

Aeronautical activity in France is still below its pre-crisis level, but could be ready to take off again in 2024

Although order book levels are considered to be very much higher than usual, activity in the aeronautics sector in France (almost 7% of industrial value added) is still lagging behind its pre-crisis level. On average over 2023, the sector's Industrial Production Index was around 25% below its 2019 level. Meanwhile, exports by value as measured by customs are 13% down on the pre-crisis level, with a difference of 25% for the assembled planes segment alone. Supply constraints generated by the economic recovery coming out of the health crisis have certainly significantly delayed recovery in the sector.

However, employment in the aeronautics sector is doing more than simply holding up. In 2023, it was 7% higher than in 2019. This difference between employment and production reflects a drop in apparent labour productivity. However, employment has evolved in very different ways, depending on socio-professional category: employment of managers has been particularly dynamic while the rest of employment has fallen back since 2019, in the wake of industrial activity.

For an international comparison, performance in the German aeronautics industry also appears to have deteriorated: however, aircraft assembly is doing better here than in France, despite the presence of the same integrated European aircraft manufacturer, Airbus, in both countries. This is a consequence of the specialisation of Airbus assembly lines, which is not currently favourable for France: in fact, the decline in Airbus deliveries compared to 2019 has been more pronounced for the types of aircraft assembled only in France (the A330 and A350 family, as assembly of the A380 has now ceased), with recovery more buoyant for single-aisle aircraft, which are assembled for the most part in Germany. Across the whole of the aeronautics sector, however, French exports deteriorated less than in Germany in 2023, due to the good performance of French engine manufacturers. On a global scale, the difficulties encountered by French and German industries are an exception: aeronautical exports have returned to levels close to those of 2019 in most other major producing countries, especially in North America.

In 2024, supply chain constraints are expected to continue to ease in France: production and exports should therefore be very dynamic, making it possible to regain a large part of the ground lost since 2019 in terms of activity and doubtless productivity. ●

Guillaume Roulleau

In France, aeronautical production and exports remain largely below their pre-crisis level

At the end of 2023, the level of activity in the aeronautics sector¹ in France was still well below its pre-health crisis level. After collapsing during the pandemic, aeronautical production saw its recovery hampered by supply chain difficulties, which began to appear during the post-health crisis economic recovery and which are still at high levels (► **Figure 2**).

Measured by the Industrial Production Index (IPI), the level of activity in the sector as an annual average for 2023 is approximately 25 points below the 2019 average (► **Figure 1**). This divergence is around 13 points in exports by value, as measured from customs data. This difference in trend can be explained by the fact that customs data are expressed in value, while the IPI measures production in volume. In addition, the faster recovery of exports by value measured by customs may mask differences in dynamics, depending on the aeronautical product under consideration: thus, in the assembled aircraft segment alone, exports in 2023 were still 25% below the 2019 average.

For example, the European company Airbus delivered 735 aircraft in 2023, which was 15% less than the 863 aircraft delivered in 2019 (► **Figure 3**), and corresponds to a drop of around 25%, once the price differences between models are taken into account: the fall in deliveries has in fact affected large aircraft more than single-aisle aircraft. This decline concerns all of the aircraft manufacturer's production lines, especially those in Toulouse, and is a good illustration of the current difficulties that the sector is experiencing as well as its significant potential for rebound.

¹ In this Focus, the aeronautics sector corresponds to division 3030 in the NAF classification of activities (Manufacture of air and spacecraft and related machinery, including both assembled aircraft and engines and part of the aircraft cockpit). As there is no such disaggregated level available, the aeronautics sector is assimilated, approximately, to "Manufacture of other transport equipment" (which, in addition to aeronautics, includes the manufacture of naval and rail equipment). Conversely, customs data can be monitored at a more detailed level: in particular, exports of assembled aircraft alone are also studied in this Focus (► **Dortet-Bernadet et al. 2016** for a discussion on relevant nomenclatures in aeronautics).

French economic outlook

In France, employment in the aeronautics sector remains dynamic nonetheless, bolstered by jobs for managers

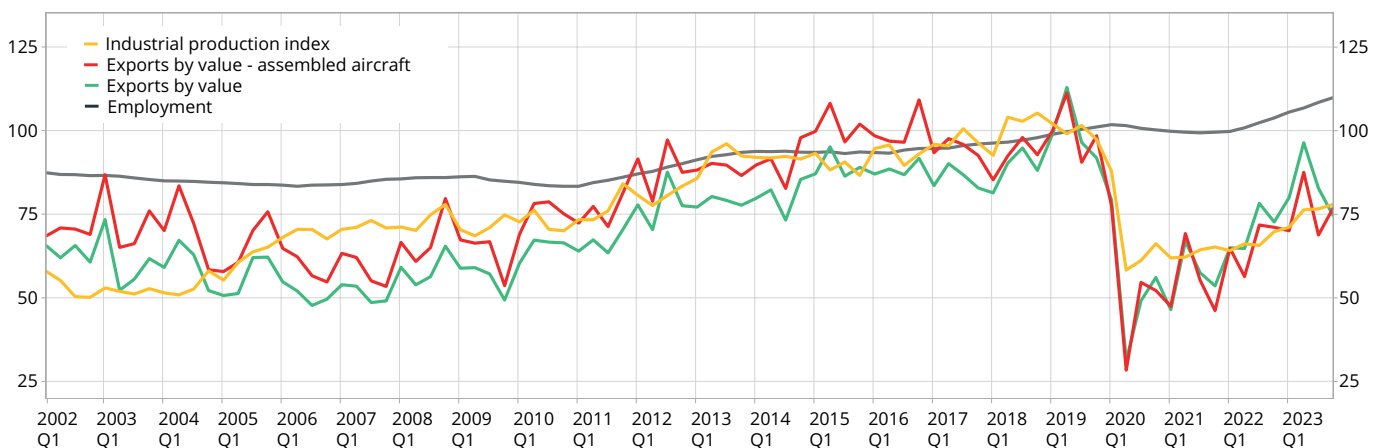
Since before the crisis, employment in the aeronautics sector has diverged significantly from production and exports. Growth in exports remains solid and in 2023 was about 7% higher than in 2019. However, compared to before the crisis, the loss of labour productivity observed in the sector has reached more than 30%. The drop in productivity in the “other transport equipment” sector (including aeronautical construction) is therefore much more marked than in the other industrial sectors (►Jauneau et al., 2022).

However, a detailed breakdown of employment dynamics in the sector reveals some very different developments, depending on socio-professional category (►Figure 4). Managerial jobs (mostly engineers) have increased substantially, especially since 2021 (about +16% in 2023 compared to 2019). The dynamics observed in managerial employment could therefore reflect an R&D investment strategy (►Morénillas, 2023), of which the impact on production is likely to be very much delayed.

However, the employment of non-managerial workers (technicians, qualified industrial workers, etc.), the momentum of which is much more closely linked to industrial activity, fell back by about 7% in 2023 compared to the 2019 level. This component of employment has therefore contracted in the wake of the drop in production. This decline is smaller than that in activity, however, which may reflect traditional “labour retention” behaviour: in a context where order book levels

► 1. Production, employment and exports in the French aeronautics sector

(seasonally adjusted level, base 100 in 2019)



Last point: Q4 2023.

Note: here, the aeronautics sector corresponds to division 3030 in the NAF classification of activities for the Industrial Production Index and exports by value. By approximation, employment in the aeronautics sector is here assimilated to employment in “manufacture of other transport equipment”.

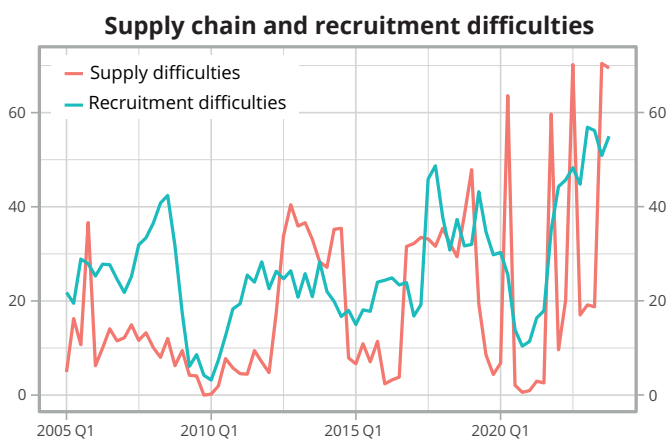
How to read it: in Q3 2023, the Industrial Production Index for the aeronautics sector was 23 points below its 2019 average.

Source: INSEE, customs, INSEE calculations.

► 2. Supply chain difficulties and order books in the aeronautics sector

(% of companies, seasonally adjusted)

(balances of opinion, seasonally adjusted)



Last point: Q4 2023 (left graph), February 2024 (right graph).

Note: by approximation, the aeronautics sector is assimilated here to the “manufacture of other transport equipment” sector.

How to read it: in Q4 2023, 70% of companies in the “manufacture of other transport equipment” sector reported having supply chain difficulties.

Source: industry business surveys, INSEE.



are high and companies in the sector are finding it very difficult to recruit, they have retained a large proportion of their employees, especially since some government initiatives, such as the long-term partial activity scheme (APLD), mean that they are able to contain the cost.

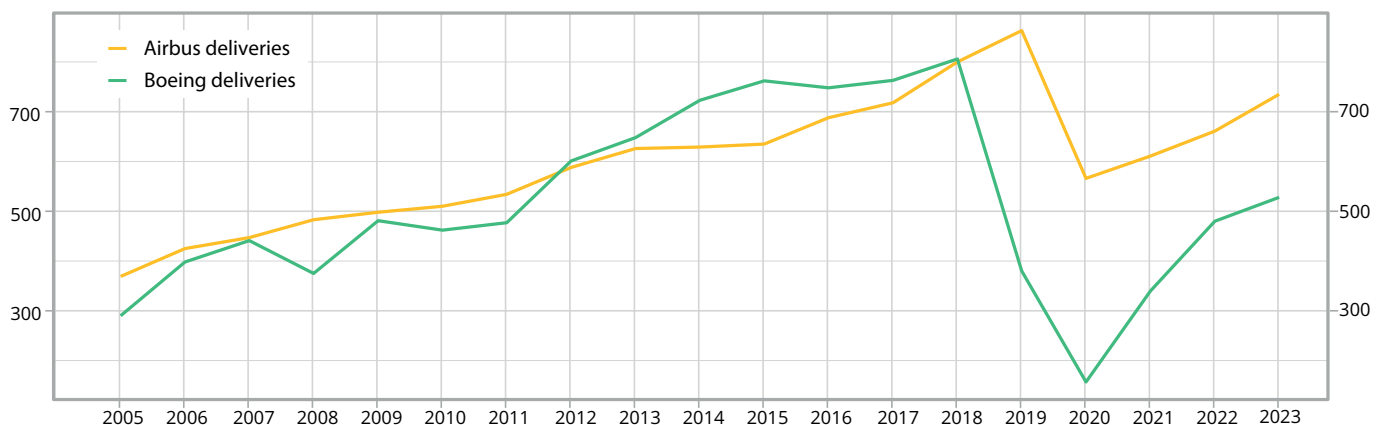
In Germany, exports of aeronautical equipment have also declined, but aircraft assembly is doing better than in France due to the geographic specialisation of the Airbus assembly lines

Given that Airbus, the main company in the sector in France, is a European manufacturer that is also strongly established in Germany, it could be interesting to compare the aeronautical industry on either side of the Rhine by studying their respective export performances: for this purpose, customs data are a more reliable indicator than the IPI, which is calculated according to different methodologies in France and Germany (► [Box](#)).

First, we consider only the assembled aircraft sub-sector (which has the largest weight by quantity), where German exports have deteriorated less than in France (► [Figure 5a](#) and ► [Figure 5b](#)): there was a decline of 15 points in Germany in 2023 compared to the pre-crisis level against almost 25 points in France. One possible explanation for this difference lies in the geographic specialisation of the Airbus assembly lines. Since the post-pandemic recovery, Airbus deliveries have been mainly driven by single-aisle aircraft in the A320 family (► [Figure 6](#)), and these are mainly assembled in Germany: the Hamburg site has four assembly lines specialising in this model, compared to only two in Toulouse, one in Tianjin in China (a second line is currently under construction) and one in Mobile in the United States (here too, a second

► 3. Annual Airbus and Boeing deliveries

(number of aircraft)

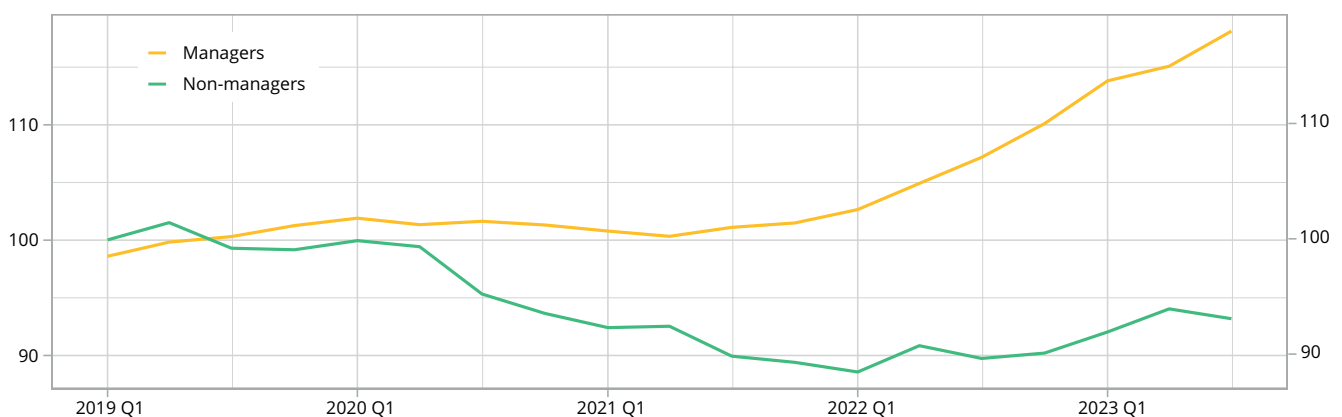


Last point: 2023.

Source: manufacturers.

► 4. Breakdown of payroll employment in the aeronautics sector in France since 2019

(seasonally adjusted level, base 100 in 2019)



Last point: Q3 2023.

Scope: France (excluding Mayotte), payroll employment by number of posts present at the end of the month.

Note: here, the aeronautics sector corresponds to division 3030 of NAF.

How to read it: in Q3 2023, employment of managers was 18 points higher than the 2019 level against -7 points for non-manager jobs.

Source: DSN - provisional processing INSEE.

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line is currently under construction). Conversely, aircraft in the A330 and A350 family, where deliveries are still very much in decline compared to 2019, are only assembled in France. This was also the case for the A380, with the last model assembled in 2021. Finally, the ramp-up of the A220 does not concern either France or Germany as this model is only assembled across the Atlantic, in Mirabel, Canada and Mobile in the United States.

When considering the aeronautics sector more broadly, the difference in exports when compared to their pre-crisis level is greater in Germany than in France (-23% in Germany as an annual average in 2023 against -13% in France). In fact, in France, exports of aircraft engines (by value) are already back to their pre-health crisis level despite the exposure of French engine manufacturers to the aircraft manufacturer Boeing, which is currently experiencing difficulties (the Boeing 737 Max, which has experienced several incidents since its launch, is equipped with the LEAP engine by Safran). Conversely, exports of engines are less buoyant and are hampering the recovery of total exports in this sector in Germany.

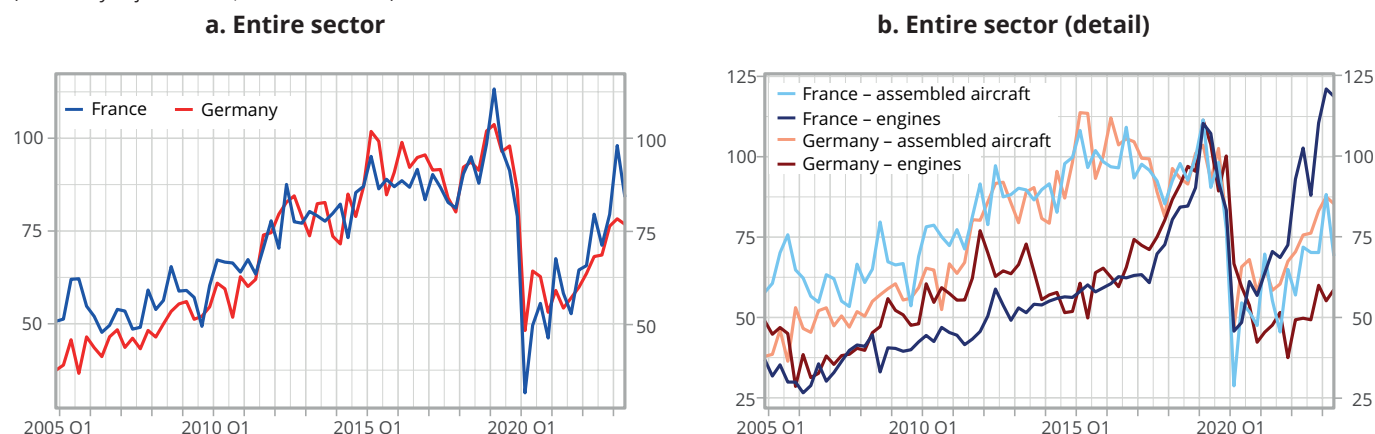
Elsewhere in the world, aeronautical exports are back to their pre-crisis level

In an international comparison, the decline of the aeronautics sector compared to its pre-crisis level appears to be a specifically European feature, and particularly Franco-German. In 2023, exports by value by those of our trading partners that have significant aeronautical activity (United States,² China, Canada, United Kingdom) were similar to or higher than in 2019 (► **Figure 7**), which was not the case in the Eurozone.

² Although Boeing's deliveries fell significantly between 2018 and 2019, American aeronautical exports were generally equivalent in 2019 (\$146 billion) and 2018 (\$150 billion). Thus, using 2019 as a point of comparison does not change the result.

► 5. Aeronautics sector exports in France and Germany

(seasonally adjusted level, base 100 in 2019)



Last point: Q3 2023.

Note: here, the aeronautics sector corresponds to division 3030 of NAF; the assembled aircraft sub-sector is 792 in the Standard International Trade Classification (SITC) and the engines sub-sector corresponds to numbers 713 and 714 in the SITC.

How to read it: in Q3 2023, exports by value for the entire aeronautics sector were 23 points lower than the 2019 level in Germany against -16 points in France

Source: Customs, INSEE calculations.

► 6. Annual Airbus deliveries by aircraft type

(number of aircraft)

Types of aircraft	2015	2016	2017	2018	2019	2020	2021	2022	2023
A320 Family	491	545	558	626	642	446	483	516	571
A220	0	0	0	20	48	38	50	53	68
A330	103	66	67	49	53	19	18	32	32
A350	14	49	78	93	112	59	55	60	64
A380	27	28	15	12	8	4	5	0	0
Total deliveries	635	688	718	800	863	566	611	661	735

Source: manufacturer-Airbus.

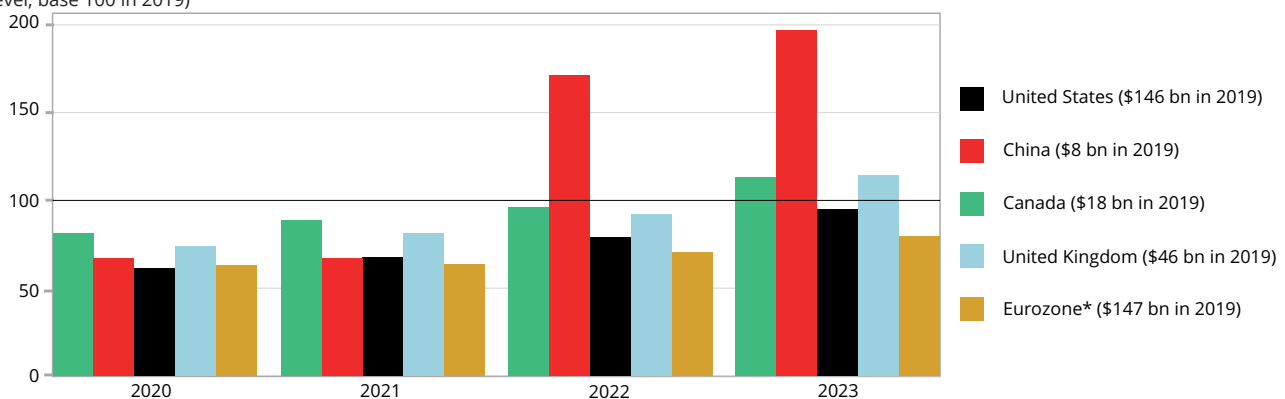
Airbus' targets for 2024 could lead to increased activity in the aeronautics sector in France

Airbus recently announced a target of 800 aircraft to be delivered in 2024, which would be an increase of almost 9% of deliveries by the group compared to 2023. Assuming that this target is reached (it was exceeded in 2023), the impact of these deliveries on French exports could be slightly encouraging.

In 2023, Airbus opened a new assembly line in France to produce type A320 aircraft, which in terms of numbers are the most important (more than three in four deliveries in 2023). Thus the share of the Toulouse site in Airbus' activity overall is expected to increase in 2024. The ramping-up of this new production line is expected to be very gradual and could partially replace the activity of the two assembly lines currently in operation. Also, French aeronautical exports could see slightly more dynamism than simply from an increase in Airbus activity. ●

► 7. International comparison of annual exports in the aeronautics sector

(in level, base 100 in 2019)



Last point: 2023.

Note: here the aeronautics sector corresponds to division 3030 of NAF. The Eurozone corresponds to the total of French, German, Italian and Spanish exports.

How to read it: in 2022, exports by value from the entire aeronautics sector in Canada were 4 points lower than the 2019 level.

Source: UN Comtrade, INSEE calculations.

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Indicators of activity in the aeronautics sector in France and Germany

There are many indicators that could be used to measure activity in the aeronautics sector and make an international comparison. Thus the diagnosis regarding the differences in trajectory between France and Germany may vary according to the indicator used (► [Figure 8](#)).

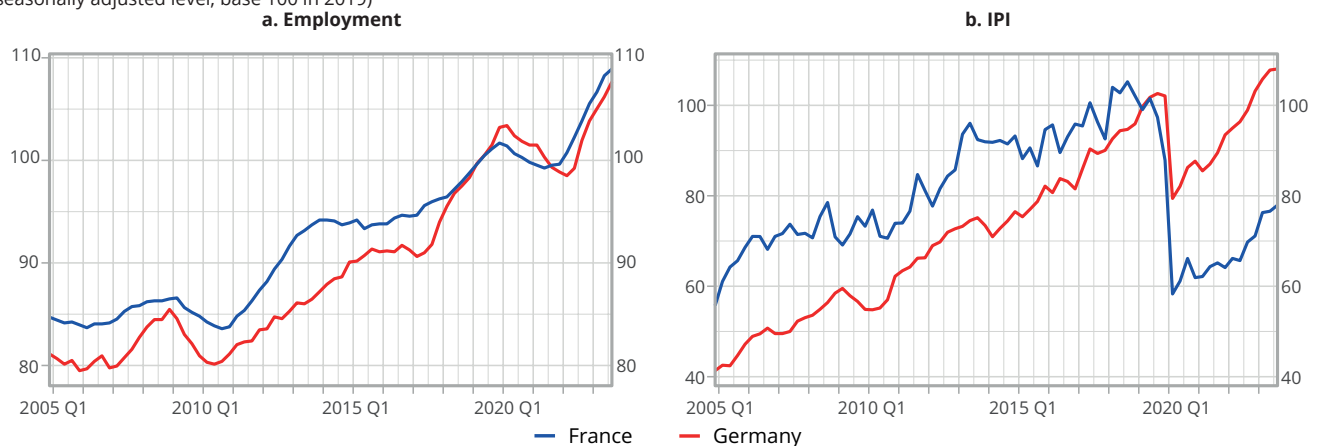
In terms of employment, the dynamics are relatively similar in the two countries, with higher levels than before the crisis. However, employment is a little more buoyant in France: here it is driven by the employment of managers (see above), in a context where the French aeronautical industry is much more specialised than Germany in research and innovation activities (► [Balcone and Schweitzer, 2019](#)).

The Industrial Production Index (IPI) is used to monitor change in industrial activity in France and Germany. The IPI is therefore an indicator of volume, making it possible to neutralise the potential impact of price differences. According to this indicator, German aeronautical industrial production – which in 2023 was around 8 points higher than its pre-crisis level – looks set to be quite a bit more dynamic than French production. However, this discrepancy reflects some methodological differences. In particular, the IPI for the French aeronautics sector measures the construction of finished planes produced by different assembly lines throughout the world (by weighting them according to a quality indicator, ► [Dortet-Bernadet et al., 2016](#) for further details on the construction of the indicator and its sub-components). In contrast, the German IPI measures activity in the aeronautics sector by hours worked within the sector: thus, and contrary to the methodological choice made in France by INSEE, the aeronautics IPI in Germany is naturally correlated with employment but is very different from dynamics of exports in the sector.

Exports by value taken from customs data reflect deliveries and therefore appear to be the best indicator for an international comparison of performances in the aeronautics sector. Customs data also have the advantage of being very granular, which makes it possible to explore the different sub-components of the aeronautics sector. However, they are expressed by value and may therefore also reflect price changes since 2019. ●

► 8. Comparison of different activity indicators for France and Germany

(seasonally adjusted level, base 100 in 2019)



Last point: Q4 2023.

Note: by approximation, aeronautical employment is assimilated to employment in the “manufacture of other transport equipment”. Here, the Industrial Production Index (IPI) corresponds to division 3030 of NAF.

How to read it: in Q3 2023, the IPI for the aeronautics sector was 23 points lower than its 2019 level in France, whereas it was 8 points higher in Germany.

Source: Eurostat, INSEE calculations.