Globalization and unemployment in the EU: new insights on the role of global value chains and workforce composition

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Motivation

- Modern globalization is closely associated with GVCs
- Even after the Great Recession and the pandemic, they remain a key feature of the global economy
- Although the macroeconomic consequences of trade have been studied, the effects of GVC participation have been less explored
  - **Benefits**: growth, productivity improvement, specialization
  - **Risks**: unemployment, income losses, inequality and polarization. + effects of the disruption of GVCs
  - "Pair of concerns": more advanced countries worry potential loss of manufacturing jobs going to lower-cost countries; countries that host new production worry about receiving the wrong type of jobs
- Micro studies:
  - higher earnings and employment within sectors and firms is associated with GVC integration
  - distributional implications of where jobs go and the types of jobs they are

Aim

- We ask whether there are effects of GVC participation on aggregate unemployment
- We estimate impulse-response functions from local projections (Jordà, 2005) for the 28 EU members between 1990 and 2015.
- Contributions:
  1. Focus on EU countries, the region with the largest participation.
     ▸▸ EU value chains
  2. We explain the heterogeneity of the responses among countries and sectors
  3. We examine the mechanisms
  4. We deal with endogeneity
  5. Our approach is macro, in contrast to most of the literature that focuses on micro or firm-level data.

Summary of the results

- **Overall negative** impact on unemployment
- **But heterogenous**, mainly across countries:
  - The effects are larger for peripheral and CEECs. Opposite for core
  - Quite homogenous by sectors, except for agriculture
- The effect is **depends on**
  - Skill of workers: skill-biased nature of GVC trade associated with high complexity of global supply chains and increased use of skill-intensive inputs, notably services
  - Labour costs
- **Mechanisms**:
  - Subsectors with higher GVC participation growth (manufacturing) can generate more employment in their sector
  - Although the capacity to increase value added is more limited, they create employment

Related Literature

- With value chains, a country can specialize in one or several activities in which it has comparative advantage
- Recent theoretical trade literature deals with the effects on GVCs on employment, as Dix-Carneiro et al. (2021) and Carrère et al. (2020).
- An increase in **productivity and efficiency** is found for developing countries and micro data: Amiti and Wei (2009); Schwörer (2013); Criscuolo and Timmis (2017).
- Richer countries, evidence is less conclusive: Yan and Baldwin (2014) for Canada; ECB (2019) and Karpowicz and Suphaphiphat (2020) for the EU. Small effects through technology diffusion.
- GVC deliver better jobs, but also reduce **employment**, according to World Bank (2020). The effect on employment is positive in developing countries. Multiple channels and country-specific.

Data and definitions

- 28 EU members from 1990-2015 (to allow for sub-sector breakdown)
- Groups:
  - **Core**: Austria, Belgium, Denmark, Finland, Germany, France, Luxembourg, the Netherlands, Sweden, and the UK.
  - **Periphery**: Cyprus, Greece, Ireland, Italy, Malta, Portugal, and Spain.
  - **Central and East European Economies**: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia.

Data and definitions

- UNCTAD-Eora GVC database (2019 edition), based on I-O data. 1990-2018

$$Backward_i = \frac{FVA_i}{VAX_i} \tag{1}$$

$\Rightarrow$ **importing intermediates** increases access to the highest-quality inputs requirements to meet demanding standards but they may crowd out local production and limit domestic value addition

$$Forward_i = \frac{DVX_i}{VAX_i} \tag{2}$$

$\Rightarrow$ **producing and exporting intermediates**, and importing countries will add further value added and export as finished products or as intermediates to other production stages

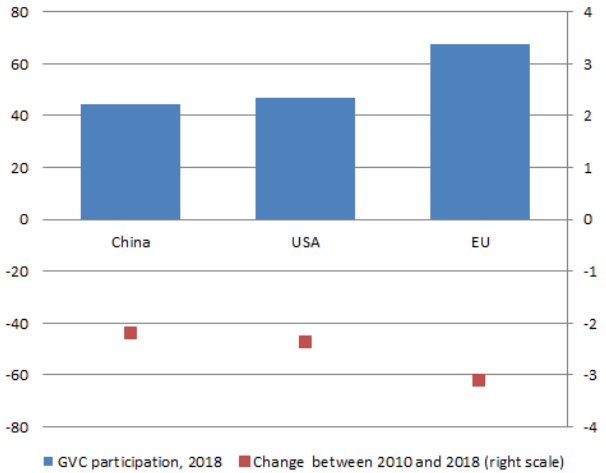
$$GVC_i = \frac{DVX_i + FVA_i}{VAX_i} \tag{3}$$

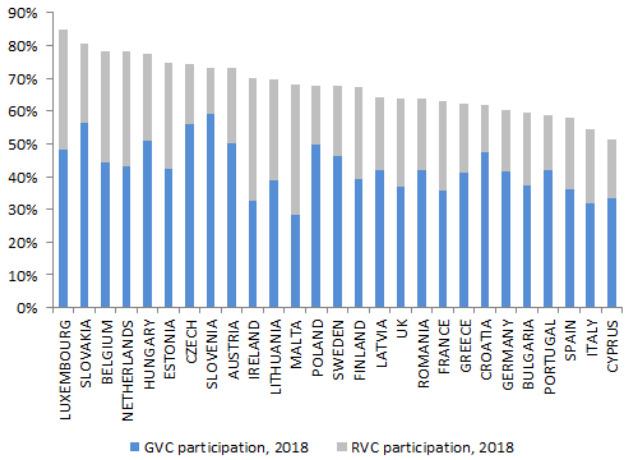
FVA : foreign value added; DVX_i : domestic value added and VAX_i value added exports.

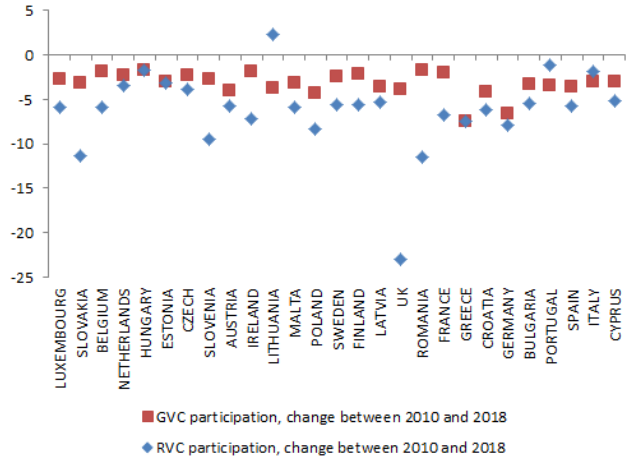
- Remaining variables obtained from the IMF and the World Bank.

Data and definitions

Global and Regional value chains: features







⏩ EU value chains

Data and definitions

Global and Regional value chains: sector heterogeneity

Global value chain participation by sectors, 1990 and 2015

Country	1990	2015	Change
Agriculture, forestry and fishing	**36.25**	**46.03**	**27.0%**
Mining and quarrying	**52.85**	**62.45**	**18.2%**
Manufacturing	**51.03**	**59.69**	**17.0%**
Textiles and wearing apparel	45.29	54.24	19.8%
Wood and paper	51.00	60.65	18.9%
Petroleum, chemicals and non metallic mineral prods.	57.19	66.22	15.8%
Metal products	61.94	71.56	15.5%
Electrical and machinery	48.84	57.17	17.1%
Transport equipment	54.43	60.94	12.0%
Other Manufacturing	37.97	45.04	18.6%
Services	**35.34**	**43.07**	**22.0%**
Maintenance and repair	37.89	45.47	20.0%
Wholesale trade	46.08	58.21	26.3%
Retail trade	20.89	28.30	35.5%
Transport	40.83	48.98	20.0%
Post and communication	34.56	43.19	25.0%
Financial intermediation	34.10	41.44	21.5%
Public administration	16.53	20.28	22.7%
Education, health and and other services	20.76	25.68	23.7%

Methodology

Local Projection Method

The baseline specification for the panel model is the following:

$$\Delta y_{i,t+h} = \alpha_i + \gamma_t + \beta_h \Delta GVC_{i,t} + \nu X_{i,t} + \epsilon_{i,t+h} \tag{4}$$

This specification includes controls ($X_{i,t}$) such as changes in the endogenous variable, in the GVC participation score and in GDP and productivity growth. **Advantages:**

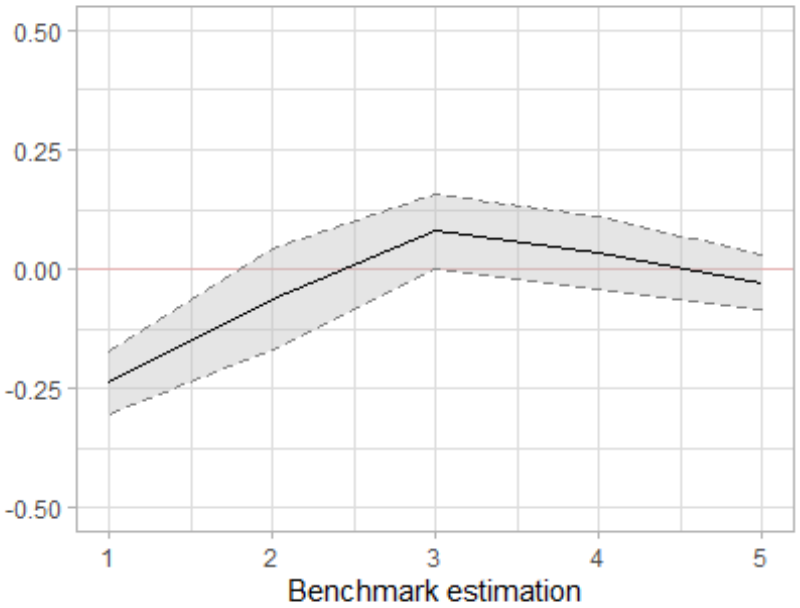
1. Less vulnerable to misspecification
2. It can accommodate non-linear specifications
3. IV approach: change in participation in the other countries of the group $\Rightarrow$ capture the variation in the participation that is driven by changes of conditions in foreign, but similar, countries that are not driven by domestic industry-specific shocks, which might be endogenous to GVCs.

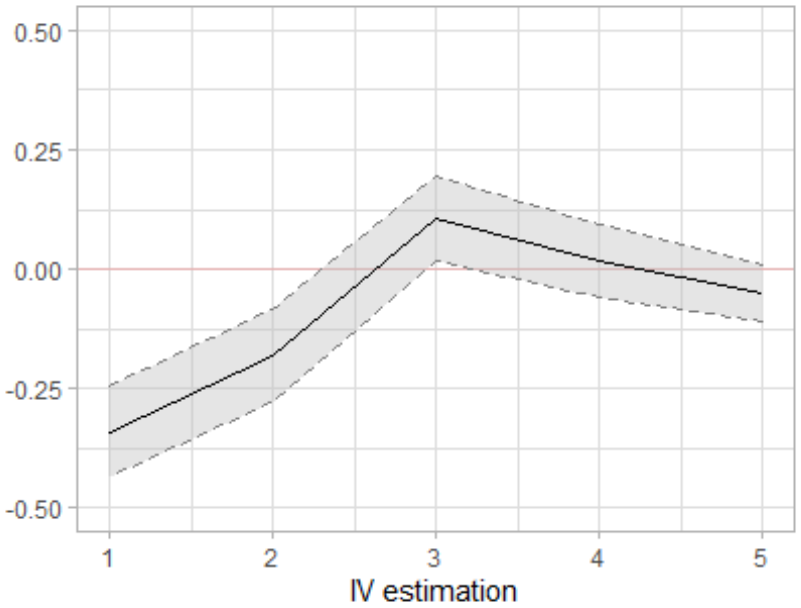
Plagborg-Moller and Wolf (2021) show that LP and VAR estimate the same impulse-responses.

Results

Total GVC participation

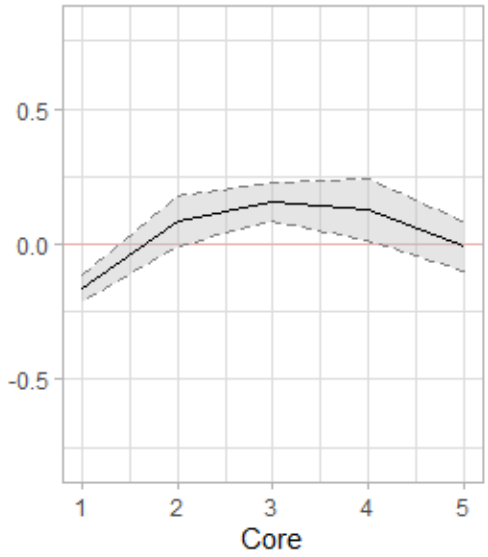
The effect of GVC participation's shocks on aggregate unemployment

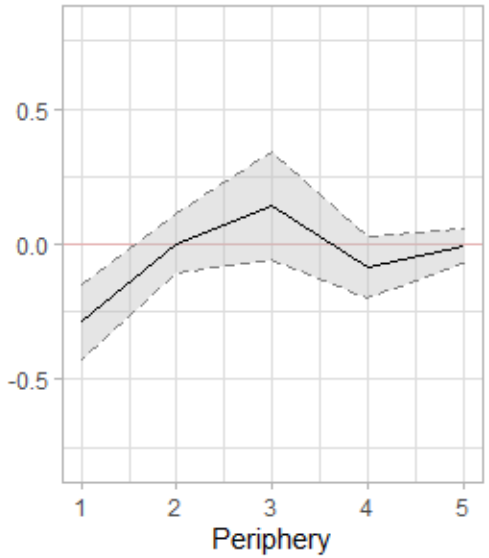


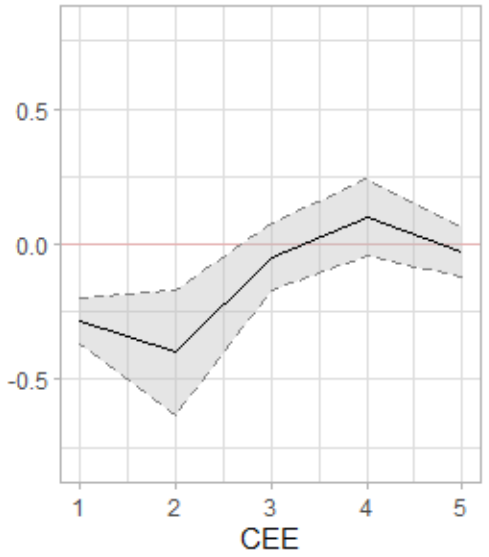


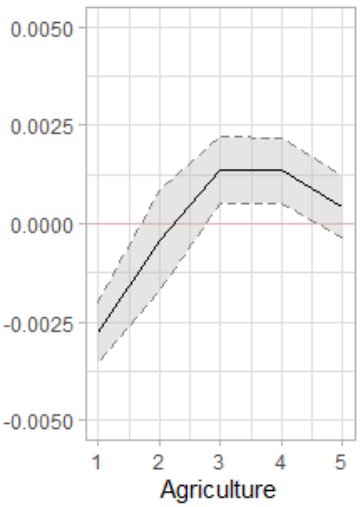
Note: Time is portrayed on the x-axes; the solid lines represent the average estimated cumulative response. We include its 90 percent confidence interval (computed using Driscoll-Kraay standard errors).

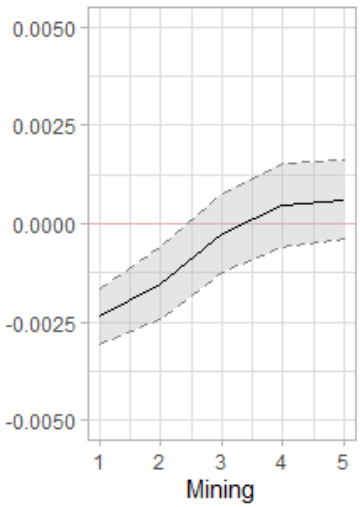
Heterogenity: regions and sectors

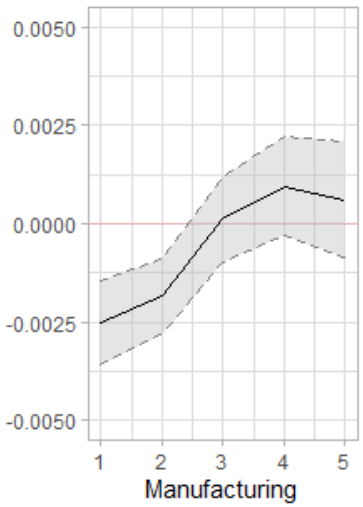


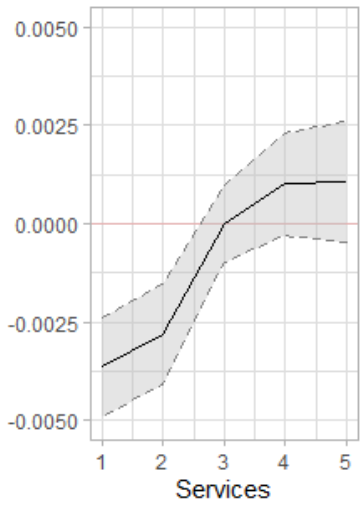




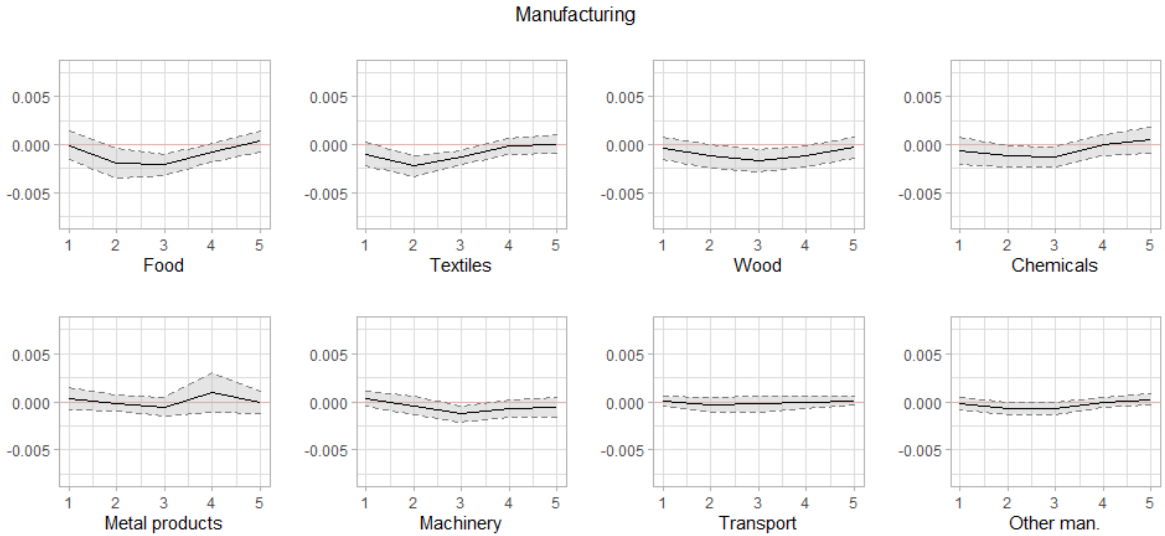




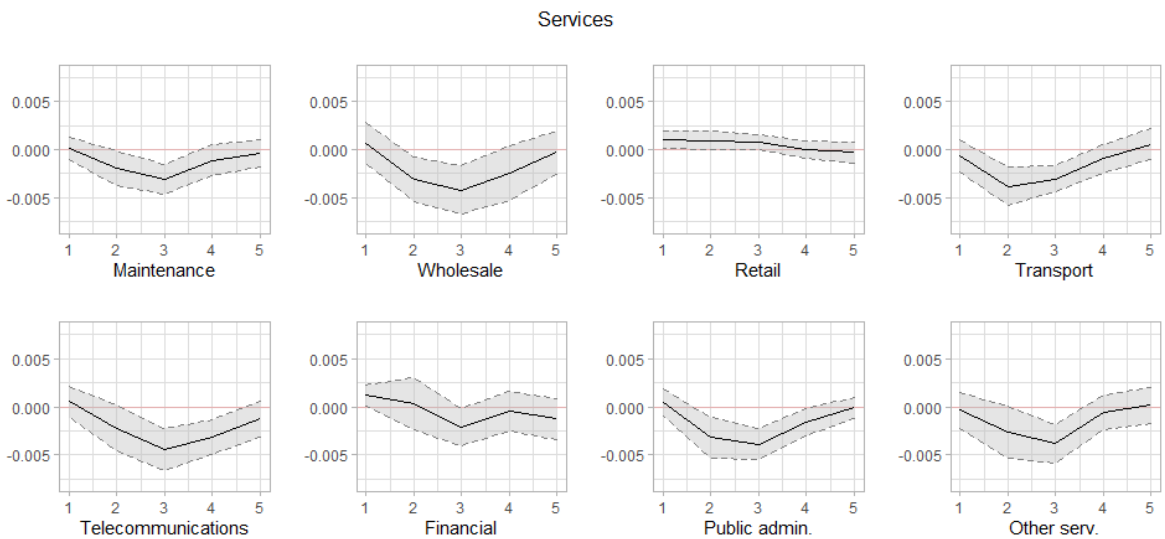




Heterogenity: subsectors



Relatively **modest role of manufacturing subsectors**



Neglecting **services**, would be a mistake

What makes unemployment more susceptible to GVCs?

Many **potential factors**. We focus on labour market composition:

- **Skills**: Low-skilled workers have been most affected by increasing unemployment due to competition from developing countries' workers and also as a result of technological progress (see Meng et al., 2020; Szymczak and Wolszczak-Derlacz, 2022)

- **Labours costs**: Shift out production to lower-cost areas (Shingal, 2015; Farole, 2016).

What makes unemployment more susceptible to GVCs?: Methodology

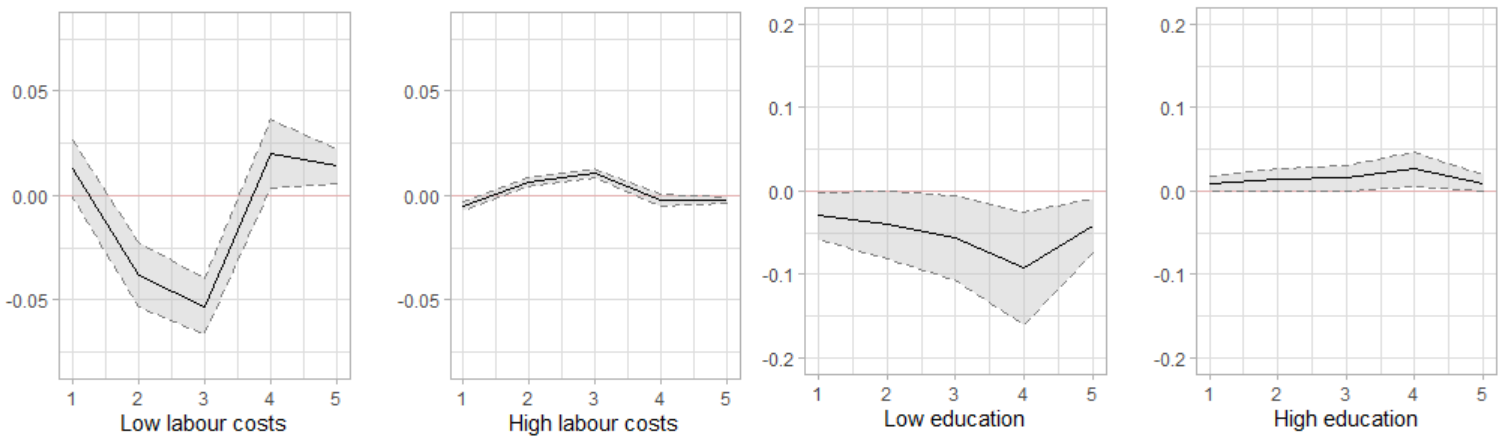
State-dependency is captured by:

$$\begin{aligned}\Delta y_{i,t+h} = \alpha_i + \gamma_t + \beta_h^{r1}(\Delta GVC_{i,t-k} \times F(z_{i,t-1})) \\ + \beta_h^{r2}(\Delta GVC_{i,t-k} \times (1 - F(z_{i,t-1}))) \\ + \nu X_{i,t-1} + \epsilon_{i,t+h}\end{aligned} \tag{5}$$

$$F(z_t) = \frac{1}{1 + \exp\left(-\theta\left(\frac{z_t - c}{\sigma^2 x}\right)\right)}$$

- IR functions corresponding to **two regimes**
- **Skills**: labor force with advanced education (% of the total working-age population with advanced education, Eurostat)
- **Labor costs**: unit labor costs (ratio of total labor costs to real output, OECD).

What makes unemployment more susceptible to GVCs?: Results



- **The effect is magnified in countries with less-educated workers or cheaper workforce**
- Labor costs and education are relative to the European level
- Increases in higher-skilled workers with high costs
- CEECs and peripheral countries are those where these production stages requiring relatively lower skills are concentrated
- Taking into account that around 70% of EU value added is in services, this may be the sector that accumulates most of the activity

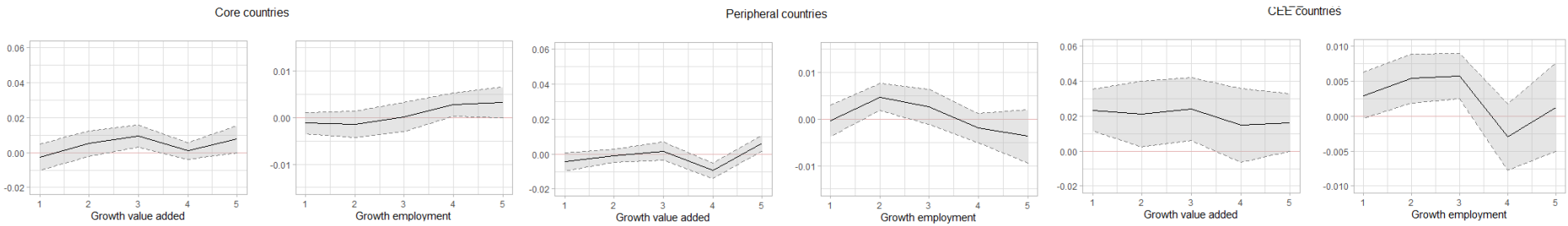
Mechanisms

Trade can impact unemployment through two broad channels:

- The **substitution** (direct) effect
  - Negative substitution effect of import competition on employment
- The **scale** (indirect) effect
  - Using cheaper imported inputs $\Rightarrow$ domestic firms can increase production, export, and hire more workers $\Rightarrow$ create more employment opportunities

Ideally, working on firms individually. We rely instead on **subsectors of the manufacturing** for which data on value-added, at constant prices, and employment (source EU KLEMS) matched with GVC data

Mechanisms: Results for manufacturing



- Value-added has shifted towards services
- and services are now externalized and produced elsewhere in the value chain
- Services are currently the main source of employment in European countries through their participation in GVCs.
- **Manufacturing jobs are more concentrated in peripheral and CEECs, but their contributions to value added are modest**

Summary and discussion

- Revisit the nexus between globalization and unemployment by focusing on **GVCs, the most prominent characteristic of the process of globalization in recent years**
- First empirical investigation of the impact of interactions between the **workforce composition and GVC-type trade** on unemployment for the 28 EU Member States over the period 1990-2015.
- The effects of GVC participation on unemployment are **not homogenous**: higher participation reduces the unemployment rate in less advanced EU economies, but it slightly increases it in Core countries
- Reinforced in countries with **lower labor costs and a higher proportion of low-skill workers** $\Rightarrow$ linked to the literature on "offshoring", where firms in advanced economies outsource parts of the value chain (goods production and/or services) to third countries

Summary and discussion

- Specially **important in services**: the production of many services allows for fragmentation due to the declining costs of services trade, thanks to digitalization. This fact has opened an avenue for the less developed countries in the EU
- Subsectors with **higher GVC participation growth in the manufacturing sector can generate more employment** in their sector, although the capacity to increase value added is more limited.