

# Technological Unemployment in the European Union: A Case of Innovation Leaders

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## ABSTRACT

The idea about technological unemployment was introduced by J. M. Keynes at the beginning of the 20<sup>th</sup> century. The link between innovation and unemployment from a theoretical perspective is very complex and ambiguous. There are various market compensation mechanisms that can absorb unemployment. But there is a negative (possible) phenomenon as well – a massive replacement of people by machines. This study provides two stages analysis. The first step in this research is clustering. Using two variables that reflect innovations – expenditure on R&D and patents – the author performs cluster analysis in order to know how the European Union countries can be divided into the clusters according to the level of innovativeness. The type of clustering algorithms is the k-means nonhierarchical method. The second step in this research is regression analysis. Using the panel data of 28 European Union countries for the period of 1992–2016, the author aims to examine how innovations affect unemployment in the European Union countries that are leaders in innovation activity. The author uses two core independent variables as the main proxies for innovations, as well as other unemployment controls in the model which was estimated using System Generalized Method of Moments (SGMM). Composing 12 different estimations of the model, the results suggest that, in many cases, technological innovations have an effect on unemployment.

**Keywords:** clustering; employment; GMM; revolution; technological change