Breaking down sectors: A novel approach to disaggregating Input-Output Tables

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Input-output (IO) tables are an important tool for analysing the structure of economies, understanding industry relationships, and conducting trade analysis. However, traditional IO tables often aggregate industries at a high level, hiding crucial sectoral differences that can have significant implications for policy and decision-making. To address this limitation, this paper proposes a novel methodology for disaggregating IO tables in three main steps. First, we collect and integrate detailed production and trade data for the disaggregated sectors of interest. Second, we build on IO insights and apply econometric techniques to estimate and balance IO flows across disaggregated sectors. Third, we validate the disaggregation by comparing estimated results with available industry benchmarks. Our methodology enables a detailed analysis of the production structures and supply chain dependencies of the disaggregated sectors.

We apply this methodology to the EU automotive industry (classified under code C29 "Manufacture of motor vehicles, trailers, and semitrailers" in the FIGARO IO tables). The European Union (EU) automotive industry is facing challenges as Chinese electric vehicles (EVs) are increasingly gaining market share due to lower prices and perceived higher quality. However, in the last decade, the industry's reliance on foreign components has increased slightly (from 8% to 11%), masking the heterogeneity of EV and internal combustion engine (ICE) manufacturing. In this context, the distinction between EVs and ICEs is particularly important for understanding the economic effects of the transition from ICE to EV production and analysing the strategic dependency for inputs in which the EU lacks a comparative advantage, such as batteries.

Using a new methodology, we disaggregate the automotive sector to separately estimate the production technology and foreign dependence of the following subsectors and technologies: ICEs, EVs, and vehicle parts. On the technological side, our results reveal substantial production differences between EVs and ICEs, with EVs exhibiting a greater reliance (in value) on batteries and electric components and services, while requiring fewer manufacturing inputs compared to the ICE segment. Moreover, we find that in EU production, EVs display significantly higher foreign dependency (29%) than ICEs (13%). The higher dependence on Chinese inputs in EV production (11%) compared to ICE (2%) is prominent. Together, these results emphasise the importance of accounting for sectoral differences in production and trade patterns. A counterfactual exercise allows us to show that this disparity is primarily (80%) due to more aggressive Global Value Chain (GVC) strategies for EVs and to a much lesser extent (20%) due to a technology gap in EV production. This highlights the importance of GVC shifts in driving the EU's higher foreign dependence in EV production. We extend the EU-level analysis to countries and regions, showing heterogeneity in EU economic structures and their reliance on the Single Market relative to non-EU economies.

A comparison with the US automotive industry reveals similar challenges. Our results demonstrate that in the US, 82% of inputs for ICE manufacturing come from domestic sources, compared to 74% for EVs. While these figures mirror the EU case, there are significant differences in the sourcing strategies. The US sources approximately 1.6 times more intermediate inputs from Mexico for EV production (7%) than for ICE manufacturing (4.5%), while reliance on China remains similar across vehicle types (2% for both ICE and EV).

The paper contributes to the existing literature on input-output analysis by providing a flexible, easy-to-implement methodology applicable to various sectors and technologies that allows cross-country and regional comparisons. By enabling more granular, tailored analysis, our approach can inform evidence-based policy actions to address competitiveness and technological gaps,

mitigate sovereignty risks, and promote resilience. The methodology's versatility and accessibility make it a valuable tool for policymakers, researchers, and industry stakeholders seeking to better understand complex production systems and inform strategic decision-making.