CHAPTER 1



CREATING COMPARATIVE ADVANTAGE

As technology advances and economies develop, the structure of countries' production and exports changes. The rapid increase in global demand for artificial intelligence and increased spending on defence may catalyse the development of new export capabilities, but leveraging this demand shock will be challenging. Economies' export structures tend to be highly persistent, and developing new export specialisations tends to be more difficult for more complex products. Building new capabilities involves trial and error, requires active policy support and is generally more successful where economies already have established specialisations in related upstream or downstream products. Large exporters often play a key role in developing and marketing new complex products, with spillover effects on the broader corporate ecosystem.



INTRODUCTION

As technology advances and economies develop, the structure of countries' production changes. Over the past three decades, many economies in the EBRD regions have managed to reinvent themselves to a significant extent, making substantial changes to their export structures and moving up the value chain as they have benefited from trade liberalisation and closer integration with the European Union (EU).[1] Exporting a diverse mix of relatively complex products to a larger number of destinations has supported economic growth. Globalisation has stalled, however, and export markets have become more concentrated. For instance, in his 2024 report on the future of European competitiveness,[2] Mario Draghi notes that Europe needs to change radically in order to remain competitive, as the era of rapid global trade growth looks to have passed and EU companies face both greater competition from abroad and reduced access to overseas markets.

The rapid increase in global demand for artificial intelligence (AI) and increased spending on defence could further catalyse the development of new export capabilities. In recent years, demand for AI-related products has boosted global growth, while average spending on defence has been on the rise.[3] The markets for AI and military goods are large. These goods tend to be complex and highly connected to other goods in production networks. This makes these markets attractive. Box 1.1 discusses the space economy as another promising sector with intensifying global competition. Falling launch costs and smaller satellites are commercialising the space economy, creating opportunities for EBRD economies even though they operate relatively few satellites, with most revenue concentrated downstream in communications, Earth observation and climate analytics, as well as space-enabled applications relating to agriculture, water and natural capital.

Could countries in the EBRD regions and beyond take advantage of such shifts in technology and policy priorities to reinvent themselves? Specifically, could economies capitalise on the resulting demand shocks to boost their competitiveness and build new areas of comparative advantage? What does historical experience suggest for economies aiming to build strong production capabilities in AI-related goods or military sectors?

To answer these questions, this chapter examines the recent evolution of economies' export specialisations, looking at how common it is for economies to develop new capabilities, how lasting such shifts are, and under what circumstances it tends to be easier for economies to develop new export specialisations. The focus on exports is, in part, driven by the availability of detailed data on international trade in various goods (and less detailed data on exports of services). It also reflects the fact that exporters tend to be the most productive firms,[4] making exports a good reflection of economies' strongest capabilities in most cases.

The analysis looks at average experiences in a large set of economies, as well as specific case studies, since for most products (AI and military products included), strong production capabilities are concentrated in a handful of exporting economies. Consequently, outlier experiences are of interest here. In the second part of the chapter, country-level analysis is complemented by a detailed analysis of individual firms, as country export specialisations are a sum total of the advantages developed by individual exporters.

The analysis in this chapter shows that economies' export structures tend to be persistent, and developing new export specialisations tends to be more difficult for more complex products.

Building new capabilities involves trial and error and tends to be more successful where economies already have established specialisations in related upstream or downstream products. It also requires active policy support, including investment promotion, negotiation of free trade agreements that grant preferential market access, worker training, tax incentives, the use of special economic zones and other well-targeted industrial policies.

[1] See Kóczán, Konovalov and Plekhanov (forthcoming).
[2] See European Union (2024).
[3] See also EBRD (2026b) and IMF (2026).
[4] See, for instance, Berthou et al. (2015).



Large exporters often play a key role in developing and marketing new complex products, especially in the case of AI-related and military goods. In doing so, they have knock-on effects on the broader ecosystem of firms. While some economies in the EBRD regions specialise in exports of specific AI-related and military goods, the average specialisation in goods connected to AI and the military is relatively low.

This chapter starts by introducing measures of export specialisation and looks at the evolution of economies' specialisation.[5] It then examines the development of new export capabilities over time and among products with different characteristics, and draws implications for developing specialisations in AI-related and military products. The chapter then turns to the impact of demand shocks and firm-level evidence on the role of top firms. The last section presents conclusions and policy implications.

MEASURING EXPORT SPECIALISATION

The analysis in this section builds on trade data for both goods and services, with the caveat that many services are not traded and services data are available at a much higher level of aggregation. Trade data for goods draw on the BACI International Trade Database developed by the Centre d'Études Prospectives et d'Informations Internationales (CEPII), which provides harmonised bilateral trade flows reconciled from the exports and imports of trading partners.[6] Depending on the analysis, the data are classified according to the HS1992, HS2002 or HS2022 revisions of the World Customs Organization (WCO) Harmonized System (HS).[7] These classifications distinguish around 5,000 products at the six-digit level (HS6) and cover 229 economies from 1995 to 2024. This level of disaggregation distinguishes between, say, other automatic data-processing machine units (HS6 847180) and parts and accessories for automatic data-processing machines (HS6 847330), and between aircraft launching and arresting equipment (HS6 880510) and air-combat flight simulators (HS6 880521).

Trade data for services have been obtained from the Balanced Trade in Services (BaTIS) database compiled by the World Trade Organization (WTO) and the Organisation for Economic Co-operation and Development (OECD).[8] The database covers 202 economies from 1995 to 2024. To construct a consistent long-run series, total services exports from the earlier version of the dataset (covering 1995-2012, based on the fifth edition of the *Balance of Payments Manual* (BPM5))[9] have been rescaled to match the later series (covering 2005-24 (BPM6))[10] based on the earliest overlapping year (2005).

The following analysis examines countries' export specialisations, relying on the concept of revealed comparative advantage (RCA). The RCA for a given product is the ratio of the product's share of the country's total exports to the product's share of world trade. If the ratio is greater than 1, a country specialises in exports of that particular product. In such cases, the country's market share of global exports of a given good exceeds its share of global exports for all products. For instance, in 2024, medicaments (HS code 300490) accounted for 1.7 per cent of world trade, but 34 per cent of Slovenia's total exports. Slovenia, therefore, exports 20 times its "share" of all medicament exports and is considered to have a (strong) RCA in the sector. Similarly, China has an RCA in electric vehicles. RCA thus reflects economies' competitive export strengths as "revealed" by observed trade flows and is straightforward to calculate using global trade data.

In 2024, medicaments accounted for just
1.7%
of world trade, but
34%
of Slovenia's exports

[5] The analysis builds on Kóczán et al. (forthcoming), which explores these issues in greater detail.

[6] See Gaulier and Zignago (2010).
[7] See WCO (2022).
[8] See WTO and OECD (n.d.).
[9] See IMF (2007).
[10] See IMF (2013).

RCA scores are further normalised to range from 0 to 1 by applying the transformation x/(1 + x).[11] Transformed values of more than 0.5 correspond to products in which the country has an above-average market share and enjoys an RCA. To restrict analysis to meaningful exports, the country-level analysis of non-zero exports is restricted to country product observations with at least US$ 100,000 in exports and a normalised RCA of more than 0.01. Changes in RCA could also reflect price effects.

CHANGING PRODUCTION AND EXPORT STRUCTURES

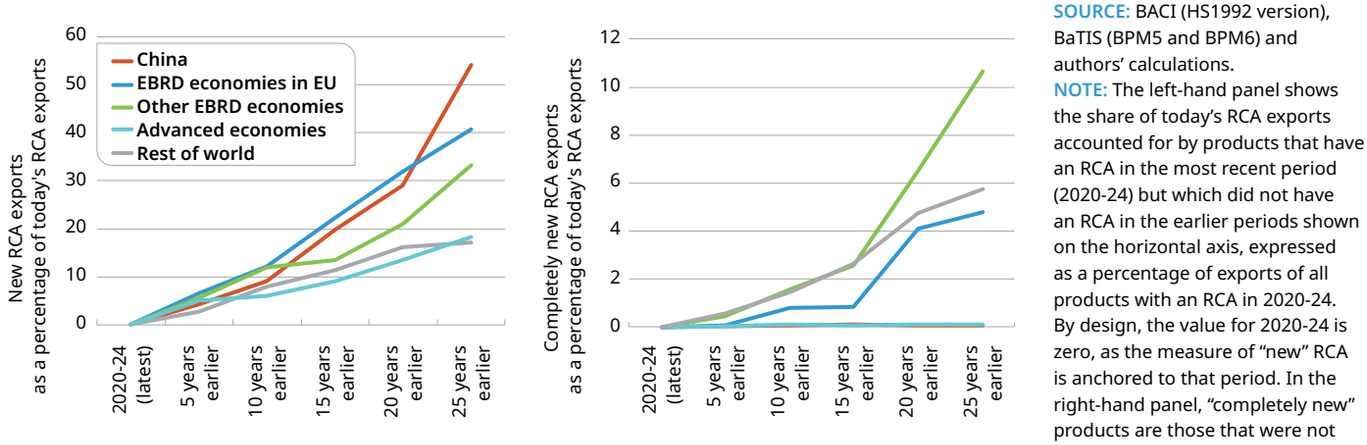
The structure of countries' exports changes over time. These changes reflect technological advances, skills upgrades and the development of new production capabilities. Over the past three decades, many economies in the EBRD regions have managed to reinvent themselves to a significant extent, substantially changing their export structures and moving up the value chain. Of the products in which a typical (median) economy in the EBRD regions specialises today, around half were not exported with an RCA 25 years ago (in 1995-99) and almost 40 per cent were not exported at all.

In the median EBRD economy, products that have an RCA today but did not have one 25 years ago currently account for about 35 per cent of total RCA exports (with goods accounting for 34 percentage points and new specialisations in services accounting for 1 percentage point; see Chart 1.1, left-hand panel). Products with an RCA today that were not exported at all 25 years ago currently account for about 6 per cent of total RCA product export sales (see Chart 1.1, right-hand panel). Many countries' export specialisations from 25 years ago were not retained.

In other words, new comparative advantages have largely replaced old ones in a typical economy, with some exceptions. The Baltic states, Egypt, Türkiye and Uzbekistan, for instance, have substantially expanded their range of export specialisations while retaining a relatively large share of their earlier comparative advantages.

In the median EBRD economy, products that have an RCA today but did not 25 years ago currently account for about **35%** of total RCA exports

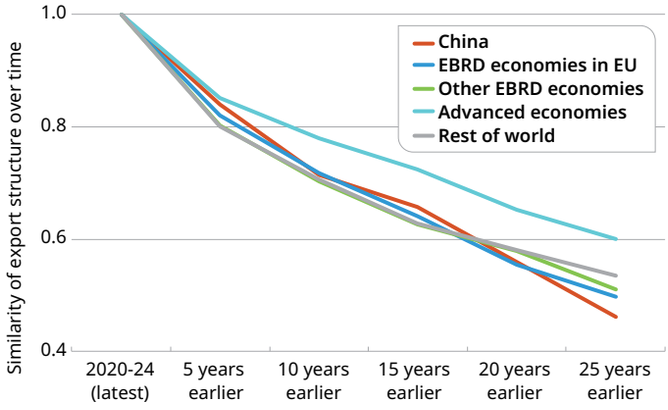
CHART 1.1 The reinvention of export baskets



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.
NOTE: The left-hand panel shows the share of today's RCA exports accounted for by products that have an RCA in the most recent period (2020-24) but which did not have an RCA in the earlier periods shown on the horizontal axis, expressed as a percentage of exports of all products with an RCA in 2020-24. By design, the value for 2020-24 is zero, as the measure of "new" RCA is anchored to that period. In the right-hand panel, "completely new" products are those that were not exported at all in the earlier periods.

[11] See also Harvard Growth Lab (2026) and Dalum, Laursen and Villumsen (1998).

CHART 1.2 China has experienced the most significant changes in its export structure over time, while advanced economies have changed far less



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.
NOTE: The export similarity index is calculated based on Finger and Kreinin (1979).

Advanced economies, such as Germany and the United States of America, have seen far less turnover when it comes to export specialisation than the median economy in the EBRD regions. Here, products that were not exported with an RCA 25 years ago account for 18 per cent of today's RCA exports. Products that were not exported at all 25 years ago account for only 0.1 per cent of RCA exports today, as these economies already enjoyed diversified export baskets in the 1990s.

In contrast, the "reinvention" of exports has been stark in China and a number of other economies in Asia, including India and Vietnam. In China, products that were not exported with an RCA 25 years ago now account for 54 per cent of the value of exports in which China specialises. Yet completely new exports account for only 0.1 percentage points of these (similar to the case of large advanced economies). China and a number of other large Asian economies have developed new comparative advantages while largely retaining their existing ones.

EXPORT SIMILARITY OVER TIME

The concept of RCA is useful for comparing specialisations in small and large economies. At the same time, it introduces a discontinuity, with a country "specialising" in products when it has a share of exports that is just above the world average and "not specialising" in exports when the product share is just below the cut-off point. The picture remains similar when looking at exports of all products.

Here, the export structures of a given economy at different points in time (for instance, Kenya today and Kenya five years ago) can be compared using a similarity index following the approach in Finger and Kreinin (1979). For each country-year, the calculation constructs shares of each product in a country's total exports in a given year and takes the minimum of those shares for each product across different years. Export similarity is then measured as a sum of these minimum export shares across all products. This yields an index ranging from 0 (where product baskets have no overlap) to 1 (where a country's export structure is unchanged).[12]

Looking at the similarity of past and present structures of a country's exports confirms the patterns described above. China has experienced the most significant changes in its export structure over time, followed by EBRD economies in the EU. To put this into perspective, China's export structure today is more similar to Japan's export structure in 1995-99 than to China's own export structure in the same period. For advanced economies, the extent of the change has been smaller, but nonetheless significant (see Chart 1.2).

Products with an RCA today that were not exported at all 25 years ago currently account for about
6%
of total RCA exports in the median EBRD economy

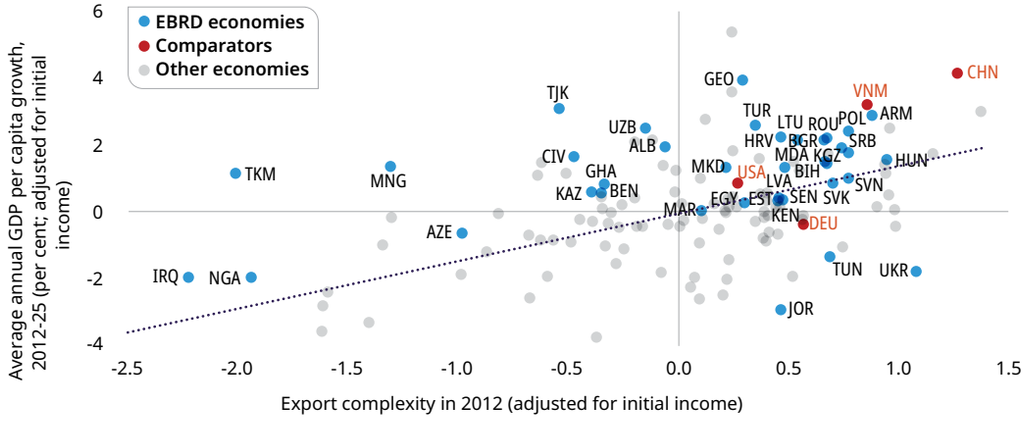
[12] See also EBRD (2025b), which looks at export similarity across countries rather than over time.

EXPORTING A DIVERSE MIX OF COMPLEX PRODUCTS HAS SUPPORTED ECONOMIC GROWTH

Which products countries export matters. Beyond looking at the number of products in which economies specialise or the volume of exports, the "complexity" of those products is also pertinent. Complexity can be seen as a proxy for the "productive knowledge" embedded in a country's exports. It is measured as the "diversity" of the export basket (how many different products a country exports competitively) discounted by "ubiquity" (how many countries specialise in exporting that product).[13] Complex goods, therefore, are those that are exported by few complex countries. Complex countries export many products competitively. This iterative procedure yields standardised complexity scores, with a mean of zero and a standard deviation of 1, with semiconductors, photographic plates and film, and nickel plates, sheets, strip and foil deemed relatively complex. Examples of low-complexity products include cocoa beans, tin ores and concentrates, and crude oil.

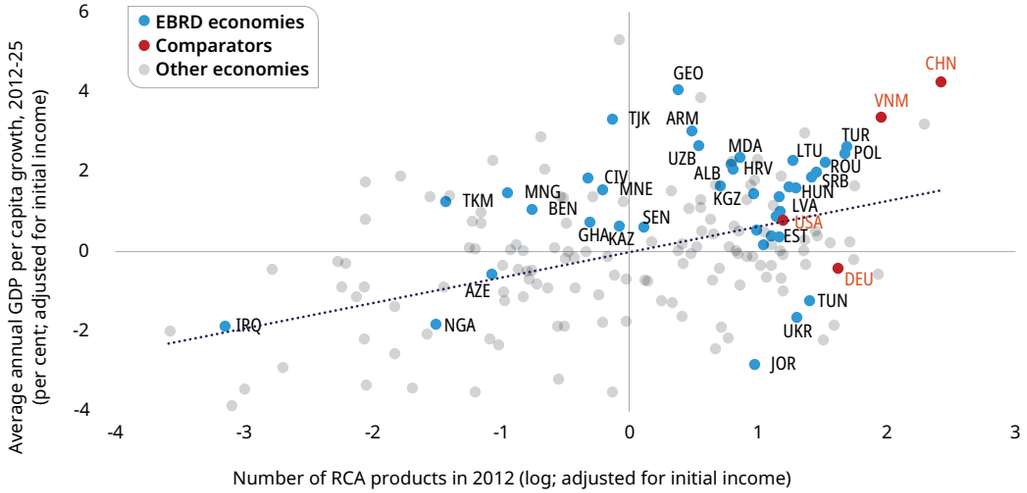
Exporting more diversified baskets containing more complex products tends to be associated with faster subsequent economic growth.[14] Charts 1.3 and 1.4 illustrate these associations for per capita income growth since 2012.

CHART 1.3 More complex exports are associated with faster subsequent growth



SOURCE: Harvard Growth Lab (2026), IMF (2026) and authors' calculations.
NOTE: The vertical axis shows residual gross domestic product (GDP) per capita growth after controlling for the logarithm of initial GDP measured at market exchange rates. The horizontal axis shows the residual average complexity of countries' exports in 2012 after controlling for the logarithm of initial GDP per capita measured at market exchange rates.

CHART 1.4 More diversified exports are associated with faster subsequent growth



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6), IMF (2026) and authors' calculations.
NOTE: The vertical axis shows residual GDP per capita growth after controlling for the logarithm of initial GDP per capita measured at market exchange rates. The horizontal axis shows the residual logarithm of the number of products exported with an RCA in 2012 after controlling for the logarithm of initial GDP per capita measured at market exchange rates.

[13] See Hausmann et al. (2014).

[14] See, for instance, Hausmann, Hwang and Rodrik (2007), Hidalgo and Hausmann (2009) and Mania and Rieber (2019).

DIVERSIFICATION OF EXPORT BASKETS IN THE EBRD REGIONS

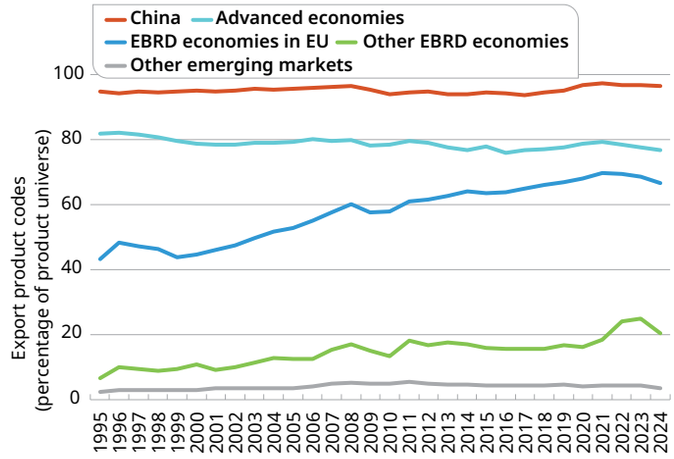
As economies in the EBRD regions have benefited from increases in trade and foreign direct investment inflows over the last three decades, they have become significantly more diversified exporters. The median economy in the EBRD regions now exports around 28 per cent of all HS6 product categories, up from around 13 per cent in 1995 (see Chart 1.5). This is a much starker increase than in the rest of the world (the trend for a typical economy in emerging Asia, for instance, being similar to that of the rest of the world). Export diversification has been especially pronounced in EBRD economies in the EU and Türkiye, where it has increased from 43 per cent to 67 per cent and from 63 per cent to 87 per cent, respectively. In general, richer and larger economies tend to export more products.

EXPORTS TO MORE DESTINATIONS

Economies in the EBRD regions also export to more destinations. In the median EBRD economy in the EU, the average product is now exported to 37 economies, up from 12 in 1995 (see Chart 1.6). In China, the number of destinations for the (trade-weighted) average product has almost tripled to 139 during this period. In the rest of the EBRD regions, the average has also increased somewhat, from 10 to 14 destinations. Advanced economies, too, have seen a gradual increase in the average number of export markets. In the rest of the world, change has been muted: in a typical economy, the average product is exported to only eight destinations.

The median EBRD economy now exports around
28%
of all product categories, up from around
13%
in 1995

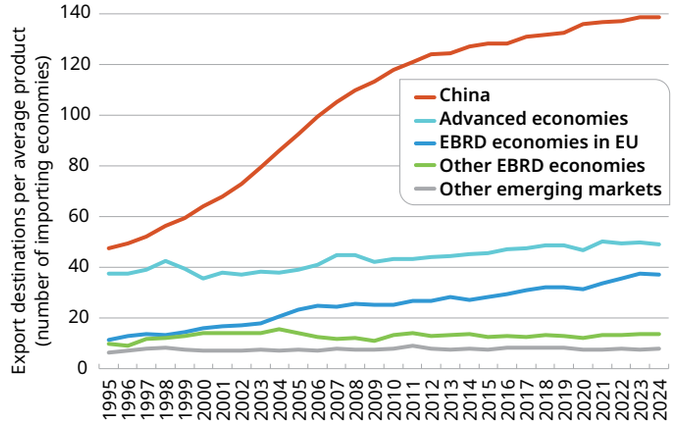
CHART 1.5 The EBRD regions have become more diversified in the goods they export



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.

NOTE: A product is considered to be exported if its export value in a given year exceeds US$ 100,000 (discounted annually by 2 per cent relative to 2024 prices). Medians are shown for each region.

CHART 1.6 In the median EBRD economy in the EU, the average product is now exported to 37 destinations, more than three times as many as in the 1990s



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.

NOTE: A country is considered to be an export destination for a given product if the value of exports to that destination in a given year exceeds US$ 100,000 (discounted annually by 2 per cent relative to 2024 prices). Averages weighted by export volumes are calculated for products in each economy, and medians are calculated for economies within a region.

BROADLY STABLE NUMBER OF EXPORT SPECIALISATIONS

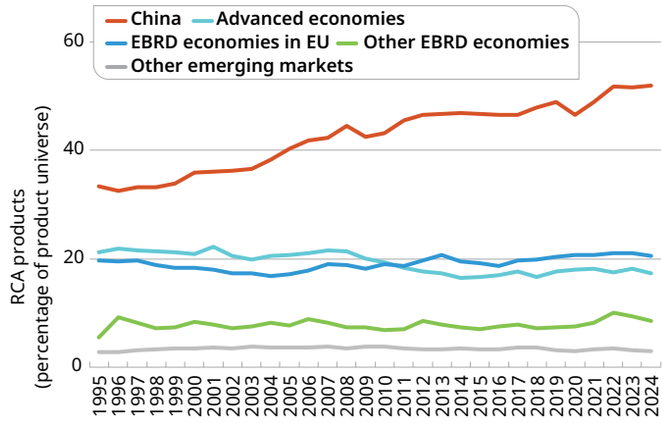
The number of products exported with an RCA has, however, remained broadly stable in the median economy in the EBRD regions, at around 500, corresponding to 11 per cent of HS6 product codes (see Chart 1.7). A notable exception is Türkiye, which has seen a large increase in the number of goods exported with an RCA over the past three decades, from 21 per cent to 35 per cent.

Advanced economies have experienced overall declines in the number of products in which they hold a comparative advantage, as comparative advantages gained have been outnumbered by those lost. For instance, the share has declined from 34 per cent to 29 per cent in the United States and from 45 per cent to 42 per cent in Germany. In contrast, the share of products in which China enjoys an RCA has risen from 33 per cent to 52 per cent over the last three decades.[15]

GROWING COMPLEXITY IN EBRD ECONOMIES IN THE EU

Goods exported by EBRD economies in the EU and China have become more complex over time (see Chart 1.8). In contrast, the average complexity of exports has declined in advanced economies since the early 2000s to a level in line with China's. It has changed little in the rest of the world, on average. In the EBRD regions, the average complexity of exports has increased most in the Baltic states, Hungary, Poland, the Slovak Republic and Slovenia, as well as in Ghana, Morocco, Tunisia and Türkiye, sometimes from a low initial level. Trends in terms of the complexity and diversification of exports have been reflected in economies' average growth performance, with EBRD economies in the EU (and China) enjoying exceptional growth in income per capita.[16]

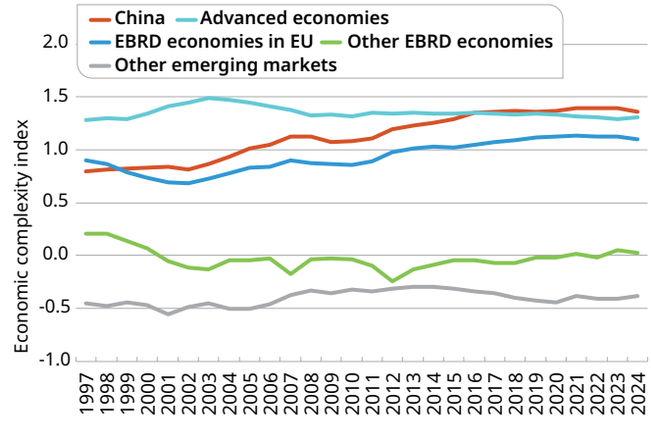
CHART 1.7 The number of products exported with an RCA has remained broadly stable in the EBRD regions



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.

NOTE: Medians are shown for all regions.

CHART 1.8 The average complexity of goods exported by EBRD economies in the EU and China has been increasing



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.

NOTE: The economic complexity index has been calculated based on a Harvard Growth Lab methodology.

The median EBRD economy has an RCA in about **11%** of all products

[15] See also EBRD (2026a).

[16] See Chupilkin, Kóczán and Plekhanov (2025).

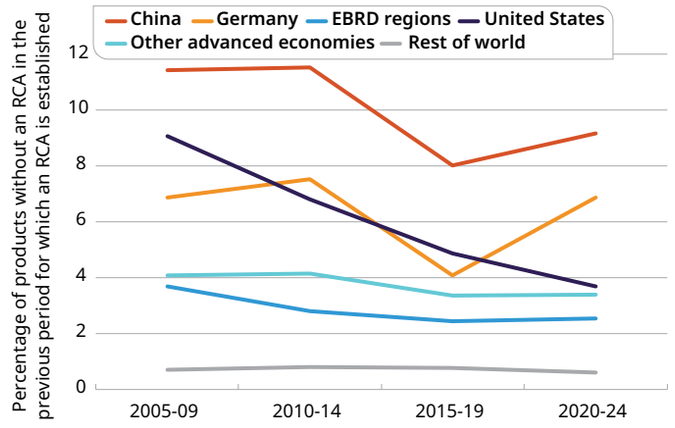
DEVELOPING NEW EXPORT CAPABILITIES HAS BECOME MORE DIFFICULT

With rising competition in export markets, developing new export capabilities has become more difficult (see Chart 1.9). While export capabilities change significantly over time, developing a specialisation in any specific product is challenging. Over a five-year period, a typical economy develops new capabilities in 55 products (which includes products without any exports in the previous period), corresponding to 7.2 per cent of products exported by that economy without an RCA in the preceding five years. Put differently, it would take a typical country 70 years to develop an RCA in a given export product, calculated as the inverse of the five-year transition rate multiplied by five years. This remains true in exceptional circumstances: fewer than 5 per cent of economies manage to develop an RCA in more than 20 per cent of previously exported products over a five-year period.

In the EBRD regions, as in many other developing economies, new comparative advantages have tended to emerge in products that are somewhat more complex than those where an RCA has been lost. The typical EBRD economy has lost RCA in products around the 40th percentile of the complexity distribution and gained RCA in products around the 50th percentile. China is characterised by a very pronounced shift towards higher-complexity products, losing RCA in products around the 28th percentile and gaining it in products around the 72nd percentile.[17]

In contrast, as emerging markets have developed export specialisations in more complex products, some advanced economies have lost their RCA in those products. For instance, 11 economies in the EBRD regions (9 economies in emerging Europe, plus Tunisia and Türkiye) have gained an RCA in motor vehicle parts and accessories (HS6 code 870899), while the United States has lost this RCA. The next section examines factors that can facilitate the development of new export capabilities.

CHART 1.9 Developing new export capabilities has become more difficult over time



SOURCE: BACI (HS2002 version) and authors' calculations.
NOTE: This analysis only counts advantages developed; it disregards advantages lost. It also includes products without any previous exports.

Over a
FIVE-YEAR PERIOD,
a typical economy develops new capabilities in
55 PRODUCTS

[17] See also EBRD (2025a) on the rising complexity of China's export basket and the rising similarity between China's export basket and those of other economies.

WHAT AFFECTS THE DEVELOPMENT OF NEW CAPABILITIES?

SPECIALISATION IN RELATED GOODS

New export capabilities are somewhat easier to develop if economies already specialise in the production of related goods – either those that are used as inputs in production (upstream linkages) or products that use a given output as an input in production (downstream connection). For example, car parts may be linked to finished steel products upstream and vehicle manufacturing downstream. A country specialising in the export of finished steel products and/or the export of vehicles is more likely to develop a new specialisation in vehicle parts, partly due to existing supply or demand in local production chains and partly due to the availability of related skills.

In this analysis, connectedness is measured as the product's position (linkages) in the production network, calculated using a PageRank algorithm applied to the AI-generated Production Network (AIPNET), taking the average of upstream and downstream connectedness. Specialisation in related goods is defined as a country's weighted average normalised RCA in those goods. The weights give greater importance to more specific production linkages. For upstream linkages, an input receives a larger weight if it is used in relatively few other products, while generic inputs used in the production of many goods are allocated smaller weights. For downstream linkages, greater weight is assigned to products that represent a relatively more specific input. For example, if one input into vehicle parts is used in five different products and another is used in 20, the former receives four times the weight of the latter, before weights are normalised to sum to 1. Upstream and downstream specialisation measures are calculated separately and then averaged.

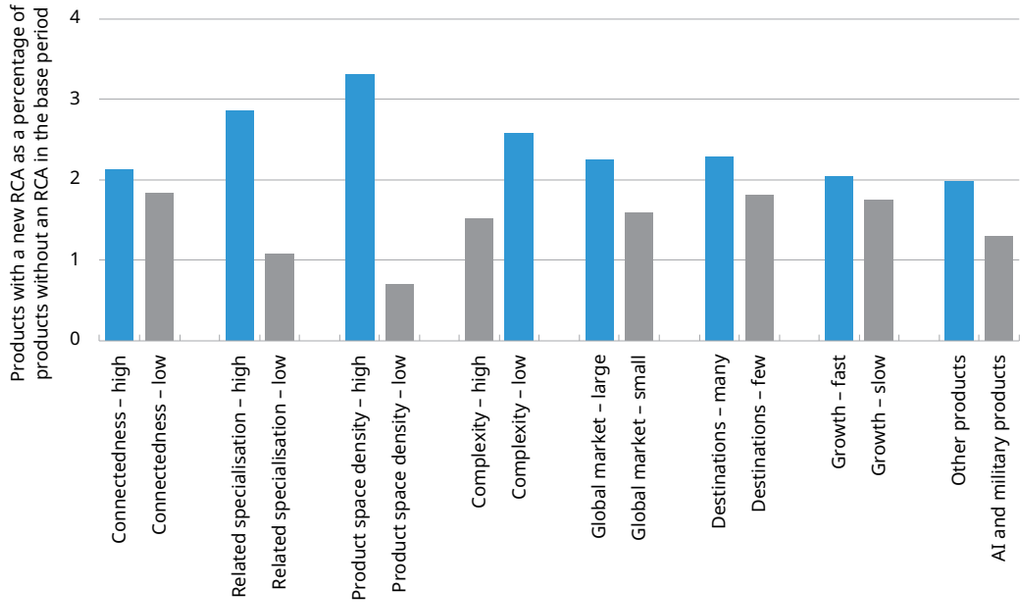
The probability of developing a new specialisation is, indeed, more than twice as high when an economy is specialised in related goods as when such specialisation is low (see Chart 1.10). Most of this effect is due to a country's structure of production, although the probability of developing a specialisation is generally somewhat higher for products that are connected to many other products (that is, products that have many inputs or are commonly used as production inputs).

Similarly, new export capabilities also tend to be easier to develop in products with greater "density" in the product space nearby. Density is measured as the weighted average of an economy's normalised RCAs in related products, where the weights are determined by the proximities between products (that is, the conditional probability of having an RCA in one product given an RCA in another). For example, economies with an RCA in electric vehicles have, on average, a 33 per cent probability of also having an RCA in battery-powered locomotives, while economies with an RCA in battery-powered locomotives have a 31 per cent probability of having an RCA in electric vehicles, yielding a proximity of 31 per cent. In contrast, the proximity between wine and beer is only 15 per cent: while 29 per cent of countries with an RCA in wine also have an RCA in beer, only 15 per cent of countries with an RCA in beer have an RCA in wine. An economy that already specialises in rubber products, vehicle components and industrial machinery would have a relatively high density of product space around tyres, as these products require similar capabilities. It would, therefore, be more likely to develop a new RCA in tyres than economies that have lower density around tyres.

THE CHALLENGE OF LEARNING TO PRODUCE COMPLEX GOODS

In turn, export markets for complex goods are considerably harder to break into, as competitive production of these goods requires many specialised capabilities.

CHART 1.10 New export capabilities are easier to develop when economies have specialisations in related goods



SOURCE: BACI (HS2002 version) and authors' calculations.

NOTE: "High" refers to values above the median and "low" refers to values below the median – except for product market growth and market size, where the "high" and "low" categories correspond to the top and bottom quintiles of the relevant distributions, respectively. Connectedness, complexity, global market, number of destinations and global market growth are product specific, but do not vary from country to country. Related specialisation and product space density vary among product-country combinations.

LARGE VERSUS SMALL MARKETS

New export capabilities tend to be easier to develop in products with larger global markets, as global market shares may be easier to "reallocate" in such markets than in smaller markets. Global market size (the share of global trade) varies dramatically between HS6 products, from niche products, such as whale meat and ski equipment, to cars and crude oil, which account for the largest shares of global trade.

New export capabilities are also easier to develop in products that tend to be exported to more destinations by a given economy, underscoring the importance of economies of scale and diversification. The number of export destinations is measured as the median number of importing economies served by exporters of a product, capturing how widely traded the product is across international markets. For instance, cars, laptops, motors or refined petroleum products are very widely exported (to 10-18 destinations on average), while music boxes, nuclear reactors and railway rolling stock tend to be exported to one or two destinations, on average. Looking at the number of export destinations for a given country rather than the average across economies yields similar results.

It also tends to be easier to develop an export specialisation in markets where global trade is growing than in markets where it is shrinking. Fast-growing markets are defined here as those products where global exports have grown most (top 20 per cent of products) between the periods in which RCA development is measured; slow-growing products are those in the bottom quintile of the distribution of global export growth. The calculations are specific to each period. Between 2010-14 and 2015-19, for instance, slower-growing industries include black-and-white display tubes (HS6 code 854050), while faster-growing goods include semiconductor photolithography equipment (HS6 code 901042) and instant cameras (HS6 code 900640).

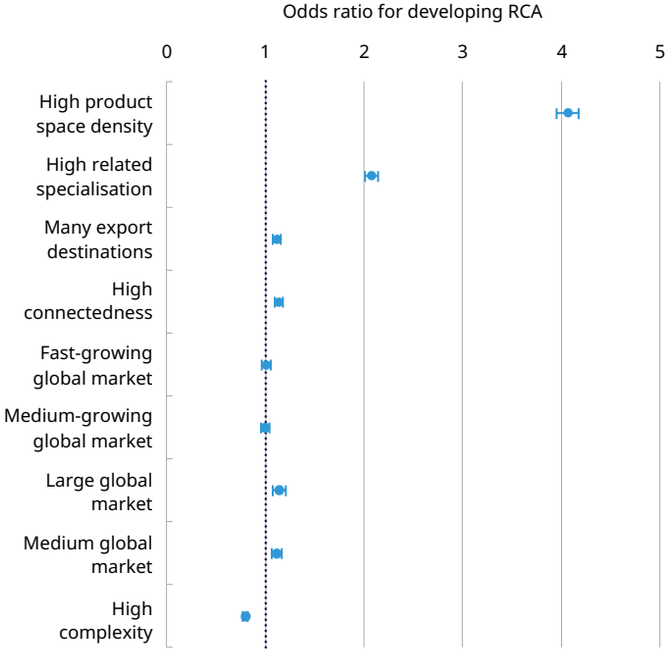
Next, the importance of these various characteristics is examined in a regression framework, where the probability of a country developing a new RCA in a given product in a given period between the two consecutive five-year periods is linked to various product characteristics.[18] Specifications include country-period fixed effects that take into account characteristics that impact all products, such as a country's level of development, the quality of the

[18] Cases where a country has an RCA in a given product in the base period are excluded from this analysis.

business environment or the average quality of skills. The results are summarised in Chart 1.11.

High product space density and specialisation in related products have the largest effects on economies' ability to develop new comparative advantages. In particular, a country is, on average, more than four times as likely to develop a new RCA in a product where it has "dense" product space as where it does not, and it is more than twice as likely where it has export specialisations in upstream or downstream products. The smaller effects of lower product complexity and larger global markets remain statistically significant, while the growth rate of global trade loses its statistical significance.

CHART 1.11 New export capabilities are easier to develop in products where the country has high density and those where it has related specialisations



SOURCE: BACI (HS2002 version), Kóczán et al. (forthcoming) and authors' calculations.

NOTE: Based on regression analysis where a unit of observation is a transition between consecutive five-year periods for a given country and product. The dependent variable equals 1 if a country develops a new RCA in a product and 0 otherwise. Coefficients are reported as odds ratios from a logit model, with country-period fixed effects and standard errors clustered at the product level. Explanatory variables are defined as in Chart 1.10. Whiskers denote 95 per cent confidence intervals. Including product-time fixed effects points to similar estimates for the density and connectedness measures.

SPECIALISATION IN SERVICES

While the analysis also includes trade in services, direct comparisons between goods and services are difficult, as trade in services is measured with less granularity. When looking at comparable levels of aggregation (at the sectional level, corresponding to 21 groups of services and 21 groups of goods), new export capabilities appear to be easier to develop in services (see also Box 1.2 on the importance of trade in services in Türkiye). In part, this could reflect the fact that traded services tend to be less complex than goods. For instance, empirically derived measures of product complexity put the most complex services, such as contract manufacturing, information technology (IT) services, business services and intellectual property, on a par with wine, plastic tableware, beer or maize seeds.

IMPLICATIONS FOR DEVELOPING NEW CAPABILITIES IN AI-RELATED AND MILITARY GOODS

AI-RELATED AND MILITARY GOODS ARE CONNECTED AND COMPLEX

In recent years, demand for AI-related products has boosted global growth, while average spending on defence has been on the rise (see the discussion in Chapters 2 and 3, as well as EBRD (2025a and 2025b)). Based on the historical patterns surveyed above, could countries build on these booms to develop export specialisations in related goods?

The following analysis defines AI-related products as semiconductors, semiconductor manufacturing equipment, semiconductor materials and inputs, and computing hardware (Chapter 3 discusses the AI supply chain in detail). As the analysis covers the last three decades, in large part predating the recent rise in AI technologies, the definition used here is intentionally broad, including, for instance, photographic chemicals,

phosphorus oxychloride ($POCl_3$) and high-purity silicon. In turn, military products are goods classified under the following HS6 codes: tanks and other armoured fighting vehicles (871000); aircraft launching gear and deck-arrestor equipment, and ground flying trainers (880510); air combat simulators and their parts (880521); warships (890610); artillery weapons (930110); rocket launchers, flamethrowers, grenade launchers, torpedo tubes and similar military weapons (930120); other military weapons (930190); parts of military weapons (930591); and military ammunition and munitions (930690). Chapter 2 provides a detailed discussion of defence spending; the results of the analysis are robust to using broader definitions of military goods.

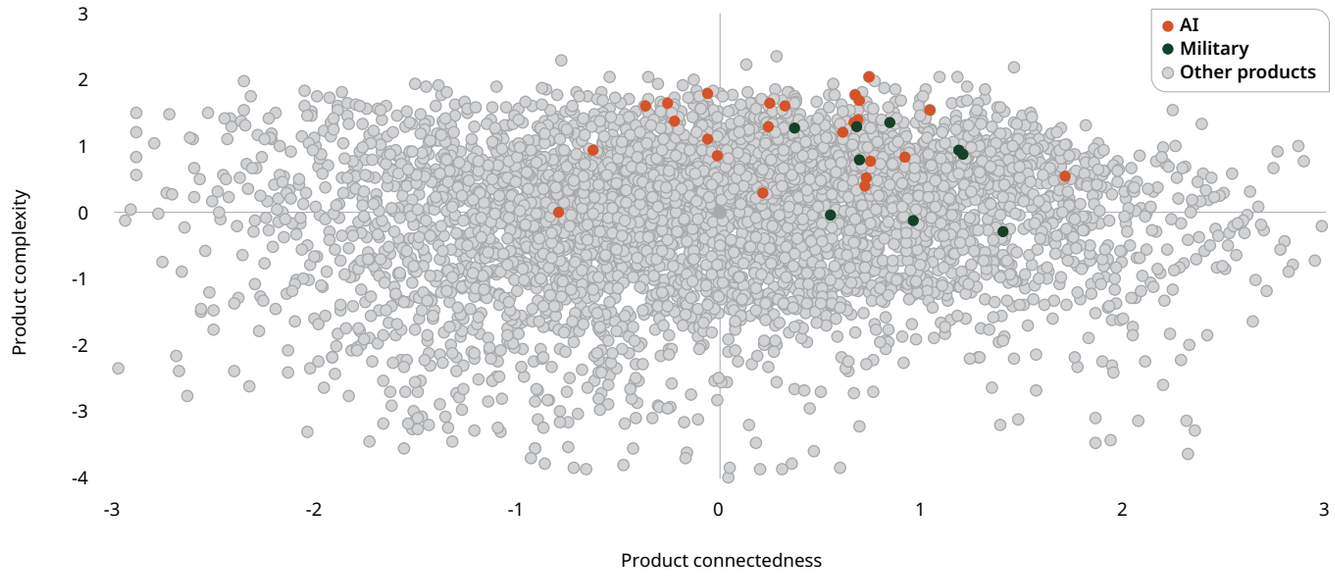
The markets for AI and military goods are large. AI-related goods as defined in this report account for 6 per cent of global trade. In terms of the size of individual product markets, the median AI-related product is in the top 5 per cent of the distribution across all HS6 codes. While the median military good is in the top half (56th percentile), the actual percentile is likely to be higher, as it is possible that not all military contracts will be reflected in official trade statistics. On average, a country exports an AI-related product to seven destinations, compared with three for other products (with military products being similar to other products in terms of destinations).

These goods also tend to be complex and highly connected to other goods in production networks. AI and military goods are, on average, around the 94th and 82nd percentiles of the complexity distribution, respectively – similar to, for instance, the complexity of electric trains and black-and-white photographic film, respectively (see Chart 1.12).

Large markets, rapidly growing demand, and the high complexity and connectedness of underlying products make AI and military markets attractive from a development perspective. The same characteristics – in particular, the high levels of complexity and reliance on existing capabilities along complex supply chains – also make these markets more difficult to break into.

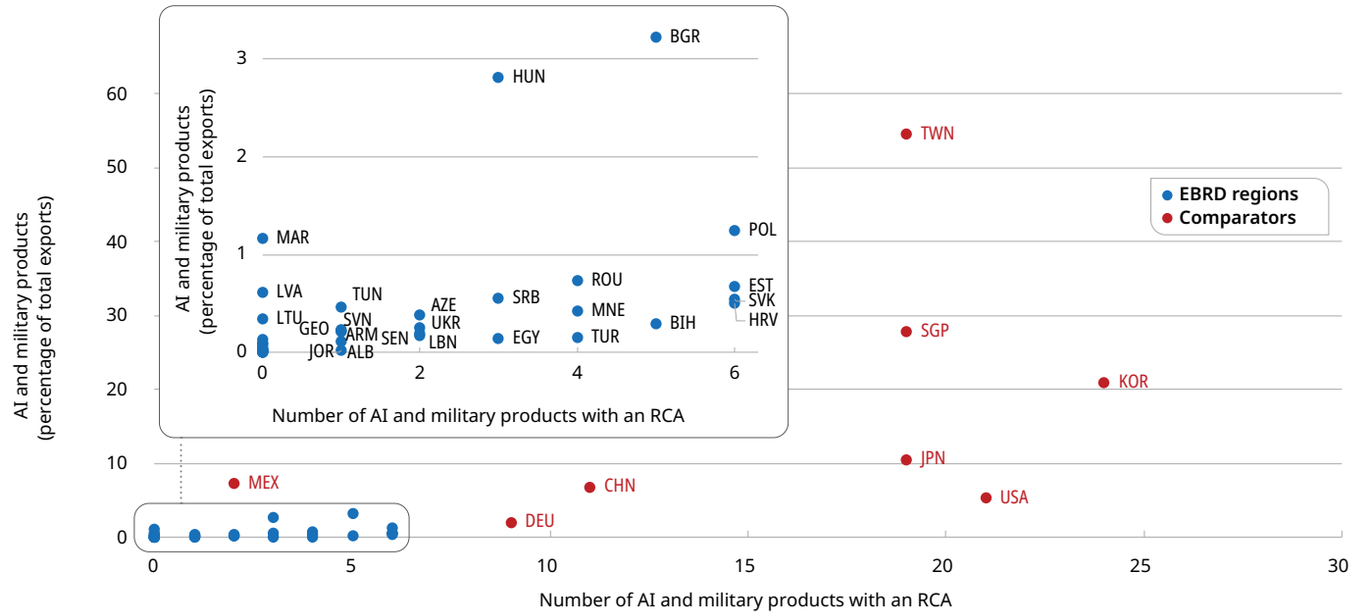
AI-related goods account for **6%** of global trade

CHART 1.12 AI-related and military goods tend to be complex and highly connected to other products throughout supply chains



SOURCE: BACI (HS2022 version) and authors' calculations.
NOTE: Data refer to 2022-24. Product connectedness measures the average intensity of upstream and downstream linkages.

CHART 1.13 Some economies in the EBRD regions already specialise in exports of specific AI-related and military goods



SOURCE: BACI (HS2022 version) and authors' calculations.
NOTE: Data refer to 2022-24. Calculated for 33 AI-related and military products versus 5,606 other products.

EXISTING SPECIALISATIONS IN SOME AI-RELATED AND MILITARY GOODS

Some economies in the EBRD regions already specialise in exports of specific AI-related and military goods (see Chart 1.13). Examples include Romania's comparative advantage in ships; Estonia's specialisation in aircraft launching and landing-arrest equipment, and critical metals; Hungary's specialisation in computer processors and processing units; and specialisations in heavy military weapon launchers in various economies, including Bosnia and Herzegovina, Bulgaria, Croatia and Poland.

LOW LEVELS OF SPECIALISATION IN RELATED GOODS

However, most economies in the EBRD regions have, on average, relatively low specialisation in AI-related goods and, to a lesser extent, military goods (see Chart 1.14). Notable exceptions, where some exposure to AI-related value chains could facilitate the development of new RCAs, include the Slovak Republic, which does not have an RCA in computer processing units, but has an RCA in related products, such as other data-processing machines. Estonia does not have an RCA in parts of integrated circuits (computer chips), but has an RCA in telecommunications testing and measuring instruments, and in navigation instruments and equipment. Hungary, the Slovak Republic, Estonia and Latvia generally have relatively high specialisation in products connected to AI products. Nigeria and Senegal do not have an RCA in processed semiconductor metals, but have an RCA in upstream inputs – niobium, tantalum and vanadium ores and concentrates – used to produce these materials. Among comparator countries, Japan's average specialisation in related products is higher for AI goods than for other products.

Some economies in the EBRD regions have also developed an RCA in exports of related services over the past two decades. Most notably, Ukraine, Serbia and Estonia have established an RCA in information and communications technology (ICT) services.

Some economies specialise in sectors with strong upstream or downstream links to military production, typically as a result of strong manufacturing bases. For instance, Türkiye has an RCA in aluminium sheets and plates; the Slovak Republic and Montenegro have RCAs in steel, aluminium alloys, copper waste and scrap; and Ukraine has an RCA in upstream steel and iron products, as well as some aircraft products (see Chart 1.14). Among comparators, the United States and Russia have higher-than-average specialisation in sectors linked to military production.

CONCENTRATED MARKETS

Military exports are highly concentrated. Only 60 economies worldwide have an RCA in any military products, with strong specialisation in a handful of economies, including China, Czechia, Germany, Israel, the United Kingdom and the United States. Military procurement contracts can be long and sticky.

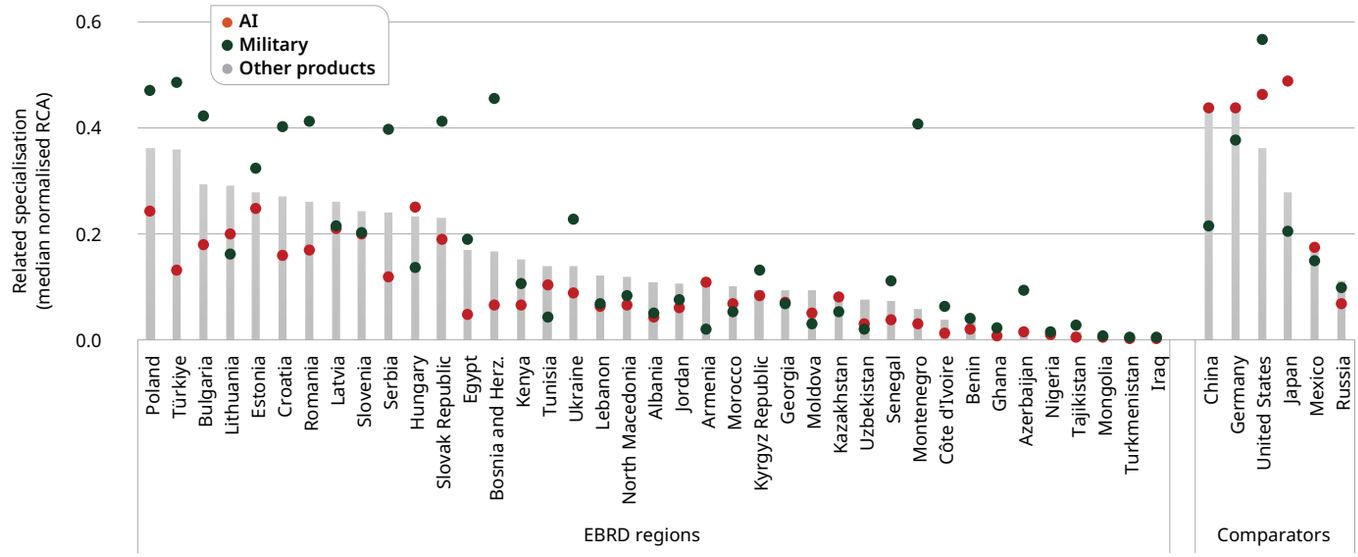
AI exports are also concentrated. Only 67 economies have an RCA in one or more AI product codes. Relatively high shares of RCA in AI-related products can be observed in Singapore, Taipei China, Malaysia, South Korea, the Philippines, Japan, the United States, Israel and China.

Only
67 ECONOMIES
have an RCA in one or more AI product codes

HOW DO EXPORT SPECIALISATIONS RESPOND TO DEMAND SHOCKS?

This section, which is based on the analysis of Kóczán et al. (forthcoming), examines the extent to which sudden increases in demand for particular products (akin to those observed recently for AI and military goods) can help economies to develop export capabilities. The analysis uses the local projections method to study the response of export specialisations to demand shocks specific to countries and products.[19] Looking at the imports of each economy, the analysis calculates a measure similar to RCA for exports. For instance, the United Kingdom has a "revealed import preference" (for simplicity, referred to as an "import RCA") in electric vehicles, as it accounts for 3 per cent of global imports overall, but 10 per cent of global imports of electric vehicles.[20] The import demand shock for a particular product is calculated as the weighted average "import RCA" of that product across a country's export partners.

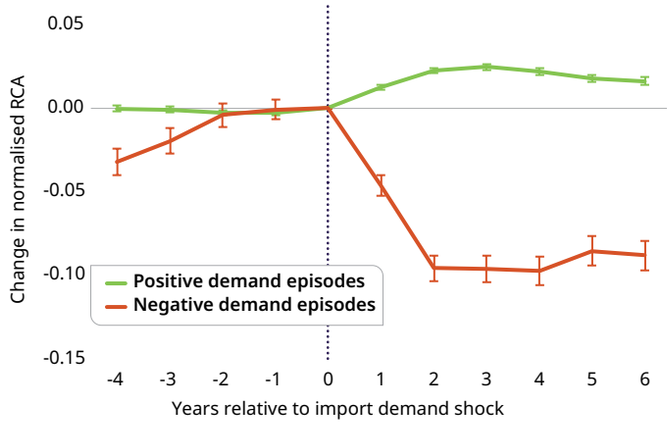
CHART 1.14 Most economies in the EBRD regions have relatively low specialisation in AI-related goods and, to a lesser extent, military-related goods



SOURCE: BACI (HS2022 version) and authors' calculations.
NOTE: Data refer to 2022-24. Related specialisation for each product is calculated as the weighted average of normalised RCA in products with upstream and downstream linkages to that product. The chart shows the median related specialisation across products within each group of goods (AI, military and other products).

[19] See Jordà (2005) for a discussion of the local projections method.
[20] This measure is similar to that used by Hummels et al. (2014), who look at the effect that increased imports by Danish firms have on workers' wages and construct an instrument that is conceptually similar to the import RCA measure used here.

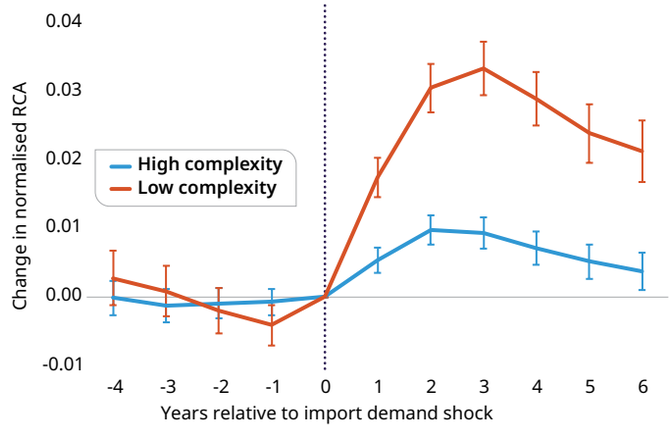
CHART 1.15 Negative demand shocks destroy export specialisation immediately for economies that are exposed



SOURCE: BACI (HS2002 version), Kóczán et al. (forthcoming) and authors' calculations.

NOTE: This chart shows the changes in normalised export RCA that are associated with positive and negative external demand shocks, estimated using the local projections method. At each horizon, the dependent variable is the change in a country-product's normalised export RCA relative to the year preceding the start of the demand episode (t = 0); t = 1 denotes the first year of the episode. A demand episode consists of consecutive annual changes in the same direction in the import RCA of the country's trading partners, with the shock measured as the total change over the episode. For example, if the trading partners' import RCA for cars rises in 2010 and 2011 before falling in 2012, 2010 marks the start of a positive episode and 2012 the start of a new negative episode. Import RCA is constructed analogously to export RCA, using imports rather than exports. For each country-product, trading partners' import RCA is aggregated using bilateral trade weights, excluding imports from the country in question to avoid a mechanical relationship between the demand measure and the country's own exports. All country-products are included when estimating the effects of positive demand episodes. For negative demand episodes, the sample is restricted to country-products with a positive export RCA in the year preceding the episode, as the RCA cannot fall below zero. Regressions include country-product, country-year and product-year fixed effects. Standard errors are clustered at the product level. Whiskers denote 95 per cent confidence intervals.

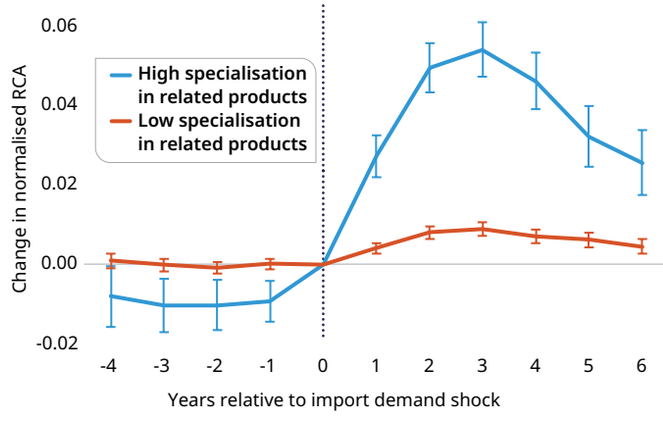
CHART 1.16 Positive demand shocks are harder to leverage for more complex products



SOURCE: BACI (HS2002 version), Kóczán et al. (forthcoming) and authors' calculations.

NOTE: This chart shows the changes in normalised export RCA that are associated with positive external demand shocks, estimated using separate local projections for low- and high-complexity products. A positive demand episode consists of consecutive annual increases in the import RCA of the country's trading partners, with the shock measured as the total increase over the episode. Product complexity is calculated annually using the economic complexity methodology, and products are ranked by complexity within each year. Low- and high-complexity products correspond to the bottom and top terciles of the annual product-complexity distribution, respectively. All country-products are included in the estimation sample. Regressions include country-product, country-year and product-year fixed effects. Standard errors are clustered at the product level. Whiskers denote 95 per cent confidence intervals.

CHART 1.17 Specialisation in related products helps to leverage positive demand shocks



SOURCE: BACI (HS2002 version), Kóczán et al. (forthcoming) and authors' calculations.

NOTE: This chart shows changes in normalised export RCA associated with positive external demand shocks, estimated using local projections separately for country-products with low and high specialisation in related products. Specialisation in related products is measured in the year preceding the episode and captures the extent to which a country is already specialised in products that are closely related to the product experiencing the demand shock. Country-products are divided separately into terciles of specialisation within each event year. Low and high specialisation correspond to the bottom and top terciles, respectively. All country-products are included in the estimation sample. Regressions include country-product, country-year and product-year fixed effects. Standard errors are clustered at the product level. Whiskers denote 95 per cent confidence intervals.

To remove any mechanical effects, the calculation of import RCAs excludes any imports originating from the country in question, while weights assigned to trading partners exclude trade in products under consideration. Positive demand shocks are defined as above-zero changes in this measure, while below-zero changes constitute negative demand shocks. For instance, Lithuania's trading partners, many of which are Alpine and Nordic economies, have a high import RCA in snow-ski equipment (HS 950619; 1.93). An increase in that import RCA would constitute a positive external demand shock for ski equipment production in Lithuania (regardless of Lithuania's existing capabilities in that area). This analysis focuses on episodes of positive or negative demand changes, defined as consecutive years of increasing (or falling) demand, with year 1 corresponding to the first year of each episode.

In general, a negative external demand shock is associated with a sizeable immediate drop in an economy's export RCA (see Chart 1.15). Positive demand shocks are associated with a statistically significant increase in export RCA, but the average effect is decidedly smaller. Positive shocks may be harder to leverage, in part because many countries may be responding to the increase in global demand, while only some countries have the right capabilities to scale up production in the near term.

Positive demand shocks also tend to be harder to leverage for more complex products, such as AI-related and military goods, although the effects are present for both more complex and less complex goods (see Chart 1.16). While the effects diminish as time passes, they remain positive and statistically significant at the end of the five-year analysis window.

As in the analysis in previous sections, economies tend to be in a better position to leverage positive demand shocks if they have relatively high export specialisations in related products. The increase in a country's export RCA is an order of magnitude higher where a country's specialisation in related products is in the top tercile in the sample (see Chart 1.17).

TARGETED POLICIES TO SUPPORT THE DEVELOPMENT OF NEW CAPABILITIES

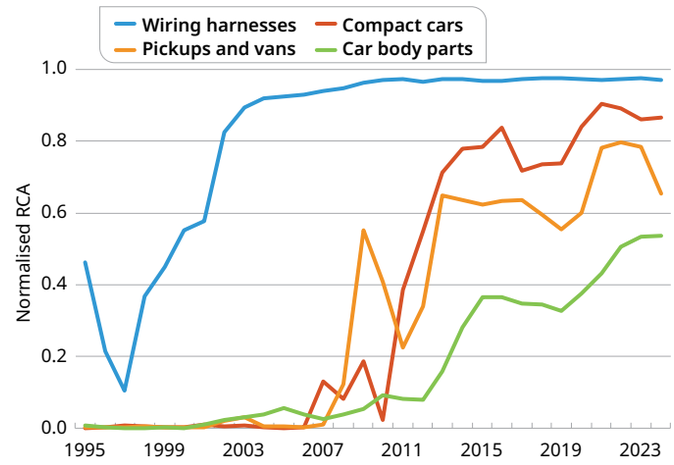
MOROCCO'S AUTOMOTIVE EXPORTS

Targeted policies also play a key role in supporting the development of new production capabilities. Morocco's emergence as a key car exporter shows how industrial policies and anchor investments can contribute to the development of export capabilities in a complex product with a large global market.

Before 2010, car exports from Morocco were negligible.[21] A sequence of industrial policies, combining tax incentives, special economic zones, worker training and previously negotiated preferential access to the EU market, helped to attract foreign direct investment (FDI) to the large export-oriented assembly plants of major multinational companies, such as those established by Renault in 2012 and Stellantis in 2019.[22]

As production expanded, Morocco built on a pre-existing specialisation in vehicle wiring sets, developing a strong RCA in small petrol cars, then pickup trucks and, more recently, car steering parts. It also diversified its export destinations (see Chart 1.18).

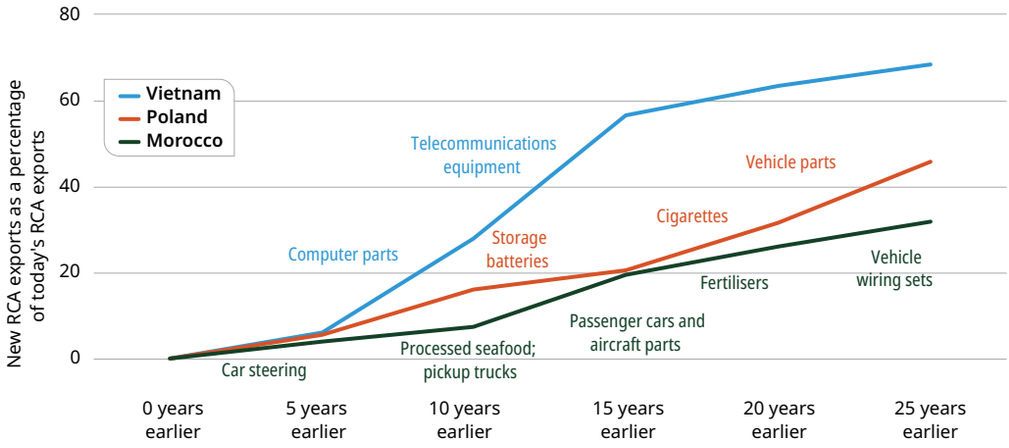
CHART 1.18 Morocco has established export specialisations in a number of automotive products



SOURCE: BACI (HS1992 version) and authors' calculations.

[21] See Hahn and Vidican-Auktor (2017).
[22] See Chauffour (2018).

CHART 1.19 Morocco has developed an RCA in cars, supported by anchor FDI investments and long-term policy frameworks



SOURCE: BACI (HS1992 version), BaTIS (BPM5 and BPM6) and authors' calculations.
NOTE: This chart indicates selected new export specialisations developed by Morocco, Poland and Vietnam at various points in time. These specialisations have made a significant contribution to the export baskets of these economies in recent years.

Chart 1.19 shows the share of current RCA exports where specialisation did not exist 5-25 years ago and indicates selected new export specialisations developed by Morocco, Poland and Vietnam at various points in time.

With cars now accounting for around 13 per cent of its exports, Morocco is one of the EU's largest external car suppliers by volume and Africa's largest car exporter. Initial anchor investments helped to catalyse related capabilities, resulting in a supplier ecosystem of more than 250 firms forming alongside the assembly plants.[23]

These accumulated capabilities have since underpinned further expansion into electric-vehicle supply chains. As global demand for electric vehicles and battery inputs has picked up, Morocco's automotive ecosystem and trade agreements have helped to attract investment from Chinese battery-materials firms, which have located processing activities in the country – partly in order to secure access to US and European markets (including through free trade agreements), as both have raised barriers to inputs of Chinese origin.[24] This illustrates how accumulated capabilities, combined with existing trade agreements, can help countries to benefit from global demand booms and shifts in global trading patterns.[25]

POLAND'S AUTOMOTIVE SECTOR

Poland provides a complementary example in the automotive sector. From the 1990s, low labour costs, geographical proximity to advanced Europe, EU integration and generous investment incentives attracted automakers and component producers to central and eastern Europe. In Poland, FDI was concentrated in components, light commercial vehicles and heavy trucks rather than passenger-car assembly, with firms such as Toyota and Mercedes-Benz investing in engine production. Accordingly, the country's strongest RCAs emerged in components such as engines, wiring harnesses, seating systems and trailers, as well as in light commercial vehicles (see Chart 1.19). This established base also helped Poland to integrate into electric-vehicle supply chains. Functional upgrading nevertheless remained limited: business research and development (R&D) expenditure as a share of production value is less than 15 per cent of German levels, and a state-led attempt to establish a domestically owned electric-vehicle producer has had only limited success so far.[26] While FDI can underpin diversification into related industries, it does not automatically generate domestic ownership of higher-value activities.[27]

[23] See Amachraa (2023).
[24] See Metz (2024) and European Commission (2024).
[25] See Cheng, Konovalov and Plekhanov (2025).
[26] See Pavlínek (2023).
[27] See Pavlínek and Ženka (2016).

VIETNAM'S ELECTRONICS SECTOR

Vietnam illustrates the rapid development of new capabilities in the electronics sector. Anchor investments by Intel and Samsung from the mid-2000s, attracted by Vietnam's large and relatively skilled manufacturing workforce, investment incentives and integration into Asian electronics supply chains, helped to build an electronics ecosystem and contributed to the emergence of RCA in consumer electronics (see Chart 1.19). Intel's assembly-and-test facility at Saigon Hi-Tech Park and Samsung's smartphone complexes in Bac Ninh and Thai Nguyen became major production hubs, attracting a wider supplier ecosystem.[28] Electronics subsequently became Vietnam's largest export sector.

This FDI-built capability base enabled Vietnam to harness new waves of demand for computing equipment and AI-related hardware, with rising RCAs from 2019 onwards in computers, processors and related parts (with some of the export surge also reflecting a rerouting of Chinese goods).[29] This expansion has, however, remained heavily concentrated among foreign firms, which account for over 90 per cent of total electronics output (and around 98 per cent of electronics exports – of which Samsung alone accounts for around a third), while domestic firms have so far enjoyed more limited technological spillovers.[30] Vietnam's semiconductor strategy, therefore, seeks to increase the local value added of production over time.

In Morocco, Poland and Vietnam, these new capabilities have been built in complex goods with large global markets. In all three countries, there were pre-existing specialisations in related sectors, albeit modest ones. A package of targeted policies centred on investment promotion, market access and skills upgrades supported the development of new specialisations over time. In each country, the number of export destinations increased sharply – more than for other products.

WARS AND EXPORT SPECIALISATIONS IN MILITARY GOODS

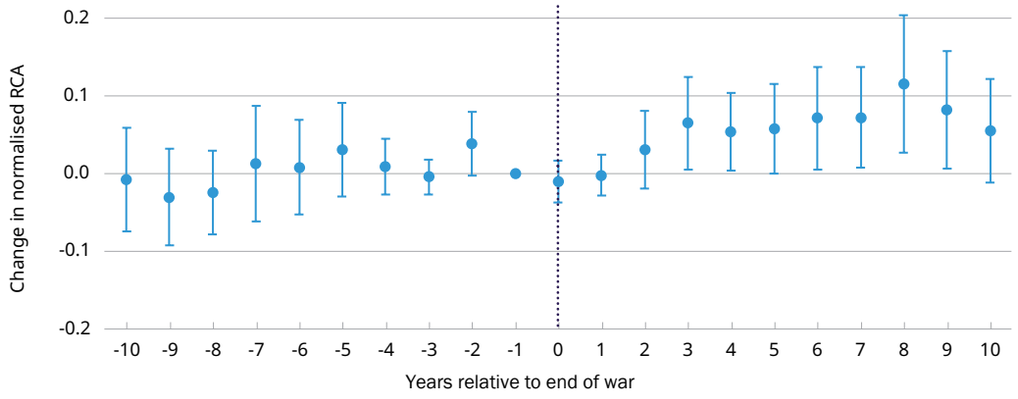
Conflicts tend to shift resources strongly towards the military sector. For example, military production increased sharply in Ukraine between 2022 and 2025 (based on industrial production data from Ukrstat). Could economies such as Ukraine build on this surge in military production to establish themselves as leading exporters of military hardware (such as drones) once the war is over? (See Box 2.1 for more on Ukraine's defence industry.)

The analysis in this section looks at whether conflict can provide impetus for the development of a competitive military industry, drawing on a sample of 39 countries involved in 58 wars from 1996 to 2014 (with the time window dictated by the availability of detailed trade data for the years before, during and after the wars in question).

Across these recent episodes of conflict, there were 60 instances of new specialisation in exports of military-related products (such as weapons, firearms and their parts, armoured vehicles and prosthetics) developed within five years of the end of the given war. This is but a modest fraction of the specialisations it is theoretically possible to develop given the number of countries and products involved (more than 10,000 possible combinations).

[28] See OECD (2025).
[29] See Iyoha et al. (2025).
[30] See Nguyen et al. (2026).

CHART 1.20 Wars can help to develop an RCA in military products



SOURCE: BACI (HS1992), EBRD (2026b) and authors' calculations.
NOTE: This chart shows the average change in chapter-level export RCA for military products (Chapter 93 of the WCO HS) over time. The definition of war follows that of the Correlates of War database – sustained combat involving organised armed forces and resulting in at least 1,000 battle-related deaths per year, excluding civilian fatalities – and includes civil as well as interstate wars.[31] The average is calculated for 58 conflict episodes in 39 economies over the 1996-2014 period (with post-conflict years extending to 2024). Year 0 is the year in which a conflict ends. Whiskers denote 95 per cent confidence intervals.

On average, therefore, wars are associated with a modest increase in export specialisation in military products. The effect appears with a delay and is, on average, around one-third of a standard deviation of changes in an RCA around three years after the end of the war (see Chart 1.20). The effect may in part reflect exports or re-exports of stocks accumulated during the conflict. The rise in RCA for military goods may also reflect a decline in exports of civilian goods during or shortly after wars.[32] The modest nature of the average effect may also stem from the difficulty of sustaining a technological advantage in the production of military products (such as drones or rifles) once the conflict has ended.

Small average effects nonetheless hide a number of lasting successes. These are typically built on a combination of a sustained (perceived) security threat (often lingering for decades after the actual fighting has ended), public procurement contracts, specialisation in related sectors and pre-existing capabilities allowing countries to take advantage of external demand booms.

In India, for instance, precision manufacturer Indo-MIM's metal injection moulding expertise has underpinned a lasting niche in pistol parts.[33] In Finland, rifle-making capabilities maintained under the country's security-of-supply doctrine underpin strong exports by firms such as Sako, whose brands include Tikka. Most of those products are sold to civilian buyers in the United States, but a rising RCA in rifles reflects growing military orders, including purchases under a Finnish-Swedish rifle procurement agreement of 2023.[34]

Israel built its defence industry around state-owned firms such as IAI and Rafael, alongside the privately owned Elbit Systems, relying on exports to sustain production at scale given its small home market,[35] an orientation reflected in persistent RCA in military and other aircraft categories. Defence-electronics expertise embodied in firms such as Elbit Systems spilled over into the civilian high-technology sector, supporting RCA in dual-use products such as radio-navigation and optical equipment. In Pakistan, successive embargoes prompted domestic production efforts through defence cooperation with China, with recent Super Mushshak trainer aircraft deliveries contributing to a rising RCA in small aircraft.[36]

In South Korea, firms such as Hanwha and Hyundai Rotem responded rapidly to the surge in European demand after 2022, because long-running domestic production programmes had kept engineering capabilities and manufacturing capacity in place (with these firms being the direct corporate descendants of the 1970s "rich nation, strong military" drive).[37]

[31] See Correlates of War Project (n.d.).
[32] See EBRD (2022).
[33] See North (2025).
[34] See Suorsa and Cannon (2025); for details of Sako's US export position, see Sako (2021).
[35] See Evron (2025).
[36] See Saw (2024).
[37] See Kim and Liang (2025).

This contributed to the emergence of RCA in military weapons and armoured vehicles.

Türkiye's centralised procurement system supported the development of domestic firearms and ammunition capabilities, with state-owned ammunition producer MKE expanding exports during the post-2022 surge in global ammunition demand.[38] The longstanding Huğlu gun-making cluster in Konya province built a strong position in civilian sporting arms, and state policy is now drawing on the cluster's skilled workforce to build defence capability, including through ASELSAN's Konya facility and dedicated technician training.[39]

In most cases, however, military export surges have proved short lived, as security shocks alone have not generated the industrial capabilities needed to sustain competitiveness. Some reflect the disposal of inherited equipment rather than new production, as with Albania's exports during its accession to the North Atlantic Treaty Organization (NATO) and Bosnia and Herzegovina's exports in the early 2000s, which drew largely on existing stockpiles before production was later upgraded under foreign operational management. Where industrial capabilities were absent, prolonged uncertainty left countries such as Yemen, Mali and Eritrea without the firms, supplier networks and technological capabilities that are needed to build a competitive defence industry.

Only a
TENTH
of firms directly export
10%
or more of their sales

FIRM-LEVEL EVIDENCE: THE ROLE OF TOP FIRMS

EXPORTS ARE CONCENTRATED IN A FEW FIRMS

As the previous examples illustrate, the export specialisations of economies reflect strong competitive positions achieved by individual firms. This section complements the earlier country-level analysis by drawing on a range of firm-level datasets. It starts off by looking at the largest firms in each country by revenue, drawing on the Forbes Global 2000 list (which includes the 2,000 largest publicly traded firms in the world), the Jeune Afrique 500 (which includes the 500 largest firms operating in Africa by revenue) and, where coverage from these two sources is limited, the Orbis online database (looking at the 20 largest firms by revenue in 45 economies).[40]

The analysis then zooms in on granular data on annual firm-level exports at the HS6 level, using customs data on 11 economies (Albania, Bulgaria, Burkina Faso, Guatemala, Jordan, Malawi, Mexico, Peru, Senegal, Uruguay and Yemen) for the period from 1997 to 2014, sourced from the World Bank's Exporter Dynamics Database,[41] complemented by 2005-16 firm-level data for Egypt from the Economic Research Forum's Egypt Imports and Exports Data.[42] Because of the small economy and firm samples, the definitions of AI- and military-related goods are broader than those used in the aggregate analysis: AI products are defined as those related to electronics (HS chapter 85) and computers (8471), while military products are those on the EU-Russia dual-use sanctions list under its dual-use, military-technology and firearms headings (a total of 391 and 1,067 HS6 product codes, respectively).[43]

As has been widely documented in various studies, only a subset of firms export, and they tend to be larger and more productive than non-exporters. Data on manufacturing firms covering 144 economies in 2006-11 show that about a quarter of firms are direct exporters and only a tenth of firms directly export 10 per cent or

[38] See Kurç et al. (2025); MKE export figures as reported to the Turkish parliament's State Economic Enterprises Commission (Türkiye Today, 2025).
[39] See Konya Investment Support Office (2023).
[40] See also Kalemli-Özcan et al. (2024) and Ayerst, Nguyen and Restuccia (2024).
[41] See Fernandes, Freund and Pierola (2016).
[42] See OAMDI (2017).
[43] See Chupilkin, Javorcik and Plekhanov (2026).

On average, the largest exporter in a country accounts for about
11%
of its total exports

more of their sales. These data come from the Enterprise Surveys, representative surveys of enterprises with at least five employees and some private ownership conducted by the World Bank in partnership with the EBRD and the European Investment Bank.[44] Direct exporters are, on average, about four times larger in terms of sales and employment than non-exporters.[45] On average, they are also 2.6 times more productive (with productivity measured as sales per employee), twice as likely to spend on R&D and 50 per cent more likely to market a new product.[46]

Exports are also highly concentrated among a few firms. The median number of exporters in a given country-product market is three.[47] In the median economy globally, the aggregate revenue of the five largest firms is equivalent to around 16 per cent of GDP (based on data for 115 economies in 2024), and this share tends to be even higher for higher-income economies.[48] Of these large firms, 36 per cent are private domestic firms, 37 per cent are state-owned domestic firms (with majority state ownership accounting for 13 percentage points) and 27 per cent are majority foreign-owned firms.

In the median of the sample of 12 economies, the single largest exporter in the country typically accounts for about 11 per cent of the country's total exports; the top 5 exporters typically account for 27 per cent; and the 10 largest exporters account for 37 per cent. These exporters account for an even higher share of export growth in the median economy: the top exporter accounts for 16 per cent of total export growth over a four-year period, while the top 10 exporters account for more than half of total growth.[49]

LAUNCHING NEW PRODUCTS REQUIRES TRIAL AND ERROR

Starting to export new products is difficult.[50] Most attempts by firms to export a new product "fail": fewer than a fifth of firms that launch a new export still sell that product abroad a year later. This holds for the largest exporters, as well as for AI-related and military products. These patterns in the sample are consistent with previous research documenting the fact that trade flows tend to be short lived.[51]

Diversification into new product exports, therefore, requires a lot of trial and error. Large exporters tend to experiment more with new products than other firms. In any given year, the top five exporters introduce, on average, 14 new products that they did not export the previous year, compared with only three new products per exporter for other exporters. Chapter 4 documents similar patterns for startups, where serial entrepreneurs account for the bulk of venture capital moving from one sector to another.

TOP EXPORTERS ARE MORE LIKELY TO BREAK INTO NEW MARKETS

Top exporters are also somewhat more likely to scale up exports and thereby drive the development of a country's new export specialisation. When one of its top five exporters launches a new export product, that country has a 16 per cent chance of gaining a new RCA in that product over the following five years. This likelihood is somewhat lower, at 12 per cent, when a smaller firm launches an export product. This finding is consistent with previous studies showing that large firms – often multinationals – drive new export discoveries.[52]

Fewer than a
FIFTH
of firms that launch a new export still export that product a year later

[44] See EBRD, EIB and World Bank (2020).
[45] See also Bernard et al. (2007).
[46] See EBRD, EIB and World Bank (2020).
[47] For a similar finding, see Crowley, Han and Prayer (2024).
[48] A similar pattern is documented in Chen (2026).
[49] See also Freund and Pierola (2015 and 2020).

[50] See Hausmann and Rodrik (2003) on economic development requiring self-discovery, with positive externalities from trial and error, such as some transfer of knowledge from leading firms to other firms.
[51] See Iacovone and Javorcik (2010), Békés and Muraközy (2012) and Cadot et al. (2013).
[52] See Artopoulos, Friel and Hallak (2013), Freund and Pierola (2010) and Hausmann and Rodrik (2003).

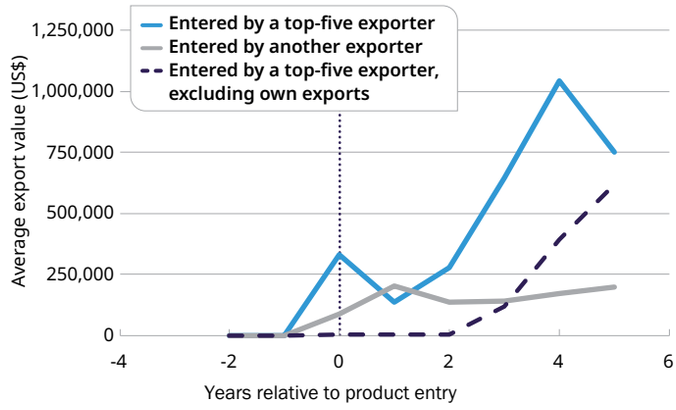
As a result, large exporters become more diversified, exporting a wider range of products. On average, the five largest exporters in a country export 20 products (at the HS6 level of disaggregation), compared with five for smaller exporters. The largest firms also tend to export more complex products, with the average complexity across their products being 0.3 standard deviations above the average for the economy as a whole (equivalent to the difference, say, between semiconductor chips and vacuum cleaners or fork-lift trucks).

LARGE EXPORTERS CREATE GAINS FOR SUPPLIERS AND SMALLER COMPETITORS

Large exporters, in turn, generate spillovers into the broader ecosystem of firms, with gains shared by their suppliers and smaller competitors.[53] Product markets where top firms start to export grow more than those where other firms start to export (see Chart 1.21). Importantly, this holds when top exporters' own exports are excluded from the calculation. The sales values of such new exports for top exporters in the year of discovery are around three times larger than for other exporters, with the differential rising to four times after five years. Smaller exporters account for 40-75 per cent of export sales for the new product four to five years after the discovery.

Large exporters buy inputs from domestic producers, thus providing smaller firms with opportunities for "indirect exports". Such indirect exporters tend to be larger and more productive than firms that do not export directly or indirectly (see Box 1.2 for an analysis of Turkish firms exporting directly and indirectly to the EU).

CHART 1.21 Product markets where top exporters start to export grow more than those where other firms start to export, even excluding the top exporters' own exports



SOURCE: World Bank Exporter Dynamics Database (EDD) exporter-level data 1997-2014 (2026 version), Economic Research Forum (ERF) Exports Dataset, BACI (HS1992 version), HS92/02/12 harmonised as in Crowley, Han and Prayer (2024) and authors' calculations.

NOTE: This analysis looks at cases of export discovery in which a country starts to export a new product (at the HS6 level) that it did not export before. Top exporters are defined as the five largest exporters by total export value in the country's first year in the sample.

LARGE EXPORTERS IN THE MARKETS FOR AI AND MILITARY PRODUCTS

Large exporters play an even more prominent role in markets for AI and military products. RCA gains in AI and military goods are also more likely to be observed in markets that are dominated by a single firm (accounting for at least half of a country's exports of that product throughout) and where the market share of that dominant firm is growing over time.

Empirical analysis suggests, on the one hand, that dominant firms can support the development of export specialisations – perhaps more so in the case of complex goods, such as AI and military goods. On the other hand, dominant firms often emerge through trial and error in competitive environments rather than as a result of strategic bets on "national champions". In addition, while dominant firms are more likely to break into new markets, specialisations are also more likely to be lost where they are concentrated in dominant firms. This highlights the risks associated with the concentration of production and lower competitive pressures in the domestic market.

[53] See also Freund and Moran (2017) and Wagner and Zahler (2015) on spillovers from pioneers to followers, and see Javorcik (2004 and 2008), Javorcik, Lo Turco and Maggioni (2018), Javorcik and Spatareanu (2011), Swenson (2008) and Swenson and Chen (2012) on spillovers from multinational to domestic enterprises in up- or downstream sectors.

CONCLUSIONS AND POLICY IMPLICATIONS

Geopolitical developments and changes in technology are reshaping policy priorities and global trading patterns. Economies can leverage these changing circumstances to develop new areas of expertise in an environment where the pursuit of export-led growth has become more challenging.

Historical experience suggests that countries can adapt their production structures to take advantage of global demand booms, such as those related to AI supply chains or fuelled by increased defence spending. In doing so, they can "reinvent" themselves and often move up the value-added chain. The analysis in this chapter identifies several factors that can facilitate this process. Developing new export specialisations is easier where related capabilities already exist – for example, where a country has an RCA in sectors upstream or downstream from the new product or otherwise possesses relevant expertise. Success is also more likely in products with larger and growing global markets, where competitive pressures may be less binding, as well as in the case of less complex products.

Trial and error are central to the discovery of new export opportunities. Research shows that experimentation by leading exporters generates benefits for the wider economy, including suppliers and competitors. With large positive externalities, experimentation tends to be underprovided by individual firms relative to the levels that are optimal from the point of view of society as a whole. Policies that encourage trial and error and support the emergence of new export specialisations could correct such externalities.[54]

Examples of policies that facilitate the building of new capabilities include the negotiation of free trade agreements granting preferential access to large product markets, worker training, tax incentives, the use of special economic zones, other well-targeted industrial policies and measures promoting the rule of law and ensuring macroeconomic stability.[55]

Attracting foreign direct investment has been shown to help countries to develop RCAs. Top exporters – often multinationals – play an important role in the development and marketing of new export products. FDI can raise the quality of exports,[56] increase complexity across the economy through the development of sophisticated supplier networks[57] and, ultimately, boost productivity.[58] Sector-specific FDI promotion efforts have been shown to play an important role in economies' "reinvention", particularly in capital-intensive industries and sectors requiring investment specific to a relationship with a specific customer.[59] More broadly, the importance of a relatively small number of large firms in export markets implies that policy changes affecting the behaviour of such firms can have a disproportionately large effect on a country's export structure.[60]

Overall, the evidence suggests that while developing new export specialisations is inherently difficult, countries can improve their chances of success by building on existing capabilities, fostering experimentation and creating an environment that attracts and supports globally competitive firms.

[54] See Hausmann and Rodrik (2003); see also Fasteau and Fletcher (2024).
[55] See also EBRD (2024) and Fasteau and Fletcher (2024).
[56] See Harding and Javorcik (2012).
[57] See Javorcik, Lo Turco and Maggioni (2018).
[58] See Abebe, McMillan and Serafinelli (2022) and Moran (1998).
[59] See Harding, Javorcik and Maggioni (2013).
[60] See Freund and Moran (2017).

BOX 1.1 DOWN TO EARTH: THE SPACE ECONOMY IN THE EBRD REGIONS

Most economies are now dependent on space without operating in it. Satellite signals and data underpin communications, navigation, transport, agriculture and finance, and the recent expansion of supply in this sector has come almost entirely from commercial operators rather than state agencies.

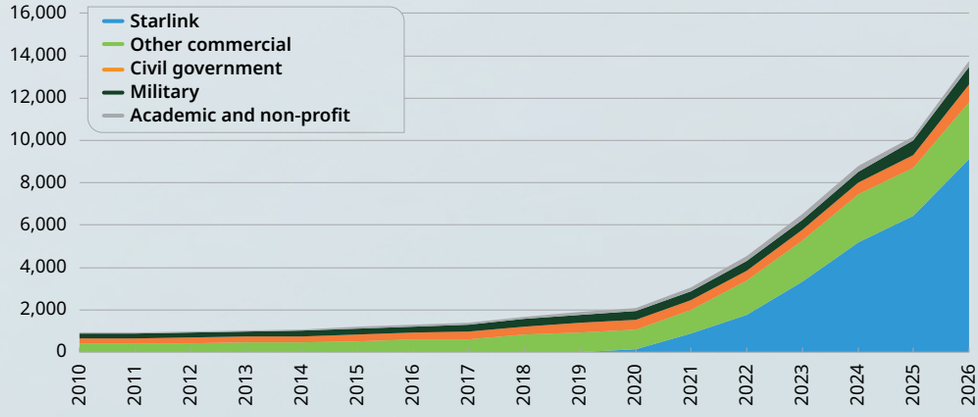
The space economy consists of three main segments. The first is the upstream segment, which covers the scientific and technological foundations of space activity: R&D, the manufacture of satellites and launch vehicles, and the launch process itself. The second is the downstream segment, which covers the daily operation of satellites and ground systems, together with products and services that require satellite signals or data to function. This includes communications, Earth observation and positioning, the equipment through which those signals are received, and the analytics that are built on them. The third segment, space-derived activities, covers activities in a number of different economic sectors that originally stemmed from space activity and technologies but are no longer dependent on that sector. Examples include technologies that have spilled over from the space sector to other parts of the economy.[61] For instance, technologies developed in the space sector have been adapted for use in crash-safety testing in the automotive sector and patient-monitoring systems in the healthcare sector. Revenue is mostly concentrated downstream.[62]

Two recent developments have turned space from a largely state-led activity into a commercial market. First, launches have become cheaper. Sending a kilogram of weight into orbit cost roughly US$ 15,000 in the early 2000s; by 2023 it only cost around US$ 4,000. This fall in cost owes much to reusability: rockets that used to be discarded after a single flight can now be recovered and reused.[63] Second, satellites have become smaller. The median launch mass has fallen from 1,450 kg in the 2000s to 305 kg in the 2020s, as constellations comprising many small satellites have replaced small numbers of large, individually designed satellites.[64]

Chart 1.1.1 shows how the composition of ownership has changed. The stock of active satellites has risen from about 2,100 at the start of 2020 to around 13,700 at the start of 2026. Commercial operators

CONTINUED

CHART 1.1.1 Commercial satellites are expanding the space economy



SOURCE: McDowell (2020) and authors' calculations.
NOTE: This chart shows satellites that are operational (that is to say, in Earth's orbit and not yet retired) on 1 January of each year. Owner classification follows the classes of organisation in the General Catalog of Artificial Space Objects (GCAT; see McDowell, 2020); satellites with several owners are assigned to the one listed first, and Starlink is shown separately.

[61] See OECD (2022).
[62] See OECD (2023).
[63] See Terzi and Nicoli (2024).
[64] See also McDowell (2020).

BOX 1.1 CONTINUED

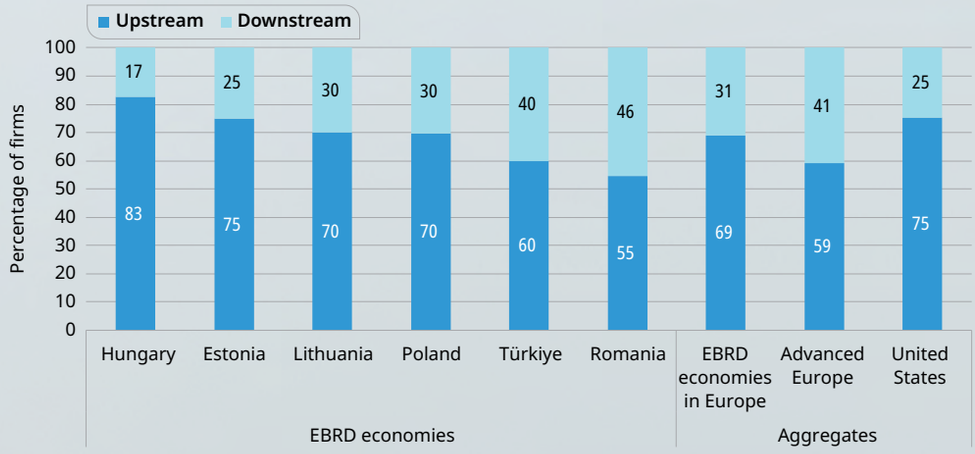
have accounted for about 92 per cent of that increase, driven largely by the rapid expansion of SpaceX's Starlink constellation from 2020 onwards. The active stock is also concentrated by function: communications satellites account for over 80 per cent of the total, while Earth observation satellites make up 9 per cent.[65]

The operation of satellites is concentrated geographically. As regards EBRD economies, Türkiye operates a total of 37 active satellites, more than any of the EBRD's regional groupings: 26 are operated by EBRD economies in the EU, 15 by economies in the southern and eastern Mediterranean, 8 by economies in eastern Europe, the Caucasus and central Asia, 3 by sub-Saharan African countries, and 1 by an economy in the Western Balkans. Together, the EBRD economies operate 90 satellites, compared with 1,085 in advanced Europe and 10,827 in the United States. Although space-based capacity is largely operated from outside the EBRD regions, commercial satellites in low Earth orbit are increasingly being integrated into terrestrial activities, including across EBRD economies.

Satellites in orbit are only one part of the space economy, however. In EBRD economies in Europe, 69 per cent of space firms are upstream, building spacecraft, launch vehicles, ground equipment and components, while 31 per cent are downstream in the navigation and Earth observation segments (see Chart 1.1.2).[66] This breakdown varies across economies in the region: Romania and Türkiye have the largest downstream shares at 46 per cent and 40 per cent, respectively, while Hungary has the smallest at 17 per cent. The upstream share is high partly because equipment manufacturing is counted as being upstream even where the work is entirely terrestrial.

Because EBRD economies operate few satellites, accessible activities tend to be on the ground rather than in orbit. On the upstream side, this means manufacturing rather than launch activities: antennae, software-defined modems, terminals and components. On the downstream side, it means operations and services: running ground stations, cloud mission control, cybersecurity, data processing and managed network services. These activities do

CHART 1.1.2 Most space firms in EBRD economies in Europe are upstream, building spacecraft and equipment



SOURCE: Dealroom (2026) and authors' calculations.
NOTE: "Space firms" are defined as companies that are active in the space economy, classified on the basis of an AI-assisted review of each firm's Dealroom record. Space firms are split into two categories, upstream and downstream, on the basis of the definition in OECD (2022). "EBRD economies in Europe" comprise EBRD economies in the EU and the Western Balkans, plus Moldova, Ukraine and Türkiye.

[65] Source: McDowell (2020) and authors' calculations.

[66] Data on space-derived activities are not available. The OECD notes that this segment is not readily measurable (see OECD, 2022); firms with products that originated in space programmes but are no longer dependent on them are also unlikely to be recorded as space firms in the underlying data.

not need assets in orbit, require less capital than launch activities or satellite manufacturing, and build skilled employment locally. Ground-station and mission-support providers are expanding into emerging hubs, including in Türkiye and Kazakhstan.

The majority of the revenue lies further downstream, in services built on satellite data, with three areas holding particular promise for some of the EBRD regions: (i) satellite communication, (ii) Earth observation, climate analytics and environmental monitoring, and (iii) space-enabled agriculture, water and natural capital. Governments remain the largest customers for Earth observation services, so public procurement shapes what is commercially viable in the second and third of these areas.

Satellite communication is the most mature of the three. Increasingly, capacity is being integrated into terrestrial networks to extend broadband coverage, reach rural and remote areas, connect local networks to wider communications networks, and maintain continuity of service for critical infrastructure. In Ukraine, direct-to-mobile services have supported emergency communications and network resilience, and infrastructure of this kind will also be crucial in post-war reconstruction efforts.

Earth observation, climate analytics and environmental monitoring are becoming increasingly mainstream. The market for raw satellite data is competitive, and market opportunities are present for firms that convert Earth observation, satellite navigation and artificial intelligence into tools for agriculture, insurance, the energy sector, cities, infrastructure and environmental monitoring. Much of the input for this comes from public programmes: the Copernicus Sentinel fleet, developed by the European Space Agency (ESA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), will be extended into the 2030s with new mission classes, and the EU's Space 2030 Agenda envisages a single European space market by the end of the decade. Economies participating in EU and ESA programmes can draw on both. For example, Terrasigna in Romania supplies analytics of this kind for insurance and risk assessment.

The third area, space-enabled agriculture, water and natural capital, includes yield forecasting, crop mapping, irrigation management, soil conservation and parametric insurance. Platforms such as SatAgro and Gisat already support crop monitoring and input optimisation across central and eastern Europe.

BOX 1.2 TÜRKIYE AND THE EU: PRODUCTION NETWORKS AND THE MARGINS OF DEEPER INTEGRATION

The EU has been Türkiye's largest trading partner for three decades, taking around 40 per cent of its goods exports and supplying a similar share of its imports. While industrial tariffs have been zero since the establishment of a customs union between the bloc and Türkiye in 1995, that customs union does not cover services, procurement, unprocessed agricultural produce or regulatory convergence. It is also asymmetrical, with Türkiye following EU policy where trade in goods is concerned.

Recent EU initiatives have reopened the debate over the optimal depth of Türkiye's economic integration with the EU. The proposed Industrial Accelerator Act (IAA) introduces EU content and low-carbon requirements for procurement and industry support schemes, preferences that can extend to third countries with an EU trade agreement, with ambiguity as to whether preferential treatment under the IAA extends to Türkiye.[67] This box assesses the merits of alternative integration paths based on detailed data on ties between Turkish firms and the EU market.

DIRECT AND INDIRECT EU DEMAND FOR THE OUTPUT OF TURKISH FIRMS

Many Turkish firms export to the EU. In addition, EU demand propagates through the supply chain: a Turkish exporter buys inputs from domestic suppliers, who buy from other domestic suppliers. A change in EU demand affects all those firms, even if they never need to fill in a customs form.

Three linked administrative datasets covering the universe of Turkish firms over the period 2006-23 make it possible to follow EU demand throughout the production network. These data encompass customs records on exports to the EU, value-added tax (VAT) filings recording transactions between firms, and balance sheets with information on sales, wages, employment and sector, yielding a panel of about 900,000 active firms in 2023.

Firms fall into three groups: direct exporters to the EU; firms that do not export directly but participate in the supply chains of exporters to the EU; and firms with no exposure to EU demand. In line with Dhyne et al. (2021), each firm's total EU exposure is built up recursively from its direct sales to Europe plus a share of its sales to other domestic firms, weighted by those buyers' own EU dependence.

Firms' indirect exposure to EU demand is large. About 9.5 per cent of Turkish employment is accounted for by direct exporters to the EU, with a further 11.5 per cent in firms indirectly exposed to EU demand. Therefore, around a fifth of Turkish employment is tied to European final demand, but only half of that link is visible in external trade statistics.

On average, within the same narrow industry, a direct exporter to the EU employs around 90 per cent more people than a firm unexposed to EU demand, reports four times its sales and pays wages that are roughly 55 per cent higher – the familiar exporter premium.

[67] See EBRD (2026b).

TABLE 1.2.1 Significant welfare effects of alternative integration paths (percentage change in real GNP)

No.	Scenario	Türkiye	EEA
1	Services, EU opens (one-sided)	0.22	0.01
2	Services, mutual	0.36	0.02
3	Buy European, Türkiye excluded	-0.48	-1.34
4	Buy European, Türkiye included	0.14	-1.31
5	Buy European (including Türkiye) + services	0.52	-1.29
6	Agrifood tariffs removed	-0.56	0.02
7	Agrifood + services	-0.20	0.03
8	Agrifood + services + Buy European	-0.04	-1.27

SOURCE: CEPII Gravity database, OECD Inter-Country Input-Output (ICIO) tables, OECD Services Trade Restrictiveness Index (STRI) and authors' calculations.
NOTE: Based on a production-network general equilibrium model and trade-elasticity estimates in Caliendo and Parro (2015). EEA figures are averages across 24 economies weighted by final-demand GNP.

Firms that are exposed to EU demand indirectly are almost indistinguishable from firms with no EU exposure, with a sales premium of 10 per cent and no significant premium in terms of employment or wages, suggesting that those firms represent ordinary (small) businesses.

INTEGRATION PATHS AND THEIR WELFARE EFFECTS

The following analysis draws on Demir, Javorcik and Yıldırım (forthcoming), which takes detailed Türkiye-EU firm linkages into account in estimating the welfare effects of various paths for economic integration between Türkiye and the EU based on a production-network general-equilibrium model published in Baqaee and Farhi (2024). The analysis also draws on the OECD Services Trade Restrictiveness Index and estimates the effects of barriers to trade in services using a structural gravity model of trade.[68] Estimations cover 15 scenarios (8 of which are included in Table 1.2.1), which differ in terms of EU-Türkiye integration in several respects: trade in services, EU content preferences, trade in agricultural produce, public procurement rules and non-tariff harmonisation. Table 1.2.1 summarises the results. Three findings stand out.

Mutual services integration (whereby barriers to trade in services between the EU and Türkiye are lowered to intra-European Economic Area (EEA) levels) raises Turkish real gross national product (GNP) by 0.36 per cent to 0.80 per cent, with a smaller gain in the EEA concentrated in services-intensive economies such as Luxembourg, Ireland and Greece. The liberalisation of trade in agricultural produce, in contrast, is estimated to be contractionary. In this scenario, a substantial protection is removed on Türkiye's side, while the reduction in EU tariffs is relatively low.

The introduction of the proposed "Buy European" preferences in EU procurement could cost Türkiye around 0.5 per cent of real GNP if Türkiye is excluded from local-content treatment. (In the model, this scenario raises costs for a firm sourcing inputs from outside the preference bloc.) The effect of those provisions turns mildly positive if "Buy European" provisions are extended to Türkiye. For the EEA, the cost of "Buy European" provisions is estimated at around 1.3 per cent of GNP in either scenario on account of the increased cost of sourcing.

[68] The estimations are run using four trade-elasticity calibrations from economic literature; the figures reported here use the baseline calibration of Caliendo and Parro (2015), with full results in Demir, Javorcik and Yıldırım (forthcoming).

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