Extended Abstract

Automation and vulnerability of migrant households in terms of risk of technology-induced job loss

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Introduction

Machines and artificial intelligence can now perform many routine tasks, not only in manual but also in white-collar and administrative occupations. As a result, the demand for workers in many occupations involving the performance of routine tasks is decreasing. At the same time, technology is raising the demand for workers in other occupations. Although newly created jobs disproportionally require higher skills, the growing share of income going to workers in high-level jobs is also increasing the demand for low-level services such as cleaning, personal care, and food preparation (the consumption hypothesis). We refer to such changes in labour demand as technology-induced job change.

Technology-induced job change affects all workers but will likely affect migrant workers to an even greater extent due to the disproportionate concentration of migrants in certain occupations. More than twice as many non-EU citizens are employed as labourers in mining, construction, manufacturing and transport, and more than thrice as many non-EU citizens are employed as agricultural and fishery labourers. Jobs in these sectors are particularly likely to disappear due to automation. In Europe, the vast majority of employees in the industrial sector are men (87%). At the same time, migrants in Europe are also disproportionately employed in domestic and care work – two sectors for which demand has increased. In Germany in 2014, for instance, 15% of all non-physician healthcare staff – and 23% of elder care staff – were non-German citizens, while more than half (55%) of domestic workers in northern, southern and Western Europe are migrants. Demand for domestic and care workers is expected to increase further in the coming years. Notably, the vast majority of domestic and care workers are women (83% and 70%, respectively).

Although migrant workers are concentrated in many of the most affected occupations, so far, few studies or reports have addressed the impact of technology-induced job change specifically on migrants. The limited existing literature has tended to emphasize migrants' overall vulnerability to technology-induced job change. Migrants in Europe are, however, a diverse group including refugees, labour and family migrants; people with nearly no formal education and highly-skilled professionals; people from highly developed countries as well as people from developing and often very traditional countries. On the receiving end, European countries offer migrants different receiving contexts (e.g., formal and informal support structures), and national policies result in different selection processes (e.g., whether the pool of incoming migrants is

more or less skilled, the proportion of female migrants). Approaching migrants in Europe as a single, homogenous group may thus miss important differences between subgroups. Although it would be highly useful for designing interventions to improve migrants' integration in the receiving society, the impact of technology-induced job change on different groups of migrants in Europe has never been systematically investigated.

As described above, contemporary labour markets in Western countries are characterized by both automation trends and high levels of migration. In Europe, depopulation, ageing populations, high levels of education and rapid technological change are coinciding with high immigration. Migrants from outside Europe predominantly occupy jobs that are susceptible to replacement as a result of automation in the near future. Consequently, these individuals are at a heightened risk of unemployment and may inadvertently impose an additional burden on the host society, rather than providing a solution to the issue. It is therefore important to ascertain whether this elevated individual risk is mitigated at the household level. For example, the consequences of losing one's job may be less severe if one's partner is employed in a secure position, and more significant if one is the primary income provider with numerous dependents.

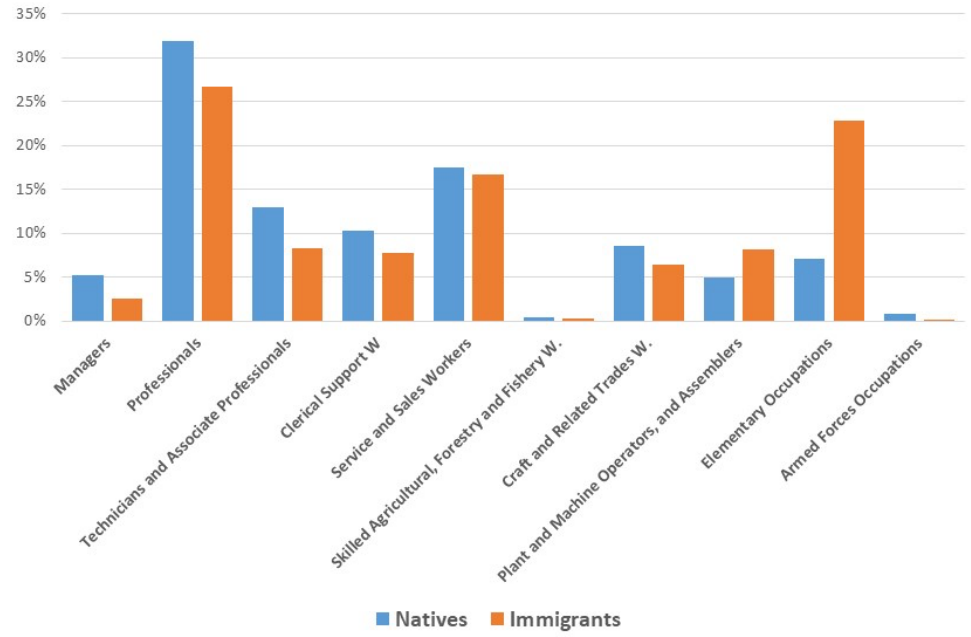
Data & Methods

The proposed study focuses on evaluation of the risk of technological-induced job loss among migrants. It is based on individual data from Danish population and labour market registers that cover the entire population of Denmark. In order to assess individual and household vulnerability to technological change, the Routine Task Intensity (RTI) index, as proposed by Autor et al. (2003), is employed, along with estimates for 2-digit ISCO occupations by country, as conducted by Lewandowski et al. (2022). RTI measures the degree to which jobs involve repetitive, predictable tasks that can be automated.

Preliminary Results

The analysis of labour market register data reveals a notable discrepancy in occupational distribution between the native and migrant population in Denmark (Figure 1). Immigrants are predominantly engaged in elementary occupations and manufacturing, whereas natives are more inclined to pursue middle-level and skilled professions.

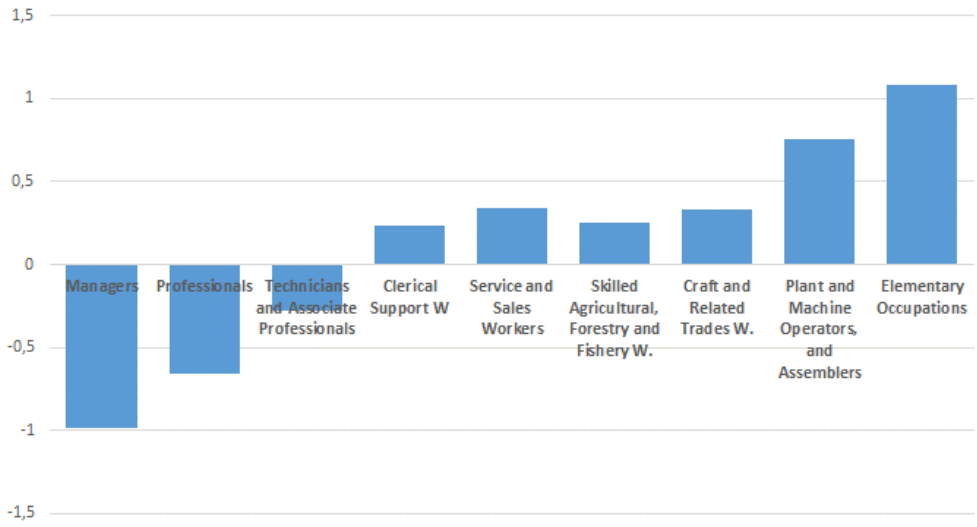
Figure 1. Distribution of occupations (ISCO 1-level) among native and immigrant employees in Denmark in 2020



Source: own calculations based on Danish labour market register (DST).

The estimated mean RTI of occupations in Denmark reveals a disparity in the degree of job routine task intensity between occupations, which in turn indicates the potential vulnerability of jobs to technological change (Figure 2). The risk of unemployment in the near future is highest among those engaged in elementary occupations and manufacturing, whereas managers and highly skilled professionals are least at risk of job loss.

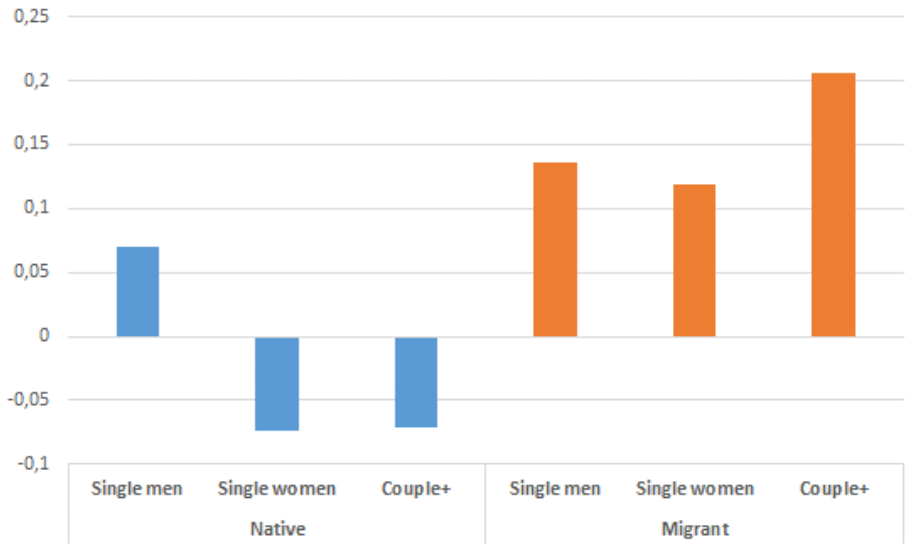
Figure 2. Average RTI by occupation in Denmark



Source: own calculations based on Danish labour market register (DST).

Our preliminary findings indicate a significant disparity in the risk of job loss between native and migrant populations in Denmark. Danes are markedly less prone to losing their jobs as a consequence of technological advancement. Those most vulnerable are males residing in single-person households. However, the average RTI for this group is considerably lower than that observed in all other types of households where an immigrant is the head of household. Furthermore, it is evident that individuals residing in couple or multi-family households (average couple RTI) are more susceptible to job loss than single immigrants.

Figure 3. Average RTI by migration status and type of household in Denamark in 2020



Source: own calculations based on Danish labour market register (DST).

The objective of this paper is to investigate the presented differences, their determinants and consequences for society in Denmark in the near future. The topic is of great significance in the context of migration and labour market policies in Europe, where depopulation, ageing populations, high levels of education and rapid technological change, is occurring concurrently with high immigration.

References

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Lewandowski P., Park A., Hardy W., Du Y., Wu S., 2022, Technology, Skills, and Globalization: Explaining International Differences in Routine and Nonroutine Work Using Survey Data, The World Bank Economic Review, 36(3), 670–686, https://doi.org/10.1093/wber/lhac003