When National Priorities Are Not European Priorities: A Note on Industrial Policy in Europe's Production Network

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Abstract

Governments often need to choose which sectors deserve priority when industrial policy cannot support everything at once. Rankings are one way to make that choice explicit. This note ranks sectors using distortion centrality: a production-network measure that gives higher priority to sectors where a policy wedge, bottleneck, or productivity improvement would have larger effects through input-output linkages. The question is whether sectors that look most important from a national perspective are also the sectors that matter most for the EU as a whole. Using Eurostat FIGARO, we build a 2010–2023 panel of EU27 country-sectors and compare national distortion-centrality rankings with EU-wide rankings. EU-wide priorities are very stable, but they are not the same as national priorities. Adjacent-year EU-wide rank correlations average 0.992, while the average national-versus-EU percentile-rank gap is 0.262. For policy, national rankings identify domestic bottlenecks; EU-wide rankings identify sectors whose importance comes from cross-border supply-chain links.

1 Introduction

Industrial policy is often discussed as a question of instruments: subsidies, procurement, regulation, public investment, or tax incentives. A prior question is which sectors should receive attention in the first place. Because governments cannot target every sector at once, they need a way to rank possible targets. In practice, many rankings are national. They ask which domestic industries are large, strategic, exposed, or politically salient. But European production is not only national. Firms buy inputs across borders, sell to foreign producers, and depend on downstream demand outside their home country. A sector that is central for a national economy need not be central for the EU production network, and a sector that looks modest domestically can matter more once cross-border linkages are counted.

The FIGARO data make this point concrete. In the panel used below, the average EU country-sector sells about 11 percent of its output as cross-border intermediate inputs before COVID and about 14 percent after COVID. These are averages across very different sectors and countries, so they understate how exposed some nodes are. The relevant policy implication is that the production system policymakers are trying to influence is partly domestic and partly European. If the ranking is constructed only within national borders, it can miss sectors whose importance comes from supplying, or being supplied by, firms elsewhere in the EU.

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This paper studies that distinction. We compare national industrial-policy rankings with EU-wide rankings for the same set of country-sectors. The ranking is based on distortion centrality, the production-network measure developed by Liu (2019). The measure ranks sectors by how much a wedge, bottleneck, or productivity improvement in that sector propagates through input-output linkages. It therefore differs from a simple size ranking. A sector can rank highly because it sells to many downstream sectors, because it sits upstream of important production chains, or because its position makes distortions costly for the wider economy.

The exercise speaks to two strands of work. The first shows that production networks shape aggregate outcomes because shocks and frictions propagate through input-output links. Acemoglu et al. (2012) show how sectoral shocks can generate aggregate fluctuations when the network is sufficiently asymmetric. Carvalho et al. (2019) summarize how input-output structure changes the mapping from micro shocks to macro outcomes. The second strand studies cross-border production and global value chains. Antràs et al. (2022) emphasize that production is increasingly organized across borders, so policy-relevant exposure is not fully summarized by domestic activity. Our contribution is to bring these ideas to a practical EU ranking problem: should an industrial-policy ranking be formed inside each country, or on the EU production network as a whole?

We use Eurostat FIGARO, the EU inter-country input-output system, to build a panel of country-sector production networks for 2010–2023. The data describe how industries in each EU country sell intermediate inputs to industries in other countries, how they sell to final demand, and how much value added they generate. This makes it possible to compare two objects year by year. The first is a national ranking: for each country, we compute distortion centrality using only that country's domestic production network. The second is an EU-wide ranking: we compute centrality for all EU27 country-sectors in one integrated network. The same German, French, Italian, or Spanish sector can therefore have one rank inside its national economy and another rank inside the European economy.

The main findings are easy to state. First, EU-wide rankings are highly persistent. Adjacent-year rank correlations average 0.992. The same large country-sectors remain near the top throughout the panel: German motor vehicles, French and German construction, real estate, public administration, and health. This persistence suggests that EU-wide distortion centrality is anchored by durable production-network positions rather than by one unusual year.

Second, national and EU-wide rankings diverge in a stable way. The average absolute percentile-rank gap between the two rankings is 0.262, and annual averages lie in a narrow range between 0.258 and 0.264. The gap is not only a COVID-period phenomenon and not only a 2018 fact. It is a recurring feature of the panel. Germany, France, Italy, and Spain show large average gaps because their largest domestic nodes also have distinctive EU-wide positions. Smaller and more open economies such as Cyprus, Latvia, Lithuania, Estonia, and Malta show large gaps with less overlap between national and EU top sectors, consistent with a stronger role for specialization and cross-border dependence.

Third, the mismatch is economically interpretable. Sectors with greater output tend to be more central in the EU-wide ranking, while cross-border and extra-EU sales shares are also associated with more central EU positions. This is what one would expect if EU-wide rankings add information about scale and cross-border propagation rather than simply relabeling national priorities. The practical implication is direct. National rankings remain useful for domestic bottlenecks. EU-wide rankings are useful when the policy question concerns European spillovers, supply-chain resilience, or sectors whose importance comes from links beyond the domestic economy.

2 Data and Measurement

2.1 FIGARO in plain language

The data come from Eurostat FIGARO, the EU inter-country supply, use, and input-output tables (Eurostat, 2025a,b). An input-output table records who buys from whom in the production system. In this setting, the "who" is a country-sector. For example, the table records sales from German motor vehicles to French wholesale trade, from Italian chemicals to Spanish rubber and plastic products, and from Polish construction to domestic final demand. The data also record value added, final demand, and intermediate sales. These objects allow us to distinguish output that is sold to consumers or investment from output that is used as an input by other producers.

We use the annual CIRCABC FIGARO 2025 industry-by-industry flatfiles for 2010–2023. Each year covers 27 EU countries and 64 sectors, giving 1,728 country-sector nodes per year and 24,192 country-sector-year observations. Table 1 reports the sample construction. The annual flatfiles use a consistent sector scheme over the panel. We normalize notation for presentation, so codes such as `C10T12` become C10–12. The panel uses the CIRCABC definitions throughout; the older 2018 API-based output is retained only as a reproducibility note in Appendix Table 3.

Table 1: Panel sample construction

Statistic	Value
Years	2010–2023
Annual FIGARO flatfiles	14
Countries	27
Sectors	64
Country-sector nodes per year	1,728
Country-sector-year observations	24,192
Source files	CIRCABC FIGARO 2025 industry-by-industry flatfiles
Sector treatment	CIRCABC annual 64-sector scheme with notation normalized for presentation

Notes: The unit of observation is a country-sector-year node. The panel uses the internally consistent CIRCABC annual flatfiles for every year. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual industry-by-industry flatfiles.

2.2 Constructing the rankings

For every year, we construct two networks. The EU-wide network contains all EU27 country-sectors and all intermediate input flows among them. The national networks restrict attention to domestic flows within each country. We then compute a Liu-style distortion-centrality score for every country-sector. Intuitively, a country-sector receives a high score if a distortion in that node would have large effects through the production network. This can happen because the sector is large, because many other sectors use its output, or because it is located upstream of important production chains.

The raw centrality scores are converted into ranks and percentile ranks. Percentile ranks are useful because the EU-wide ranking orders 1,728 country-sectors, while each national ranking orders 64 domestic sectors. Our main comparison is the absolute gap between a country-sector's national percentile rank and its EU-wide percentile rank. A large gap means that the sector's importance looks different when evaluated inside the domestic network than when evaluated inside the EU-wide network.

3 Methodological Framework

The ranking exercise uses the main insight from Liu (2019): in an economy with input-output linkages, the policy relevance of a sector depends not only on its own size but also on how distortions in that sector propagate through the production network. A sector can have a large welfare relevance because it is large, because many other sectors use its output, or because it sits upstream of production chains that amplify the effect of a wedge. This is the object Liu calls distortion centrality.

Let j denote a supplying sector and i a buying sector. From the input-output table, define Ω_{ij} as the share of sector j's output sold as an intermediate input to sector i, and define Ω_j^C as the share of sector j's output sold to final demand. These shares satisfy

$$\Omega_j^C + \sum_i \Omega_{ij} = 1 \quad \text{for each supplying sector } j. \tag{1}$$

Liu's distortion-centrality recursion can be written as

$$\xi_j = \delta \Omega_j^C + \sum_i \xi_i (1 + \chi_{ij}) \Omega_{ij}, \tag{2}$$

where ξ_j is the distortion centrality of sector j, δ is final-demand importance, and χ_{ij} is the distortion associated with selling input j to buyer i. Equation (2) has a simple interpretation. A sector is central if it sells directly to final demand, or if it sells to other sectors that are themselves central. Distortions magnify these links because wedges accumulate along production chains.

In matrix notation, let Ω collect the intermediate sales shares, let Ω^C collect the final-demand shares, and let D collect the distortion terms $1 + \chi_{ij}$. The vector of centralities is

$$\xi' = \delta (\Omega^C)' \left[I - D \circ \Omega \right]^{-1}, \tag{3}$$

where $\circ$ denotes element-by-element multiplication. This is the equation we take to the data. In the benchmark ranking we use a common wedge, $\chi_{ij} = 0.10$, so differences in ξ_j come from the observed input-output network rather than from assumed sector-specific imperfections. The centrality vector is normalized before ranking, so the empirical object is the ordering of sectors rather than the level of ξ_j.

The useful result for this note is a ranking result. In Liu's framework, when policymakers consider marginally relaxing distortions or supporting production in one sector, sectors with higher distortion centrality generate larger network-wide gains. The centrality measure is therefore a sufficient statistic for ordering sectors in a production network. It combines direct importance, captured by the sector's role in production and final demand, with indirect importance, captured by the input-output paths through which shocks or wedges travel to the rest of the economy.

This logic differs from a Domar-weight or output-share ranking. A large sector is often central, but size alone is not the criterion. A smaller upstream supplier can rank highly if many sectors depend on it. Conversely, a large sector can be less central if its links to the rest of the network are limited. The empirical question in this paper follows directly: if distortion centrality is computed on a national network, do we obtain the same priorities as when it is computed on the EU-wide network?

We implement this idea in a deliberately transparent way. For every year, we compute a Liu-style centrality score using the observed FIGARO input-output matrix. We then rank country-sectors by that score. The national ranking uses only domestic input-output links within each country. The

EU-wide ranking uses the full EU27 inter-country production network. The comparison between the two rankings isolates the role of cross-border production linkages in changing the apparent priority of a sector.

4 Findings

4.1 EU-wide centrality is persistent

The first empirical fact is that EU-wide rankings are remarkably stable over time. Figure 1 reports adjacent-year Spearman correlations for EU-wide and national percentile ranks. EU-wide rank correlations average 0.992 and never fall below 0.987. National rankings are also persistent, with an average adjacent-year correlation of 0.975, but they move more than the EU-wide ranking.

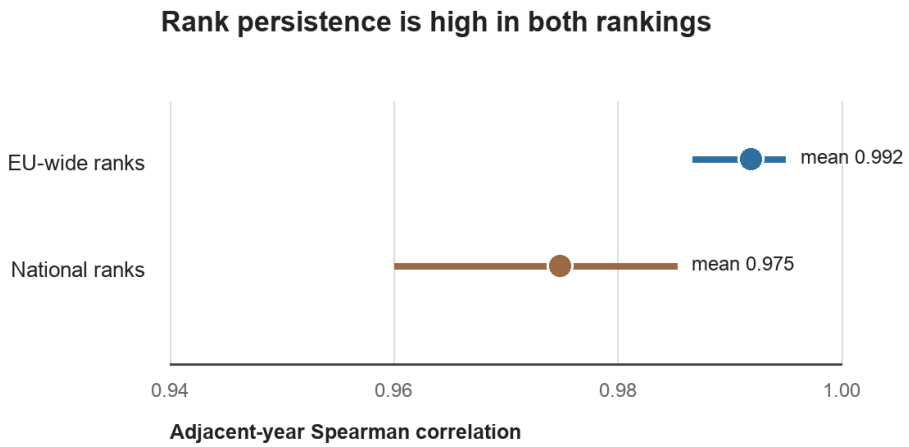


Figure 1: Annual rank stability. The figure reports the mean, minimum, and maximum adjacent-year Spearman correlations for EU-wide and national percentile ranks over 2011–2023. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.

The persistence matters for interpretation. If the EU-wide ranking were dominated by one year, it would be a poor guide for policy priorities. Instead, the ranking identifies country-sectors that occupy durable positions in the European production network. Figure 2 shows the mean EU-wide rank of the most persistently central nodes. German motor vehicles has an average EU-wide rank below 2. French construction, German real estate, German construction, French real estate, public administration, and health also remain near the top. These are not all tradable manufacturing sectors. Some are large domestic service or public-service nodes whose centrality comes from their scale and their links to other parts of the economy.

4.2 National and EU-wide priorities differ

The second empirical fact is that national and EU-wide rankings differ by a stable amount. Figure 3 summarizes the annual distribution of the average national-versus-EU rank gap. The panel mean is 0.262, and annual means range only from 0.258 to 0.264. This tight range is informative. It says

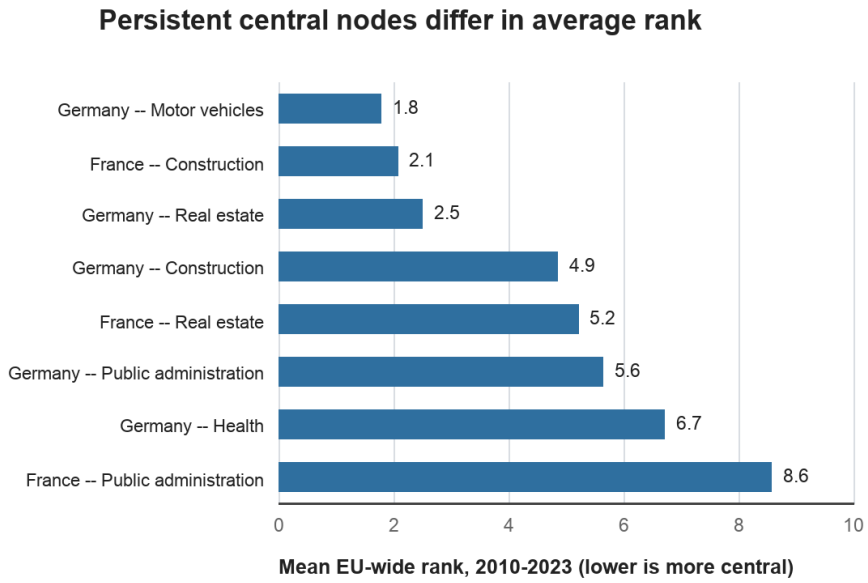


Figure 2: Persistent EU-wide top country-sectors. The figure reports mean EU-wide rank over 2010–2023 for country-sectors that appear persistently among the most central nodes. Lower values indicate greater centrality. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.

that the mismatch between national and EU-wide priorities is a persistent structural feature of the production network rather than a temporary shock.

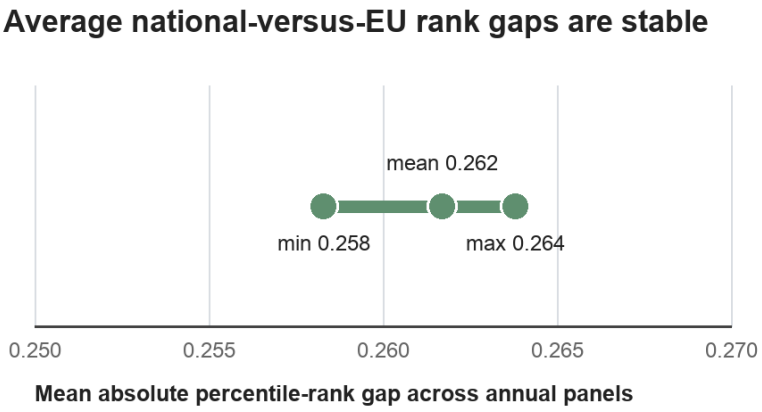
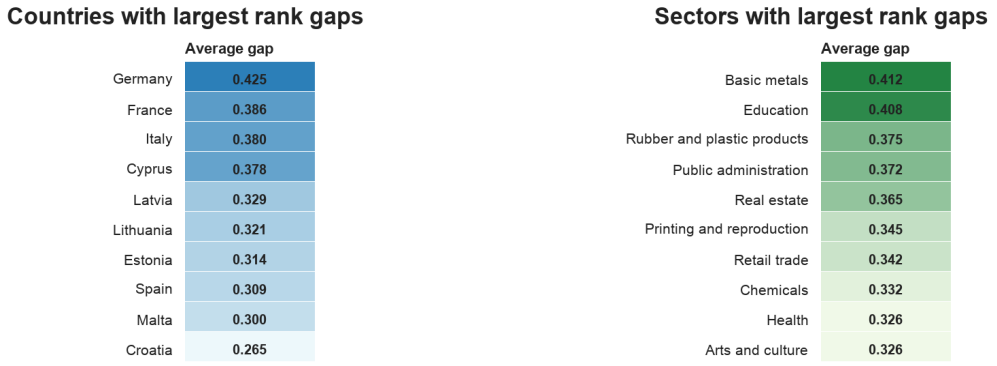


Figure 3: Average national-versus-EU rank divergence. The figure reports the minimum, mean, and maximum annual average absolute percentile-rank gap over 2010–2023. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.

Figure 4 shows where the gaps are largest. At the country level, the largest average gaps appear in Germany, France, Italy, Cyprus, Latvia, Lithuania, Estonia, Spain, Malta, and Croatia. These

countries enter the list for different reasons. Large economies contain many domestically central sectors, but only some of those sectors are also central for the EU as a whole. Smaller open economies can have specialized sectors whose EU-wide role differs sharply from their domestic rank.

At the sector level, the largest gaps appear in basic metals, education, rubber and plastic products, public administration, real estate, printing, retail trade, chemicals, health, and arts and culture. This list mixes upstream manufacturing sectors with large non-manufacturing sectors. The pattern reinforces the main point: an EU-wide ranking is not simply a list of export industries. It captures how each country-sector sits in a broader input-output system.



(a) Countries **(b)** Sectors

Figure 4: Largest national-versus-EU rank gaps. Each cell reports an average absolute percentile-rank gap over 2010–2023. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.

4.3 The mechanism is network position, not only size

The third empirical fact is that the ranking differences line up with observable network features. Figure 5 reports simple Spearman correlations between EU percentile rank and several country-sector characteristics. Because lower percentile ranks indicate greater centrality, negative correlations mean that a variable is associated with a more central EU-wide position.

Output is strongly associated with EU-wide centrality, as expected. But cross-border intermediate sales and extra-EU sales are also associated with more central EU positions. This supports the interpretation that EU-wide rankings add information about the geography of production links. They are not only a re-scaling of national rankings. They identify nodes whose policy relevance comes from propagation across the European production network.

The volatile observations are also consistent with this mechanism. Appendix Table 3 lists the country-sectors whose EU-wide percentile ranks move most over time. The list includes Estonian professional services, Luxembourg pharmaceuticals, Lithuanian wood products, Luxembourg forestry, and Cypriot air transport. These are cases where specialization, openness, and small-base effects can produce visible changes in rank even when the aggregate ranking structure is stable.

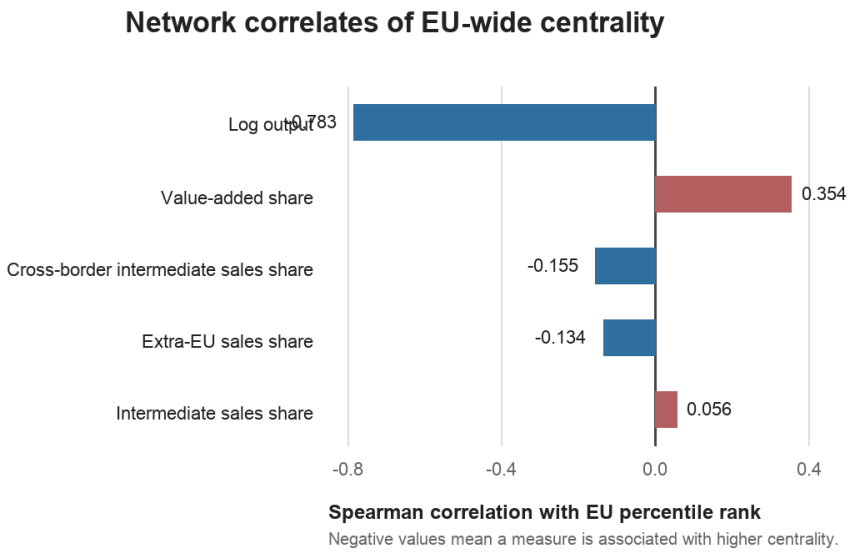


Figure 5: Network correlates of EU-wide centrality. Bars report Spearman correlations with EU percentile rank in the full country-sector-year panel. Lower percentile ranks indicate higher centrality, so negative values are associated with more central positions. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.

5 Discussion

The results suggest a practical distinction between two uses of industrial-policy rankings. A national ranking is well suited to domestic bottlenecks: which sectors are central inside a country's own production network? An EU-wide ranking is suited to European spillovers: which country-sectors matter because of their position in cross-border production? Both rankings are useful, but they answer different questions.

This distinction is especially relevant for EU policy. If an intervention is funded, coordinated, or justified at the European level, then a purely national ranking can miss the sectors whose importance comes from cross-border links. Conversely, if a policy is designed to address a domestic bottleneck, an EU-wide ranking may not be the right object. The contribution of the FIGARO panel is to make this difference measurable year by year and to show that it is persistent.

6 Conclusion

This paper builds a 2010–2023 panel of EU27 country-sector distortion centrality using FIGARO and compares national rankings with EU-wide rankings. Three facts stand out. EU-wide rankings are highly persistent. National and EU-wide rankings differ by a stable amount. The differences are related to scale and cross-border production links. Taken together, these facts imply that ranking exercises should match the policy problem. National industrial policy can use national centrality to identify domestic bottlenecks. EU-level industrial policy needs the additional EU-wide ranking because some sectors matter precisely through links that cross national borders.

A Appendix Tables

Appendix Table 2 reports persistent EU-wide top nodes and countries with the largest national-versus-EU rank gaps. Appendix Table 3 reports volatile nodes, network-driver correlations, and the 2018 flatfile/API comparison.

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Table 2: Persistent centrality and country-level divergence

Panel A. Most persistently central EU country-sectors

Country-sector	Years top 100	Years top decile	Mean EU rank
Germany – Motor vehicles, trailers and semi-trailers	14	14	1.786
France – Construction	14	14	2.071
Germany – Real estate activities	14	14	2.500
Germany – Construction	14	14	4.857
France – Real estate activities	14	14	5.214
Germany – Public administration and defence	14	14	5.643
Germany – Human health activities	14	14	6.714
France – Public administration and defence	14	14	8.571

Panel B. Largest country-level rank gaps

Country	Mean absolute rank gap	Top-10 overlap
Germany	0.425	1.000
France	0.386	0.907
Italy	0.380	0.921
Cyprus	0.378	0.321
Latvia	0.329	0.143
Lithuania	0.321	0.250
Estonia	0.314	0.171
Spain	0.309	0.921
Malta	0.300	0.271
Croatia	0.265	0.186

Notes: Panel A reports country-sectors that appear most often in the EU-wide top 100 over 2010–2023. Lower mean ranks indicate greater centrality. Panel B reports country averages across sectors and years. Top-10 overlap compares each country's ten highest national ranks with the same country's ten highest EU-wide ranks in each year. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.

Table 3: Volatility, network correlates, and reproducibility

Panel A. Most volatile EU-wide ranks

Country-sector	SD rank	Range rank
Estonia – Other professional and veterinary activities	0.213	0.564
Luxembourg – Basic pharmaceutical products and preparations	0.202	0.783
Lithuania – Wood and products of wood and cork	0.187	0.459
Luxembourg – Forestry and logging	0.185	0.535
Cyprus – Air transport	0.181	0.728

Panel B. Network correlates

Network measure	EU rank	Absolute gap
Cross-border intermediate sales share	-0.155	0.008
Extra-EU sales share	-0.134	0.025
Intermediate sales share	0.056	0.000
Value-added share	0.354	-0.068
Log output	-0.783	0.075

Panel C. 2018 reproducibility check

Item	Value
Comparison	2018 reproducibility note
Flatfile nodes	1,728
Panel source	CIRCABC annual flatfiles
Sector note	J58, J59_60, and L in panel
Earlier API split	J58–60 and L68A/L68B

Notes: Panel A measures volatility using the EU-wide percentile rank over 2010–2023. Panel B reports Spearman correlations in the full country-sector-year panel; lower EU percentile ranks indicate greater EU-wide centrality. Panel C documents why the panel uses internally consistent CIRCABC sector definitions for all years. Source: authors' calculations from Eurostat FIGARO 2025 CIRCABC annual flatfiles.