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**AUTOMOBILES AND THE FATE OF NATIONS: A GREEN
RESTRUCTURING OF THE WORLD CAR INDUSTRY?**

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**The future of the automotive industry:
dangerous challenges or new life for a saturated market?**

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Outline

- ❖ The hierarchical regionalisation of production and trade

- ❖ Transformation and challenges
 - ❖ Process: digitalisation
 - ❖ Product: CASE (connectivity, autonomy, sharing, electrification)
 - ❖ Geopolitical: trade agreements and the spectre of mercantilism?

- ❖ Questions
 - ❖ International division of labour: core-peripheries
 - ❖ Profit allocation between sectors and within the automotive sector
 - ❖ Jobs gained and jobs lost

- ❖ Policies?
 - ❖ Orienting and governing the transformation
 - ❖ Safeguarding jobs and labour standards

The hierarchical regionalisation of production and trade

From core areas to global sourcing:

Technology: Just in time and lean production

OEMs (Original Equipment Manufacturers):

costs: exploit countries' differences

markets: "produce where you sell"

Tiers-1: follow sourcing

The geographic structure of the automotive industry is now based on the presence of large assemblers and leading (global) suppliers in all major markets, organized in functionally integrated macro-regional production networks.

The competitive process results in the dynamic nature of nations' position within auto-motive production networks, with production moving between core, semi-periphery and integrated periphery.

GVCs and (regional) clusters

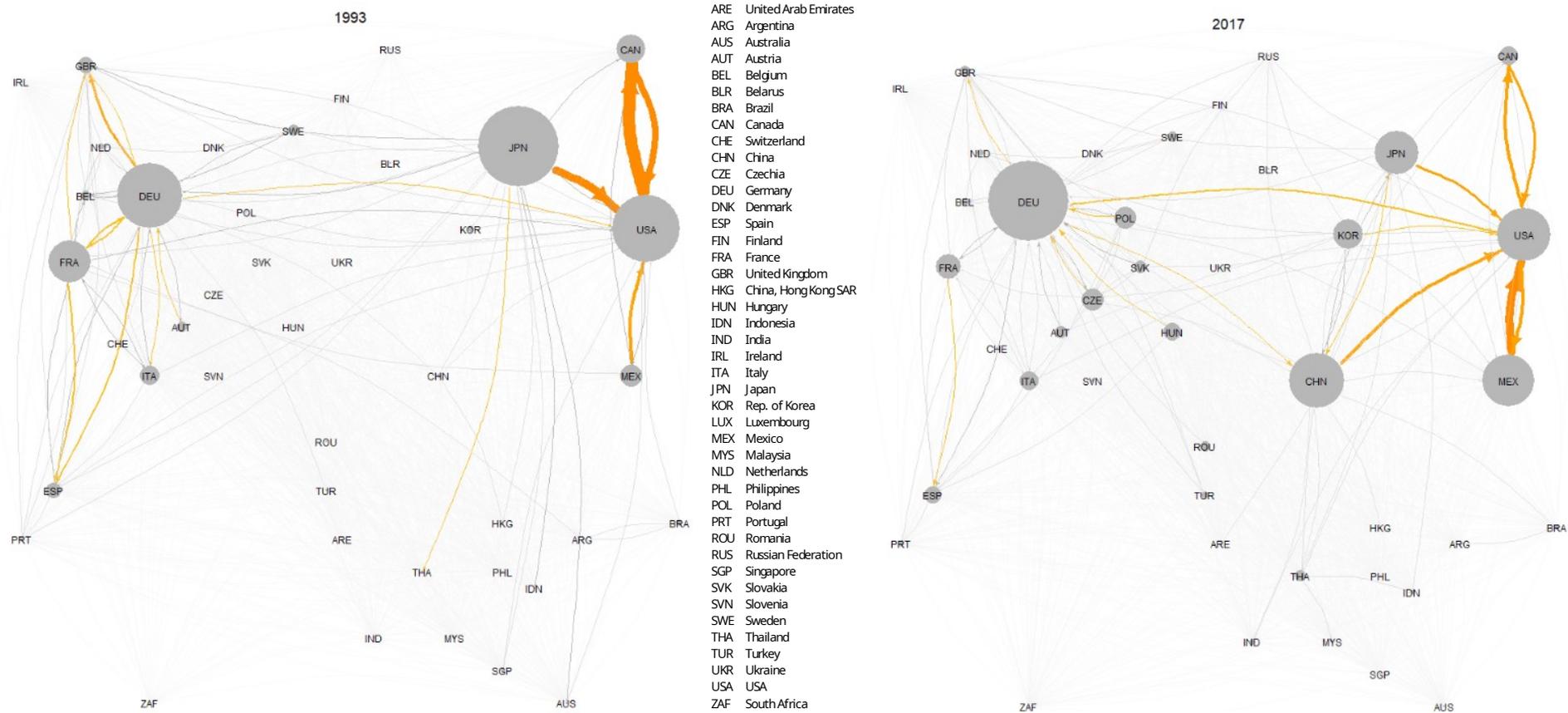
Russo et al (2020) use network analysis to study changes in clustering of countries in the automotive components trade

- 30 commodities, parts and components
 - 42 reporting countries (98% of total world exports of automotive components and parts),
 - Over the period 1993-2017
- ✓ Clustering method highlights specific sub-clusters of countries that later merged into other clusters
 - ✓ the spatial distribution of clusters is largely associated to the geographical position of countries,
 - ✓ Trade is organized in macro-regions, which somehow redefines the 'global' in global value chains.
 - ✓ much trade occurs within the macro-regions: GVC had already been shortened by OEMs localisation and follow sourcing.

Figure 4 – Bilateral trade of automotive components and parts (30 SITC3), in 1993 and 2017, 42 countries

Nodes [countries]: size proportional to share of export; Edges [export trade flows]: thickness proportional to weight, compared to the maximum share in 1993 and 2017: $E(gE)\$width <- 15*(E(gE)\$weight/0.1091114)$;

Colour of edges: 6 classes defined on the basis of the distribution of shares in 1993 and 2017:



Source: Russo, Alboni, Carreto, Righi, Simonazzi (2020)

Integrated semiperipheries

Mexico and Central and Eastern European countries (CEE)

- Common features:

- Cheap labour, geographic proximity to large markets, membership in regional trade agreements, and public incentives to foreign investment

A dualistic production structure (Singer 1950) or a stepping stone for development?

- The creation of clusters that bring together a multiplicity of suppliers and auxiliary services around the main OEMs, the exceptional growth in production and exports, the direct and indirect creation of jobs, have been cited as indication of the activation of positive linkages

however

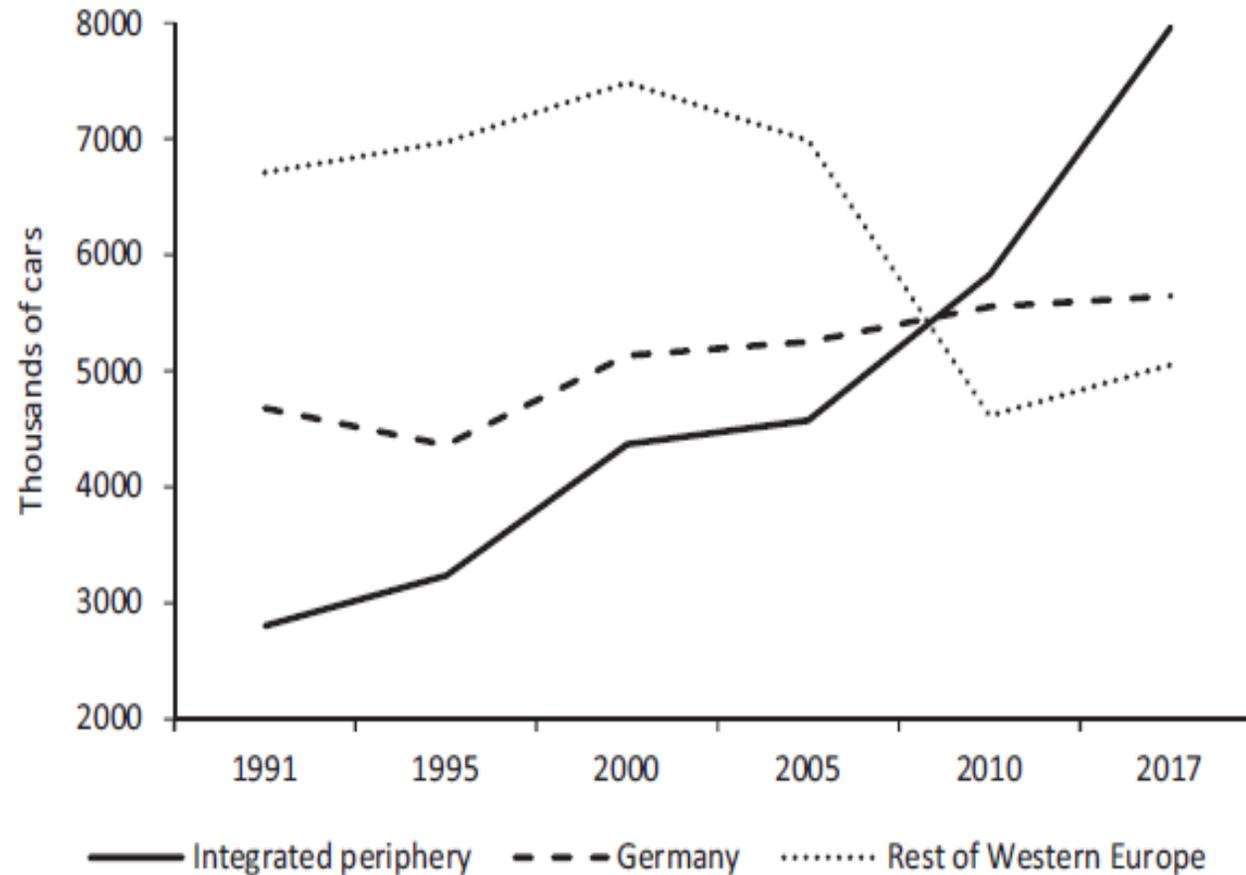
- Foreign firms (OEMs and Tiers-1) dominate production
- Based on state of the art factories and technologies
- R&D occurs mostly in corporate headquarters

Little spill-over effects on domestic industry?

Core and semiperiphery

- Delocalisation puts pressure on production, jobs and wages in the core
- Different effects on core countries: Germany vs. France and Italy (fig.)
 - more extensive offshoring of car assembly by French and Italian automakers
 - explained by a greater share of small cars in their product portfolio,
 - and Germany's large exports of mostly premium cars to China.
- At the same time, German automakers offshored a greater proportion of the production of components, especially to Eastern Europe, in order to benefit from its lower labour costs, attaining a more efficient intra-corporate division of labour.
- As in other core countries, German locations were under great competitive pressure. Shifts in jobs to low-wage countries have resulted in concession bargaining at many automotive supplier locations to prevent relocations or to gain new products for the plant

Car production trends in Europe, including Turkey and Morocco, 1991-2017



Source: Pavlinek (2020)

Challenges

Social, environmental, technological, and geo-political challenges open new scenarios

- Digitalisation (Industry 4.0) changes the organisation of production and puts jobs at risk of automation, deskilling and work intensification (Pardi et al 2020)
- Connectivity, autonomy, sharing, electrification (CASE) radically change the nature of the product and the way of using it
- Changes in the balance of power between the main countries influence trade agreements, redefining the convenience of localization

Effects on the structure of the automotive industry and on its geographical organisation

Digitalisation and trade agreement: the case of Mexico

- USMCA Treaty: requirements on regional content, wages and labour rights
- In highly fragmented value chains the capacity to track the product, that is to verify the history, location or status along and across all the stages of the value chain by means of documented identification is a critical issue
- Digitalisation: a challenge and an opportunity
- Making traceability effective by the adoption of digital technologies could start a big transformation across the entire supply chain. It may represent an efficient support to Tiers-1 and Tiers-2 in achieving quality control of products and ensuring the flexibility in the just-in-time programming of the flow of products, and in certifying their compliance with the Treaty's requirements
- Great variety in the intensity and methods of application of digital technologies (even in German firms). Manual work is not going to disappear.
- The question is whether Tiers-2 and Tiers-3 will be able to plan now the transformation of their organization to keep up with digital transformation. Companies unable to keep the pace of traceability risk losing their customers.

What is a car?

The “CASE” revolution

- The automotive product is changing: with connectivity, autonomy, sharing and electrification (CASE), electronics and software play an ever greater role and represent a significant share of the value of the vehicle.
- Competition is no longer between the traditional players, but extends beyond the automotive sector, to include batteries, software, connection, mobility.
- Core competences are changing rapidly and require skills that have not, so far, been among the core competences of automotive engineering.
- The shift to electric vehicles will result in a drastic reduction in components, new inputs, new value chains, with jobs lost and gained, and a new configuration of the comparative advantage of countries.

Software giants: partners or competitors?

- The automotive industry confronts deep uncertainty about the future evolution. OEMs and their suppliers need to consider multiple hypotheses in formulating their strategies. Their competences are no longer sufficient to master the digital innovation.
- Alliances and flexible forms of collaboration - with old competitors and the new players in the technology industry alike - offer a safer route as a way to share the risk: "to gain speed, to gain technological advantage, to share risk"
- The increasing relevance of (big) data and digital devices may shift the power from OEMs and their suppliers to high-tech and IT players and platforms. If the car follows the destiny of the computer, where the value is increasingly in the software, a re-distribution of profits across sectors is very likely.
- Moreover, since R&D in the new software and digital technologies are mostly developed in regions other than those dominated by OEMs, even the automotive industry's old core, which based its supremacy in engineering excellence, risks losing ground. The core is also shifting.

Public policy

- Competition between technologies that are still in an early phase make for an uncertain scenario, leaving room for the role of the state in orienting and governing the change.
- Public policy will be needed also because the shift to electric batteries will impact on suppliers with different intensity, and may result in a drastic reduction in jobs. Semi-peripheries and integrated peripheries in Europe, that specialise in the production of parts and components, may suffer more.
- The two main European countries are investing heavily in the industry to tackle the new challenges. Given the number of people directly and indirectly employed by the automotive industry in Europe, a coordinated policy at the European level is urgently needed to reduce the risks for employment and ensure a common benefit from innovation.