

**European union countries' innovation inputs and innovation outputs: Is digital transformation a configurational moderator?**

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### **Introdução**

Digital transformation (DT) is changing the innovation landscape not only at the level of the firms but also at the macro level. The topic has gathered substantial interest due to the potential of DT to facilitate innovation and enhance competitiveness. Recently, scholars began paying attention to the impacts of DT on levels other than the firm, proposing that transformations are being felt at the institutional and societal levels.

### **Problema de Pesquisa e Objetivo**

The purpose of this study is to analyse the impact of DT on European Union (EU) countries' national systems of innovation (NSI). Drawing from an innovation input-output perspective, the study aims to assess how configurations of countries' innovation inputs that lead to innovation outputs are affected by the levels of national DT. We argue that the ability of countries to translate innovation inputs into innovation outputs is contingent on the level of DT.

### **Fundamentação Teórica**

This study is grounded in the NSI approach, which states that economic, social, political, organisational, institutional, and other factors influence the development, diffusion and use of innovation. Such definition highlights the configurational nature of NSI. Regarding DT, it is defined as a socioeconomic change that is shaped by the adoption and use of digital technologies. Empirical evidence shows that an interplay exists between DT and both innovation inputs and outputs, yet, how this interplay is established still eludes our grasp.

### **Metodologia**

A novel configurational moderation approach is adopted to assess the impact of DT on the 27 EU countries' NSI. Secondary data for this study was gathered from the European Commission's Digital Decade DESI database and WIPO's Global Innovation Index, with both reporting to the year of 2023. A two-stage fuzzy-set Qualitative Comparative Analysis was used to identify the moderating effects of DT on the relationship between innovation inputs and outputs.

### **Análise dos Resultados**

Results show that the presence of all innovation inputs is a sufficient configuration for the presence of high innovation outputs, while three different configurations are found to be sufficient for its absence. The configurational moderation analysis revealed that DT effectively moderates the arrangement of innovation inputs leading to the presence of high innovation outputs, where the human capital and research pillar loses its importance. No moderation effect was identified in the solution leading to the absence of high innovation outputs.

### **Conclusão**

Overall, this paper allowed us to understand the role of DT on EU countries' NSI, which was revealed to be of central importance in achieving high innovation outputs. One of the main points highlighted by this study is that high levels of DT contribute to the loss of importance of human capital and research in explaining high innovation outputs, stressing the need for a continual and fast-paced upgrade of digital skills throughout all EU member-states.

### **Referências Bibliográficas**

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