

Editorial

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Editorial: 2024 Best Paper Award

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For the third time, the *Journal of Economics and Statistics* is awarding a prize for the best paper published in the journal's volume of the previous year. The editorial board of the journal would like to thank De Gruyter, the publisher, for supporting the prize with 500 €. The award-winning article was selected by the board members in an anonymous vote, starting from nominations by a committee composed of Michael Frenkel (WHU), Sandra Nolte (Lancaster University), and Susanne Prantl (University of Cologne).

For the volume 244 of 2024, the Best Paper Award goes to

“Robot Adoption at German Plants”

by **Liuchun Deng** (Yale-NUS College, Singapore), **Verena Plümpe** (Halle Institute for Economic Research (IWH), Halle), and **Jens Stegmaier** (Institute for Employment Research (IAB), Nuremberg), published in volume 244 (3), 201–235.

The authors address a timely topic as advancing automation technologies will strongly shape economies and societies in the future, and probably much more than already during the last four decades. Automation in the form of computerization, robotization, and artificial intelligence-driven automation represent processes of substantial, long-lasting technological change with manifold transformative impacts.

In the case of robotization, existing empirical studies on causes and consequences have often been based either on data from robot suppliers indicating initial robot sales at the country-industry level or on data from import data sources that can neither capture re-sales nor domestic purchases of robots. Deng, Plümpe, and Stegmaier aim at overcoming the resulting limitations that are particularly strong in the case of a country like their country of interest, Germany. Compared to other countries worldwide, Germany has started to invest in its stock of industrial robots relatively early and has relied to a large extent on domestic robot production.

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The author's high-quality micro data is part of the 2019 survey wave of the IAB Establishment Panel. Similar to the other waves of this panel, the 2019 wave provides comprehensive data on a sample of around 15,500 plants¹ that was drawn from the large establishment population of the Federal Employment Agency Establishment File.² The unique advantage of the 2019 wave is the fact that it provides plant-level measures on the use of robots at the intensive and the extensive margin as well as on robot heterogeneity. The authors contributed to developing the robot-specific survey questions and, to the benefit of other researchers, Verena Plümpe and Jens Stegmaier published a detailed description of the data in the *Data Observer* Series of this journal in 2023.³

At the beginning of the empirical analysis in the award-winning paper, Deng, Plümpe, and Stegmaier shed light on the use of robots in Germany from 2014 to 2018, weighting the survey data to adjust to the population. While less than 2 % of all plants are found to use robots in 2018, about 25 % of those in the manufacturing of motor vehicles, or plastics, do so. Reflecting the size of such robot-intensive industries, about 30 % of all employees in the manufacturing sector work in robot-using plants. Among robot-users, the robot distribution is highly skewed. About 50 % of the total robot stock is, for example, installed in the top 5 % of robot users ranked by the plant-level robot count. Studying within-industry robot distributions confirms skewness for most industries in manufacturing. Robot-using plants rely on different types of robots in 2018. At the extensive margin, plants that start adopting robots between 2014 and 2018 contribute substantially to the growth in the share of robot users and in the total stock of robots.

In the next part of their empirical analysis, the authors focus on whether and how robot users differ from non-users. Estimating ordinary least squares regressions on cross-sectional data, they report that plants' status of robot use in 2018 correlates strongly with contemporaneous plant characteristics. Robot users have, in particular, higher labor productivity, are larger, more likely to export or adopt new technologies, and invest more. Some of these differences to non-users vary with the types of installed robots.

Subsequently, the authors study the predictive power of plant-level characteristics observed in 2014 for robot adoption in the following years up to 2018. They present cross-sectional and panel analyses that are correlative in nature. Their findings are in line with theoretical arguments suggesting that firms with large

¹ We use the two terms, establishment and plant, interchangeably in this editorial.

² When drawing the sample, panel updating and disproportional stratification by establishment size classes, sectors and federal states were taken into account.

³ See Plümpe and Stegmaier (2023) for details. See also Wagner (2022) for an introduction to the *Data Observer* Series.

employment size, or firms that act as exporters or foreign direct investors on international markets, are more likely to start automation due to cost-related advantages. Most of their results are, among others, also consistent with theories that identify firms with high skill intensity of their work force as focusing more on complex, less automatable activities such that they are less likely to start robot adoption.

Overall, the award-winning paper of Deng, Plümpe, and Stegmaier contributes comprehensive, original, and evidence-based insights from careful work with high-quality data at the plant level to the research on the automation of production processes.

Congratulations to the authors for winning this best paper award!

References

- Plümpe, Verena, and Jens Stegmaier. 2023. "Micro Data on Robots from the IAB Establishment Panel." *Journal of Economics and Statistics* 243 (3–4): 397–413.
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