

## The role of global value chains and their spatial spillovers in convergence dynamics of EU regions

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Since the beginning of globalization, with the increase of international networks and the improvement of technology, economic systems are becoming increasingly interdependent. These global processes have been characterized by an increasing fragmentation of production, being each stage located in different geographical points. In this context, the concept of Global Value Chains (GVCs) emerged, which could be defined as the value added generated in each step of the production outsourced in different locations. The emergence of GVCs has been seen as an opportunity to economic growth for many economies through their economic upgrading. However, different authors point out that positive outcomes are not equally distributed among countries, generating potential disparities among them.

On the other hand, the behavior of economies advancing at different speeds is highly related to the concepts of economic convergence and catch up. One of the clearest examples of the convergence process is the European Union. Since its creation, the promotion of economic growth, the implementation of the common currency or the creation of a single market and common regulations aimed to foster the EU economies to advance at the same pace. This process has been seen as one of the main attractions for potential EU candidate countries. At the regional level, the goal of regional convergence has been declared and committed to in the EU Treaties. However, the level of inequality between regions remains high, and different international institutions and scholars have claimed on the effects of these raising income differences in the observed dissatisfaction level within specific geographical areas and social groups, threatening social cohesion.

GVCs have been, commonly, studied at country level. Nevertheless, recent literature has also paid attention to their regional scale. Existing literature shows that regional economic specialization and the different intersectoral and interregional linkages affect the economic performance of regions. Besides, the latest research has found potential different gains of EU regions position in GVCs and highlights the role of spatial spillovers to determine their performance in the international chains.

Within this framework, the main objective of this paper is to analyze to what extent the configuration of GVCs in Europe, and the way in which the regions have engaged in them, has contributed to the processes of income convergence and catch up in Europe. In this context, some works claim the necessity of incorporating the potential spillovers among regions to capture a more informative picture of regional economic growth, challenges and opportunities in a highly interconnected and globalized economic environment. Thus, we also aim to check the importance of neighboring regions, both geographically and economically, in explaining these processes.

From an empirical standpoint, we combine an interregional input-output with a spatial econometrics strategy. Particularly, we use the EUREGIO database, which contains information on 249 NUTS2 EU regions for the period 2000-2010, and EUROSTAT Regional Statistics as main databases. EUREGIO is used to calculate participation and position in GVCs. Participation is calculated using the approach of Los et al., 2015, while the upstreamness measure of Antràs et al., 2012 is used as position. As a measure of catch up we define the ratio between regions value added and the maximum value added achieved among all EU regions. The higher is the ratio, the closer is the region respect the one that best performed. As dependent variable it is included the catch-up variation between 2010 and 2019. As independent variables, we will include participation

and position in GVCs in the first year of the period analyzed (2010) and other control variables as people in science and technology, degree of urbanization, specialization in EU trade and a dummy variable that takes value 1 if the region shares a border with a region of another country.

To check the spatial dependence two matrices are used. To account for potential geographical dependence among European regions, a queen weight matrix has been employed. This matrix considers all neighboring regions surrounding each specific region. On the other hand, economic distance is defined as the similarity in the production structure among regions. To build this matrix, we first calculate specialization indices of each region on the basis of the sectoral information provided by EUREGIO. Next, correlation coefficients between specialization indices are used to determine the "economic neighbors". We consider economic neighbors those regions with correlation coefficient greater than 0.7. First results suggest a significant role of participation and position in catch-up variations and reveal the importance of geographical spillovers in these processes.