

Heterogenous Effect of Job Teleworkability and Labour Outcomes in the Time of COVID-19

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Transition of working places from offline to telework or a hybrid, together with the pre-crisis sectoral level of digitalisation, is considered one of the main factors of labour-market resilience in the face of COVID-19 (e.g. Adams-Prassl et al. 2022; in the EU: Aksoy 2023; in Germany: Arntz et al. 2022; in the EU, the US and the UK: Joumotte et al. 2023; Oiconomou 2023). Before the pandemic, only 5 percent of workers were teleworking in the EU (Joumotte 2023). This figure doubled over 2020 and increased by 16 percent in 2021 (ibid). One of the COVID-19 pandemic recession lessons to learn is how teleworkability of jobs affected labour outcomes. Studies find that the effect was heterogeneous across sectoral distribution, professional occupations, parental status and subjective evaluation of benefits from telework that later caused self-selection in the choice to telework.

Dingel and Neiman (2020), Mongey et al. (2021) and Sostero et al. (2020) proposed classifications of jobs suitable and not suitable for telework using the Occupational Information Network (O*NET). Conversely, Soh et al. (2022) proposed a classification focused on digital skills in occupations, using O*NET measures of knowledge and work activity related to computers, which Joumotte et al. (2023) interpreted as the classification of digitalisation of occupations. Sectors, as well as firms, with higher level of pre-COVID-19 digitalisation experienced lower decrease in working hours and labour productivity (e.g., Joumotte et al. 2023). According to Sostero et al. (2020) classification, 37% of EU jobs (ranging between 33% and 44% across the EU countries) could have been performed on a platform in 2020, and the predictions were very accurate compared with the estimates received from surveys (Sostero et al. 2020).

Teleworkability across sectors and occupations has contributed to socio-demographic heterogeneity and pandemic-related changes in employment patterns. Therefore, telework has led to a new balance between wages and working hours. On the one hand, it limited losses in working hours. According to Joumotte et al. (2023) telework reduced losses by 85 per cent in non-contact-intensive sectors and by 40 per cent in contact-intensive ones in 2020. On the other hand, it is not clear whether labour productivity remained unchanged after the transition to telework. Despite significant interest in the effect of teleworkability on labour market resilience during the pandemic, little is known about its effect on labour outcomes, such as employment, working hours and wages in Russia. To our knowledge, ours is the first thorough investigation into the topic.

This study explores the effect of teleworkability on employment, working hours and hourly wages during the COVID-19 pandemic in Russia. The empirical evidence relies on data from the Russia Longitudinal Monitoring Survey¹, the difference-in-

¹ 'Russia Longitudinal Monitoring survey, RLMS-HSE', conducted by National Research University Higher School of Economics and OOO Demoscope together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology of the Federal Centre of Theoretical and Applied Sociology of the Russian Academy of Sciences. (RLMS-HSE website: <https://rlms-hse.cpc.unc.edu>, <https://www.hse.ru/org/hse/rlms>).

differences, triple difference, propensity score method and a doubly robust estimator for the period of 2019–2020 and 2016–2022. Three definitions of teleworkability based on work from home, professional occupation and workplace digitalisation are tested. The study demonstrates the presence of a measurement error in responses on work from home question. This indicator remained relatively stable since the first year of observation (2006), which contradicts to the results presented in existing studies. Suitability of profession for telework based on Sostero et al. (2020) definition demonstrate low sensitivity, which can be explained by heterogeneity of workplace conditions within professional groups. The response to the question on whether a person uses the Internet for work or not shows relatively sensitive results. Therefore, not occupational choice but workplace conditions were likely to serve as a factor of labour market resilience during the pandemic.

First, we employ DD to analyse the changes in labour outcomes (y_{it}) across socio-demographic groups, assuming time-invariant individual heterogeneity that causes self-selection into a professional occupation. The response to telework ($D_i=1$ for teleworkable and 0 for non-teleworkable professions) within each socio-demographic group is taken to be homogenous. Working hours and wages are transformed into logarithms. The linear probability model for employment status simplifies the interpretation of the treatment effect. The model in first differences, specified in the model below, is estimated in a baseline and extended specification. The latter includes x_i as a vector of controls individual, family, labour market characteristics and scores for the in-person intensity of a job from O*NET.

$$\Delta y_{it} = \alpha + \beta D_i + x_i' \gamma + x_i' D_i \delta + \varepsilon_{it}$$

Parameter α reflects the shock of 2020 on all workers, β relates to the average treatment effect (ATT) under the assumptions listed below. Preliminary estimates show heteroskedasticity of the errors ε_{it} . Therefore, White standard errors are applied.

Second, we run triple differences (DDD) to establish some particular effects (δ). Following the literature, we expect the effect of teleworkability to vary across gender and age, educational level, marriage and parental status, and the size of local labour markets. Third, we employ a propensity score matching (PSM) creating comparable groups by propensity to telework as a robustness check. And last, a doubly robust estimand (DR), which combines a DD approach with inverse probability weighting to balance the treated and control groups across socio-demographic characteristics. In contrast to DD, DR allows for controlling for observed heterogeneity or systematic differences in the labour outcomes of the compared groups across marital status, educational level and the size of the local labour market. Callaway and Sant'Anna (2021) point out that one advantage of the DR approach is that even if one of the models, outcome or propensity score is misspecified, the DR enjoys additional robustness against misspecification compared to DD and the inverse probability weighting approaches separately.

The main results are as follows. First, we found a positive effect of teleworkability on working hours in relatively large labour markets. Partly, this can be explained by strict COVID-19-related restrictions there. Other potential reasons are the level of workplace digitalisation, greater proportion of service sector and a higher speed of adaptation to shocks. Second, the results provide

evidence that wage of teleworkers grew up together with a decrease in working hours. This somewhat contradicts the hypothesis that benefit from telework mode expressed in a decrease of commuting time and more flexible working mode was at costs of wage growth. Thus, we may expect that teleworkers were more productive compared to their counterparts. Third, the results demonstrate that the group of women with the youngest child aged of 2–3 years old benefited from teleworkability at most. The effect is observed in the increase of working hours and wages as well as in the probability to be employed. The probability to be employed was also higher among married workers with ability to telework. Forth, certain groups were less likely to enjoy teleworking mode. They are women older than 55 years old, who transited to inactivity with a higher probability. Fifth, the working status of teleworking fathers is negatively associated with the presence of children with the youngest child aged of 4–6 years old. Likely, at the time of school and day care centres closures this group of workers experienced difficulties to consolidate their working duties and childcare. It should be mentioned that workers in essential businesses kept option to use child facilities.

Telework and its effect on labour markets outcomes is central in many post-COVID-19 studies. They help to understand to what extent telework and hybrid job would facilitate equal rights in the labour market. Our study provides evidence that development of such opportunities as tele- or hybrid work would be beneficial for mothering women at the time transition from inactivity to formal employment. Another potential direction to develop labour market policies is to create incentives for employers providing tele- or hybrid work opportunities in large labour markets. This has direct effect on benefit in amenities of workers. Indirectly it generates a positive externality decreasing traffic congestion in populated areas. Also, it could generate a potential core-to-periphery migration flows facilitating more even resettlement of population.

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