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Where are the Growth Potentials in CESEE?

An Illustration of Sectors and Products Using the Product Space

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Abstract

This paper investigates the sectoral and export structures as well as the product spaces of 11 economies in Central, East and Southeast Europe (CESEE). We first employ an analysis based on revealed comparative advantages (RCAs) to identify promising sectors for future growth and then combine this analysis with a product space approach to detect related and complex products that could help these economies diversify and upgrade. The RCA analysis shows that the CESEE countries still hold a comparative advantage in manufacturing, although a slightly negative trend emerged between 2013 and 2020. Meanwhile, some services – particularly computer programming, consultancy and information service activities – have emerged as the most successful sectors to date. The product space analysis indicates that for the majority of the CESEE economies, it is possible to identify relatively complex products that could be easily targeted to spur upgrading. We also find that while we run the analysis separately for each of the 11 CESEE countries, the identified opportunities are often the same. While this is intuitively explained by the similar specialisations of these 11 countries, from a policy perspective this finding implies that each country has to deploy a battery of indicators to identify profitable and realistic niches within these broadly defined product categories.

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1. Introduction

The Central, East and Southeast European (CESEE) countries have experienced rapid growth in the last 20 years. After the collapse of communism and their accession to the EU, a significant inflow of foreign direct investment (FDI) fostered structural transformation and sectoral convergence with Western Europe (Stehrer and Stöllinger 2015). This FDI-oriented growth model has created a strong export-oriented manufacturing sector, which is often engaged in medium- and high-tech industries and particularly in automotive (Grieveson et al. 2021; Stöllinger 2021; Kordalska et al. 2022). While having served as a catalyst for a deep structural transformation process, today this growth model has clearly reached its limits and a new growth model based on new growth opportunities is being sought for the future (see Bykova et al. 2023; Zavarskà et al. 2023). This study aims to illustrate where these new growth potentials could be found for the region by using several complementary data sources and leveraging the concepts and metrics of the product space. This exercise comes during a time of disruption and uncertainty in which new technologies and actors are putting pressure on established sectors and in which predictions about future developments between path dependency and new trends are rather uncertain. Such exercises also generally require highly disaggregated data and analyses across a wide range of dimensions, such as FDI patterns, demand trends and innovation trajectories. For this reason, this analysis should not be taken as an effort to identify the sectors and products that will become targets of future industrial policies, but rather as food for thought on how different data and methodologies can inform policy decisions.

In doing so, this paper analyses the sectoral and export structures of the countries in the region to shed light on some of the promising sectors for the region, which are identified by the data analysis and based on their current specialisations. The countries included in the analysis are the 11 Central and Eastern European member states of the EU (EU-CEE): Bulgaria, Croatia, Czechia, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovakia and Slovenia. The study relies on two main data sources and types of analysis. It first looks at value-added shares and revealed comparative advantage values (RCAs) by using Eurostat's FIGARO database, which covers 64 industries (NACE rev. 2 classification), including both the manufacturing and service sectors. It then uses the product space analytical framework and indicators to study more detailed export data from the UN Comtrade database. As the product space literature does not yet analyse trade in services, this second analysis focuses on manufacturing products and provides insights on the four-digit Harmonized System (HS) level. By combining these two analyses, this paper reveals an overall picture of the growth potentials for the region's economies.

The paper is structured as follows: Section 2 starts with a review of the structure of CESEE economies today in terms of value-added shares, asking what their main sectors and industries are and which of their industries have been growing in recent years. This is complemented by an analysis of the export structures using RCAs that looks at both the manufacturing and services sectors. Section 3 then looks at detailed growth potentials within manufacturing industries through the lens of the product space. Lastly, Section 4 provides a summary of the paper's main findings as well as concluding remarks.

2. Setting the scene: Importance of sectors and industries today

2.1. INDUSTRY STRUCTURE

This chapter first depicts the structure of the CESEE economies today by looking at valued-added shares within the total economy and manufacturing, asking what their main sectors and industries are and whether distinct specialisation patterns can be identified. Second, we look at recent trends, asking which industries grew during the period between 2013 and 2020 as well as which industries were on a declining path.

Looking at broad sectors of the economy (see Figure 1 and Table A1 in Appendix A), manufacturing stands out as the single largest sector in the countries of Central and Eastern Europe (CEE) and is an important distinguishing feature within the region. The most industrialised economies are those of the Visegrád countries: In Czechia and Slovenia, the manufacturing sector accounted for 24% of the economy's value added in 2020. The manufacturing sector also plays a prominent role (18-20%) in Hungary, Slovakia, Poland and Romania,[1] and it is only much smaller in the Baltic countries, Bulgaria and Croatia.

While agriculture, mining, electricity and water supply are generally small sectors within the economies of the region, certain market and non-market services do play an important role, with the wholesale and retail trade as well as real estate being especially large sectors (accounting for more than 10% of value added). Sectors accounting for around 5% of value added include: construction; transportation; information & communication; professional, scientific and technical activities; public administration; education; and human health. Some country-specific features stand out: While Lithuania and Poland have a very large wholesale and retail trade sector, Lithuania has the largest transportation sector in the region.[2]

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[1]   In some parts of the paper, we use Austria and Germany as comparative countries. In 2020, manufacturing accounted for an 18% share in Austria and a 20% share in Germany.

[2]   On average, the CESEE economies have larger shares compared to Austria and Germany in agriculture, wholesale & retail trade, and transportation, and smaller shares in real estate, administrative and support service activities, and human health.

Figure 1 / Shares of sectors in value added, in % of total economy, 2020
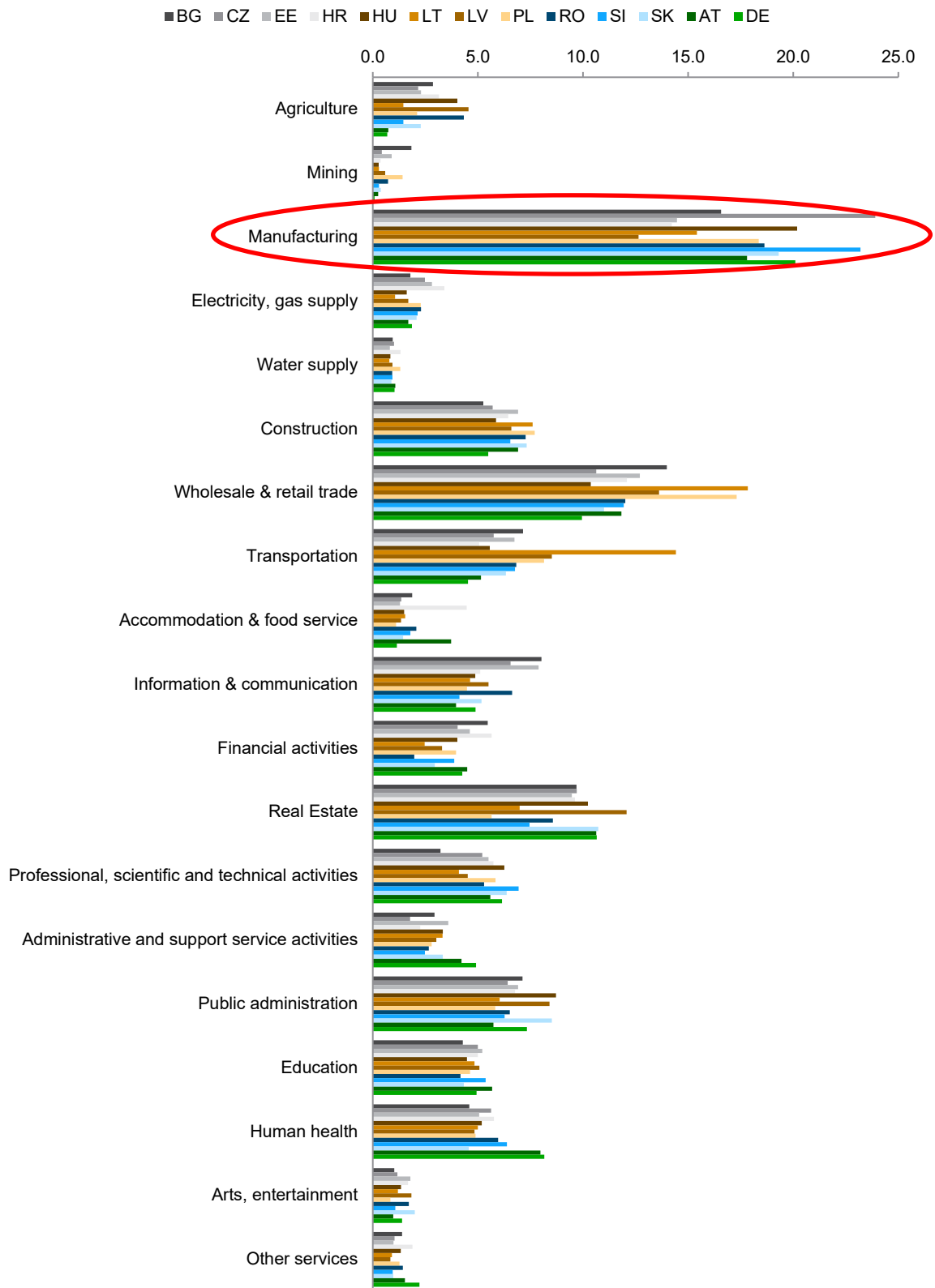
Notes: NACE rev. 2 classification, broad sections A-N.
Source: Eurostat's FIGARO database.

Looking at manufacturing in detail, one can find more differentiation in industry patterns and identify country specialisation patterns. Figure 2 shows value-added shares of manufacturing: Most of the Visegrád countries (Czechia, Hungary, Slovakia) are heavily specialised in the automotive industry, together with a large share in fabricated metal products. While Slovenia's largest manufacturing industry is the pharmaceuticals industry, Poland's is the food industry. The Baltic countries are specialised in wood products and furniture, but they also have large food sectors. The EU countries of Southeast European (EU-SEE) – encompassing Bulgaria, Croatia and Romania – are likewise heavily specialised in the food sector, though Romania is also specialised in the automotive industry.[3]

After the global and financial crisis, the size of the manufacturing sector declined in the region, which was in line with a general trend of a shrinking industrial sector. This development was most pronounced in Romania and Lithuania, where the manufacturing sector lost five percentage points during the period between 2013 and 2020. The decline was smaller in the other countries. The manufacturing sector only retained its size in Poland and Latvia, and it grew in Bulgaria (by 1 pp) and Slovenia (by 2 pp).

Trends were not uniform across broad sectors over time, as there were both growing and declining industries within manufacturing and services (see Figure 3 and Table A2 in the Appendix A). Looking at positive developments, value-added shares increased in all 11 CESEE countries in two service sectors: 'computer programming, consulting, and information service activities' (J62_63) and 'human health activities' (Q86). In addition, positive value-added changes in most countries occurred in the following industries:

› Manufacturing: 'electrical equipment' (C27), 'motor vehicles, trailers and semi-trailers' (C29), and 'furniture; other manufacturing' (C31_32) as well as 'construction (F)

› Market services: 'wholesale and retail trade and repair of motor vehicle and motorcycles' (G45), 'retail trade; except of motor vehicles and motorcycles' (G47), 'architectural and engineering activities; technical testing and analysis' (M71), 'advertising and market research' (M73), 'other professional, scientific and technical activities; veterinary activities' (M74_75), 'renting and leasing activities' (N77), 'security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support activities' (N80-T82)

› Non-market services: 'public administration and defence; compulsory social security' (O84), 'education' (P85), 'residential care activities and social work activities without accommodation' (Q87_88).

On the other hand, the value-added share decreased in all 11 CESEE countries in three industry sectors and one service sector: 'manufacture of textiles, wearing apparel, leather and related products' (C13-T15), 'manufacture of coke and refined petroleum products (C19), 'electricity, gas, steam and air conditioning supply' (D35) and 'telecommunications' (J61).

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[3] On average, the CESEE economies have larger shares compared to Austria and Germany in the food, textiles and wood sectors, and smaller ones in computers and electronics, machinery and motor vehicles.

Figure 2 / Shares of sectors in value added, in % of manufacturing, 2020
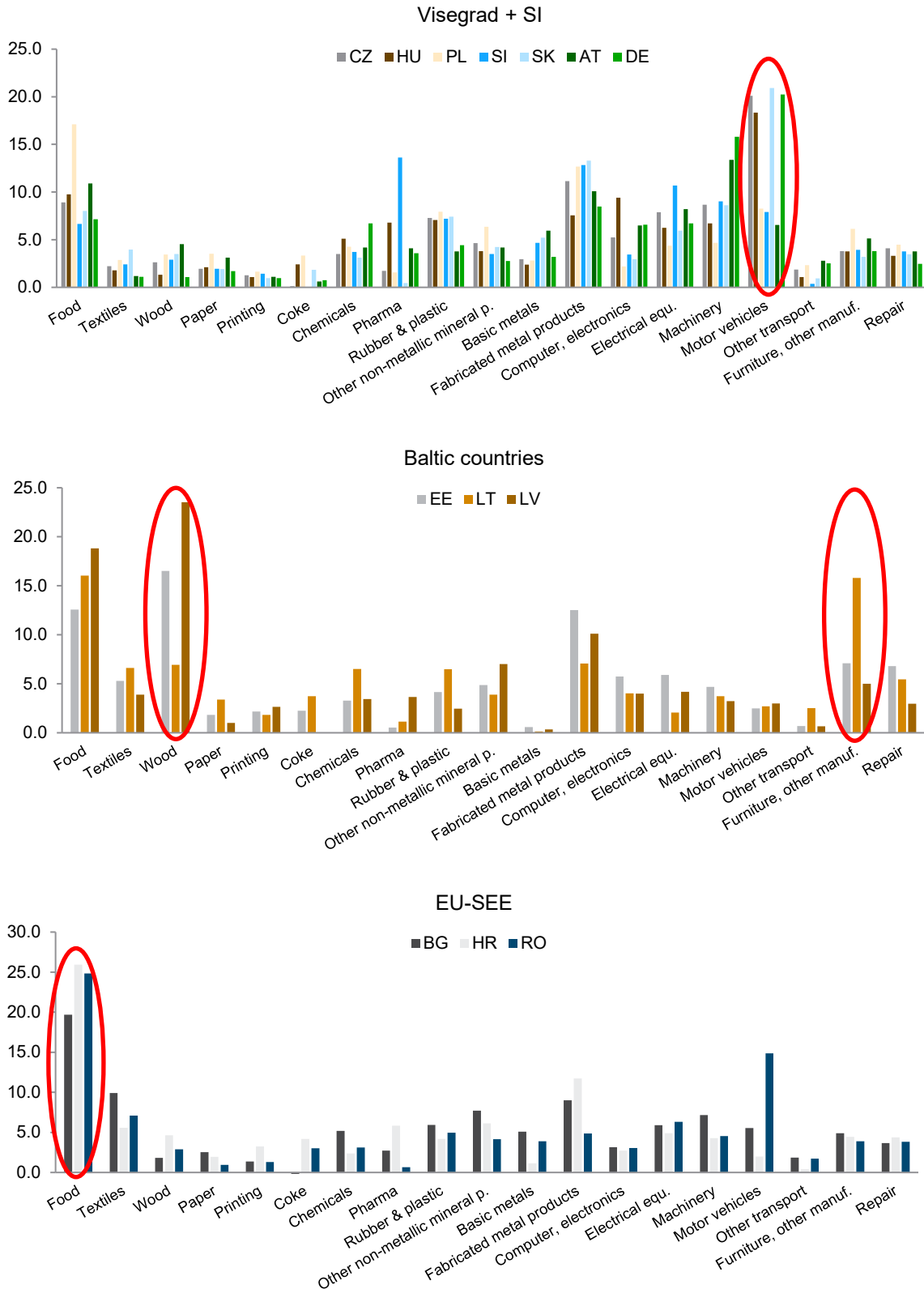
Notes: NACE rev. 2 classification, 2-digit-level.
Source: Eurostat FIGARO Release 2022.

Figure 3 / Change in value added shares, 2013-2020, in percentage points
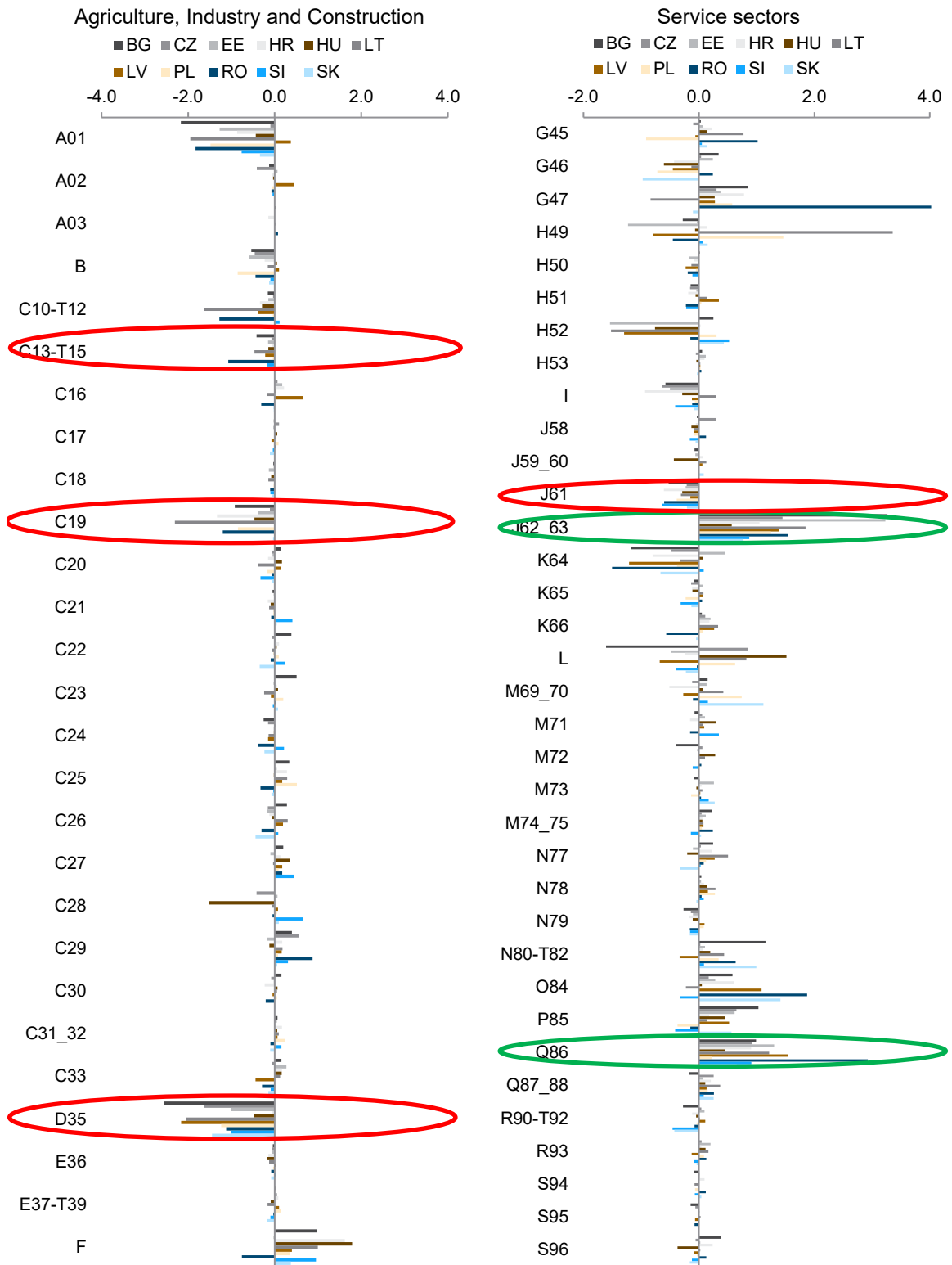
Notes: NACE rev. 2 classification, 2-digit-level. See Appendix A for list of industries.
Source: Eurostat FIGARO Release 2022.

2.2. TRADE SPECIALISATION

In this section, we analyse the export structure of the CESEE economies by looking at normalised revealed comparative advantage values (RCAs). They range between 1, signaling a comparative advantage, and -1, indicating a comparative disadvantage for the respective sector. The simple RCA analysis on a broad level shows a diverse picture of comparative advantage patterns not only across manufacturing and services sectors but also across countries. Table 1 shows the RCA values for 2020, highlighting the strengths and weaknesses of countries in terms of RCAs. Table 2 then depicts how the RCAs changed between 2013 and 2020, revealing trends over time and displaying gaining and losing sectors.

Overall, the CESEE countries, together with Austria and Germany, hold a comparative advantage in many manufacturing sectors. This can be seen from the mainly green picture in the upper part of Table 1 covering the manufacturing sectors, with green representing a positive RCA and thus a comparative advantage (e.g. for wood products, rubber and plastic products, other non-metallic mineral products, fabricated metal products, and repair). Only the Baltic countries show more red fields, indicating negative RCAs and thus a comparative disadvantage. Looking at service sectors, which are depicted in the bottom part of Table 1, a more varied picture emerges, and the colour turns from green to red as one moves further down the table. Thus, while the CESEE countries mostly hold a comparative advantage in the trade and transport sectors, they exhibit a comparative disadvantage in the other service sectors, notably in non-market services. For Austria and Germany, in contrast, the picture is lighter and the comparative patterns are less pronounced.

Looking at trends over time, Table 2 then shows how the RCAs changed between 2013 and 2020. Overall, the picture is very light, indicating that no marked changes occurred during this time period. For manufacturing, more red-coloured fields appear, indicating a slightly negative trend and a decrease in RCAs in many CESEE countries. The RCAs also declined somewhat for Austria and Germany. The picture is more varied in services and turns out to be more country-specific. For Estonia, Croatia and Germany, the picture is greener, indicating increasing RCAs. This is evident in both market and non-market services for these countries. Looking at trends across sectors, RCAs increased in all 11 CESEE countries in two service sectors: 'computer programming, consultancy, and information service activities' (J62_63) and 'public administration and defence; compulsory social security' (O84). Other positive developments can only be seen in one manufacturing sector, motor vehicles, and in a number of market service sectors (wholesale, accommodation, auxiliary services, architectural and engineering activities, employment activities, security and investigation) and another two non-market service sectors (education, membership organisations). On the other hand, RCAs decreased in all countries for the pharmaceutical industry.

Table 1 / RCAs, 2020, per country

NACE	BG	CZ	EE	HR	HU	LT	LV	PL	RO	SI	SK	AT	DE
A01	0.40	-0.33	-0.23	0.14	0.06	0.32	0.38	-0.13	0.37	-0.35	-0.36	-0.53	-0.59
A02	0.04	0.57	0.81	0.50	-0.18	0.61	0.86	0.03	0.05	0.68	0.23	-0.49	-0.61
A03	-0.38	-0.52	0.39	0.69	-0.80	-0.70	0.19	-0.77	-0.67	-0.81	-0.96	-0.96	-0.87
B	-0.39	-0.89	-0.81	-0.84	-0.98	-0.82	-0.54	-0.53	-0.89	-0.88	-0.90	-0.90	-0.95
C10-T12	0.16	-0.07	-0.03	0.07	0.05	0.31	0.17	0.29	-0.36	-0.38	-0.30	0.19	-0.07
C13-T15	0.07	-0.29	-0.11	-0.10	-0.49	-0.02	-0.35	-0.30	-0.07	-0.27	-0.36	-0.45	-0.65
C16	-0.05	0.19	0.87	0.59	-0.21	0.57	0.89	0.31	0.47	0.51	0.17	0.53	-0.21
C17	-0.08	0.30	0.11	-0.16	0.11	0.04	-0.25	0.31	-0.35	0.38	0.23	0.43	0.18
C18	-0.23	-0.28	0.78	0.62	0.14	-0.62	0.76	0.41	-0.61	0.53	-0.09	0.37	0.27
C19	0.23	-0.94	-0.33	-0.02	-0.19	0.69	-0.98	0.15	-0.20	-1.00	0.08	-0.49	-0.22
C20	-0.23	-0.15	-0.25	-0.55	-0.15	0.16	-0.37	-0.17	-0.41	-0.12	-0.35	0.11	0.21
C21	-0.29	-0.68	-0.77	-0.17	0.07	-0.85	-0.48	-0.54	-0.84	0.55	-0.85	-0.12	0.27
C22	0.10	0.44	0.02	-0.14	0.38	0.11	-0.30	0.39	0.38	0.39	0.44	0.07	0.18
C23	0.50	0.36	0.24	0.32	0.18	-0.05	0.25	0.28	-0.27	0.31	0.19	0.12	0.02
C24	0.44	-0.22	-0.82	-0.82	-0.33	-0.92	-0.58	-0.21	-0.10	0.17	0.15	0.22	-0.06
C25	0.03	0.42	0.35	0.37	0.16	0.06	0.23	0.36	0.18	0.49	0.41	0.41	0.12
C26	-0.63	0.02	0.02	-0.88	0.18	-0.73	-0.50	-0.52	-0.56	-0.61	-0.22	-0.33	-0.22
C27	0.06	0.28	0.15	-0.22	0.21	-0.41	-0.27	0.12	0.26	0.42	0.13	0.16	0.10
C28	-0.23	0.10	-0.36	-0.47	-0.10	-0.62	-0.66	-0.28	-0.08	0.01	0.07	0.25	0.34
C29	-0.43	0.59	-0.53	-0.84	0.56	-0.69	-0.61	0.18	0.39	0.22	0.68	0.10	0.39
C30	-0.54	-0.35	-0.83	-0.49	-0.56	-0.66	-0.75	-0.33	-0.40	-0.83	-0.64	-0.15	-0.03
C31_32	-0.16	0.01	0.11	-0.31	-0.21	0.41	-0.18	0.19	0.10	0.00	-0.18	-0.05	-0.13
C33	0.10	0.39	0.69	0.48	0.33	0.41	-0.41	0.34	0.24	0.51	-0.08	0.57	0.21
D35	0.55	0.19	0.46	0.74	0.25	-0.93	-0.12	-0.14	0.09	0.68	0.07	0.42	0.01
E36	0.20	0.72	-0.56	0.61	0.45	0.43	0.76	0.42	-0.72	0.74	0.75	-0.72	0.18
E37-T39	0.40	0.15	0.35	0.54	-0.18	0.33	0.50	0.22	0.25	0.14	0.10	-0.20	0.17
F	0.67	0.18	0.74	0.82	0.07	0.53	0.61	0.77	0.42	0.59	0.05	0.36	-0.03
G45	-0.09	-0.85	0.13	0.27	-0.27	0.00	0.10	0.51	-0.08	-0.24	-0.59	-0.06	0.09
G46	0.21	-0.66	-0.05	0.12	-0.19	0.12	0.28	0.14	0.01	-0.26	-0.52	0.11	0.02
G47	0.47	-0.70	-0.27	0.63	-0.67	-0.49	0.17	0.53	-0.99	-0.28	-0.25	-0.58	-0.81
H49	0.30	0.25	0.14	0.32	0.09	0.75	0.64	0.34	0.65	0.42	0.12	0.02	-0.64
H50	-0.92	-0.98	-0.29	-0.06	-0.94	-0.69	-0.64	-0.90	-0.41	-0.86	-0.96	-0.98	0.17
H51	-0.38	-0.67	-0.16	-0.24	-0.04	0.00	0.60	-0.15	-0.51	-0.71	-0.95	-0.46	-0.09
H52	0.25	-0.10	0.64	0.44	0.11	0.61	0.45	0.00	0.15	0.32	-0.26	0.05	-0.29
H53	-0.30	-0.43	0.48	0.37	-0.18	-0.02	-0.20	-0.70	-0.21	-0.35	-0.24	0.32	-0.46
I	-0.72	-0.97	-0.92	-0.45	-0.85	-0.38	-0.95	-0.67	0.21	-0.90	-0.91	-0.06	-0.24
J58	-0.50	0.18	-0.88	-0.69	-0.55	-0.46	-0.39	-0.18	-0.25	-0.30	-0.73	-0.30	0.12
J59_60	-0.53	0.18	-0.58	0.02	0.06	-0.67	-0.50	0.01	-0.81	-0.35	-0.75	-0.53	-0.30
J61	0.25	0.05	0.42	0.40	-0.41	0.04	0.27	-0.20	0.24	0.42	-0.06	-0.13	-0.21
J62_63	0.27	-0.21	0.41	0.30	-0.09	-0.38	0.09	-0.06	0.36	-0.44	-0.20	0.01	-0.15
K64	-0.95	-0.81	-0.49	-0.38	-0.68	-0.71	0.12	-0.74	-1.00	-0.78	-0.82	-0.22	-0.22
K65	-0.31	-0.50	-0.90	-0.77	-0.95	-1.00	-0.99	-0.61	-0.59	-0.26	-0.86	-0.30	-0.03
K66	-0.94	-0.89	-0.42	-0.16	-0.99	-0.95	-0.83	-0.91		-0.98	-0.95	-0.65	-0.19
L	-0.17	-0.38	0.21	0.65	-0.18	-0.32	-0.64	0.56	-0.95	-0.24	-0.14	-0.09	-0.27
M69_70	-0.42	-0.16	-0.02	0.10	0.08	-0.62	-0.46	-0.18	0.21	-0.38	-0.05	0.09	-0.07
M71	-0.17	-0.42	-0.42	0.50	-0.17	-0.72	-0.63	-0.26	0.48	-0.18	-0.44	0.11	-0.09
M72	-0.28	-0.35	-0.66	0.08	-0.08	-0.78	-0.81	-0.46	-0.19	-0.43	-0.76	-0.24	-0.13
M73	0.13	-0.08	0.45	0.71	-0.20	0.18	0.50	0.26		0.30	-0.16	0.21	0.24
M74_75	0.07	-0.69	0.01	0.25	0.43	0.21	0.04	0.22	-1.00	0.51	-0.09	-0.33	-0.35
N77	-0.76	-0.65	-0.25	-0.29	-0.40	-0.56	-0.67	-0.89	-0.55	-0.87	-0.74	-0.29	0.11
N78	-0.85	-0.50	0.85	0.19	-0.51	-0.97	0.82	-0.52	-0.92	-0.50	-0.73	-0.03	0.49
N79	0.55	-0.85	-0.26	-0.10	-0.99	-0.53	-0.95	-0.39	-0.99	-1.00	-0.98	-0.76	-0.05
N80-T82	0.21	-0.21	-0.05	-0.28	-0.30	-0.46	0.00	-0.28	-0.97	-0.66	-0.21	-0.32	-0.01
O84	-0.42	-0.44	-0.18	-0.14	-0.51	-0.14	-0.09	-0.65		-0.38	-0.63	-0.28	-0.06
P85	-0.41	-0.85	-0.92	-0.76	-0.94	-0.85	-0.97	-0.81	-0.99	-0.80	-0.83	-0.56	-0.68
Q86	0.28	-0.73	-0.04	0.89	-0.30	-0.18	-0.83	0.09	-0.32	0.38	-0.22	0.36	-0.20
Q87_88	-0.87	-0.98	-0.93	0.01	-1.00	-0.98	-1.00	-0.61		-0.42	-0.27	-0.50	-0.73
R90-T92	0.08	-0.74	-0.05	0.55	-0.70	-0.25	-0.27	-0.53	-0.77	-0.93	-0.94	0.07	-0.54
R93	0.37	-0.92	0.26	0.73	-0.25	0.10	-0.92	-0.05		-0.32	-0.31	-0.09	-0.58
S94	-0.63	-0.60	-0.11	0.87	-0.96	-0.90	-0.88	0.44	-1.00	0.24	0.45	0.36	0.09
S95	-0.56	0.86	0.12	0.84	0.70	-0.99	-0.90	0.36	-0.82	-0.80	-0.61	-0.36	0.07
S96	0.69	-0.94	0.39	0.82	-0.19	-0.99	-0.87	0.06	-0.79	-1.00	-0.43	-0.61	-0.95

Notes: NACE rev. 2 classification, 2-digit-level. See Appendix A for list of industries.
Source: FIGARO Release 2022; own calculations.

Table 2 / RCAs, Change 2013-2020, per country

NACE	BG	CZ	EE	HR	HU	LT	LV	PL	RO	SI	SK	AT	DE
A01	-0.1	-0.1	-0.2	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.1	-0.2	-0.1	-0.1
A02	0.0	0.1	0.1	-0.2	-0.1	0.2	0.1	0.0	-0.3	0.0	-0.1	-0.1	-0.1
A03	0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	-0.1	0.0	0.0
B	0.2	-0.1	0.0	-0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
C10-T12	0.0	0.0	-0.2	0.1	-0.1	0.0	0.0	0.0	-0.3	0.0	-0.1	0.0	-0.1
C13-T15	-0.1	0.0	0.0	-0.1	-0.1	0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.1	-0.1
C16	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.2	0.0	0.0
C17	0.0	0.1	0.0	0.0	0.1	0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0
C18	0.3	-0.3	0.0	0.2	0.2	-0.7	0.1	0.2	0.0	0.0	-0.2	-0.3	-0.1
C19	-0.2	-0.4	0.1	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	-0.1	0.0
C20	0.0	0.0	-0.1	-0.4	0.0	0.0	0.1	-0.1	-0.2	-0.1	-0.1	-0.1	0.0
C21	-0.2	-0.4	0.0	-0.3	-0.1	0.0	0.0	-0.2	-0.3	-0.1	-0.1	0.0	0.1
C22	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C23	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0
C24	0.0	-0.2	0.0	-0.3	-0.1	-0.1	-0.4	-0.1	-0.2	0.1	-0.1	0.0	-0.1
C25	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	-0.1	0.1	0.0	0.0
C26	0.1	0.0	-0.3	0.0	-0.1	0.1	0.1	-0.1	-0.1	0.0	-0.3	0.1	0.0
C27	0.1	0.0	0.0	-0.3	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	-0.1
C28	0.0	-0.1	0.1	-0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
C29	0.2	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	0.0	0.1	0.0	0.0	-0.1
C30	0.1	0.0	-0.1	0.1	0.1	0.1	-0.1	0.0	-0.1	0.0	0.0	0.2	0.0
C31_32	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
C33	0.2	0.3	0.3	0.1	0.3	0.0	-0.3	0.1	0.0	-0.1	-0.3	0.0	0.0
D35	-0.1	-0.2	-0.1	0.1	0.1	-0.1	-0.1	0.0	0.6	0.0	0.6	0.0	0.0
E36	-0.5	0.0	0.1	0.2	-0.1	-0.2	0.1	0.0	0.3	0.0	0.0	0.0	-0.2
E37-T39	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.1	-0.3	-0.1	0.0	0.1	-0.1
F	0.1	-0.1	0.0	0.2	-0.2	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.5
G45	-0.2	-0.1	0.0	0.0	-0.2	0.1	-0.1	-0.1	0.1	0.0	-0.1	-0.1	-0.1
G46	0.1	0.0	0.1	0.0	-0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.1	0.1
G47	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
H49	0.0	0.0	-0.2	-0.3	-0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0
H50	0.0	0.0	-0.4	-0.1	0.0	-0.1	-0.3	0.0	0.0	-0.4	0.0	0.0	0.1
H51	-0.4	-0.3	0.2	0.1	0.0	0.4	0.2	0.1	-0.2	-0.5	0.0	0.0	0.3
H52	0.1	0.1	-0.1	0.0	0.1	-0.1	-0.1	0.1	0.0	0.1	0.1	0.1	0.1
H53	0.1	0.2	0.6	0.4	0.2	0.0	0.0	0.0	-0.2	0.2	-0.2	0.1	-0.3
I	0.1	-0.1	0.0	0.1	-0.1	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.2
J58	-0.2	0.1	-0.1	-0.5	-0.1	-0.1	-0.2	-0.1	0.4	-0.3	-0.2	-0.2	0.0
J59_60	-0.1	0.2	-0.1	0.9	-0.3	-0.1	-0.1	-0.1	-0.7	-0.1	-0.2	-0.2	-0.2
J61	0.0	0.2	0.0	0.6	0.0	0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.1
J62_63	0.2	0.0	0.3	0.2	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.1
K64	0.0	0.0	0.0	0.0	0.1	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1
K65	0.1	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	0.3	0.0	0.0	-0.3	0.1
K66	0.0	0.0	0.2	0.7	0.0	0.0	0.1	0.0		0.0	0.0	0.0	0.2
L	0.0	-0.2	0.1	-0.2	0.3	-0.5	0.2	0.1	0.0	0.1	-0.6	0.0	0.1
M69_70	0.0	-0.2	0.1	0.1	0.1	0.0	-0.1	0.0	-0.1	-0.1	0.1	0.0	-0.2
M71	0.0	-0.2	0.2	0.0	0.2	0.1	0.1	0.1	0.1	0.2	-0.4	0.0	0.0
M72	-0.4	-0.1	-0.1	0.4	0.0	0.0	0.0	-0.1	0.1	0.0	-0.1	0.1	-0.1
M73	-0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.0		0.1	0.0	-0.1	0.1
M74_75	0.4	0.0	0.0	-0.1	0.0	0.1	0.1	0.0		-0.1	-0.1	0.1	0.0
N77	0.1	-0.1	-0.2	0.3	-0.3	0.2	0.1	0.0	-0.2	0.0	-0.2	0.0	0.1
N78	0.1	0.2	0.1	1.1	0.0	0.0	0.0	0.3	0.0	0.5	0.0	0.1	0.0
N79	-0.3	0.0	0.4	0.2	0.0	0.0	0.0	0.2	0.0	-0.2	-0.2	-0.5	0.2
N80-T82	0.4	0.2	0.1	0.1	0.4	0.3	-0.1	0.1	0.0	0.1	0.5	0.1	0.2
O84	0.2	0.0	0.3	0.4	0.0	0.2	0.1	0.1		0.2	0.2	0.2	0.2
P85	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Q86	-0.1	0.0	0.2	0.7	-0.1	-0.1	0.0	-0.1	0.3	0.0	-0.1	-0.1	0.0
Q87_88	-0.1	-0.1	0.0	-0.3	0.0	0.0	0.0	0.1		0.1	0.5	0.0	0.2
R90-T92	-0.1	0.0	0.3	0.9	-0.1	-0.1	0.0	0.0	0.0	-0.2	-0.4	-0.2	0.1
R93	0.0	-0.2	0.2	0.5	0.2	0.2	-0.4	0.1		-0.1	-0.3	0.0	0.2
S94	0.1	-0.1	0.0	0.9	0.0	0.0	0.1	0.0	0.0	0.7	0.3	0.4	0.8
S95	-0.2	0.1	-0.2	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.2
S96	0.3	-0.1	0.3	0.4	-0.4	0.0	0.0	0.1	-0.1	-0.4	0.5	0.1	0.1

Notes: NACE rev. 2 classification, 2-digit-level. See Appendix A for list of industries.
Source: FIGARO Release 2022; own calculations.

3. Identifying growth potentials through the lenses of the product space

This chapter employs the metrics developed in the product space literature (Hausmann and Klinger 2007; Hidalgo et al. 2007; Hidalgo and Hausmann 2009) to identify some growth potentials of the 11 CESEE countries. Like any analysis based on the product space methodology, our analysis excludes services, which are not measured in the product space, and uses gross exports, which do not account for the domestic value-added content of the exports. In particular, we apply the following methodology:

i.   We define the key metrics needed to characterise the performance of countries and their diversification opportunities (Section 3.1);

ii.   We analyse the product space of the countries under scrutiny to understand similarities across them and design similar diversification approaches across homogenous groups of countries (Section 3.2);

iii.   We devise a methodological framework to identify growth potentials based on the product space metrics and then apply it for each of the 11 CESEE countries (Section 3.3).

To undertake this analysis, we make use of the data produced and made available via the Atlas of Economic Complexity.[4]

3.1.   THE KEY CONCEPTS OF THE PRODUCT SPACE

In the literature on the product space, the specialisation patterns and structural change paths that countries undergo are depicted via a 'product space'. The product space contains all products exported in the world. The services sector is not included in the analysis due to data limitations.[5] In this space, 'similar' products are placed next to each other, while products that do not share many characteristics are placed far away. Methodologically, the degree of similarity between two products is proxied by the probability of producing one of them for a country that already produces the other. This concept is referred to as **proximity**. The underlying idea is that two similar products share the same knowledge base and require similar inputs, skills and capabilities to be produced. Proximities are country-independent product-specific characteristics. The product space of a specific country is then constructed by accounting for the products that the country is exporting with an RCA.

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[4]   The Atlas of Economic Complexity is maintained by the Growth Lab of the Harvard Kennedy School of Government. The team produces and makes available both the product space metrics and visualisations via the webpage: https://atlas.cid.harvard.edu/. The raw data used by the Atlas of Economic Complexity come from the UN COMTRADE database. To be able to identify growth potentials at a sufficient level of disaggregation, while avoiding long lists of very detailed product codes for 11 countries, we rely on four-digit HS codes.

[5]   The Atlas of Economic Complexity does not include services in the product space analyses because data of trade in services are still not of sufficient quality worldwide.

To determine whether a certain export product is 'compatible' with the export structure of a country, this literature has developed the concept of **relatedness**. Relatedness measures how similar a certain product is to the products already exported by the country. This is a crucial metric when one is interested in identifying the diversification opportunities of an economy, as the higher the degree of relatedness of a new product to the country's export basket, the easier it is to diversify into that new product. In turn, relatedness grows with the number of related products exported by a country. So, if the product space around a certain product is densely populated, it is possible to assume that the country has the production capacity and capabilities to produce that product. In other words, the country holds the production inputs, knowledge and capabilities to develop that area further by adding new related products to its export basket. In identifying paths for export diversification, this literature builds on the idea that the easiest way for a country to diversity is through related diversification – or, in other words, by diversifying into related (closer) products. The opposite of relatedness is **distance**; the lower the distance, the more the country's capabilities can be leveraged to produce the new product.

But all products are not alike, as some require more knowledge and capabilities (i.e. are more 'complex') than others. More complex products offer more advantages in terms of value added and economic growth and are generally a prerogative of advanced economies. Therefore, countries aim not only to diversify into new export goods, but also to upgrade towards more complex products. In this literature, the level of complexity of products is captured by an indicator of **product complexity**. By accounting for the degree of complexity that a country can export competitively, a measure of country-level complexity – referred to as the **economic complexity index** – provides an indication of how complex a country is.

The typical product space is visualised as shown in Figure 4, where each dot is a product and all products form a network in which the links are given by their **proximities**. Since proximities are country-invariant, products feature exactly in the same place for all countries worldwide. By looking at the figure, it becomes immediately evident that: i) product groups tend to cluster (e.g. virtually all textile products are placed next to each other, all electronics are clustered, and so on); ii) some parts of the product space (those in the middle) are more densely populated than others; in particular, the more peripheral parts of the network are more sparsely populated. Indeed, the position of each product (and therefore of each product group or community) depends on the average proximity of a community's product to all other products. The more the product is close to many other products (i.e. the higher its degree of connectedness), the more central its position. In turn, it can be shown that the higher connectedness of a product to all other products, the higher its **complexity**. Thus, the most peripheral products in the product space are the least connected as well as the least complex.

Figure 4 / How the product space is visualised
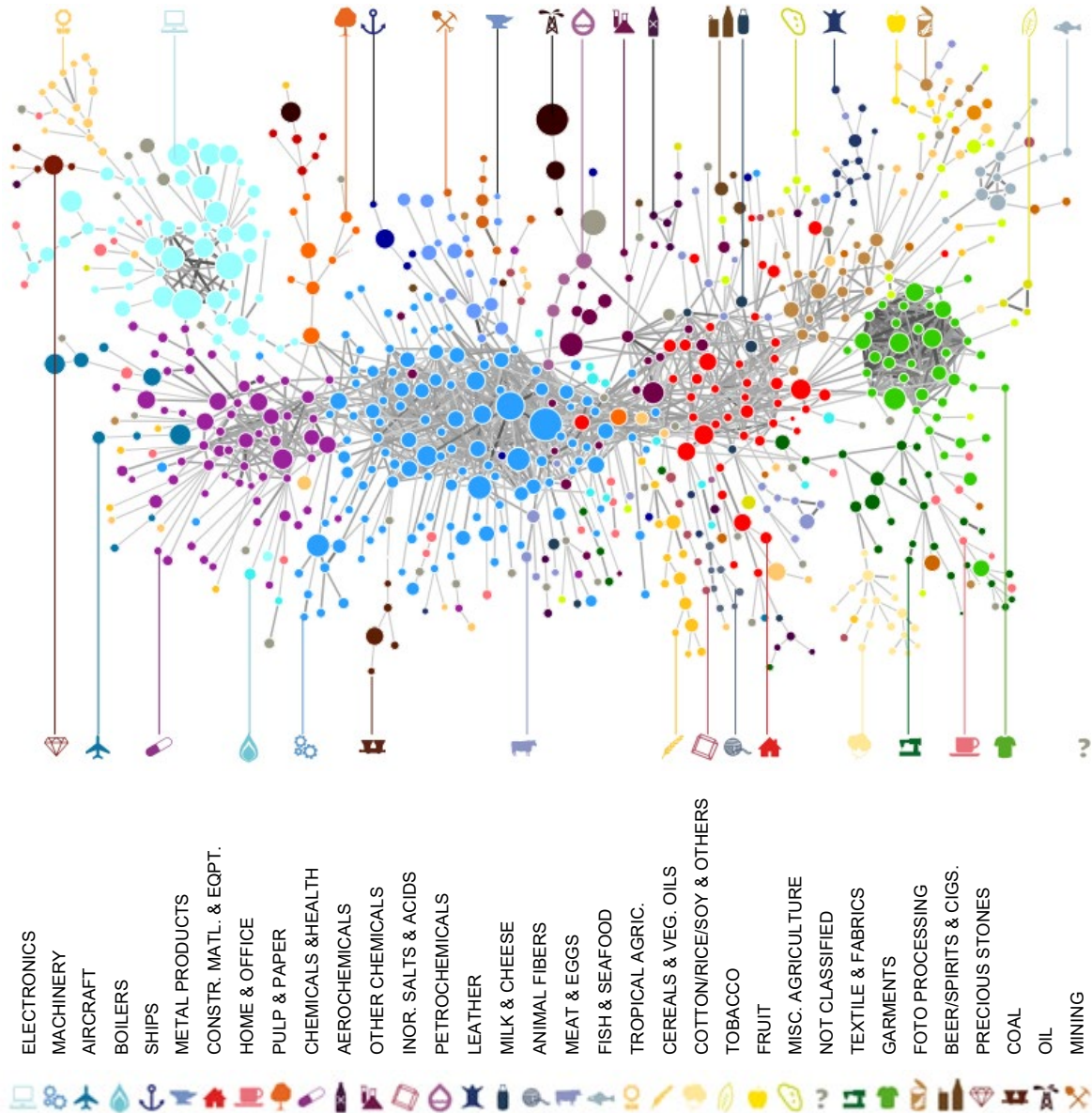
Source: Hausmann et al. (2013).

BOX 1 / THE METRICS OF THE PRODUCT SPACE

Five metrics are essential for understanding the product space methodology:

i. Proximity
ii Relatedness density
iii Distance
iv Product complexity
v   Economic complexity

Proximity is based on the minimum conditional probability that a country that (competitively) exports product i also exports product j (Hidalgo et al. 2007). For a pair of goods i and j, we define proximity as:

$$\varphi_{i,j} = \min\{P(RCA_i \mid RCA_j), P(RCA_j \mid RCA_i)\}$$

where $\varphi_{i,j}$ is the probability that a country exports good i with an RCA greater than 1, given it also exports good j with RCA greater than 1. For example, if 10 countries export product i and 5 out of them also export product j with RCA greater than 1, then the proximity between products i and j is 0.5.

Relatedness density measures the average proximity of a product j to a country's export basket:

$$w_j^k = \frac{\sum_i x_i \varphi_{ij}}{\sum_i \varphi_{ij}}$$

where w_j^k is the density around product j for country k, x_i equals 1 if RCA_i is greater than 1, and φ_{ij} is the matrix of proximities between products i and product j.

Distance is the inverse of relatedness.

The **product complexity index** is measured via an algorithm that combines two aspects: a product's ubiquity (i.e. the number of countries that export a product) and a country's diversity (i.e. the number of products exported by that country). The higher the product's ubiquity, the lower its complexity, and if many countries are capable of exporting a certain product, it is assumed that it is a rather standard product. By contrast, the higher the country's diversity, the higher the product's complexity. This is because more diversified economies are generally more advanced and are generally the only ones with the skills and knowledge to excel in the production of complex products.

The **economic complexity index** measures how diversified and complex a country is based on its export basket. Countries that export very diverse and complex products are considered more complex. Therefore, in shaping their structural change trajectories, countries aim at both diversifying and upgrading their economies. This process inevitably increases their economic complexity, as they become more competitive in increasingly complex products. Like the product complexity index, the economic complexity index is calculated using an iterative algorithm that combines information on products' ubiquity and countries' diversity.

Building on these notions, it is possible to visualise the product space of all world economies as is shown using the example of Romania in Figure 5. The way in which we can interpret the product space of a country (in this case, Romania) is as follows: First, considering how many bubbles are coloured in the graph, we can infer how diversified the economy is. Indeed, only products that are exported with an RCA greater than 1 are coloured in the graph. By contrast, all grey bubbles indicate products that are either not exported or exported without an RCA (i.e. have an RCA between 0 and 1). Second, we can expect the relatedness densities of agricultural products (in yellow) to be quite high and those of electronics (in celeste) to be quite low. The economic complexity of Romania can be expected to be of medium level; while several central products are exported competitively, the most central parts of the product space are not as densely populated as they are in more advanced economies, such as Germany or Austria (see Appendix B).

Figure 5 / The product space of Romania in 2020
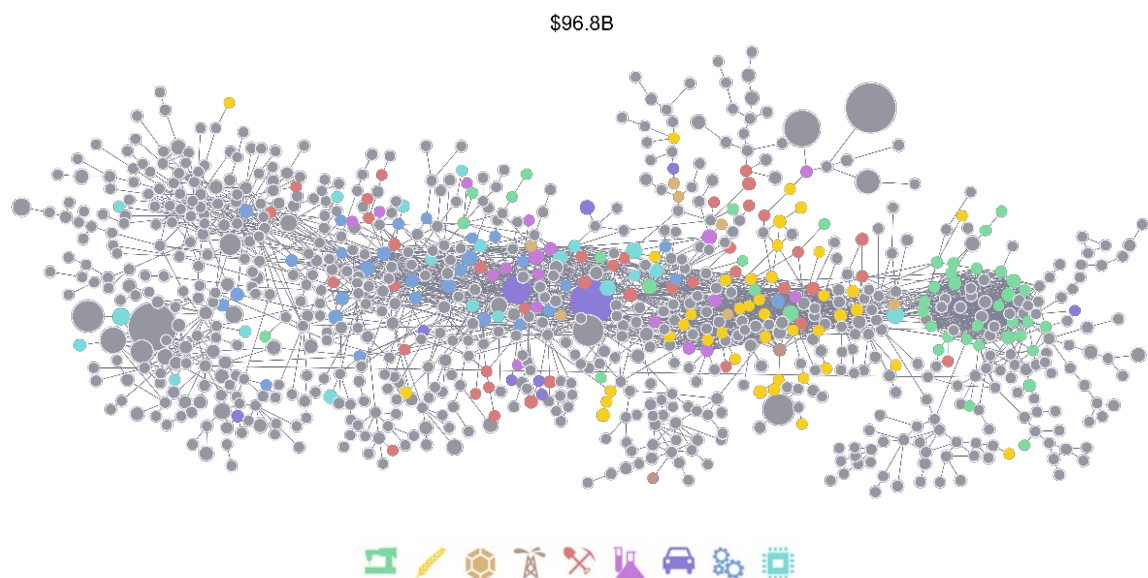
$96.8B

Notes: 4-digit HS products. The size of the bubbles reflects the world export volume of the HS 4-digit product category. The colours of the bubbles (and the icons of the legend below the figure) indicate: textiles (green), agriculture (yellow), stones (ochre), minerals (brown), metals (red), chemicals (lilac), vehicles (purple), machineries (light blue), and electronics (celeste).
Source: The Atlas of Economic Complexity.

Similarly, if we compare the product spaces of the most and least complex economies in the region – Czechia and Bulgaria, respectively – a number of key differences emerge. First, the central parts of the Czechian product space are much more densely populated than the Bulgarian ones, hinting at the higher economic complexity of Czechia. Second, while Czechia has lost competitiveness in simpler products, such as textiles (in green), Bulgaria is still competitive in these products as well as in a number of other peripheral products.

Figure 6 / A comparison of the product spaces of Czechia and Bulgaria in 2020
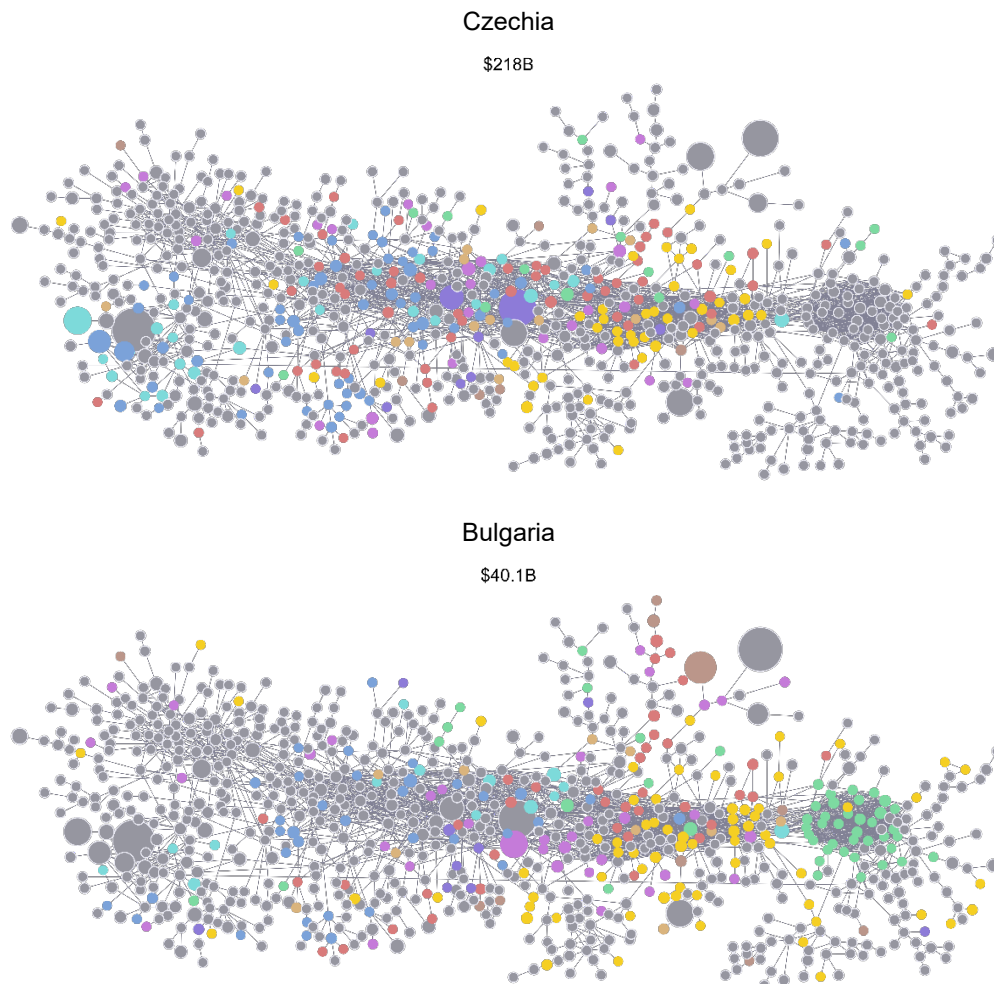
Czechia

$218B

Bulgaria

$40.1B

Notes: 4-digit HS products. The size of the bubbles reflects the world export volume of the HS 4-digit product category.
Source: The Atlas of Economic Complexity.

3.2. THE PRODUCT SPACES OF THE CESEE ECONOMIES

Relying on the concepts outlined above, this section describes the product spaces of the CESEE economies. In carrying out this analysis, it is worthwhile to stress that any product space analysis suffers from at least two limitations. First, since the product space is based on **gross exports**, it does not take into account the domestic value-added content of exports. This is an important caveat in the present global context, in which production is organised in global value chains and countries might export highly complex products while only adding a tiny fraction of value added to that export. CESEE economies are particularly vulnerable to this consideration. Even though these countries could enter medium- and even high-tech export markets, their role in these value chains is confined to rather simple activities (i.e. production and assembly). Functional upgrading (i.e. moving towards more sophisticated activities, such as R&D), and not just sectoral upgrading (i.e. moving towards increasingly complex products), should therefore be the policy focus of these economies (e.g. Bykova et al. 2023). These aspects cannot be captured in the product space analysis.

The second limitation is related to the exclusion of **services** from the product space analysis. For CESEE economies, this is a relevant limitation because some of these economies have reached a level of socioeconomic development for which services could indeed be the most relevant source of growth potentials. As Section 2.1 showed, the manufacturing industry in many CESEE economies is declining in importance, while services are gaining in importance. In particular, the analysis shows that the CESEE economies enjoyed value-added growth in services, such as computer programming and information service activities, engineering activities, and professional, scientific, and technical activities. These services are particularly important in Bulgaria and Estonia, but also in Slovakia, Poland and Lithuania.

Despite these limitations, the analytical insights offered by the product space analysis can still offer some insights on potential new exports that could allow for diversification and technological upgrading.

Having pointed out these caveats, we start the analysis of the product spaces of the CESEE economies from the most complex regional sub-groups before moving towards less complex groups. We therefore begin the discussion with the Visegrád economies, which we analyse together with two economies that resemble them in many aspects: Slovenia and Romania. We then move on to the Baltic countries before discussing the EU-SEE without Romania (i.e. Croatia and Bulgaria).

3.2.1.   Visegrád plus Slovenia and Romania

Czechia features as the single most complex economy of all the CESEE countries. The Czechian product space is densely populated around central sectors in the product space (machineries), indicating strong capabilities in complex products. The country has a comparative advantage in two of the most central products, namely, cars and parts of motor vehicles. While this specialisation is common across the economies in the region, the country competitively exports other complex products, such as computers, electronics and pharmaceuticals. This suggests that the country has explored much of the product space and is successfully exporting a wide variety of complex products. Hence, its key challenge at this juncture is not necessarily to explore more complex products in the product space, but rather to upgrade to more complex activities in the value chain (i.e. to upgrade from a functional perspective) and to become innovative in the sectors in which it holds a strong position. This finding has also been evidenced in other analyses and hints at the role of services for an economy like that of Czechia (e.g. Bykova et al. 2023; Zavarskà et al. 2023).

While Czechia stands out for its higher complexity and diversification, Hungary, Slovakia and Slovenia have many characteristics in common when it comes to their specialisations. The three economies are competitively exporting automotive products and have abandoned lower-tech products, such as textiles. While they export a few more sophisticated products, especially machinery and electronics, the area of the product space that hosts more complex products is still sparsely populated. This is indicative of the existence of diversification and upgrading opportunities at reasonable distances.

Poland is slightly different from the other Visegrád economies, as its product space is particularly dense in the least complex parts of the product space, notably around textiles, agriculture and other natural resource-based industries. By contrast, just a few complex products, most notably computers, are exported with a comparative advantage. Owing to this specialisation pattern, Poland's complexity is still

at a medium-low level. This discussion indicates that there are some competencies (created mostly over the past decade or so) that would increase the chances of success of an upgrading strategy.

While not belonging to the Visegrád group, Romania shares several commonalities with this group of countries when it comes to the product space. As for Czechia, Hungary and Slovakia, cars and parts of motor vehicles are part of the export basket of Romania. Other more complex products, such as machinery and electronics (e.g. electromagnets and batteries), are exported with a comparative advantage. More similarly to Poland, Romania maintains a comparative advantage in textiles, agricultural products and other natural resource-based industries (especially metals). Indeed, while more products have been added to Romania's export basket since the mid-1990s, the country has kept its specialisation in these lower-value-added industries. Owing to this duality, the complexity of Romania is at an intermediate level, placing it between Hungary, Slovenia and Slovakia on one side and Poland on the other. This medium complexity also means that the country has some capabilities on which to build an upgrading strategy.

3.2.2. The Baltic countries

The product spaces of the Baltic countries are reminiscent of dual economies, as strong specialisations in less complex products coexist with comparative advantages in some more complex products. Still, the core of the product space is sparsely populated. This is particularly evident in the case of Estonia, where the product space looks dense around agricultural products, chemicals and metals in addition to showing some competencies in some machinery and electronics (e.g. broadcasting equipment and electrical boards). This duality explains Estonia's medium level of economic complexity and suggests that some upgrading could be achieved via related diversification.

The other two Baltic countries are less complex than Estonia. For Lithuania, the core of the product space is sparsely populated, while a few more complex products (e.g. radars and some machineries) have been successfully added to its export basket. Latvia is the least complex economy of the Baltics and the second-least complex economy of the entire CESEE region. Similarly to the other two Baltic economies, its product space is still dominated by agriculture and natural resources while only having a few niches of competencies in more complex products, most notably in electronics. Due to the small densities around complex products, Lithuania and Latvia do not seem to be mastering the capabilities needed to easily build up complex industries at this point. The acquisition of competencies in more complex products is therefore paramount to further populate those parts of the product space and thereby establish a solid position in more complex industries.

3.2.3. EU-SEE (without Romania): Croatia and Bulgaria

Croatia and Bulgaria number among the least complex countries in the region. The Croatian product space is very dense around agricultural and other resource-intensive products. On the other hand, the core of the product space is not very dense, leading to a medium-complexity profile for Croatia. This ultimately suggests that it is not easy for Croatia to diversify into higher-complexity products.

Bulgaria is the only middle-income economy under analysis here, and its economic complexity score has consistently been the lowest across the countries of CESEE. As discussed in Section 3.1, the country

specialises in many uncomplex products – mostly textiles and agricultural products as well as natural-resource-based products, such as metals. Some more sophisticated products – particularly within machinery, electronics and chemicals – are also produced with an RCA, but these products are not enough to populate the core of the product space densely enough.

3.3.   USING THE PRODUCT SPACE TO IDENTIFY GROWTH POTENTIALS IN CESEE ECONOMIES

3.3.1.   Identifying export diversification opportunities

Some authors (e.g. Balland et al. 2019; Prognos and CSIL 2022) build on the key concepts of the product space to identify the export diversification opportunities available to countries seeking to both find new opportunities and upgrade their economic structures. By intersecting distance and complexity, as in Figure 7, four potential diversification strategies can be outlined:

1.   A high-risk/high-benefits strategy (top-right quadrant of Figure 7), according to which a country accepts the risks inherent to unrelated diversification (i.e. of moving towards more distant products) in order to upgrade more (i.e. to gain in complexity);

2.   A low-risk/high-benefits strategy (top-left quadrant) that allows countries to diversify into products which are both close and complex;

3.   A low-risk/low-benefits strategy (bottom-left quadrant) that would lead countries to diversify into both closer and uncomplex products. Although this represents a 'safe' strategy, it does not lead to upgrading; and

4.   A high-risk/low-benefits strategy (bottom-right quadrant) that leads countries to diversify into both distant and uncomplex products, which represents a rather unattractive option for any country.

Figure 7 / Identifying growth potentials via the product space methodology
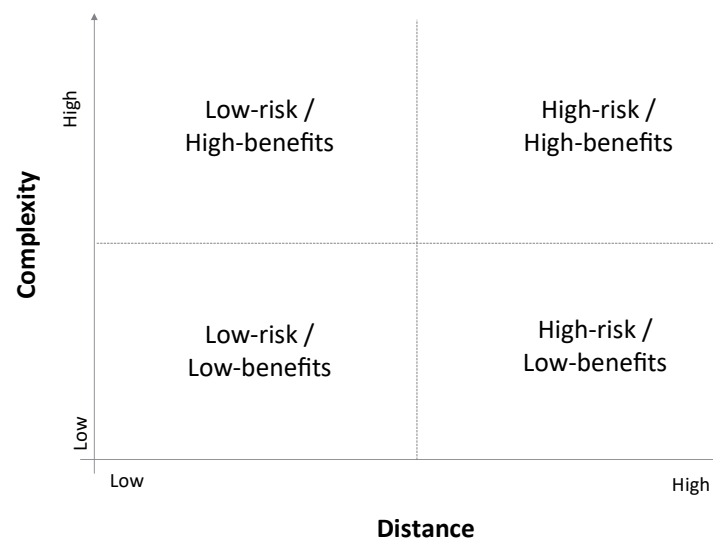
Source: Authors based on Balland et al. (2019).

Of these strategies, those in the two upper quadrants are growth-enhancing but differ in their degree of riskiness, as the first strategy requires developing products that are distant from the country's current export basket. While theoretically more attractive, a low-risk/high-benefits strategy is only a serious option for more advanced countries that already possess some capabilities in sophisticated products and can therefore build on these competencies to branch out to other complex products. At the same time, at very high levels of economic complexity, a diversification strategy that builds on relatedness might be difficult to identify. For example, if the country already exports all complex products (or most of them), the only diversification possibilities would entail moving into lower-complexity products, which is not advisable when upgrading is a policy objective. In other words, if countries have explored a large part of the product space, finding new (and still more complex) products is challenging. At this stage of development, innovating by creating new products and services is the path towards sustained economic growth.

As this discussion shows, the particular strategies that are feasible and sensible for each country crucially depends on the characteristics of the country – and what its product space looks like. To operationalise this framework and identify the products that could act as growth potentials, we first apply the following four 'filters':

› **RCAs**: We take all products without a comparative advantage (i.e. with an RCA between 0 and 1) that the country exports or that were not exported by the country in 2020 (i.e. the RCA is equal to 0).

› **Sectoral focus**: We exclude natural resources and manufacturing industries based on the processing of natural resources (i.e. what the Atlas of Economic Complexity classifies as 'Agriculture', 'Minerals', 'Metals' and 'Stones').[6] Services are excluded because the Atlas of Economic Complexity does not include them.

› **Market size**: We focus on products with larger market potentials as measured by world trade. In particular, products whose world export value is below USD 1 billion are not considered here.[7]

› **Product complexity greater than economic complexity**: We aim to identify growth potentials with an upgrading potential (i.e. that can boost the country's economic complexity). This is because we assume that more complex products have higher growth potentials than low-complexity products in the medium to long run thanks to their role in structural and technological change.[8]

After applying these filters, we design viable strategies based on the key characteristics of the CESEE economies. In particular, we identify three groups of countries:

› **Group 1: Countries at high levels of economic complexity** – The country is already diversified and has capabilities in several complex products. Therefore, further exploring the product space would not be a profitable strategy, as the most rewarding areas of the product space have already been explored. In these cases, a more detailed analysis using highly disaggregated data could identify some promising products. At the same time, the core objectives of these countries should be to become more innovative and move into more complex activities within these complex sectors (or what

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[6] The 'Others' category, which contains trade discrepancies, is also dropped.

[7] This does not mean that these products are not growth potentials. However, for the sake of simplicity, this exercise focuses on the largest markets.

[8] Identifying products with upgrading potential is just one of the possible criteria that exercises of this sort can select. Alternative criteria could include, for example, market trends (e.g. products whose global demand or prices are rising), strategic autonomy (e.g. products that allow the countries to be less reliant on imports of some critical inputs), or products that are relevant to the green and digital transitions.

could be referred to as functional upgrading). Looking at the countries under scrutiny here, Czechia is the only CESEE country that belongs to this group.

› **Group 2: Countries at medium levels of economic complexity** – The country has some capabilities in complex products, although further diversification could be achieved. In these contexts, upgrading is a key policy objective. The country may possess some of the capabilities needed to move towards more complex products, whether closer or slightly more distant from its set of existing capabilities. Hungary, Slovenia and Slovakia fit in this category.

› **Group 3: Countries at low levels of complexity** – The country is still specialised in uncomplex products and is not sufficiently diversified. In some countries, some complex products are already exported competitively, but these represent niches rather than consolidated areas of strength. Since the product space around complex products is not densely populated, moving to other complex products would not be easy. In this context, closer products (i.e. related diversification) are to be preferred. To foster upgrading, a few strategic bets could be placed by exploring more distant products that could offer a particularly high degree of reward in terms of complexity. Romania and Poland, the Baltic countries, Croatia and Bulgaria are the CESEE economies that fall in this group and might find it beneficial to follow this kind of dual strategy.

Following this discussion, no growth potentials can be identified via the product space for **Group 1**. For **Group 2**, a list of growth potentials can be identified based on the product space metrics and by applying the three criteria outlined above. For **Group 3**, a large number of potential products can be identified due to their lower economic complexity and level of economic development (and, hence, level of diversification and number of products with an RCA below 1). Among these many products, some are easier to export but will potentially offer fewer benefits in terms of upgrading. Others are more distant to the current specialisation of the country but would allow increasing complexity. For these reasons, two sets of products will be listed:

i. '**safe bets**': These are products that allow for some upgrading (as their complexity is higher than the economic complexity of the country) while being closer to the export basket of the country.[9]

ii. '**strategic bets**': These are products that have greater upgrading potential (i.e. with complexity higher than for the safe bets) but entail higher (though still manageable) risks.[10]

In listing growth potentials, we remove 'brown' products as identified by the Green Transition Navigator.[11] Finally, when the number of products identified by this methodology is too large, we only

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[9] To identify 'close products', we take all products that pass the four filters outlined above. We then look at the distribution of the metric of distance and define as 'close products' all products falling within the first quartile of the distance.

[10] This is operationalised by limiting the list to products with a distance lower than the third quartile (i.e. by excluding the most distant products).

[11] The Green Transition Navigator (Andres and Mealy 2023) is based on research efforts aimed at developing a quantitative methodology for measuring countries' green production capabilities, identifying new green export opportunities, and predicting future green export growth. It also incorporates insights on 'brown' products, relying on measures of lock-in based on countries' exports of brown products. On the one hand, 'green' products are defined as products with environmental benefits and are based on a compilation of the APEC, OECD and WTO green goods classifications. On the other, 'brown' products are defined as products that are likely to decline in demand as the world mitigates climate change. Since this classification is operated at the six-digit level and this exercise is conducted with data at the four-digit level, we consider a four-digit code to be 'brown' if the majority of its six-digit codes are considered brown. If only half are considered brown, we still include it in our analysis. The classification of products is available at: https://green-transition-navigator.org/

show products with a **lower distances** to the export basket of the economy under scrutiny. In presenting the growth potentials, we move from the most complex to the least complex countries.

3.3.2.   Identifying the growth potentials of CESEE countries

Slovenia

Our methodology identifies 30 growth potentials for Slovenia. The top 20 products by distance (considering only non-brown products) are listed in Table 3. While half of these products are machinery, seven are chemicals. These include some green products, namely, 'self-propelled railway coaches' and 'ion-exchangers based on polymers'. The closest products (i.e. the least risky bets) are 'other machine tools for planning and cutting metals' and 'machining centres for working metal'. The latter product faces a market currently dominated by Japan and Germany (which collectively account for over 50% of global exports), but in which Slovenia has an RCA of 0.93 and Czechia and Poland also play a role in Europe. This product is also among the most complex in the list, together with 'microscopes, other than optical' and 'machines (n.e.s.)'.

Table 3 / The top 20 growth potentials for Slovenia

Name	Code	World Trade	RCA	Distance	PCI	Sector
Forklift trucks	8427	16.1	0.15	0.72	1.73	Machinery
Machines to extrude, cut man-made textile fibres	8444	1.1	0.00	0.72	2.03	Machinery
Machines for working materials by laser and similar means	8456	5.7	1.00	0.70	2.00	Machinery
Machining centres for working metal	8457	7.4	0.93	0.69	2.09	Machinery
Other machine tools for planning and cutting metals	8461	2.0	0.34	0.69	1.99	Machinery
Machines for assembling electric lamps	8475	4.6	0.13	0.72	1.64	Machinery
Machines n.e.c.	8479	124.0	0.72	0.71	2.11	Machinery
Microscopes, other than optical	9012	3.0	0.14	0.72	2.09	Machinery
Drafting tables and machines	9017	2.1	0.68	0.73	1.60	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.32	0.70	1.98	Machinery
Compounds of precious metals	2843	10.0	0.02	0.74	1.82	Chemicals
Phenols, phenol-alcohols	2907	5.5	0.45	0.74	1.65	Chemicals
Esters of other inorganic acids of non-metals	2920	1.5	0.06	0.76	1.84	Chemicals
Photographic plates	3701	3.9	0.34	0.76	1.70	Chemicals
Photographic film, developed	3705	1.7	0.01	0.75	2.08	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.51	0.70	1.79	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.03	0.72	1.64	Chemicals
Ion-exchangers based on polymers	3914	1.9	0.21	0.71	1.83	Chemicals
Sound storage media	8523	54.3	0.21	0.75	2.07	Electronics
Self-propelled railway coaches	8603	4.8	0.00	0.70	1.59	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Hungary

In the case of Hungary, 40 products are identified by applying the four filters listed above. Table 4 below only reports the top 20 products by distance (excluding brown products). As the table shows, the majority of the products that could allow Hungary to upgrade are types of machinery and equipment (e.g. 'machining centres for working metal' and 'microscopes', to name the most complex product categories). Two electronics products are also present in the table together with two green products – namely, 'ion-exchangers based on polymers' and 'self-propelled railway coaches'. The latter, in particular, has enjoyed rapid export growth in recent years. Germany and Poland play an important role at the global level in this product category.

Table 4 / The top 20 growth potentials for Hungary

Name	Code	World Trade	RCA	Distance	PCI	Sector
Calendering or other rolling machines, other than for metals or glass	8420	1.2	0.24	0.76	1.63	Machinery
Forklift trucks	8427	16.1	0.10	0.77	1.73	Machinery
Machinery for making paper	8439	5.1	0.38	0.74	1.59	Machinery
Machines for working materials by laser and similar means	8456	5.7	0.12	0.77	2.00	Machinery
Machining centres for working metal	8457	7.4	0.10	0.77	2.09	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.19	0.77	1.99	Machinery
Tools for hand working, pneumatic, hydraulic motors	8467	8.6	0.98	0.76	1.59	Machinery
Machines for assembling electric lamps	8475	4.6	0.16	0.77	1.64	Machinery
Machinery for working rubber or plastics	8477	24.5	0.41	0.76	1.89	Machinery
Machines n.e.c.	8479	124.0	0.46	0.78	2.11	Machinery
Moulding boxes for metal foundry	8480	16.9	0.78	0.75	1.53	Machinery
Microscopes, other than optical	9012	3.0	0.09	0.77	2.09	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.85	0.76	1.98	Machinery
Phenols, phenol-alcohols	2907	5.5	0.00	0.78	1.65	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.08	0.77	1.64	Chemicals
Polyamides	3908	11.9	0.09	0.76	1.69	Chemicals
Ion-exchangers based on polymers	3914	1.9	0.12	0.77	1.83	Chemicals
Electric soldering machines	8515	10.7	0.87	0.76	2.14	Electronics
Sound storage media	8523	54.3	0.25	0.77	2.07	Electronics
Self-propelled railway coaches	8603	4.8	0.00	0.76	1.59	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Slovakia

The number of growth potentials for Slovakia identified via our methodology is 44, which is slightly more than for Hungary and Slovenia. The top 20 by distance (i.e. the closest products) are listed in Table 5. Of these, 13 are machinery products and six are chemical products. 'Serums and vaccines', recently considered strategic products, emerge as a growth potential for Slovakia. Several of the identified products (e.g. 'self-propelled railway coaches' and 'forklift trucks') also come up as viable opportunities for Hungary and Slovenia, reflecting the similar specialisations and levels of complexity of these two countries.

Table 5 / The top 20 growth potentials for Slovakia

Name	Code	World trade	RCA	Distance	PCI	Sector
Machinery for making paper	8439	5.1	0.42	0.77	1.59	Machinery
Moulding boxes for metal foundry	8480	16.9	0.40	0.77	1.53	Machinery
Machine tools for drilling by removing metal	8459	2.6	0.24	0.77	1.47	Machinery
Appliances for thermostatically controlled valves	8481	85.6	0.32	0.78	1.58	Machinery
Tools for hand working, pneumatic, hydraulic motors	8467	8.6	0.37	0.79	1.59	Machinery
Calendering or other rolling machines, other than for metals or glass	8420	1.2	0.71	0.79	1.63	Machinery
Auxiliary machinery for use with knitting and textile machines	8448	3.9	0.59	0.80	1.47	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.34	0.80	1.99	Machinery
Forklift trucks	8427	16.1	0.18	0.80	1.73	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.13	0.81	1.98	Machinery
Machining centers for working metal	8457	7.4	0.22	0.81	2.09	Machinery
Microscopes, other than optical	9012	3.0	0.17	0.82	2.09	Machinery
Machines n.e.c.	8479	124.0	0.71	0.82	2.11	Machinery
Serums and vaccines	3002	222.0	0.04	0.79	1.56	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.09	0.79	1.79	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.14	0.81	1.64	Chemicals
Acrylic polymers	3906	15.2	0.08	0.81	1.47	Chemicals
Polyamides	3908	11.9	0.54	0.80	1.69	Chemicals
Ion-exchangers based on polymers	3914	1.9	0.02	0.81	1.83	Chemicals
Self-propelled railway coaches	8603	4.8	0.43	0.81	1.59	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on Atlas of Economic Complexity.

Romania

For Romania, 74 growth potentials were identified. While their distances range from 0.72 to 0.84, their complexities range from 1.22 to 2.27. Given this variability, products are classified based on the risk and reward profiles into safe and strategic bets. The 19 safe bets (excluding one brown product) are listed in Table 6. Several of them are machinery. Strategic products (e.g. 'batteries' as well as 'serums and vaccines') are part of the list. Some of these safe bets (e.g. 'electric soldering machines') would allow the country to upgrade significantly thanks to its high complexity.

Table 6 / The safe bets for Romania

Name	Code	World Trade	RCA	Distance	PCI	Sector
Calendering or other rolling machines, other than for metals or glass	8420	1.2	0.16	0.76	1.63	Machinery
Dishwashing machines	8422	30.7	0.54	0.72	1.29	Machinery
Machinery for making paper	8439	5.1	0.77	0.74	1.59	Machinery
Machinery for processing fabrics	8451	8.9	0.29	0.74	1.30	Machinery
Lathes for removing metal	8458	5.0	0.47	0.76	1.33	Machinery
Machine tools for drilling by removing metal	8459	2.6	0.90	0.74	1.47	Machinery
Machines with grinding stones for finishing metal	8460	3.5	0.52	0.76	1.42	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.19	0.77	1.99	Machinery
Machine tools for moulding and forging metals	8462	8.2	0.28	0.77	1.44	Machinery
Tools for hand working, pneumatic, hydraulic motors	8467	8.6	0.81	0.75	1.59	Machinery
Machinery for working rubber or plastics	8477	24.5	0.30	0.76	1.89	Machinery
Moulding boxes for metal foundry	8480	16.9	0.91	0.73	1.53	Machinery
Gaskets and similar joints of metal sheeting	8484	3.8	0.20	0.76	1.23	Machinery
Machinery parts, not containing electrical features, n.e.c.	8485	9.9	0.62	0.73	1.36	Machinery
Serums and vaccines	3002	222.0	0.02	0.76	1.56	Chemicals
Plastic floor coverings	3918	11.2	0.04	0.76	1.22	Chemicals
Self-adhesive plastic sheets	3919	21.0	0.28	0.77	1.29	Chemicals
Batteries	8507	66.7	0.44	0.73	1.22	Electronics
Electric soldering machines	8515	10.7	0.80	0.75	2.14	Electronics

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

No strategic bet is identified for Romania because the safe bets already include a rather complex product and because no benefit in complexity is achieved when moving at relatively higher distances.

Poland

For Poland, 109 growth potentials were identified. Owing to their various degrees of distances and complexities, we split these potentials into safe and strategic bets. Regarding the former, 19 safe bets emerge and are reported in Table 7. As for the other countries, the majority of these products are machinery, followed by four electronics and two chemicals, which include serums and vaccines. Reflecting Poland's lower level of complexity, one textile product is also included among the safe bets. Some of these products would allow the country to upgrade significantly. This is the case for 'serums and vaccines' (a strategic area in recent years) as well as 'appliances for thermostatically controlled valves'.

Table 7 / The safe bets for Poland

Name	Code	World Trade	RCA	Distance	PCI	Sector
Pumps for liquids	8413	60.6	0.74	0.60	1.42	Machinery
Furnace burners	8416	2.5	0.79	0.56	1.09	Machinery
Industrial furnaces	8417	4.2	0.79	0.58	1.07	Machinery
Equipment for temperature change of materials	8419	39.4	0.95	0.56	1.17	Machinery
Parts and accessories for metal working machines	8466	15.8	0.93	0.59	1.49	Machinery
Moulding boxes for metal foundry	8480	16.9	0.59	0.61	1.53	Machinery
Appliances for thermostatically controlled valves	8481	85.6	0.97	0.61	1.58	Machinery
Machinery parts, not containing electrical features, n.e.c.	8485	9.9	0.65	0.60	1.36	Machinery
Parts of musical instruments	9209	1.5	0.73	0.60	1.06	Machinery
Automatic regulating instruments	9032	31.1	0.80	0.58	1.20	Machinery
Other parts for machines and appliances	9033	3.2	0.47	0.57	1.24	Machinery
Vacuum cleaners	8508	19.6	0.76	0.60	1.15	Electronics
Tapes, cassettes, records and compact disks	8524	1.7	0.80	0.60	1.15	Electronics
Electric signal and traffic controls	8530	2.4	0.66	0.55	1.01	Electronics
Insulating fittings for electrical machines	8547	5.9	0.91	0.60	1.25	Electronics
Serums and vaccines	3002	222.0	0.21	0.61	1.56	Chemicals
Amino-resins	3909	14.6	0.96	0.61	1.08	Chemicals
Textile articles for technical use	5911	5.0	0.72	0.58	1.22	Textiles
Work trucks	8709	1.6	0.82	0.59	1.21	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Ten strategic bets (of which one is a brown product) can also be identified for Poland (Table 8). Several of these products (e.g. electric soldering machines) were also identified as growth opportunities for other countries, which highlights once again the similar production structures of the countries in the region and the resulting need to identify specific niches within these product categories.

Table 8 / The strategic bets for Poland

Name	Code	World trade	RCA	Distance	PCI	Sector
Calendering or other rolling machines, other than for metals or glass	8420	1.2	0.21	0.63	1.63	Machinery
Forklift trucks	8427	16.1	0.73	0.64	1.73	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.25	0.64	1.99	Machinery
Tools for hand working, pneumatic, hydraulic motors	8467	8.6	0.51	0.62	1.59	Machinery
Machines for assembling electric lamps	8475	4.6	0.24	0.65	1.64	Machinery
Machinery for working rubber or plastics	8477	24.5	0.27	0.63	1.89	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.62	0.65	1.98	Machinery
Prepared culture media for micro-organisms	3821	3.2	0.85	0.65	1.64	Chemicals
Electric soldering machines	8515	10.7	0.83	0.64	2.14	Electronics

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Estonia

Estonia is the most complex of the Baltic countries, although it is less complex than the Visegrád countries, Slovenia and Romania. Its complexity level is on a par with that of Poland. Our analysis of its product space yields a list of 114 products. There are 28 safe bets in total. The closest 20 (as ranked by distance) are reported in Table 9. Of these 20 products, 11 are machinery, followed by four vehicles. Among all these products, 'parts of motor vehicles' would provide huge business opportunities (in terms of market size), while 'appliances for thermostatically controlled valves' would offer the greatest potential in terms of complexity.

Table 9 / The top 20 safe bets for Estonia

Name	Code	World Trade	RCA	Distance	PCI	Sector
Parts suitable for use with spark-ignition engines	8409	53.6	0.40	0.71	1.05	Machinery
Pumps for liquids	8413	60.6	0.30	0.72	1.42	Machinery
Dairy machinery	8434	2.2	0.27	0.68	0.99	Machinery
Other machinery for making paper	8441	6.8	0.75	0.72	1.07	Machinery
Machine tools for drilling by removing metal	8459	2.6	0.33	0.72	1.47	Machinery
Parts and accessories for metal working machines	8466	15.8	0.64	0.71	1.49	Machinery
Appliances for thermostatically controlled valves	8481	85.6	0.34	0.72	1.58	Machinery
Transmission shafts	8483	51.9	0.16	0.72	1.53	Machinery
Machinery parts, not containing electrical features, n.e.c.	8485	9.9	0.42	0.71	1.36	Machinery
Machines for testing the mechanical properties of materials	9024	2.2	0.49	0.71	1.33	Machinery
Parts of musical instruments	9209	1.5	0.35	0.72	1.06	Machinery
Railway service vehicles	8604	1.0	0.23	0.72	1.32	Vehicles
Tractors	8701	44.4	0.67	0.71	1.05	Vehicles
Vehicle Bodies	8707	7.3	0.60	0.71	1.11	Vehicles
Parts of motor vehicles	8708	332.0	0.63	0.70	1.18	Vehicles
Compounded rubber	4005	5.0	0.05	0.71	1.14	Chemicals
Vulcanised rubber plates	4008	3.9	0.22	0.69	1.05	Chemicals
Vulcanised rubber tubes	4009	9.1	0.49	0.70	1.04	Chemicals
Radar	8526	17.5	0.78	0.72	1.07	Electronics
Rubberised textile fabrics	5906	1.4	0.25	0.71	1.12	Textiles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

A total of 17 products are instead identified as strategic bets (Table 10). Beyond machinery, a few chemical products could help the Estonian economy upgrade. The most complex product (i.e. 'electric soldering machines') is not the most distant product and is already exported (with an RCA of 0.45). The product is currently also exported by Czechia and Poland, which respectively account for 3.4% and 2.8% of EU exports.

Table 10 / The strategic bets for Estonia

Name	Code	World Trade	RCA	Distance	PCI	Sector
Forklift trucks	8427	16.1	0.30	0.74	1.73	Machinery
Machines for working materials by laser and similar means	8456	5.7	0.05	0.76	2.00	Machinery
Machining centers for working metal	8457	7.4	0.08	0.77	2.09	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.55	0.75	1.99	Machinery
Machines for assembling electric lamps	8475	4.6	0.28	0.75	1.64	Machinery
Machinery for working rubber or plastics	8477	24.5	0.23	0.74	1.89	Machinery
Machines n.e.c.	8479	124.0	0.64	0.75	2.11	Machinery
Microscopes, other than optical	9012	3.0	0.51	0.76	2.09	Machinery
Other salts of acids	2842	2.0	0.08	0.76	1.66	Chemicals
Phenols, phenol-alcohols	2907	5.5	0.61	0.75	1.65	Chemicals
Nucleic acids and their salts	2934	25.2	0.03	0.77	1.73	Chemicals
Photographic plates	3701	3.9	0.07	0.76	1.70	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.13	0.73	1.79	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.88	0.75	1.64	Chemicals
Polyamides	3908	11.9	0.06	0.75	1.69	Chemicals
Industrial electric furnaces	8514	5.0	0.90	0.74	1.93	Electronics
Electric soldering machines	8515	10.7	0.45	0.74	2.14	Electronics

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Lithuania

The methodology to identify growth potentials developed in this study finds a total of 157 potential export opportunities for Lithuania. The number of safe bets was 32, of which the 20 closest products are listed in Table 11. As the table shows, the options for Lithuania are quite varied in terms of sectors. The list includes 'parts of motor vehicles', a product with a very large market. Considering the low RCA and the size of this industry, it is questionable whether this could realistically be a growth potential for Lithuania.

Table 11 / The top 20 safe bets for Lithuania

Name	Code	World trade	RCA	Distance	PCI	Sector
Wadding, gauze and bandages	3005	8.2	0.42	0.67	1.05	Chemicals
Pharmaceutical goods	3006	13.8	0.89	0.69	0.81	Chemicals
Refractory cements	3816	2.2	0.80	0.69	0.86	Chemicals
Compounded rubber	4005	5.0	0.16	0.69	1.14	Chemicals
Vulcanised rubber tubes	4009	9.1	0.41	0.68	1.04	Chemicals
Other articles of vulcanised rubber	4016	25.3	0.60	0.67	0.86	Chemicals
Electric motors and generators	8501	53.1	0.33	0.69	0.84	Electronics
Electric signal and traffic controls	8530	2.4	0.66	0.66	1.01	Electronics
Parts for electrical apparatus	8538	32.3	0.82	0.69	1.03	Electronics
Electrical insulators of any material	8546	2.4	0.57	0.68	0.85	Electronics
Other engines and motors	8412	22.0	0.48	0.70	0.88	Machinery
Centrifuges	8421	74.4	0.87	0.68	1.00	Machinery
Machinery for making paper	8439	5.1	0.62	0.70	1.59	Machinery
Automatic regulating instruments	9032	31.1	0.35	0.69	1.20	Machinery
Non-woven textiles	5603	18.0	0.40	0.69	0.92	Textiles
Rubberised textile fabrics	5906	1.4	0.47	0.68	1.12	Textiles
Textile articles for technical use	5911	5.0	0.82	0.69	1.22	Textiles
Medical, dental or veterinary furniture	9402	4.7	0.75	0.68	1.00	Textiles
Vehicle Bodies	8707	7.3	0.50	0.69	1.11	Vehicles
Parts of motor vehicles	8708	332.0	0.35	0.69	1.18	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Table 12 / The strategic bets for Lithuania

Name	Code	World Trade	RCA	Distance	PCI	Sector
Forklift trucks	8427	16.1	0.47	0.73	1.73	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.48	0.75	1.99	Machinery
Machines for assembling electric lamps	8475	4.6	0.32	0.74	1.64	Machinery
Machinery for working rubber or plastics	8477	24.5	0.49	0.74	1.89	Machinery
Machines n.e.c.	8479	124.0	0.49	0.75	2.11	Machinery
Microscopes, other than optical	9012	3.0	0.49	0.76	2.09	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.82	0.72	1.98	Machinery
Compounds of precious metals	2843	10.0	0.02	0.76	1.82	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.33	0.72	1.79	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.98	0.73	1.64	Chemicals
Polyamides	3908	11.9	0.33	0.72	1.69	Chemicals
Ion-exchangers based on polymers	3914	1.9	0.45	0.75	1.83	Chemicals
Electric soldering machines	8515	10.7	0.70	0.75	2.14	Electronics

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Fourteen products make it into the category of strategic bets for Lithuania, of which one is classified as brown (Table 12). These products include 'ion-exchangers based on polymers', a green product that was also found in the lists of other countries in the region.

Latvia

A large number of products (195) are identified for Latvia by applying the four filters explained in Section 3.3.1. When looking for the safe bets for Latvia, our methodology detects 52 products. For some of these products, the complexities are more than double the economic complexity of Latvia, suggesting potential benefits in terms of upgrading. The closest 20 safe bets (by distance) are reported in Table 13. The list represents a good mix of sectors, including machinery and chemicals, but also electronics and vehicles. As was the case for Lithuania, the list includes 'parts of motor vehicles', a product with a large market and possibly an industry that would be difficult to develop for a country like Latvia.

Table 13 / The top 20 safe bets for Latvia

Name	Code	World Trade	RCA	Distance	PCI	Sector
Electric motors and generators	8501	53.1	0.78	0.74	0.84	Electronics
Electromechanical domestic appliances	8509	29.3	0.64	0.74	0.88	Electronics
Electrical lighting equipment used for motor vehicles	8512	29.5	0.16	0.73	0.78	Electronics
Electric signal and traffic controls	8530	2.4	0.79	0.71	1.01	Electronics
Electric sound or visual signaling apparatus	8531	15.5	0.85	0.73	0.76	Electronics
Electrical insulators of any material	8546	2.4	0.16	0.74	0.85	Electronics
Furnace burners	8416	2.5	0.52	0.73	1.09	Machinery
Centrifuges	8421	74.4	0.97	0.73	1.00	Machinery
Dishwashing machines	8422	30.7	0.39	0.73	1.29	Machinery
Dairy machinery	8434	2.2	0.74	0.71	0.99	Machinery
Binoculars and telescopes	9005	1.4	0.40	0.74	0.83	Machinery
Other parts for machines and appliances	9033	3.2	0.59	0.72	1.24	Machinery
Compounded rubber	4005	5.0	0.38	0.74	1.14	Chemicals
Vulcanised rubber plates	4008	3.9	0.56	0.73	1.05	Chemicals
Vulcanised rubber tubes	4009	9.1	0.16	0.73	1.04	Chemicals
Other articles of vulcanised rubber	4016	25.3	0.40	0.72	0.86	Chemicals
Tractors	8701	44.4	0.55	0.74	1.05	Vehicles
Parts of motor vehicles	8708	332.0	0.55	0.74	1.18	Vehicles
Baby carriages	8715	2.0	0.14	0.74	0.80	Vehicles
Rubberised textile fabrics	5906	1.4	0.32	0.74	1.12	Textiles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Looking at the products that can give a greater advantage in terms of complexity, we identify 19 strategic bets for Latvia. Since one of these is a brown product, the remaining 18 products are displayed in Table 14. These strategic bets are mostly machinery and chemicals. One electronic product is also identified – namely, 'electric soldering machines' – which is also the most complex product in the list and a product identified for many other countries in the region. Moreover, an automotive product – namely, 'self-propelled railway coaches' – was identified as a promising product for other countries and is considered a green product. Another green growth potential is 'ion-exchangers based on polymers'.

Table 14 / The strategic bets for Latvia

Name	Code	World Trade	RCA	Distance	PCI	Sector
Phenols, phenol-alcohols	2907	5.5	0.14	0.80	1.65	Chemicals
Nucleic acids and their salts	2934	25.2	0.14	0.80	1.73	Chemicals
Photographic plates	3701	3.9	0.94	0.80	1.70	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.49	0.78	1.79	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.07	0.80	1.64	Chemicals
Polyamides	3908	11.9	0.05	0.78	1.69	Chemicals
Petroleum resins	3911	6.0	0.09	0.81	1.94	Chemicals
Ion-exchangers based on polymers	3914	1.9	0.11	0.80	1.83	Chemicals
Calendering or other rolling machines, other than for metals or glass	8420	1.2	0.32	0.78	1.63	Machinery
Forklift trucks	8427	16.1	0.49	0.79	1.73	Machinery
Tools for hand working, pneumatic, hydraulic motors	8467	8.6	0.37	0.78	1.59	Machinery
Machines for assembling electric lamps	8475	4.6	0.08	0.80	1.64	Machinery
Machinery for working rubber or plastics	8477	24.5	0.06	0.79	1.89	Machinery
Machines n.e.c.	8479	124.0	0.32	0.81	2.11	Machinery
Appliances for thermostatically controlled valves	8481	85.6	0.21	0.78	1.58	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.24	0.79	1.98	Machinery
Electric soldering machines	8515	10.7	0.18	0.80	2.14	Electronics
Self-propelled railway coaches	8603	4.8	0.00	0.80	1.59	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Croatia

Croatia's economy is slightly more complex than Latvia's. Our methodology identifies 167 potential products that could promote its upgrading. These products vary greatly in terms of their distances and complexity. Considering only the closest products to the current export basket of Croatia, we produce a list of 49 safe bets, of which the top 20 (by distance) are displayed in Table 15. Two important products for this region – namely, 'cars' and 'parts of motor vehicles' – feature in the list, together with five electronic goods.

Table 15 / The top 20 safe bets for Croatia

Name	Code	World Trade	RCA	Distance	PCI	Sector
Parts suitable for use with spark-ignition engines	8409	53.6	0.52	0.68	1.05	Machinery
Industrial furnaces	8417	4.2	0.78	0.69	1.07	Machinery
Centrifuges	8421	74.4	0.34	0.67	1.00	Machinery
Other lifting machinery	8428	28.5	0.40	0.66	0.93	Machinery
Other agricultural machinery	8436	7.2	0.20	0.67	1.01	Machinery
Machine tools for working wood	8465	7.8	0.60	0.69	1.15	Machinery
Electric motors and generators	8501	53.1	0.51	0.66	0.84	Electronics
Electrical lighting equipment used for motor vehicles	8512	29.5	0.30	0.66	0.78	Electronics
Electric sound or visual signaling apparatus	8531	15.5	0.89	0.68	0.76	Electronics
Parts for electrical apparatus	8538	32.3	0.57	0.67	1.03	Electronics
Electrical insulators of any material	8546	2.4	0.90	0.68	0.85	Electronics
Wadding, gauze and bandages	3005	8.2	0.22	0.69	1.05	Chemicals
Compounded rubber	4005	5.0	0.09	0.67	1.14	Chemicals
Vulcanised rubber tubes	4009	9.1	0.30	0.65	1.04	Chemicals
Non-woven textiles	5603	18.0	0.31	0.69	0.92	Textiles
Rubberised textile fabrics	5906	1.4	0.37	0.67	1.12	Textiles
Textile articles for technical use	5911	5.0	0.23	0.68	1.22	Textiles
Cars	8703	631.0	0.40	0.69	0.92	Vehicles
Vehicle Bodies	8707	7.3	0.33	0.69	1.11	Vehicles
Parts of motor vehicles	8708	332.0	0.79	0.67	1.18	Vehicles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Following our methodology, we identified 14 strategic bets that could trigger deeper processes of structural transformation in Croatia. These products are more complex than those categorised as safe bets. The 14 of them that are not categorised as brown are listed in Table 16. Beyond 'electric soldering machines' (which were identified as opportunities for several other countries in the region), the most complex product is 'machining centers for working metal', for which Croatia has an RCA of 0.6. In CESEE, Czechia and Poland also play a minor role in this industry, which is dominated by a few highly industrialised countries (mainly Japan and Germany). At the same time, it is worth noting that global exports in constant terms have been experiencing a downward trend since at least 2018.[12] These figures show that assessing the validity of these products as targets of a diversification or industrial policy would require a more profound analysis.

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[12] According to the data provided by the Atlas of Economic Complexity.

Table 16 / The strategic bets for Croatia

Name	Code	World trade	RCA	Distance	PCI	Sector
Forklift trucks	8427	16.1	0.28	0.75	1.73	Machinery
Machines for working materials by laser and similar means	8456	5.7	0.28	0.76	2.00	Machinery
Machining centers for working metal	8457	7.4	0.60	0.76	2.09	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.15	0.76	1.99	Machinery
Machines n.e.c.	8479	124.0	0.73	0.76	2.11	Machinery
Microscopes, other than optical	9012	3.0	0.04	0.77	2.09	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.22	0.74	1.98	Machinery
Phenols, phenol-alcohols	2907	5.5	0.01	0.76	1.65	Chemicals
Nucleic acids and their salts	2934	25.2	0.30	0.78	1.73	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.10	0.73	1.79	Chemicals
Prepared culture media for micro-organisms	3821	3.2	0.27	0.75	1.64	Chemicals
Polyamides	3908	11.9	0.13	0.74	1.69	Chemicals
Ion-exchangers based on polymers	3914	1.9	0.14	0.75	1.83	Chemicals
Electric soldering machines	8515	10.7	0.91	0.75	2.14	Electronics

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Bulgaria

Since Bulgaria is the least complex economy in CESEE, a high number of products could potentially increase its complexity level. By applying only the filters defined in Section 3.3.1, we identified 197 products that could be growth potentials for Bulgaria. We narrowed this list down by taking the closest products to the export basket of Bulgaria. Of these, 45 were identified as safe bets, although some of these products already have the potential to boost the overall complexity of the country. Table 17 lists the top 20 safe bets by distance. Beyond eight machinery products, the list includes some products in the automotive sector, namely, 'cars' and 'parts of motor vehicles'. In addition to being big in terms of size, these markets are also more complex than what Bulgaria already exports as well as relatively close to its export basket. 'Electric motors and generators', a green product, is also identified as a safe bet.

Table 17 / The top 20 safe bets for Bulgaria

Name	Code	World trade	RCA	Distance	PCI	Sector
Central heating boilers	8403	6.8	0.83	0.65	0.65	Machinery
Parts suitable for use with spark-ignition engines	8409	53.6	0.68	0.68	1.05	Machinery
Industrial furnaces	8417	4.2	0.59	0.68	1.07	Machinery
Centrifuges	8421	74.4	0.78	0.68	1.00	Machinery
Dish washing machines	8422	30.7	0.99	0.68	1.29	Machinery
Other lifting machinery	8428	28.5	0.31	0.67	0.93	Machinery
Other agricultural machinery	8436	7.2	0.75	0.68	1.01	Machinery
Revolvers and pistols	9302	1.2	0.83	0.68	0.88	Machinery
Glaziers' putty	3214	8.3	0.37	0.66	0.66	Chemicals
Antifreezing preparation	3820	1.0	0.95	0.67	0.63	Chemicals
Vulcanised rubber plates	4008	3.9	0.79	0.68	1.05	Chemicals
Other articles of vulcanised rubber	4016	25.3	0.92	0.66	0.86	Chemicals
Electric motors and generators	8501	53.1	0.34	0.67	0.84	Electronics
Parts for use with electric generators	8503	17.4	0.85	0.65	0.59	Electronics
Electromechanical domestic appliances	8509	29.3	0.27	0.69	0.88	Electronics
Electric heaters	8516	54.7	0.84	0.65	0.61	Electronics
Cars	8703	631.0	0.21	0.69	0.92	Vehicles
Parts of motor vehicles	8708	332.0	0.41	0.67	1.18	Vehicles
Trailers and semi-trailers	8716	23.7	0.54	0.66	0.60	Vehicles
Rubberised textile fabrics	5906	1.4	0.66	0.68	1.12	Textiles

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Although a wide variety of products with upgrading potential can be identified among the safe bets, we nevertheless report the list of strategic bets. These are products that can provide an even stronger boost in terms of complexity while requiring a higher risk tolerance, so to speak, as these products are more distant from the set of capabilities that the country already possesses. In the case of Bulgaria, there are 11 strategic bets, of which 10 are reported in Table 18 (as one of the products is brown). As for other countries in the region, the most promising product in terms of complexity gain is 'electric soldering machines', followed by 'machines for working materials by laser and similar means'.

Table 18 / The strategic bets for Bulgaria

Name	Code	World Trade	RCA	Distance	PCI	Sector
Calendering or other rolling machines, other than for metals or glass	8420	1.2	0.25	0.73	1.63	Machinery
Machines for working materials by laser and similar means	8456	5.7	0.42	0.75	2.00	Machinery
Other machine tools for planing and cutting metals	8461	2.0	0.79	0.75	1.99	Machinery
Machines for assembling electric lamps	8475	4.6	0.71	0.75	1.64	Machinery
Machinery for working rubber or plastics	8477	24.5	0.28	0.73	1.89	Machinery
Instruments for physical or chemical analysis	9027	47.9	0.21	0.75	1.98	Machinery
Phenols, phenol-alcohols	2907	5.5	0.08	0.75	1.65	Chemicals
Pickling preparations for metal surfaces	3810	1.6	0.70	0.74	1.79	Chemicals
Polyamides	3908	11.9	0.16	0.74	1.69	Chemicals
Electric soldering machines	8515	10.7	0.48	0.74	2.14	Electronics

Notes: World Trade is expressed in billions of USD. PCI refers to the Product Complexity Index.
Source: Authors based on the Atlas of Economic Complexity.

Summary

When we put together all the lists for the 10 countries (i.e. excluding Czechia), a total of 102 products are identified. Of these, 42 are unique to one of the 10 economies. For example, 'radars' only emerge as an opportunity for Estonia, while 'batteries' only emerges for Romania. The other 60 products emerge as opportunities for at least two countries and, of these, 41 are common to more than two countries. The most commonly identified products are listed in Table 19, together with the countries for which these products are identified as growth potentials. Considering the similarities in the production structures of these economies and the high level of aggregation of our analysis, it is not surprising that some product categories emerge for virtually all countries in the region. On the one hand, it can be argued that, within these broadly defined product categories, each country can and should find specific market niches to target. This is, for example, what smart specialisation strategies aim for. On the other hand, it should be considered that these products are safe bets for some countries and strategic bets for others, implying varying chances of success and risk profiles.

Finally, it is important to recall that this exercise is not meant to offer policy makers the list of the next products to be targeted by their industrial and innovation policies. On the contrary, these policy targets should be identified based on a wide variety of indicators and considerations while looking at specific products and technologies and without exclusively limiting one's attention to products that are not exported or exported without an RCA or to products that ensure an upgrading from a complexity perspective.

Table 19 / Common products for the CESEE region

Name	HU	SK	SI	PL	RO	EE	LT	LV	BG	HR
Phenols, phenol-alcohols	x		x			x		x	x	x
Pickling preparations for metal surfaces		x	x			x	x	x	x	x
Prepared culture media for micro-organisms	x	x	x	x		x	x	x		x
Polyamides	x	x				x	x	x	x	x
Ion-exchangers based on polymers	x	x	x				x	x		x
Rubberised textile fabrics						x	x	x	x	x
Calendering or other rolling machines, other than for metals or glass	x	x		x	x			x	x	
Forklift trucks	x	x	x	x		x	x	x		x
Machines for working materials by laser and similar means	x		x			x			x	x
Machining centers for working metal	x	x	x			x				x
Other machine tools for planing and cutting metals	x	x	x	x	x	x	x		x	x
Tools for hand working, pneumatic, hydraulic motors	x	x		x	x			x		
Machines for assembling electric lamps	x		x	x		x	x	x	x	
Machinery for working rubber or plastics	x			x	x	x	x	x	x	
Machines n.e.c.	x	x	x			x	x	x		x
Electric soldering machines	x			x	x	x	x	x	x	x
Parts of motor vehicles						x	x	x	x	x
Microscopes, other than optical	x	x	x			x	x			x
Instruments for physical or chemical analysis	x	x	x	x			x	x	x	x

Source: Authors based on own analysis.

4. Conclusions

This paper investigates the sectoral and export structures of the countries in Central, East and Southeastern Europe (CESEE) to identify promising sectors and broad product categories for future growth by employing a simple revealed comparative advantage (RCA) analysis at the industry level and a product space approach at a product level.

Rather than offering a ready-made list of industries and products to be targeted by industrial policies of countries in the region, this paper illustrates how data and even sophisticated indicators (such as those developed in the product space literature) can help to inform industrial policy making. Today, a variety of policy approaches call for a more data-driven and transparent approach when designing industrial policies. The 'smart specialisation' approach, for example, is used by the European Commission and requires EU territories to identify current areas of strength as well as areas with potential for future competitiveness and technological upgrading.

This study contributes to these efforts by identifying industries and broad product categories that could help the region to move up the technological ladder and avoid middle-income traps. Indeed, after the collapse of communism and the accession to the European Union of several countries in Central and East Europe (EU-CEE), a consistent inflow of foreign direct investment (FDI) fostered rapid transformation in these countries, creating a strong export-oriented manufacturing sector. Especially in the Visegrád countries, the manufacturing sector – and, in particular, the automotive industry – has been playing an important role. However, the share of manufacturing in value added has recently declined in most countries, although there have been differences within manufacturing as well. Thus, there are several questions regarding the future growth potential of the region: Will established industries contribute to future growth? Will new ones emerge? Or will service industries contribute to future growth instead? And which products have the potential to help these economies to build new capabilities and spur technological upgrading?

Our analyses offer some insights related to these questions. First, the RCA analysis shows that the EU-CEE countries still hold a comparative advantage in manufacturing sectors, together with Austria and Germany. However, between 2013 and 2020, a slightly negative trend emerged, with RCAs declining somewhat. For services, a more varied picture over sectors and countries emerges. Service RACs improved in several countries, including Estonia, Croatia and Germany. Overall, 'computer programming, consultancy, and information service activities' seems to be the most successful industry to date, both in terms of value added and RCA change. It is already a star performer in five countries (Bulgaria, Croatia, Estonia, Latvia and Romania) and a growth potential in the remaining six countries of the region.

Second, the product space analysis indicates that for the majority of the CESEE economies, it is possible to identify products that are in line with the current specialisations of these countries while allowing for some upgrading at the same time. In some cases, these opportunities may be slightly more distant from the set of knowledge, skills, capabilities and production inputs that these countries already possess. We also find that while we run the analysis separately for each of the 11 CESEE countries, the

identified opportunities are often the same (as demonstrated in the 'Summary' part of Section 3.3.2). While this is intuitively explained by the similar specialisations of these countries, from a policy perspective this means that each country has to deploy a battery of indicators and checks to identify profitable and realistic niches within these broadly defined product categories.

Indeed, to gauge the potential impact of a certain industry, the important additional aspects to analyse include, for example: market trends; the degree of competition and the market structure at the product level; the employment potential (in terms of quantity and quality of jobs); and the potential to generate new innovations and spawn new firms. Today, aspects such as the potential to accelerate the twin transition or to open strategic autonomy might also be relevant. Beyond the assessment of whether an industry can deliver a certain policy goal, the analysis would also need to assess whether a certain industry can be feasibly developed within a certain territory. In this respect, considerations regarding the level and degree of competition cannot be overlooked.

This discussion is indicative of the data needs and depth of analysis required by an exercise that aims at designing industrial policy strategies. In this regard, our analysis showcases how trade and industrial data as well as various sophisticated indicators, such as relatedness and complexity, can be used to help inform the policy debate.

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Appendix A

Appendix Table 1 / List of industries A*64 (NACE rev. 2 classification)

Code	Name
A01	Crop and animal production, hunting and related service activities
A02	Forestry and logging
A03	Fishing and aquaculture
B	Mining and quarrying
C10-T12	Manufacture of food products; beverages and tobacco products
C13-T15	Manufacture of textiles, wearing apparel, leather and related products
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17	Manufacture of paper and paper products
C18	Printing and reproduction of recorded media
C19	Manufacture of coke and refined petroleum products
C20	Manufacture of chemicals and chemical products
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22	Manufacture of rubber and plastic products
C23	Manufacture of other non-metallic mineral products
C24	Manufacture of basic metals
C25	Manufacture of fabricated metal products, except machinery and equipment
C26	Manufacture of computer, electronic and optical products
C27	Manufacture of electrical equipment
C28	Manufacture of machinery and equipment n.e.c.
C29	Manufacture of motor vehicles, trailers and semi-trailers
C30	Manufacture of other transport equipment
C31_32	Manufacture of furniture; other manufacturing
C33	Repair and installation of machinery and equipment
D35	Electricity, gas, steam and air conditioning supply
E36	Water collection, treatment and supply
E37-T39	Sewerage, waste management, remediation activities
F	Construction
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles
G46	Wholesale trade, except of motor vehicles and motorcycles
G47	Retail trade, except of motor vehicles and motorcycles
H49	Land transport and transport via pipelines
H50	Water transport
H51	Air transport
H52	Warehousing and support activities for transportation
H53	Postal and courier activities
I	Accommodation and food service activities
J58	Publishing activities
J59_60	Motion picture, video, television programme production; programming and broadcasting activities
J61	Telecommunications
J62_63	Computer programming, consultancy, and information service activities
K64	Financial service activities, except insurance and pension funding
K65	Insurance, reinsurance and pension funding, except compulsory social security
K66	Activities auxiliary to financial services and insurance activities
L	Real estate activities
M69_70	Legal and accounting activities; activities of head offices; management consultancy activities
M71	Architectural and engineering activities; technical testing and analysis
M72	Scientific research and development
M73	Advertising and market research
M74_75	Other professional, scientific and technical activities; veterinary activities
N77	Rental and leasing activities
N78	Employment activities
N79	Travel agency, tour operator and other reservation service and related activities
N80-T82	Security and investigation, service and landscape, office administrative and support activities
O84	Public administration and defence; compulsory social security
P85	Education
Q86	Human health activities
Q87_88	Residential care activities and social work activities without accommodation
R90-T92	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities
R93	Sports activities and amusement and recreation activities
S94	Activities of membership organisations
S95	Repair of computers and personal and household goods
S96	Other personal service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organisations and bodies

Table A1 / Value-added shares, 2020, per country

NACE	BG	CZ	EE	HR	HU	LT	LV	PL	RO	SI	SK	AT	DE
A01	2.4	1.8	0.8	2.4	3.8	0.8	2.1	1.7	3.8	0.7	1.6	0.5	0.6
A02	0.4	0.3	1.3	0.5	0.2	0.5	2.3	0.4	0.4	0.7	0.7	0.2	0.1
A03	0.1	0.0	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
B	1.8	0.4	0.9	0.4	0.3	0.3	0.6	1.4	0.7	0.3	0.4	0.3	0.1
C10-T12	3.3	2.1	1.8	3.7	2.0	2.5	2.4	3.1	4.6	1.5	1.5	1.9	1.4
C13-T15	1.6	0.5	0.8	0.8	0.4	1.0	0.5	0.5	1.3	0.6	0.8	0.2	0.2
C16	0.3	0.6	2.4	0.7	0.3	1.1	3.0	0.6	0.5	0.7	0.7	0.8	0.2
C17	0.4	0.5	0.3	0.3	0.4	0.5	0.1	0.6	0.2	0.5	0.4	0.6	0.3
C18	0.2	0.3	0.3	0.5	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2
C19	-0.5	0.0	0.3	0.6	0.5	0.6	0.0	0.6	0.6	0.0	0.4	0.1	0.2
C20	0.9	0.8	0.5	0.3	1.0	1.0	0.4	0.8	0.6	0.9	0.6	0.7	1.3
C21	0.5	0.4	0.1	0.8	1.4	0.2	0.5	0.3	0.1	3.2	0.1	0.7	0.7
C22	1.0	1.7	0.6	0.6	1.4	1.0	0.3	1.5	0.9	1.7	1.4	0.7	0.9
C23	1.3	1.1	0.7	0.9	0.8	0.6	0.9	1.2	0.8	0.8	0.8	0.7	0.6
C24	0.8	0.7	0.1	0.2	0.5	0.0	0.0	0.5	0.7	1.1	1.0	1.1	0.6
C25	1.5	2.7	1.8	1.7	1.5	1.1	1.3	2.3	0.9	3.0	2.6	1.8	1.7
C26	0.5	1.3	0.8	0.4	1.9	0.6	0.5	0.4	0.6	0.8	0.6	1.2	1.3
C27	1.0	1.9	0.9	0.7	1.3	0.3	0.5	0.8	1.2	2.5	1.1	1.5	1.3
C28	1.2	2.1	0.7	0.6	1.4	0.6	0.4	0.9	0.8	2.1	1.7	2.4	3.2
C29	0.9	4.8	0.4	0.3	3.7	0.4	0.4	1.5	2.8	1.8	4.0	1.2	4.1
C30	0.3	0.4	0.1	0.1	0.2	0.4	0.1	0.4	0.3	0.1	0.2	0.5	0.5
C31_32	0.8	0.9	1.0	0.6	0.8	2.4	0.6	1.1	0.7	0.9	0.6	0.9	0.8
C33	0.6	1.0	1.0	0.6	0.7	0.8	0.4	0.8	0.7	0.9	0.7	0.7	0.5
D35	1.8	2.5	2.8	3.4	1.6	1.1	1.7	2.3	2.3	2.1	2.1	1.7	1.9
E36	0.5	0.4	0.4	0.5	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.2	0.2
E37-T39	0.5	0.6	0.4	0.8	0.5	0.6	0.7	1.0	0.7	0.5	0.5	0.9	0.9
F	5.3	5.7	6.9	6.4	5.9	7.6	6.6	7.7	7.3	6.5	7.3	6.9	5.5
G45	1.0	1.2	1.6	1.2	1.1	2.6	1.5	2.8	1.5	1.5	1.2	1.3	1.6
G46	7.7	5.4	6.2	5.2	4.7	8.3	6.5	6.7	3.7	5.5	4.8	6.3	4.9
G47	5.3	4.1	4.8	5.6	4.5	6.9	5.6	7.8	6.7	5.0	5.0	4.3	3.4
H49	4.3	3.1	3.1	2.4	3.1	10.9	4.1	5.2	4.9	3.7	3.7	2.6	1.7
H50	0.1	0.0	0.2	0.4	0.0	0.2	0.1	0.0	0.3	0.0	0.0	0.0	0.2
H51	0.1	0.0	0.0	0.1	0.2	0.2	0.7	0.2	0.1	0.0	0.0	0.1	0.2
H52	2.2	2.3	3.0	1.6	1.6	2.9	3.2	2.3	1.2	2.5	2.2	2.0	1.7
H53	0.4	0.4	0.4	0.6	0.5	0.3	0.4	0.4	0.3	0.6	0.4	0.4	0.6
I	1.9	1.4	1.3	4.5	1.5	1.5	1.3	1.1	2.1	1.8	1.4	3.7	1.1
J58	0.1	0.7	0.3	0.3	0.4	0.2	0.2	0.3	0.5	0.2	0.2	0.3	0.58
J59_60	0.4	0.6	0.3	0.5	0.4	0.3	0.3	0.5	0.4	0.3	0.3	0.3	0.5
J61	1.8	1.3	1.6	1.8	1.3	1.2	1.4	1.0	1.3	1.0	1.4	0.9	0.9
J62_63	5.7	4.0	5.7	2.4	2.8	2.9	3.6	2.7	4.5	2.6	3.2	2.4	3.0
K64	3.9	2.9	3.6	4.1	3.0	1.5	2.2	2.8	1.3	2.3	2.2	2.9	2.5
K65	1.2	0.6	0.6	0.8	0.4	0.5	0.4	0.7	0.2	1.4	0.5	1.2	1.1
K66	0.4	0.5	0.5	0.8	0.6	0.5	0.6	0.5	0.4	0.2	0.3	0.4	0.7
L	9.7	9.7	9.5	9.6	10.2	7.0	12.1	5.7	8.6	7.5	10.7	10.6	10.6
M69_70	1.2	1.7	2.3	2.3	2.6	2.1	1.8	2.8	2.3	2.5	3.2	2.9	3.2
M71	0.6	1.4	1.0	1.8	1.4	0.7	1.0	1.1	1.1	1.8	1.5	1.5	1.4
M72	0.4	0.7	1.0	0.6	1.2	0.2	0.5	0.5	0.5	1.1	0.4	0.5	0.8
M73	0.3	0.6	0.8	0.6	0.4	0.7	0.8	0.8	0.5	0.5	0.9	0.4	0.4
M74_75	0.7	0.8	0.4	0.4	0.7	0.3	0.5	0.6	0.9	1.0	0.5	0.3	0.4
N77	0.5	0.5	1.1	0.9	0.6	0.9	0.9	0.6	0.3	0.2	0.5	1.3	1.6
N78	0.3	0.1	0.8	0.3	0.8	0.6	0.5	0.7	0.3	1.3	0.3	1.1	0.9
N79	0.1	0.1	0.1	0.2	0.0	0.3	0.3	0.2	0.1	0.0	0.1	0.1	0.2
N80-T82	2.1	1.1	1.5	0.9	1.9	1.4	1.3	1.3	2.0	1.0	2.4	1.7	2.2
O84	7.1	6.4	6.9	6.8	8.7	6.0	8.4	5.8	6.5	6.3	8.5	5.7	7.3
P85	4.3	5.0	5.2	5.0	4.5	4.8	5.1	4.6	4.2	5.4	4.3	5.7	4.9
Q86	3.9	4.6	4.5	5.0	4.0	4.2	4.2	4.1	5.6	5.1	3.8	6.1	5.7
Q87_88	0.7	1.0	0.6	0.8	1.2	0.8	0.7	0.8	0.3	1.3	0.8	1.8	2.5
R90-T92	0.8	0.8	1.0	1.1	0.9	0.9	1.4	0.5	1.4	0.8	1.7	0.6	0.8
R93	0.2	0.4	0.7	0.6	0.5	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.6
S94	0.4	0.4	0.5	0.6	0.6	0.1	0.3	0.2	0.7	0.3	0.3	0.9	1.1
S95	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.3	0.2	0.1	0.1	0.0	0.1
S96	0.9	0.5	0.4	1.1	0.6	0.7	0.5	0.8	0.5	0.5	0.6	0.6	1.1

Source: FIGARO, own calculations.

Table A2 / Value-added shares, change 2013-2020, per country

NACE	BG	CZ	EE	HR	HU	LT	LV	PL	RO	SI	SK	AT	DE
A01	-2.2	-0.1	-1.3	-0.9	-0.4	-2.0	0.4	-1.5	-1.8	-0.8	-0.3	-0.5	-0.3
A02	-0.1	-0.4	0.1	-0.1	0.0	0.0	0.4	-0.1	-0.1	-0.1	0.0	-0.2	0.0
A03	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
B	-0.5	-0.5	-0.6	-0.2	0.1	-0.2	0.1	-0.9	-0.4	-0.1	-0.1	-0.2	-0.1
C10-T12	-0.2	0.0	-0.1	-0.3	-0.3	-1.6	-0.4	0.0	-1.3	0.1	0.0	0.2	-0.1
C13-T15	-0.4	-0.1	-0.2	-0.1	-0.1	-0.5	-0.2	0.0	-1.1	-0.2	-0.1	-0.1	-0.1
C16	0.0	0.1	0.2	0.2	0.0	-0.2	0.7	0.0	-0.3	0.0	0.0	0.1	0.0
C17	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	0.1	0.0	0.0	-0.1	0.0	-0.1
C18	0.0	0.0	-0.1	0.0	-0.1	-0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
C19	-0.9	-0.1	-0.4	-1.3	-0.5	-2.3	0.0	-0.8	-1.2	0.0	0.0	0.1	0.0
C20	0.2	-0.1	0.0	-0.2	0.2	-0.4	0.1	-0.2	-0.1	-0.3	-0.1	0.0	-0.2
C21	-0.1	0.0	0.0	-0.2	-0.1	-0.1	0.0	0.0	-0.1	0.4	0.0	0.1	-0.1
C22	0.4	-0.1	0.0	0.1	0.0	-0.1	0.0	0.1	-0.1	0.2	-0.3	-0.1	-0.1
C23	0.5	0.0	0.0	0.1	0.1	-0.2	-0.1	0.2	0.0	0.0	0.1	-0.1	-0.1
C24	-0.3	-0.2	0.0	0.0	0.0	-0.1	-0.2	0.0	-0.4	0.2	-0.2	-0.1	-0.1
C25	0.3	0.0	0.0	0.3	0.0	0.3	0.2	0.5	-0.3	0.0	-0.1	-0.1	-0.3
C26	0.3	-0.2	-0.2	-0.1	-0.1	0.3	0.2	0.0	-0.3	0.1	-0.4	0.2	0.1
C27	0.2	0.0	-0.1	0.1	0.3	0.0	0.2	0.1	0.2	0.4	0.0	-0.1	-0.3
C28	0.0	-0.4	0.1	0.0	-1.5	-0.1	0.1	0.1	-0.1	0.7	0.1	-0.2	-0.2
C29	0.4	0.6	-0.2	0.2	-0.1	0.2	0.2	0.1	0.9	0.3	0.1	-0.1	0.2
C30	0.2	-0.1	0.0	-0.2	0.1	0.1	-0.1	0.1	-0.2	0.0	0.0	0.2	0.0
C31_32	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.2	-0.1	0.2	-0.1	0.0	-0.1
C33	0.2	-0.1	0.3	0.2	0.2	0.1	-0.4	0.0	-0.3	-0.1	-0.1	-0.1	-0.1
D35	-2.6	-1.6	-1.0	-0.1	-0.5	-2.0	-2.2	-1.2	-1.1	-1.0	-1.5	-0.9	-0.1
E36	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0
E37-T39	0.0	0.0	0.1	0.1	-0.1	-0.2	0.1	0.1	0.0	-0.1	-0.2	0.0	0.0
F	1.0	0.0	0.0	1.6	1.8	1.0	0.4	0.4	-0.8	1.0	0.4	0.6	1.1
G45	0.0	-0.1	0.1	0.2	0.1	0.8	-0.1	-0.9	1.0	0.1	0.1	-0.1	0.1
G46	0.3	0.0	0.2	-0.4	-0.6	-0.1	-0.4	-0.7	0.2	0.0	-1.0	0.3	0.4
G47	0.9	0.3	0.4	0.8	0.3	-0.8	0.3	0.6	4.0	0.0	-0.1	-0.3	0.2
H49	-0.3	0.0	-1.2	0.1	-0.1	3.4	-0.8	1.5	-0.5	0.1	0.2	-0.3	-0.1
H50	0.0	0.0	-0.2	-0.1	0.0	-0.1	-0.2	-0.1	-0.2	-0.1	0.0	0.0	-0.1
H51	-0.1	-0.2	0.0	-0.2	-0.1	0.1	0.3	0.0	-0.2	-0.2	0.0	0.0	0.0
H52	0.3	0.0	-1.5	0.0	-0.8	-1.5	-1.3	0.3	-0.1	0.5	0.4	-0.1	-0.1
H53	0.1	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I	-0.6	-0.6	-0.5	-0.9	-0.3	0.3	-0.1	-0.1	-0.1	-0.4	-0.1	-1.2	-0.3
J58	0.0	0.3	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.1	-0.2	-0.1	0.0	-0.1
J59_60	-0.1	0.0	-0.1	0.1	-0.4	0.1	0.1	0.0	0.0	0.0	0.1	0.0	-0.1
J61	-0.5	-0.2	-0.2	-0.6	-0.3	-0.3	-0.1	-0.4	-0.6	-0.6	-0.2	0.1	-0.1
J62_63	3.3	1.4	3.2	1.1	0.6	1.8	1.4	1.3	1.5	0.9	0.8	0.6	0.5
K64	-1.2	-0.5	0.4	-0.8	0.1	-0.3	-1.2	-0.4	-1.5	0.1	-0.7	-0.1	-0.5
K65	-0.1	-0.1	0.1	-0.1	-0.1	0.1	0.1	-0.2	0.1	-0.3	-0.1	0.1	0.1
K66	0.1	0.1	0.2	0.2	0.0	0.3	0.3	0.1	-0.6	0.0	0.0	0.0	0.1
L	-1.6	0.8	-0.5	-0.2	1.5	0.8	-0.7	0.6	0.0	-0.4	-0.2	1.1	-0.6
M69_70	0.2	-0.1	0.1	-0.5	0.1	0.4	-0.3	0.7	-0.1	0.2	1.1	0.3	0.0
M71	-0.1	0.1	0.1	-0.2	0.3	0.1	0.1	0.0	-0.2	0.3	0.0	0.0	-0.1
M72	-0.4	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.0	-0.1	0.0	0.2	0.0
M73	-0.1	0.0	0.3	0.0	0.0	0.1	0.0	-0.1	0.0	0.2	0.3	0.0	-0.1
M74_75	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	-0.1	0.0	0.0	-0.1
N77	0.2	0.0	-0.1	0.2	-0.2	0.5	0.3	0.1	0.1	0.0	-0.3	0.0	0.1
N78	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.3	0.0	0.1	0.0	0.0	-0.2
N79	-0.3	-0.1	-0.1	-0.2	-0.1	0.0	0.1	0.1	-0.2	-0.2	-0.2	-0.2	0.0
N80-T82	1.2	0.0	0.1	0.1	0.2	0.4	-0.3	0.3	0.6	0.1	1.0	0.2	0.4
O84	0.6	0.2	0.3	0.6	0.1	-0.2	1.1	0.0	1.9	-0.3	1.4	0.4	0.9
P85	1.0	0.6	0.6	0.2	0.5	0.1	0.5	-0.4	-0.1	-0.4	0.6	0.2	0.4
Q86	1.0	0.9	1.3	0.9	0.5	1.2	1.5	0.2	2.9	0.9	0.7	0.8	0.3
Q87_88	-0.2	0.3	0.1	0.2	0.1	0.4	0.1	0.2	0.3	0.1	0.3	0.2	0.4
R90-T92	-0.3	0.0	0.1	-0.1	0.0	0.0	0.1	0.0	-0.1	-0.5	-0.4	-0.2	-0.1
R93	0.0	0.0	0.2	0.0	0.1	0.2	-0.1	0.1	0.1	-0.1	0.0	0.0	0.1
S94	-0.1	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
S95	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0
S96	0.4	-0.1	0.0	0.2	-0.4	0.0	-0.1	0.0	0.1	-0.1	-0.2	-0.1	-0.2

Source: FIGARO, own calculations

Appendix B

Figure A1 / Bulgaria
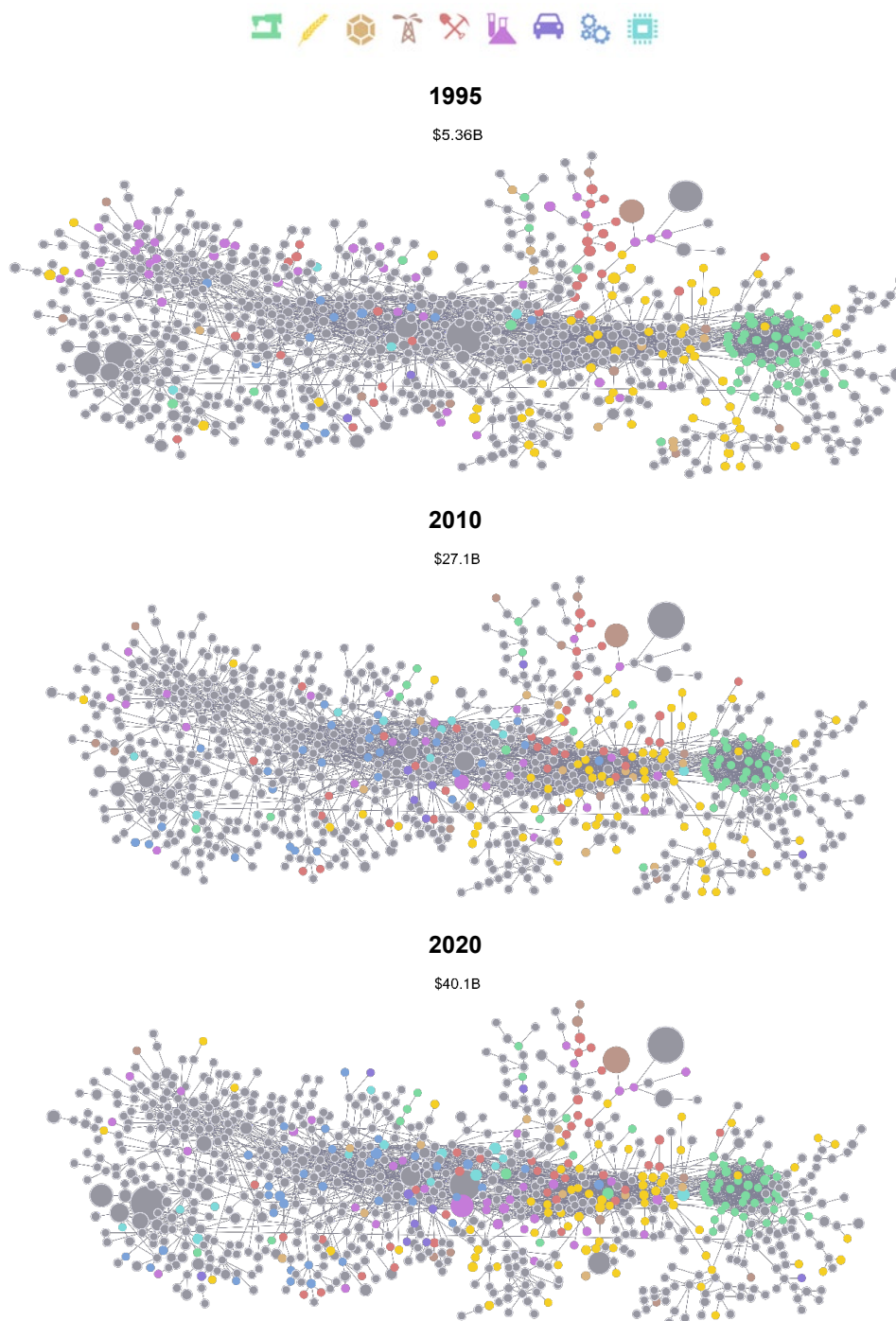
1995

$5.36B

2010

$27.1B

2020

$40.1B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
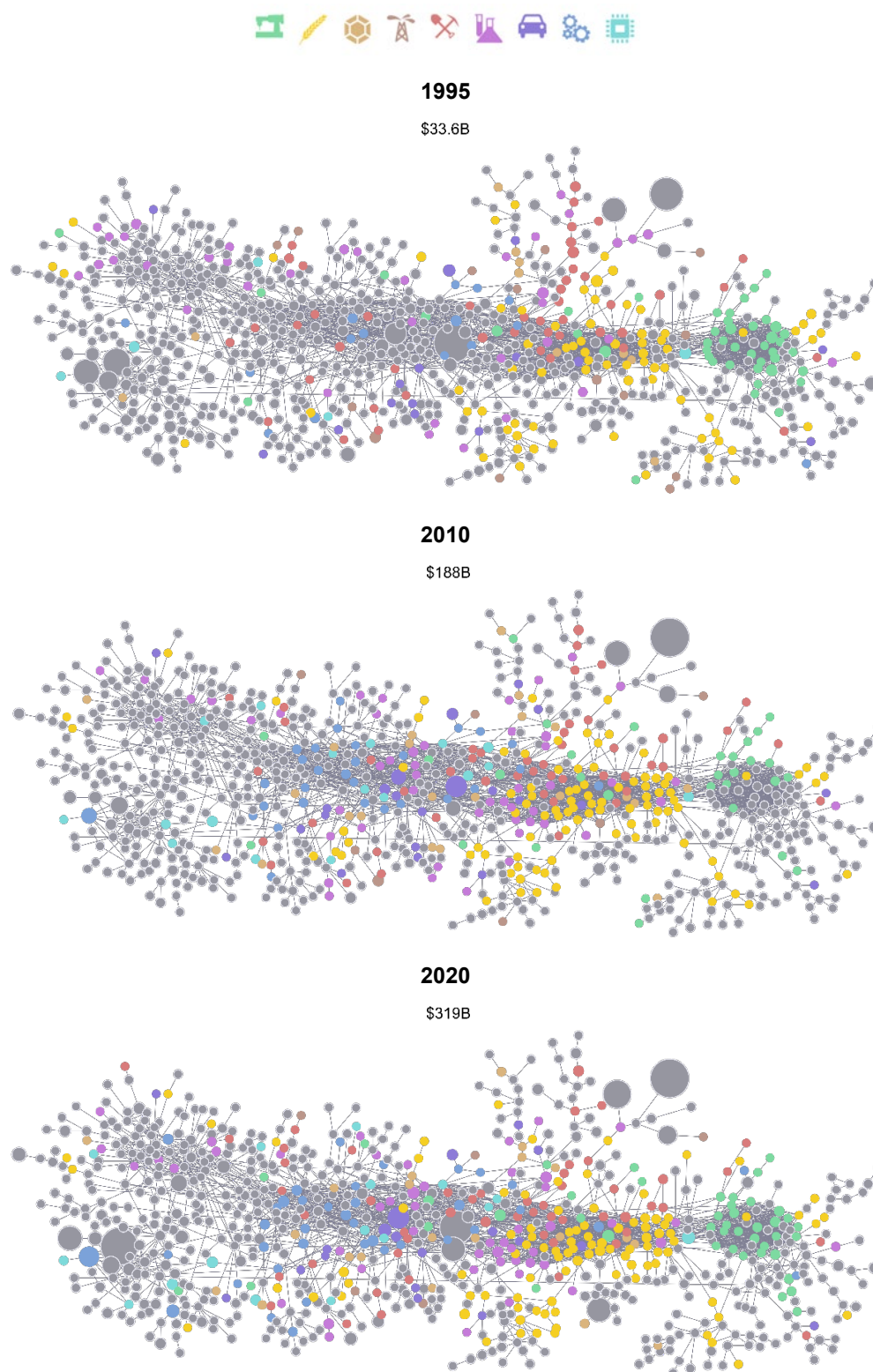Source: The Atlas of Economic Complexity.

Figure A2 / Czechia
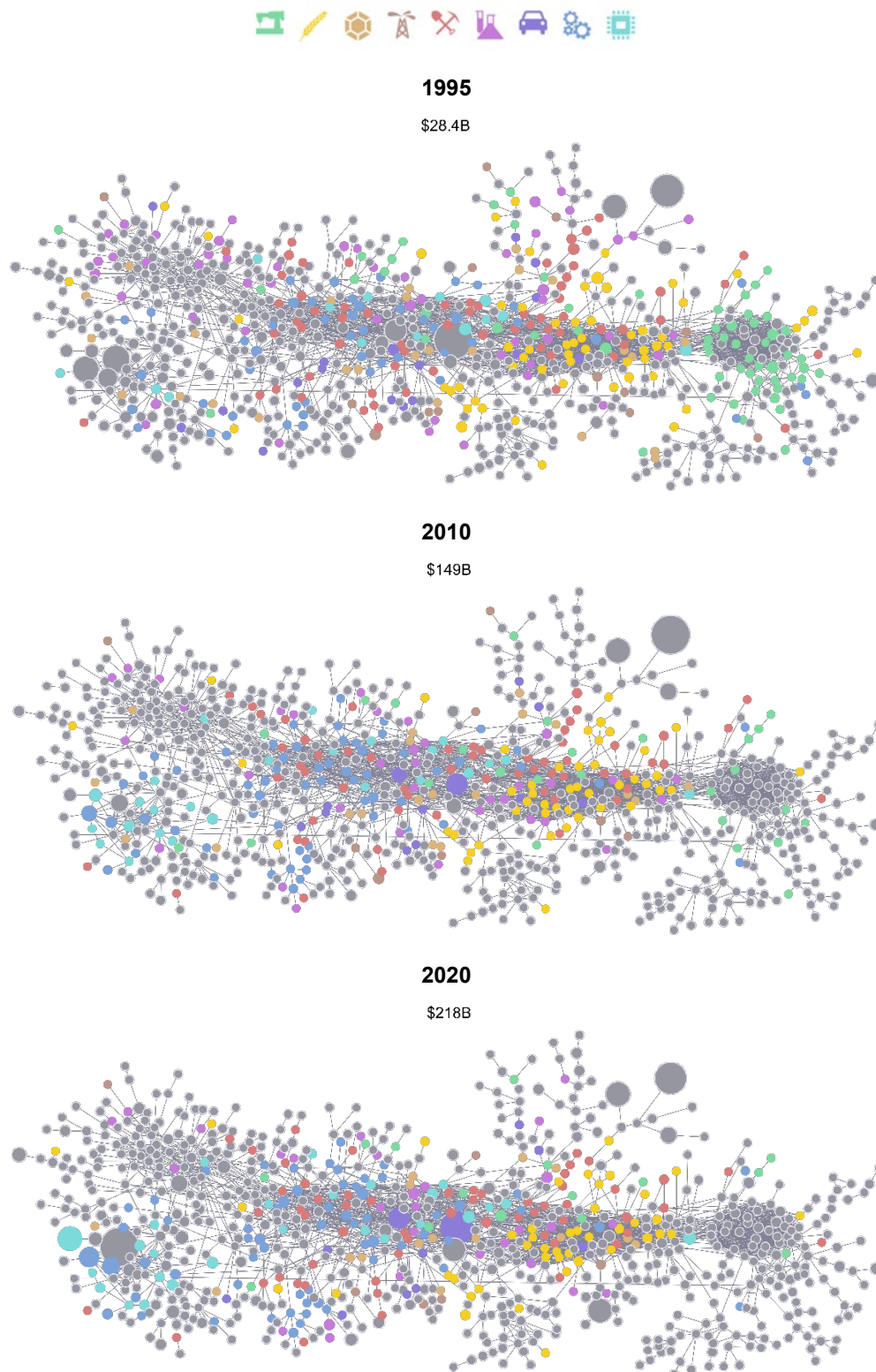
1995

$28.4B

2010

$149B

2020

$218B

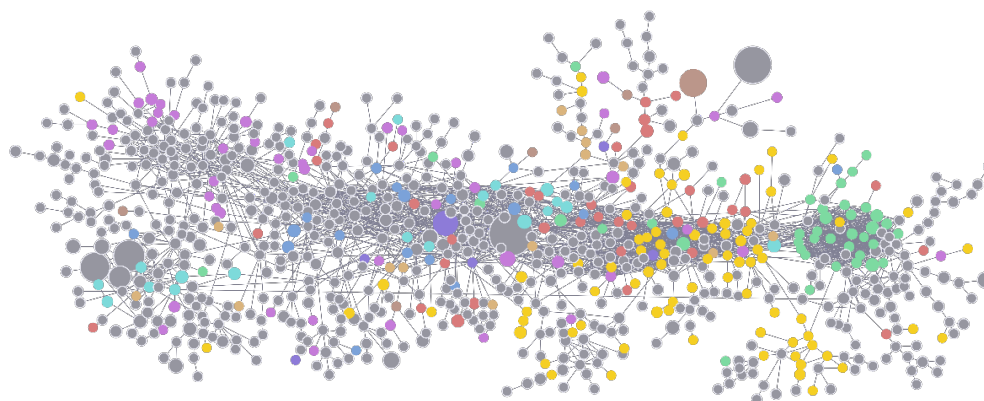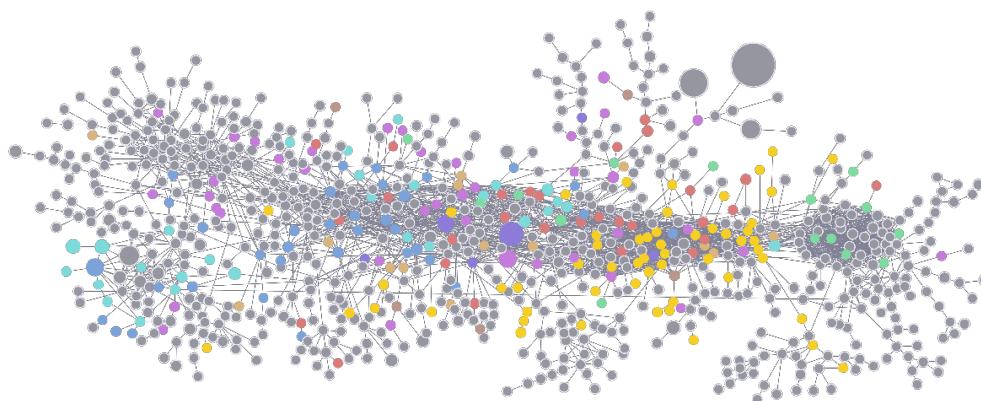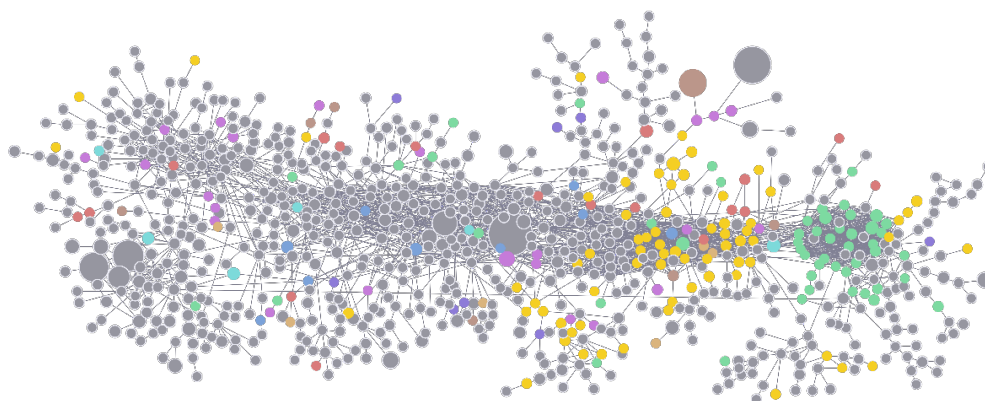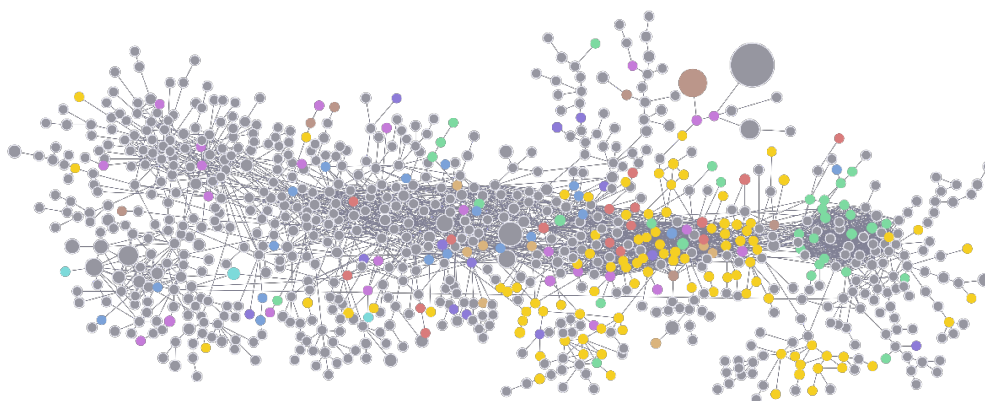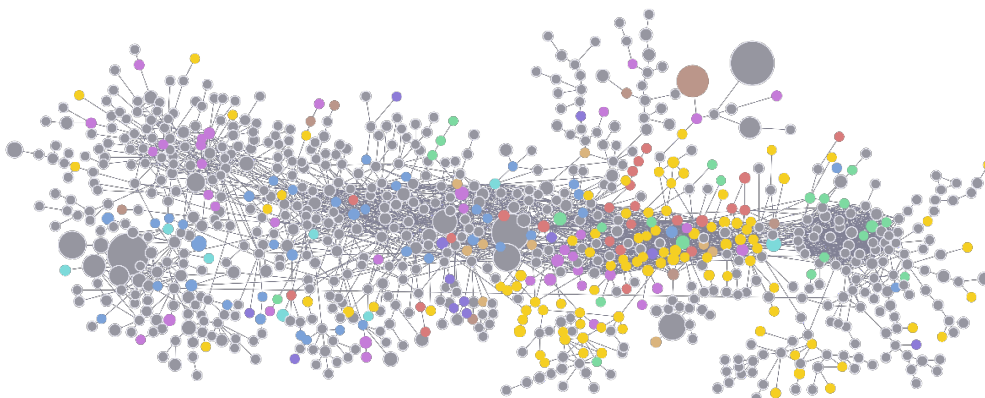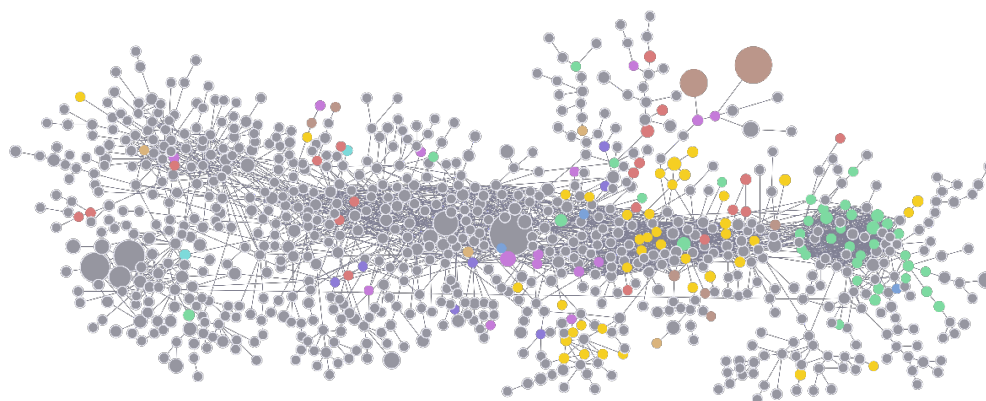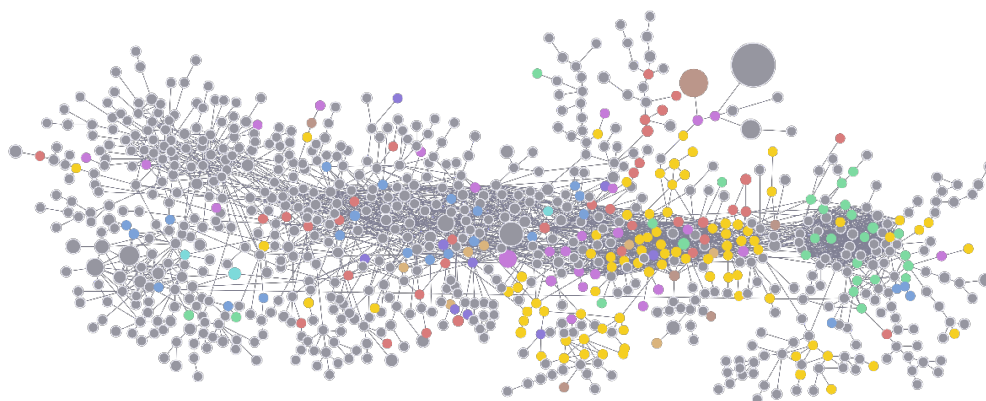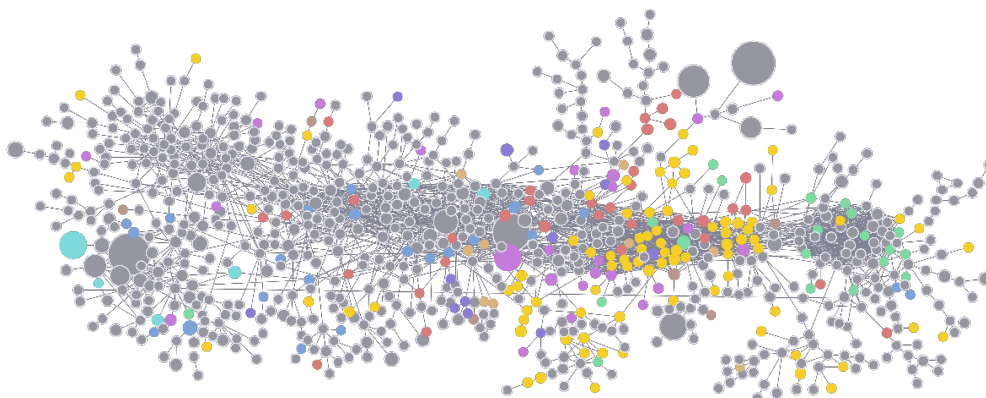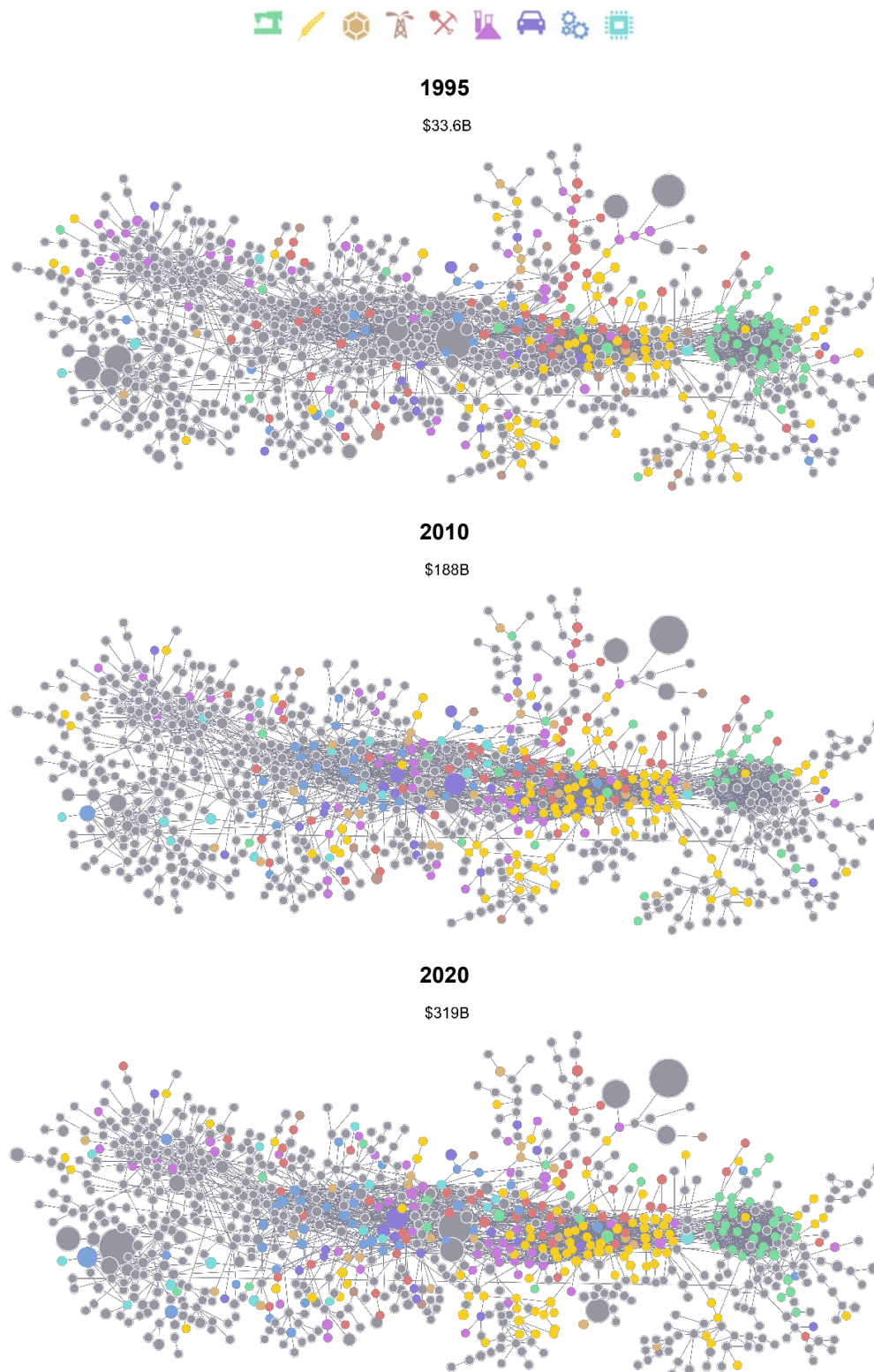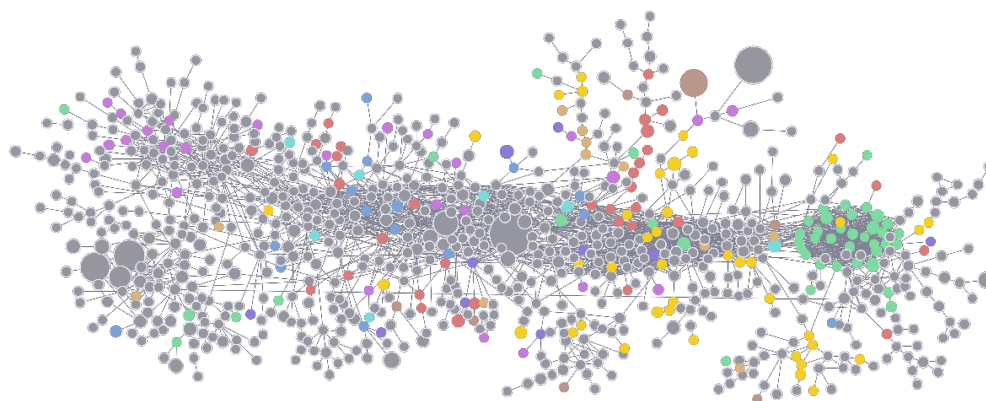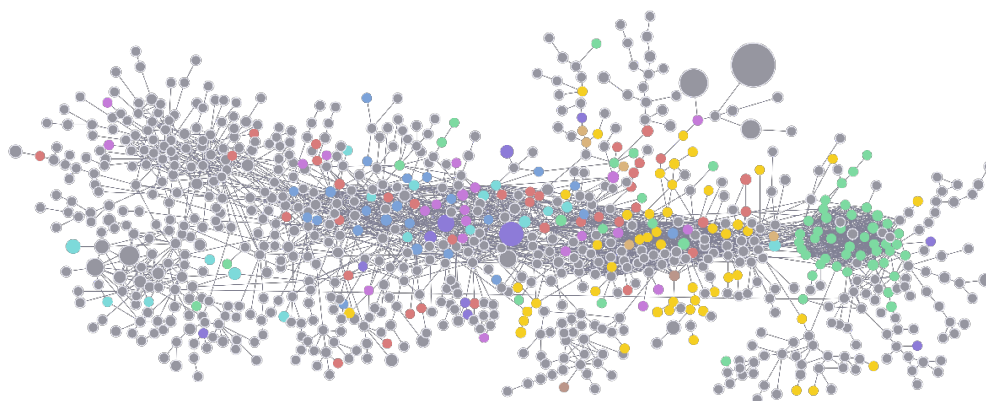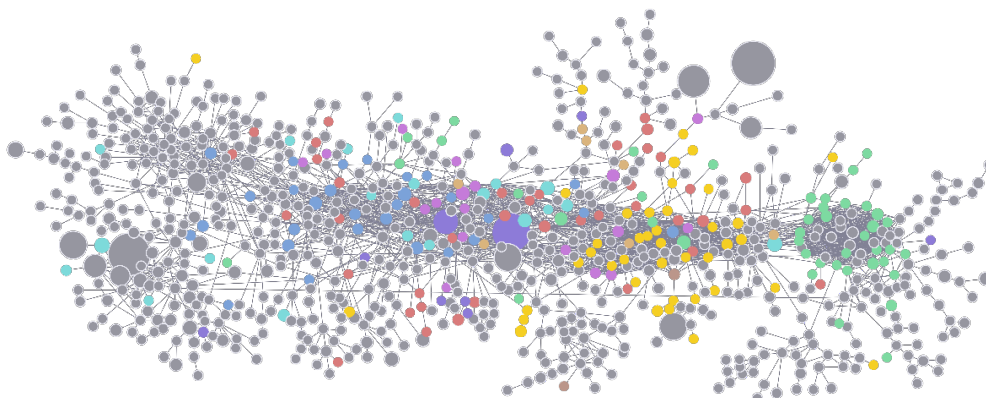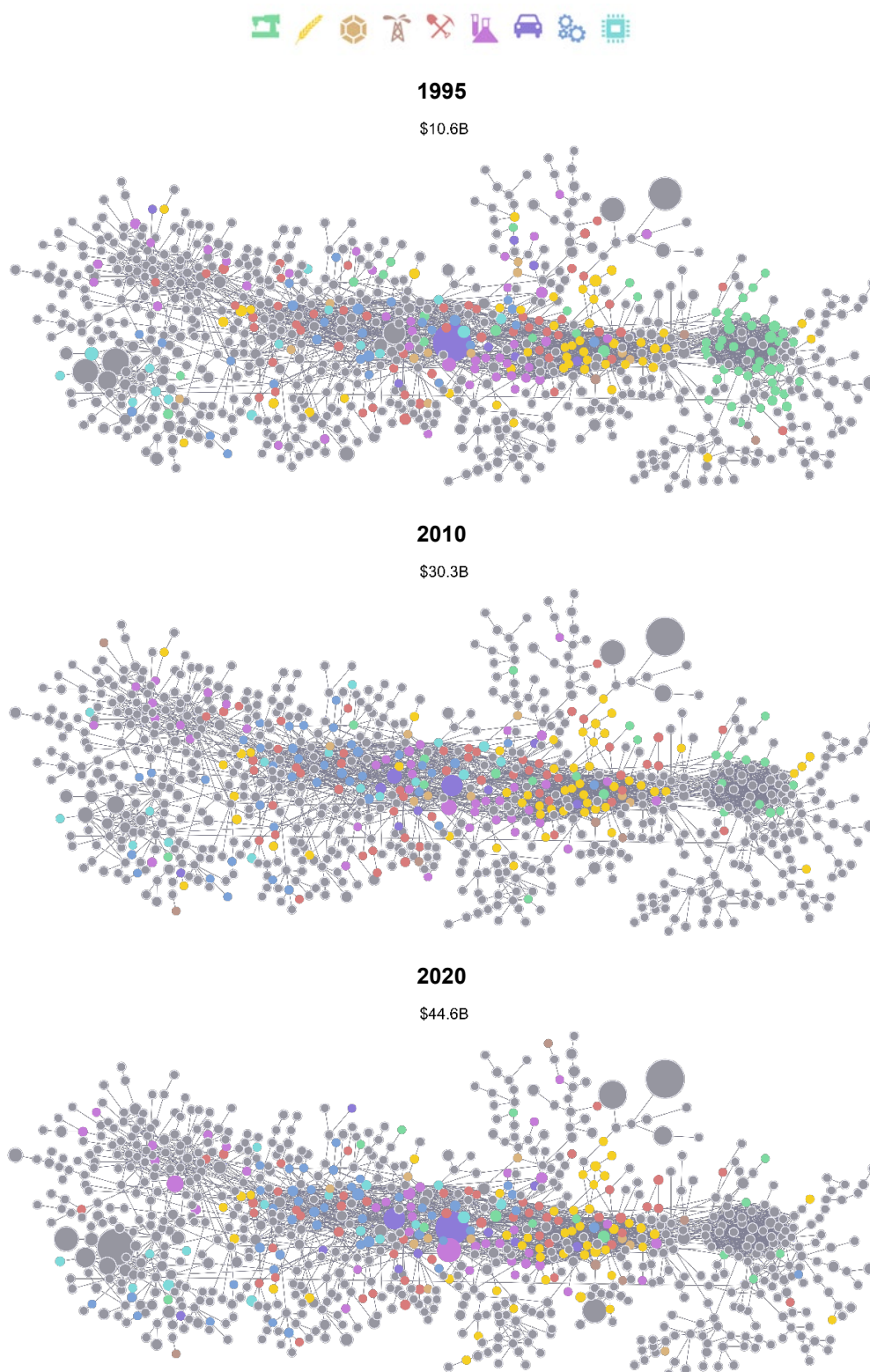Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
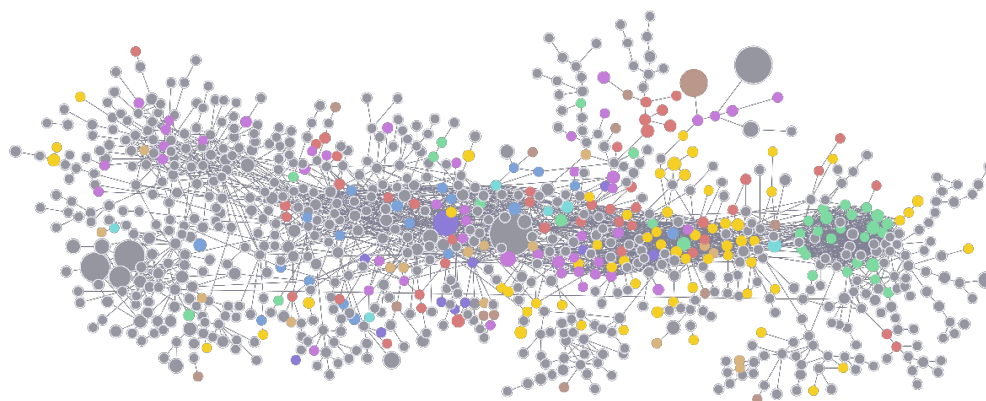Source: The Atlas of Economic Complexity.

Figure A3 / Estonia

1995

$33.6B

2010

$188B

2020

$319B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A4 / Croatia
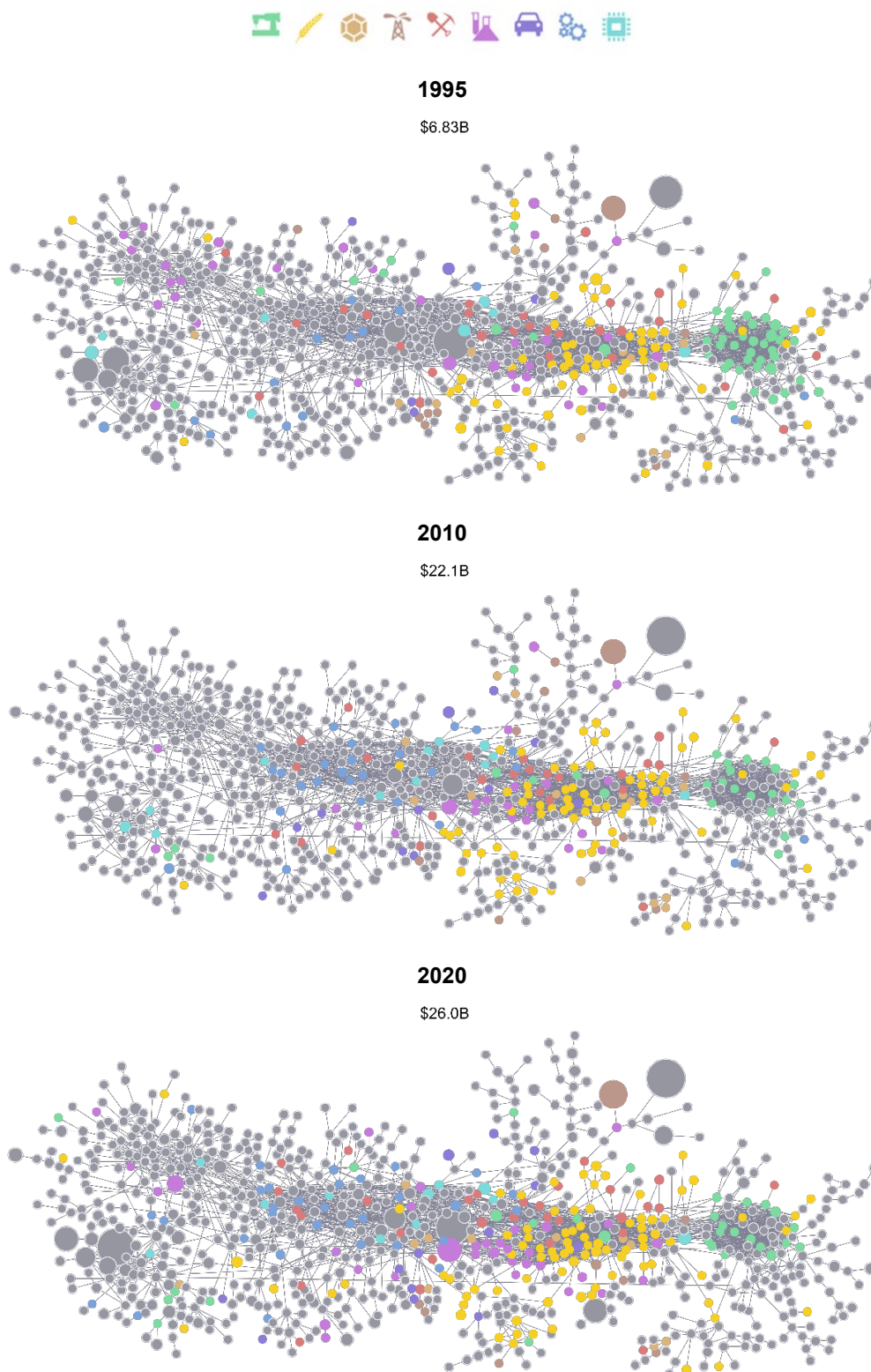
1995

$6.83B

2010

$22.1B

2020

$26.0B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
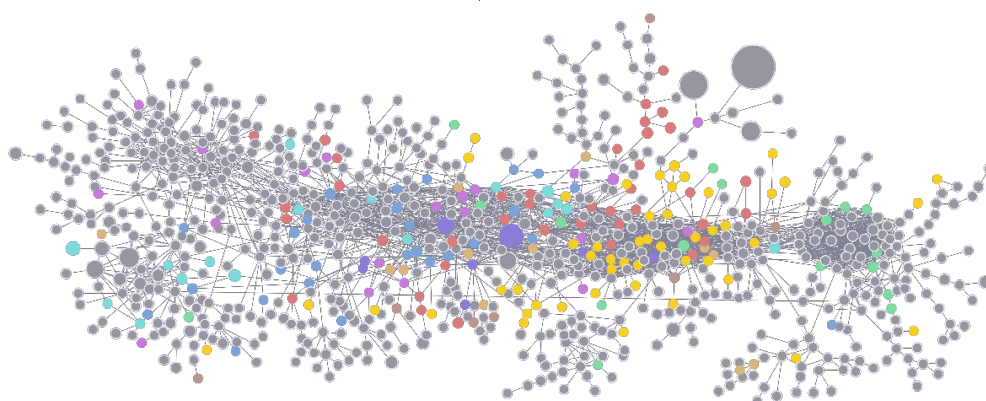Source: The Atlas of Economic Complexity.

Figure A5 / Hungary

1995

$21.3B

2010

$112B

2020

$140B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
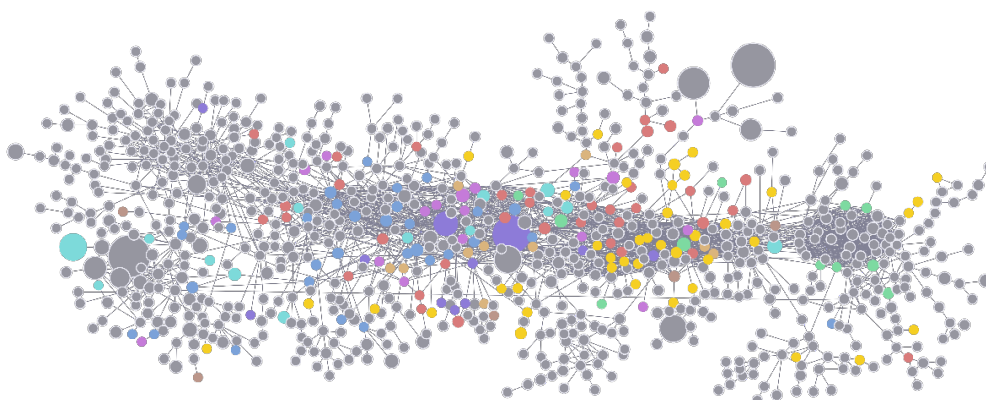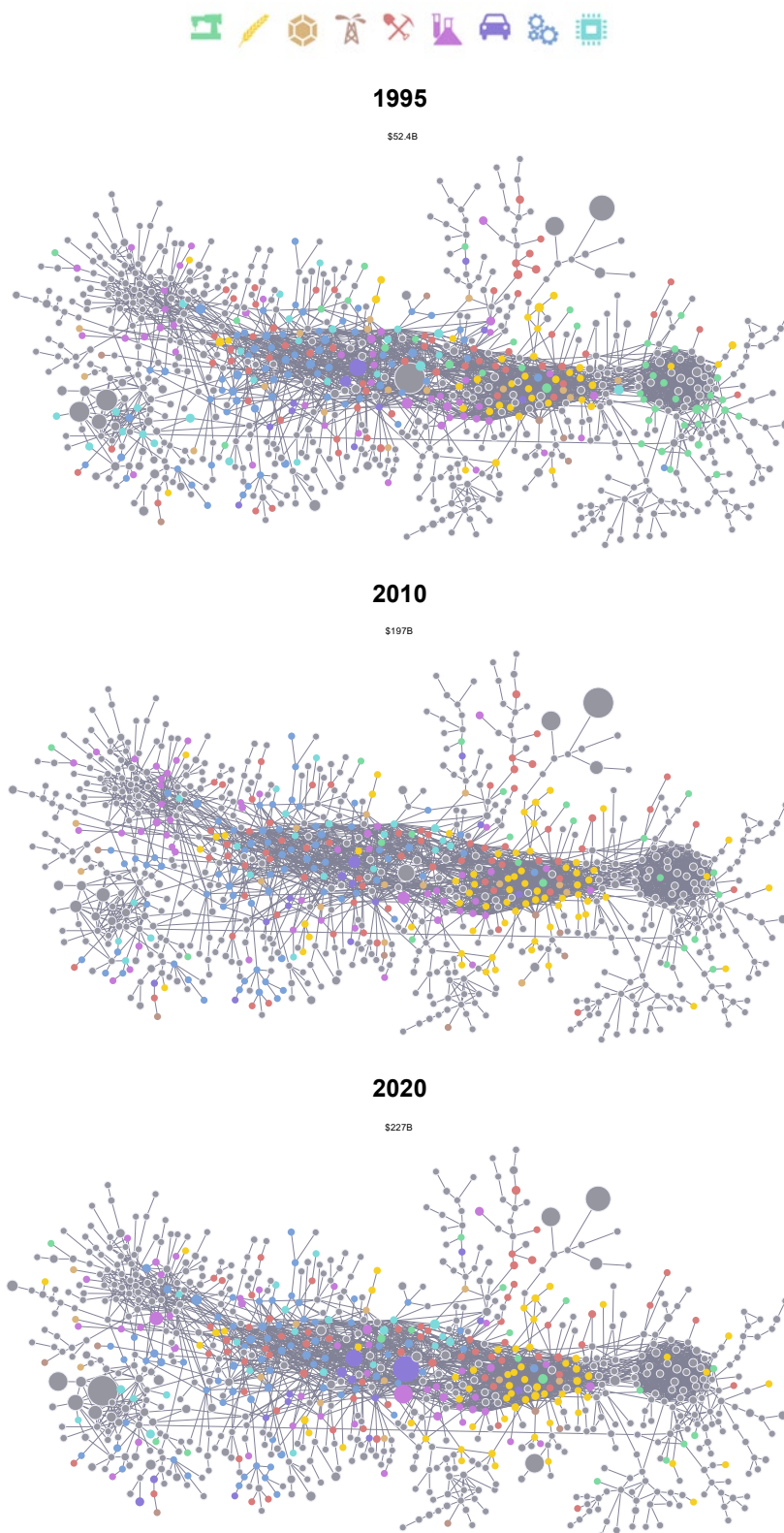Source: The Atlas of Economic Complexity.

Figure A6 / Lithuania

1995

$3.44B

2010

$22.4B

2020

$42.4B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A7 / Latvia

1995

$3.25B

2010

$12.9B

2020

$19.7B

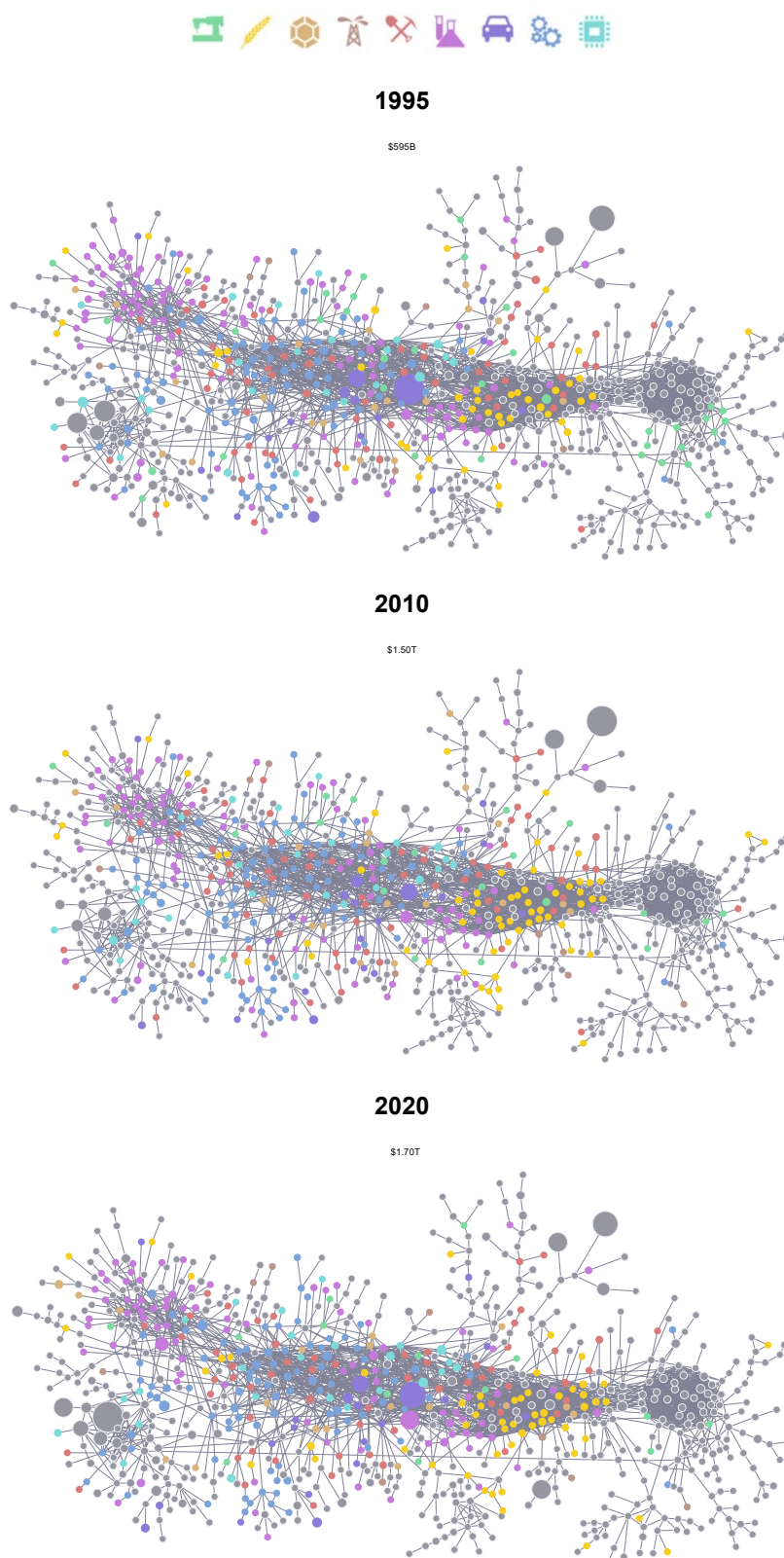Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A8 / Poland

1995

$33.6B

2010

$188B

2020

$319B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A9 / Romania

1995

$9.54B

2010

$58.5B

2020

$96.8B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A10 / Slovenia

1995

$10.6B

2010

$30.3B

2020

$44.6B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A11 / Slovakia

1995

$11.6B

2010

$68.9B

2020

$93.8B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A12 / Austria

1995

$52.4B

2010

$197B

2020

$227B

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.

Figure A13 / Germany

1995

$595B

2010

$1.50T

2020

$1.70T

Notes: 4-digit HS products. The size of the bubbles reflects world export volumes of HS 4-digit products.
Source: The Atlas of Economic Complexity.