

# Position in global value chains, technological capabilities and economic performance

Summary of the post-doctoral project

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# The scholarship

- **Candidate:** economist at Jagiellonian University in Kraków (global value chains, technological and structural change)
- **German host institution:** University of Bremen, iino, prof. Jutta Gunther (innovation and international economics)
- **Foreign host institution:** Sussex University, SPRU, prof. Maria Savona (industrial and innovation policy, global value chains)

# Research problem

- emergence of **global value chains**: production of many final goods and services is fragmented, sliced into multiple stages, dispersed around the globe
- **'Factory Europe'** – the most-integrated region in the world, with very dense internal linkages between countries
  - specific patterns of labour division between highly-developed European Core and catching-up Peripheral countries.
- vertical specialization in narrow stages of the value chain poses risks for development of **technological capabilities**, which are widely recognized as a key determinant of long-term growth

# Research questions

- **How does the position in global value chains influence the evolution of technological capabilities and the economic performance of industries in countries at diverse levels of development?**
  - How did technological capabilities evolve in countries of European headquarter and factory economies?
  - What was the role of linkages in global value chains for the evolution of capabilities?
  - Do headquarter economies benefit in terms of technological capabilities from the vertical specialization in high-value-added stages of GVCs?
  - Is a peripheral position in GVCs detrimental to the technological upgrading in factory economies?
  - How does the integration in GVCs influence the growth of productivity and value added via the channel of technological capabilities?
  - Does integration in GVCs lead to convergence between headquarter and factory economies in terms of the intensity and the types of capabilities and in terms of their productivity?

# Inspirations

- The issue of **growing interdependence of economies and of its consequences have been the object of qualitative analyses** of scholars from Global Value Chain and Global Production Network approaches since the late 1990s.
- importance of the position that the country in question occupies in the value chain and of the relationships between domestic enterprises with international corporations.
- More recently, those phenomena have been investigated widely by use of multi-region input-output matrices. They allow for estimating flows of value added in production processes dispersed around the world
- So far only a few attempts have been taken to systematically examine the impact of the fragmentation of production on economic performance using econometric methods.
- The technological dimension started to be explicitly involved into quantitative global value chains analyses. Analysed issues included internationalization of innovation processes in value chains and the interaction between domestic and foreign factors of technological upgrading. Recently, MRIO data was employed to assess channels for technology spillovers, especially by linkages with Business Services.

# Investigation strategy, methods and data

## Main research tasks:

1. The conceptualization of technological capabilities in a multi-dimensional way, including the nature of innovation processes and their products, all the while drawing on the experience of the Bremen team.
2. The calculation of variables and indices of technological capabilities, with use of patent data from the EPO and survey-based data of the Community Innovation Survey.
3. The conceptualization and estimation of the econometric model, which will relate GVC positions with technological capabilities and economic performance in terms of productivity and value added growth.

## Employment of quantitative techniques:

- Description of GVC positions will be based on analysis of World Input-Output Tables.
- Description of capabilities will be based upon patent data and surveys on types of innovation activities and learning mechanisms.
- Econometric work will include techniques of panel-data analysis and systems of structural equations.

# Project relevance and expected impact

- **High practical relevance.** Its results may constitute valuable information for all parties (both supporting and doubtful) interested in the consequences of the globalization of production processes in Europe and other regions of the world
- Contribution to the scientific debate on the influence of international integration on economic performance of industries in particular countries
  - **linking the GVC framework with the economics of STI**
- Participation in the program at the Universities of Sussex and Bremen will enable the candidate to continue the scientific development in various dimensions; stays at reputable foreign universities will provide a unique opportunity to establish a lasting cooperation with local scientists

# Timeline

Month	Research task	Activities in details	Institution
1-3	I	<ul style="list-style-type: none"> <li>Development of a detailed approach in cooperation with both host institutions, conceptualization of technological capabilities</li> <li>Initial seminars at both institutions</li> </ul>	iino, University of Bremen (month 1) SPRU, University of
4-7	II	<ul style="list-style-type: none"> <li>Analysis of technological capabilities – empirical work on patent and survey data; statistical investigation</li> </ul>	Sussex (months 2-13)
8-9		<ul style="list-style-type: none"> <li>Presentation of results at seminars and conferences</li> <li>1<sup>st</sup> paper preparation and submission</li> </ul>	
10-13		III	
14-16	<ul style="list-style-type: none"> <li>Econometric work on the model of structural equations</li> <li>Presentation of results at seminars and conferences</li> </ul>		iino, University of Bremen (months 14-18)
17-18	<ul style="list-style-type: none"> <li>2<sup>nd</sup> paper preparation and submission</li> </ul>		