22nd Global Economy Lecture: David Dorn on "The rise of the machines – how computers have changed work"

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On October 11, 2017, the Oesterreichische Nationalbank (OeNB) hosted the 22nd Global Economy Lecture[1], which was delivered by David Dorn, Professor of International Trade and Labor Markets at the Department of Economics, University of Zurich. Professor Dorn's research covers the interlinkages between trade, technology and the labor market. His lecture investigated how rapid technological progress and automation have fundamentally affected the patterns of employment and unemployment levels, and how they have contributed to income inequality.

Professor Dorn started from the observation that the labor share, i.e. the fraction of aggregate income obtained through labor, has been declining over the past decades in developed countries. This trend is frequently interpreted as "the end of labor," a result of rapid technological change with cheap robots increasingly substituting human labor. Professor Dorn mitigated these concerns by addressing the issue from several angles:

- While technological change is certainly rapid today, its speed is not without historical precedents, and it does not automatically translate into fast productivity growth. Actually, growth of real GDP per capita has declined steadily over the past decades. This reflects Robert Solow's (1987) famous statement, "You can see the computer age everywhere but in the productivity statistics."[2]
- Based on the example of spinning techniques in the textile industry, Dorn illustrated that several historical automation episodes had caused concerns about huge job losses. However, such technological innovations never led to massive unemployment; instead, they fundamentally changed the structure of the labor market. New jobs emerged as a result of both the new technologies (e.g. machine engineering and maintenance tasks) and declining production costs that freed financial resources for other commodities.
- Professor Dorn put the substitutability of labor by machines into perspective by emphasizing that computers are good at routine jobs, but struggle with non-routine tasks and are bad in fine motor skills, visual recognition and social interaction.

This is why the last stages of production still largely rely on human labor today. Even if jobs are lost through automation, adjustment to this circumstance can take various forms that do not necessarily imply unemployment. For example, young people may increasingly target jobs with high employment prospects, while older workers would automatically drop out of the labor market in weaker segments as they retire. Policymakers should thus focus on equipping future generations with the necessary skills in problem solving, interpersonal relations and information technologies.

According to Professor Dorn, we should therefore not fear massive job losses because of automation. However, he sees great challenges in the distributional effects of technological change. While routine occupations may suffer, demand for skilled non-routine jobs (managers, engineers, software developers) increases.

[1] *The Global Economy Lecture is an annual event organized jointly by the Oesterreichische Nationalbank (OeNB) and The Vienna Institute for International Economic Studies (wiiw).*

[2] *Solow, R. 1987. We'd better watch out. New York Times Book Review. July 12. 36.*

Low-skilled non-routine tasks, such as cleaning, should remain broadly unaffected. As a result, we already observe a polarization of employment and wage dynamics, as it is actually the middle-skilled (and middle-paid) segment that has the poorest prospects. Furthermore, adverse effects may be concentrated on the eldest age cohort. Unfortunately, the effectiveness of retraining measures for older workers have turned out to be rather limited.

For a written version of Professor Dorn's contribution, see Dorn, D. 2015. The Rise of Machines – How Computers Have Changed Work. UBS Center Public Paper no. 4.