



Accounting for heterogeneity: Possibilities of using TEC to extend supply & use tables

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Accounting for heterogeneity

- **Key assumption in TiVA: homogeneous industries**
 - all firms allocated to a particular industry have the same ‘production’ function
 - That for a given product, imports by industries (firms) are sourced from the same mix of countries
- **Key challenge: taking the GVC beyond the industry level: accounting for firm heterogeneity**
 - Not all firms in each industry are equally (or similarly) involved in GVCs
 - Extent of GVC involvement is correlated with virtually all dimensions of GVC impact, including value added, productivity, technology, size, growth, survival rate



Accounting for heterogeneity

- To what extent can we capitalize on existing statistics, including TEC, STEC, FATS, “TEC+”, to
 - a) improve our estimates (of e.g. the import content of exports) and
 - b) develop new, ‘richer’ indicators on GVCs (how, where, who)
- These statistics are policy relevant in their own right *and* for integration within TiVA framework

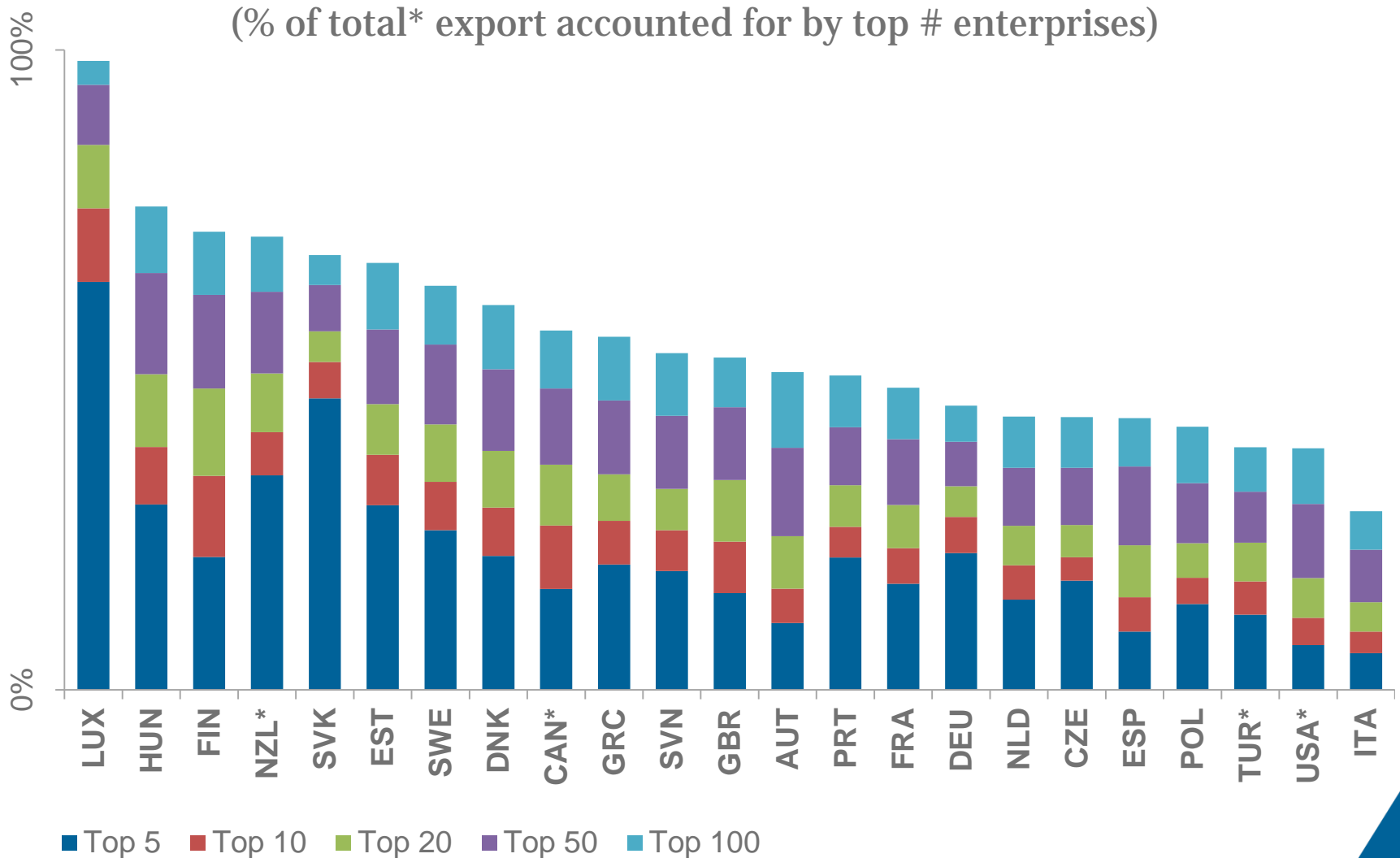


This presentation

- Highlights the importance of heterogeneity (using TEC)
- Explains more about TEC & how the data are compiled
- Lists the ‘ideal’ additional data needs for breaking down SUTs by enterprise characteristics
 - Requires combination of TEC and additional business statistics (including SBS and FATS)
- Illustrates its possible uses in breaking down supply and use tables and challenges to overcome
- Gives an overview of current steps taken by the OECD to further this research agenda



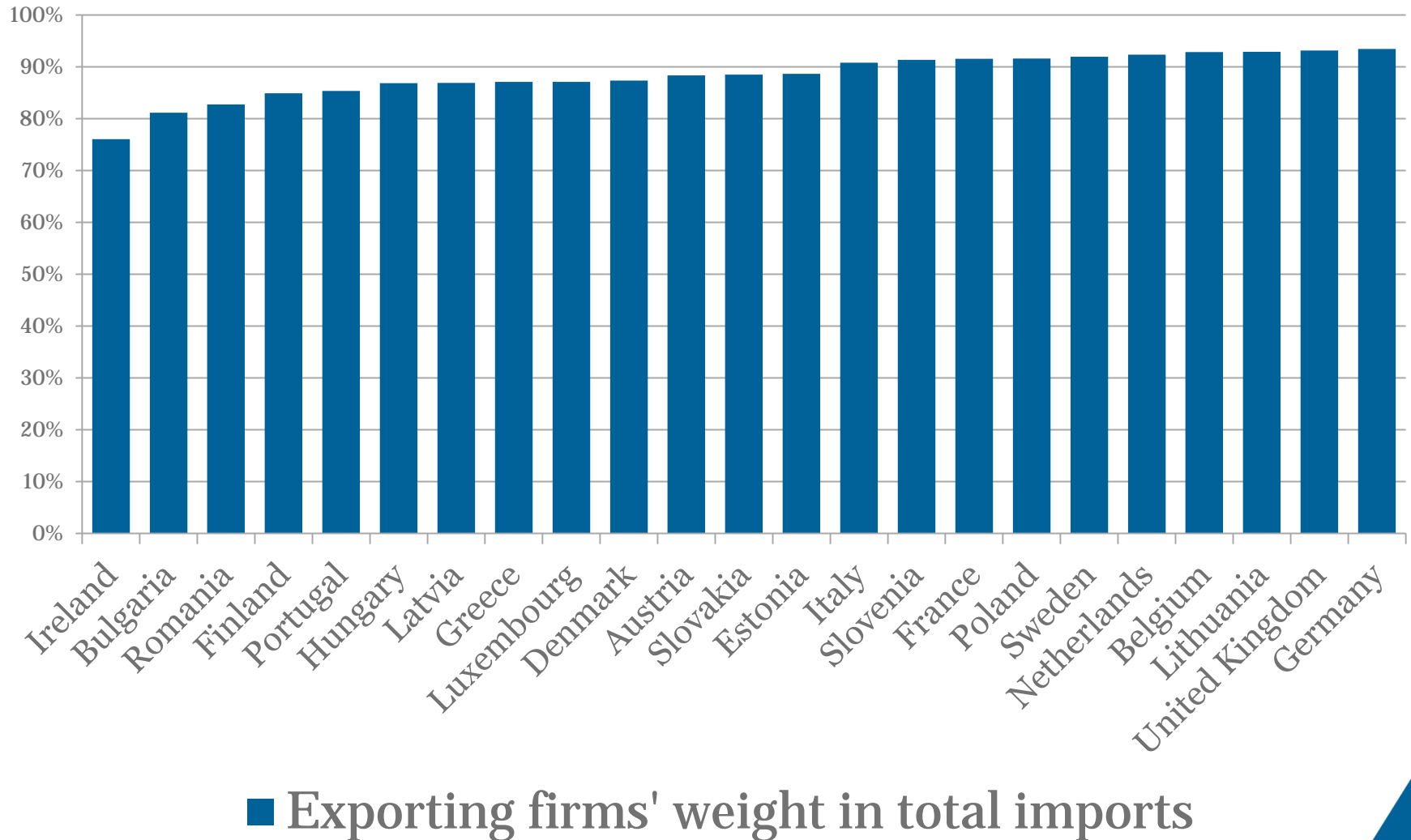
Trade is concentrated among a few enterprises



* For EU countries, data refer to extra-EU exports instead of total



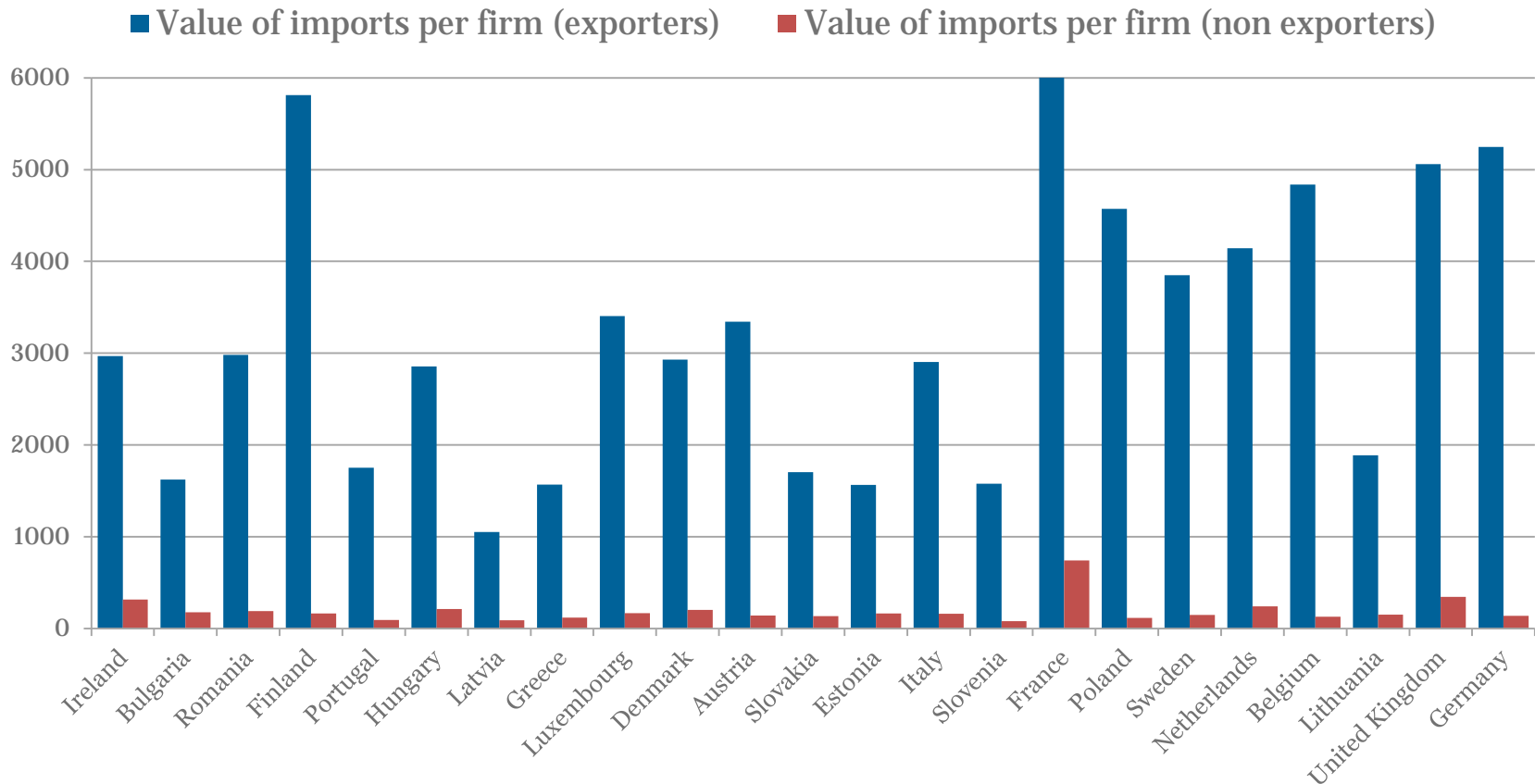
Exporting firms are responsible for the majority of imports (1)





Exporting firms are responsible for the majority of imports (2)

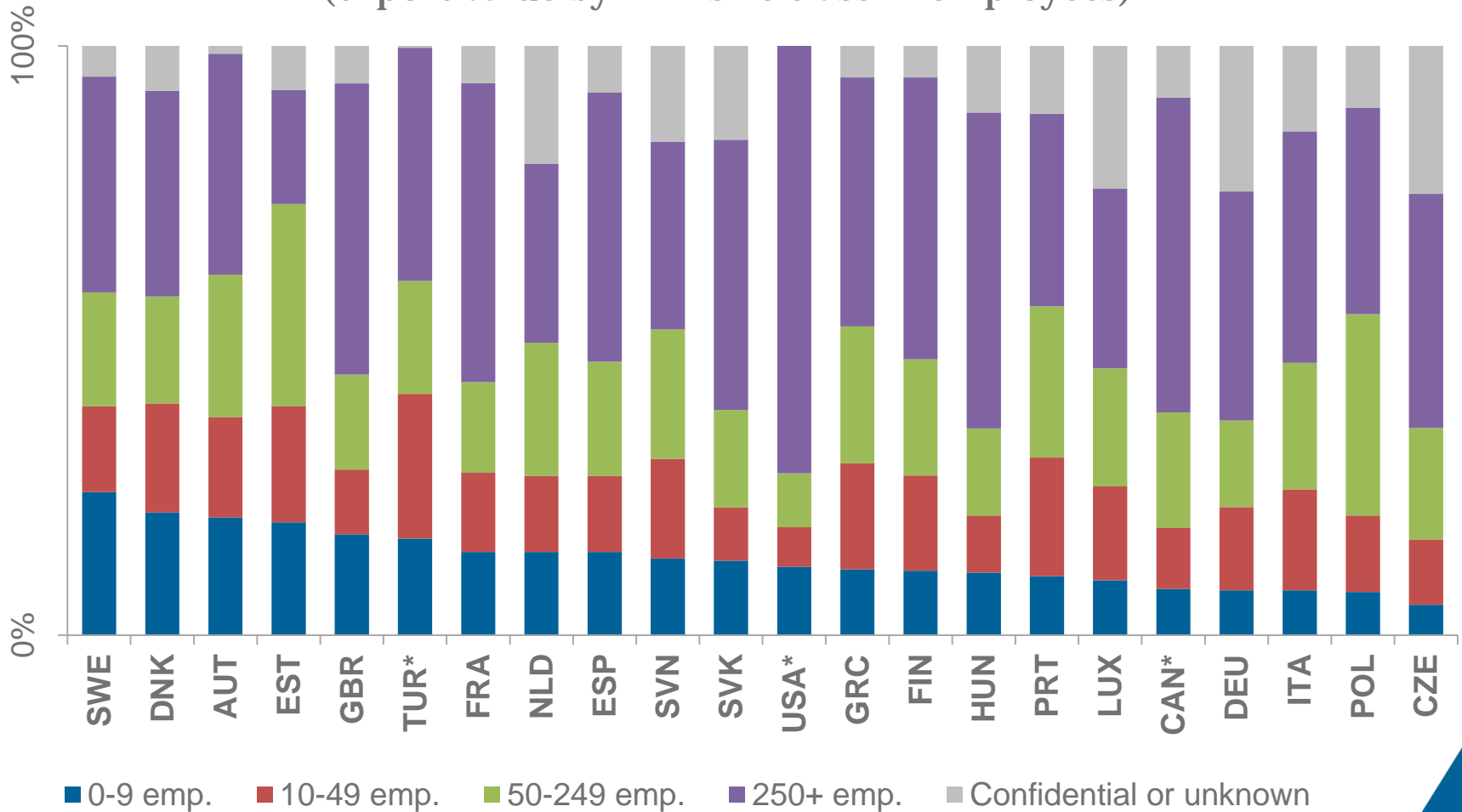
The value of imports per firm are on average 20 times greater for exporters than for non-exporters





Size matters (2)

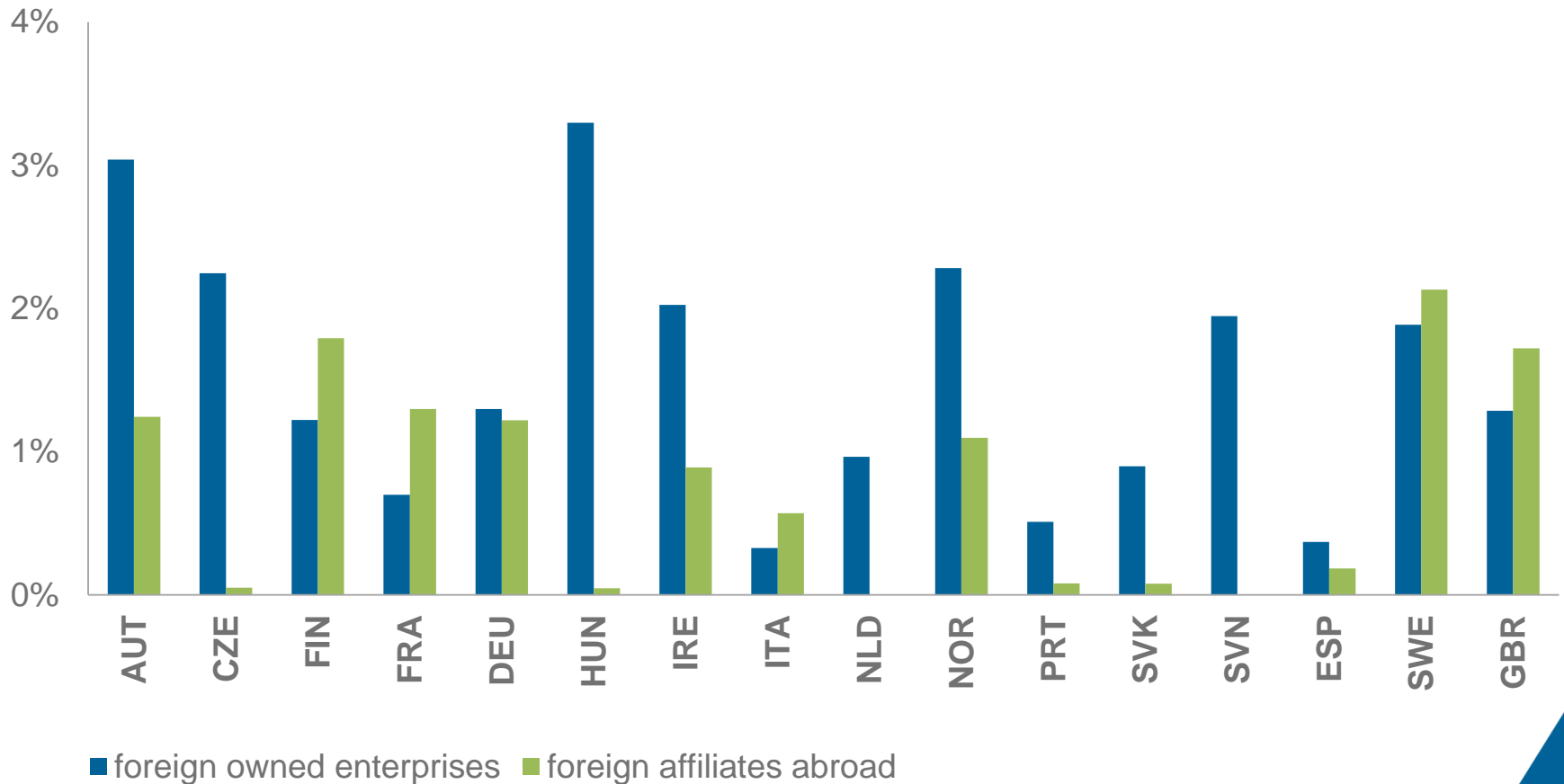
Trade is concentrated among large firms
(export value by firm size class in employees)





Ownership matters (1)

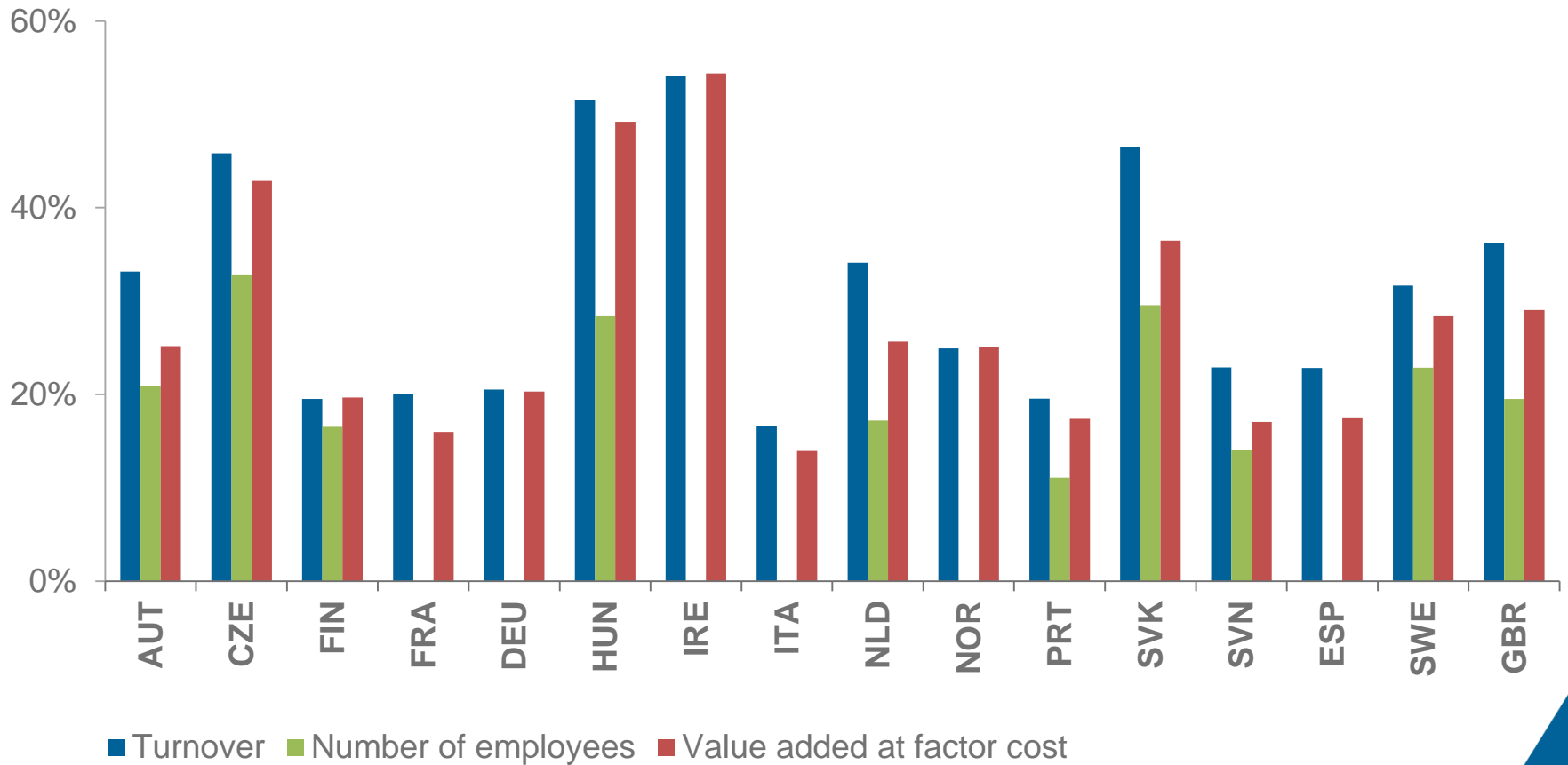
Very few firms are foreign owned, but...
(foreign owned firms and foreign affiliates, as % of all enterprises)





Ownership matters (2)

foreign owned enterprises account for ~ 1/3 of turnover, 1/5 of employment and 1/4 of value added in OECD countries...
(% of turnover, employment and value added by foreign owned enterprises)





Ownership matters (3)

...and for at least 1/3 of international trade





Trade by Enterprise Characteristics (TEC)

- All these presented examples are based on TEC data (OECD/Eurostat):
 - Trade by Size Classes & Economic Activity
 - Trade by Economic Activity & Top Enterprises
 - Trade by Economic Activity & Partner Zones
 - Trade by Economic Activity & Number of Partner Countries
 - Trade by Economic Activity & Commodity Group
 - Trade by Type of Ownership & Economic Activity
 - Domestically controlled enterprises (with or without own affiliates)
 - Foreign controlled enterprises



TEC coverage and compilation

About the OECD-Eurostat TEC database:

- Covers 33 countries (6 non-OECD) from 2005 onwards, up to 2 digit level of ISIC rev 3 & 4
- Based on trade statistics linked to the business register
- Matching rates excellent to perfect
- But some issues remain
 - e.g. non-resident trade
 - overemphasis of wholesalers
 - Confidential data



Use Table

			Industry 1				Industry 2				HHFC	GGFC	GFCF	Changes in Inventories	Vauables	Exports	of which re-exports	of which - non-residents expenditure
			Foreign Exporter	Non-Exporter	Domestic Exporter	Non-Exporter	Foreign Exporter	Non-Exporter	Domestic Exporter	Non-Exporter								
Industry 1	Foreign	Exporter																
		Non-Exporter																
1	Domestic	Exporter																
		Non-Exporter																
Industry 2	Foreign	Exporter																
		Non-Exporter																
2	Domestic	Exporter																
		Non-Exporter																
Taxes on Products																		
Subididies on Products																		
Total Domestic intermediate Consumption																		
Total imports																		
Total intermediate Consumption																		
Value-Added																		
<i>of which</i>																		
<i>Mixed Income</i>																		
<i>Compensation of Employees</i>																		
<i>Gross Operating Surplus</i>																		
<i>Other Taxes on Production</i>																		
<i>Other Subsidies on Production</i>																		
Total Output																		
<i>of which</i>																		
<i>own-account production of software</i>																		
<i>own-account production of R&D</i>																		
<i>other own-account production</i>																		



Accounting for heterogeneity in SUTs

A strongly simplified example (1 industry)

	Homogeneous (now)	Heterogeneous (future)	
	All Industry	'Domestic'	'Trader'
Imports	25	0	25
Domestic purchases	30	15	15
Value added	45	15	30
Total output	100	30	70
Export	60	0	60
Domestic sales	40	30	10
Import content of export:	25% (25 / 100)		36% (25 / 70)



Information needs

For a breakdown between exporting / non exporting firms:

- Geographical breakdown (e.g. main trading partners, regions) of imports and exports (by exporting / non-exporting firms)
- Purchases, output, value added (employment if possible), by industry, broken down by exporting vs non-exporting firm
- → link TEC with SBS

For a breakdown with (also) foreign ownership:

- (Same as above) + exports by ownership, industry and foreign ownership
- → link TEC with FATS



Feasibility of 'macro-linking'

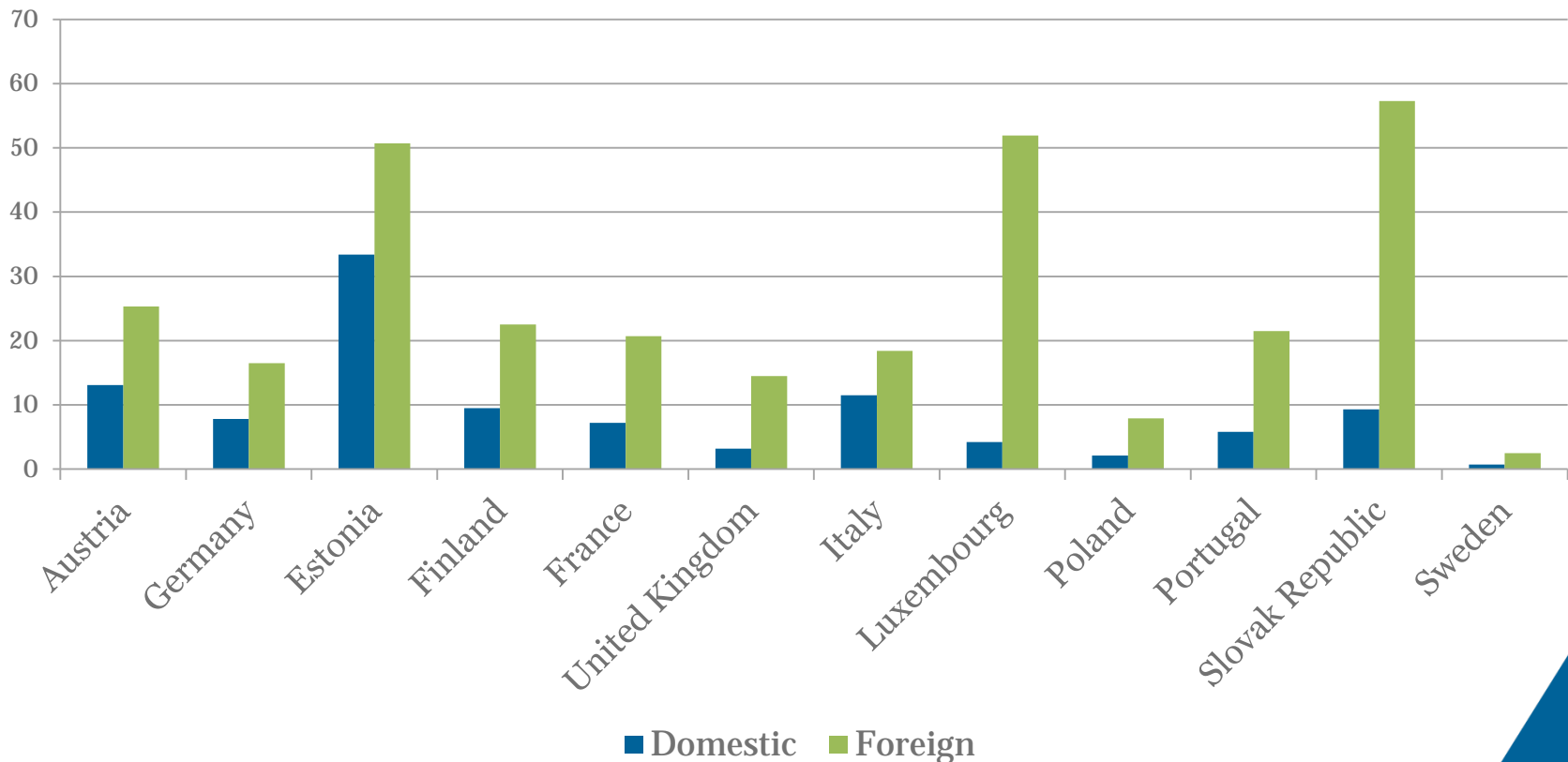
- Use the information from the three different data sources at the ISIC 2-digit industry level
- Illustrates (again) the importance and relevance of accounting for heterogeneity
- BUT: highlights also some problems that can only be solved at micro level



Examples of 'Macro-linking' (1)

Foreign-controlled enterprises are more export intensive

Export to turnover ratios, total economy (2011)

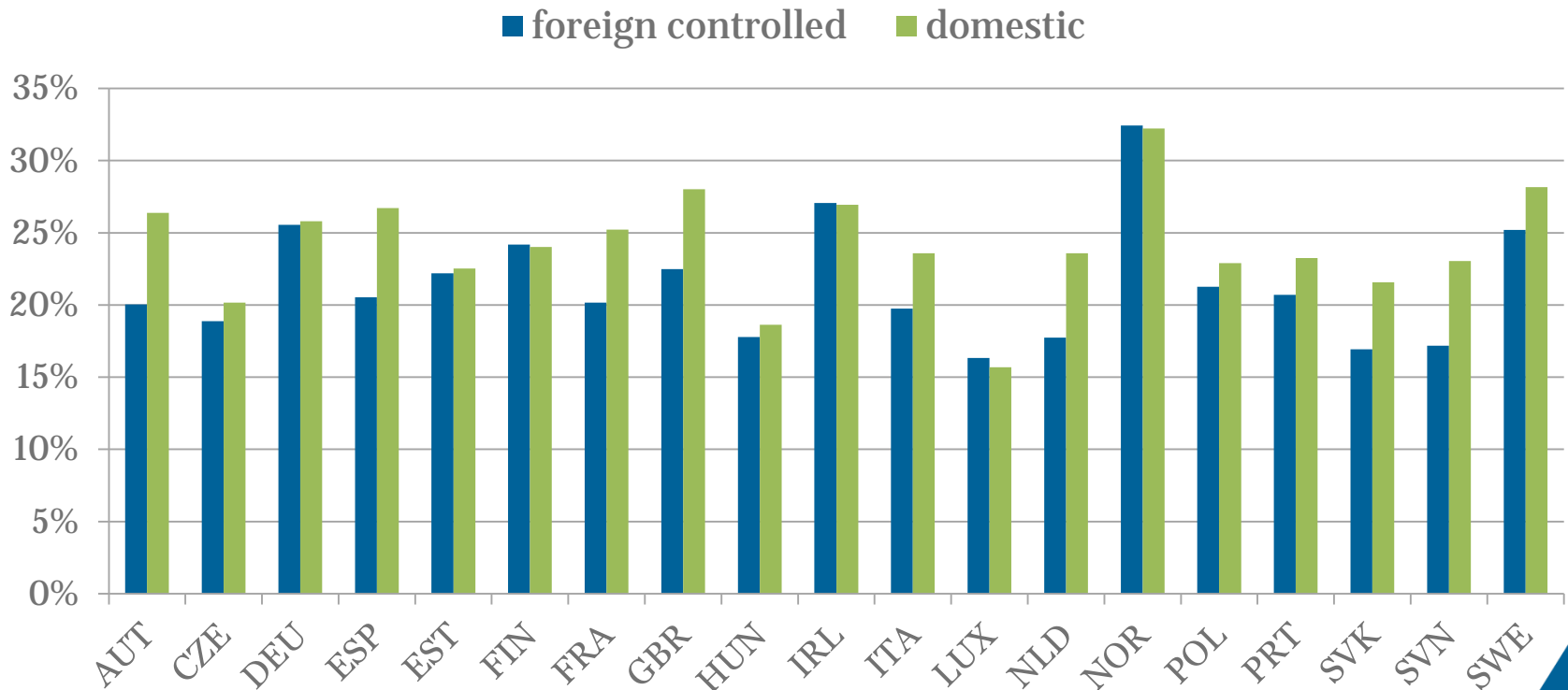




Examples of 'macro-linking' (2)

Value added over turnover ratio tends to be higher for domestic firms

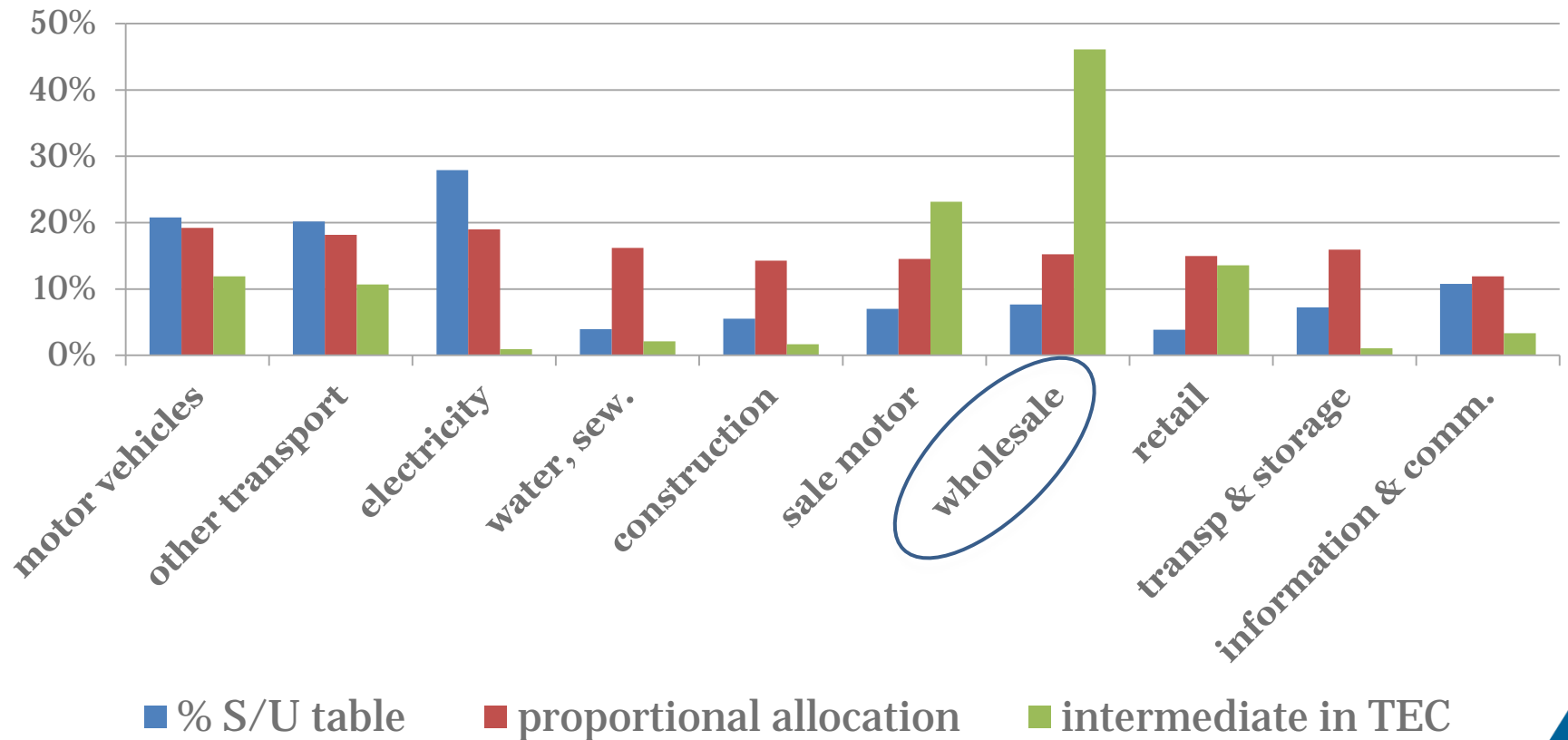
Value added/Turnover by firm ownership, total economy (2011)





Challenges (1): wholesale is treated very differently across data sources

Imported intermediates / total intermediates: comparing SU table, proportional allocation and TEC data (Italy 2010)



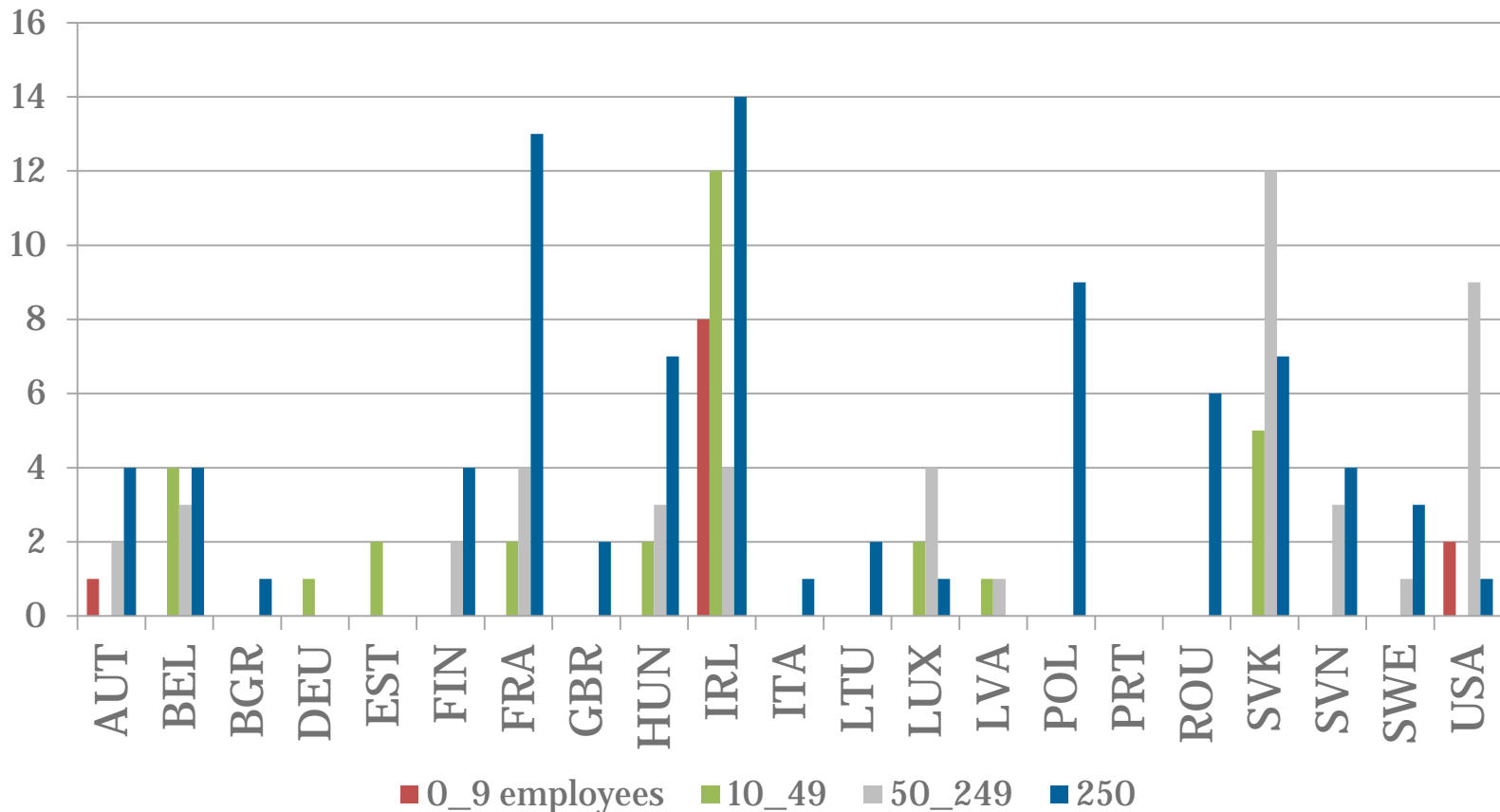
Correlation S/U and proportional allocation: 0.8

Correlation S/U and TEC intermediate imports: 0.55



Challenges (2): Populations are inconsistent across data sources

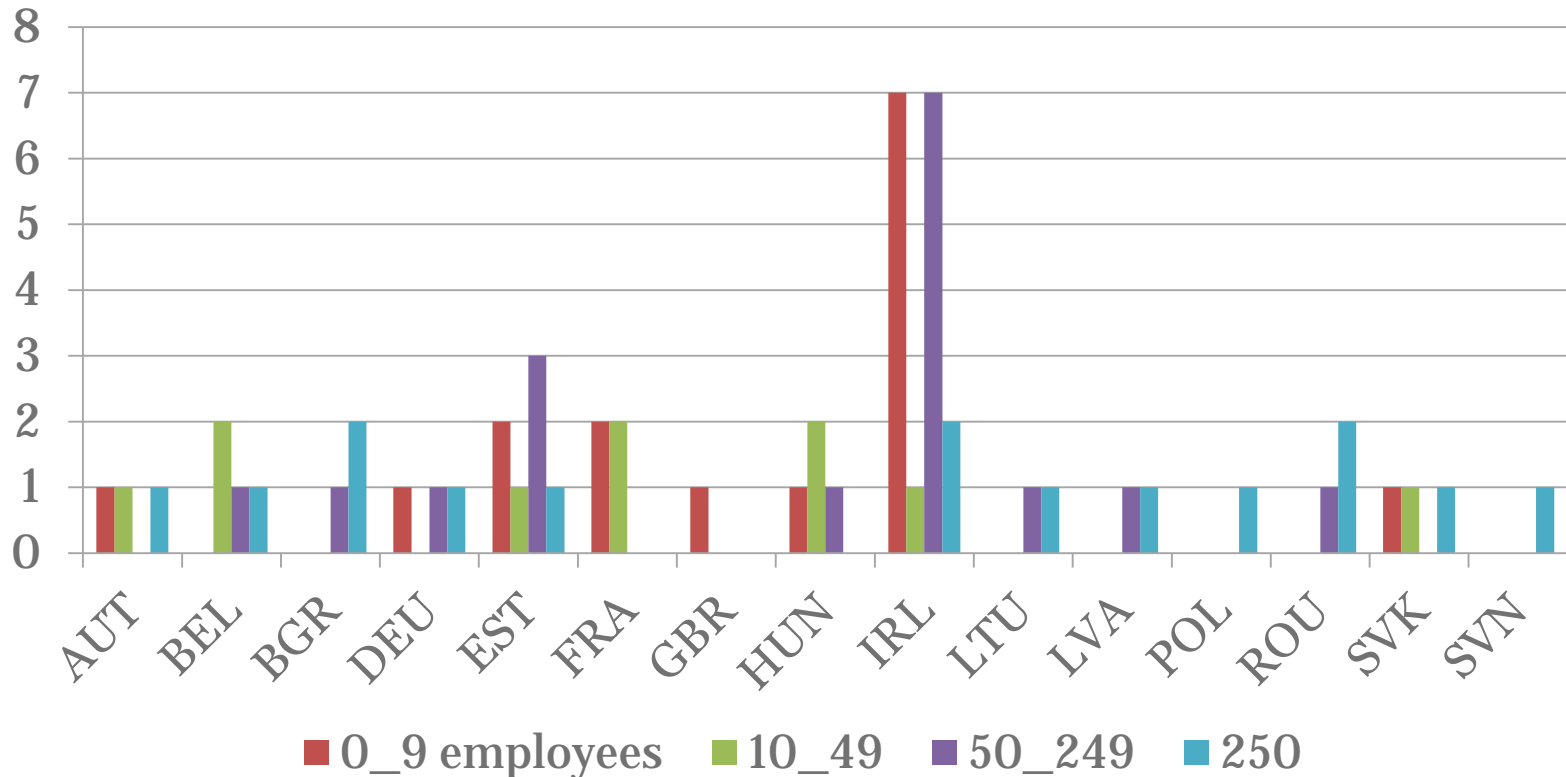
Number of 2 digit industries where the number of exporters in TEC is larger than the number of enterprises in SBS, by size, 2011





Challenges (3): Variable values are inconsistent across data sources

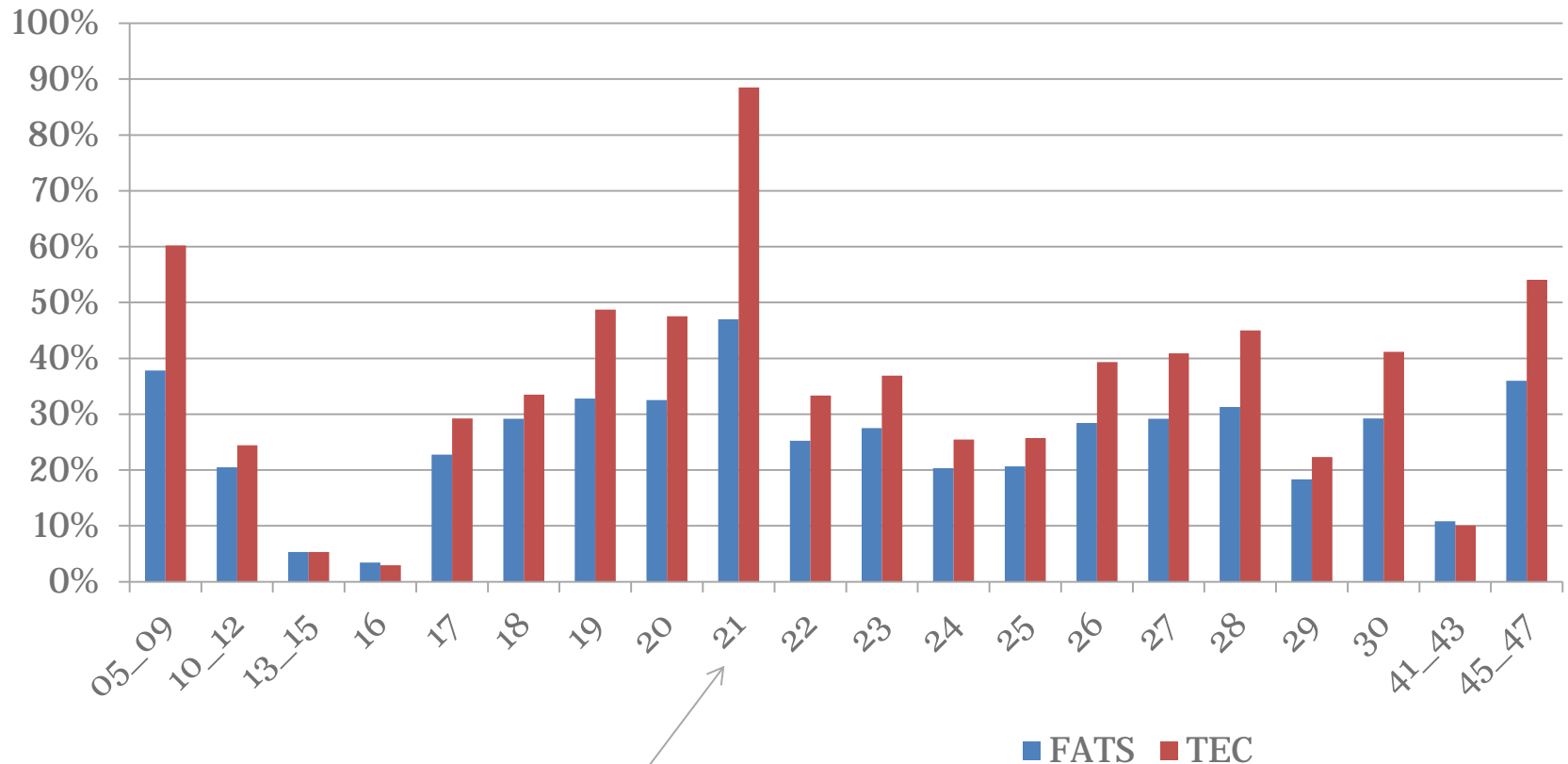
Number of industries for which exports (from TEC) are larger than turnover (SBS) (by firm size, 2011)





Challenge (4): Inconsistencies between TEC and FATS

Differences in the share of imports of foreign-controlled firms as measured in TEC and in FATS (Italy 2011)



Pharmaceutical products



Current activities at the OECD

- Increase country coverage in TEC data
- Investigate methodological improvements
 - Better explanation of matching rates (non-resident trade);
 - Better assignment of trade accounted for by retailers and wholesalers to underlying economic activities;
 - Explore if confidentiality issues can be overcome by deciding on (harmonized) aggregation of certain items;
- Include services (STEC)
- Add to visibility: e.g. website on TEC : <http://oe.cd/tec> with country notes (forthcoming)
- Continue with feasibility studies re. heterogeneity in SUTs (including work with individual countries who can provide data)
- Institutional: WPTGS; Expert Group on Extended SUTs



Thank you

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<http://oe.cd/tec>

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