Trento has plans to design a comprehensive plan for teleworking as a way to foster local economic and social development. Opportunities and challenges for a smooth transition to an ever more hybrid work environment are explored in view of a number of societal objectives, including an improvement in living standards, territorial cohesion and competitiveness. The paper identifies six policy areas for recommendations, reflecting the conditions needed to achieve these objectives. .

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Keywords: remote work, teleworking, local development, place-based policy, Italy, Trentino

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Executive summary

The COVID-19 pandemic has entailed a mass experiment in teleworking, unique in size and scope. Different social and economic implications are envisaged should its diffusion on a large-scale become a permanent feature of local labour markets. Whether the benefits of such a transformation outweigh its costs is an open question, with studies providing mixed evidence on crucial aspects, such as productivity and work-life balance. Nonetheless, the idea that higher levels of teleworking could promote a relocation of some jobs across space is gaining ground. A number of factors, including the regulatory framework and Internet infrastructure, will contribute to determining teleworkability levels in countries and regions. Public policy therefore has a role in shaping the framework conditions to steer the future developments of large-scale teleworking.

In Italy, the Autonomous Province of Trento has ambitious plans on teleworking. Commonly known as Trentino, this high-income mountainous area located at the northern end of the country enjoys large legislative, administrative, and fiscal power according to the national Constitution, which makes it an ideal testbed for innovative policy solutions. After experimenting with teleworking for years to increase efficiency in public administration, the local government is resolved to leverage its expertise to achieve a set of societal objectives, spanning from a drop in commuting to a boost to public sector efficiency. This report provides a quantitative assessment of potential and actual teleworking levels and their explanatory factors, as well as qualitative evidence for a place-based strategy documenting the local assets and constraining factors to a balanced and equitable adoption of remote working in Trentino's economy.

Employee and employer representatives in Trentino acknowledge the potential for teleworking to contribute to firm productivity and employee well-being. An overwhelming majority of workers had a positive experience with teleworking in Trentino based on surveys conducted during the pandemic, and would like to continue doing so a few days a week in the future. The public administration of Trento had an existing teleworking model prior to the pandemic, which allowed it to scale up the practice rapidly just after the outbreak. Other Italian and OECD regions could gain useful insights from this experience.

In Trentino, 57% of workers can work at least one full day remotely, based on the current occupational distribution**.** The majority, 35% of all workers in the province, could work from home one to three days a week. Prior to the pandemic, around 5% of workers in Trentino reported working remotely. Although the rate climbed to 22% during the pandemic-induced lockdown of 2020, it dropped rapidly as soon as social distancing restrictions were eased. The gap between the estimated teleworking potential and the actual levels reported in Trentino, especially given the positive feedback by employers and employees, calls for deeper analysis.

Place-specific factors deeply affect teleworking uptake among Trentino's employers. These include moderate levels of digital skills among workers and of digitalisation in firms, as well as a limited penetration of high-speed Internet infrastructure and a management culture that was still largely unfamiliar with remote work prior to the COVID-19 pandemic. The economic structure of the region plays a role in shaping these factors. The higher employment in the sector of personal and public services (including tourism) in Trentino relative to the national average, in combination with low teleworkability in this sector, provides an important local consideration to develop a teleworking strategy for the private sector.

Stronger public and private investments are required to foster digitalisation and remote working in Trentino. While broadband penetration is high relative to other Italian regions and the OECD mean, average speed tends to lag. A substantial share of firms based in Trentino, especially SMEs, also needed to invest in ICT systems to further enhance the digital workplace in response to the enactment of social distancing. Several public and private organisations, including co-operative enterprises, have developed or are planning to establish co-working spaces in the near future. Differences in management experience with teleworking, quality of ICT systems, and the provision of decentralised offices that allow for remote and hybrid working may become important competitiveness factors for firms to attract talent in the future.

There are potentially large spatial implications for Trentino's labour market should hybrid working become a widespread reality. In the absence of a daily commute, employees could consider accepting larger, less frequent, commuting distances. Peripheral areas may be able to attract and retain workers and firms who previously would move towards urban areas. In addition, expanding travel distances from 30 to 60 minutes from the city centre of the provincial capital increases the hypothetical labour market from approximately 0.5 million to 2.2 million, providing scope for greater efficiency in labour market matching, and in turn, higher productivity and competitiveness, whilst also boosting employees' well-being.

The tourism sector is a major economic contributor to the regional economy and firms active in the sector could explore the potential for new types of remote working visitors. Across the OECD, the sector was particularly hard-hit by the pandemic. National or international footloose workers could provide a new clientele to peripheral areas that currently rely mostly on seasonal tourism. Investment in workspaces and high-speed Internet facilities in hotels are among the most often cited solutions for Trentino to become more attractive for teleworkers. Nonetheless, moving from a seasonal to a year-round business model may require further policy support to smaller family-based enterprises in the region.

Based on a set of indicators for regional teleworking readiness, there is space for improvement in Trentino. Across five criteria, encompassing digital infrastructure, housing quality, access to public services, digital skills and regional attractiveness for younger workers, Trentino scores lower than the OECD average in all but one.

The report concludes with a series of place-based policy recommendations, centred around six points:

1. **Continue to track local labour market trends.** The pandemic is not finished, and firms and workers are searching for the right balance. Early evidence suggests that remote working is falling considerably below potential and the expressed preferences of workers. Frequent labour market surveys and the availability of administrative sources would allow trends to be continuously monitored, and in turn, provide a mechanism to assess the efficacy of policy interventions.
2. **Facilitate knowledge and experience sharing on teleworking among public and private sector organisations as well as the wider public.** Larger organisations, both private and public, tend to have better organisational and management capabilities to facilitate remote working. This experience and knowledge of the required digital services, management skills and local regulatory frameworks could be shared among local businesses, including with firms in sectors that tend to have low levels of teleworking, such as tourism and personal services.
3. **Improving the regulatory framework for employees and firms.** Local collective bargaining agreements will need to fundamentally incorporate remote working, defining the rights and obligations for workers and employers. These could be informed by agreements in countries where remote working is more commonplace, allowing Trento to be in the vanguard among Italian regions.
4. **Integrate teleworking into other policy areas.** Teleworking has the potential to contribute to other policy objectives of the region, such as improving social inclusion in the workforce and worker well-being, attracting innovative start-ups and fostering the green transition through a transformation of mobility.

5. **Invest in Internet infrastructure and plan transport systems with the demands of remote working in mind.** Teleworking requires improvement in digital infrastructure, such as fibre broadband and 4G/5G mobile connectivity, and a reconsideration of the role of public transport system connectivity between peripheral and urban areas.
6. **Raise Trentino's profile as an attractive destination for teleworkers and as a reference for a governed transition to large-scale teleworking**. With further policy initiatives, Trentino could become a source of information and practices for other OECD regions aiming to expand the uptake of, and capitalise on the benefits of teleworking.

1. Teleworking is high on policy makers' agendas

1.1. Teleworking and its implications for local development

The COVID-19 pandemic entailed a mass experiment in teleworking, unprecedented in size and scope. A permanent shift to higher levels of teleworking would have different impacts across society and space, whose interconnections call for a systemic analysis (OECD, 2020[1]). Breaking down the implications for different groups of people, places, and firms may help to obtain a comprehensive overview of the various issues at stake, highlighting the opportunities and threats that may affect each (Table 1.1).

Table 1.1. Overview of the potential impacts of teleworking on people, places and firms

	Implications on	Opportunities	Threats
People	Work-life balance	• Better work-life balance • Reduced commuting time • Adaptability of work cycle to personal needs • More flexibility for parent workers	• Blurred life-work borders • Self-induced increase in workload • Difficulties in reporting overtime • Higher caregiving burden on women
	Savings	• More flexibility in choosing household location • Lower daytime meal costs	• Higher household costs for electricity, IT facilities, space to work, etc.
	Career prospects	• Increased trust between employer and employee	• Less visibility, fewer promotions • Less in-company networking and union activism • Lower access to training and knowledge flows
Firms	Worker performance	• Reduced absenteeism • Higher hourly productivity with moderate teleworking intensity	• Managers' reduced ability to supervise staff • Lower hourly productivity with excessive teleworking intensity
	Savings	• Partial downscaling of facilities	• More investment in digital training and equipment
	Corporate spirit	• Higher job satisfaction (moderate teleworking intensity) • Higher retention of employees	• Lower job satisfaction (excessive teleworking intensity) • Reduced sense of community
	Competitiveness	• Decreasing marginal cost of ICT investment • Digital spill-overs, i.e. teleworking-driven improvement of digital skills, processes and infrastructure	• Higher costs for SMEs in digital uptake • Increased cyber-security risks • Competitive disadvantage for firms located in areas with poor IT networks • Exclusions of firms in sectors whose tasks are mainly non-teleworkable
Places	High-density areas	• Reduced congestion, less pressure on transport infrastructure • Lower rents if fewer people seek housing • Increased cohesion with rural areas	• Drop in demand for public and private services • Devaluation of real estate investment in central business districts • Outflow of human capital

	Implications on	Opportunities	Threats
	Low-density areas	• New work opportunities, job retention • Inflow of human capital, repopulation • Larger tax base to finance public services • Incentive to speed up investment in IT networks • Increased cohesion with urban areas	• Initially, lower availability of public and private services • Pre-existing digital divide with urban areas • Risk of excessively increased rent prices, displacement of locals
Society	Environment	• Less polluting emissions due to lower commuting and business travel	• Increased climate impact of data centres • Decentralised heating systems and dissipation of other economies of scale
	Social well-being	• Improved well-being • Improved welfare sustainability (e.g. more flexibility for childcare) • Improved territorial cohesion (e.g. inner/outer-city)	• Potentially increased costs for healthcare: sedentariness, anxiety, social isolation • Disparities in access to opportunities (high- vs. low-skilled workers, seniors vs, juniors, online vs. offline industries) • Risk of increased domestic violence

Source: Authors' elaboration based on (OECD, 2020[1]).

Whether the overall benefits of a mass shift towards teleworking would outweigh its costs is an open issue. Past studies provide mixed evidence on crucial aspects, including variations in productivity and job satisfaction, depending on the type of job, industry, and even worker considered. Nonetheless, the idea that higher levels of teleworking could promote a relocation of some jobs away from urban areas and represent an opportunity for regions lagging behind to catch up is gaining ground. Four spatial scenarios could emerge in the new normality with higher levels of teleworking, which can be presented in increasing order of impact on workers' location choices (OECD, 2021[2]):

1. **Business as usual:** dense cities would continue to agglomerate workers and firms, with increased adoption of teleworking within the city having little impact on workers' location choices;
2. **Doughnut effect:** city centres would become less densely populated, with workers relocating to the outskirts to find more affordable housing, but still within reach of employers' offices;
3. **Rise of intermediate cities:** cities whose critical mass allows for agglomeration benefits would take advantage of the drain of densely populated urban areas, with workers attracted by better living conditions;
4. **City paradox:** high-skilled workers would move outside of central business districts and spread out across the territory, with an increase in location-independent workers and co-working spaces.

A variety of factors, including workers' individual preferences and the working model most often adopted by employers, will help determine the prevalence of one or the other scenario. In particular, proximity to employers' premises still plays a role for workers in *hybrid* models, which combine teleworking and office presence, whereas this factor becomes negligible in *work-from-anywhere* models, which primarily rely on online communication, with personnel distributed across locations and, often, time zones. However, it may well be that more than one scenario will take hold in different places and affect local development in different ways depending on local circumstances and habits. This suggests that policy has a role to play in shaping the framework conditions and steering future developments. For instance, beyond efforts aimed at ensuring the basic requirements for teleworking, such as high-speed Internet and an enabling legal environment, a number of communities have made headlines with their teleworker relocation incentive programmes.

1.2. Governments worldwide continue to explore policy options for teleworking

Even prior to the pandemic, policies aimed at the attraction of teleworkers and people employed in the digital sector had become increasingly popular at the initiative of national, regional and local governments worldwide (OECD, 2020[1]). Since the outbreak, new initiatives of this kind have been mushrooming, with digital nomad visas, which legally entitle location-independent workers and entrepreneurs for entry and relocation to the issuing country, as a typical example.

According to governmental sources, Estonia was the first country in the world to introduce a digital nomad visa in August 2020, allowing teleworkers and their families to reside in the country on a temporary basis while legally working for a company registered abroad.[1] Iceland and Croatia have also introduced new visa programmes for teleworkers in order to enhance local economies, riding the wave of public enthusiasm for this working mode.[2] [3] The Nomad Residency Permit, inaugurated by the government of Malta, is one of the most recent additions to date to migration schemes addressed at teleworkers, allowing non-EU remote employees to remain and work in the country for a period of up to one year.[4]

The national government of Greece has gone a step further by introducing fiscal benefits for self-employed professionals who wish to relocate their fiscal residency within the country, halving their taxable income.[5] Similar initiatives have also been implemented at the local level, such as in Italian municipalities. The provincial capital of Rieti (46 750 residents), in Lazio,[6] and even very small towns such as Santa Fiora (2 500), in Tuscany,[7] have issued public notices providing vouchers to teleworkers who relocate locally for at least two months. Such incentives will cover the expenses of renting a home up to a maximum of 50% of the rental costs, for a monthly value of up to EUR 200 and a term of not more than six months, with the possibility of an extension by the municipal administrations.

Lastly, adapting pre-existing regulations has recently been envisaged by countries that have not devised ad-hoc measures specifically aimed at teleworkers. This has been the case in Germany and Portugal, which have redirected teleworkers interested in relocating to the country into established visas – for freelancers and for retirees or other foreigners living of a recognised stable income, respectively.[8]

Such initiatives are aimed towards a work-from-anywhere way of operation, rather than a hybrid model that combines teleworking and office presence. The logic behind such schemes is clear: the expense of the incentive is worth the boost to the local economy that teleworkers may provide, even if they only remain for a limited time. However, such initiatives may be isolated from a larger strategic environment, which would set a constraint and hence an area deserving particular attention. When it is not immediately evident how such efforts are part of comprehensive regional development strategies, they may create the perception of serving more as marketing tools seizing the current public enthusiasm for teleworking, rather than as well-thought-out instruments embedded into broader policies and objectives. Once a new normal

[1] For further information, visit: https://e-resident.gov.ee/nomadvisa/

[2] For further information, visit: https://work.iceland.is/working/icelands-remote-work-long-term-visa

[3] For further information, visit: https://mup.gov.hr/aliens-281621/stay-and-work/temporary-stay-of-digital-nomads/286833

[4] For further information, visit: https://nomadvisamalta.com/

[5] For further information, visit: https://www.schengenvisainfo.com/news/greece-plans-to-create-special-visa-for-digital-nomads/

[6] For further information, visit: https://www.comune.rieti.it/content/rieti-smart-village

[7] For further information, visit: https://santafioraturismo.it/vivi-in-paese/

[8] For further information, visit: https://govisafree.com/digital-nomad-visa-remote-work-visa/

emerges that defines how people live and work, the potential long-term benefits of such initiatives may fade, if not properly integrated into strategic plans across different levels of government.

Several local governments, however, have pursued a more holistic approach towards teleworking. Irelands's experience has emerged as a compelling example for teleworker attraction through the enactment of its rural policy, which has the overarching aim to revitalise low-density areas (Box 1.1) (Government of Ireland, 2021[3]). Japan has also adopted a comprehensive approach, as the government is aiming to encourage people to relocate to less-populated areas while continuing to work for Tokyo-based businesses, in order to lower population density in the capital. The administration intends to accomplish so by introducing an award system for companies that support teleworking and by granting municipalities a subsidy scheme to assist enterprises in building satellite offices outside of the Tokyo area.[9] In Belgium, Flanders' "Telewerk" action plan aims to guide workers and firms through teleworking during the pandemic and to make this model a sustainable part of the future of work. The focus is on SMEs, for which teleworking involves specific challenges. The Flemish government offers practical information about teleworking, including on recommended practices, the legal framework, available forms of financial support, etc. Importantly, teleworking is monitored through monthly firm surveys, so that targeted support can be provided according to the needs of different sectors. In addition, workers who had to abruptly shift to teleworking due to the pandemic can assess the professional and psychological impact of this working mode with the support of a career coach. Firms, in turn, can receive vouchers ("werkbaarheidscheques") to get professional advice at lower fares on how best to organise teleworking, with special attention to worker well-being.[10] These examples can be a source of inspiration for the Autonomous Province of Trento, which also has strategic ambitions in offering a comprehensive solution for teleworking that may be integrated into its broader plans for local development.

[9] For further information, visit: https://japantimes.co.jp/news/2021/05/03/business/relocations-outside-tokyo/

[10] For further information, visit: https://www.beswic.be/fr/themes/teletravail/initiatives-regionales-sur-le-teletravail

Box 1.1. Our Rural Future – Ireland's rural development plan 2021-2025

Our Rural Future represents the Irish Government's blueprint for a post-COVID-19 recovery and development of rural areas over the next five years. Its stated objectives are optimising digital connectivity, supporting employment and careers in rural areas, revitalising rural towns and villages through enhanced participation, public services and resilience, as well as fostering the transition to a climate neutral society. The plan places particular importance on teleworking, acknowledging that the rise of this working mode has contributed to reducing transport emissions, provided a boost for small local businesses across the country, and offered possibilities for young people to build a career while continuing to live in their communities, regardless of where their employer is headquartered. Planned actions specifically related to teleworking include, among other things:

- Invest significantly in teleworking infrastructure to provide an opportunity for people to continue to live in rural communities while following their career ambitions;
- Provide financial support to local authorities to bring vacant properties in town centres back into use as Teleworking Hubs and develop an integrated network of over 400 teleworking facilities throughout the country, with shared back-office services and a single booking platform for users: teleworking facilities would support the retention of skilled people in rural communities and attract mobile talent to rural areas;
- Pilot co-working and hot-desking hubs for civil servants in a number of regional towns, and move to 20% home or teleworking in the public sector in 2021, with further annual increases over the lifetime of this policy;
- Examine the potential to introduce specific incentives to encourage teleworkers to relocate to rural towns and provide funding to local authorities to run innovative marketing campaigns targeted at attracting teleworkers and mobile talent to their county.

Source: (Government of Ireland, 2021[3]).

1.3. Trentino has plans to improve its attractiveness for teleworkers

Located in north-eastern Italy, the Autonomous Province of Trento (commonly referred to as Trentino) is a fully mountainous area with relatively low population density (88 inh./km^2 against a national mean of 196 inh./km^2). Relative to other Italian regions, Trentino presents high income levels[11] and a remarkably equal distribution of wealth. It nears the top under all employment metrics, and its population is one of the most educated in the country.[12] R&D expenditure is also high in the Italian context, with an unusually strong contribution by the public sector. Trentino also ranks high among most parameters of regional well-being, notably in health, safety and community.[13] However, compared across all OECD regions, Trentino shows

[11] In 2018, Trentino's GDP per capita, expressed in terms of purchasing power standards, amounted to 126% of the EU average, the fourth highest rate among the Italian regions: https://ec.europa.eu/eurostat/documents/2995521/10474907/1-05032020-AP-EN.pdf/81807e19-e4c8-2e53-c98a-933f5bf30f58

[12] According to the Human Development Index, a composite index of life expectancy, education, and per capita income indicators, Trentino ranks second among the Italian regions: https://globaldatalab.org/shdi/shdi/ITA/?levels=1%2B4&interpolation=1&extrapolation=0&nearest_real=0&years=2019

[13] Trentino's ranking under the OECD Regional Well-Being Index is available at: https://www.oecdregionalwellbeing.org/ITH2.html

ample room for improvement in life satisfaction, environment and housing, i.e. three indicators that, as discussed later in this report, are closely related to teleworking. Table 1.2 provides an overview of the basic demographic and economic statistics of Trentino.

Italy's devolved local governance confers significant policy making powers to its 20 first-level sub-national units, i.e. regions. Moreover, five regions are designated by the Italian Constitution as "autonomous", being disciplined by ad hoc autonomy statutes. Trentino-Alto Adige/Südtirol further delegates its powers to its constituent provinces, Trento and Bolzano-Bozen, which are thus named "autonomous provinces", and are counted as regions in the framework of the nomenclature of territorial units for statistics (NUTS2). In this framework, the devolved powers transferred to the autonomous provinces cover political, legislative, administrative and fiscal issues, making them a unique test-bed for innovative policies.

While provincial law no. 3/2020 made a first step in promoting teleworking in Trentino as a way to enforce social distancing in the context of the pandemic,[14] a resolution by the provincial government mandated the administration to design a longer-term strategy for teleworking in late 2020.[15]

The resolution defines "agile working" as a "*form of employment characterised by the absence of time (or space) constraints and by an organisation* [of tasks] *based on phases, cycles and objectives, established between the employee and the employer in such a way as to encourage productivity growth*". This implies that a shift to teleworking requires adopting a holistic approach to rethinking employment relationships, going beyond a mere transposition of traditional processes to an online environment.

In promoting such a working mode across the public and the private sectors, and setting standards common to all employers, the resolution acknowledges that the transition may "*have an impact on the socio-economic fundamentals of the territory, such as mobility and economic development in rural areas, which will have to be rethought based on new paradigms*". Indeed, the local government shows interest in the effects not only within but also outside of organisations that adopt teleworking, consistently with its stated strategic purpose of enhancing the overall competitiveness of Trentino. In its plans, teleworking could serve such a purpose in different ways, including: a more efficient provision of public services, as service hours could be extended and civil servants reallocated to smaller communities; savings from lower investments in work premises, with more people working from home; an incentive to the digitalisation of processes within public and private employers; and an improved ability to attract workers and residents, thanks to better framework conditions to reconcile professional and personal needs.

The institutional process underpinning the preparation of the strategy reflects the level of ambition and the plurality of goals pursued by the local government. Consultation with stakeholders is organised following a tripartite structure, with each group responsible for setting standards on a specific dimension at the heart of teleworking, i.e. managerial, digital, and spatial. Participants include members of the local government and its agencies in charge of relevant policy areas, business associations and individual firms of particular relevance, as well as the academia and research institutions. According to the resolution, a second round of consultations would subsequently identify the potential impacts of teleworking on a number of fields, including mobility, territorial cohesion and environment protection, to name but a few. The whole process should lead to presenting a first version of the strategy by the end of 2021, immediately followed by the launch of pilot measures, with a time horizon of 2021-23.

This report aims to contribute to the effort of Trentino's provincial government by providing quantitative (Section 2.) and qualitative (Section 3.) evidence for its planned strategy as well as a set of evidence-based policy recommendations (Section 4.).

[14] Provincial law no. 3/2020: https://www.consiglio.provincia.tn.it/doc/clex_36556.pdf

[15] The goal is the creation of a strategic plan at local level aimed at fostering social and economic development. For further information, visit: https://www.ufficiostampa.provincia.tn.it/Comunicati/Lavoro-agile-verso-la-creazione-di-un-distretto-Trentino-intelligente

Table 1.2. Trentino basic demographic and economic statistics

Territory and demographics		Ranking in Italy (out of 21 regions)*	Year and source
Size (km²)	6 206.86	17th	2021 (ISTAT)
Population	544 745	17th	2021 (ISTAT)
Population density	88 inh./km²	16th	2021 (ISTAT)
Share of mountainous territory (>600m)	100% of municipalities		2021 (ISTAT)
Economy			
GDP (EUR million, constant prices, base year 2015)	20 203.8 (2019)	18th	2019 (OECD)
GDP per capita (EUR, constant prices)	37 339	3rd	2019 (OECD)
Gini index (disposable income)	0.282	6th lowest	2013 (OECD)
Employment			
Employment rate (15-64 years)	68.5%	3rd	2019 (OECD)
Men	74.9%	5th	2019 (OECD)
Women	61.7%	4th	2019 (OECD)
Youth (25-34)	76.3%	3rd	2019 (ISTAT)
Skills and innovation			
Total tertiary education (ISCED2011 levels 5 to 8), 25-64	22.4%	4th	2020 (OECD)
R&D expenditures (% GDP)	1.57%	5th	2018 (OECD)
From business	0.65%	11th	2018 (OECD)
From government	0.41%	2nd	2018 (OECD)
From higher education institutions	0.46%	7th	2015 (OECD)
Regional well-being*			
Housing	4.4	12th	2017 (OECD)
Life satisfaction	5.9	2nd	2017 (OECD)
Access to services	7.4	3rd	2017 (OECD)
Civic engagement	6.7	10th	2017 (OECD)
Education	6.7	1st	2017 (OECD)
Jobs	7.4	2nd	2017 (OECD)
Community	8.5	2nd	2017 (OECD)
Environment	5.3	6th	2017 (OECD)
Income	5.0	4th	2017 (OECD)
Health	9.9	1st	2017 (OECD)
Safety	9.5	13th	2017 (OECD)

Note: *Each region is measured in eleven topics important for well-being. The values of the indicators are expressed as a score between 0 and 10. A high score indicates better performance relative to the other OECD regions. Data refer to 2017 or the latest available year.
Source: Authors' elaboration on a plurality of ISTAT (Italian National Institute for Statistics) and OECD sources.

2. Measuring teleworking in Trentino

This section documents quantitatively the teleworking potential of Trentino and South Tyrol based on the current employment in comparison with the Italian national average. The average level of teleworkability across all jobs in Trentino prior to the pandemic (2018-2019) was about 33%. It was slightly lower in South Tyrol, and the national average was a few percentage points higher. These figures are closely in line with those found in other G7 countries (OECD, 2021, p. 51[2]). However, substantial differences emerge between sectors. Moreover, the percentage of workers that could work at least one day a week amounts to an outstanding 57%, under the assumption that teleworkable tasks can be concentrated on the same day.

The second quantitative assessment looks at the levels of teleworking recorded in workforce surveys over the past three years in Trentino, including during the pandemic period. *Actual* teleworking was low prior to the pandemic, averaging around 5% of all workers. During the first peak of the pandemic, the share of respondents who indicated that they had worked remotely at least one day a week climbed to 22%. However, after the first emergency of the pandemic dissipated, a quick reversal towards office-based work has emerged.

Ultimately, this section shows that the teleworking potential of a job is a strong predictor of the associated worker reporting to work remotely, even if the general adoption of teleworking is low. Further factors that strongly predict teleworking are the level of education and firm size. These are shared in Trentino and South Tyrol, as well as in Italy overall. Some other factors, such as the family situation, gender and job sector, do not show a significant correlation to the practice of teleworking.

2.1. Teleworking potential

In 2019, the average share of teleworkability among Italian jobs amounted to 32.3%, based on national employment distribution by type of occupation (Figure 2.1).[16] That figure is higher for Trentino and South Tyrol than the national average by 1.3 and 1.2 percentage points respectively, although the size of the gap should be taken with caution given the smaller number of observations in the two provinces on which these numbers are estimated.[17]

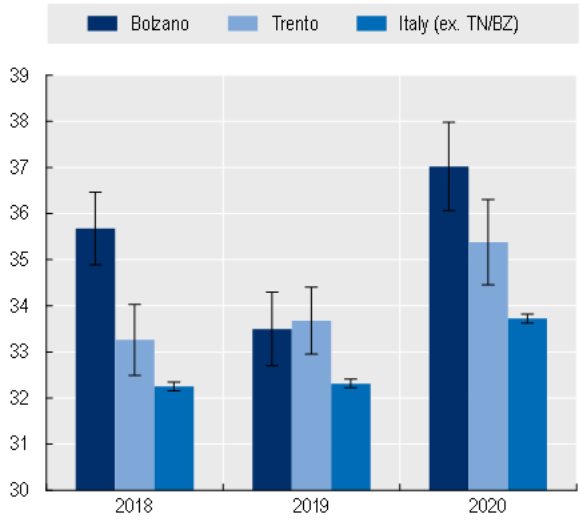
The estimated level of teleworkability grew during the pandemic in both provinces as well as in Italy at large. The increase is due to changes in employment (notably, a decrease among the least teleworkable occupations), rather than in the amenability of occupations to be performed remotely, which is held constant over the period. Although the employment trend may be reversed once social distancing and

[16] The methodology of determining which and to what extent occupations are teleworkable follows earlier OECD publications (OECD, 2020[4]). In brief, for every occupation the associated tasks typically performed are qualified as teleworkable or not. Occupations with more teleworkable tasks will receive a higher score. Specific teleworking scores thus obtained are then merged with the Italian Labour Force Survey data.

[17] Since the labour force survey is based on a sample of individuals, year-to-year variation and variation across provinces can be due to sampling variation, at least in part. The 95% error bands suggest that the variation between 2018 and 2019 does not appear to be statistically significant.

other containment measures are no longer in place, it is important to note that the increase in teleworking was disproportionally higher in the provinces observed

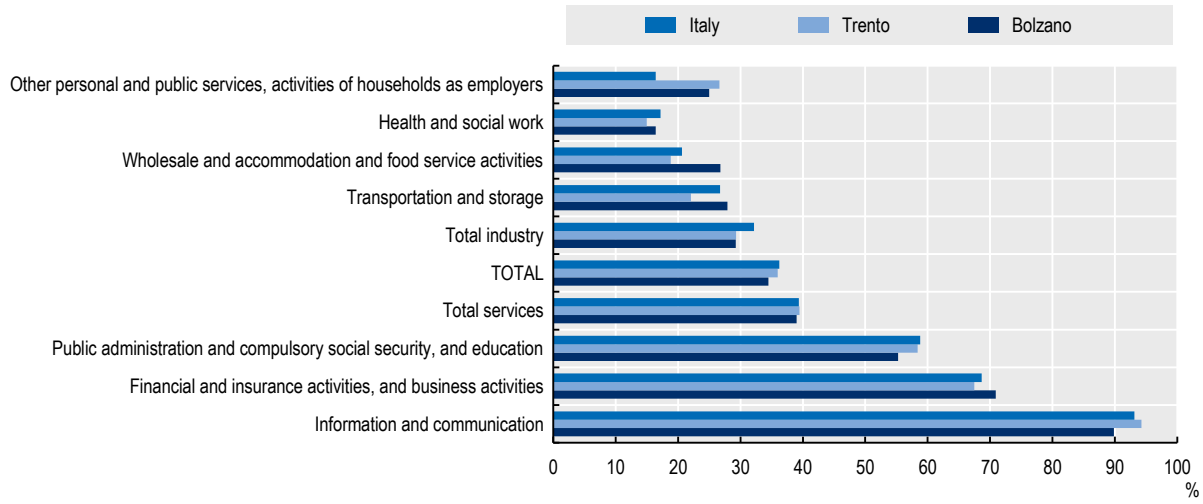
Figure 2.1. Teleworkability in South Tyrol, Trentino and rest of Italy



Note: Average teleworkability based on occupation codes (OECD, 2020[4]). Error bands indicate 95% confidence intervals, which are wider for the provinces due to lower number of observations. Note that the vertical axis is truncated from below.
Source: OECD calculations based on Italian Labour Force Survey, 2018-2020 (ISTAT, 2020[5]).

The variation in teleworking potential between regions ultimately depends on the presence of teleworkable occupations. Occupations with higher levels of teleworkability tend to concentrate in specific sectors. Therefore, there are large differences in teleworkability between sectors, more so than between places (see Figure 2.2). Especially service sectors related to ICT and business administration tend to have high shares of occupations that are teleworkable. In contrast, sectors active in services to persons, transport and much of manufacturing see relatively low levels of teleworkability. The higher employment in the sector of personal and public services (including tourism) in Trentino and South Tyrol relative to the national average, in combination with low teleworkability in this sector, goes a long way in explaining the regional differences observed in Figure 2.1.

Figure 2.2. Teleworkability by sector



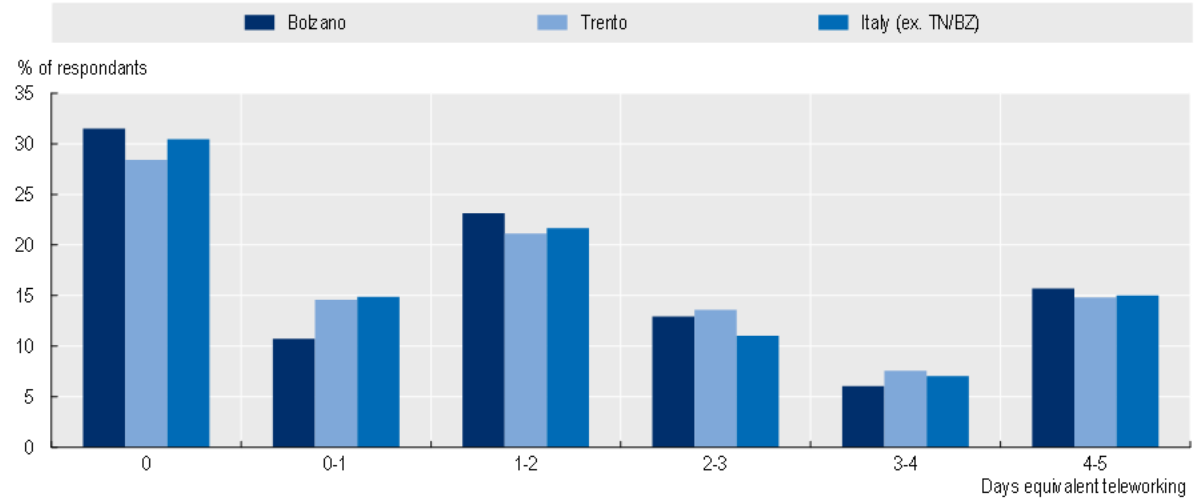
Note: Teleworkable jobs by sector as percentage of all jobs within sector. Teleworkability follows the definition and methodology of ISTAT (2021[6]). The methodology is conceptually identical to the one adopted by the OECD (2020[4]), but has variations in the occupation specific teleworkability ratings.
Source: Custom tabulations provided by ISTAT, based on ISTAT (2021[6]).

The pandemic has increased the salience of teleworking, including for occupations that were not usually associated with this practice. However, each occupation consists of a combination of tasks, and some tasks may become teleworkable with new investments and technological developments. For instance, machine operation in manufacturing may not be typically associated to teleworkability, but with further investments in "smart manufacturing" this may become a possibility in the future. This offers the potential to increase teleworkability in a region or sector, even if the main occupations remain largely unchanged. The next section will further address whether firms in Trentino may be able and interested in exploring such new production methods.

The average teleworkability by region or sector still obfuscates the range of teleworkability over a typical work week. For instance, if some jobs are 20% teleworkable, then this would still offer an employee the opportunity to work remotely one day a week.[18] Figure 2.3 indicates that in Trentino 28% of workers have a zero potential to telework. Hence, 72% of workers have at least some potential of teleworking. If not counting the workers that have less than a full day equivalent of teleworking potential, 57% of workers can work at least one full day remotely. The majority of them, 35% of all workers in Trentino, tend to have a teleworkable potential that would equate to one to three days a week.

[18] Under the assumption that teleworkable tasks can all be performed on the same days, while concentrating the majority of tasks that require in-person presence to the days at the workplace allows representing the percentage of teleworkability (e.g. 20%, 40%, 60%) to a potential of number of days an occupation can be performed from home (e.g. 1, 2, 3 days respectively).

Figure 2.3. Teleworking potential by day equivalent

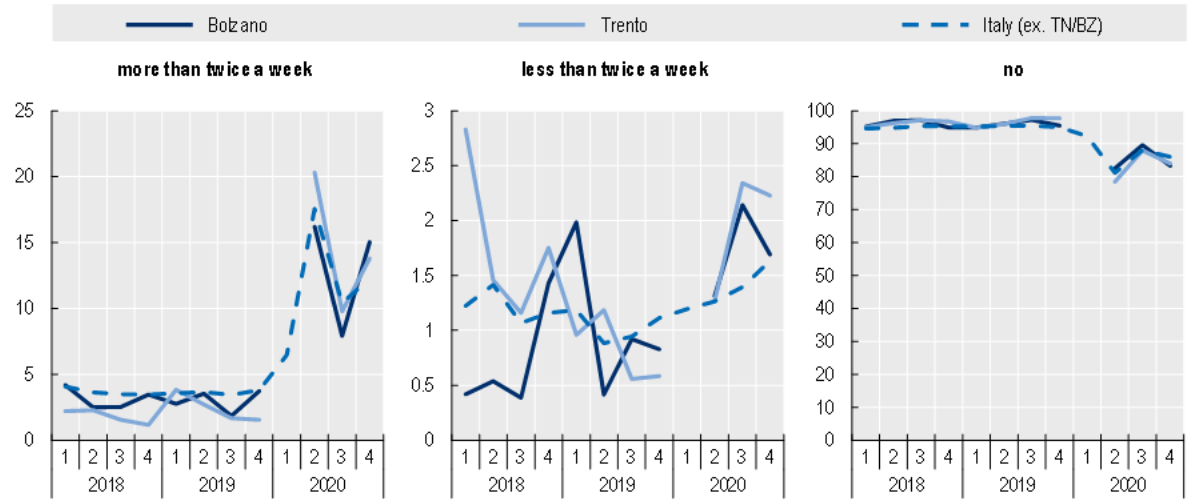


Note: Teleworking potential translated from a percentage to days equivalent, where up to 20% equals to 1 day, 40% up to 2 days etc. The zero bars are those with zero potential, and 0-1 includes only those that have more than zero but less than 20% of teleworking potential.
Source: OECD calculations based on Italian Labour Force Survey, 2019.

2.2. Actual teleworking

The practice of teleworking over time can be gauged using the Italian Labour Force Survey. The results are summarised in Figure 2.4. In 2018 and 2019, about 3 to 4% of respondents answered to work more than twice a week remotely on national average, with an additional 1% of respondents less than twice a week. In Trentino and South Tyrol, the uptake of more than twice a week was lower, but the share of people working less than twice a week was slightly higher than the national average. Overall, the actual use of teleworking in Trentino and South Tyrol was similar to the national average. The situation substantially changed from the first quarter of 2020 onwards. The practice of teleworking more than twice a week increased to 20% in Trentino and 16% in South Tyrol, while the national average increased to 18%. There is also an increase in the response of people working less than twice a week remotely, but this increase is relatively small, in line with the practice of full teleworking during the peak of the pandemic. Teleworking dropped during the third quarter of 2020 and increased again during the fourth, closely mirroring the number of COVID-19 cases in the country and the associated governmental decrees on social distancing.

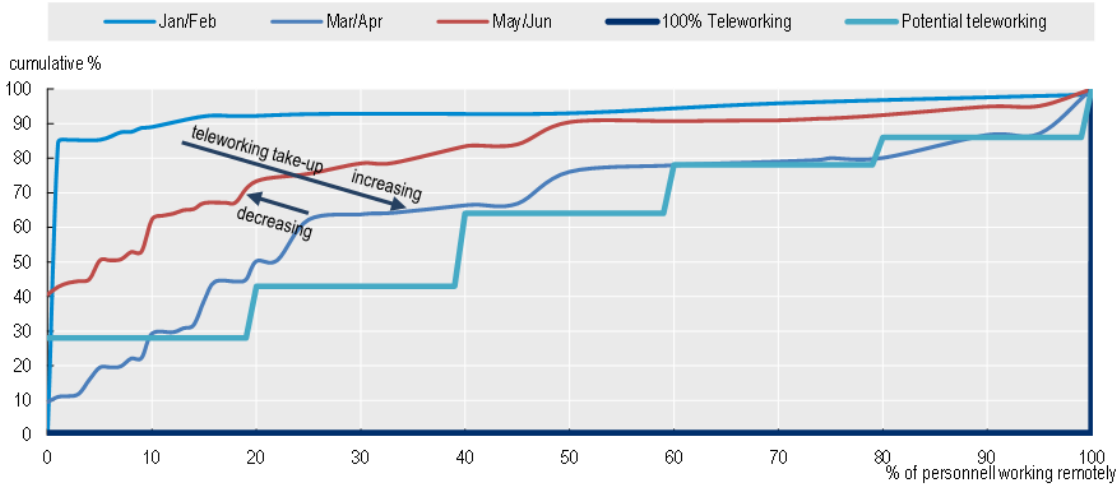
Figure 2.4. Reported teleworking



Note: Reponses to the question "Have you worked from home during the past four weeks?" The gap for 2020 Q1 is due to lack of enough responses in the data for the two provinces.
Source: OECD calculations based on Italian Labour Force Survey, 2018-2020.

Data from a survey of firms in Trentino further attests to the variation in the practice of teleworking during 2020. Firms were asked to indicate the percentage of their employees that worked remotely, as well as how much. For instance, a firm could respond indicating that 20% of employees worked remotely 20% of the time (one day a week), with an additional 30% of employees working remotely 40% of the time (two days a week). As indicated in Figure 2.5, prior to the pandemic (January/February 2020), few workers worked remotely. By March/April the practice of teleworking substantially increased, and it can be argued that it reached levels that are close to the maximum potential. However, by May/June the practice of teleworking substantially reduced again, in line with the relaxation of social distancing measures.

Figure 2.5. Teleworking in Trentino enterprises during 2020



Note: The figure indicates cumulative percentages on the question to enterprises "What percentage of your personnel worked remotely?" Weighted responses to a Trentino based survey. The higher the line the lower is the teleworking take up, the lower the line the larger is the share of workers working remotely. Potential teleworking follows the percentages indicated in Figure 2.3 (based on occupational distribution in 2018). Total teleworking represents the extreme case of 100% teleworking for all workers. The opposite, no teleworking for all employees would be the mirror image into the top-left corner, which is what the Jan/Feb line almost represents.
Source: OECD calculations, based on ISPAT and the Italian Labour Force Survey, 2019.

People's choices to work remotely are the result of a combination of factors, including occupation (defining the teleworking potential), personal situation, educational level, work situation, and characteristics of employing firms. Linear regression analysis allows to empirically test which factors are associated most strongly to teleworking in Italy overall and the Trentino and South Tyrol separately.

Table 2.1 presents estimates on individual and regional factors that predict the participation in teleworking of individuals.[19] The table compares the pre-pandemic period (2018-2019, all quarters, columns 1 and 2) responses with those from during the pandemic (2020, quarters 2 to 4, columns 3 and 4). In addition, it compares the responses from across Italy with those of workers with their work place in the provinces of Trentino and South Tyrol. An individual's occupation-specific teleworkability is added as an explanatory variable. This variable controls to a large extent the role of a worker's occupation and sector on the probability of teleworking.

Teleworkability is indeed a good predictor for actual teleworking, in Italy overall and in Trentino-South Tyrol separately. The results also indicate a strong increase in the coefficient during the pandemic, confirming that teleworking became more common but was still occupation-specific. The coefficients are relatively small, however. Especially prior to the pandemic, an increase in teleworkability of 10 percentage points only increases the probability that a person engages in some teleworking by 0.3%.

Looking at the individual worker, the most important characteristics that influenced teleworking prior to 2020 were the level of education (the higher the level the higher the probability of working remotely) and the type of worker when split between "blue collar", "white collar", manager and self-employed.[20] These results are also found for Trentino and South Tyrol. During the pandemic period, the coefficients of these explanatory variables increased, suggesting again that the practice of teleworking relates to underlying job characteristics even in emergency conditions. While these results are perhaps not surprising, it is remarkable to see that some other characteristics are shown to be *not* important, including gender (even if statistically significant, the coefficient is very small) and the family situation.[21]

Concerning the contextual variables, the probability of a worker having experience with teleworking increases with firm size, as indicated by the increasing coefficients by firm size category and the increasing statistical significance of these coefficients. The same pattern is observed for Trentino and South Tyrol although the effects look slightly weaker and less pronounced for smaller and the largest firms, potentially due to the smaller sample size for the region. While the occupational aspect is largely controlled for, the distinction still indicates that workers at firms in business services and technology were more likely to work remotely prior to the pandemic relative to workers in manufacturing, and this became more important during the pandemic. Services to people, instead, fell behind the rate of teleworking in manufacturing. The regional indicators suggest that teleworking was slightly more likely among workers in the north of the country and the gap in teleworking between the northern and southern areas increased during the pandemic. However, this might also be explained by the variation in the intensity of the virus and related social restrictions put in place in the different regions over time, noting that the number of COVID-19 cases was disproportionally concentrated in the north.

[19] Teleworking is based on a single question in the labour force survey, "over the past four weeks, have you worked from home" to which there were 4 answers: "More than twice a week", "Less than twice a week", "No", "Do not know". For the purpose of this modelling, the first two answers are counted as an individual practicing teleworking. Analysis from the Bank of Italy and Istat have performed similar analysis (Depaolo and Giorgi, 2021[16]; ISTAT, 2021[6]). The results here use a different empirical specification and estimate the models separately for workers in Trentino-South Tyrol.

[20] Blue collar and white collar substitute here for the Italian terms used in the survey, *operaio* and *impiegato*.

[21] Results in Depaolo and Giorgi (2021[16]) suggest that the number of children and their age does affect teleworking in Italy. However, their empirical model specification is different from the one used here.

Table 2.1. Worker, firm and place characteristics effects on teleworking in Italy and Trentino-South Tyrol before and during the pandemic

	(1)	(2)	(3)	(4)
Period	**2018-2019**		**2020**	
Place	**Italy**	**Trentino-S. Tyrol**	**Italy**	**Trentino-S. Tyrol**
Teleworkable	0.023***	0.038***	0.170***	0.153***
	(9.9)	(5.8)	(34.5)	(7.6)
Gender (base is male)				
Female	-0.004***	-0.003	0.008*	-0.007
	(-4.5)	(-0.6)	(2.0)	(-0.5)
Schooling (base is low)				
Middle	0.004**	0.006	0.055***	0.052*
	(3.0)	(1.1)	(11.6)	(2.6)
High	0.011***	0.019**	0.099***	0.118***
	(6.2)	(2.7)	(14.5)	(4.7)
Family situation (base is single)				
Couple with children	0.002	0.010*	-0.011*	0.010
	(1.4)	(2.0)	(-2.4)	(0.5)
Couple with no children	-0.000	0.019**	-0.006	0.017
	(-0.1)	(2.7)	(-1.2)	(0.7)
Single parent, male	0.002	0.008	-0.012	-0.009
	(0.4)	(0.5)	(-0.9)	(-0.2)
Single parent, female	0.001	0.021*	-0.011	0.000
	(0.4)	(2.1)	(-1.5)	(0.0)
Worker type (base is blue collar)				
Manager	0.013***	0.004	0.167***	0.128***
	(4.6)	(0.5)	(10.7)	(4.2)
White collar	0.003*	0.001	0.137***	0.123***
	(2.5)	(0.2)	(15.0)	(7.2)
Self employed	0.116***	0.127***	0.193***	0.251***
	(15.0)	(4.1)	(16.0)	(4.6)
Company size (base is 1-10)				
11-15	0.000	-0.004	0.038***	0.007
	(0.3)	(-0.6)	(6.7)	(0.3)
16-19	0.003	0.002	0.035***	0.043
	(1.4)	(0.2)	(3.9)	(1.2)
20-49	0.003*	0.007	0.064***	0.075***
	(2.3)	(1.0)	(8.4)	(3.3)
50-249	0.008***	0.015*	0.090***	0.056**
	(4.6)	(2.2)	(11.3)	(2.8)
250+	0.010***	0.002	0.107***	0.043
	(4.0)	(0.3)	(10.0)	(1.8)
Sector (base is manufacturing)				
Wholesale and accommodation and food service activities	-0.000	-0.011*	-0.040***	-0.036
	(-0.2)	(-2.2)	(-5.5)	(-1.6)
Transportation and storage	0.000	0.005	-0.032***	-0.068*

	(0.2)	(0.5)	(-3.9)	(-2.2)
Information and communication	0.019***	-0.002	0.118***	0.137**
	(7.3)	(-0.2)	(10.5)	(2.8)
Financial and insurance activities, and business activities	0.008***	-0.002	0.064***	0.035
	(4.3)	(-0.4)	(7.7)	(1.3)
Public administration and compulsory social security, and education	-0.004	-0.006	0.073***	0.135***
	(-1.7)	(-0.9)	(5.8)	(4.0)
Health and social work	0.012***	0.039***	-0.013	-0.003
	(3.4)	(5.1)	(-1.1)	(-0.1)
Other personal and public services, activities of households as employers, and other	0.001	-0.006	0.001	-0.042
	(0.5)	(-0.7)	(0.1)	(-1.2)
Region (base is North-West [columns 1, 3]]/ South Tyrol [columns 2, 4])				
North-East	0.006*		-0.023	
	(2.3)		(-1.6)	
Centre	-0.003		-0.018	
	(-1.2)		(-1.2)	
South	-0.007**		-0.023	
	(-3.2)		(-1.8)	
Islands	-0.006**		-0.042**	
	(-3.1)		(-3.0)	
Trentino		-0.013***		-0.001
		(-3.3)		(-0.1)
Observations	98173	6793	38538	2382

Notes: Margins based on probit regressions on Italian Labour Force Data. The coefficients are interpretable as changes in the probability of observing teleworking for an individual. Since all covariates are factor variables, the coefficients should be seen as changes in this probability relative to the base group, which is indicated in the row headings. Columns (1) and (3) standard errors clustered by province, columns (2) and (4) robust standard errors. Significance levels: * p<0.10, ** p<0.05, ***p<0.01.
Source: OECD calculations based on Italian Labour Force Survey.

3. Preferences and trends among Trentino's stakeholders

This section addresses the perspectives of different types of stakeholders regarding the opportunities and challenges associated with a more extensive use of teleworking (see Box 3.1). A first issue concerns what is understood precisely with the term "teleworking", suggesting the presence of deep-rooted opinions on the subject (subsection 3.1). Bargaining between the social partners reflects a plurality of interests underlying the practice of teleworking (3.2). Questions about future preferences highlighted both tangible and intangible barriers to a further adoption of teleworking (3.3), while management practices shared by representatives of the public and the private sector offered lessons for how to move forward (3.4). Further considerations raised include the spatial and market implications of teleworking (3.5 and 3.6 respectively).

Box 3.1. Grasping local teleworking trends through stakeholder interviews

A series of interviews conducted between May and June 2021 with selected stakeholders from Trentino complements the body of quantitative evidence illustrated in the previous section.

A general framework of questions had been prepared before the interviews, having in mind three groups: i) representatives of local government, ii) labour unions and, iii) business associations. Most of the respondents falling under these groups hold management positions, thus being in an ideal position to comment on the impact of teleworking within their respective organisation or community, in the case of social partners. The selected business associations account for the plurality of sectors making up the economy of Trentino, including manufacturing, retail trade and tourism. Most questions addressing these three groups aimed at grasping systemic aspects, such as the perceived opportunities and challenges associated with teleworking, the presence of barriers to and future preferences regarding this working mode, as well as the potential implications of its large-scale diffusion for local development.

A fourth stream of interviews addressed HR professionals from medium and large companies of Trentino in fields such as engineering, energy and software, each with a meaningful share of staff in teleworkable occupations. In this context, interviews aimed at collecting information on corporate practices related to teleworking before, during and after the pandemic among firms that, given their relevance for the regional economy, may serve as a benchmark for other employers in the future. A similar methodology for a regional assessment of teleworking in the private sector was recently conducted in Northern England (Taylor et al., 2021[7]).

3.1. Understanding teleworking

Definitions: a matter of substance

According to a common opinion, the future forms of remote work should be radically different from the one experienced during the COVID-19 pandemic. While the latter model was motivated by a health emergency and negatively affected by strict social distancing rules, future remote work may be more value-oriented and innovative, going well beyond a mere online transposition of office work.

In Italy, two terms are used to denote such a distinction: "*telelavoro*" (literally teleworking) and the commonly used pseudo-Anglicism "smart working", the former taking on a negative connotation, the latter a positive one. Pandemic practices were viewed not as real smart working, but rather its second-rate version, i.e. *telelavoro*. To make the picture even more complex, an Italian law approved in 2017 coined the term "*lavoro agile*", literally "agile working", but typically referred to as smart working on the press and even in the official sources. As the law attaches specific features and objectives to the notion of smart working (Box 3.2), the widespread use of this term is of substantive importance, as it indicates a large preference for the model envisaged by the legislator and calls for its full implementation in the future.

In this regard, it is common opinion that teleworking should be driven by opportunities (notably, a better reconciliation of work and family life), duly regulated, and adopted on a voluntary basis upon an agreement between employers and employees. According to this view, the combination with flexible working hours and a shift from time-based to task-based work cycles would make teleworking an even more efficient tool to improve job satisfaction, without detriment to productivity.

With regard to post-pandemic scenarios, there is a clear preference for hybrid work, which combines remote and office work. While granting days of teleworking may contribute to reducing commuting, improving work-life balance, and, therefore, enhancing job satisfaction, maintaining some degree of office work would benefit teamwork, corporate spirit and, ultimately, productivity. Hybrid work is largely favoured also because it avoids a dispersion of the labour force across space, which is key to retaining talent and residents as well as to foster territorial rooting. Different forms of hybrid work also feature on top of workers' preferences according to the internal surveys carried out by several organisations of Trentino, as the following paragraphs indicate.

Box 3.2. National regulations on teleworking at a glance, and the case of Italy

While it prominently came to the fore during the pandemic, teleworking had emerged as an object of regulation in some OECD countries long before that (for example, the European Framework Agreement on Telework dates back to 2002). The crucial issues of access to teleworking and the working conditions of teleworkers have evolved in many OECD countries in the last decade (OECD, 2021[8]).

Access to teleworking is currently associated with a varied degree of legal guarantees across OECD countries. These can be grouped according to whether a statutory right to request teleworking is inscribed in the law (in which case it can be more or less extensive, conditional, and enforceable), granted by a collective agreement (either at the national, sectoral or firm-level), or its conditions are left entirely to negotiation in individual contracts between employers and employees (or to firm-level agreements covering only a minority of workers).

Regulations of the working conditions of teleworkers, in turn, are more or less extensive across countries, ranging from rules about the process of establishing teleworking arrangements (e.g. voluntariness, reversibility, etc.), to anti-discrimination provisions, rules about employers' liabilities for occupational safety and health, working schedules and overtime, data privacy and cyber-security, and the cost of equipment and maintenance.

In Italy, there is an enforceable right to request occasional teleworking (known as "*lavoro agile*"), granted in law no. 81/2017, which also lays out the working conditions for agile workers. Conversely, there is no enforceable right to request regular teleworking ("*telelavoro*"), i.e. employers have an unlimited ability to refuse employees' requests, and working conditions for regular teleworkers are laid out in general legislation (e.g. the Statute of Workers).

Italian law defines agile working as "*a method of executing the employment relationship established by agreement between the parties, including forms of organisation by phases, cycles and objectives and without precise time or place of work constraints, with the possible use of technological tools for carrying out the work activity*".[22] Individual agreements stipulated between employers and employees regulate agile working arrangements, including the performance of work outside the office, the forms of exercise of the employer's executive power and the equipment used by the employee. Agreements also identify workers' rest periods as well as the technical and organisational measures necessary to ensure the worker's disconnection from work devices. During the pandemic crisis, a ministerial decree established that agile working applies even in the absence of individual agreements.

In agile working, activities are carried out both in the office and outside (thus, it can be meant as occasional), while in regular teleworking (*telelavoro*) employees work at a fixed location, typically home, in an attempt to replicate in-office work remotely. The discipline of *telelavoro* still lacks a legislative source, and it mainly rests on a general agreement signed by the social partners in 2004 in accordance with the European Framework Agreement mentioned above.[23] The general agreement delegates the definition of detailed rules to sectorial collective bargaining. *Telelavoro* can only be started by agreement, either individual or collective, therefore, it is voluntary. Generally, it is left to the request of the individual employee, and is always reversible, in the sense that the employee may ask to return to work at the employer's premises, or the employer may dispose return to the office if the performance does not meet the required standards.

Source: (OECD, 2021[8]).

Limited evidence on future preferences

Future teleworking levels will be established in the first instance by negotiations between employers and employees. Therefore, having access to information on preferences of both groups is a critical step for estimating the spread of this practice over time and, thus, setting viable policy objectives in a wide array of areas, including social, environmental, and economic considerations.

During the pandemic, several public and private employers of Trentino have run surveys among their own staff to track teleworking trends and to gauge future preferences. These efforts served as an important ground to shape stakeholders' opinions on the matter. However, no studies encompassing the entire workforce of Trentino are currently available other than the national Labour Force Survey, which, however, focused more on measuring present trends rather than shedding light on what could happen in the new normality. The overarching consequence is a dearth of statistically representative data on workers and firms' preferences towards the maintenance of teleworking in the future.

The employee surveys conducted to date appear to show a clear preference for workers to continue their activities in a remote form, predominantly in a hybrid mode, even though a significant proportion of them would opt for a prevalence of teleworking days as opposed to office presence (see the next subsection for more details). Employers' preferences, on the other hand, seem to be different. As analysed in the previous section, a study conducted by the Trentino Institute for Statistics shows that companies tend to underestimate the teleworkability of staff's occupations, compared to estimated levels of teleworking potential based on employment characteristics. Such a gap could be due to information asymmetries between employers and employees, including misalignments in assessing the degree of teleworkability of certain tasks. Other motivations may relate to reluctance on the part of employers to promote teleworking, because of the investment it entails in the short term (combined with uncertainty on potential gains) and a loss of control by management – the latter being a frequently reported factor in interviews.

Workers, firms and social partners remain uncertain about the future. While the majority of stakeholders believes that the spread of teleworking is irreversible, none dares to predict how far it will expand or what influences it will have in the future, emphasising the necessity to track its use. Surveying current preferences among firms and workers may help local policy makers to anticipate where the balancing point in terms of the spread of teleworking will be.

3.2. A plurality of interests at play

Perceived opportunities and challenges

As outlined in Table 1.1, the large-scale diffusion of teleworking may imply a number of opportunities and challenges for people, places and firms. For instance, stakeholders in Trentino place particular emphasis on the potential for an improved reconciliation of work and family life. Conversely, they appear to devote relatively little attention to the risk of widening inequalities across occupations in the economy, based on whether their jobs can be performed remotely.

Internal workforce surveys on teleworking trends conducted by public and private employers in Trentino during the pandemic found that four out of five teleworkers report a positive experience with teleworking

[22] Law 22 May 2017, no. 81: Measures for the protection of non-entrepreneurial self-employment and measures to encourage flexible working arrangements in terms of time and place of employment. Available at: https://www.gazzettaufficiale.it/eli/id/2017/06/13/17G00096/sg

[23] Interconfederal Agreement for the implementation of the European framework agreement on telework concluded on 16 July 2002: https://www.cliclavoro.gov.it/Aziende/Documents/accordo_interconfederale_telelavoro_9_6_2004.pdf

(Table 3.1). In fact, 80% to 95% of respondents claimed that they had a positive experience with teleworking, and stated they would choose to continue teleworking in the future in 67% to 95% of the reported cases. The lower bound increases to 77% when leaving out one issuing organisation that included staff in non-teleworkable jobs in the surveyed population.

Table 3.1. Teleworking trends in five workforce surveys in Trentino

Type of entity	Response rate	Positive experience	Higher productivity	Future preferences
Private 1	97%	88%	49%	93%
Private 2	not available	91%	44%	95%
Private 3	100%	80%	83%	77%
Public 1	58%	81%	72%	67%
Public 2	70%	91%	95%	82%

Note: All surveys were conducted in 2021, except for one in summer 2020. The entities to which the surveys refer present structural differences in terms of their public or private nature, their size and sector. Samples also vary significantly across entities, e.g. depending on whether staff in non-teleworkable occupations were surveyed. Columns show the shares of respondents who positively assessed their teleworking experience during the pandemic, who indicated that teleworking increased their productivity, and who indicated a preference for maintaining teleworking in the future.
Source: Authors' elaborations based on five workforce surveys on teleworking by public and private employers in Trentino (2020-2021).

The most frequently mentioned benefits among workforce survey respondents were an improvement in the balance between work and family responsibilities, along with the possibility to save on commuting times and costs, as well as the ability to enjoy a greater degree of autonomy and flexibility during working hours, resulting in enhanced productivity and time management. The main perceived challenges, on the other hand, all seem to point in the same direction, i.e. difficulties arising from an abrupt transition to a remote working environment due to the COVID-19 outbreak.

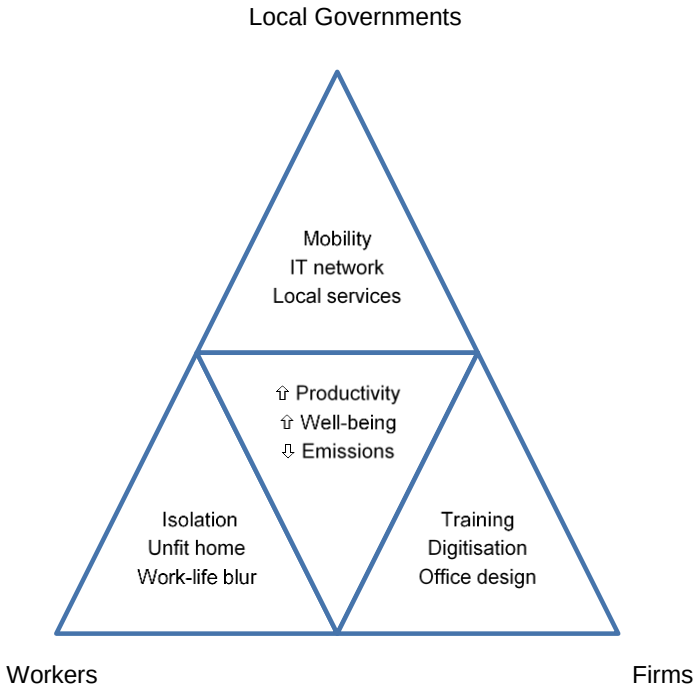
While all employees had somehow experimented with teleworking before the pandemic, this practice was still a niche for most of them in early 2020. Moving to large-scale teleworking meant having to deal with a number of issues, including poor network connection in households, lack of adequate space to work from home, and, crucially, an unplanned mass shift from paper to digital-based processes and practices that prevented conducting ordinary tasks seamlessly. Such practical concerns often featured jointly with an increasing sense of isolation caused by a lack of in-person interaction with colleagues, as well as the risk of blurring the boundaries between work commitments and private affairs.

Accounting for the diversified set of opportunities and challenges associated with teleworking shows that that all parties involved, i.e. workers, firms and the local government, may benefit from it over the medium-to-long term, assuming that each is prepared to invest adequate effort and to incur uncertainty in the short term (Figure 3.1). Public policy can contribute to ensuring that the individual risks are minimised and the common benefits are maximised, so that the experimentation can occur safely for all.

Short-term investments for the local government may include, among other things, accelerating plans to expand fibre optic network infrastructure, a potentially beneficial approach to reinvigorate low-density areas in the long run. For firms, initial investments could relate to the need to digitise administrative processes and production in such a way that a larger share of tasks can be performed remotely, but this may result in increased productivity over the medium term. Workers, in turn, may face a lack of critical public and private investment in the early stage, resulting in several negative repercussions (e.g. local public services not yet fully ready to serve a growing population in small towns) that may fade afterwards. While each group perceives a set of reasonably defined costs that are distinct from other actors', benefits are instead shared by all. Increased productivity may be more immediately relatable to firm gains in terms of profitability, but it may also translate into higher rewards for employees and an improved wealth at the aggregate level. Reduced commuting time may benefit employees in terms of an improved work-life

balance in the first place, but also businesses and society as a whole over the long period, as improved job satisfaction may increase competitiveness in talent attraction and lower costs for the public health system respectively (Table 1.1).

Figure 3.1. Teleworking entails individual challenges and shared benefits for all involved groups



Note: Outer triangles provide a selection of individual actors' own challenges, meant as areas requiring short-term investment by the local government and firms, and risks in the case of workers. The inner triangle exemplifies expected benefits, which are common to all groups.
Source: Authors' own elaborations based on interviews.

The role of social partners

Since the pandemic outbreak, social partners have played an active role in adapting the regulatory framework for teleworking to the changed circumstances. The national law on smart working (see Box 3.2), i.e. the type of remote work arrangement that has gained the most ground during the pandemic, requires employers and employees to sign individual agreements, which the former must submit via a dedicated platform to the Italian Ministry of Labour for supervision. This rule has been lifted during the pandemic, with social distancing becoming a matter of utmost necessity. To speed up the activation procedure, the current setting dispenses employers from submitting full-fledged individual agreements, which are replaced by mere notifications that can cover multiple employees at the same time. Initially, both business associations and unions welcomed this provision given the health emergency. Law no. 87 of 17 June 2021 has extended its validity until the end of 2021,[24] raising unions' concerns, a waiver of individual agreements being no longer justified by the epidemiological situation in their view.

More generally, unions appear to be in favour of the introduction of an enforceable right to request teleworking and have been vocal in supporting a reform of the existing legislation. Their primary goal is to

[24] Law 17 June 2021 no. 87: https://www.lavoro.gov.it/documenti-e-norme/normative/Documents/2021/L-17062021-n-87.pdf

institutionalise the role of collective bargaining in negotiating framework agreements on the matter, in an effort to strengthen workers' bargaining power when discussing single arrangements with employers. Another major claim concerns the creation of a right to telework, to increase the likelihood that people in amenable jobs can actually adopt this practice. In fact, differently from smart working, Italian employees do not enjoy an enforceable right to obtain *telelavoro*, as employers have an unlimited ability to refuse their requests (see Box 3.2). Thirdly, the introduction of a right to disconnect also features among union requests, to avoid work outside of contractually agreed hours and blurring work-life borders, which can result in anxiety and other side effects, such as the so-called "fear of missing out". Other concerns relate to a potential reduction of training and career opportunities for junior personnel, as well as of union activism for all staff.

Business associations acknowledge the importance of negotiation with workers' representatives to define framework agreements on remote working in its various forms. However, their focus is on arrangements to be specifically defined by employers and employees based on local circumstances, including the work cycle and people's individual needs. Their main argument in this sense is that each industry and firm has own specificities that cannot be codified *a priori* or based on a one-fits-all approach. Concerns were raised also with regard to the potential impact on productivity and team-based business and product innovation development, claiming that too little evidence is currently available on these crucial issues.

Albeit with different nuances, social partners agree that a three-tier setting could be put in place, consisting of an overarching legislation setting few core principles and rules, regional or firm-level (in the case of large employers) collective agreements mediated by unions and business associations, and, lastly, individual agreements between employers and employees. Both business associations and unions in Trentino appear to be well aligned with the statements of their own national umbrella associations, and there are some reported examples (albeit not publicly disclosed) of local collective labour agreements whose dispositions on remote working have been recently updated in light of the pandemic at local or firm level.

However, different stances appear to coexist among associated firms, whose opinions are meaningfully affected by their individual size and sector. Larger employers appear to be more culturally inclined and managerially equipped to shift to teleworking and take advantage of its opportunities. Conversely, firms in sectors where fewer occupations are teleworkable, such as retail trade and manufacturing, are generally less prone to acknowledge the potential implications of the large-scale adoption of this working mode, with the notable exception of service providers in urban areas, which may suffer from reduced demand. Business associations also appreciate the potential for teleworking accelerating other digital processes and practices at the firm level, but claim that that increasing remote control in production and similar trends are far from entailing systematic effects in terms of an increased share of teleworkable jobs, as they are still limited to a niche of firms. These opinions further attest to the plurality of interests at play.

3.3. Presence of barriers on the ground

Room for improvement in Internet connection speed

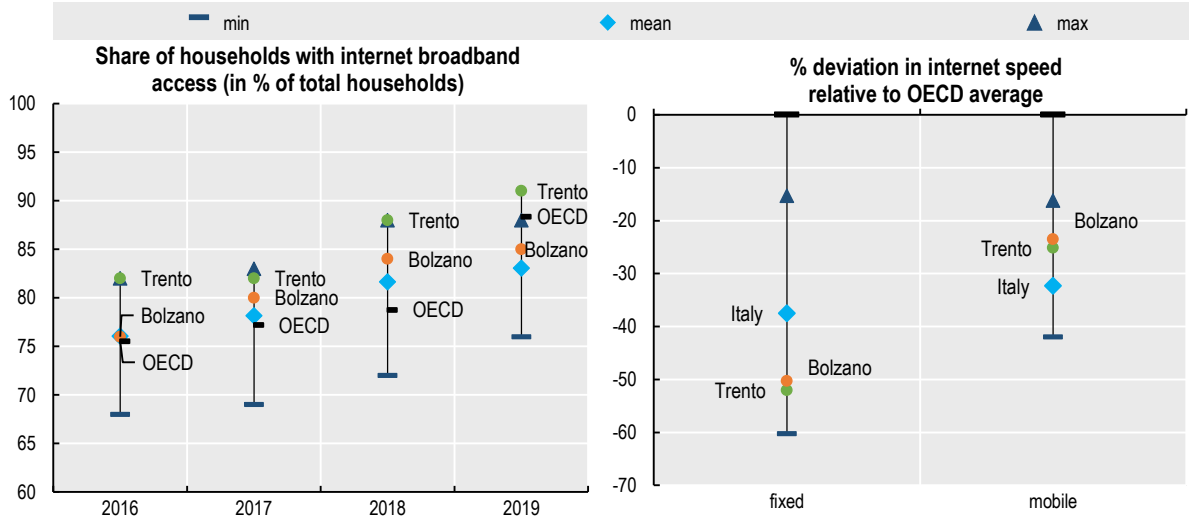
As teleworking implies that regular activities are performed remotely, the availability of a stable Internet connection is a key local determinant to actual uptake. This issue particularly affects rural areas, which are frequently among the most underserved in terms of Internet access. Trentino is a fully mountainous region whose population lives for the most part in small municipalities. Therefore, the matter of Internet broadband access and quality plays a crucial role.

The most common opinion is that Trentino benefits from a rather steady connection and robust network coverage in the majority of its locations, therefore this factor would not constitute a major barrier to a wider spread of teleworking in the region. However, some representatives of the hotel and tourism sector find that access to the network is a concern. In their view, the issue of lacking or slow connection speed is

particularly noticeable in inner and remote areas. Regional experts in the field of IT confirmed that additional investments in fibre Internet connections are necessary, despite claiming that overall such a factor does not pose a major barrier to teleworking diffusion.

Data confirm this twofold picture: Trentino is a top performer in broadband access compared to other Italian regions, but it lags behind the national average in terms of Internet speed for fixed devices (Figure 3.2). Trentino stands out as the Italian region reporting the highest share of households with broadband access, while neighbouring South Tyrol ranks slightly above the mean of the rest of Italy. However, both rate poorly for fixed and around the national average for mobile connections in terms of measured Internet. As digital infrastructure is not a fundamental impediment to a wider adoption of teleworking, the consensus from the interviews is that potential barriers should be traced back to an insufficient digital uptake and managerial culture in the region, as will be further explored in the following subsection.

Figure 3.2. Broadband access and speed among households



Note: Minimum, mean and maximum at TL2/NUTS2 level for Italian regions excluding Bolzano and Trento and the mean of all other OECD regions against values for Bolzano and Trento. Right panel is presented in relative to OECD average, indicated at 0.
Source: OECD Statistics, Regions and Cities, 2021, OECD calculations based on data from OOKLA, average over 2020.

Box 3.3. Trentino's network infrastructure at a glance

In 2010, the Autonomous Province of Trento was able to introduce Asymmetric Digital Subscriber Line (ADSL) to 98% of Trentino's territory, with speeds of up to 20 megabit. Although the notions of broadband and ultra-broadband connections are continually evolving, Trentino can be regarded to be very advanced in terms of ADSL broadband penetration.

Locations with network shortages can benefit from options for non-competitive areas, such as the Fixed Wireless Access (FWA), which is not a standard mobile phone connection but rather a radio signal that can reach up to 1 gigabit. While smaller FWA operators in remote areas may frequently pass on expenses to the final customer, this remains a viable option, allowing for an adequate network diffusion in remote areas.

Out of the 449 000 residential and commercial units in Trentino, 253 000 have access to fibre connection in white areas.[25] Furthermore, 124 000 units in grey and black areas of Trento have been cabled, and medium-sized towns such as Pergine Valsugana, Rovereto, and Riva del Garda will be covered by 2023.

Regarding the approximately 72 000 units that are not currently covered, 30 000 will be included in the regional action plan for white areas, while 42 000, relating to intermediate municipalities (grey or black areas), are the subject of negotiations with fibre connection providers.

Beyond the quality of the infrastructure itself, lack of public awareness of the connection options available on the ground may represent a major barrier to a wider network uptake, particularly in the case of firms. Only a meagre 25% of the almost 3 000 corporate users in the region who have had fibre connection theoretically available in industrial areas for the past four years have taken advantage of it, according to provincial government reports that were confidentially shared for the purposes of this research. As a result, a moral suasion campaign is currently ongoing to urge users of older technologies to switch to fibre, which provides superior performance over longer distances. In light of such an effort, which has been presented as the first pilot project of its sort at the national level, and of planned infrastructural investments, the rate of users adopting fibre connection in Trentino is expected to rise in the coming years.

Note: Autonomous Province of Trento internal reports.

Intangible barriers to a wider uptake of teleworking

The availability of high-speed Internet is not the sole factor influencing teleworking uptake, digital readiness of both workers and businesses also playing a critical role. Two potential obstacles arise in this respect. First, the widespread consensus among local stakeholders is that digital skills still have great room for improvement in Trentino. Second, an existing managerial culture still largely centred on the traditional concept of control and presence in the office could be an impediment to a wider adoption of teleworking. The analysis of available data sources somewhat confirms the validity of these opinions.

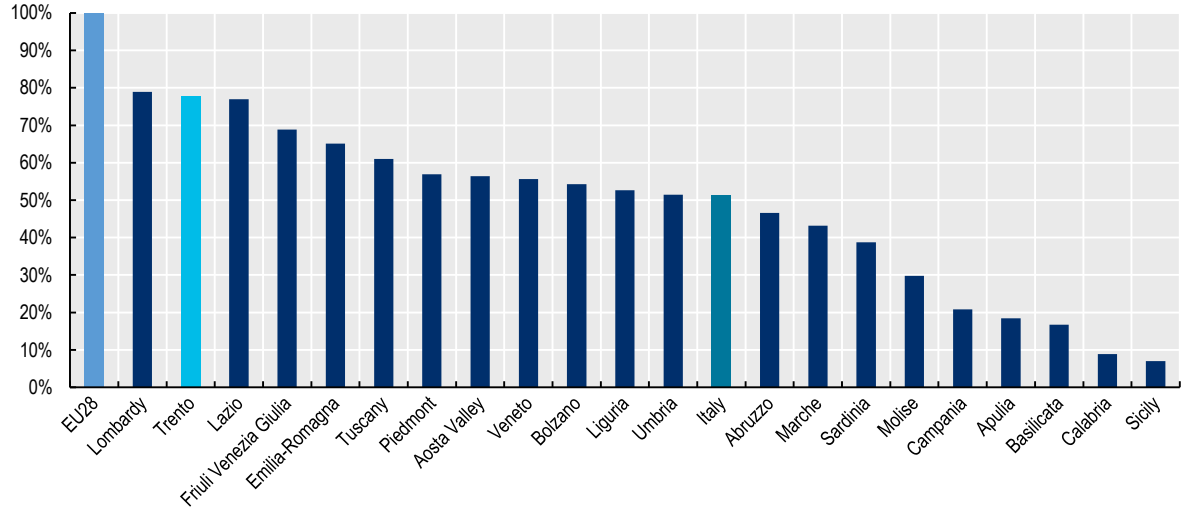
The Digital Economy and Society Index (DESI) has been measuring digital skills and other related trends in the EU since 2014.[26] In recent years, a regional adaptation of the DESI has been designed in order to

[25] Black, grey and white areas are part of a classification established by the European Commission to measure the level of private investment in ultra-wideband networks across geography. Black areas have at least two ultra-wideband networks of different operators; grey areas have only one ultra-wideband network; white areas do not have any private investment forecasts for ultra-wideband. For more information: https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX%3A52013XC0126%2801%29

[26] The Digital Economy and Society Index (DESI) summarises indicators on Europe's digital performance and tracks the progress of EU countries: https://digital-strategy.ec.europa.eu/en/policies/desi

investigate the spatial dimension of digital development in Italy (Osservatorio Agenda Digitale, Politecnico di Milano School of Management, 2020[9]). Trentino performs well above the national average in terms of its human capital, which includes both basic and advanced digital skills according to this version of the index, and outperforms all Italian regions except for Lombardy, however still ranking largely below the European average.

Figure 3.3. Digital human capital across Italian regions



Note: Human capital includes both basic and advanced digital skills. Basic skills include people with "basic" or "above basic" digital skills in each of the following four dimensions: information, communication, problem solving and software for content creation (as measured by the number of activities carried out during the previous 3 months). They also include basic software skills, thus people who, in addition to having used basic software features such as word processing, have used advanced spreadsheet functions, created a presentation or document integrating text, pictures and tables or charts, or written code in a programming language. Advanced skills include people with a degree in ICT, as well as employed ICT specialists and female specialists. The broad definition is based on the ISCO-08 classification and including jobs like ICT service managers, ICT professionals, ICT technicians, ICT installers and servicers.
Source: (Osservatorio Agenda Digitale, Politecnico di Milano School of Management, 2020[9]).

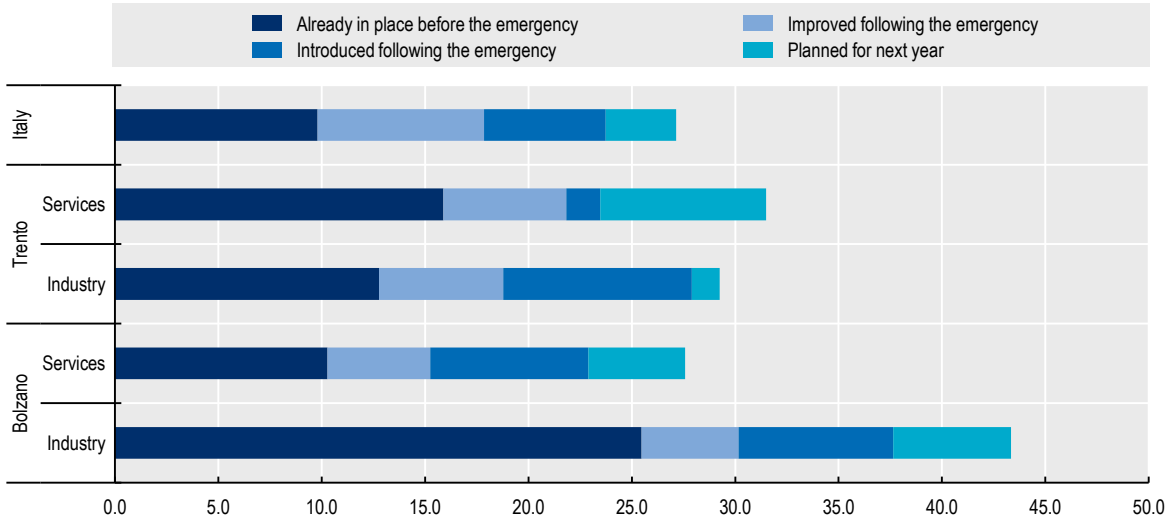
The ability of an organisation to continuously innovate and anticipate trends may also be linked to the educational attainment of the local labour force. In Trentino, the share of the labour force with a tertiary education as a percentage of the total labour force is 22%, in line with the national average (21%). However, these figures are significantly lower than those observed at the OECD level, where the share of the labour force with a tertiary education is approximately 35%.[27]

In addition, organisational culture may pose a hindrance to teleworking adoption. As this working mode is commonly associated with a significant loss of control on the part of managers, reluctance has long been the prevailing attitude in firms (pre-pandemic teleworking adoption rates analysed in Section 2. are meaningful in this sense). The COVID-19 outbreak, however, has been a game changer, including at cultural level. Following early reluctance from managers, the pandemic has had a learning value, fostering a mindset shift towards a more favourable view of teleworking. Trends in investment in infrastructure and hardware for teleworking may be a barometer of changing attitudes and propensities towards this practice.

[27] For further information, visit: https://stats.oecd.org/Index.aspx?DataSetCode=RWB#

Figure 3.4. Enterprise preparedness for digital and online workplace

Infrastructure and hardware for remote work (cloud services, workstation virtualization, etc.).



Source: Custom tabulations based on a survey data from ISTAT.

Data from ISTAT suggest that the manufacturing sector in the Autonomous Province of Bolzano/Bozen was better equipped to shift to large-scale teleworking when circumstances required, compared to Trento and the rest of Italy. The divide is likely to persist even when accounting for the new investments in digital technology planned for next year. For services, the results between the two provinces are reversed, which may partly reflect diversity in intra-sectoral composition. Overall, an acceleration of digital investment and practices appears to be a promising legacy of the necessity-driven shift to large-scale teleworking experienced during the pandemic, in Trentino like elsewhere. Nonetheless, business associations stressed that the focus for many of their associates is on how to overcome the aftermath of the crisis. Especially smaller firms and those that were more exposed to a decline in demand will face this challenge. Nonetheless, there is still little clarity on recovery and post-pandemic reorganisation strategies, which may explain still limited planned investments in the industrial sector.

3.4. Teleworking management practices

Employers of Trentino have been very active in experimenting with teleworking during the pandemic. Generally, the public sector has a higher prevalence of administrative jobs, which are teleworkable by default. Conversely, firms included strong industrial players that devolve a significant portion of their core business to manufacturing activities, which requires physical presence in the factory. Nonetheless, actors on both sides embraced teleworking, with slightly varying practices across organisations.

A well-established practice in the public sector

The public sector is particularly worth of attention in Trentino because of its considerable size (it accounts for 41 965 out of 239 900 people employed locally, i.e. 17% of the local workforce)[28] and of the large legislative and fiscal power enjoyed by the Autonomous Province. The provincial government manages a number of incentives for businesses, including in distinctive areas such as employee well-being and social responsibility. For example, firms that adopt family-friendly practices for parent workers, which are certified by public authorities, can benefit from higher scores in public procurement.[29] Throughout the pandemic, the Autonomous Province presented a compelling case of attention in measuring job satisfaction and productivity while carefully implementing teleworking for a large share of its own staff (see Box 3.4 for more details). A similar effort was made by the Trentino-South Tyrol region, which though in light of the number of competences transferred to its constituent provinces has a much smaller number of employees, most of whom in non-teleworkable jobs, notably in the judicial sector.

Box 3.4. The Autonomous Province of Trento anticipates teleworking trends

The Autonomous Province of Trento is a recognised model for teleworking in the Italian public administration. The local government started experimenting with teleworking practices several years ago.

In 2012, the TelePAT pilot project aimed to implement 200 teleworking stations for public officials.[30] Three years later, an agreement with the trade unions standardised teleworking and integrated it into manager's work cycle as a way to promote organisational growth. In 2018, the Autonomous Province joined the VeLA Project as a transferor of "smart working" good practices to other Italian regions.[31] The project aims to support structural change within the public administration, in such a way to increase productivity and well-being.[32]

The COVID-19 outbreak thus expanded pre-existing processes within the provincial administration, which had to move from 474 to 2 603 teleworkers overnight in line with broader measures for social distancing. According to internal surveys, the large-scale shift to teleworking resulted in an overall increase in productivity.

In December 2020, the provincial government announced its plans to promote a larger adoption of teleworking in Trentino (subsection 1.3). The strategic plan will benefit from consultation with public and private stakeholders, and will lead to pilot initiatives, such as training on and certification of digital and soft skills for teleworking among management and other staff. One of the main goals pursued is to create a catalyst for innovation within the administration. Interdepartmental teams consisting of three figures, namely innovation ambassadors, digital transformers, and domain experts, have recently been set up in five provincial departments to digitise processes.

Lastly, the Province is weighing the benefits of maintaining or even expanding the use of decentralised offices and co-working spaces, which are already present in few medium-sized towns but have been suspended because of the pandemic. The issue is linked to the redesign of workspaces for a post-pandemic future, which will inevitably

[28] For further information, visit: https://www.agenzialavoro.tn.it/Open-Data/I-dataset-disponibili/Popolazione-e-societa/Mercato-del-Lavoro/Occupazione-nel-pubblico-impiego/Anno-2019/Occupazione-pubblica-alle-dipendenze-e-complessiva-in-provincia-di-Trento-2013-2018-Serie-Storica

[29] For further information, visit: https://www.trentinofamiglia.it/Certificazioni-e-reti/Family-Audit

[30] For further information, visit: https://www.forumpa.it/riforma-pa/smart-working/telepat-2-0-azione-strategica-per-la-valorizzazione-del-capitale-umano/

[31] For further information, visit: https://trasparenza.provincia.tn.it/archivio28_provvedimenti-amministrativi_-1_28245_725_1.html

[32] For further information, visit: https://www.smartworkingvela.it/progetto

be influenced by the teleworking ambitions of the Province. Eventually, workstations in public offices may be gradually reduced in favour of a desk reservation system aimed at optimising workspace.

Note: Autonomous Province of Trento public and internal reports.

Selected case studies from the private sector

Firms displaying a stronger organisational structure were more proactive in shifting to teleworking, and so were firms that had previously experimented with this working mode – the two groups often overlapping with each other. There were a few compelling cases among local firms where teleworking was not conceived as a company benefit, but rather as a standard method of working. According to this vision, firms, especially in manufacturing settings, should constantly update their organisational systems and production processes in order to remain competitive, especially in light of competition from countries around the world where labour costs are significantly lower. With this in mind, companies would work to ensure that the concepts of autonomy and accountability guide their employees' actions. Autonomy is expressed in workers' ability to select their work location and schedule, rather than being constrained to working from home. Any location that they perceive as adequate would be suitable for teleworking, while accounting for workplace safety and data protection. As a result, a large component of responsibility on the part of workers counterbalances such a process of autonomy.

The first reported pilot project in the field of teleworking started in 2015, and progressed over time until an agreement with labour unions formalised made it structural in 2019. In such a setting, employees ("white collars") would be able to work remotely for a quota of 40% of their annual working time under such an arrangement, corresponding to around 96 days per year. While teleworking levels remained meaningfully below the abovementioned quota before the pandemic due to a widespread lack of familiarity with this practice and other cultural factors, the threshold had to be waived after the outbreak to protect workers. Practically, all staff in office jobs has been working online since then, even in the current transition phase to a new normality, indicating a strong preference for this mode.

Furthermore, the case of blue-collar workers was raised, with the argument that important measures were taken to ensure that some manufacturing operations can be handled remotely at least in part, implying a scope to increase teleworkability across a larger share of the workforce.

Employers are aware, however, that teleworking may be a barrier to the placement of new apprentices and entry-level employees, due to an inability to meet co-workers and perform certain training processes that are facilitated by physical presence; as a result, companies would tend to encourage their presence at the workplace during the probationary period.

A company presented an additional case where it had introduced policies to facilitate remote working and decentralised teleworking areas prior to the pandemic outbreak. The company had mapped employee residences and identified a few peripheral areas with a large concentration of resident workers, in which co-working facilities were then developed. In order to provide adequate digital accessibility, the company invested in secured Internet networks for such branch offices, which were obtained on loan for use by the respective local municipalities. The goal of the initiative is to enhance the balance between professional and personal responsibilities for employees and reduce their commuting expenses while preserving the fundamental interaction among workers. Furthermore, the company introduced the role of the mobility

manager,[33] as well as other professional figures within the human resources office in charge of redesigning workspaces and working arrangements based on workers' commuting practices.

Overall, the consensus of the private sector is that teleworking assisted in overcoming various concerns among managers and employees during the pandemic. Managers feared opportunistic behaviour from the side of workers and employees feared a reduction in protection and the impracticability of this method in certain occupations. When teamwork is essential, innovative procedures, technology, and effective activity planning, including week-to-week agreements and adequate communication, can compensate for the absence of physical presence and address the reservations of managers and employees alike.

3.5. The spatial implications of teleworking

Hybrid work mode emerged as the most popular option among local stakeholders. Despite widespread hesitation in predicting how far large-scale teleworking will expand in the future, it was possible to discern recurring expectations regarding its prospective spatial implications in Trentino. Notably, hybrid work could lead to stronger territorial cohesion by providing opportunities for relaunching community life in inner areas. This is an issue of great importance in Trentino, where 52% of population live in an inner area,[34] against a national average of 22% (OECD, 2020[10]). According to a common opinion, inner areas are scarcely frequented in daily life by active workers, who for the most part commute to central areas for their job, which results in an inevitable deterioration of the human and natural habitat, as well as a decline in population in the long run. Furthermore, the reduction of commuting implied by hybrid work could contribute to cutting polluting emissions. In fact, although performing slightly better than the national average, Trentino still lags behind across OECD countries in environmental performance.[35] An additional advantage of the hybrid mode is that it inhibits the risk of *resident drain* by requiring workers to be in the office for a few days each week or month, which makes relocation far away from the workplace impracticable.

Because of the growing popularity of hybrid work, there has been a surge in attention and action in the areas of decentralised offices and co-working spaces. Several public and private organisations in Trentino have become increasingly interested in the subject and have either developed or are planning to establish co-working spaces in the near future. The advantage of such options is that they are frequently located at a convenient distance between households, which are commonly situated in inner areas, and workplaces, which are instead generally located in urban districts, allowing for reduced commuting and appropriate workstations without compromising on preferred residence location. In this regard, examining the region's housing conditions could be particularly beneficial, as locations with a less favourable housing market, as measured by the potential number of rooms per capita, may favour or discourage the adoption of decentralised workplaces. Trentino, with an average of 1.7 rooms per person in occupied dwellings, falls slightly below the average of the OECD regions.[36] Another claimed benefit of hybrid solutions over home

[33] Required by Italian Law since 1998, the role of the mobility manager was strengthened in 2020 with Law 77/2020, and made compulsory for companies with over 100 employees with a special decree on 12 May 2021, requiring them to create a home-office commuting plan for employees. For more information: https://www.gazzettaufficiale.it/eli/id/2021/05/26/21A03111/sg

[34] Inner areas constitute a refined measure of "remoteness" introduced by the Italian government in 2014 in the framework of a national strategy to improve territorial cohesion. Under to this classification, remoteness is a function of how close a municipality is to key Service Provision Centres (e.g. schools, major hospitals, and well-connected train stations). This classification provides a basic distinction between central and inner areas, with the latter being located further away from Service Provision Centres. Under a more granular classification, which divides both areas in three subgroups each, inner areas include intermediate, peripheral and ultra-peripheral areas.

[35] The figures refer to the Regional Social and Environmental Indicators in the OECD Regional Statistics, with particular reference to the Air Pollution in PM2.5 indicator: https://stats.oecd.org/Index.aspx?DataSetCode=RWB#

[36] For further information, visit: https://stats.oecd.org/Index.aspx?DataSetCode=RWB#

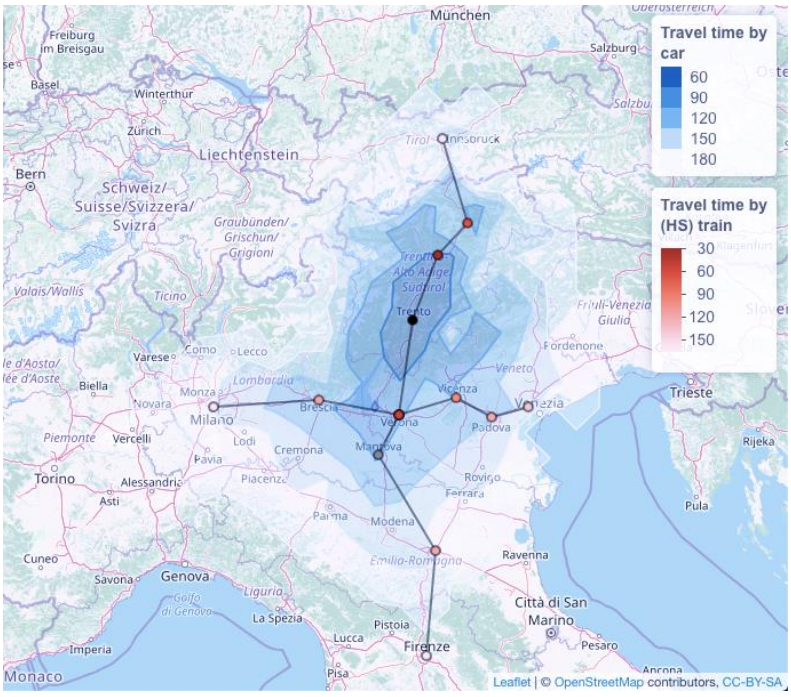
offices is that they may foster social interactions among workers from various professional backgrounds, thus preventing the feeling of isolation that is associated with teleworking. However, because co-working facilities are shared spaces, they may increase the exposure to information leaks, thereby potentially threatening privacy and intellectual property.

Rethinking workplace architecture in light of a permanent trend towards hybrid work has also piqued the interest of businesses. In this regard, a popular approach has been to implement *hot-desking* techniques, which allow workers to reserve their required desk for the workday in the office, bidding farewell to allocated desks. Although such measures may necessitate an initial investment on the part of businesses aimed at reorganising office premises, the long-term ramifications of such redesign include a reduction in occupied space, which ultimately results in lower rent and maintenance costs.

While the vast majority of stakeholders looked with more interest at hybrid forms of work, which have short-range spatial effects, the tourism industry may look with favour at long-range teleworkers, notably those groups who aim to reside for longer periods rather than pay a one-time visit. Consequently, people who choose to combine vacations and work, the so-called *workationers*, are gaining in popularity in the hospitality industry. On the other hand, location-independent workers and entrepreneurs, sometimes known as *anywhere teleworkers*, may become the target of inner-city policies and market strategies aimed at luring new residents or renting out unused dwellings by real estate businesses or second-home owners respectively.

Lastly, in a labour market where hybrid working is commonplace, the geographical area of residence of people employed by Trento-based firms could expand. For instance, workers that normally commute for sixty minutes per day for five days a week may find it equally acceptable to travel the same amount of time over three days, working from home for two days a week. This could potentially increase the overall travel distance to 100 minutes. Figure 3.5 presents travel times by car and train (see Table 3.2 for more details).

Figure 3.5. Travel times to and from Trento



Note: In shaded areas, travel times in minutes by car, not accounting for traffic conditions. Lines and dots indicate main train lines, with times according to the fastest quoted times by destination using high speed trains (where available). See Table 3.2 for detailed times.
Source: OECD calculations using Open Source Routing Machine (OSRM), OpenStreetMaps (OSM), Trenitalia.

Table 3.2. Travel times by train

Direction	City	Regional train	High Speed train
South-East	Verona	65	55
	Vicenza	110	100
	Padua	130	120
	Venice	150	137
South-West	Brescia	135	115
	Milan	210	155
	Mantua	125	-
South	Bologna	170	120
	Florence	312	160
North	Bolzano	36	32
	Bressanone/Brixen	65	65
	Innsbruck	160	-

Note: Quickest travel time in minutes as quoted on Trenitalia.com.
Source: Trenitalia online travel planner (accessed 21 May 2021).

Overall, the labour market that is potentially accessible for Trentino-based firms expands massively if the commuting constraint is partially lifted by hybrid teleworking (Table 3.3). Approximating the labour force by the available figures for TL3 regions, its size is about 0.5 million people within 30 minutes of Trento (primarily including the labour forces of Trentino and Bolzano). Expanding to a one-hour distance expands this figure to 2.2 million. Similarly, Trento residents may be able to apply to jobs further away if given the possibility to work regularly from home. Overall, this has the potential to increase the efficiency of labour matching if employees and employers can both consider a deeper pool of jobs and candidates.

The potential for workers and employers to be matched over longer distances and across regional economies may have implications that go beyond Trentino, since the same dynamics hold for all regions in Italy. Existing regional wage differences could be affected if employees in lower wage regions can work for firms in higher wage regions without the added costs of living in a more expensive area. Therefore, the reduction of geographical distance as a constraint to employer-employee relationships may decrease wage growth for some teleworkable occupations in high wage areas and increase wage growth for some teleworkable occupations in low wage areas. The precise implications for Trentino and other Italian regions is beyond the scope of this report, but monitoring wage and price level dynamics at the regional level could shed light on the matter in the future.

Table 3.3. The size of the labour force in Trentino at increasing travel distances

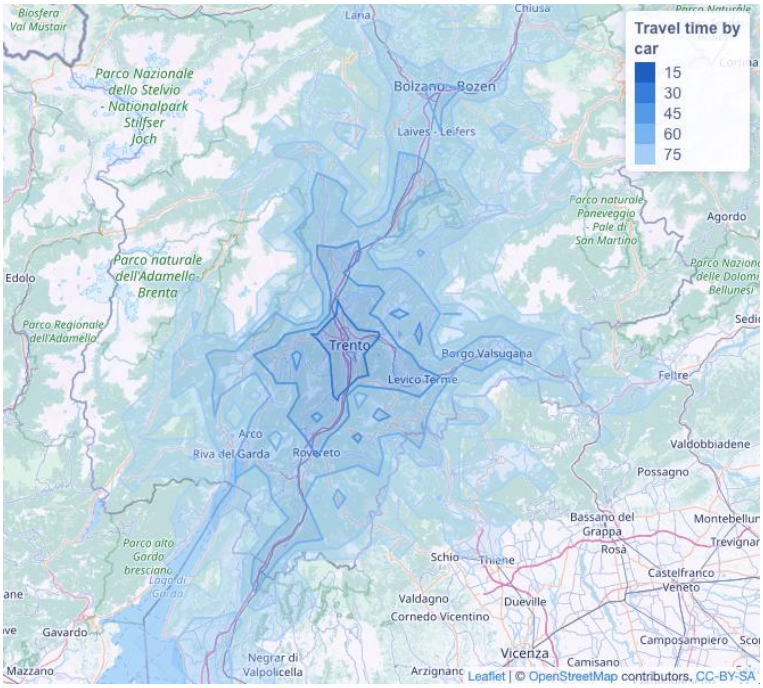
Within	Size of combined labour market (Millions of people)	% increase from previous level
0h30	0.5	-
1h00	2.2	340
1h30	4.0	82
2h00	7.1	78
2h30	9.1	22

Note: Based on labour force numbers (15-64 year olds) from OECD Statistics at TL3 level, for 2018. The areas indicated in Figure 3.4. were overlapped with TL3 areas. TL3 areas at least covered for 5% by a travel area are included in the total sum.
Source: OECD Regions and Cities Statistics; OpenStreetMaps (OSM), Open Source Routing Machine (OSRM).

The potential expansion of the geographical area of residence of people employed by Trento-based firms has two corollaries, which Figure 3.6 helps to visualise. First, workers residing in the most peripheral areas

of Trentino may greatly benefit from the opportunity to concentrate commuting in a few days a week, in terms of an improved work-life balance in days when working remotely. Second, employers providing the opportunity to commute to Trento a few days a week rather than on a daily basis may become an attractive option for residents of neighbouring provinces of Bolzano in the north, and of Belluno, Vicenza and Verona (Veneto region) in the South-East. Conversely, the Adamello-Presanella alpine group, which spans across the western part of Trentino, constitutes a natural barrier to commuting from Brescia and other provinces in Lombardy.

Figure 3.6. Car travel areas in Trentino



Note: In shaded areas, travel times by car, in minutes, not accounting for traffic conditions.
Source: OECD calculations using Open Source Routing Machine (OSRM), OpenStreetMaps (OSM).

3.6. Market implications of teleworking

A new ground for business competition

Workers have been acclimated to a new working model following the recent surge in teleworking. As a result, in addition to the challenges and benefits that such a transition entails, businesses are now in a position to consider the expectations of present and potential employees when it comes to the opportunity to telework. Thus, the ability to allow employees to work remotely could become a factor of competitive advantage for businesses looking to attract new talent. A significant portion of business representatives believe this is already the case, supporting the idea that employers who require workers to be physically present in the office will lose competitiveness in the medium term, especially vis-à-vis younger generations. Voices who tend to underestimate such repercussions, instead, normally came from industries that perform less teleworkable activities.

The growth of teleworking on a broad scale, according to "sceptics", has various negative implications on competition. This tendency, they believe, will yield winners and losers, fostering a divide between sectors based on whether or not the activities involved in the occupation are primarily teleworkable. Furthermore,

increased levels of teleworking may result in a collision between firms in services based on whether they are located in urban or remote areas, with the latter gaining increasing market share at the expense of the former. This, in their view, may particularly be the case in the provincial capital of Trento, where a number of shops rely on the demand traditionally ensured by proximity to public offices. While warning against the polarisation potentially arising from teleworking, sceptics do not believe that firms that do not adopt this mode, which they claim is incompatible with most jobs in their sectors, will face competitive disadvantages, nor do they believe that their associated companies will attempt to move tasks online, despite admitting that e-commerce adoption has recently grown in popularity.[37]

Other stakeholders have different perspectives on the issue. The main regional representation of firms in manufacturing is updating a toolbox for businesses. This package contains a checklist of technological and legal requirements, a collection of best practices, as well as trade union agreement schemes, a regulatory archive, and other resources to assist member companies in implementing "smart working" methods, drawing from a model elaborated from the provincial government. In addition, the issue of teleworking has gained in prominence in the context of the discussion forum of HR managers of associated firms.

Various views coexist also when establishing which firm characteristics are most likely to be associated with the uptake of teleworking. According to the local Chamber of Commerce, three factors may decisively influence the propensity of firms to embrace this practice: employee qualifications, teleworkability of occupations, and team organisational autonomy. Adoption rates of teleworking will vary depending on how these elements are distributed among sectors and worker types. Other local stakeholders raised the issue of business dimensions, stressing that only medium to large-sized firms that are more advanced in terms of labour relations and management have adequately equipped themselves for teleworking. Among the others, the fear of making irreversible commitments prevailed. Similar to other Italian regions,[38] the provincial government of Trentino has introduced incentives for SMEs to purchase software, hardware and training services to increase teleworking during the pandemic, with the aim of addressing the issue of size-driven divisions among firms,[39] but business associations appeared to be unaware of such initiatives.

Finally, structural disparities in local labour markets may result in varying degrees of sensitivity to the issue. Teleworking may become a ground for competition more rapidly in South Tyrol, where luring talent is a serious difficulty, than in Trentino, where greater unemployment rates may mean that fewer people are in a position to deny a job offer based on teleworkability.

New models in tourism

Tourism plays a prominent role in the regional economy. For instance, accommodation and food service activities alone accounted for 14.1% of total employment in Trentino, against a national average of 9.1% in 2019.[40] However, this industry was particularly exposed to the international mobility crisis triggered by the COVID-19 pandemic (with a yearly variation of -39% in arrivals and of -36.5% in visitor numbers in

[37] Data seems to confirm this trend. By April 2020, goods exports were 6 percent above January 2020 levels – the strongest growth rate of any major Eurozone economy, compared with rates of less than 1 percent in France and Germany. In particular, the surge in goods' trade surplus may have been driven by a spectacular increase in online sales:
https://www.ft.com/content/dfb16c93-9e1f-45ad-98c7-d477f05fa9f6?sharetype=blocked

[38] For further information, visit: https://www.oecd.org/coronavirus/policy-responses/italian-regional-sme-policy-responses-aa0eebbc/

[39] For further information, visit: https://ripartitrentino.provincia.tn.it/Misure/Misure-attive/CONTRIBUTI-DA-UTILIZZARE-IN-COMPENSAZIONE-FISCALE/Investimenti-e-consulenze-COVID-19

[40] Figures are extracted from ISTAT: http://dati.istat.it/

hotels and other accommodations in the 2019-2020 period),[41] calling for the adoption of tailored measures for recovery.

The implications of teleworking in tourism raised diverse views among managers in tourism promotion consortia in Trentino. The sector may benefit from new business models arising from the large-scale diffusion of teleworking according to respondents. The focus is on the so-called "workationers", a neologism indicating those travellers who combine periods of work and tourism during a stay in a place other than that of their habitual residence.

Experts also argued that teleworking could contribute to addressing the long-standing issue of concentration of tourism within a few months in winter (especially for skiing) and summer, mostly in a few natural areas. One of the most typical challenges of these places, which often correspond to inner areas defined in subsection 3.5, is a dramatic reduction of social and economic activities outside the high seasons, to the detriment of labour stability, community life and local development in the remaining months. For instance, the periods comprised between January and March as well as between July and September accounted for 34.5% and 45.7% of hotel and non-hotel stays respectively in 2018.[42] While the growing market segment of workationers could contribute to extending the duration of the tourist season, the so-called "workers everywhere" (as defined in subsection 1.1) might constitute a new pool of residents, should location-independent work take hold on a large scale.

On the other hand, experts mentioned a number of barriers that may hinder a shift towards these target groups, featuring both tangible and intangible factors. Culturally, firms in the tourism sector, which are family-led for the most part, show a widespread lack of propensity to innovate their business models and make the investment this would imply. This may be due to problematic inter-generational exchange and a limited understanding of trends and challenges posed by a market that has been quickly evolving in the last few decades, in light of megatrends such as climate change (which threatens the future of low-altitude ski resorts) and digitalisation (of which large-scale teleworking is the latest example). For example, in 2019, four in ten hotels in Trentino had not yet developed a website optimised for mobile devices.[43] Access to high-speed Internet is also a concern in the tourism industry, as discussed in subsection 3.3.

Investment in workspaces and high-speed Internet facilities in hotels are among the most often cited solutions for Trentino to become for attractive for teleworkers, in line with the general trend of a growing interest in co-working spaces examined in subsection 3.5. Actions of this kind could go hand in hand with a renewed marketing strategy, in the form of a redefinition of the narrative about Trentino as a tourist destination and its target groups. The reported issue of redeployment of workers in accommodation and food service towards other activities offering more stable working conditions compared to employment concentrated in high seasons, and the resulting lack of labour supply in the tourism industry (requiring provincial authorities to recently launch exceptional, large-scale job postings in the sector),[44] makes the need for these measures even more urgent.

[41] For further information, visit: http://www.statistica.provincia.tn.it/binary/pat_statistica_new/turismo/SintesiMovimentoTuristicoTrentinoAnno2020.1615372937.pdf

[42] For further information, visit: http://www.statistica.provincia.tn.it/binary/pat_statistica_new/turismo/TurismoTrentino2018.1553697771.pdf

[43] For further information, visit: http://www.statistica.provincia.tn.it/binary/pat_statistica_new/turismo/InnovazioneDigitaleGestionePromozioneAlberghi.1579161074.pdf

[44] For further information, visit: http://www.agenzialavoro.tn.it/TESTI-AVVISI/IL-SETTORE-TURISTICO-ASSUME

4. Towards a place-based strategy on teleworking

4.1. An irreversible trend and the role of local government

There is a consensus among interviewed stakeholders that teleworking is here to stay in the aftermath of the pandemic. Albeit not numerous and potentially not fully representative of the entire labour force, workforce surveys conducted in Trentino appear to corroborate this viewpoint. A previously niche practice has spread on a large scale and, in doing so, has shown its potential benefits to large sections of the population that had never experienced it before. In spite of concerns on key issues such as productivity and teamwork in remote settings, employers are likely to maintain this practice in the future to a certain extent. However, as a comparison of data from firm and workforce surveys carried out in Trentino suggest, workers more than anybody else are deemed the driving force in promoting the spread of teleworking in the future.

Surveys conducted in other regions worldwide confirm strong expectations for a greater use of teleworking by the workforce, as suggested by the increase in vacancies involving teleworking arrangements (OECD, 2021[11]). Conversely, several large corporations that had shown enthusiasm in the early stages of the pandemic have recently called their staff back to the office.[45] This confirms the presence of a recurring pattern across countries, with potentially opposing interests and a growing role for collective bargaining between the social partners. However, the question is not whether but how teleworking will develop. The "new normality" is likely to record higher levels of teleworking compared to before the pandemic in light of a sustained demand by workers, but the scale of the trend, as well as its economic, social and spatial repercussions, are yet to be determined and dependent on local factors.

The spread of teleworking on a large scale is redefining the relationship between workers, businesses and the public sector. First, the COVID-19 pandemic has triggered a transformation that aligns with workers' interest. Any attempt to reverse such a trend is likely to meet their opposition, despite a widespread awareness that unregulated forms of telework pose risks to the workforce. Second, negotiation between the social partners has the central stage in shaping teleworking scenarios. However, this setting still leaves the public sector as a major actor in shaping the future, if only in terms of fostering dialogue between the social partners across places and industries. In fact, for teleworking to spread on a large scale and sustainably, i.e. in such a way that it takes into account the needs of all the stakeholders involved and prioritises general interests, several enabling conditions are needed. In addition to market factors, public policy plays a crucial role in different key areas, spanning from public infrastructure to work place regulations. The availability of such framework conditions will also affect the pace of the transition.

[45] For more information, visit: https://www.bloomberg.com/news/articles/2021-06-01/return-to-office-employees-are-quitting-instead-of-giving-up-work-from-home

4.2. Local conditions show room for improvement

The evidence base on trends and preferences related to teleworking is still limited. Anonymised data on individual "smart working" agreements (Box 3.2) could be made available for research purposes. This data may provide further insights into the actual extent of this practice in Italy as well as on the characteristics of teleworkers and their distribution across economic sectors, firms of different sizes and space.

However, labour force and business surveys shed the light on the key issue of the persistent gap between the actual and potential levels of teleworking, in Trentino like elsewhere Italy. In Trentino, the adoption rate of teleworking grew from 5% to 22% during the pandemic, but showed a quick reversal towards office-based work as soon as social distancing measures were relaxed. This means that, even at its peak, actual teleworking was much lower than the potential levels (i.e. 57% amenable to be performed remotely at least one day a week) estimated based on employment characteristics.

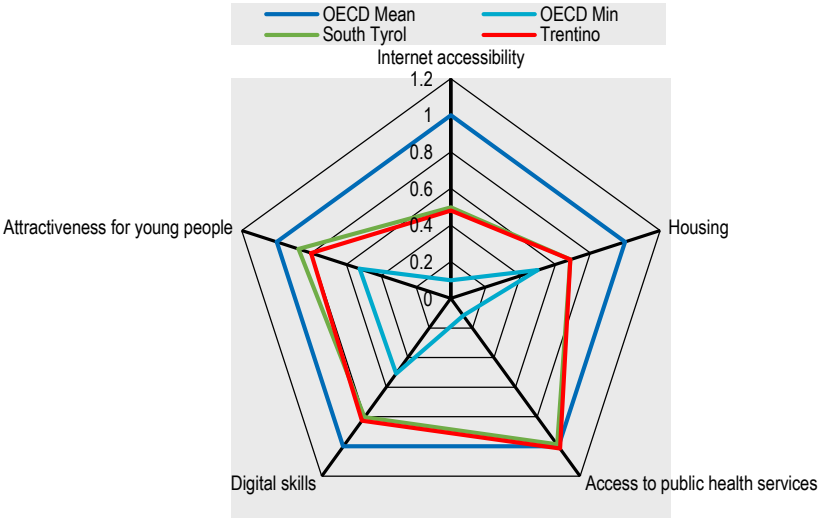
A glance at indicators related to the enabling factors of teleworking and other relevant local conditions can help to identify areas requiring priority action by policy makers. A comparison with neighbouring South Tyrol as well as with other Italian and OECD regions can provide a useful benchmark. The factors analysed include:

1. **Household Internet accessibility**, as the availability of an advanced Internet infrastructure is a basic precondition for people, both incumbents and entrants, to telework;
2. **Rooms per capita**, as having sufficient physical space in households is another key requirement for people to work remotely;
3. **Prevalence of active physicians among the population** as a proxy for the quality of local public services, a key factor teleworkers may want to look into before relocating to a given place;
4. **Share of young new comers over total new comers**, which is indicative of the attractiveness of local firms for an age group that may be particularly keen to telework;
5. **Share of local population with digital skills**, which may be predictive of the share of incumbent employed in teleworkable occupations net of potential entrants.

Other enabling factors, such as the quality of the regulatory framework for teleworking and the propensity for co-operation by the local partners (with the rate of unionised workers serving as a potential proxy), are not taken into account in this context, as the former is a prerogative of national legislation and the latter cannot be decisively affected by public policy. The presence of an advanced transport infrastructure may be particularly appealing for "anywhere workers" and other groups of employees travelling regularly across regional borders, but this factor could not be captured due to data limitations.[46]

[46] While the lack of statistical sources prevents comparative analyses, interviews suggest that investment to make road transport more efficient and sustainable is much needed in Trentino. According to respondents, the mountainous geography of Trentino poses some restrictions in expanding or updating its rail network, although the future opening of the Brenner railway tunnel may increase its accessibility to Austrian regions. Eurostat has data on motorway density for TL2/NUTS2 regions for most European regions, but Trentino is one of the few regions in Italy where data is unavailable (see Eurostat "Motorway density by NUTS 2 regions, 2019 (km/1 000 km^2), 'tran_r_net', available at: https://ec.europa.eu/eurostat/databrowser/view/tran_r_net/default/table?lang=en).

Figure 4.1. An overview of local conditions for teleworking in Trentino compared to South Tyrol, Italian and OECD regional average



Note: The following indicators, based on TL2 regions, were used, with the OECD mean (indicated in brackets) normalised to one: Internet accessibility as measured by the average download speed of fixed connections relative to OECD mean; housing measured by rooms per capita, 2018 (1.7=1); access to public health services measured by active physicians for 1000 population, 2018 (3.3=1); digital skills measured by the share of people with "basic" or "above basic" digital skills, 2019 (.6=1); attractiveness for young people measured by the share of young (15-29 yo) new comers over total new comers, 2018 (33.8=1).
Source: OECD calculations based on OOKLA, OECD regional statistics.

Albeit being imperfect measures of the actual situation, the selected indictors still provide policy makers with a first overview of areas worthy of attention. As discussed in subsection 3.3, while broadband access is widespread in Trentino, average speeds are relatively low. The housing conditions are slightly below the OECD average (subsection 3.5), indicating an additional potential target area for public policy. However, the indicator does not account for the quality of residences in a more general sense. The high incidence of active physicians may hint the presence of a critical mass in local public services, testifying to Trentino's longstanding tradition of policies for territorial cohesion. Trentino's modest share of young new comers over total new comers suggests room for improvement in terms of attractiveness for people in junior positions, irrespective of teleworking-specific considerations. Finally, its below-OECD average level of digital skills indicates that incumbents' amenability to telework could be improved with training. However, beyond technical skills, the incorporation of teleworking at the work place also requires innovative management skills and a disposition towards considering new organisational practices.

4.3. The need for an expanded evidence base

Teleworking levels during the transition to the new normality are likely to remain above pre-pandemic levels but below the peak reached during the lockdown. Uncertainty about a number of key factors hinders the formulation of more detailed forecasts, including the outcomes of collective bargaining between the social partners, likely reforms of teleworking regulations, and economic trends not specifically related to teleworking. In particular, broader labour market trends are likely to affect the composition of the workforce and employment levels, with potential repercussions on teleworking rates. Moreover, there is a lack of national (or regional) information on workers' preferences on teleworking in a post-pandemic future.

Gathering such kind of information in a structured way would allow for a better prediction of the future size of teleworking and its related trends, such as people relocating further away from office premises due to an increased ability to work from home. The actual models adopted on the ground appear to be particularly important, the spatial implications of hybrid work being radically different from "anywhere teleworking" where proximity to employers' premises becomes irrelevant; therefore, each model requires a specific approach in policy areas such as housing, transport mobility and local services (e.g. with local transport conditions for commuting playing a larger role for hybrid workers). Teleworkers' features, another type of information potentially arising from surveys, may also contribute to informing public action, for instance in the field of training and active labour market policies. More broadly, any forecast of the regional impacts of large-scale teleworking requires a collection of information on teleworking trends and preferences. For example, using teleworking as a lever for attracting qualified human capital from abroad is conceivable only if "anywhere teleworking" reaches a critical mass.

In the regard, the Autonomous Province of Trento could use its established institutional networks, including with central government agencies, to collect administrative data on teleworking and make them available for research. In addition, it could promote national or, if unviable, regional surveys on the preferences of workers and firms on future teleworking. A national survey is preferable, as it would allow providing better insights into cross-regional worker mobility.

4.4. Six steps to informing a policy roadmap on teleworking for Trentino

Large-scale teleworking is a new trend that affects multiple policy areas and stakeholders. Its framework conditions are rapidly evolving, and evidence of its trends is still limited. All these factors call for a gradual policy approach. Piloting new solutions, monitoring their outcomes and, if necessary, adjusting their set-up in accordance with pre-set objectives may contribute to pursuing balanced and adaptive initiatives.

A roadmap based on a series of questions could help guide policy action, ensuring that the proposed actions are empirically sound, mutually consistent and functional to a single framework. This subsection aims to identify the policy objectives that may underlie a regional strategy on teleworking, corroborate their rationale based on evidence available and explore the policy actions needed to pursue them.

1. What defines a sustainable teleworking model?

There is consensus among Trentino stakeholders that for large-scale teleworking to benefit regional development it needs to be:

- Duly regulated;
- Agreed upon between employers and employees;
- Combined with a meaningful amount of work in the office;
- Inclusive, i.e. mindful of pre-existing and new potential labour inequalities;
- Innovative, entailing new forms of work organisation, such as flexible work arrangements, team-based performance management, etc.;
- Supported by the required enabling conditions, both tangible (i.e. availability of high-speed Internet and physical space) and intangible (i.e. digital skills, managerial culture).

2. What societal objectives may underlie a regional strategy on teleworking?

Public consultation with stakeholders, interviews with local experts and the review of literature point to five general-interest objectives that may underlie a regional strategy on teleworking, each justified by specific expectations associated with this practice. Sustainable teleworking models defined in Q1 may contribute to:

a. Improving work-life balance, thus increasing job satisfaction and living standards;

b. Enhancing territorial cohesion, in terms of a better balance between central and inner areas;

c. Reducing polluting emissions, through a reduction of daily commuting;

d. Increasing productivity, by accelerating digitisation and reducing production costs;

e. Improving regional attractiveness for incumbent and entrant teleworkers as well as tourists.

3. What kind of interconnections exist between the objectives?

Identifying the potential conflicts and synergies between the set objectives can contribute to enhancing the resilience and impact of the strategy. A number of mutually beneficial links exist, at least from a theoretical point of view. For example, the achievement of a better work-life balance, a reduction in polluting emissions and higher labour productivity may contribute to making the region more attractive for residents, tourists and businesses. Strengthened territorial cohesion, in turn, may contribute to enhancing human and natural habitats, potentially leading to higher life satisfaction and, thus, labour productivity.

Conversely, aggregate productivity may suffer from reduced agglomeration, should a meaningful share of the workforce relocate from high- to low-density areas on a permanent basis. Moreover, redesigning office space and work cycles in light of higher teleworking levels could entail costly investment, negatively affecting productivity in the short term. While the regional government may tolerate a marginal reduction of productivity in return for improved living standards or other general benefits, public policy can help to avoid a "zero-sum game" situation in several ways. These include setting up mechanisms to monitor and assess the social, economic and environmental impacts of large-scale teleworking, in order for the regional government to identify potential antinomies, and introducing compensatory policies to make up for any losses in a specific area or group.

In fact, potential conflicts exist not only between the objectives, but also within them. For example, a wider use of domestic heating systems instead of centralised office heating may partially offset the improvement of air quality entailed by lower daily commuting. This makes it all the more urgent to provide public support to energy efficiency in residences and speed up the transition away from fossil fuels for heating and cooking. Conflicting interests may also exist between social groups, and even within them. While employers and employees may be more sensitive to work-life balance and productivity considerations respectively, service providers located in central and inner areas, with the latter potentially gaining market shares at the expense of the former, may represent a compelling case for intra-sectorial conflicts.

While the links between and within the objectives will become clearer over time, public action and can help to maximise benefits. In the wake of ongoing consultation by the provincial government, it is recommended that stakeholder engagement be embedded into the design and implementation of the regional strategy on teleworking, as inclusive policy-making processes are more likely to resist over time and achieve their underlying goals.

4. Are the objectives justified by empirical evidence?

Data can inform priorities for Trentino's efforts based on its characteristics and its comparisons with other Italian and OECD regions.

a. **Work-life balance** refers to the ability to combine family responsibilities, leisure, and work. Italy is the OECD country where full-time working adults spend the largest amount of time on leisure and personal care, whereas ranks at the bottom when only females are considered. This implies that women work more hours each day on average compared to their male colleagues, and such a gap is much larger than in other countries (OECD, 2020[12]).[47] As data on work-life balance are available just at country level, regional data on life satisfaction and female participation in labour

[47] Figures are from the OECD Better Life Index, accessible at: https://www.oecdbetterlifeindex.org/topics/work-life-balance/

can serve as a substitute. The assumption is that better work-life balance will translate into higher levels of life satisfaction and larger female labour participation, since female workers are more likely to experience role conflicts. Trentino ranks in line with the OECD average in terms of self-evaluated life satisfaction, and slightly ahead of the national level.[48] However, the share of females in labour (49 percent) stands below the OECD average of 53 percent.[49]

b. **Territorial cohesion** is about ensuring that residents are able to make the most of the inherent features of the areas in which they live. Trentino presents the fifth-largest share of inter-municipal commuting of the resident active population among Italy's 21 NUTS2 regions (51 percent, against a national average of 46 percent), implying that a comparatively lower share of the local population will find job opportunities in the municipality of residence compared to other regions.[50]

c. **Air pollution**: Italy has rather high levels of air pollution (PM2.5 levels), reporting an average of 15.9 micrograms per cubic metre compared to the OECD average of 12.8, with which Trentino falls in line (12.7).[51]

d. **Productivity**: according to OECD figures, labour productivity as measured by GDP per worked hour places Italy below the OECD average (OECD, 2021[13]). In addition, economic indicators in Trentino indicate stagnant productivity growth. Its reported 0.6 percent annual growth rate in regional GDP per capita is weaker than the national average of 0.8 percent and significantly lower than South Tyrol's 2 percent in 2018.[52] The rate of technological innovation in Trentino enterprises is also slightly below the national average by 3 percentage points, pointing to persisting gaps in the future (ISTAT, 2019[14]).

e. **Attractiveness**: in Trentino, the share of new residents aged 15 to 29 years old as a percentage of total new comers from another region is 26 percent, compared to a 35 percent OECD regional average.[53] As young people are keener to telework than older generations, offering competitive conditions for teleworking may contribute to reversing this trend.

[48] Figures are from the OECD Regional Well-being Index, accessible at: https://www.oecdregionalwellbeing.org/

[49] Figures are from the World Bank database, accessible at: https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?name_desc=false

[50] Figures are from the ISTAT Labour Force Survey.

[51] For further information, visit OECD Regional Statistics at: https://www.oecd.org/regional/regional-statistics/

[52] The analysis is based on the following breakdown of GDP per capita: *GDP/population = GDP/worked hours * worked hours/employed people * employed people/pop15-64 * pop15-64/population*, where *GDP/worked hours* is a measure of labour productivity, *worked hours/employed people* is a proxy for labour intensity, *employed people/pop15-64* is the employment rate and represents the extensive margins of employment, *pop15-64/population* is the share of the population of working age. The growth rate of GDP per capita can therefore be approximated by the sum of the percentage changes of each component.
Source: https://www.bancaditalia.it/pubblicazioni/economie-regionali/2020/2020-0022/20-22-eco-regioni.pdf

[53] For further information, visit OECD Regional Statistics at: https://www.oecd.org/regional/regional-statistics/

Table 4.1. Trentino positioning across societal objectives

Comparison with Italy and OECD average

	Trentino	Italy	OECD	Year and source
a. Work-life balance				
Life satisfaction	67%	63%	67%	2019 (OECD)
Female work participation	49%	41%	53%	2019 (World Bank)
b. Territorial cohesion				
Inter-municipal commuting	51%	46%	-	2019 (ISTAT)
c. Air pollution				
PM2.5 levels	12.7	15.9	12.8	2019 (OECD)
d. Productivity				
GDP per capita increase	0.6%	0.8%	2.7%	2019 (OECD)
Tech innovation	46%	49%		2016 (ISTAT)
e. Attractiveness				
Young new comers	26%	25%	35%	2019 (OECD)

Source: Authors' elaboration on OECD, World Bank and ISTAT sources.

5. Are the objectives achievable through higher teleworking levels?

The following questions can help identify if Trentino can address the societal objectives through increased teleworking, given that other framework conditions are put in place.

a. **Improved work-life balance**: large-scale teleworking may lead to a cut of commuting time. The time saved could shift towards family responsibilities and self-care. In addition, teleworking may lead to greater flexibility when choosing working hours, if combined with a structural innovation of work cycles and organisational settings.

b. **Enhanced territorial cohesion**: large-scale teleworking may lead to rethinking the balance between central and inner areas in more sustainable terms, improving workers' ability to spend more time in the communities where they reside. In Trentino, this could imply boosting community life and economic activities as well as fostering the protection of human and natural habitats in peripheral areas.

c. **Reduced air pollution**: large-scale teleworking may lead to a substantial drop in commuting, with fewer journeys and shorter distances if decentralised co-working spaces are established;

d. **Increased productivity**: large-scale teleworking may lead to a reduction in production costs over time (e.g. optimised workplaces) and accelerated digitisation, as well as organisational innovation and greater job satisfaction (hence better performance) among workers;

e. **Improved regional attractiveness**: the provision of advanced local conditions for teleworking may improve the opportunity cost of applying for a job offered by a firm located in Trentino, relocating to Trentino, or choosing Trentino as a destination for "workation".

6. Under what conditions can teleworking contribute to pursuing the set objectives?

This step highlights the local factors relevant to each objective:

a. Improved work-life balance:
   - Provision of a sound regulatory framework for teleworking;
   - A fertile ground for collective bargaining between the social partners;
   - Enabling cultural context (e.g. managerial culture, organisational innovation, etc.).

b. Enhanced territorial cohesion:
   - Availability of a widespread, high-speed Internet, including in inner areas;
   - Provision of adequate public services in low-density areas.

c. Reduced air pollution:
   - Sufficient levels of teleworking, for the drop in commuting to be meaningful;
   - Availability of decentralised co-working spaces to reduce commuting distances.

d. Increased productivity:
   - Non-excessive levels of teleworking (e.g. as in hybrid work), so as to safeguard teamwork and knowledge flows;
   - Digitisation and reorganisation of the work cycle;
   - Redesigned workplaces.

e. Improved regional attractiveness:
   - Provision of competitive teleworking packages by employers;
   - Availability of adequate space (in households, co-working hubs and tourism facilities) for incumbent and entrant teleworkers, including so-called workationers.

4.5. Policy recommendations

The following recommendations aim to foster a smooth transition to a sustainable teleworking model. For this to happen, the measures proposed seek primarily to fulfil the local conditions that enable this practice. As promoting a sustainable teleworking model is meant as means to achieve broader societal objectives, the recommendations include the adoption of complementary measures that leverage existing policy and financial streams (including EU Structural and Investment Funds and NextGenerationEU) in fields such as territorial cohesion, local public services and mobility, as well as digitalisation and Internet infrastructure. The suggested measures are grouped under six policy areas:

1. Expanding the evidence base on local labour market trends to capture the emerging trend of large-scale teleworking:

- Establish monitoring mechanisms to keep track of the economic and social implications of a likely increase of teleworking uptake at provincial level (e.g. variations in commuting levels and transport trends, movements of people across space and housing, etc.);
- Survey potential target groups for teleworking attraction policies (e.g. Trento university graduates, tourists visiting Trentino on a regular basis, cross-regional commuters) to measure the perceived strengths and weaknesses of Trentino as a potential teleworking destination;
- Promote a national workforce survey to gather statistically representative data on future trends and preferences related to teleworking. In particular, such a survey may help to shed some light on the implications of the likely reallocation of workers across space, such as the impact on the urban-rural divide, housing, office facilities and cross-regional worker mobility, a dynamic that is equally relevant to policy makers in Trentino and other Italian regions;
- Advocate open data policies for individual “smart working” agreements at national level (or, if not possible, support their adoption at regional level), in order for researchers to be able to investigate the spatial and social implications of large-scale teleworking in Trentino relative to other Italian regions;

- Commission an independent evaluation of existing firm attraction tax incentives, a distinctive feature of Trentino's policy environment:[54] the results could unearth useful information to design similar incentives for the attraction of individuals, including teleworkers.

2. Facilitate knowledge and practice sharing on teleworking among public and private sector organisations as well as the wider public:

- Keep on fostering an evidence-based public discussion on the social and economic implications of large-scale teleworking, and raise awareness of the opportunities and challenges inherent in this practice at the firm level and beyond, targeting key groups such as managers and directors as well as mayors of municipalities located in low-density areas;
- Promote a broader adoption of mobility planning among public and private employers, including by incentivising the recruitment of mobility managers in charge of develop coordinated commuting plans for employees, in view of reducing the carbon footprint at the firm level with ascending levels of teleworking;
- Incentivise certified training aimed at upgrading teleworking skills for managers and other staff in the public and the private sector;
- Embed teleworking into active labour market policies, e.g. by adding teleworking-related digital and soft skills into training programmes for the unemployed;
- Establish pilots to further digitise processes and service delivery in the public sector, including by setting up dedicated teams that combine staff with advanced digital and organisational skills with other staff having a deep understanding of existing practices, for the latter to be jointly rethought in innovative fashions;
- Establish prizes for private employers offering the best well-being solutions for staff, including teleworking and other flexible work arrangements, in order to promote role models and best practices;
- Improve technology transfer to foster digitisation and innovation in businesses managed in traditional fashions, to create a fertile ground for teleworking uptake.

3. Improving the regulatory framework for teleworkers and their employers:

- Promote collective bargaining between the local social partners to achieve a general agreement on teleworking levels and arrangements across industries and places in Trentino;
- Introduce guidelines, set standards and promote good practices to guide the large-scale shift toward sustainable teleworking models at the firm level, involving HR managers from the private sector;
- Contribute to the national debate on a potential reform of the legislation on teleworking, with a view to guaranteeing an enforceable right to request teleworking for all people in relevant jobs, including in the private sector, and at improving the working conditions of teleworkers. Trentino is in an ideal position to share a number of innovative solutions in fields such as teleworking in public administration;
- Include teleworking in the evaluation criteria that inform Trentino's Family Audit scheme,[55] which awards higher scores in public procurement to firms that adopt well-being practices for staff or report higher levels of job satisfaction;

[54] For more information, visit: https://www.investintrentino.it/en/why-in-trentino/taxes-finances-and-incentives

[55] For more information, visit: https://www.trentinofamiglia.it/Certificazioni-e-reti/Family-Audit/Agevolazioni/Sistema-premiante

- Review regulations on meal vouchers to grant access to public officials who telework, as a way to foster consumption in the proximity of remote workstations and maintain aggregate demand levels constant.

4. Integrate teleworking into other policy areas:

- Set an example as an employer by defining targets and standards for teleworking among public administrators, and by conducting periodic user surveys to track variations in the perceived quality of the services provided by teleworking staff;
- Further engage with the private sector in a joint effort to achieve a critical mass in teleworking intensity and, thus, a sizeable drop in commuting and the related emissions. This could take the form of incentives for firms to incorporate emissions produced by car commuting employees in their green transition plans. Larger employers may commit to more ambitious commuting reduction targets, as they can leverage economies of scale and are better equipped managerially and technologically for a large-scale transition to teleworking;
- Promote hybrid models among public and private local employers, combining remote work and work in the office, possibly based on set days or times, to reduce urban traffic and pressure on mobility infrastructure in a coordinated way;
- Promote a governed transition to large-scale teleworking at national level, in order to make sure that the social, economic and spatial implications of this trend (such as the potential improvement of job satisfaction, matching between labour supply and demand, and territorial cohesion) benefit all regions, preventing zero-sum games (e.g. an uneven competition between regions in teleworker attraction). Ultimately, consider supporting a multi-level national strategy for teleworking and teleworker attraction, which takes into account the multiple dimensions affected by this practice (e.g. digitisation, skills, mobility, labour, etc.) and is informed by comparison with international practices (see subsection 1.2);
- Set quantitative and qualitative standards for local public services (e.g. education, health, welfare, cultural and recreational activities, etc.) in inner and other low-density areas, in order to ensure that moving away from urban areas allows maintaining access to essential services for all, and consider timing as a crucial dimension in planning, as not all municipalities will be ready from the start;
- Support the electrification (and expansion) of local public transport, and consider setting up public or shared shuttle bus services in place of the individual arrangements (more polluting at aggregate level) currently provided by accommodation facilities in the tourism sector, which are becoming increasingly popular among anywhere workers.

5. Invest in the digital infrastructure and plan transport systems with the demands for remote working in mind

- Secure adequate funding for investment in high-speed Internet infrastructure, leveraging all the financial sources available (EU, national, and regional) and ensuring that low-density areas are duly covered, in order to increase their attractiveness towards incumbent and entrant teleworkers, including workationers. In doing so, make the most of the OECD body of knowledge on financing of the roll-out of broadband networks[56] and paving the way to 5G networks (OECD, 2019[15]);
- Foster public-private partnerships for local investment in Internet infrastructure, including through streamlined regulations, fiscal incentives and the involvement of municipalities, individually or in partnership;
- Consider expanding the network of decentralised co-working spaces for people working in the public sector, based on residential patterns;

[56] For more information, visit: https://www.oecd.org/daf/competition/financing-of-roll-out-of-broadband-networks.htm

- Consider reconverting unused public buildings into co-working spaces or de-centralised office facilities for all workers, including in the third sector, also through joint investments with private players and following due diligence of market demand and mobility patterns, which may imply starting from few selected areas; on the demand side, provide private employers and municipalities with a model of reference for loan for use agreements, to make sure that both have gains;
- Support SMEs in adopting teleworking by incentivising investment in hardware, software, and training necessary for a hybrid organisation, combining office and virtual settings, to function effectively;
- Incentivise the redesign of work places in fashions that foster organisational innovation and inclusive employment, building on current national tax breaks for renovations aimed at increasing energy efficiency in households and other buildings. The "Families! Friendly" funding programme, with which the Styrian Chamber of Labour and the Styrian Business Promotion Agency have been supporting the creation of teleworking jobs and more inclusive working premises in smaller firms since 2019, can serve as a reference (OECD, 2020, p. 49[1]);
- Use teleworking and the related need to redesign office spaces as a means to encourage investment for improving energy efficiency in public buildings, accommodation facilities and households;
- Support firm scaling-up and open innovation, as larger and more receptive businesses are more inclined to adopt teleworking;
- Monitor inflationary pressures in housing prices, which may occur and harm tenants when the inflow of high-income teleworkers is not governed.

6. Raising Trentino's profile as an attractive destination for teleworkers and as a reference for a governed transition to large-scale teleworking

- Incorporate the issue of teleworking and teleworker attraction into regional marketing narratives, to ensure that the supply of favourable conditions for remote workers reaches out to audiences potentially interested in relocating to Trentino on a temporary or permanent basis, or choosing it as a destination for workation;
- Showcase local co-working spaces and other teleworker-friendly facilities in few selected public and/or private online platforms, leveraging existing initiatives in order to achieve scale in terms of visibility and access;
- Encourage local employers to advertise teleworking options in job postings, for the region to stand out as a teleworking-friendly community;
- Raise Trentino's profile as a source of information and practices for other regions aiming to adapt their economies to a world where teleworking becomes commonplace.

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