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Executive Summary

# „The Central European Manufacturing Core: What is Driving Regional Production Sharing?“

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## Abstract

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There is evidence that Europe's manufacturing activity is increasingly concentrated in a Central European (CE) core which the IMF in a recent publication also refers to as the German-Central European supply chain. This CE manufacturing core is dominated by Germany and in addition comprises Austria and the four Visegrád countries (the Czech Republic, Slovakia, Hungary and Poland). The case of Austria is particularly interesting because it is neither the primary technology leader within the country group, nor is it an offshoring destination and therefore takes an intermediate position. This study provides further empirical evidence for the growing concentration of European industrial production in the CE manufacturing core and explores in detail the structure and development of the regional supply chains over the period 1995-2011. This includes an analysis of the impact of international production integration on the value added share of manufacturing in the economy. The econometric results point towards differentiated effects for the members of the CE manufacturing core and the remaining EU Member States. Focusing on value added generated by the manufacturing sector, the industries which build the backbone of this regional manufacturing cluster are identified. Finally, the report investigates which factors are conducive to the intensification of international production sharing. In line with the notion of a production-investment-services nexus, it is found that (inward) FDI in the manufacturing sector is associated with higher degrees of production integration. Again, the econometric evidence suggests that some of the factors explaining international production sharing, such as the level of export sophistication, have differentiated effects for the members of the CE manufacturing core as compared to the other EU countries.

**Keywords:** European manufacturing, production integration, global value chains, structural change

**JEL-codes:** F14, F15, L16

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### **Summary**

## **The Central European Manufacturing Core: What is Driving Regional Production Sharing?**

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# **The Central European Manufacturing Core: What is Driving Regional Production Sharing?**

## **Summary**

There is ample evidence that Europe's manufacturing activity is increasingly concentrated in a Central European (CE) core. In a recent publication the IMF refers to this CE manufacturing core as the German-Central European supply chain comprising Germany, which takes a pivotal role in the organisation of the region's production networks, Austria as well as the four Visegrád countries, i.e. the Czech Republic, Slovakia, Hungary and Poland. This study "The Central European Manufacturing Core: What is Driving Regional Production Sharing?" provides further empirical evidence concerning this CE manufacturing core and explores in detail the structure and development of the regional supply chains over the period 1995-2011. In addition the structure and development of regional production integration since 1995 is analysed. Importantly, the study also sheds light on the relationship between the intensification of production integration on the one hand and the concentration of manufacturing capacity on the other hand.

A common feature of the members of the CE manufacturing core is that they figure among the EU countries with the highest share of manufacturing in GDP, reaching close to 20% in most countries. Moreover, the structural change which has occurred over the period 1995-2011 – notably the shift out of manufacturing – was less pronounced in the CE manufacturing core than in other EU Member States or even reverted. Moreover, the CE manufacturing core is characterised by a higher "manufacturing intensity" defined as value added exports per capita as compared to the rest of the EU. The average manufacturing export intensity, defined as value added exports per capita, in the CE manufacturing core was similar to that in the rest of the EU back in 1995. However, from the early 2000s onwards the two groups have embarked on divergent trends. While the manufacturing core countries significantly increased their export intensity to approximately EUR 3,700, the value of the other Member States basically had stagnated, hovering around EUR 2,000 for several years and reached EUR 2,200 in 2011. This implies a huge differential in export intensities between the two groups of countries which has in fact swollen to 40% in 2011.

This development of export intensities is paralleled by an impressive 8 percentage points increase in the CE manufacturing core's share in total EU value added exports to 42.6% in 2011 (comprising both extra- and intra-EU exports). Notably, the share in total EU manufacturing industries' exports has increased in each single member of the CE manufacturing core. Given their economic size, Germany and Poland contributed most strongly to this development with gains in market shares amounting to 2.4 and 1.9 percentage points respectively. The flip side of this agglomeration of manufacturing activities in the CE region is a significant decline in the share of EU manufacturing value added exports in other EU Member States (again considered as a share in total EU value added exports), in particular in high-income countries including the Nordic and the Benelux countries and above all France and the United Kingdom.

One of the main results of the report is that the integration in international production chains can have very different effects on individual countries' economic structures. The integration in international supply chains reflects two forms of production integration: backward production integration which is measured by the share of foreign value added in a country's exports on the one

hand and forward production integration, which refers to a country's exported value added which is further embedded in its trading partners exports on the other hand.

The relationship between the change in the manufacturing share (a proxy for manufacturing-related structural change) and the degree of participation in global value chains (GVC participation) is investigated with the help of a panel regression model. This quantitative exercise suggests that on average there is a negative relationship between the share of manufacturing in the economy and GVC participation. More precisely, a 10 percentage point higher GVC participation rate accelerates the negative rate of structural change of the average EU Member State *not* belonging to the CE manufacturing core by 0.35 percentage points. The result is, however, very different for the members of the CE manufacturing core: for the average CEMC country a 10 percentage point higher GVC participation rate slows down the structural shift out of manufacturing by 0.26 percentage points. This result clearly supports the view that the structural impact of global supply chain integration is country-specific. Some countries see their manufacturing sector strengthened by international production sharing, while in others it accelerates the 'de-industrialisation' process. Within the EU, there seems to be a different effect of supply chain integration observable for the members of the CE manufacturing core and the other EU countries. One can therefore conclude that the integration into supply chains has contributed to the agglomeration of manufacturing activities.

A second key finding of the study, emerging from an in-depth analysis of the production integration among the members of the CE manufacturing core, is the strong orientation towards integration with other group members, i.e. a high share of 'intra-CEMC' production sharing. The overall degree of both backward and forward production sharing is shown to be highest in the Czech Republic and in Slovakia reaching almost 70 per cent of gross exports. The focus on intra-CEMC production integration, however, is most pronounced in Austria where about half of all production inter-linkages are established with other members of the CE manufacturing core. In this context it is interesting to note that the pattern of production integration in Germany and Austria – in stark contrast to the Visegrád countries – is characterised by relatively stronger forward production integration than backward integration. This suggests that the role of Germany and Austria in the CE manufacturing core is primarily that of suppliers of specialised inputs, i.e. they are the primary technology providers for the CE manufacturing core. At the same time, however, it is also clear that, given its size, the importance of Austria, both as a supplier of inputs for other CE manufacturing core members' exports and as a destination for onward-processing, remains limited when compared to Germany. Overall this suggests that the CE supply chain is very much driven and presumably also managed by the activities of German lead firms. In fact, Germany is the dominant source of foreign manufacturing value added in the exports of the other CE manufacturing core countries, ranging from 10% (Poland) to 13% (Austria and the Czech Republic), and it is also the country which absorbs the highest shares of manufacturing value added originating from the CE manufacturing core countries (ranging from around 7% in Slovakia to almost 10% in Austria) in its own exports.

Bringing in the time dimension, it is also shown that intra-CEMC production integration has increased over time. Considering the backward production integration, i.e. the foreign value added in exports, the intra-CEMC production integration accounted for a fifth of the country group's foreign value added in exports but this share increased to more than 25% in 2011. This re-orientation of production sharing within the CE manufacturing core occurred mainly between 1995 and 2004. Since then the development has been more or less flat. So it seems that the crisis has not left its trace on the geographic orientation of international backward production integration – at least not yet.

Thirdly, looking at the industry dimension within the manufacturing sector, five industries can be identified to be the drivers of international production integration in the CE manufacturing core. These are the transport equipment industry, the electrical equipment industry, the metallurgy industry, including metals and metal products, the machinery industry and the chemical industry. Taken together these five industries account for more than 90% of global value chain participation in the CE manufacturing core. This result is based on these sectors' contributions to the economy-wide foreign value added in exports and their contributions to domestic value added embodied in foreign exports.

Finally, an attempt is made to explain the factors that foster respectively hamper international production sharing. In line with the notion of a production-investment-services nexus, the econometric results put forward by the study suggest that (inward) FDI in the manufacturing sector is associated with a higher degree of production integration. Moreover, geographic proximity to Germany seems to foster production integration, which confirms the earlier finding that Germany is at the heart of the CE manufacturing core. However, also in this context some factors seem to affect global value chain participation differently in the CE manufacturing core and the rest of the EU. One such example is the level of export sophistication which reflects a country's production capabilities. On average, EU Member States' higher export sophistication is associated with a lower degree of international production integration. The opposite, however, is true for the average CE manufacturing core country where the results point – similar to the findings above – to a positive relationship. An explanation for these differentiated effects is that on the one hand higher export sophistication reduces the dependence on imported inputs which tends to reduce global value chain participation. On the other hand, a certain level of export sophistication is needed in order to serve as a partner in international production networks which implies a positive association between export sophistication and international production integration.