

PRESS RELEASE

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Research: How Job Losses Caused By Machines Led To Better-Paid Work

- **Empirical analysis of 380,000 women in Norway**

Bonn, Mannheim, Germany, 07.05.2024 – **Artificial intelligence, self-driving cars or smart robots are rapidly changing the way we work. People are more and more afraid of being replaced by machines. Research shows that the outlook is not necessarily negative. A new study analyzes the careers of young rural women who were being pushed out of agriculture in the 1950s upon the adoption of milking machines in Norway. Upskilling and education are the key to long-term success for the human workforce when technology automates tasks. These results are published by the EPOS Economic Research Center at the Universities of Bonn and Mannheim.**

Hand milking of cows was a task typically performed by young rural women. Hundreds of thousands of them were being displaced by the uptake of milking machines in the 1950s. “This was a real technology shock,” says Philipp Ager from the EPOS Economic Research Center. “We analyzed the effects over a period of 40 years and find that women paid a high price initially. They lost their job and were being pushed out of agriculture altogether. Yet, the data also reveal that those affected benefited in the long term.”

Investment in education makes the difference

The reason: Affected women moved to the cities where they invested in their education. Later on, as middle-aged adults, they had higher-skilled jobs and better incomes compared to rural women who were not displaced. “It is important to stress that such positive outcomes would not have been possible without the initial investment in better education,” says Ager.

Gender gap decreased, as men stayed on farms

Unlike young women, men were not displaced by the new technology and remained largely in rural areas. This disparity contributed to reducing the gender income gap in Norway. Another positive effect for the economy: as women moved to municipalities, workers were better distributed across economic sectors to where they were needed.

The Norwegian economy at the time provided new job opportunities in the cities. Growth rates were high and the economy was in a transition phase, especially in the manufacturing and service industries. Apart from education, the economic momentum also helps to explain why women on average benefited from being pushed from the farms in the long run.

Parallels to current debate on AI

“Our findings have some parallels to today’s debate about the adoption of more and more sophisticated technologies, such as artificial intelligence, self-driving cars and industrial robots,” says Ager. “There are concerns about the effects of new technologies which — like milking machines did in the past — could replace traditional jobs. In light of our results, the need to provide workers with new skills for future work cannot be overemphasized. Policy-makers and employers should support workers to adapt to changes in the world of work in good time.”

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The Collaborative Research Center (CRC) Transregio 224 EPoS

Established in 2018, [the Collaborative Research Center Transregio 224 EPoS](#), a cooperation of the universities Bonn and Mannheim, is a long-term research institution funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG). EPoS addresses three key societal challenges: how to promote equality of opportunity; how to regulate markets in light of the internationalization and digitalization of economic activity; and how to safeguard the stability of the financial system.

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