

# Global Value Chains as Pathway to Innovation: the Case of Central and Eastern Europe

**Pijus Krūminas (Visionary Analytics)**

**Egidijus Rybakovas PhD (Visionary  
Analytics, Kaunas Kaunas University of  
Technology)**

**Agnė Paliokaitė PhD (Visionary Analytics)**

Research was carried out in the project “Middle-income trap: global value chains, skills and innovations in CEE countries”, funded by the Lithuanian Research Council (grant No. S-MIP-17-116).

# Motivation and rationale

- The paper proposes an explanation for the reasons of the relatively slow innovation growth in CEE countries and a way to improve it.
- Participation in global value chains (GVCs) affects the actual competences of employees and firms' incentives to innovate, determining country's innovativeness.
- Upgrading in GVCs leads to higher value added creation, including through innovation, and increases the pressure to hire more highly skilled employees.

# Theoretical proposition

**Involvement in GVCs is linked to skill development and increased innovativeness.**

# Theoretical background [1]

- CEE countries can be considered as experiencing the **regional innovation paradox**, where investment in R&D and innovation activities is not fully exploited (Oughton et al, 2002; Muscio et al, 2015).
- Due to:
  - Inefficient public investment in R&D and education;
  - Unsuitable fundamental social institutions;
  - The industrial structure of the CEE economies affecting their success.
  - ... ???

# Theoretical background [2]

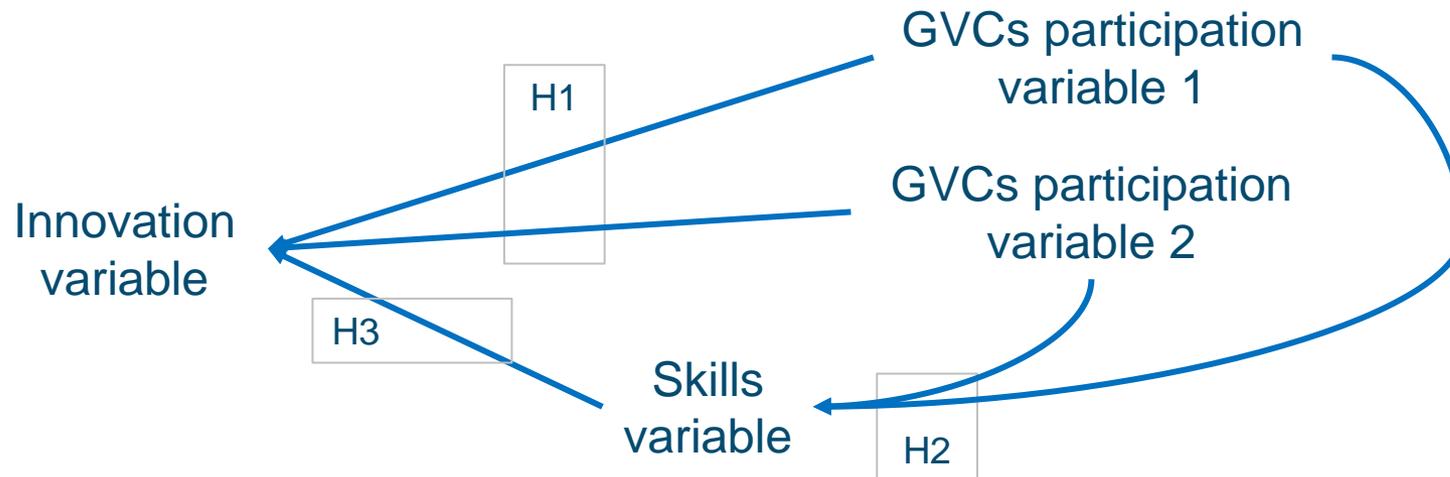
- **Increased involvement in GVCs is one important driver of overcoming the regional innovation paradox and the middle-income trap that CEE region is facing.**
  - ... due to the potential for upgrading and increased value added;
  - ... due to enabled knowledge transfers;
  - ... due to need for better skilled employees;
  - **Increased competition, demand for higher quality inputs, foreign assistance to local firms.**

# The Model

- **The model involves:**
  - **direct effects of GVC participation on innovation and skills**
  - **an indirect effect of GVC participation through their effect on skills**

# Hypotheses

- H1. Participation in GVCs positively affects innovation at the sector level.
- H2. Participation in GVCs positively affects skills at the sector level.
- H3. Higher skills positively affect innovation at the sector level.



# Method, Sample and Data

- **Method:**
  - regression-based path analysis
- **Sample:**
  - 11 Central and Eastern European countries
- **Data:**
  - GVC participation data – WIOD (Timmer et al., 2015) and UIBE-GVC databases (Wang, et.al, 2017).
  - Skills and innovation – Eurostat.

# Why CEE region?

- Up until the early 1990s the countries in the region have been closely integrated into the Eastern bloc, and the economy of the Soviet Union,
- Relative down- and up- streamness (Cieřlik, 2014, 2016; Hagemeyer and Ghodsi, 2017) of CEE country sectors' is already researched.
- The effects of GVCs integration in CEE countries have been missing in literature, and even the analysis of integration has focused on relatively limited indicators.

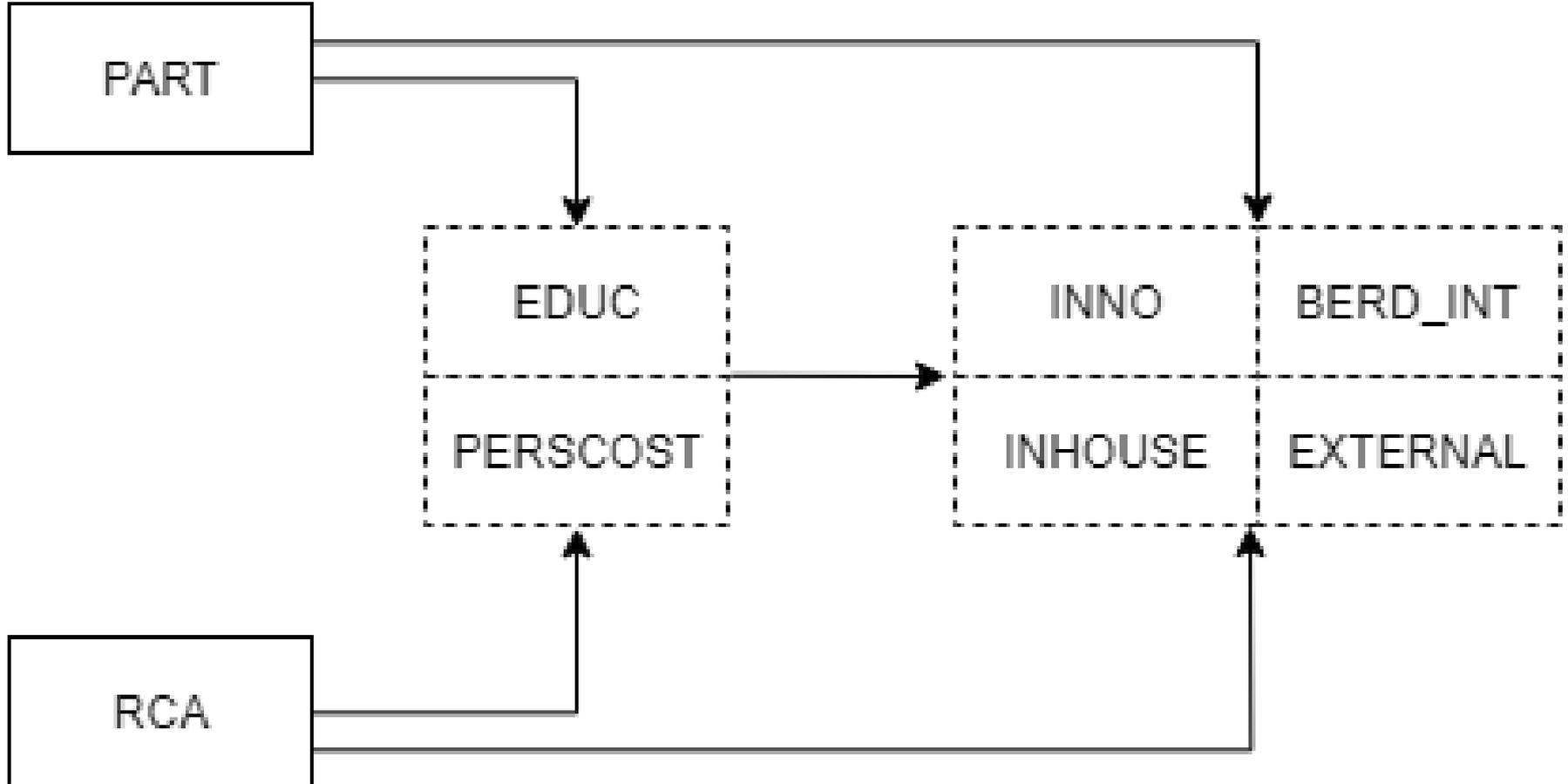
# Contribution

- **An assessment of the links between GVC participation, skills, and innovation, which is important globally.**
- **Improved understanding of the CEE region's integration into GVCs nearly 'from scratch'.**
- **Insights into how economic globalization may unfold in other developing countries.**

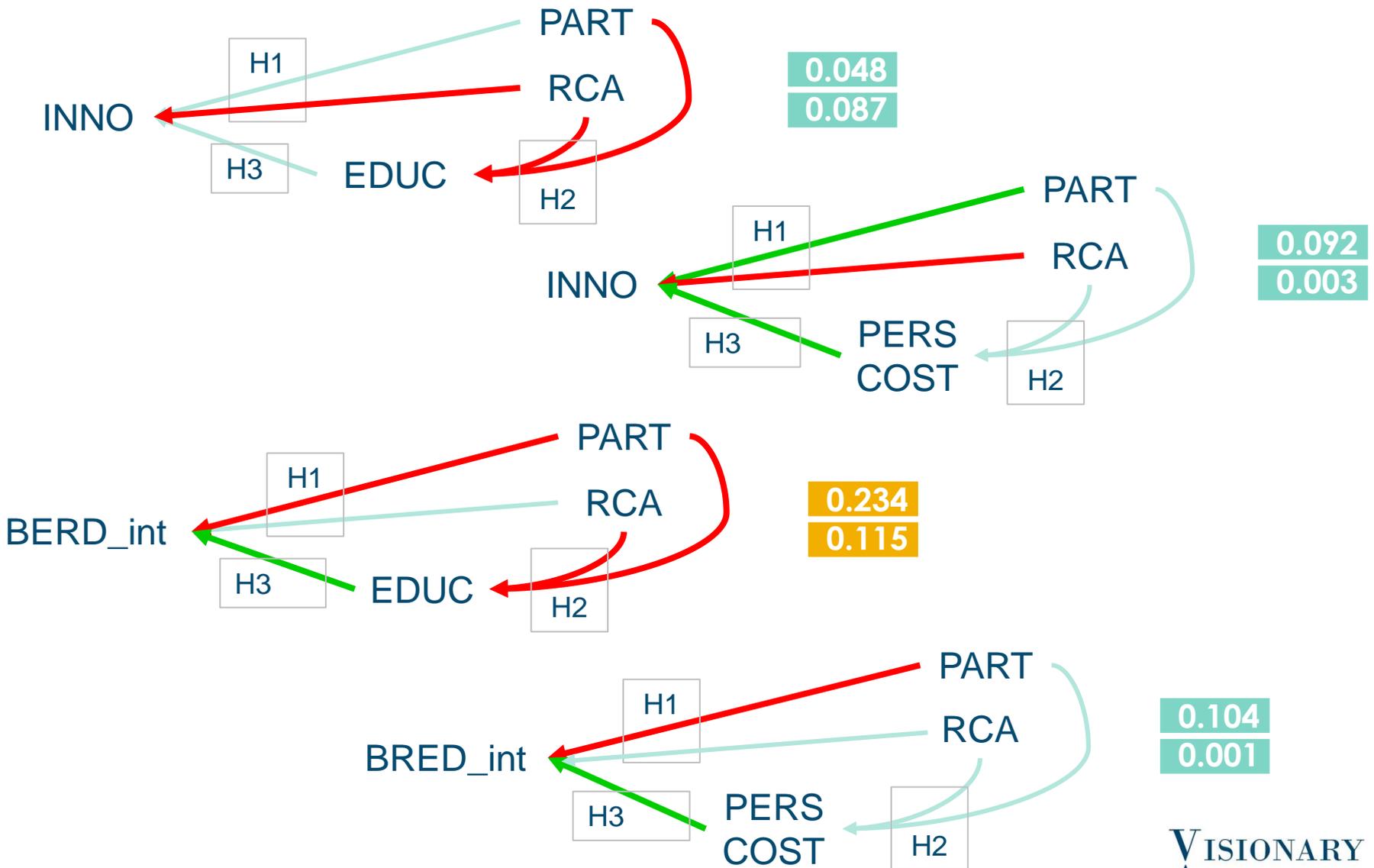
# Variables

	Explanation	Source
PART	Calculated as the ratio between domestic VA in intermediary products and total domestic VA for a country-sector.	UIBE GVC, WIOD.
RCA	An indicator measuring country-sector's revealed comparative advantage (RCA) in terms of domestic VA in intermediate products' export.	
BERD_INT	BERD intensity measured as total business expenditure on R&D in a given sector divided by turnover/ gross premiums written in a country-sector	Eurostat
INNO	Share of innovative enterprises in a country-sector	
INHOUSE	Expenditures for in-house R&D as share in total turnover of a country-sector	
EXTERNAL	Expenditures for external R&D as share in total turnover of a country-sector	
EDUC	Enterprises with more than 75% of employees with university education out of innovative enterprises in a country-sector	
PERSCOST	Average personnel cost per employee at country-sector	

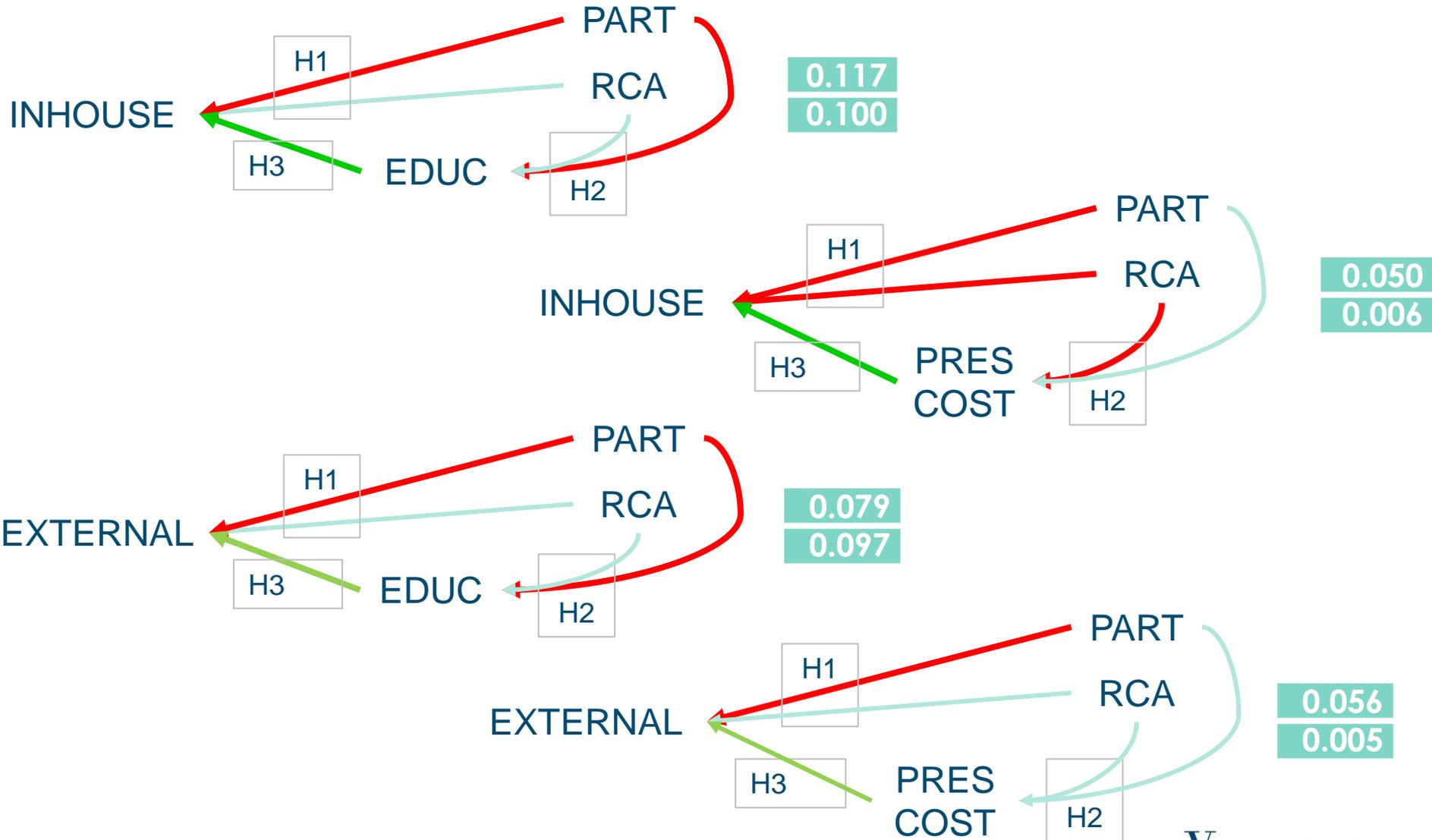
# Multiple model testing



# Results of Tests [1]



# Results of Tests [2]



# Conclusions [1]

- H1. Participation in GVCs positively affects innovation at the sector level. **Mostly rejected:**
  - Generally, most models identified negative effect of PART on R&D-related variables.
  - The relationship between PART and INNO suggests that higher participation in GVCs helps sectors to adopt more innovations.
  - RCA in most cases is not related to innovation indicators at a statistically significant level. One of the exceptions is INNO, which shows that revealed comparative advantage does not emerge through country-sector's innovativeness.

# Conclusions [2]

- H2. Participation in GVCs positively affects skills at the sector level. Rejected:
  - The links between PART and RCA and EDUC are negative and statistically significant in nearly all cases. The effects of PART and RCA are statistically insignificant in nearly all cases. Therefore, the hypothesis is rejected.
- H3. Higher skills positively affect innovation at the sector level. Supported:
  - Seven out of eight models found positive and statistically significant relationship between skills indicators (either EDUC or PERSCOST) and innovation indicators. Therefore, as expected, the relationship between skills and innovation is positive.

# Discussion

- It could be guessed, that companies involved in GVCs enter them through cheap factors of production (most likely labor), rather than R&D capacities and innovation.
- This is further supported by the negative relationship between GVC involvement and skills in most of the models.
- GVC participation is associated with lower R&D and lower skills, meaning that enterprises are likely to enter GVCs in mid-section of chains, where neither R&D activities, nor highly skilled employees are required.

# Discussion: CEE vs. WE

- H1. Participation in GVCs positively affects innovation at the sector level. Mostly rejected in both CEE and WE samples.
- H2. Participation in GVCs positively affects skills at the sector level. Rejected in CEE sample, but partially supported in WE sample:
  - Participation in GVCs positively effects PERSCOST, but not EDUC in WE country-sectors sample.
- H3. Higher skills positively affect innovation at the sector level. Supported in both CEE and WE samples.