No more Workers in the Factories? 
Industrial Robots and Work in the Automotive Sector in Austria, in the Context of the New Automation Debate

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Central Tension

One of the central assumptions in the recent (New) "Automation Debate" (Benanav, 2020) is that productive technology leads to a "displacement effect" of living labour in production. This intuitive assumption, however, appears contradictory to the empirical observation that it is not those industries and countries, which have automated the most (measured as number of industrial robots per 10.000 workers) which have also de-industrialised the most (measured as the percentage of the industrial workforce relative to the total workforce). The present project asks why this is the case and how it can be explained for the specific case of the Austrian Automotive industry, for which this tension is particularly pronounced. The results of this theoretical and empirical engagement will be central to the overall conclusions of the present "Automation Debate" and its related literatures on De-Industrialisation, the "Productivity Paradox" and industrial concentration. A theoretical gap (lacking consideration of stagnation and productivity dynamics in relation to displacement) as well as empirical gap (lacking consideration of co-dependencies and industrial and national variations) in the literature will thus be addressed.

Specific Research Questions, Methodology and Data

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<td>RQ 1 How can robot density (number of robots per 10,000 workers) and various market concentration indices (HHI and c-measures) explain the variation of the productivity dynamics in different national automotive sectors (AUT, BR, CAN, CZ, FR, GER, HU, IT, JPN, MEX, NL, PO, POR, RO, SLO, SLOV, SP, SW, SWITZ, UK, US)?</td>
<td>Countries: Traditionally strong Automotive Sectors but varying institutional conditions</td>
<td>Available Time Series: 2010 till 2018</td>
<td>Multivariate analysis</td>
<td>Fixed Effects Model based on Panel Data</td>
<td>The relationship of productivity, concentration and robot density in different automotive sectors</td>
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<td>RQ 2 How can the interdependence of robot density, market concentration and productivity explain &quot;technological displacement&quot; (and manufacturing employment more generally) in the specific case of the Austrian automotive sector?</td>
<td>Variables: same as above + relative manufacturing employment shares; manufacturing value added; output hours worked</td>
<td>Same as above + Statistics Bureau of Austria</td>
<td>Institutional Economic Analysis</td>
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<td>RQ 3 How do workers, management and engineering at an Austrian automotive manufacturing site conceptualize the use of automation technology and technological displacement?</td>
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Available Time Series: 2010 till 2018

Data Bases: IFR, OCED STAN, Conference Board, Orbis, CompNet

Method: Stylized Facts and Auxiliary Contextual Data

Analysis: Institutional Economic Analysis

1st Order Interpretation: The relationship of productivity, concentration and robot density in different automotive sectors

The figure on the left illustrates the issues at hand, based on data from the IFR (2019), Eurostat(2020) and Statistik-Austria. It shows that (1) the automotive sector is much more automated than general manufacturing,(2) employment has increased slightly therein and automation significantly, thus (3) the central tension of this research is validated. The table below illustrates the specific research questions and methodologies for engaging this tension. Please note the incomparability of the shown variances based on different scales. The graph is merely intended for illustrative purposes.

Selected Literature


The competing explanations for de-industrialization and specificity of the Austrian automotive sector...