

Digital Transition and Regional Inequalities: Telework and the Dynamics of Peripheralisation in Estonia

The rapid acceleration of digital technologies over the past decades has profoundly reshaped spatial behaviours, labour structures, and the organisation of economic life. While digitalisation has long been recognised as a transformative force, the COVID-19 pandemic triggered a decisive shift by normalising large-scale adoption of flexible work arrangements and accelerating the integration of digital tools into everyday practices (Hu et al., 2021; Thulin et al., 2023). One of the most consequential outcomes of this Digital Transition (DT) has been the widespread uptake of telework, which has decoupled residence from workplace and altered longstanding relationships between job location, commuting, and residential choice (Asadieh & Neisch, 2025; Hostettler Macias et al., 2022). Teleworkability—defined as the potential to work outside the traditional workplace—has thus emerged not only as a marker of digital privilege, but also as a key mechanism through which the DT shapes spatial sorting, mobility, and affects regional dynamics (Galster, 2023; Hook et al., 2024). Yet despite growing interest in the spatial implications of remote work, the broader significance of teleworkability for regional development, peripheralisation, and socio-spatial divides remains insufficiently understood, particularly at national scale and across entire populations, as individual data on telework is scarce.

Estonia offers a particularly compelling case for examining these dynamics. On the one hand, Estonia is internationally recognised for its advanced digital governance, high levels of digital literacy, and strong ICT infrastructure (Annus, 2022; Mets, 2017). These characteristics position the country as an ideal setting for the widespread adoption of remote work and other digitally mediated practices. On the other hand, Estonia displays persistent socio-demographic and spatial inequalities, including ethnic divides in mobility behaviour (Järv, Masso et al., 2021), urban-rural disparities in opportunities and services (Tammaru, 2003), substantial occupational-based income inequalities (Aasa et al., 2026), and a rapidly ageing population (World Bank, 2025). At the spatial scale, Estonia has long been characterised as a monocentric country, with the capital city Tallinn and its suburban ring functioning as the main economic and demographic growth pole while many peripheral counties experience population loss (Ubarevičienė et al., 2024; Tammaru et al., 2023). This combination of digital advancement, structural inequality, and spatial imbalance creates an ideal environment for exploring how teleworkability interacts with life-course structures and regional contexts to shape residential mobility.

Against this backdrop, this study develops a population-wide longitudinal analysis of residential mobility using national demographic data from 2019, 2022, and 2024. These three time points capture conditions before, during, and after the pandemic-related shift toward remote work. A synthetic teleworkability indicator for the entire working population constructed by Statistics Estonia guides the analysis, employing this variable, the study compares mobility patterns among teleworkable and non-teleworkable groups and investigates how these patterns differ across the urban hierarchy and between household types—single adults and couples—whose opportunities and constraints diverge in important ways. This dual

comparison allows us to examine not only whether teleworkability changes mobility overall, but also whether it does so unevenly across social groups and spatial contexts.

The theoretical framing of this study connects the DT to classic and contemporary approaches to residential mobility. Housing research traditionally interprets mobility as a mechanism for adjusting housing situations to household needs, embedded in life-course trajectories shaped by partnership changes, childbirth, job transitions, and retirement (Clark & Onaka, 1983; Huang & Clark, 2002; Lee et al., 1994). The life-course framework positions residential moves as negotiated decisions embedded in social roles, household structure, and resource constraints (Rabe & Taylor, 2010; Steele et al., 2013). Recent work has emphasised that residential mobility should be conceptualised as involving both mobility and immobility, and as embedded within structural conditions such as housing market pressure, labour market segmentation, and constrained access to digital technologies (Coulter et al., 2016). Telework therefore enters this framework not simply as a technical possibility but as a form of digital privilege unevenly distributed along socioeconomic, spatial, and occupational lines (Foley et al., 2022; Lythreitis et al., 2022). Individuals and households with higher teleworkability face different opportunity structures than those unable to work remotely.

The adoption of telework alters the meaning and value of distance by reducing the frequency of commuting, enabling households to tolerate longer home–work distances or relocate without sacrificing employment opportunities (Delventhal et al., 2022; Hostettler Macias et al., 2022). For many, this shift increases the attractiveness of suburban areas that combine accessibility with more spacious and affordable housing—the so-called “donut effect” (Ramani & Bloom, 2021). While some studies have speculated that remote work might trigger a revival of rural regions, the empirical evidence remains mixed and often context-specific. Most research finds substantial suburbanisation, modest or selective counter-urbanisation, and very limited large-scale moves to remote rural areas (González-Leonardo et al., 2022; Vogiazides & Kawalerowicz, 2023; Ramani et al., 2024). Importantly, many teleworkers remain immobile, using remote work to maintain current residence despite job changes rather than relocating (Asmussen, Mondal & Bhat, 2024). This combination of mobility and immobility underscores the need for nuanced, context-sensitive analysis.

Against this conceptual backdrop, the Estonian case allows us to examine how teleworkability interacts with a sharply differentiated urban-suburban-rural geography. Estonia’s major cities and suburban municipalities host most teleworkable jobs and high-skill occupations (Delventhal et al., 2022), while rural areas face demographic ageing, service retrenchment, and more limited digital infrastructure development (Richter et al., 2019; Rosário & Dias, 2022). Understanding whether teleworkability intensifies or alleviates these divides requires disentangling mobility patterns across different household types and settlement categories.

The empirical analysis follows two main stages. First, individual-level origin–destination flows were used to calculate net migration across Estonia’s settlement types for each teleworkability group, summed separately for 2019–2022 (pandemic period) and 2022–2024 (post-pandemic period). This approach allowed for the comparison of spatial gains and losses among teleworkable singles, non-teleworkable singles, partial-telework couples, dual-telework couples, and their non-teleworkable counterparts. Second, multinomial logistic regression

models were applied to assess the likelihood of urbanisation (movement to higher-tier settlements), suburbanisation (movement to suburban municipalities), and counter-urbanisation (movement to non-suburban lower-tier settlements) as functions of teleworkability and a range of life-course and socio-demographic indicators.

The net migration analysis reveals highly differentiated spatial responses to the pandemic and its aftermath. During 2019–2022, rural areas experienced substantial population losses across nearly all groups, consistent with long-term patterns of peripheral decline. Teleworkable singles and couples alike showed strong tendencies to remain in or move toward urban and suburban regions, reflecting the concentration of telework-compatible employment and the advantages of proximity to services. However, the post-pandemic period (2022–2024) displays a notable shift. While rural depopulation continues for singles—particularly those in teleworkable occupations—rural areas begin to exhibit positive net migration among partial-telework and dual-telework couples. This suggests that the stabilisation of hybrid work practices has begun to expand the residential possibilities for digitally flexible households who may seek more spacious environments but still require periodic access to urban jobs. These findings align with international evidence showing modest but discernible increases in rural migration among families with strong preferences for amenities and flexible commuting patterns (Hook et al., 2024; Ramani et al., 2024).

Suburbanisation emerges as the dominant mobility process, with strong positive net migration into the suburban rings of Tallinn and other county capitals in both periods. Teleworkable singles show substantial suburban gains, driven by relative housing affordability and reduced mobility constraints. Among couples, suburbanisation is particularly pronounced for partial-telework households, in which one partner requires regular access to on-site employment while the other benefits from remote-working flexibility. These results closely mirror findings from the USA and Europe showing that suburban regions have been the principal beneficiaries of remote work, often seeing intensified population growth at the expense of core cities (Ahrend et al., 2025; McManus, 2022; Gupta et al., 2022).

Regression analyses confirm that teleworkability shapes residential mobility but indicate that its impact is modest relative to life-course and socio-economic variables. Age, presence of children, occupation, and partnership status remain the most influential predictors of mobility. Ethnic minorities—especially those in non-teleworkable occupations—exhibit significantly lower odds of both teleworkability and relocation, reflecting enduring structural inequalities. Teleworkability increases the likelihood of urbanisation and suburbanisation among singles, reinforcing the idea that digitally privileged individuals gravitate toward labour markets and service environments offering higher opportunities. Among couples, however, teleworkability reduces the likelihood of urbanisation: dual-telework households in particular show high probabilities of remaining immobile. This suggests that remote work reduces pressure to locate near job centres and enables households to prioritise stability, local networks, and housing characteristics over proximity to urban employment hubs.

Despite these immobility tendencies, teleworking couples also exhibit increasing probabilities of counter-urbanisation—movement to non-suburban rural areas—particularly in the post-pandemic period. These shifts, although modest, suggest that hybrid work arrangements

may be creating new pathways for residents to explore living environments beyond suburban belts, contributing to a slight softening of Estonia's historically strong core–periphery divide. However, the evidence also demonstrates that rural gains are concentrated among teleworking couples, while rural areas continue to lose singles and non-teleworkable workers, reinforcing divergent spatial pathways within the population.

Taken together, these findings illuminate a paradox embedded in the Digital Transition. On one hand, remote work facilitates a partial de-concentration of population by relaxing locational constraints and opening opportunities for certain households—especially digitally privileged couples—to relocate beyond urban cores. On the other hand, economic activity, job opportunities, and digital infrastructure remain heavily concentrated in major urban regions, sustaining patterns of agglomeration and reinforcing the advantages of capital regions such as Tallinn. The DT thus creates simultaneous pressures toward dispersion and concentration, amplifying opportunities for some while deepening vulnerabilities for others.

In the Estonian context, these dynamics carry significant implications for regional inequalities and population futures. While teleworkability offers new residential flexibility for some groups, it appears to align with pre-existing socio-economic divides: highly educated, majority-ethnic, and financially secure individuals are far more likely to benefit from the spatial freedoms enabled by digitalisation. Conversely, minority populations, lower-skilled workers, and residents in peripheral regions remain constrained by limited telework access and a lack of viable residential alternatives. As a result, the DT risks reinforcing structural inequalities unless complemented by targeted policy measures addressing digital infrastructure gaps, labour market segmentation, and uneven access to remote-compatible occupations.

By analysing population-wide mobility across the pandemic and post-pandemic periods, this study contributes to emerging debates surrounding digitalisation, peripheralisation, and the future geography of work. The evidence shows that teleworkability interacts with household structure, life-course dynamics, and settlement hierarchies to produce differentiated mobility pathways rather than a uniform shift. Estonia's digital leadership does not automatically translate into spatially balanced development; rather, the benefits of telework are stratified along socio-economic and demographic lines.

Ultimately, the findings underscore the importance of integrating digital transition considerations into regional planning, labour policy, and demographic forecasting. Remote work alone cannot reverse long-term demographic decline in rural areas, but it may offer selective opportunities for stabilisation among specific household types. Suburbanisation remains the most robust trend, while large-scale counter-urbanisation appears limited. Understanding how digitalisation shapes mobility across different population segments is essential for anticipating future regional dynamics and addressing the structural inequalities that the DT may both mitigate and reproduce.