

Abstract

Automation and individual unemployment risk – A task-based approach

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Most recent studies suggest that technological change and automation technology will not necessarily affect total employment but lead to a displacement of occupational task. Thus, especially manual and cognitive routine-tasks are expected to have a higher risk of being replaced by machines. To measure the impact of automation current researchers commonly use two different types of measures: 1) the abstract measurement of occupational substitution potential, which do not enable statements about actual automation or 2) technology measures on the level of firms or industries with no information which groups of employees are affected. In this study, we combine these two types of measurements to investigate whether the substitution of occupational tasks indeed leads to a higher risk of getting unemployed. We expect that a high share of routine-task will only lead to a displacement of labour for individuals working in industries with a high degree of robotic installations. In our sociological individual-level approach we also examine, whether there is a variation in the impact of different social groups of employees (e.g. low qualified). To test these hypotheses we use employment data from the socio-economic panel (1994-2014) merged with yearly information about the installation of industrial robots in Germany (IFR data) and information about the occupational tasks. Our findings support the assumption of a routine-biased technological change: As expected a significant difference in the individual unemployment risk due to the share of routine-tasks only can be demonstrated for employees in industries with huge investments in robotics. Furthermore, by now only manual routine-task, compared to cognitive routine-task, seem to be affected by automation processes.