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"Italian firms in European value chains: asymmetries in ownership structure, multinationality and technology"

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Outline

- **Aim of the study**
- **Literature review**: Italian firms in GVCs and the role of Multinational Enterprises (MNEs)
- **Project approach**: heterogeneity of MNEs in terms of ownership structure and technology
- **Output 1**: asymmetries in EU MNEs ownership structure and patents in sectors NACE 28 and 29
- **Output 2**: heterogeneity of Italian firms, GVC linkages and technology adoption
- **Concluding remarks**

Aim of the study

- One of the aims of the PRIN project in WP2 was to assess the **positioning of Italian sectors and firms in European value chains** over time, **using micro-data** (while in WP1 an I-O analysis was employed)
- Several studies have been reviewed, focusing on two main topics:
  - The specificities of **data sources**
  - The **positioning** of Italian firms, related to external shocks (e.g. the financial and the pandemic crises) and to competition with other EU firms
- In line with the overall objectives of the project, the review has looked for evidence on two related aspects explaining Italian firms' involvement in GVCs and the asymmetry with EU competitors:
  - The heterogeneity of firms in terms of **group belonging** and **degree of multinationality** (belonging to a multinational group, having international linkages)
  - The **innovativeness** of firms (intangible assets, patents, technology adoption)

Italian firms in GVCs: an overview

- Overall, literature shows how Italy presents an **intermediate positioning** in GVCs, often operating as suppliers of other foreign firms (e.g. in Agostino et al., 2016)

- However, there is a documented **polarisation** between more technologically dynamic and low-tech firms (e.g. in Bugamelli et al., 2018)

- **Lead firms in GVCs** are almost completely **absent** among Italian firms

- Some heterogeneity in this literature comes from analyses based on different data sources, the most important ones including the **EFIGE dataset** and the **MET database**

Italian firms in GVCs: data sources and evidence

- The **EFIGE survey** (Barba Navaretti et al., 2011) was conducted in 2009/2010 on a sample of 15,000 firms from seven European countries
- Papers using these data show the specificities of **Italian firms as relevant suppliers in global and European value chains**, comparing them with firms from other European economies
- In a direct **comparison of Italian and German firms**, for instance, Accetturo and Giunta (2018) show how German firms were "prominent in the downstream stages of GVCs in which Italy takes part as a supplier of intermediate goods"
- Agostino et al. (2016) show that **Italian and French firms** "are suppliers (65% and 71% respectively), whereas in the other countries the incidence of suppliers is much lower, most notably in Germany (around 40%)"
- The EU-EFIGE has been also used to confirm the **consistency of micro and macro data sources** for the analysis of GVCs (Giunta et al., 2022)

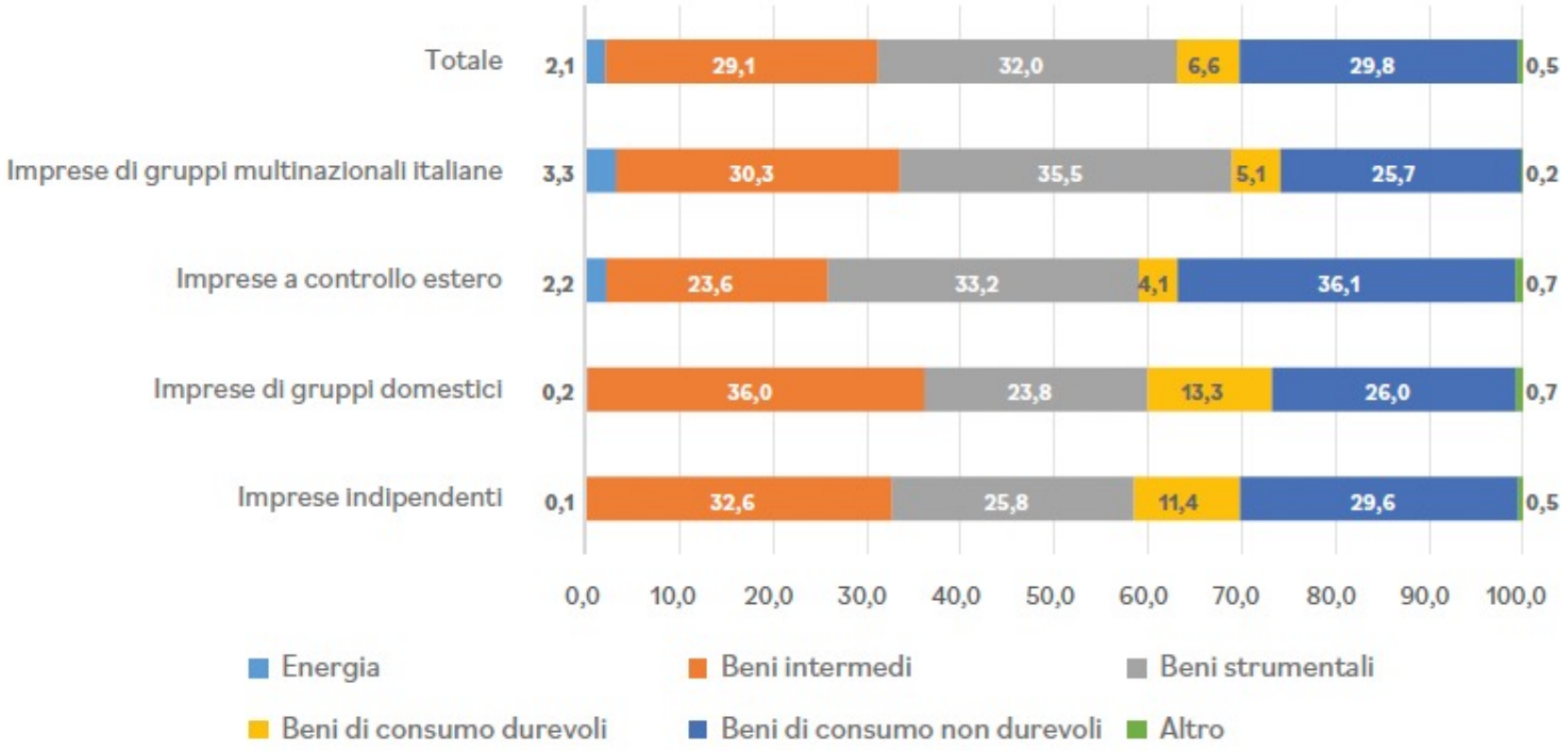
Italian firms in GVCs: data sources (2)

- Several papers have analysed data coming from the **MET survey**, carried out since 2009 every two years on a representative sample of around 25,000 Italian firms, highlighting vertical market relationships between clients and suppliers, a positive association between SMEs participation to GVCs and **efficiency** (e.g. in Agostino et al., 2020) and the key role of **value chain governance** in Italy (e.g. in Brancati et al., 2017 and 2024)
- A relevant attempt to integrate I-O and firm-level data for Italy has also been recently conducted with multiple data sources produced at ISTAT (Frame-SBS, COE, ASIA, GTAP; see **Fusacchia et al., 2025**), showing a certain degree of «**heterogeneity** in international trade typically 'hidden' by proportional allocation methods commonly used in constructing ICIO tables»
- Finally, some scholars also use the **World Bank Enterprise Survey for Italy**. Among others, Giovannetti et al. (2021) find more **resilience** to the pandemic crisis for «firms operating in sectors more involved in GVCs»

Multinational enterprises, technology and participation of Italian firms in GVCs

- All these studies recall the importance of **intra-group trade and linkages**, that is especially relevant in the case of **multinational groups** (as well-known since OECD studies, e.g. 2002 and 2011); also confirmed in several national reports (e.g. by ISTAT, OIE, Bank of Italy, CDP)
- According to latest ISTAT Inward FDI statistics, in **2023** subsidiaries of **foreign MNEs** – despite being just the 0,4% of firms resident in Italy – **accounted for the 35,8% of Italian export and the 49,7% of Italian import**; their **intra-group trade** being almost half of their export and almost 2/3 of their import
- The VII OIE Report (2025) also confirms that 1/3 of Italian «persistent exporting firms» are subsidiaries of foreign MNEs, together with the key role of Italian MNEs in the increased involvement of this type of firms in GVCs → for the **manufacturing sector, all MNEs** (foreign and Italian) **in 2024** generated the **73% of export and 76% of import** (ISTAT, 2025)
- The **attraction of foreign MNEs** to promote the Italian positioning in GVCs was also a key strategy in the **CDP Strategic Plan 2022-2024**
- In these reports, however, the ***heterogeneity*** of MNEs is usually limited to the domestic vs. foreign nationality distinction, or to the parent vs. subsidiary one

Multinational enterprises, technology and participation of Italian firms in GVCs (2)



can be either the HQ or a subsidiary (resident in Italy)

Firms in Italian <u>MNE groups</u>

Italian subsidiaries of foreign MNEs

Italian firms in <u>domestic groups</u>

Italian stand-alone firms

can be either the HQ or a subsidiary

Composition of exports by firm type and product type, year 2024
Source: OIE, 2025

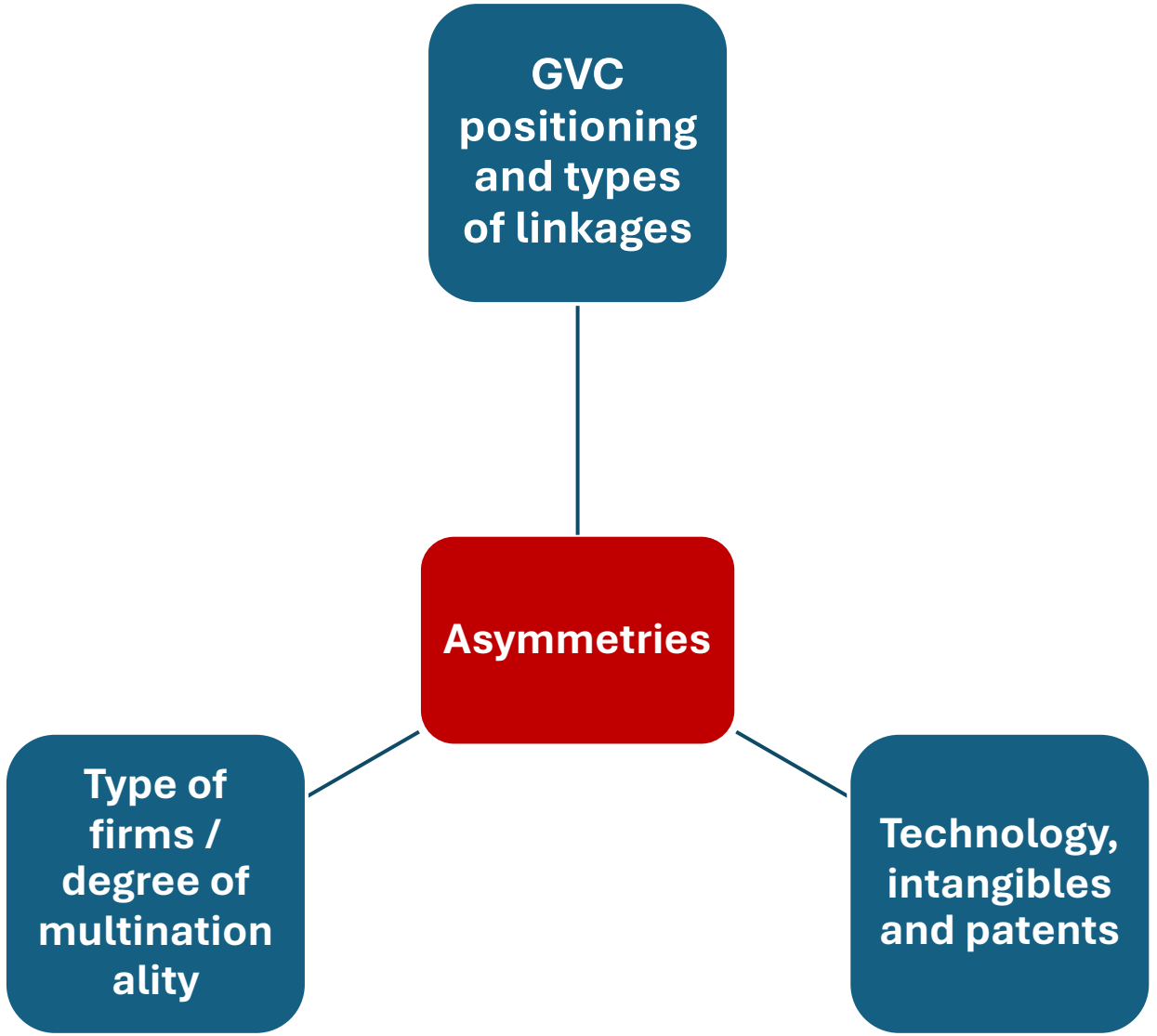
Multinational **groups**, technology and GVCs

- The typical focus of macro and micro analyses of GVCs does not provide an extensive analysis of the **heterogeneity in the ownership structure** and in the **technological** characteristics of **firm groups** in the various countries. In other words: where (in terms of countries, sectors and "hierarchical levels") do business groups perform the production of their value added and novel technology?
- Works trying to overcome this limitation have used either **commercial databases** (from DnB or BvD) or **international projects** (OECD-UN MEIP, EUROSTAT EuroGroup Register)
- In particular, papers using the **BvD ORBIS** database face some **disadvantages** (it is not a census of firms, several country biases exist, problems when M&As happen). However, concerning its **representativeness** it has been noted that biases concern smaller firms, while ORBIS is "suitable for studies that: i) take a global perspective rather than making comparisons across countries; ii) analyse top performers and multinationals" (OECD, 2020)

Use of BvD ORBIS database

- Works by Rungi and colleagues show the **key role of MNE groups**: relying partially on the work by Antras and Chor (2013), they look at the different strategies of MNEs in order to decide on upstream versus downstream integration (e.g. Del Prete and Rungi, 2017 and 2020). In this literature, the analysis is often conducted at the parent level or relating specific subsidiaries to their ultimate parent companies. Indexes of upstream / midstream / downstreamness are calculated
- In other cases, ORBIS (or similar databases) have been used to produce **synthetic measures** of the "whole group": "network complexity" (Rungi, 2020), "network control" (Vitali et al., 2011; Brancaccio et al., 2018) or "corporate control networks" (Rungi et al., 2017); or to assess an "entropy-like metric able to summarize the hierarchical complexity of a group" (Altomonte and Rungi, 2013)
- In particular, ORBIS data have been used to create "centrality metrics reflecting position within GVCs to identify central hubs and peripheral European economies and sectors" (Criscuolo and Timmis, 2018)

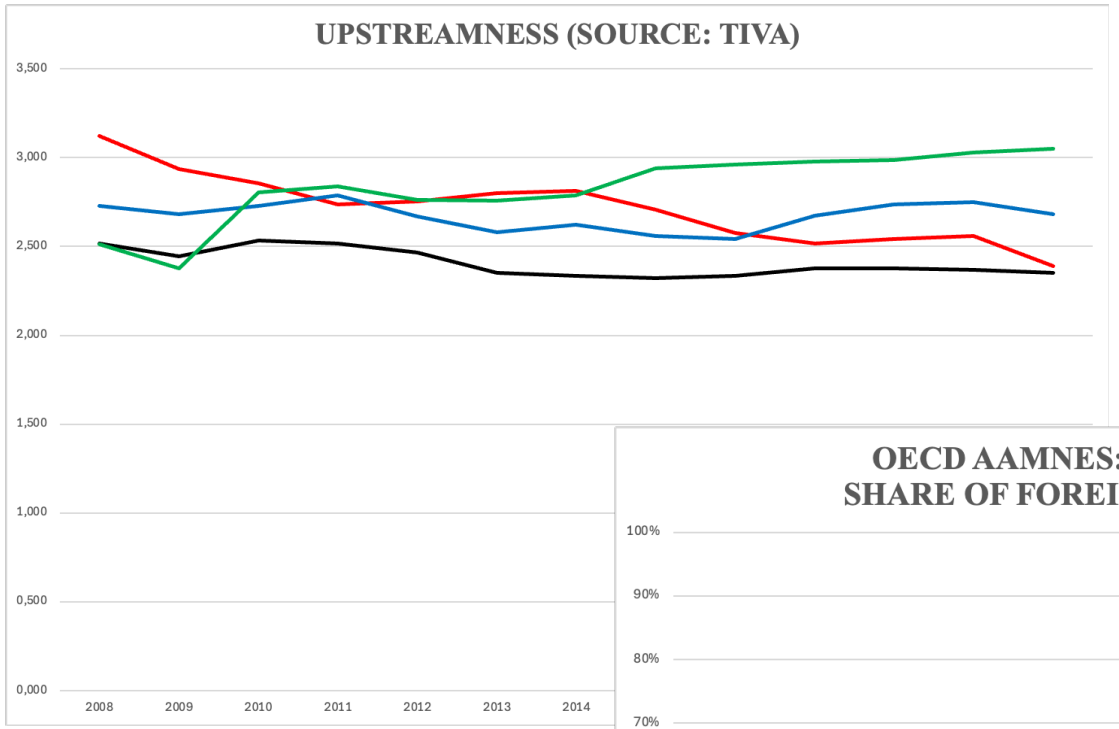
The overall project approach: asymmetries and heterogeneity of MNEs

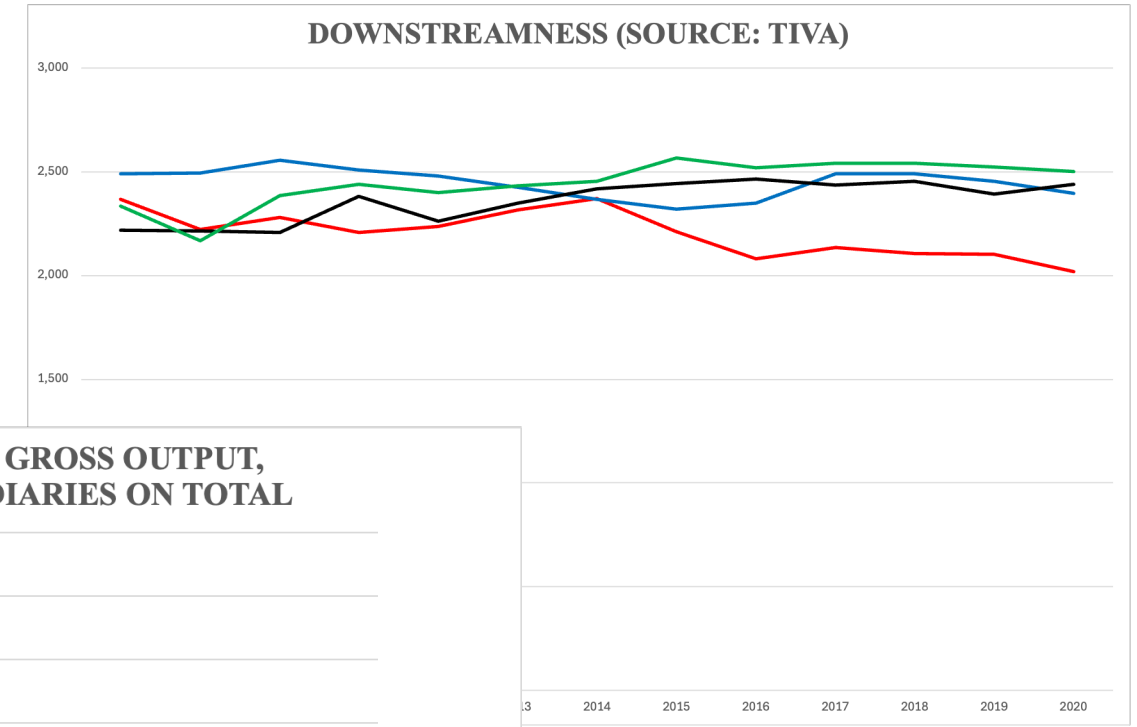


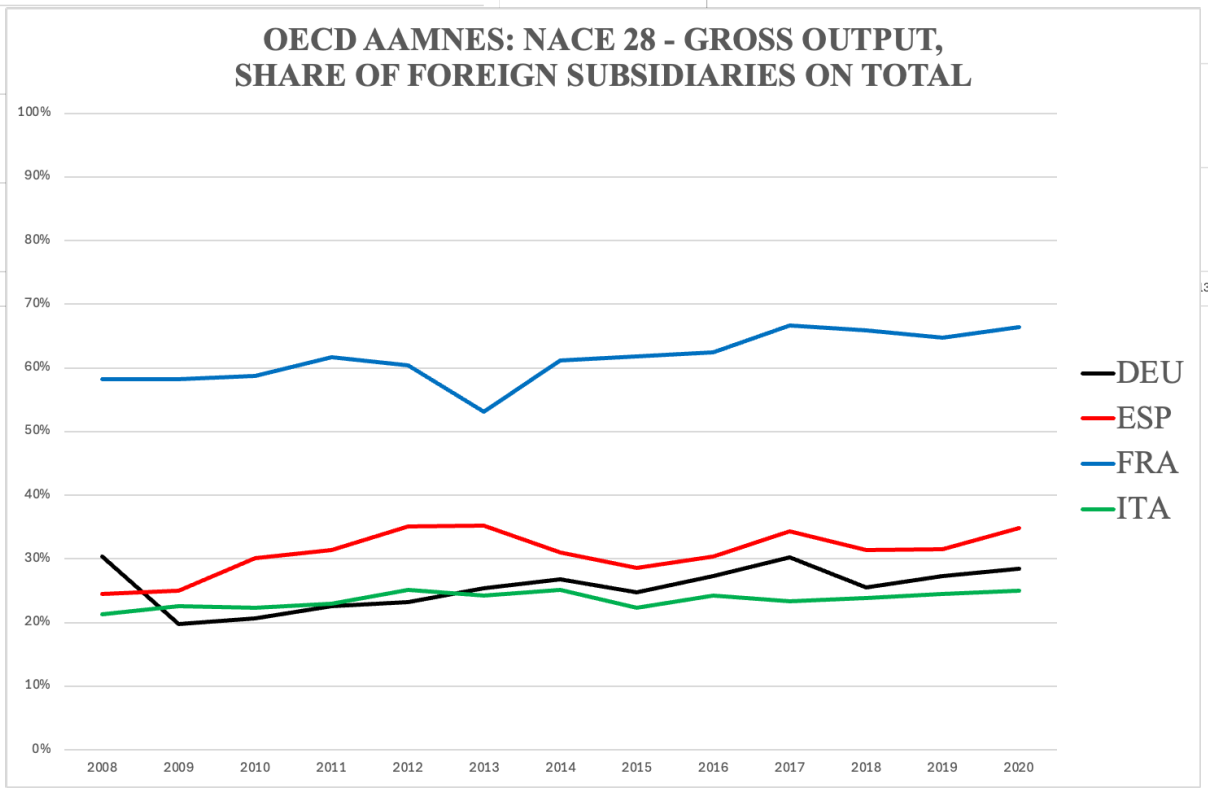
Two (and half) outputs of the project

- Half – a methodological point: divergence between GVCs positioning and presence of MNEs according to the OECD Analytical AMNE database → setting-up of a **dataset** (ORBIS + PATSTAT) that includes details of the **ownership structure** (like in the OECD-UNSD MEIP for top 500 global MNEs) and of **patenting activity**
- **First output** – asymmetries in multinational groups' ownership structures and patents/citations: difference between Italy and other EU countries, descriptive overview for two sectors (NACE 28 and 29)
- **Second output** (work in progress) – using the ISTAT Italian Permanent Census of enterprises (years 2018 and 2022), estimation on how asymmetries in (multinational) group belonging and (international) linkages relate to the technology adoption strategy of firms

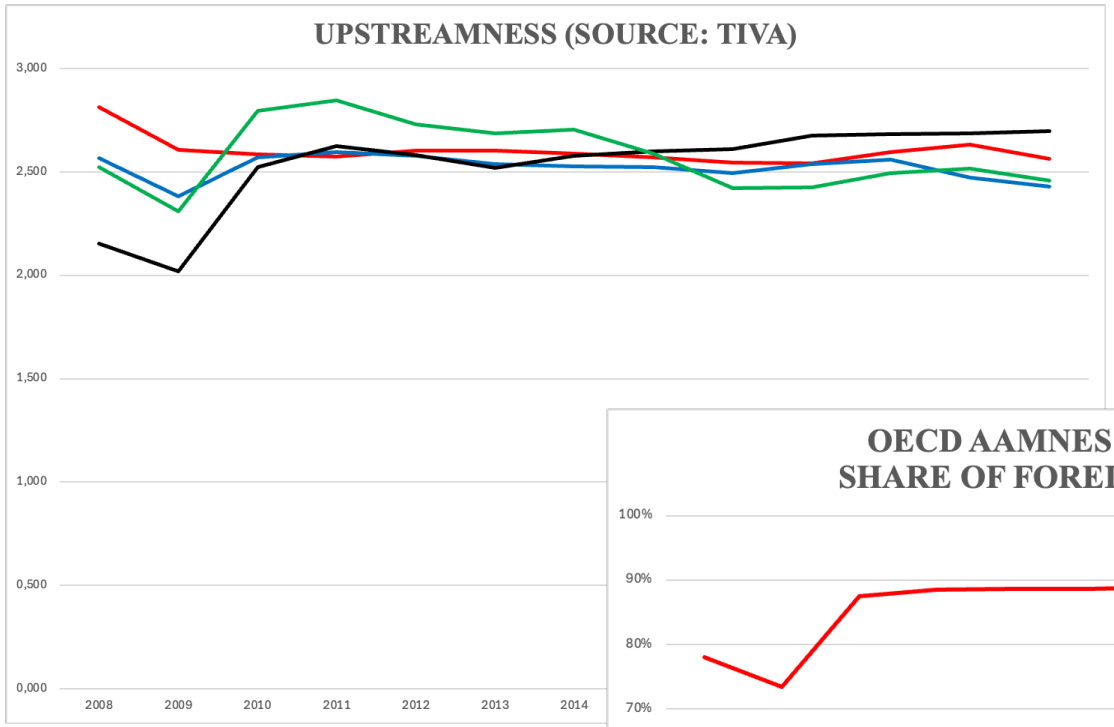
NACE 28: asymmetries (and not) in the EU

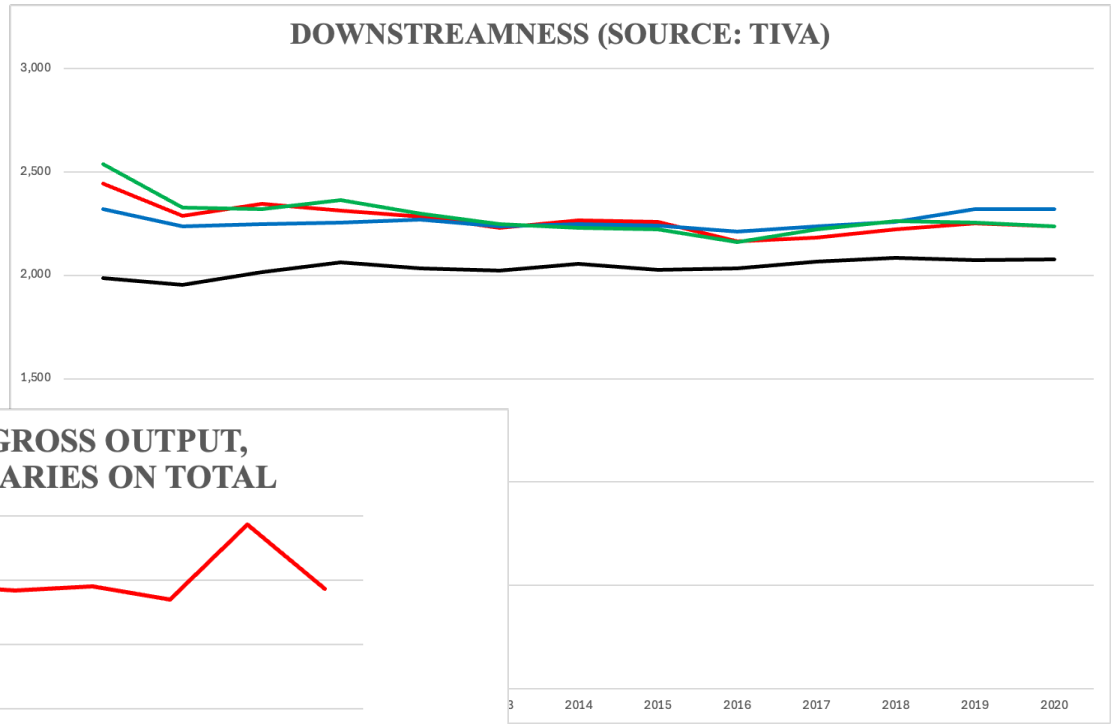


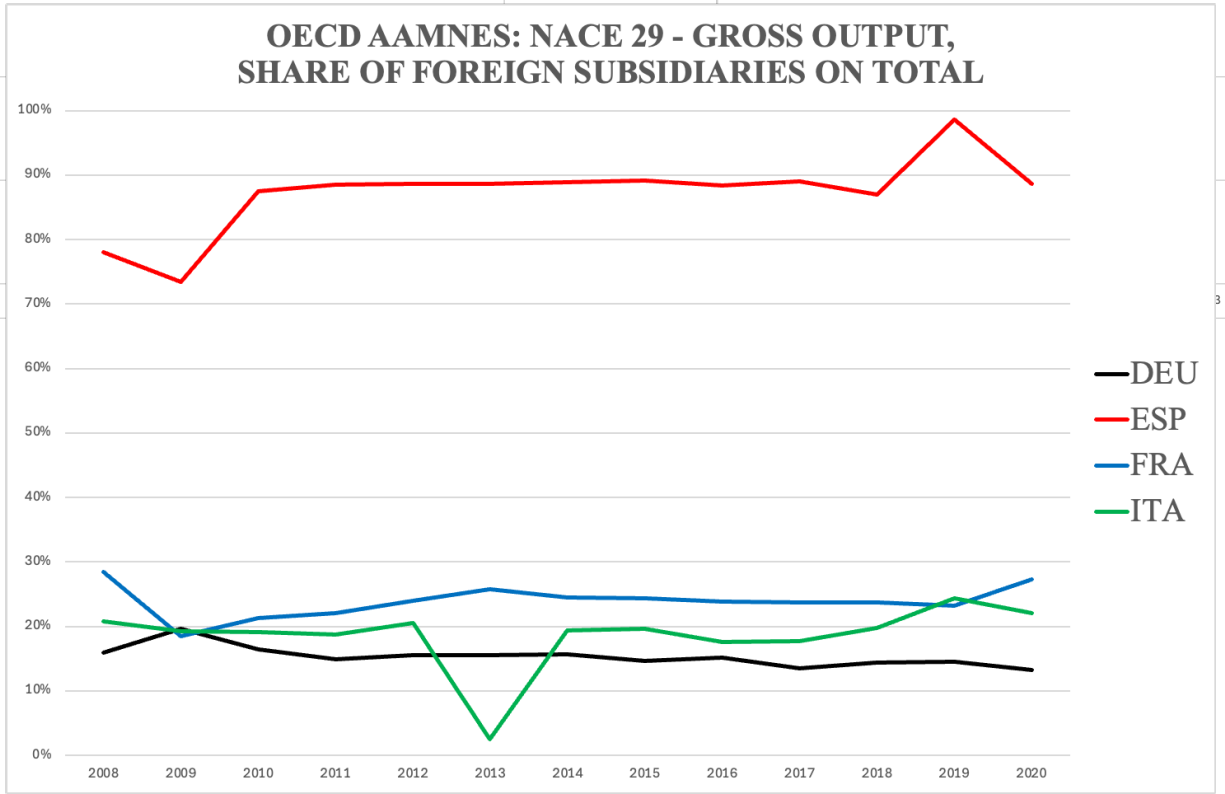




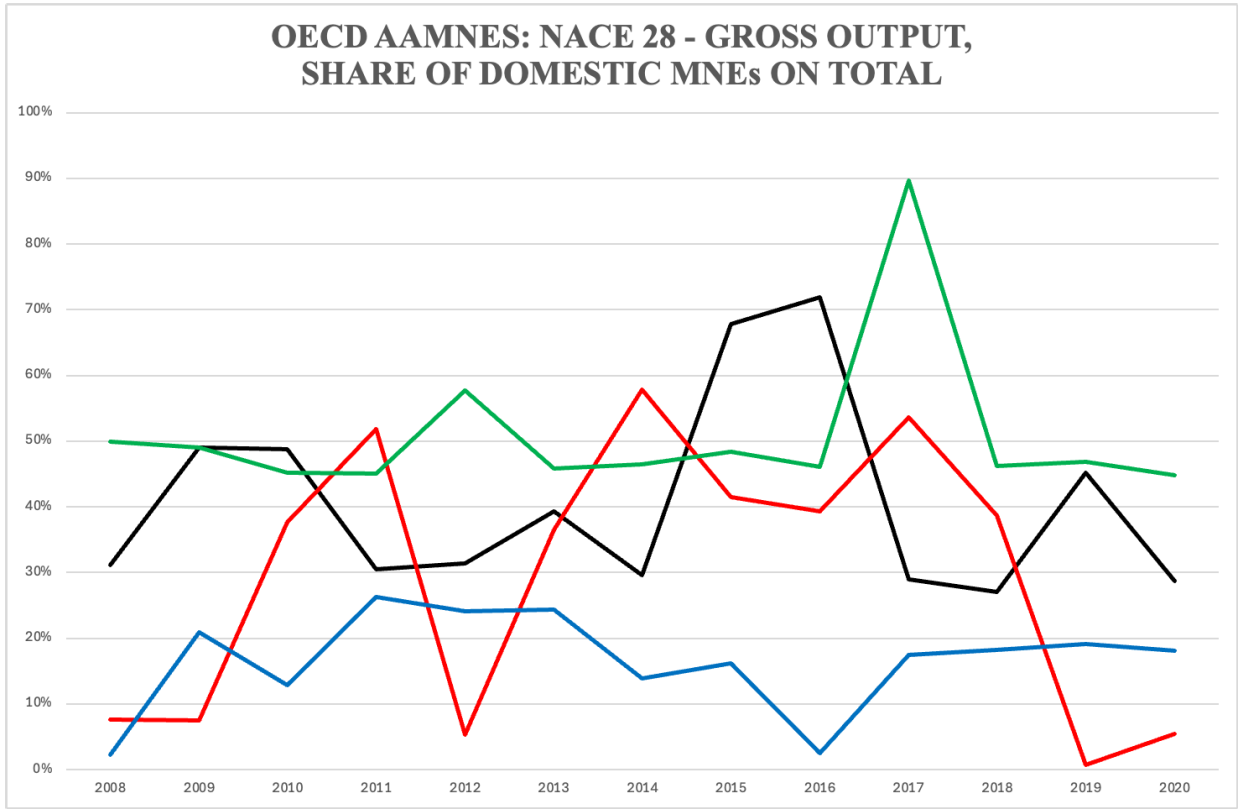
NACE 29: asymmetries (and not) in the EU

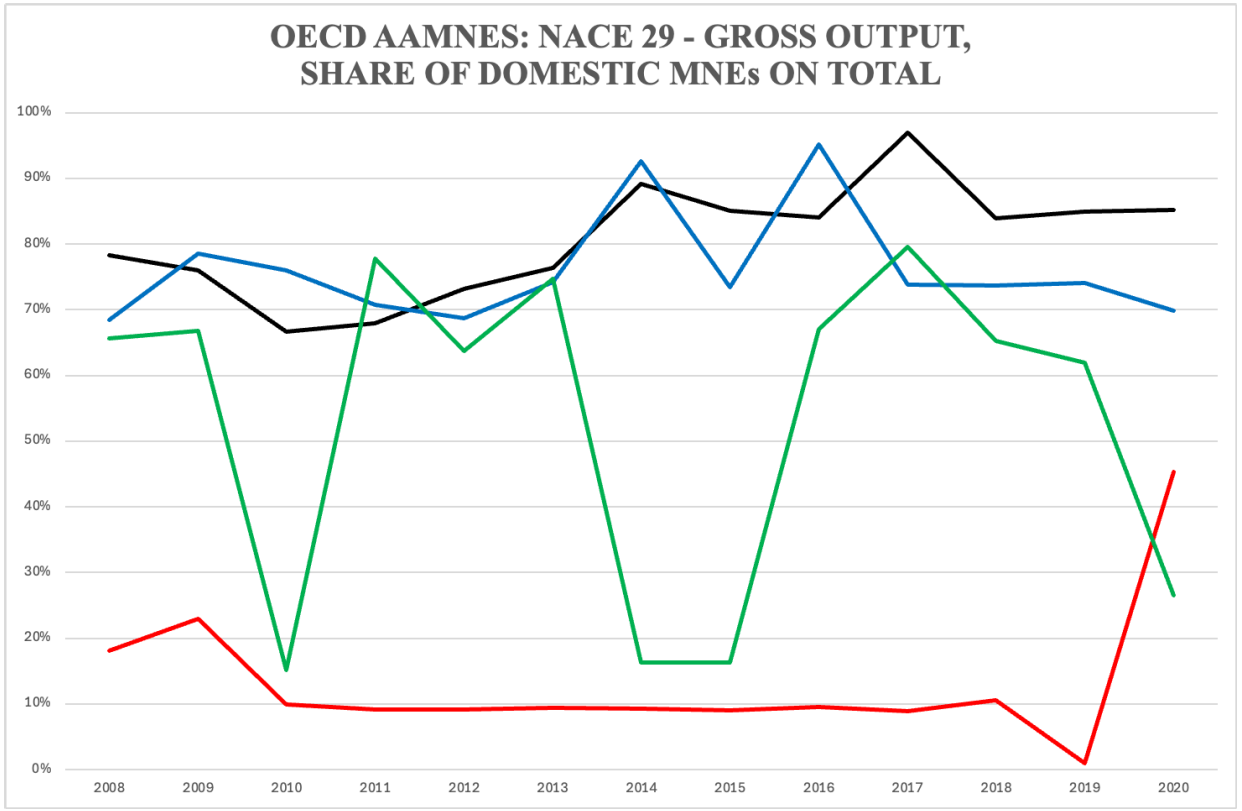






NACE 28 and 29: asymmetries of DMNEs





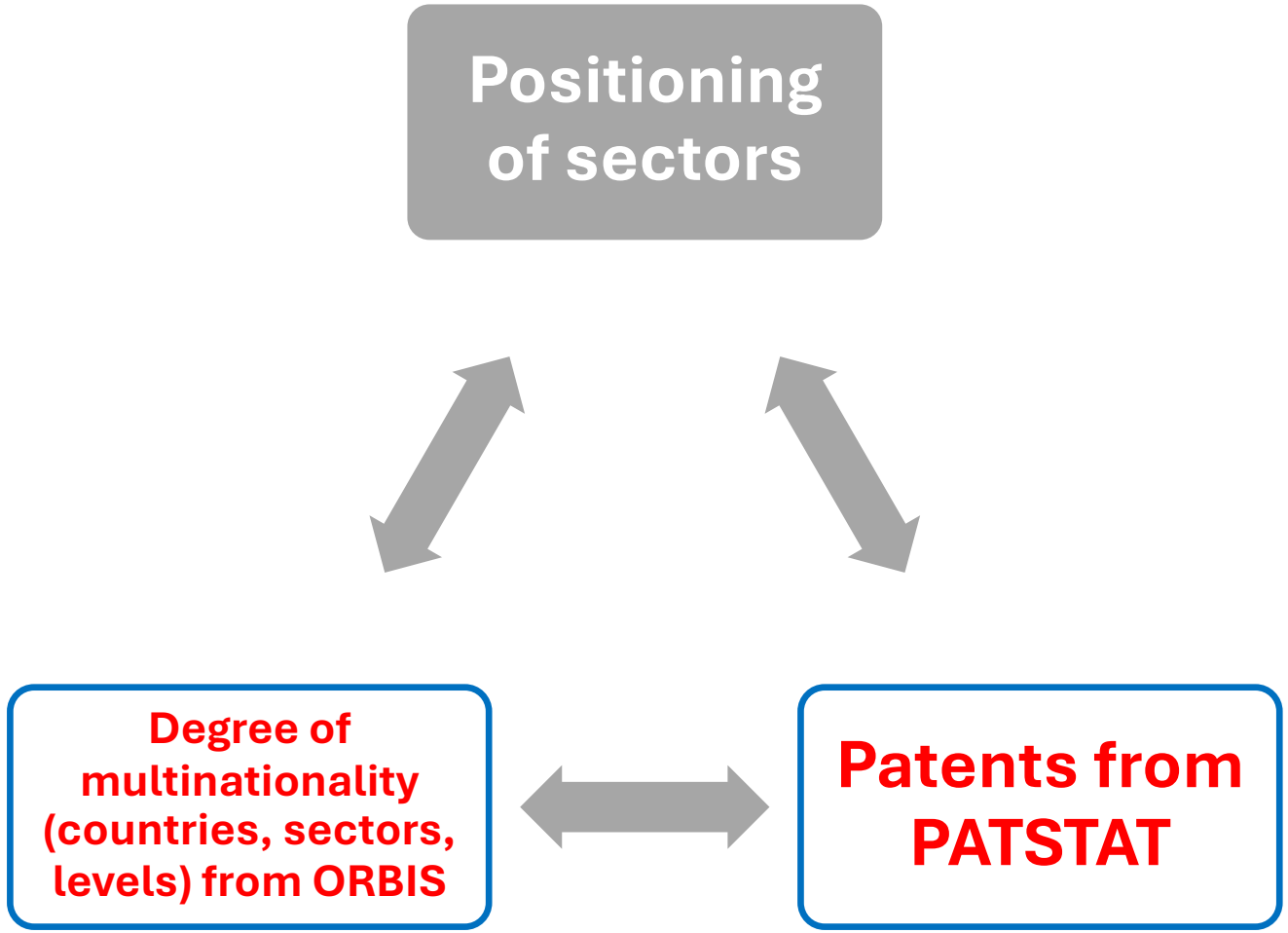
Limitations in statistical measurement of MNEs' activities or heterogeneity in their (changing) ownership structure and strategies, including the technological ones?

Sector selection and methodological approach

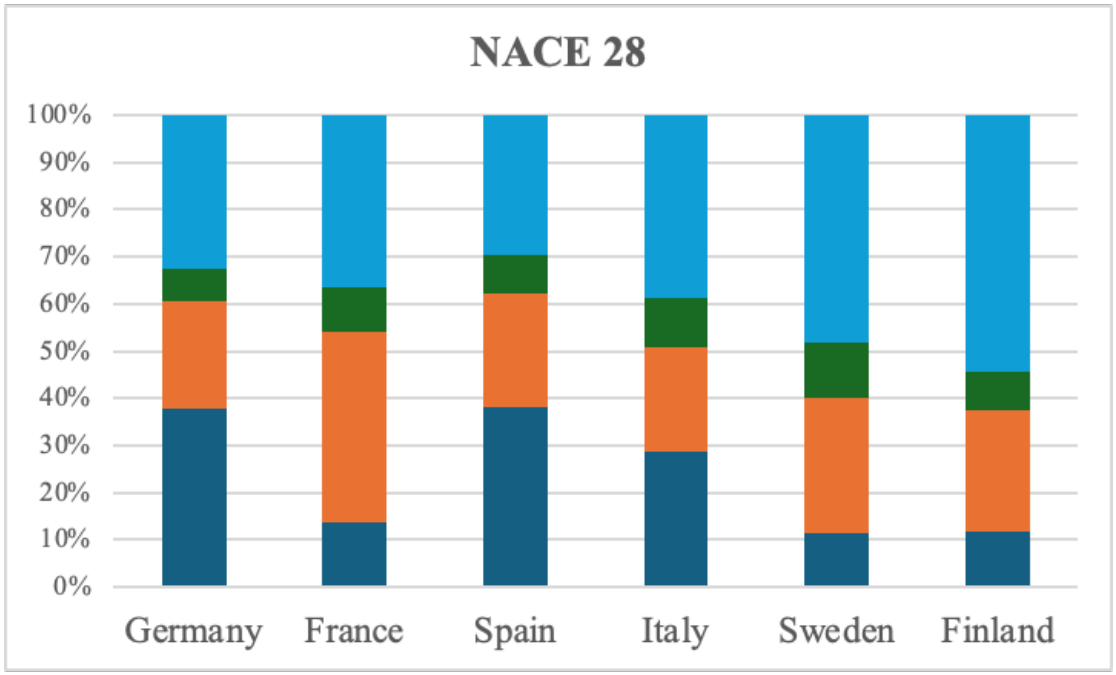
- **NACE sectors 28 and 29** have been selected for the historical relevance in Italian industry as well as their involvement in GVCs. Also, they are the top 2 sectors in Italian business R&D in 2022 (11% and 14% of BERD total, respectively). Finally, the output of project WP1 has confirmed the relevance of these sectors in terms of GVC linkages and intangible intensity
- Data extracted from BvD ORBIS (Dec. 2024), using a mix of bottom-up and top-down approaches:

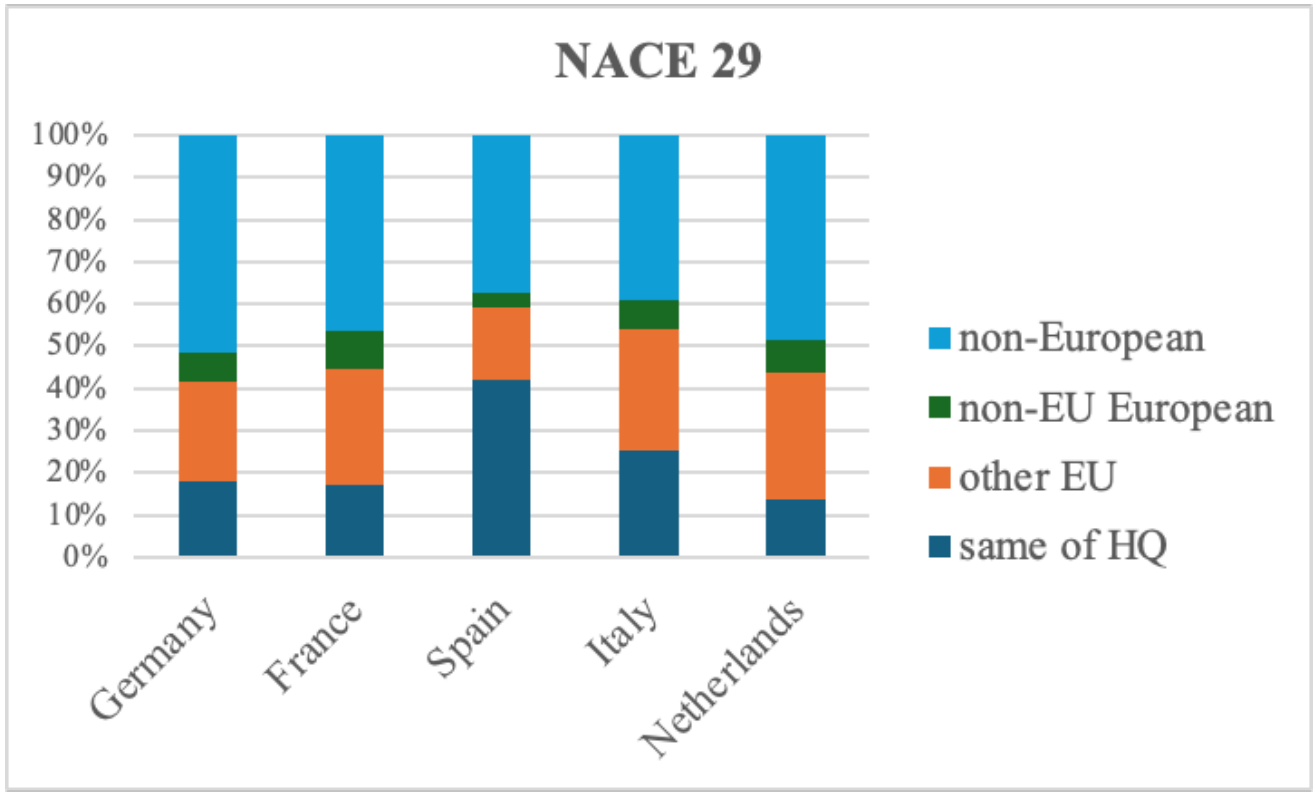
1. Identification of **all global MNE** groups that "cross" the EU, that is **controlling** (50%+1) **at least one firm resident in the EU and active in the 28 or 29 sectors**
2. By definition: **exclusion of purely domestic groups**, albeit active in the two sectors; inclusion of all EU HQs in sectors 28 or 29
3. Labelling as **HQs** in sectors 28 or 29 also those **firms at the "second level"** (controlled by a financial or state-owned, thus not manufacturing), that ORBIS would not define GUO
4. For all these MNE groups, **download of all global subsidiaries**
5. Matching of balance sheet data from ORBIS and EPO patents from **PATSTAT** for all firms in the sample: **22,760 firms for NACE 28** (of which **2,119** with at least one patent application in 2009-2024); **12,064 firms for NACE 29** (of which **781** with at least one patent application)

Output 1: asymmetries in EU MNEs ownership structure and patents in NACE sectors 28 and 29



Some evidence on the asymmetries in MNEs ownership structure: Distribution of group firms by HQ country and **geographical area of subsidiaries**





Only for Italy (and partially for Spain) the distribution is almost the same in both sectors

Some evidence on the asymmetries in MNEs ownership structure (2)

NACE 28	Distribution of subsidiaries' core 2-digit sector								
HQ country	28	46	64	35	70	25	29	others	Total
Germany	22%	18%	11%	10%	6%	2%	8%	22%	100%
France	12%	16%	19%	0%	3%	1%	0%	47%	100%
Sweden	29%	35%	4%	0%	2%	3%	1%	27%	100%
Italy	**34%**	**24%**	3%	0%	1%	5%	1%	32%	100%

Global subsidiaries of Italian NACE 28 MNEs are more concentrated in the same sector and in wholesale trade (similarly to Sweden)

NACE 29	Distribution of subsidiaries' core 2-digit sector								
HQ country	29	45	64	46	70	62	28	others	Total
Germany	26%	14%	8%	5%	4%	4%	3%	37%	100%
France	**29%**	**9%**	**7%**	**3%**	**4%**	**6%**	**1%**	**41%**	100%
Spain	34%	4%	10%	7%	1%	1%	4%	40%	100%
Italy	**27%**	**9%**	**5%**	**4%**	**3%**	**6%**	**1%**	**45%**	100%

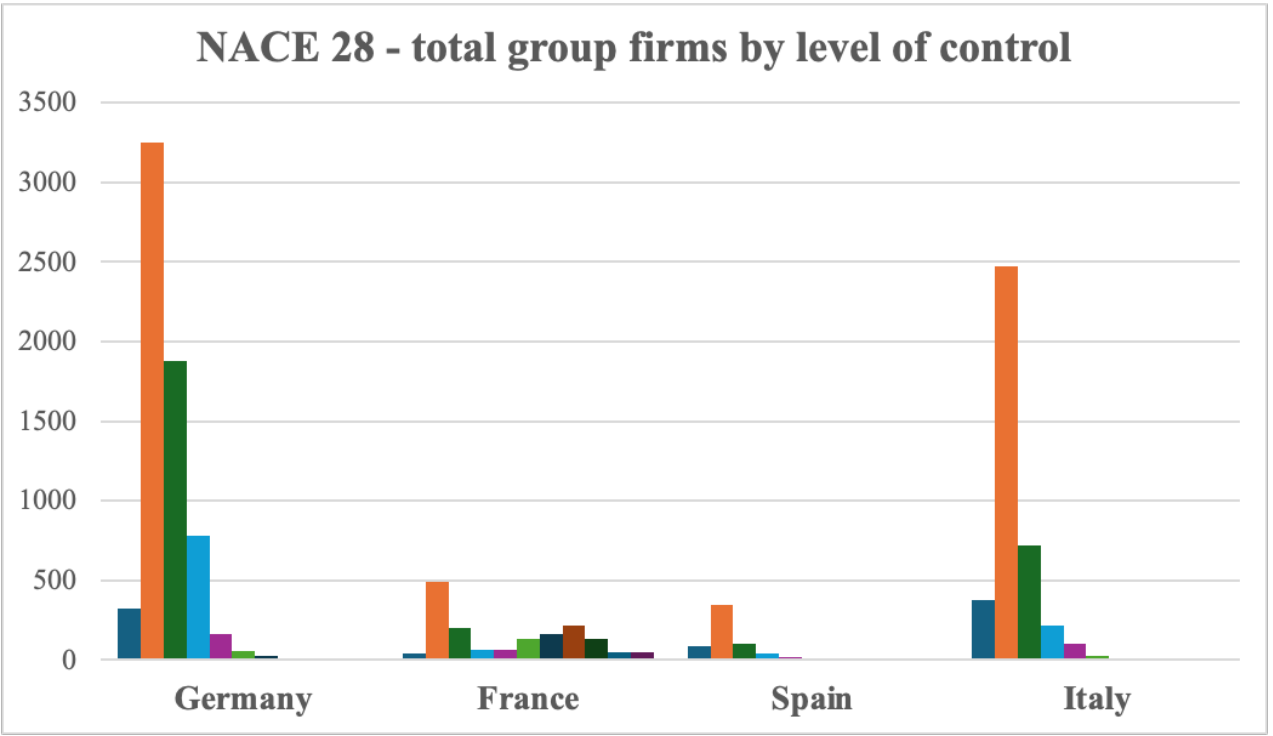
While global subsidiaries of Italian NACE 29 MNEs are more spread across sectors, with a distribution almost overlapping with that of French MNEs

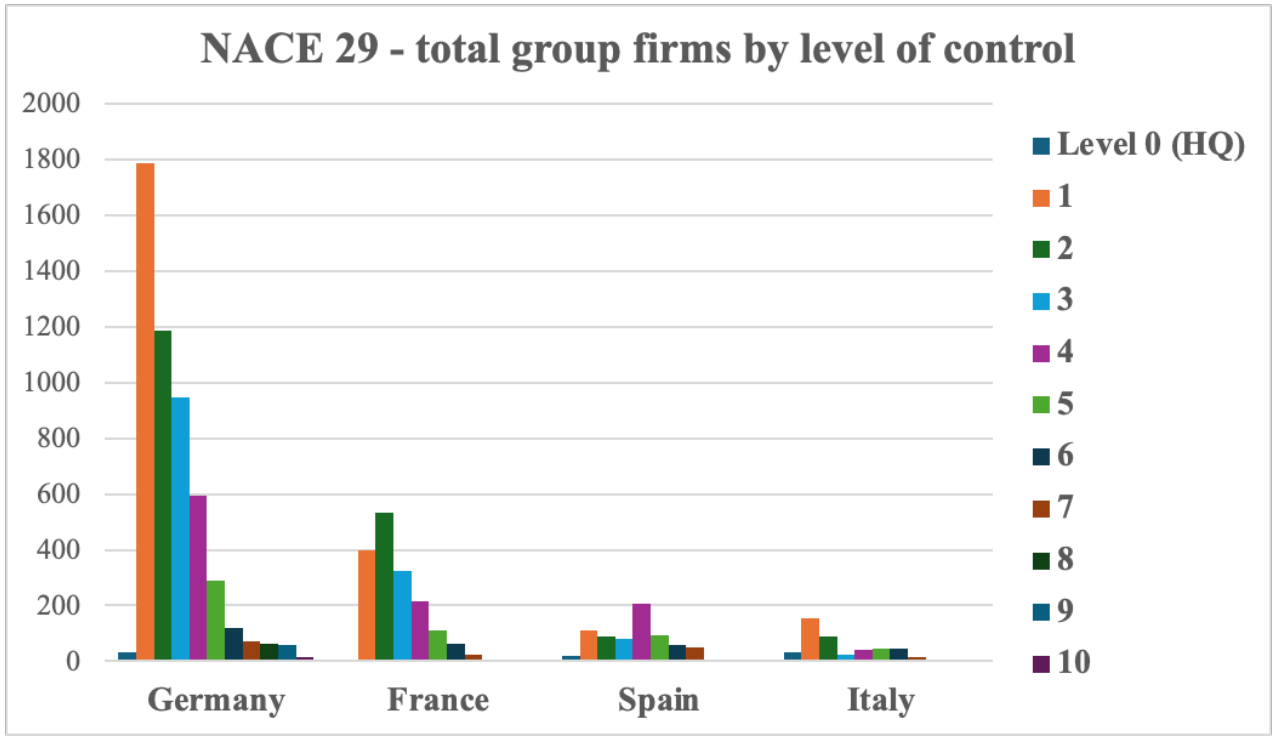
Some evidence on the asymmetries in MNEs ownership structure (3)

	Average Multinational Spread	
HQ country	NACE 28	NACE 29
Germany	5,9	18,4
France	7,7	25,1
Spain	2,8	4,0
Italy	4,1	4,8

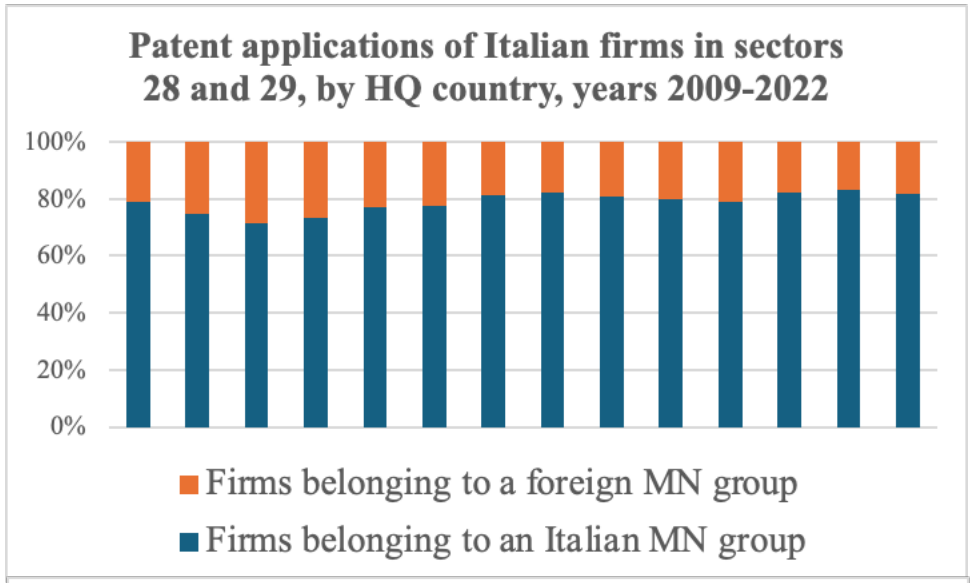
Subsidiaries of Italian MNEs reside (MN spread) on average in less countries than for German and French

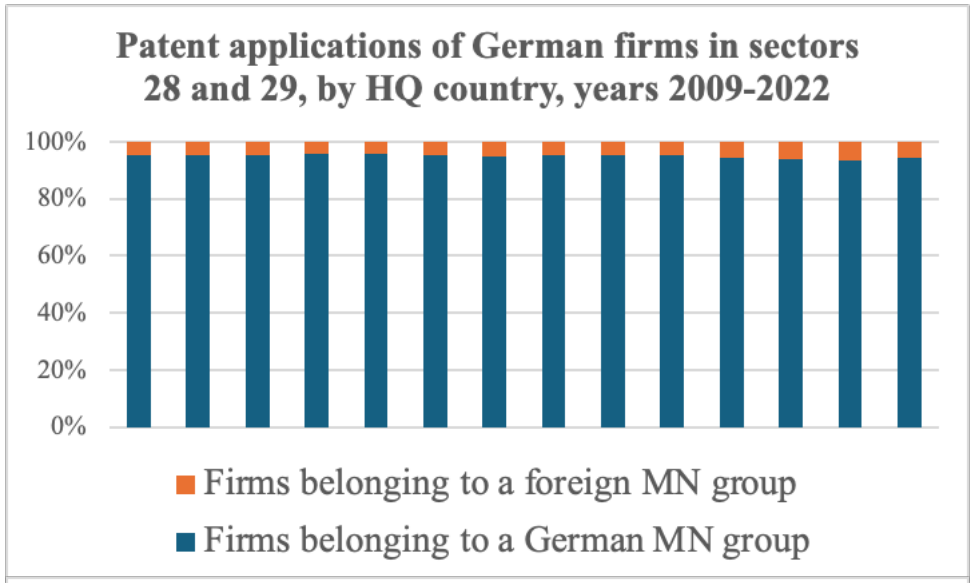
For NACE 28, the distribution of levels of control is proportionally similar to Germany
For NACE 29, absolute numbers are low for all levels

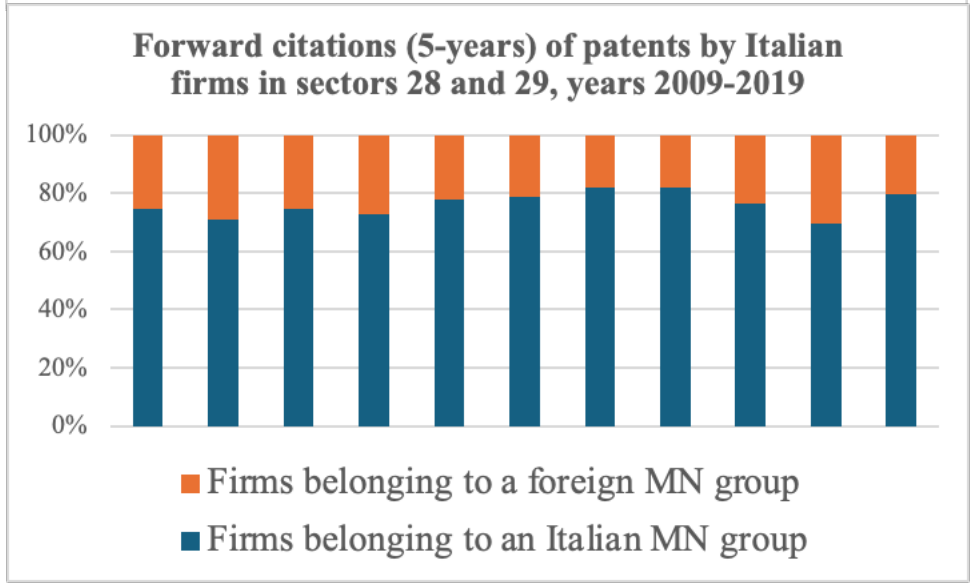


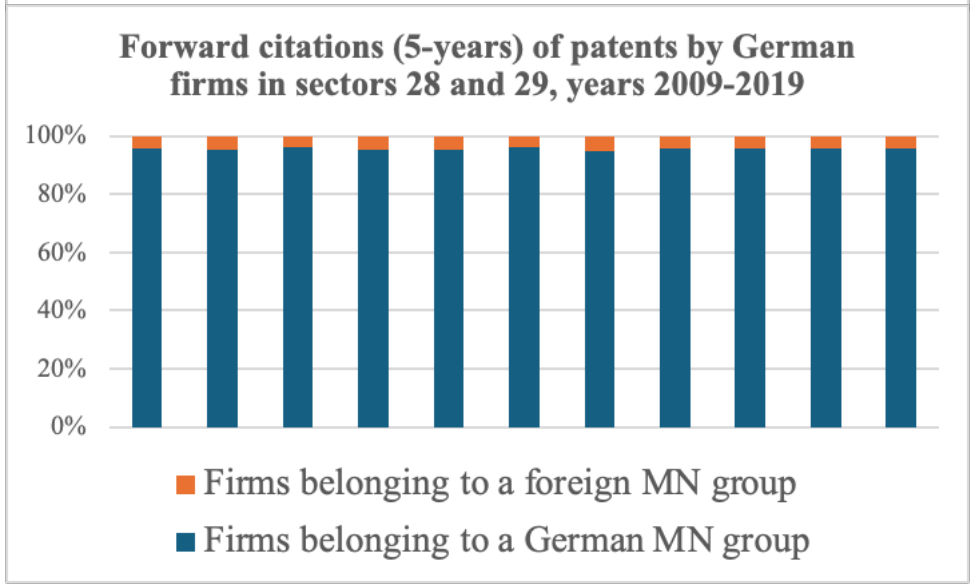


Some evidence on the asymmetries in MNEs technology









Patent applications in year 2022 for NACE 29

Patent applications of Italian firms by top HQ country and level of control

		42%				
	HQ-country	**0**	**1**	**2**	**3**	**Total**
95%	Italy	**144**	53			197
	Netherlands		88	41		129
	Germany			12	1	13
	Belgium			3		3
	France		1		1	2
	Total	**144**	**142**	**56**	**2**	**344**

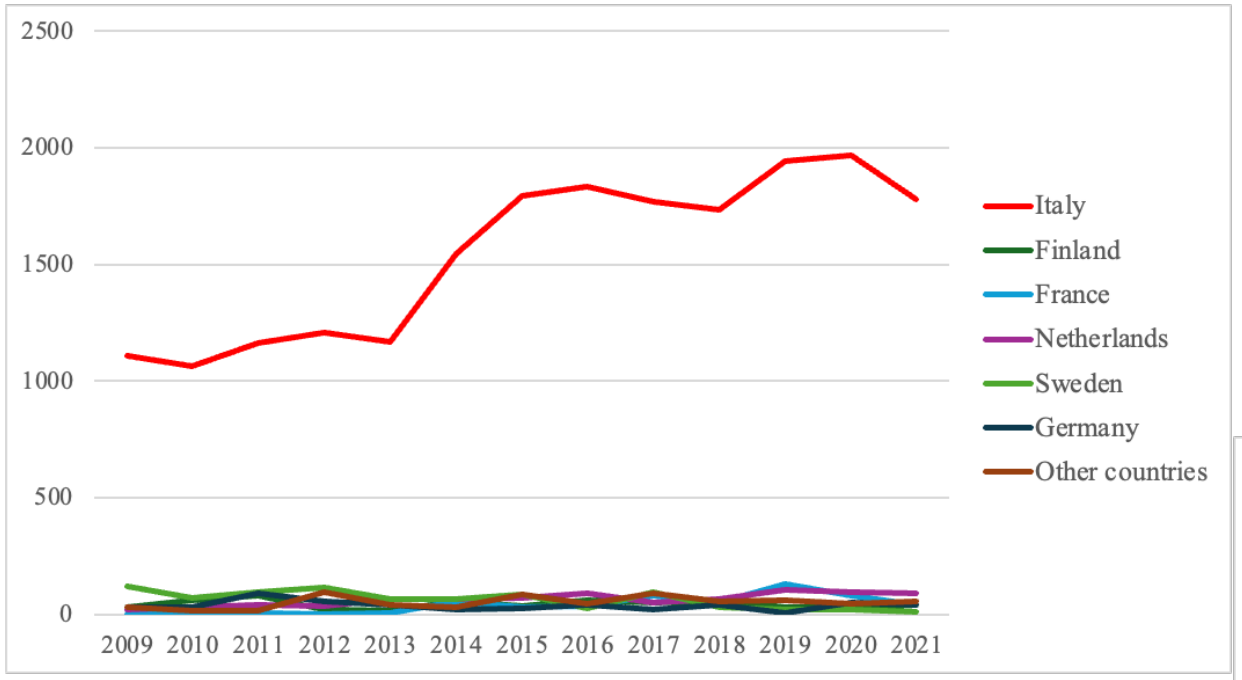
Patent applications of French firms by top HQ country

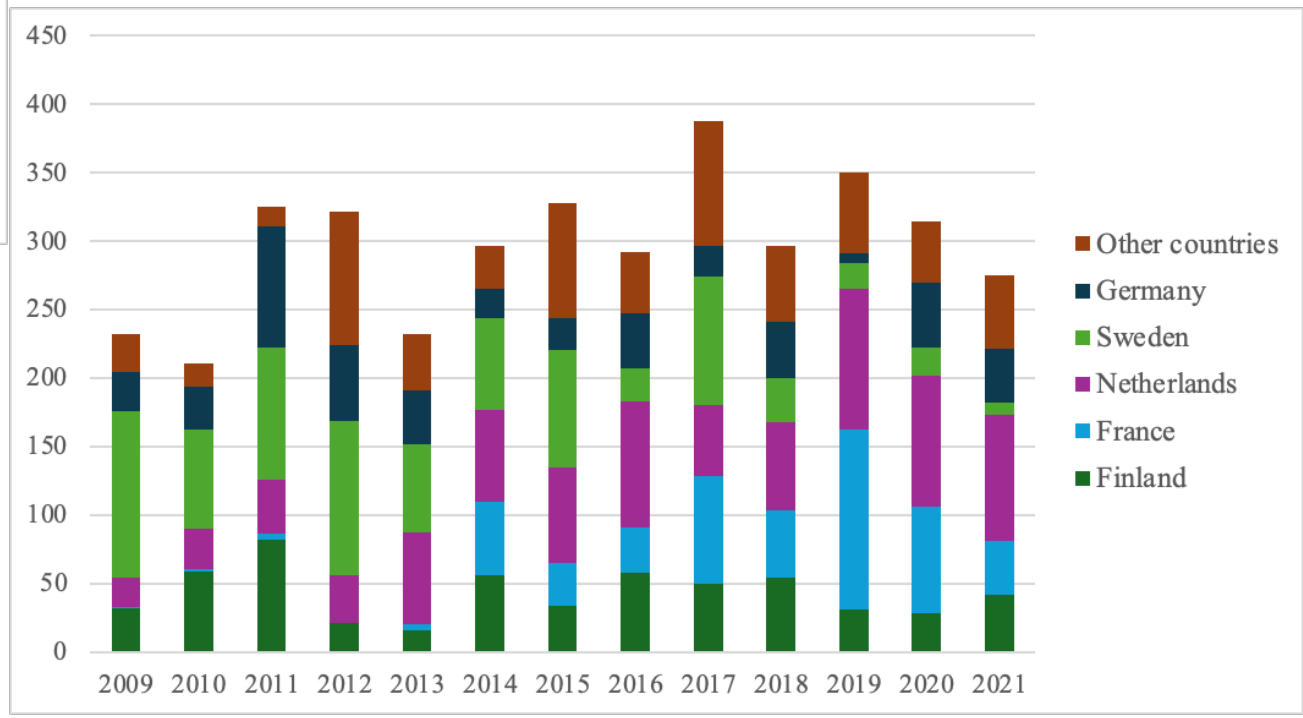
		14%				
	HQ-country	**0**	**1**	**2**	**3**	**Total**
99%	France	233	120	804		1157
	Netherlands		498		4	502
	Sweden			1	8	9
	Italy		4	4		8
	Spain				6	6
	Total	**233**	**622**	**809**	**18**	**1682**

Patent applications of German firms by top HQ country

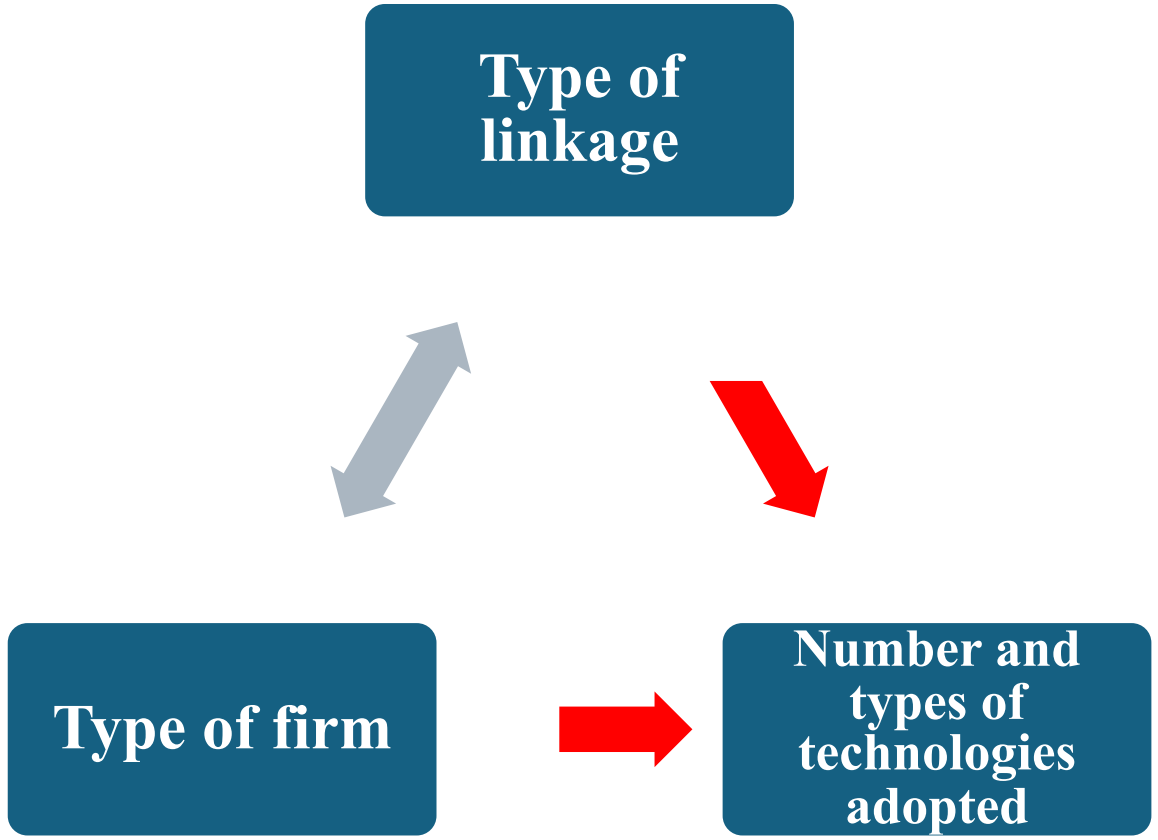
	64%							
HQ-country	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Germany	**6318**	1815	980	2	71		19	9205
France			128	64	354			546
Netherlands			42					42
Sweden			7	29				36
Spain					11			11
Total	**6318**	**1815**	**1157**	**110**	**436**		**19**	**9855**

Patent applications of Italian firms in NACE 28, years 2009-2021, by HQ country





Output 2: asymmetries in (multinational) group belonging, (international) linkages and technology adoption



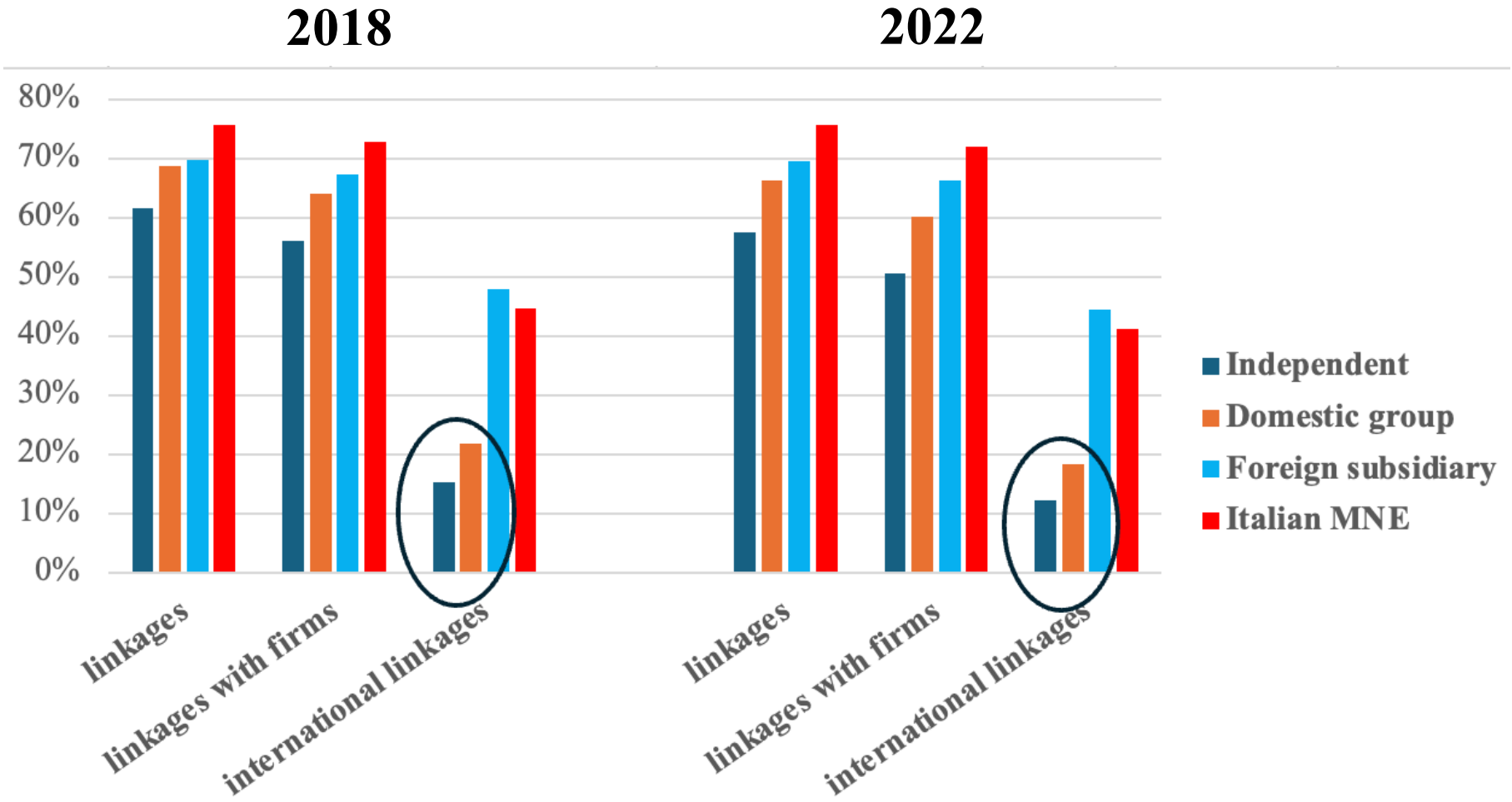
Output 2: aim

- Output 1 has two main limitations:
  - There is no measurement of the supply chain firm linkages (with suppliers, clients, partners), both at the national and international level
  - Although the relevant role of MNEs has been shown, there is no comparison between MNEs and non-MNEs
- A complementary output of project WP2 (still work in progress) has instead:
  - Focused on recent data for Italy only (**ISTAT Permanent Census of enterprises, years 2018 and 2022**)
  - Shown the **reverse perspective**: how being a specific type of firm with specific linkages is associated with technology adoption strategies
- In this case, the **firm type breakdown** is the most usual. Firms can be: independent, part of a domestic group, part of a MNE from Italy, subsidiary of a foreign MNE
- We use this breakdown to complement **recent works** on technology adoption in Italy (e.g. Calvino et al, 2022; Cirillo et al., 2023; Agostino et al., 2025; Gahn, 2025)

Output 2: overview and methodology

- Respondents to ISTAT Census **both in 2018 and 2022**: **93,402 firms**
- In both waves, a specific question on the **adoption of digital technologies** (10 different technologies, ranging from internet connection, cybersecurity and cloud services, to big data analysis, robot and 3D printing)
- Estimation method: Negative Binomial, pooled
- Dependent variable: count of digital technologies
- Main regressor: linkage strategies, distinguishing:
  - Linkage with other firms (even domestic ones)
  - Linkage with international firms
  - Linkage with "technological motivation"
  - Linkage with "globalisation motivation"
- Estimation on sub-samples:
  - **Type of firm** (independent, in domestic group, in an Italian MNE, subsidiary of foreign MNE)
  - GVC positioning (linkage as a **supplier**, as a **buyer**, as a **partner**)

Output 2: comparison of linkages in the two waves



Preliminary results show, as expected, that firms involved in any type of linkage are more likely to be associated with a higher number of digital technologies, always with high significance

Note: "international linkages" are a sub-set of "linkages with firms" that are a sub-sample of "linkages"

Concluding remarks

- Still preliminary output based on an extensive qualitative work
- Hint #1: heterogeneity (in terms of firm type, global ownership structure, global technological strategies, international linkages) of MNEs matters more than “multinationality per se”
- Hint #2: when measuring, going beyond the simple flag: “being or not being an MNE”
- Hint #3: “describing” in detail such complex heterogeneity is as important as developing synthetic indicators to be put in an econometric estimation
- In a policy perspective: should Italy generally attract foreign MNEs? Foreign patenting MNEs? An in-depth knowledge of the characteristics of these MNEs might help policy decisions and avoid opportunistic behaviour of foreign MNEs we have seen coming because of public money/incentives and soon running away from Italy, in recent times

Thank you for your attention!

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