

# Determinants of GVC participation in CESEE



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# Why focus on GVC trade?

- ∞ The traditional view of international trade is no longer true presentation of international trade
- ∞ The analysis of international trade is now typically taking place within the Global Value Chains (GVC)
  - A value chain can be defined as “the full range of activities that firms and workers do to bring a product from its conception to its end use” (Gereffi and Fernandez-Stark, 2011).
  - According to UNCTAD (2013) - GVCs account for some 80 % of global trade; 28 % of world gross exports come from foreign value added; in 2010 USD 15 billion out of the total USD 19 billion of world gross exports was related to international production networks of MNCs
- ∞ The drivers of GVC:
  - Reduction in trade costs
  - Rapid advancing in ICTs facilitated coordination and monitoring of activities at large distance
  - Falling barriers to trade and investments
  - Large gaps in skilled and unskilled wages

# Theory

- ∞ Two separate, but interrelated streams of literature
  - Fragmentation theory focuses on the location of production processes (Jones and Kierzkowski, 1990)
  - Production processes are fragmented or separated into multiple slices and located in different countries
  - Fragmentation makes sense when:
    - there is production cost saving in fragmented production blocks, whereby the firm can benefit from differences in location (lower labour and production costs) between the original position and a new position
    - incurred service link costs involved in connecting remotely located production blocks are lower
    - the cost of network set-ups is small
  - Economics and characteristics of GVCs (Baldwin, 2012)
    - Mainly interested in the macro-development aspects of GVCs' expansion based on fractionalisation and dispersion of activities

# Firm heterogeneity

- ∞ Models based on product differentiation, monopolistic competition and firm heterogeneity are crucial for understanding the decisions of firms related to the creation of and integration into GVCs
  - (Melitz, 2003; Helpman et al., 2004) - the impact of intra-sector firm heterogeneity on the decisions of a firm on how to service markets
  - Grossman and Helpman (2002) and Antras (2003) - the choice between procuring intermediate products via vertical integration and procuring them from independent suppliers (outsourcing).
- ∞ Heterogeneous producers of final products choose different organisational forms of intermediate products procurement that vary with respect to ownership structure and location (Antras and Helpman, 2004)

# Research questions

- ∞ Which factors internal to the firm influence GVC participation in CESEE?
- ∞ Are there significant differences in GVC participation between different group of countries and firms' size?
- ∞ How local sourcing of inputs and technology spillovers from MNCs affect propensity to enter GVC?

# Data and Sample Characteristics

- ∞ Fifth wave of Business Environment and Enterprise Performance Surveys (BEEPS) conducted in 2013
  - Provides information on the characteristics of firms across various dimensions, including size, ownership, trading status, innovation and performance.
  - Focus on all EU NMS plus (potential) candidates' states in SEE region excluding Kosovo
  - Final sample consists of 1,223 firms located in 21 manufacturing industries

# Definition of GVC participation

- ∞ Dummy variable: 1 if the firm has exported (directly or indirectly) more than 10% of their sales and the firm's share of imported inputs is more than 10%; 0 otherwise
  - Use of both criteria highlights back-and-forth aspect of global economic linkages
  - Kasahara and Lapham (2013) estimate that both exporting and importing entail large start-up costs and being both an importer and an exporter benefits firms due to complementarities between importing and exporting
  - Our joint exporter-importer definition also increases the likelihood that an actual specialization of function occurs in the production process
  - In line with OECD indicator of GVC participation which focuses on intermediates produced in one country and then included in another country's exports

# The patterns of firms' internationalization

	Non-importers	Importers	Total
Non-exporters	214	425	639
%	17.5	34.75	52.25
Exporters	108	476	584
%	8.83	38.92	47.75
Total	322	901	1,223
%	26.33	73.67	100

	Domestic	Foreign	Total
nonGVC	694	53	747
%	56.75	4.33	61.08
GVC	372	104	476
%	30.42	8.5	38.92
Total	1066	157	1,223
%	87.16	12.84	100

- 83% of firms is engaged in either export, import or both
- 39% of firms conform to our definition of GVC
- Importing is among the most frequent activity, as 74% of firms buy products from abroad.
- Out of 48% of firms that export, 39% use imported intermediates
- 9% of foreign firms is engaged in GVC trade. This corresponds to 28% of the foreign firms among the two-way traders and to 66% of the two-way traders among foreign firms.



# Empirical model

- ∞ Roberts and Tybout (1997) theoretical model on the determinants of exporting applied to GVC.
- ∞ A firm  $i$ 's propensity to participate in a GVC depends on the firm's expected profits,  $\pi$ , which, in turn, are influenced by expected revenues,  $R$ , and costs,  $c$ , plus sunk GVC entry costs,  $S$
- ∞ The firm's expected profits  $\pi$  are affected by firm level characteristics, which can generate or lower revenues  $R$  or costs  $c$ .
- ∞ The empirical model then translates to:

$$\Pr(Y_i = 1) = \Phi(\beta X_i + \delta_i + \tau_i \varepsilon)$$

where  $Y$  is the vector denoting GVC participation indicator,  $\Phi$  is the c.d.f. of the standard normal distribution,  $X$  is the matrix of explanatory variables,  $\beta$  is the matrix of coefficients, and  $\varepsilon$  is the matrix of error terms. We also control for country  $\delta_i$  and industry  $\tau_i$  unobserved effects.

# Definition and measurement of variables

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<b>Dependent variable</b>	<b>Definition</b>
GVC	1 if the firm has exported (directly or indirectly) more than 10% of their sales and the firm's share of imported inputs is more than 10%
<b>Independent variables</b>	
Age	ln (No. of years in operation)
Size	1 if firms has fewer than 50 employees small ;0 otherwise
Credit	1 if firm has credit line/loan from financial institution; 0 otherwise
Certificate	1 if the firm owns internationally recognized quality certification; 0 otherwise
Foreign licence	1 if firm uses technology licensed from foreign-owned company (excluding software); 0 otherwise
Product innovation	1 if firm introduced new or significantly improved products or services in the last three years; 0 otherwise
Process innovation	1 if firm introduced any new or significantly improved methods for the production or supply of products or services in the last three years; 0 otherwise
R&D	1 if firms spent on research and development activities, either in-house or contracted with other companies in the last three years; 0 otherwise
Labour productivity	Sales per worker (2013 EUR)
Human capital	Average real wage per worker (in logarithms) as a proxy for worker skills
Foreign Backward	1 if firm has foreign ownership (more than 10%); 0 otherwise A proportion of all material inputs or supplies of domestic origin purchased by foreign firms in country i and sector s
Horizontal	The share of foreign firms' output in total industry output in country i and sector s

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# Results

	(1)	(2)	(3)	(4)	(5)
	All firms	Small	Medium and large	SEE	CEE
Age	-0.0776	-0.0649	-0.00656	-0.151*	0.0209
Size	-0.856***			-1.048***	-0.554***
Credit	0.258***	0.226*	0.287**	0.123	0.545***
Certificate	0.258***	0.338**	0.218*	0.242**	0.263*
Foreign licence	0.250**	0.379**	0.0913	0.201	0.310
Product innovation	0.0301	0.169	-0.0113	0.0937	-0.0724
Process innovation	0.0435	0.245	-0.0801	0.0594	-0.0492
RD	0.227*	0.147	0.347**	0.302*	0.243
Labour productivity	0.0810*	0.131**	0.0968	0.00784	0.178**
Average wage	-0.0230	0.0728	-0.0730	-0.0189	-0.000965
Foreign	0.599***	0.817***	0.591***	0.569***	0.766***
Backward	0.0366	-0.0132	-0.0641	-0.0785	-0.259
Horizontal	-0.261	-0.106	-0.191	-0.0767	-0.386
Constant	-1.825***	-4.705***	-1.685**	-0.652	-3.444***
Observations	1,154	580	566	728	414
Country FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Pseudo R <sup>2</sup>	0.26	0.23	0.21	0.26	0.28

# Conclusion

- ∞ Economies of scale and fixed cost together with the possession of industry standard certificates and access to credit are important factors for GVC participation
- ∞ Countries in the sample are technology users and this is reflected also in their reliance of foreign licensing. Therefore, governments should provide incentives to adopt foreign technology and provide financing models to finance necessary investment in innovation and quality upgrading, especially in SEE.
- ∞ Relatively limited effects of R&D investment on GVC participation being significant only in South-East Europe and for large firms. Efforts to increase the knowledge stock are crucial for firms to differentiate themselves from competitors and enable them to participate and potentially move up the value chain.
- ∞ Productivity matters for small firms, but not for medium and large firms
- ∞ Given the insignificant effects of FDI spillovers, investment in absorptive capacity should be a top priority for firms in CESEE