

Less than Meets the Eye



The Real Impact of Brexit on UK Trade

Phil Radford

Foreword by Rt Hon Jeremy Hunt MP,
former Chancellor of the Exchequer



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Foreword

by Rt Hon Jeremy Hunt MP, former Chancellor of the Exchequer

The new US Administration's stance on tariffs has thrust international trade back to the forefront of the policy agenda. For some, this has been used as an opportunity to re-open debates about Brexit. They argue that if the US is a less reliable trading partner, the UK has no choice but to seek closer ties with Europe – either by joining the Single Market, or even by rejoining the EU.

This is a false dichotomy. In the first instance, we should not give up on the idea of a trade agreement with the United States, either comprehensive or sectoral, – something that it is much more feasible to achieve with our own independent trade policy. Secondly, the idea that the ideal situation for the UK is to prioritise either the United States or Europe is flawed: we must have a good trading relationship with both if we are to prosper.

In 2016 I voted to remain in the European Union. Yet I thought both then and subsequently that many claims about the impact of Brexit upon the UK's economy were overly exaggerated – as, it must be said, were the more hyperbolic claims of some Brexiteers about its benefits.

This excellent paper by Policy Exchange clearly demonstrates that Brexit has had much less impact on British exports to the EU than has been previously thought. It does this not by modelling at aggregate level, but by a painstaking analysis of UK-EU trade sector-by-sector. This reveals a shift in some sectors from high-volume to high-value exports, removes the misleading impact of 're-exports' (which have minimal relevance to UK manufacturing or real trade intensity) and exposing the unusually high dependence of UK exports on sectors that were particularly impacted by the COVID-19 pandemic, such as automotive and aerospace.

This sort of analysis matters. Assumptions about UK trade performance are used by bodies such as the OBR and Treasury when assessing the impact of Brexit – and in modelling the performance of the UK economy going forward. This in turn feeds into the economic projections that determine, amongst other things, whether the Chancellor is meeting his or her fiscal rules. Policy Exchange's work in this area should be carefully scrutinised by the OBR when they next update their models.

Those who seek to relitigate Brexit are deeply mistaken. The half-decade of political instability that followed Brexit took its toll on governance and neither business, nor the population at large, would thank the Government for reopening these questions. Our priority must be to focus

on strengthening the UK's economic performance, both domestically and internationally.

In this era of increasing geopolitical uncertainty, it is more important than ever that the UK keeps all of its allies close. Britain does not need to choose between the EU and the US on trade, but should seek to maintain positive and open relationships with both.

Executive Summary

Much of the existing analysis of UK trade data since Brexit contains serious flaws. These flaws have been incorporated in forecasts made by the Office for Budget Responsibility and risk undermining UK trade and economic policy at a critical time. They also create a false impression of UK export challenges. Most important of all, these flaws deflect scrutiny from policies that are undermining the long-term prospects for high-value exports.

The adverse impact of Brexit on exports to the EU and the UK economy has become a matter of received opinion, not only for opponents of Brexit, but for key advisory bodies like the Office for Budget Responsibility (OBR). Figures suggesting Brexit has caused a 15% reduction in goods exports to the EU are frequently cited.

This paper analyses trade sector by sector, rather than via aggregate data. It argues that most underlying analysis is deeply flawed; that Brexit-related reductions in exports are a fraction of this amount; and that other causes account for the biggest hits to UK exports since 2020.

Analytical flaws are not a purely academic issue, however. OBR assumptions feed into long-term economic forecasts, and these forecasts affect ministerial decision-making on taxation and spending. What's more, a proper understanding of changes in aggregate trade data is vital to practical policymaking in two areas:

- **The UK's negotiating position for its 'reset' in UK-EU relations.** This should depend on a correct calibration of the impact of the Trade and Cooperation Agreement (TCA) on UK exports.
- **Understanding the real drivers of UK good exports to the rest of the world.** This is essential in trade negotiations. It will be vital to trade discussions with the Trump administration.

At a time when some are arguing that the new Trump administration's approach to trade means that the UK must choose between the United States and Europe, these findings help to demonstrate that this is an unnecessary choice, and that the UK should seek to retain positive and open trading relationships with both.

The 5 flaws in UK trade analysis

The main driver for pessimistic assessments of the impact of Brexit has been a series of econometric analyses based on 'doppelgänger' studies.¹ But the conclusions delivered by doppelgänger analyses raise awkward

1. Springford, J., *Brexit, four years on: answers to two trade paradoxes*, January 2024, and its preceding analysis, *The Cost of Brexit*, March 2021; Goldman Sachs, UK: *The structural and cyclical costs of Brexit*, February 2024; Aston Business School: *Brexit unbound*, September 2024.

questions. The chief difficulty is this: if Brexit is the principal cause of poor trade outcomes, why have exports to non-EU countries performed just as poorly as exports to the EU since 2020?

This paper seeks to explain discrepancies and paradoxes in UK trade since Brexit. It highlights five areas in which UK trade analysis is either flawed or misinterprets the data. These flaws are relevant to all trade analysis, because they show why UK export performance was bound to diverge significantly from other countries from 2020 onwards. This paper highlights:

- 1. The divergence between volume and value metrics.** Volume-based reporting takes no account of rapid shifts into high-value/low-volume manufacturing. In units, UK vehicle exports are down 28% on 2019. In value terms, however, exports are down just 2%.
- 2. How downturns in the global auto and aerospace industries meant that UK exports suffered a unique ‘hit’ in 2020 to 2023.** In 2019, cars and aerospace delivered a greater share of UK goods exports than for any other country in the G7. This meant that UK exports were predestined to underperform other countries, regardless of Brexit.
- 3. The inclusion of re-exports in pre/post Brexit export comparisons.** Approximately £4.5 billion of apparel and footwear has disappeared from export data, but these were re-exports. Their loss has no relevance to UK manufacturing or trade intensity. Re-exports were also a common feature in pre-Brexit trade in food and agriculture.
- 4. The UK’s chronic export underperformance in EU markets before Brexit.** UK goods exports to the EU underperformed virtually every developed economy from 2000–2019, typically by 2.5 to 3 ppts per year. Doppelganger models that do not factor this in naturally over-estimate a counterfactual projection of UK export growth.
- 5. Some of the UK’s most advanced engineering exports are now sold as services.** Rolls Royce Plc now books 63% of its revenue from commercial aircraft engines as services income. This means UK exports of jet turbines show up principally as services exports in national accounts.

The threats to export growth

This sectoral analysis also identifies policy areas that should attract critical attention because of their impact on trade. These include:

- **the impact of energy dependency on UK trade**, with deficits of £33 billion in 2022, £26 billion in 2023 and £21 billion in 2024. These sums far outweigh any export shortfalls that can be attributed to Brexit.

- **the impact of high energy costs on the chemicals sector.** This sector now delivers the single biggest sectoral shortfall in post-Brexit exports to the EU.
- **the impact of uncompetitive taxation rates on pharmaceuticals manufacturing.** This has triggered chronic export decline in a sector that benefits from huge R&D spending.

This analysis also exposes the vital importance of our aerospace and premium car-manufacturing industries. These two sectors delivered the fastest growth of any export sectors pre-Brexit, and their resurgence should be a top priority for Government policy making.

Lastly, this paper provides an outline explanation to the biggest mystery of all: why UK exporters underperformed dramatically in EU markets before Brexit, despite all the advantages of the Single Market and Customs Union.

1. The pitfalls of volumetric data

Volumetric reporting is suddenly popular in UK trade analysis. With good reason. Inflation ripped asymmetrically through UK trade sectors in 2022 and 2023, with energy and food impacted especially severely. This makes comparisons of pre- and post-Brexit trade more taxing than they were before the inflationary spike.

One way to sterilise the trade data of the effects of changes in relative prices is to measure trade in volumes. This is precisely what the Office for Budget Responsibility (OBR) does.² Using volume measures, it asserts that the UK trade data is consistent with a long-term 15% reduction in trade intensity, compared to if the UK had stayed in the EU. (See Chapter 7.)

But measuring trade by volumes is only credible if the goods stay the same, year by year. It is a popular metric for countries that are commodity exporters where prices swing wildly. But it is hazardous when applied to countries that export manufactured goods, where the goods keep evolving. In the UK's case, 85–90% of the goods we export are manufactured.

The litmus test: UK auto manufacturing

The UK's auto export industry is an obvious sector to evaluate, because it is our biggest. Automotive goods exports are worth 13 to 14% of UK goods exports in a typical year³, so what happens here impacts aggregate data. Two principal trends characterise the UK auto-manufacturing industry since 2017:

- A dramatic fall in the number of passenger vehicles (cars) assembled in the UK from 1.7 million in 2017 to 775,000 in 2022.⁴ Output in 2024 was still low, at 780,000 units.
- A dramatic rise in the per-unit value of UK-made vehicles. This is because UK premium marques, luxury vehicles and customisation have begun to dominate output.

As a result, the impressions given by volume and value reporting diverge dramatically when applied to car manufacturing. And since 80% of cars manufactured in the UK are exported, this value/volume divergence applies equally to exports.

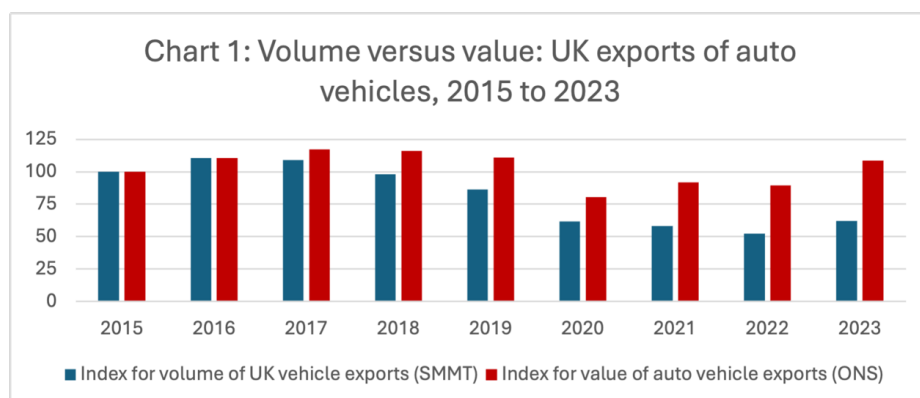
Chart 1 below compares UK exports of motor vehicles (measured in units) as against their export value (measured in 2019 prices). Both are indexed to 2015. If the value of individual units stayed the same, the two columns would move in sync. But they diverge – dramatically.⁵

2. Office for Budget Responsibility. Economic and Fiscal Outlook, March 2024. Page 37-40.

3. Minus precious metals and energy. ONS: UK Trade in goods by Classification of Product by Activity, annual exports time series dataset, current prices, seasonally adjusted, July 2024.

4. Society of Motor Manufacturers and Traders, January trading updates, 2018 and 2023.

5. Commercial vehicles made up 5-6% of the total number of export vehicles until 2021 and mostly consists of vans. Both sets of data only include vehicles, and not engines or other auto parts.



Source: Volume: SMMT January bulletins, 2016 to 2024, plus annual bulletins on UK commercial vehicle production. Value: ONS UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2023 Q4, Published February 2024. Line 29.1, which excludes auto parts and vehicle bodies. Deflated using the ONS IDEF deflator for machinery and transport equipment exports to all markets.

In raw numbers, this is what has happened. The volume of exports of UK-assembled vehicles (cars and commercial vehicles) increased from 1.28 million in 2015 to a peak of 1.4 million in 2016-2017. That is as high as the blue columns get. Then export volumes collapsed to just 668,000 vehicles in 2022. At this point the UK exported just 52% of the number of vehicles we exported back in 2015. In volume terms, this appears an horrific collapse of our biggest export industry.

In value terms, however, the picture looks far different.

The ONS produces deflators for specific goods-export sectors.⁶ This means it is possible – with reasonable accuracy – to adjust for inflation in UK exports of specific types of goods. Using these deflators the value of those 1.28 million vehicles the UK exported back in 2015 was £33.5 billion (in 2019 prices). So that is where the red column kicks off.

Export values then peaked in 2017 at £39 billion. But the subsequent decline in export values was far less savage than the decline in export numbers. The nadir occurred in 2020 when export values touched £27 billion. This represents a fall of just 19% on 2015 values – or less than half the fall registered when counting the number of vehicles.

The recovery in export values then set in two years earlier than the recovery in export volumes. The value of our auto exports began to climb in 2021. And by 2023 the value of vehicles the UK exported had returned to £36.4 billion (in 2019 prices), which is just £2.9 billion shy of its 2017 peak.

Most pre/post Brexit trade analysis references 2019 as the benchmark year. So, running the calculations from that year:

- a volumetric analysis says that UK vehicle exports in 2023 were 28% below 2019 levels

6. These are the IDEF deflators, which categorise goods according to the SITC classification system.

- a value-based analysis says that UK vehicles exports in 2023 were just 2% below 2019 levels.

So: there is a 26 ppt difference between a volumetric assessment of UK's post-Brexit vehicle exports, and one that measures value instead. This is a gaping discrepancy. And remember, volumes are how the OBR mostly measures UK trade.⁷

Are the numbers right?

Could either of these two metrics be wrong? The volume number would be difficult to corrupt. The export totals are published by the Society of Motor Manufacturers and Traders (SMMT), which is the lead industry body. They are accepted as accurate by industry analysts. And they tally almost precisely with figures published by the European Automobile Manufacturers' Association (ACEA).

What about the value numbers? They are taken from the ONS' quarterly updates on UK trade. Like all data, they are subject to revisions. And in 2024, the ONS did make startling upward revisions to its auto data for the 2019–2022 period, adding – progressively – £1bn per year to non-EU exports. This retrospectively enhanced the UK's trade performance in those years. But economists working with the old data would still have picked up a dramatic divergence between value and volume. The ONS updates barely make a scratch on the divergence between volume and value metrics.

The quiet rise of premium UK auto

The logical way to corroborate whether value and volume metrics are dramatically out of sync is via companies' annual reports. And sure enough, commercial sources confirm the premiumisation of UK car production. It is happening at two levels:

1. **Individual UK-built cars are becoming more valuable thanks to customisation.** JLR is the UK's biggest car manufacturer (by value, not by volume), and the average value of its vehicles has increased from £54,000 in 2015/16 to £68,293 in 2022/23 (2019 prices).⁸ Aston Martin's numbers have soared from £134,00 per vehicle in 2019 to £231,000.⁹ Bentley and Rolls Royce Motor cars exhibit the same trait.¹⁰

Incidentally, JLR's corporate numbers almost perfectly mimic the trajectory of UK exports. In volume terms, JLR output dropped 32% between 2015/16 and 2022/23. Meanwhile, revenue per vehicle increased by 24%, in real terms.

2. **The balance of investment and production is shifting towards luxury brands.** Closures at mass-market manufacturers (Honda and Ford) are balanced by expansion at luxury marques. Rolls

7. Office for Budgetary Responsibility. Economic and Fiscal Outlook, March 2024. See pages 37-40. Volumes appear to be the principal metric in the March Outlook, see para 2.3, and Box 2.4

8. JLR Annual Reports 2016 and 2023. Calculated in terms of revenue per vehicle. Deflated using ONS GDP deflators at market prices.

9. Telegraph. The Bentley chief tasked with saving gas-guzzling Aston Martin from electric death. [Link](#)

10. See, for example, Rolls £300 million expansion at Goodwood to expand bespoke car-making. Rolls Royce, January 2025 [Link](#)

Royce Motor Cars and Bentley have announced record production in most years since 2016 – bucking the defining trend in volume output. Both are investing heavily in UK production – as are all luxury brands.

Crewe-based Bentley illustrates the point to perfection. Bentley increased production by almost 40% from 2015 to 2022, from 10,888¹¹ vehicles to 15,174¹². This delivers the tiniest blip of a difference in total UK vehicle export volumes (0.4% on 2015 numbers).¹³ But it delivered an approximate £853 million (2.5% increase) in UK auto export value.¹⁴

A quick glance at the ultra-luxury end of the industry shows the absurdity of reporting on trade by counting cars. JLR is making just 12 Range Rover ‘Ranthambore’ (tiger) limited edition models for the India market. Each is priced at £460,000. At the extreme end is the new Rolls Royce Droptail, which retails for US\$28 million. Each of these cars is an epic of customisation and is worth the equivalent of 1,000 Nissan Leafs. But volume reporting counts them just the same.

Until recently trade data could capture some of the differences in car values, by categorising them according to engine size. Thus, different 6-digit HS codes apply to vehicles whose engine sizes vary between 1,000cc and 3,000cc. But this categorization doesn’t capture the gear shifts in the UK car industry: First, that cars with the same engine sizes are becoming vastly more valuable thanks to customisation; and second, that a small increase in car exports in one category – like Bentleys – leads to a disproportionate increase in export value.

What this means is that even trade analysis that uses 6-digit HS codes will only faintly capture the up-market shift in UK auto exports.

Analysts beware

This example should cause the OBR deep unease. It is possible – just possible – that a contrary value/volume shift elsewhere in the UK’s exports balances out what is happening in autos. But it is more likely that other sectors replicate the trend. Outside of aircraft wings (thanks to demand for A220/A320 aircraft) UK manufacturing is trending relentlessly towards high-value/low-volume goods, because that is almost always the direction of competitive advantage for UK-based engineering. Triumph Motorbikes is a classic example. Until recently, it steadily reduced output from its Hinkley factory until it only made premium customised models in the UK.

Volume reporting also misses critical trends in export markets. Virtually all the growth in UK auto exports from 2000 to 2019 came from fast-growing demand for premium marques in global markets, especially the US, the Middle East and Asia. These non-EU exports grew at a blistering 8.2% per year from 2000 to 2019.¹⁵ Meanwhile, our EU exports (dominated by mass-market models) scarcely grew at all, with a CAGR of 1.4%, and all – all – growth occurring prior to 2007.

This means volume reporting completely misses the one trade fact that truly matters for the UK auto industry – that growth in our biggest export sector comes from premium vehicles in

11. Volkswagen Aktiengesellschaft 2016 [Link](#)

12. Bentley Media. 2023 [Link](#).

13. The proportion of Bentley production that is exported ranges within a fairly tight band: 85% (2015) to 91% (2023) of sales.

14. Source: Bentley News Media 2016 and 2023. See Appendix for Data.

15. ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1. Released, July 2024. Deflated using ONS IDEF deflators for world exports of SITC7, Machinery and Transport Equipment.

non-EU markets, in particular the US.

The distorted perspective of volume reporting is, in one respect, divisive. The SMMT's monthly bulletins only use volumes. Naturally, journalists rely on these numbers. But the discrepancy between the volumes that the SMMR reports, and the value of the vehicles involved makes for deeply misleading inferences. Consider the following statements, both of which are true:

- In 2024, the EU took 54% of UK passenger vehicle exports.¹⁶
- In 2024, the EU accounted for 35% of the value of UK vehicle exports.¹⁷

In other words, volumetric reporting doesn't just exaggerate the decline in UK auto output, it flips the significance of EU markets. In value terms, the EU now takes little more than 1/3 of exports. Conversely, the US market is far more important than first appears. In volume terms, the US takes 10% of UK passenger vehicle exports; in value terms, it takes 18%.¹⁸ These exports, too, are shifting rapidly towards high-value vehicles, currently worth an average of US\$77,655.¹⁹

The EU's declining share of UK auto exports is an established, 20-year trend.²⁰ It will continue because almost all of the recently announced investment in UK assembly is in premium marques. There is certainly demand for premium British vehicles in EU markets, but demand is far stronger outside the EU. JLR's latest annual report shows that Europe (excluding UK) accounted for 17% of vehicles sales in 2023–24. North America accounted for 22%. This is a typical market share for premium British marques. Meanwhile, the trade data for 2024 showed another downward shift in the EU's share of UK car exports.²¹

The discrepancy between volume and value metrics undermines observations in recent studies. In the automotive section of the Aston Business School paper, the authors state the value of UK auto exports but then flip to volumetric reporting to assert that 78% of UK-manufactured cars “were destined for EU markets”.²² However, in at least two of the four years the authors used to make their calculations²³ the authors' own source data (UN Comtrade), shows that by value, the EU took under 40% of UK vehicles.

Similarly, the ONS should be circumspect in its reliance on volumetric reporting. The variance between volume and value measures in the auto industry alone is 26 ppts after 4 years. This is more than sufficient to sway aggregate data, because auto accounts for 13–14% of UK goods exports. And remember, the shift to high-value/low-volume manufacturing is all but ubiquitous across UK manufacturing. So automotive is but one instance of this trend.

16. SMMT: December 2023 UK Car Manufacturing, January 2025. [Link](#)

17. ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4, February 2025. Line item 29.1 Motor vehicles. Note, this includes commercial vehicles, although commercials comprise 10% of the total. Neither stat includes auto parts.

18. Source: Volume data: SMMT Industry Facts 2024, page 10. Value Data: HS8703. Trade-map, accessed November 2024.

19. UN Comtrade. In 2019, the average value of UK passenger vehicle exports to the US was US\$45,531 (2019 prices).

20. The EU took 70% of UK vehicle exports by value in 2000. This declined to 60% in 2008, and 50% in 2011. The EU share hovered around 40% from 2013 to 2019. In 2024, it reached 35%.

21. By 6 ppts in volume terms; and 4 ppts in value terms.

22. Aston Business School: Brexit unbound. Pp 15. This is, anyway, an impossibly high number. See below.

23. The author is unable to replicate the Aston Business School's figure for 78.3% of UK vehicles headed for EU markets since volume data for 2021 and 2022 are absent in UN Comtrade at time of writing. But the figure is implausible. The SMMT number typically hovers at around 60%, and UN Comtrade data for 2019 suggests 53%.

2. Doppelgängers and counterfactuals

Another way that analysts have tried to assess the impact of Brexit on UK goods exports is to compare the UK's trajectory with other economies, particularly in the G7 grouping. Analysts typically use a 'doppelgänger' technique, comparing what actually happened to UK trade with what would have happened if UK trade mimicked similar economies.

Typical is John Springford's analyses for the Centre of European Reform in 2024. According to his analyses, "Goods exports are 13% lower as a result of Brexit" and UK's goods exports are underperforming both EU-to-EU trade and EU-Rest of World trade.²⁴

In September 2024, Aston Business School asserted a 17% fall in UK exports.²⁵ And it attributes Brexit as the cause, based on a projection, or counterfactual, of what UK exports *would have been* if the UK had not left the EU, using a wide series of 'bilateral pairs'.²⁶

But for a doppelgänger comparison to be valid, one of two propositions must be true:

1. Either the countries involved export roughly the same goods as the UK in roughly equal proportions in comparable markets, or
2. Disruptions to trade – including COVID, supply chain dislocation, and the war in Ukraine – impacted all goods-export sectors equally.

Neither of these propositions is remotely true. And a sectoral analysis of UK trade shows why UK trade was predestined to emerge from the dislocations of 2020–2022 in a worse state than our global peers.

Asymmetric hits to UK exports

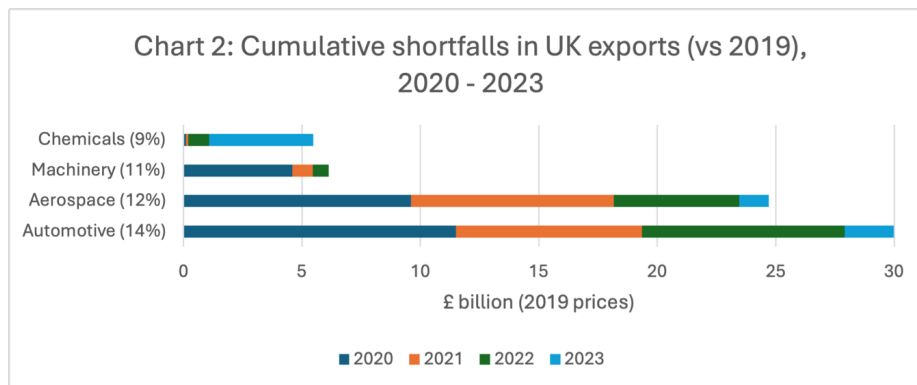
First, global events hit some export industries far harder than others. And the industries that took the biggest global 'hit' during 2020–2023 were our two biggest: aerospace and automotive.

Chart 2 below shows the cumulative impact of recent events on specific UK export sectors. It includes the UK's four biggest export industries – auto, aerospace, machinery and chemicals – which together delivered 46% of UK goods exports in 2019 (excluding precious metals and energy). The charts shows the losses in exports to all markets (EU and non-EU) as compared to 2019, and over four successive years. Included are the percentages each sector contributed to UK goods exports in 2019.

24. John Springford: Brexit Four Years On: Answers to Two Trade Paradoxes. Centre for European Reform. January 2024. [Link](#)

25. Aston Business School. Unbound: Trade post-Brexit. September 2024. Page 4

26. Aston Business School. Unbound: Trade post-Brexit. September 2024. Page 29 to 30



Source: ONS UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2023 Q4, Published February 2024. Deflated using ONS IDEF sectoral deflators according to SITC classification

The discrepancies are obvious. In 2020 alone, exports of UK auto and aerospace equipment fell by around £10 billion each, as compared to 2019. Then they did practically the same the next year. By 2022, the huge shortfalls were stacking up and it was clear that nothing happening anywhere else in UK exports would come close to the cumulative hits taken by these two industries. So extreme was this asymmetry that the shortfalls registered in 2020 in our auto and aerospace exports (around £10 billion in each) exceeded shortfalls for the entire four-year period in machinery and chemicals.

Nor does this picture change if you expand the above chart to include all the sectors where the value of exports fell, such as food, agriculture, apparel, computers and pharmaceuticals (see Chapter 6). None even begin to approach those sustained, £10 billion-per year losses in our auto and aerospace sectors.

In other words, regardless of what impacted UK exports in 2020–2023, the effect on UK exports differed wildly according to sector. The losses the UK suffered were concentrated in our two most valuable export industries: autos and aerospace. And that’s a simple, straightforward observation of huge significance to UK trade that’s been almost universally overlooked.

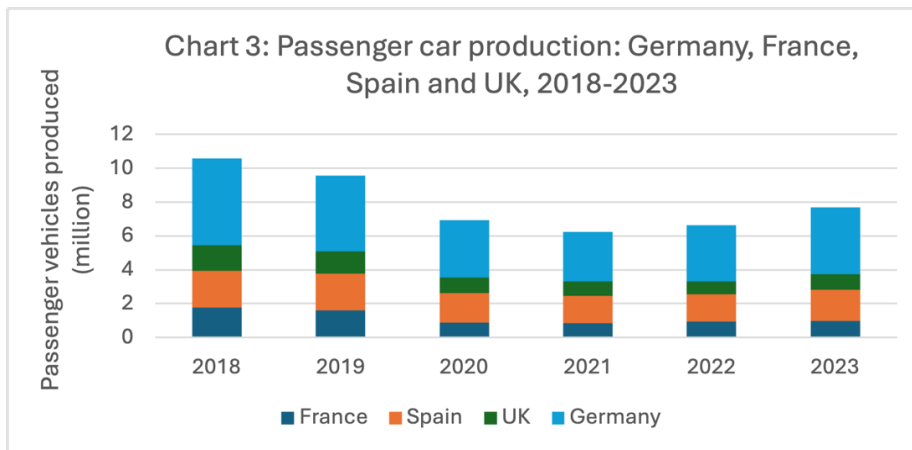
The global picture: autos and aerospace get whacked

So, did cars and aerospace exports suffer a similar fate in other countries – and if so, did they matter as much to them? The answers are ‘yes’; then ‘no’.

First, the European auto industry has had a frightful five years. The decline actually set in during 2018, meaning COVID impacted an industry already in a cyclical downturn. In 2020, the pandemic led to factory closures, followed by supply chain dislocation. Then 2022/23 saw a global shortage of microchips, and production fell or failed to recover because carmakers could not meet demand. As if that weren’t enough, in 2024, EU-wide production suffered from below-forecast demand for electric

vehicles (EVs). That's now leading to swift downgrades in forecasts for auto output across Europe.

This succession of challenges cut passenger-vehicle output across Europe. By 2021, car output among the four biggest West-European producers – France, Spain, UK and Germany – was just 59% of 2018 volumes, as is shown in Chart 3.²⁷ Unnervingly, output among those four countries was still only 73% of 2018 output by the end of 2023.



Source: European Automobile Manufacturers Association (EAAE). *Economic and Market Report, Full Years, 2019, 2020 and 2023*.

Curiously, UK car production almost precisely mirrors German declines from 2017 to 2021. From 2019 to 2021, passenger vehicle output in Germany fell from 4.6 million units to 3.1 million units.²⁸ This represented a fall of 32.6%. Over the same period, the UK's output fell by a near-identical 34%. The German auto industry commenced a rebound a year before our own, but by the end of 2023 German car production was still down 27% on its 2017 peak.²⁹

The UK's performance – at least in volume terms – sits between Germany and France. Output of passenger vehicles in France fell by a shocking 45.8% in 2020. Output has been very slow to recover, with production averaging 58% of 2019 output over the 2021–2023 period, compared to 64.3% for the UK. So, UK auto output has mirrored what happened elsewhere in Europe. It is somewhat worse than the average, but not as dire as in France – at least in volume terms.

Then there is civil aerospace. Our aerospace isn't just our second-biggest export industry, it is probably the second biggest in the world. The US International Trade Administration estimates the UK is home to 17% of the global aerospace industry.³⁰ So, when commercial air travel collapsed in 2020, the UK was hit especially hard. Airlines deferred or cancelled whatever orders they could. Curiously, the downturn in volumetric output preceded COVID. So – just as with auto – the pandemic hit an industry that was already in a cyclical downturn.

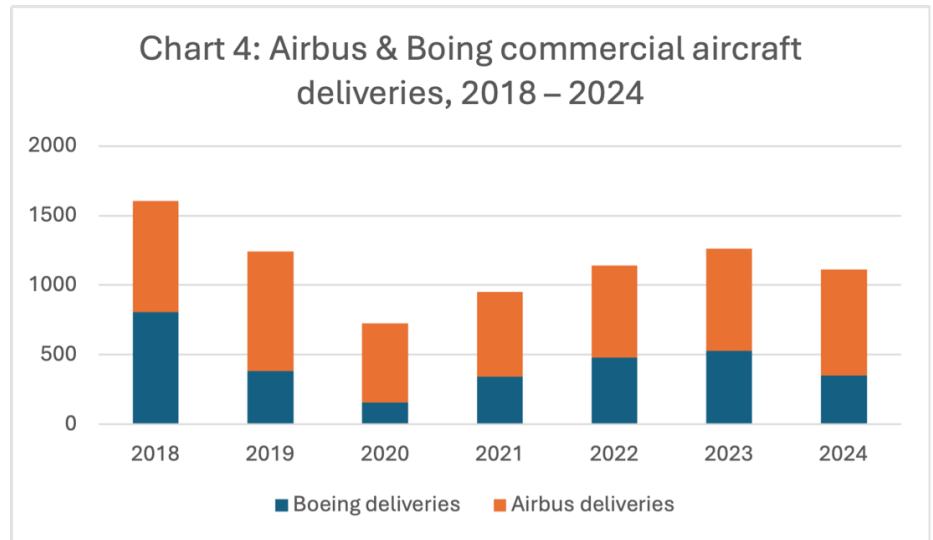
27. European Automobile Manufacturers Association (EAAE). *Economic and Market Report, Full Years, 2019, 2020 and 2023*.

28. The German Association of the Automotive Industry (VDA). *Automobile Production: Annual Figures*. Accessed June 2024. [Link](#). Note, this provides a very slightly different number to the ACEA

29. See Appendix for direct comparisons in output, 2015 to 2023.

30. International Trade Administration. *UK - Country Commercial Guide*. November 2023. [Link](#)

The UK suffered as a supplier to both Airbus and Boeing – and these two companies matter because one way or another they are where the bulk of our civil aerospace exports end up. Currently, Airbus is the more important: UK factories in Bristol, Belfast and North Wales assemble the wings for almost all Airbus aircraft. And Rolls Royce assembles the engines for both of Airbus’ widebody models – the A350 and the A330neo. But the UK is home to literally hundreds of second- and third-tier suppliers to both Airbus and Boeing.



Source: Boeing, Fourth Quarter Delivery Media releases for January 2019 to January 2024. Airbus, Orders and Deliveries, August 2024. Includes Airbus: A220, A320 family, A330, A350; Boeing: 737, 767, 777, 787.

As Chart 4 above shows, both companies have had a ghastly time. Airbus deliveries slumped from 863 aircraft in 2019 to 566 in 2020. Deliveries are recovering steadily but were still 11% below 2019 levels by December 2024. Boeing suffered a near-total collapse from 2018 to 2020, with deliveries nose-diving from 806 to 157. It staged a fair recovery until 2023, but production woes meant 2024 was another dismal year. Ongoing commercial and engineering troubles mean that output is unlikely to reach 2018 levels for many years.

To put this data in perspective, for the entire 2020–2024 period, aircraft deliveries by the Airbus/Boeing duopoly were just 65% of their 2018 peak. And note, the trouble is not yet over. UK aerospace exports will not properly recover until Boeing recovers.

The knock-on effects to the UK have been frightful – including in investment and including to SMEs. From 2020, investment stalled across UK supply chains. To take Rolls Royce as an example: Rolls’ capital expenditure dropped from 5-6 % of revenue in the 2017–2019 period to just 2.8% in 2021.³¹ By mid-2021, Rolls’ spend on its own subcontractors

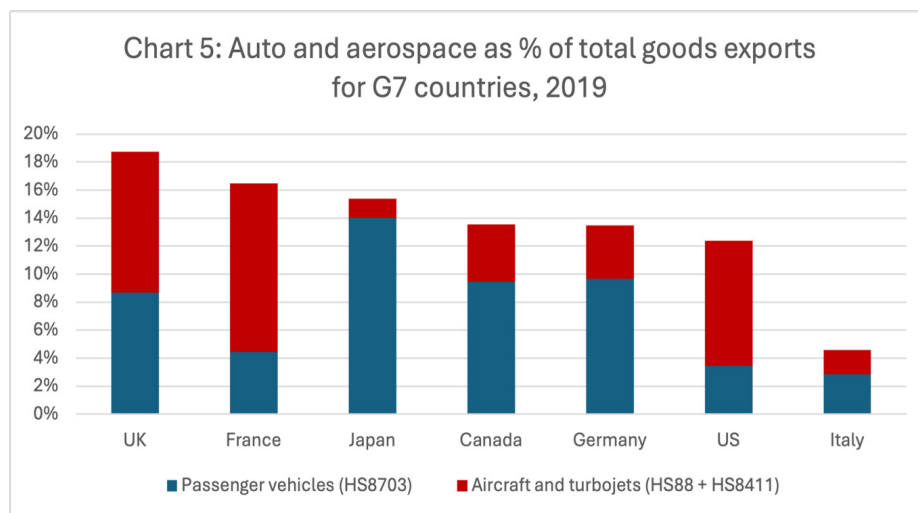
31. Rolls Royce Annual Report 2021, page 16

had plummeted to under 1/3 of its pre-Covid level.³² Thousands of SMEs in the UK aerospace supply chain slowed production. Worse, they stopped investing. The industry consensus was that civil aviation would take the best part a decade to recover, and that view only changed after the Paris Airshow in mid-2023.

Our unique misfortune

The UK's misfortune was unique, however. Autos and aerospace aren't just our two biggest export industries. Combined, they are more important to our exports than they are to other G7 countries. That makes the UK an international standout.

Chart 5 is taken from UN Comtrade data for 2019. It doesn't capture all the goods in the auto and aerospace sectors (which are scattered across scores of HS codes), but it captures most.³³ Combined, HS8703 (passenger vehicles), HS88 (aircraft and parts) and HS8411 (turbojets) made up a larger proportion of UK exports than for any other country in the G7. Outside the G7, no country comes close, except Spain.



Source: UN Comtrade. Precious metals excluded. Accessed February 2023. Note, the HS classification system differs substantially from the SIC system used for the rest of this analysis.³⁴

Proportionately, Germany and Japan have bigger car-export industries, but their aerospace exports are tiny in comparison. France is the UK's nearest equivalent. It has a huge aerospace export industry and like ours it consists mostly of civilian airliners and jet engines (made by Safran³⁵, formerly SNECMA). But French cars are mostly for domestic consumption. From 2019-2023, the value of France's exports of passenger vehicles (HS8703) averaged just 68% of the UK's.³⁶ This means even in 2020, aerospace dominated the 'hits' to French exports,³⁷ while in UK autos and aerospace delivered roughly equal shortfalls in 2020, 2021 and 2022.

Sadly, the UK's misfortune didn't stop there. Through sheer mischance,

32. Rolls Royce Investor Presentation, March 2021: page 13.

33. For example, this data excludes commercial vehicles.

34. Data excludes commercial vehicles and some aerospace goods.

35. Safran has a 50% stake with GE in the CFM joint venture, which makes engines for narrow-body jets.

36. UN Comtrade, accessed December 2024.

37. Banque de France: French Exports in 2020: Chapter 2. Aero-dependence. Page 4. [Link](#)

UK aerospace happens to be most heavily invested in precisely those parts of the global aerospace industry that came off worst in 2020 to 2023.

- **Our civil/military split.** Unlike in the US, our aerospace industry is slanted towards commercial aerospace. Defence aerospace – which survived 2020-23 in far better shape – represents a far smaller proportion of our aerospace industry than in the US.
- **The narrowbody/widebody split.** Unlike for France, UK value-add is concentrated in wide-body (or twin aisle) aircraft, as opposed to smaller narrow-body (single aisle) aircraft. This is mostly due to Rolls-Royce’s withdrawal from the narrow-body sector. An A350-900, Airbus’ lead wide-body, might see UK factories deliver around 40% of the value of the aircraft.³⁸ On an A320, however, UK value-add could easily fall below 20%.³⁹

Table 1: Airbus deliveries relative to 2019, 2020 - 2024

Airbus deliveries	2020 vs 2019	2021 vs 2019	2022 vs 2019	2023 vs 2019	2024 vs 2019
Narrow body (A320 & A220)	-30%	-23%	-18%	-7%	-2%
Widebody (A350 & A330 neo)*	-53%	-55%	-47%	-45%	-49%

Source: Airbus, *Orders and Deliveries, December 2024*. *Includes deliveries of 17 Airbus A380s in 2019 to 2021, when the program terminated.

UK industry’s over-exposure to wide-body jets is hugely important to the UK’s economic downturn and our poor recent, export performance. From 2020 to 2023 the crash in airliner deliveries hit the UK’s most vulnerable spot – widebody jets. And recovery is still slow. By the end of 2024, Airbus deliveries of widebody jets were still down by almost half. Airbus delivered 89 A350s and A330s during 2024, compared to 165 in 2019. Meanwhile narrow-body deliveries were almost back to normal, with 677 deliveries as opposed to 690 in 2019.⁴⁰

Now, back to doppelgängers. The problem is that when trade dislocation becomes asymmetric, the challenge for doppelgänger analyses became acute. Aerospace is an exclusive export industry to be in. Few countries do it. So, the task of replicating the UK’s export profile in order to build a fair counterfactual within the G7 is difficult enough and becomes almost impossible once you step beyond. Virtually no country in Asia, other than Japan, is a significant aerospace exporter. Africa exports nothing, and only Brazil in South America has an industry in which global airlines take an interest. And yet it’s our second-biggest export industry.

The UK’s misfortune extended into other sectors, too. Machinery is the UK’s third-biggest export industry. It survived Covid and supply chains issues exceptionally well – both in the UK (see Chart 2 above: Cumulative shortfalls in UK trade) and around the world. But big though it is, the UK’s

38. The equation breaks down thus. The engines make up around 25% of the value of the aircraft and they are assembled in Derby. The wings account for around 15% of the value of the aircraft. The interior – depending on the fit-out – will generally account for 10% of the value of the aircraft, and UK is a major supplier of seating. Besides these, the main landing gear for the A350-900 is made in Gloucester. UK suppliers are also responsible for cabin windows (GKN), UHF and VHF communications (HR Smith), galley equipment (IPECO) and multiple avionics and electrical systems. In the case of wings, engines and landing gear, a proportion of components are imported, but the core elements (wing spars, fan blades etc) are sourced in UK.

39. The UK is a major supplier of aircraft seating (by value), with UK-based operations skewed towards premium seating. So, long-haul jets with multiple non-economy classes will likely carry a higher proportion of UK-origin interior fit outs as compared to short-haul jets.

40. Airbus, *Orders and Deliveries, December 2024*.

machinery export sector delivered a smaller share of UK goods exports than for any other G7 country except Canada in 2019.⁴¹ So, here, again, the UK lost out.

Self-inflicted export losses

Our export woes have been compounded not just because of what we export, but because of what we don't export. This also hits the viability of counterfactuals.

Energy is the standout, because since 2021 it has proved a stellar export industry – for those who are net exporters. The US, for example, executed its transition from net energy importer to net exporter in 2018/2019. Since then, exports have rocketed in value and volume. The value of oil, gas and other petroleum products boosted US exports by a staggering US\$125 billion in 2022⁴². Total energy exports grew a further 8% in 2023. This surge transformed US trade. In 2022 alone, energy gained a 5ppts share of US exports to deliver a 19% share of US exports.⁴³ This is a phenomenal turnaround.

Canada had an even better ride. Thanks primarily to the Alberta oil sands, crude oil production has jumped since 2010, and Canada is now the world's fourth largest producer and third largest exporter.⁴⁴ The share of hydrocarbon exports in Canada's export mix rocketed from 23% in 2022 to 32% in 2022–23.⁴⁵ For both countries, 2022–23 saw money flooding in thanks to rocketing exports and prices.

Meanwhile, the UK was in the reverse position. Declining North Sea oil production turned the UK into a net energy importer in 2004, but output has plummeted over the past decade. The events of 2022–23 therefore inflicted trade-related mayhem. The UK's deficit in trade in energy⁴⁶ plummeted from an average £5 billion in 2017 to 2019 to £33 billion in 2022, £26 billion in 2023 and £21 billion last year.⁴⁷ Nothing remotely compares with these numbers in terms of negative impacts on UK trade since Brexit.

Pharmaceuticals were a missed opportunity. Despite global leadership in pharmaceutical research, the UK's pharma manufacturing exports are stagnant. They peaked (in real terms) back in 2009.⁴⁸ Since then, production has off-shored to Ireland, Belgium and other parts of the EU. The UK's pharmaceutical malaise is all-too evident in one particular subsector: vaccines manufacturing. For example, by 2020 GSK had consolidated its global vaccine business in Belgium, with facilities at Wavre, Rixensart and Gembou.⁴⁹ Even today, UK institutes are leaders in vaccine research, but the UK is not a major vaccine producer⁵⁰ and struggles to attract investment.

So, when the pandemic hit, the UK was in a poor position to benefit commercially. The Oxford vaccine – adopted by AstraZeneca – was mostly manufactured overseas under a set of global agreements made by the Jenner Institute, initially at 5 sites in 4 countries.⁵¹ These included the Serum Institute of India (the single biggest production site) as well as plants in China and the EU. Generously, AstraZeneca embraced an at-cost pricing model.

41. Calculated as HS 84 plus HS85, minus turbojets (HS 8411). Data for 2019. UN Comtrade, accessed, Feb. 2023.

42. BEA: US International Trade in Goods and Services, December and Annual 2022. Exports (Exhibits 3,6,7) [Link](#)

43. United States International Trade Commission, 2021 and 2022. [Link](#). Accessed on 7 July 2024.

44. Natural Resources Canada. Energy Fact Book, 2022-2023. Page 2.

45. Natural Resources Canada. Energy Fact Book, 2022-2023. Page 12.

46. Defined as crude petroleum, natural gas and electricity.

47. SIC 06 plus SIC 35.1. ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4. Published February 2025.

48. At £28 billion, in 2019 prices.

49. GSK Belgium; At a Glance. [Link](#)

50. See Rt Hon Pat Macfadden, submission from House of Lords Science and Technology Committee, December 2024. [Link](#)

51. The Jenner Institute: The Oxford AstraZeneca Covid 19 vaccine / Large Scale Manufacturing and Industry Partnerships. [Link](#)

Not so Pfizer and Moderna, who concentrated manufacturing in plants in the US and continental Europe, including Switzerland^{52,53} and adopted a commercially hard-headed pricing strategy (US\$30 per shot⁵⁴). The end result was that UK exports benefitted little from global demand for the AstraZeneca vaccine. For example, by Quarter 3 2021 Pfizer had generated US\$13 billion from its BioNTech vaccine; AstraZeneca US\$1 billion from the Oxford vaccine.⁵⁵

The consequences are laid bare in trade data. In Europe, Belgium, Germany and Switzerland did spectacularly well in pharma exports up to 2022, with increases of US\$38 billion, US\$36 billion and US\$15 billion respectively (current prices) as compared to 2019.⁵⁶ US pharma exports jumped US\$29 billion (current prices). Any one of these increases would have transformed the UK's aggregate export data. As it was, the UK's pharma exports flatlined – as they did in France and Netherlands.⁵⁷

Lastly, there's the general issue of the cost of industrial energy.

In 2023, the UK had the highest industrial energy costs of any major economy in Europe, according to official data.⁵⁸ This matters to UK trade for one straightforward reason: manufacturing. Whilst manufacturing delivers only around 9% of UK GDP, it delivers around 85% of UK goods exports in a typical year. Some sectors of UK manufacturing are intensely power-hungry: specifically, chemicals (including fertilizers), steel making, petrochemical refining and food production. A recent report by Civitas based on interviews⁵⁹ identified energy costs as one of the two principal barriers to growth for SME manufacturers in 2023.

Chemicals appears the principal casualty. As Chapter 6 will show, out of all UK export sectors, chemicals now delivers the biggest post-Brexit 'hit' to UK goods exports, with the value of exports down £6.8 billion in 2024, as compared 2019 (in 2019 prices). Losses are spread almost equally between EU and non-EU markets.⁶⁰ The UK's Chemical Industry Association (CIA) puts uncompetitive energy costs alongside weakening demand and high labour costs as the principal challenges.⁶¹

Critically, the CIA reports that UK chemicals production is still 25% below pre-pandemic levels. And that slowdown is why the chemicals sector is now the biggest sectoral 'drag' on UK goods exports.

The above points mean there are virtually no countries on which to build a reliable counterfactual. No G7 country replicates the unique misfortune that befell the UK's most valuable export industries in 2020 to 2023 – not even France. And other countries benefitted far more from demand for energy and pharmaceuticals, for which we can only blame ourselves.

It all comes down to sector

The pertinent fact in comparative trade analyses for 2020 to 2023 is that the UK was uniquely unfortunate in its export mix.

- The export industries hardest hit by COVID and supply chain disruption – auto and aerospace – happened to be our largest.

52. Principally Puurs, Belgium and Kalamazoo, Michigan in the case of Pfizer. Pfizer, Shot of a Lifetime. [Link](#)

53. For Moderna, manufacturing was concentrated in Norwood, Massachusetts with EU vaccines made by Swiss firm Lonza. Moderna opened peripheral sites, including in Europe, as the pandemic progressed.

54. Guardian: From Pfizer to Moderna: who's making billions from Covid-19 vaccines? April 2023. [Link](#)

55. Vaccine (ScienceDirect), How manufacturing won or lost the COVID-19 vaccine race. Michael L King, February 2024. [Link](#)

56. UN Comtrade data (HS30), 2022 versus 2019.

57. Ibid. Current prices, 2022, versus 2019. UK (up US\$0.7 billion), Netherlands (down US\$1.5 billion) and France (up US\$1.9 billion).

58. Gov.UK. International Industrial Energy price. For the UK in 2023, the price inc. taxes was 25.85 pence per kWh. This compared to 17.84 in France, 17.71 in Germany, 19.25 in Belgium. The UK has now overtaken Italy.

59. Civitas: SME Manufacturers, Meeting the costs of affordable energy and a skilled workforce. September 2024.

60. The EU typically takes around 60% of UK exports of chemicals, which is higher than for most sectors.

61. Chemicals Industry Association, UK's chemical industry faces stalling growth against backdrop of rising costs, sluggish demand and Chinese competition. October 2024. [Link](#)

- These two industries delivered a higher proportion of UK exports than they did for other G7 economies, or any advanced economy that a doppelgänger might base itself on.
- The industries that did well out of global events – energy and pharmaceuticals – are in decline in the UK or weren't sufficiently strong for the UK to benefit.
- UK manufacturing companies incur the highest power costs of any major economy in Europe – and this is particularly impacting our 4th-biggest export sector: chemicals.

Put those factors together, and UK goods exports were pre-set to under-perform industrial economies in the EU and the G7 *even if Brexit had never happened*.

On the plus side, the UK can expect something of a rebound, at least in comparative terms. UK aerospace exports should rise quickly as production of Airbus A350s jumps first to 6 per month in 2025 and 12 per month in 2028 to fill a backlog of 707 orders.⁶² However, the dip in Boeing production in 2024, means that a full recovery is probably still several years ahead.

The auto industry's recovery looks shakier, principally because of a downturn in the European EV market. Add in model changeovers and retooling at UK assembly lines during 2024⁶³, and this means exports will remain subdued into 2025. Ominously, car production in the UK in 2024 returned to 2022 levels (780,000 vehicles). However, the big hits in volume terms tended to be lower-value vehicles (Nissan, down 13%; Toyota down 20%) while premium vehicles – apart from Bentley – did well (JLR up 8%). From 2025, export values should rise strongly, so long the US market remains tariff free.⁶⁴

This doesn't help with current analysis, however – especially doppelgänger analyses. Basing counterfactuals for how UK GDP and exports might have behaved based on other countries' performance is a reasonable, theoretical proposition. But to be valid, assessments need to take some account of different countries' export strengths, and how the relevant industries perform globally. And there's the problem. In none of the commentaries by the OBR, the CER or Aston Business School is there a reference to the global misfortunes endured by the UK's most-valuable export industries, or our weakness in those industries that did well during 2020 to 2023. These omissions undermine otherwise thorough statistical analyses.

62. Airbus: Orders and Deliveries, December 2024. [Link](#)

63. SMMT: Automotive still the UK's biggest goods exporter – and can grow further, October 2024. [Link](#)

64. Compared to Europe, the UK auto-export industry should start to pull ahead. At the end of 2024, Germany car exports remained 9% below 2019 levels. At time of publication, it was anticipated that EU-wide production for 2024 would slip 6.5% on 2023 levels.

3. Re-exports in UK trade data

Assumptions are what should keep economists awake at night. To create models and forecasts, economists need to assume that one set of trade numbers is directly comparable to another. But too often, it isn't.

Pick up any sectoral investigation into post-Brexit export declines and three industries leap out: apparel, footwear and food. For example, in September 2024 the Aston Business School created a scatter diagram showing all the sectors where the variety of traded goods has fallen the most since 2019.⁶⁵ Almost all the worst performing culprits come from just two sectors: textile clothing goods (HS50-67) and agrifoods (HS01-24). A similar phenomenon occurs in the equivalent diagram that shows the HS codes where the value of exports has fallen the most.⁶⁶

Catherine McBride has repeatedly pointed out how re-exports impact trade data in these two sectors.⁶⁷ Some are obvious, like tropical fruit and nuts. But what is missing is hard evidence that re-exports were of sufficient value to sway aggregate data. Fortunately, by cross referencing UK export data with factory production data, analysts can reliably quantify the value of re-exports in one major sector – and it's the sector that most matters.

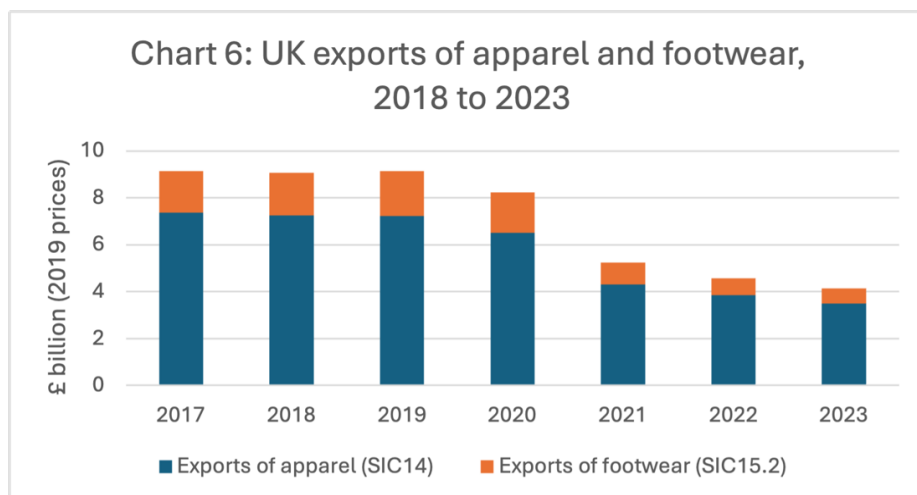
Apparel and footwear

On the face of it, apparel and footwear are a showcase for post-Brexit export decline. The sectors delivered £9.1 billion in UK exports per year up to 2020, before executing a brisk collapse to just £4 billion today, as is shown in Chart 6. And, yes, this is a pure UK–EU phenomenon. Our exports of apparel and footwear to EU markets plunged from £7 billion in 2019 to just £2.2 billion in 2023 (in 2019 prices), while exports to non-EU markets stood stationary. This is a 'bingo' moment in Brexit data analysis. In no other sector is there such a dramatic fall in EU exports, which is unmatched by a fall in exports to countries outside the EU.

65. Aston Business School. Unbound: Trade post-Brexit. September 2024. Page 58.

66. Aston Business School. Unbound: Trade post-Brexit. September 2024. Page 55.

67. McBride: How to recognise misinformation on Brexit. Briefings for Brexit, September 2024.



Source: ONS UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1. Deflated using IDEF deflator, SITC 8 (material manufactures).

But stand back for a moment: why should exports halve? The entire point of the UK-EU Trade and Cooperation Agreement (TCA) was to allow UK goods into the EU tariff free. Can customs processes really be so taxing that half of UK apparel exporters simply packed up? It makes no commercial sense.

When confronted with an abrupt change in trade, analysts should either lengthen the perspective or seek comparative data sets. In this case, perspective illuminates the scene. Lengthen the export time frame for these two sectors and something very interesting emerges.



Source: ONS UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1. Deflated using IDEF deflator for SITC 8.

Chart 7 tracks the real value of UK exports of apparel and footwear back to 2000. It shows that the value of UK exports of apparel and footwear oscillated very slightly from 2000 to 2008. Then, suddenly, exports began to grow very strongly. In value terms, apparel exports grew from £4.1 billion in 2005 (2019 prices) to £7.2 billion in 2019. Exports of footwear grew even faster: from £700 million in 2005 to £1.9 billion in 2019. These growth rates far exceed anything else in UK exports, and certainly in UK-EU trade.

But this seems counter-intuitive given the state of the UK garment industry. True, we have niche clothes makers and tailors, and shoe factories turning out high-quality footwear. But just as for most developed economies, clothes-making in the UK declined drastically in the late 20th century. Fast fashion now comes from overseas. According to ONS data from the Annual Business Survey (ABS) total UK turnover in apparel and footwear manufacturing in 2019 was just £4.1 billion.⁶⁸ This means turnover in UK factories in 2019 was worth just under half of UK export values. That is odd.

As it turns out, ABS data is exceptionally valuable because it categorises goods in exactly the same way as export data (SIC 14 for apparel and 15.1 for footwear) and because it extends back to 2008, when exports rocketed. Unusually for the ABS, this data peters out in 2019, which is a pity. But it shows us precisely what was going on in UK factories during that hectic decade when exports doubled. As it turns out the answer is – absolutely nothing.



Source ONS, Annual Business Survey, 2024. Data for 2022, deflated to 2023 prices. SIC 14 and 15.2 have been added. Deflated using HMG Treasury GDP deflator.

Chart 8 shows that the total turnover in UK manufacturing of apparel and footwear remained static from 2009 to 2019. Turnover and total purchases (or inputs) fell from 2015, while UK value add rose slightly. What this means is that the UK apparel and footwear manufacturing industry basically did not grow during the decade that exports doubled.

68. ONS: Annual Business Survey, 2022. SIC 14 plus SIC 15.2.

Shady trading

The only explanation for the above data is re-exports. Pre-Brexit, the export data from ONS captured a huge volume of clothing and footwear that was being imported into the UK before being re-exported to the EU. But why should exports have suddenly rocketed in the first place? The answer to that lies in quotas and a court case.

Back in 2005, the EU abolished import quotas on clothing from WTO members. At this point the UK became an import hub for the whole of the EU. All was not above board, however. By the late 2010s the EU Commission began to suspect that the UK was being ‘used’ as a soft entry point for Asian apparel and footwear. It suspected companies were under-reporting import values in order to minimise customs and then re-exporting the goods tariff-free from the UK to the rest of the EU.

Inevitably, this nice little earner came to a crashing halt when the UK exited the Customs Union and stopped being a soft entry point into the Single Market. But Brexit did not deter the EU Commission from bringing a case against the UK for permitting the fraud in the first place. In 2022, the European Court of Justice found that the UK was in fact guilty; that the effect had been to ‘flood’ EU markets with cheap clothing⁶⁹; and it promptly fined the UK Government £2.3 billion for non-collection of customs.⁷⁰ If nothing else, this demonstrates that the UK had indeed become a gigantic hub for apparel re-exports.

In 2021 the exports of apparel and footwear returned to what they had been before the UK had got itself into a customs pickle. As for the goods themselves, one of two things have begun to happen:

- Merchandisers now import directly into the EU, bypassing UK customs altogether. This is the commercially obvious thing to do, to avoid two sets of customs.
- The goods are still re-exported from the UK, but since they fail to meet RoO thresholds they incur the relevant tariff (applied, presumably, with more vigour).

The former is the most likely, since total imports of apparel and footwear were down a not-at-all-coincidental £5.9 billion in 2023 as compared to 2019.

In terms of the impact on UK export data, the numbers for 2021, 2022 and 2023 are consistent. Around £4.5 billion of exports (in 2019 prices) have disappeared. But what this actually means is that £4.5 billion of re-exports have departed from UK export data. What’s left in the trade numbers are clothes and shoes that have at least touched the inside of a UK factory.

The impact of re-exports on trade comparisons

It is standard practice to extract specific categories of goods from trade figures because of their power to distort aggregate numbers. That is why most analysts instantly extract precious metals from tallies. Given recent

69. Guardian: UK faces large EU bill over Chinese imports Fraud. March 2022, [Link](#)

70. Guardian: UK pays EU £2.3 billion to settle China import row. [Link](#)

epic flows in natural gas, it makes sense to do the same with energy.

What should have happened since 2021 is that trade analysts should have ploughed through sectoral trade data to alert economists to data sets that involve goods with little or zero UK value-added which would drop out of the tallies, thanks to rules of origin in the TCA. Sadly, that has not happened. And so distorted commentary persists. The Aston Business School paper asserts that clothing and apparel was one of the top 10 UK exports to the EU prior to Brexit⁷¹ based purely on that inflated, pre-2020 data.⁷²

Today, there really is no excuse. Catherine McBride has repeatedly alerted analysts to the dangers of including certain foodstuffs in trade comparisons because so many are re-exports. For example, the worst performing category in the Aston study was HS08 (fruit and nuts) which includes all those tropical fruits and nuts that are not grown in the UK.

Incorporating re-exports in trade data impacts four separate aspects of UK trade reporting:

- 1. Pre/post-Brexit comparisons.** There is now an in-built decline in post-Brexit UK exports, measured in value or volumes. Re-exports should be excluded from before/after comparisons, in the same way as precious metals.
- 2. Comparisons with other countries.** For the same reason UK goods exports are now hard-wired to underperform other countries in all comparative analyses.
- 3. Declines at the ‘extensive’ margin of trade.** Re-exports inevitably made up the only goods in many specific HS codes – think pineapples.⁷³ This helps explain why we’ve stopped exporting a wide variety of goods altogether.
- 4. A double impact on trade intensity.** Trade intensity is calculated by adding exports and imports and expressing the sum as a fraction of GDP. Re-exports increase trade intensity because they add value to imports (on the way in) and exports (on the way out) while only adding slightly to UK value added on the way through.

The last point is probably the most pertinent, given that trade intensity is a favoured trade metric for the OBR.⁷⁴ For example, it was the trade metric that the chief economic adviser to the OBR, David Miles, used during Budget 2024 announcements, when the OBR re-iterated a projected 15% drop in trade intensity owing to Brexit.⁷⁵

The issue with trade intensity and re-exports should be readily apparent. Currently, pre-Brexit trade intensity numbers contain a double dose of apparel and footwear, none of which stayed or was made in the UK – approximately £9–10 billion-worth according to this analysis. That’s a big number to back out of the trade intensity equation.

But this is just one sector. The issue of how re-exports are accounted for applies equally to trade in agricultural produce, foodstuffs, sports goods, probably jewellery and possibly pharmaceuticals. This in turn means that

71. Aston Business School, *Brexit Unbound*, pp 17

72. The headline data showed it delivering 3.1% of UK exports to the EU pre-Brexit. But manufacturing data shows – predictably – that it delivers just 0.5% of UK manufacturing, in terms of turnover, value add and employment.

73. This number is probably quite high, since low-value manufacturing in apparel, footwear and sports goods has all but disappeared from the UK. It therefore makes sense that many HS two-digit codes included only re-exports prior to Brexit.

74. OBR *Economic and Fiscal Outlook*. March 2024. Page 38

75. Guardian: OBR says Budget unlikely to lift economic growth over the next five years. October, 2024. [Link](#)

the OBR's trade intensity should either be heavily recalibrated or heavily qualified as a principal metric for UK trade performance.

4. Britain's pre-Brexit failure in EU markets

There is one error that pervades almost all Brexit-related trade commentary: the assumption that before exiting the EU, the UK had a track record of positive trade outcomes with the EU, or at least a track record that resembled other economies. The problem is, we didn't. This affects the validity of almost all attempts to compare UK trade with other countries. And it highlights the most fundamental – and least talked about – phenomenon in all UK trade.

According to two decades of trade data, UK goods exports to the EU before Brexit underperformed virtually every major economy that wasn't a member of the EU – and by a very wide margin. What's more, our exports also underperformed intra-EU trade among other members.

This means that even if doppelgängers account for the UK's industrial strengths and asymmetric global shocks, there is still an 'X' factor. For reasons that remain unexplored, UK goods exports to the EU before 2020 underperformed peer economies by around 2.5 to 3.0 ppts per year.

Only the doppelgänger authors know if their models accommodate this pre-existing deficiency. But if they do, the authors haven't mentioned it; and if they do not their observations are old news. What's arguably worse is that analyses are then attributing to Brexit what is in fact a pre-existing condition.

Sick trade

First, a quick history lesson. UK goods exports to the EU fared badly in the decades prior to 2019 on every conceivable measure. A 2020 study by Michael Burrage and the current author covering the years 1999 to 2018 found that:

- **Export growth to the EU ground to a crawl in the 20 years before Brexit.** Our long-term goods export growth rate to the EU 14 from 1999 was just 0.6% p.a.⁷⁶
- **UK goods exports to the EU underperformed EU GDP growth.** During that period, UK goods exports to the EU 14 came in at 0.8 ppts slower than EU 14 GDP growth.⁷⁷
- **UK exports to WTO partners rose on a par with GDP.** Goods exports to our top 14 WTO partners grew 3.4% p.a., which was marginally faster than those partners' GDP growth.⁷⁸

76. Burrage and Radford: EU versus WTO: an assessment of the relative merits of the UK's trade relationships, 1999 to 2018. Civitas, June 2020. Page 5

77. Ibid, page 5

78. Ibid, page 7

So, there was something bizarrely weak about our goods export trade with the EU before Brexit occurred.

But the killer point was exposed by Michael Burrage back in 2017, in his analysis for Civitas – *It's Quite OK to Walk Away*. This study compiled a ranking of the rates at which 22 countries had grown their goods exports into EU markets between 1993 and 2015. He discovered that the UK's performance in terms of goods exports to the EU undershot virtually everyone else's – despite all the advantages of the Single Market and our membership of the Customs Union.⁷⁹

In no particular order, the UK's goods exports to the EU underperformed our principal WTO trade partners, bilateral trade agreement partners, and other EU members themselves. Out of the 22 countries listed, only Japan saw exports to the EU grow more slowly than the UK.

This should have delivered a jolt to every trade commentator at the time. And it should be front of mind today as those global comparisons roll in.

What the Burrage analysis showed is that even before 2016, the EU was not delivering the benefits to UK exports it was supposed to. Our exports to the EU stagnated, despite our membership; others' exports soared, despite their non-membership. But the most important point is now more relevant than ever: that factors other than regulatory alignment and tariff-free access appear to have a preponderant impact on UK trade in goods with the EU.

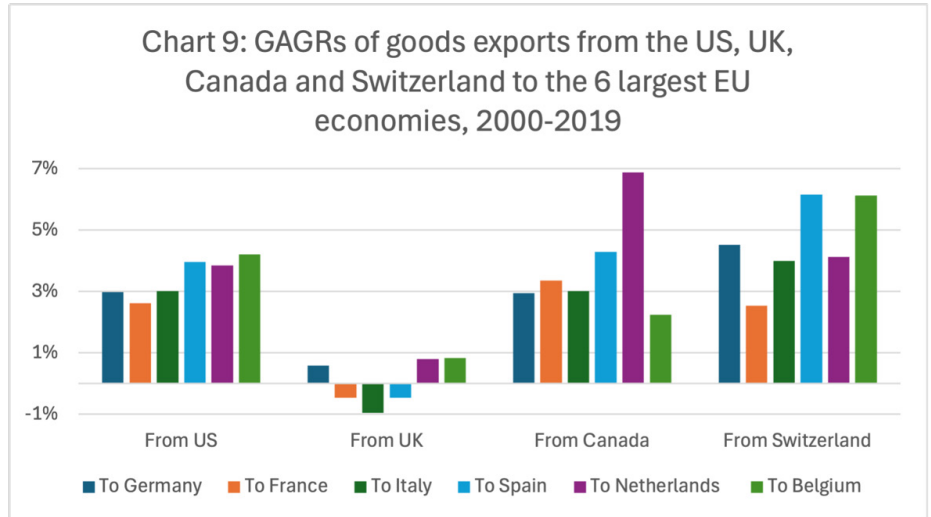
Bottom of the class: 2000 to 2019

Analysts' understanding of trade has come a long way since Burrage published his seminal work. Specifically, analysts are attuned to the Rotterdam and Antwerp effects (where trade data is distorted by re-exports through those ports). Also, including the UK in EU data when calculating third-party growth rates skews the comparisons.

One way to bring the analysis up to date is to restrict the analysis to exports into the principal EU economies. So, for the purpose of this paper, the author has calculated the CAGRs of goods exports to the EU's six largest economies – Germany, France, Italy, Spain, Netherlands and Belgium – from the UK and 13 non-EU countries for the period 2000 to 2019. The reporting countries are either the EU's largest trade partners, or its closest, or developed economies, or all three.

The three most directly comparable to the UK (in terms of proximity and export mix) are the US, Canada and Switzerland. Chart 9 shows that against these, the UK's underperformance in EU markets is stark.

79. Burrage: *It's Quite OK to Walk Away*. Civitas, 2017. Page 26.

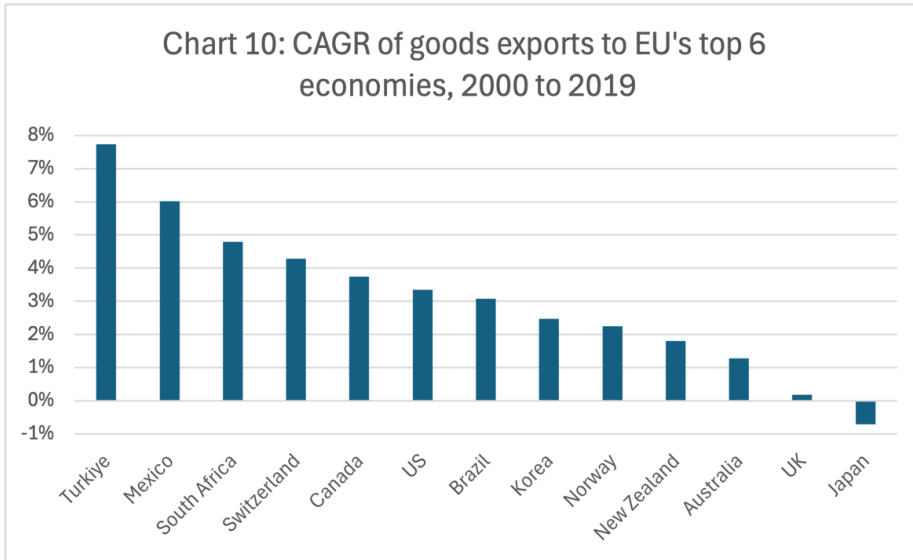


Source: UN Comtrade accessed October 2024. Minus HS 71, which includes precious metals. Deflated using Bank of St Louis export deflators for US goods and services exports.

This is shocking data. While the US, Canada and Switzerland all managed to grow exports to the ‘Big 6’ EU economies from 2000 to 2019 by more than 3 % p.a., the UK did not. We eked out a 0.6% p.a. growth rate to Germany – which is hopeless. As for France, Italy and Spain, our exports actually fell in real terms. Our aggregate growth rates for the top 6 economies only just strays into positive territory (0.3% p.a.) when including Netherlands and Belgium (which captures the Rotterdam/ Antwerp effect).

Comparison with the US is the most painful. We export a broadly similar array of products to the EU as the US does: aerospace/defence goods, vehicles, construction equipment, machinery and pharmaceuticals. Back in 2000, US exports to those six top EU economies were worth 25% less than UK exports. But by 2019, US exports were worth 49% more. And this happened while the US traded with the EU on WTO terms.

The scale of the UK’s comparative underperformance is clear when comparing the UK to a broad array of non-EU trade partners. This is shown in Chart 10 below. China is excluded from this chart, since its growth rate (11.8% p.a.) deranges the scale. But the result replicates Burrage’s original analysis for the years 1993 to 2015. The only major country to come out worse than the UK was, again, Japan.



Source: UN Comtrade accessed October 2024, minus HS 71 (which includes precious metals). Deflated using Bank of St Louis export deflators for US goods and services exports. Data for Germany, France, Italy, Spain, Netherlands and Belgium.

These results are inexplicable according to orthodox assumptions. All other major exporters except Japan performed better than the UK, even though they enjoyed none of the benefits of EU membership. Even Australia and New Zealand managed to increase their goods exports to the EU despite being as far from Europe as it is possible to be and attempting to sell agrifoods into the EU's high tariff agrifood markets. Meanwhile, UK goods exports to the EU's six largest economies grew by just 0.3% p.a. during that two-decade, pre-Brexit period.

As paradoxes go, this one is epic. And it begs the obvious question: why did UK goods exports to the EU underperform other countries' so drastically in the decades before Brexit?

This is a huge and under-investigated topic. One explanation might be that non-EU countries benefited from a lowering of EU tariffs and a removal of NTBs during the first two decades of the century, as part of the global liberalisation of trade. This meant that non-EU countries experienced an improvement in their competitiveness in EU markets during the decades preceding Brexit, whereas Britain's remained static. According to estimates, the average CET fell from an average of just over 3% in 1999 to 2001 to under 2% in 2018 to 2020.⁸⁰ Although this is a slight reduction, it might help explain the paradox.

Unfortunately, the data indicates that if this was a factor, it was a very minor one. Switzerland serves as a benchmark. Although a non-EU country, Switzerland did not experience an improvement in its tariff-related competitiveness in EU markets during this period. It already enjoyed tariff-free, quota-free trade in industrial goods with the EU, thanks to its 1972 FTA⁸¹. Switzerland also has a series of bilateral agreements that provide for mutual recognition⁸². And yet, as the chart above shows, its goods exports

80. Macrotrends: European Union Tariff Rates 1988-2025. Accessed January 2025. [Link](#)

81. Agriculture was added in 2002.

82. EU: Switzerland. EU trade relations with Switzerland. Facts, figures and latest developments. Accessed January 2025. [Link](#)

to the principal EU economies outpaced (by 1 ppt) export growth from the US and Canada. So, whatever benefit EU liberalisation delivered, it was insufficient to push US and Canadian growth above Swiss ones.

Another way to assess if non-EU countries gained a comparative benefit from external liberalisations is by comparing their export growth to intra-EU trade. The same pattern emerges, however. In Michael Burrage's original 2017 analysis, he analysed intra-EU goods exports among the 12 founder nationals of the Single Market.⁸³ This showed that from 1993 to 2015, goods exports from the EU 11 (which excludes the UK) to fellow EU members grew in real terms by 70%. The US clocked up 68% growth; Canada 54%. Those figures are all fairly similar. In other words, external countries grew their exports to the EU at a similar rate to members themselves. But the UK's intra-EU export growth was just 25%, which is fractionally more than 1% p.a.

The same picture emerges in bilateral trade within the EU, which was similarly immune to the effects of external liberalisation. As shown above, the growth rate of UK goods exports to Germany from 2000 to 2019 was just 0.6% p.a. But during this period, France increased its goods exports to Germany by 2.3% p.a.; Italy by 2.4%; Spain by 4.1%. UK goods exports to France actually fell, (by 0.5% p.a.). But Germany's exports to France grew by 2.7% p.a.; Italy's by 2.5% p.a.; Spain's by 3.5% p.a. And so it goes on. Whichever way the data is cut, that differential keeps emerging.

What went wrong?

This paper cannot provide a rigorous answer to the question of why UK exports to the EU performed so poorly in the decades before Brexit. But the sectoral approach used in this paper offers clues.

Comparisons of sectoral growth rates from 2000 reveal no clear link between the export sectors that had most to gain from EU membership (via tariff protection and Single Market rules) and those sectors' actual export performance in EU markets. A short, exploratory chapter is included in this paper at Appendix A, but the chief observations can be summarised as follows.

- **The Single Market's benefits were ill-matched to the UK's export profile.** UK export sectors that had the most to gain from the Single Market and the Customs Union were either small (food, agriculture), in decline (chemicals) or subject to unequal subsidies (automotive).
- **The Single Market did not deliver comparative benefits to our best export industries.** Highly competitive UK sectors – notably aerospace, machinery and beverages – gained little or nothing from the UK's membership, partly because tariffs were low.
- **The UK's single biggest export industry in 2000 – computers and electronics – has collapsed.** In 2000, this sector delivered almost one-quarter of UK goods exports: 24%. Now it is 9%. Sadly UK (and EU) manufacturing proved uncompetitive.

83. Burrage: It's Quite OK to Walk Away. Civitas, 2017. Pp 26.

- **The UK has lost competitive advantage in pharmaceuticals.** With a 9%-plus growth rate from 2000 to 2009, pharma could have been our star export performer. However, countries such as Ireland engineered a far more favourable investment environment.

A chronic and unaddressed issue

The core problem today, however, is how historical performance affects current analysis. Doppelgänger studies rely on counterfactuals built via comparisons with other major economies. But the UK's trade history reveals, unambiguously, that the UK drastically underperformed almost all major economies in terms of goods exports to the EU *before we left*, by very roughly 2.5 – 3.0 ppts p.a.

The silence on this key trend raises nagging doubts. In none of the recent papers – Springford's or the Aston Business UK School's – is there any acknowledgement of this pre-existing deficiency. This raises a fundamental problem. If the models don't factor-in the UK's chronic, in-built underperformance, then the analyses are re-discovering something that – in part or in whole – already existed.

The OBR's silence on this topic also deserves special mention. The trade section in its March 2024 outlook dwells – at some length – on the UK's under-performance in EU trade. Multiple charts ram home the point. But again, the authors do not acknowledge that this comparative underperformance was a clear, observable trait in UK trade prior to 2019. This in turn undermines assessments of the degree to which Brexit is responsible for the UK's current trade performance.

5. Goods sold as services

One of the key features of UK trade is the strength of services exports. This is often contrasted with the weakness of our goods exports. For example, the OBR observes that UK services exports have outpaced the G7 average since 2019,⁸⁴ noting that two-thirds of this growth belongs to a broad category: ‘other business services’ (which includes management consultancy, research and development, and advertising).

The size and strength of UK services exports are a source of academic curiosity. In May 2024, Emily Fry of the Resolution Foundation noted the contrast between the UK’s global rankings, with the UK slipping to 13th place as a goods exporter, while our rocketing services exports retain the No.2 slot for the UK.⁸⁵ In 2023, UK services exports were worth 19% more than goods exports – and that makes the UK an international oddity.⁸⁶

One observation helps to explain these phenomena: some of our most advanced goods exports are now sold as services.

Rolls Royce: Our services supremo

The standout example is Rolls Royce Plc. Around half of Rolls-Royce’s revenue in a normal year comes from civil aerospace. The jet engines it makes for airlines accounted for £7.3 billion of revenue in 2023 out of total revenue of £15.4 billion.⁸⁷ These are big numbers for UK trade. They are what makes Rolls-Royce one of the UK’s most-valuable engineering exporters.⁸⁸

But today, the bulk of Rolls Royce revenue from civil aerospace comes not from selling jet engines (‘Original Equipment’, in Rolls’ parlance), but from Long Term Service Agreements (LTSAs). In simple terms Rolls sells its engines at a discount, and airlines agree to pay Rolls fees for the time the engines actually spend in the air plus maintenance.

The key point is that these LTSAs now *dominate* Rolls’ revenue. In 2023, they accounted for 63% of Rolls’ revenue in civil aerospace.⁸⁹ And what this means is that almost two-thirds of the export revenue that Rolls earns in airliner jet engines accrues in national accounts as service exports – not goods – even though Rolls is a manufacturing exporter. This has had the effect of artificially depressing goods exports data in favour of services exports.

Nemesis: 2020-2022

The impact of this accounting shift can be seen in our services export data. When the pandemic hit, airlines didn’t just stop buying aircraft, they parked them. This was catastrophic for Rolls’s services income because

84. OBR: Economic and Fiscal Outlook, March 2024. Page 39.

85. Resolution Foundation: Emily Fry, Britain needs to acknowledge rather than deny its weaknesses in goods trade, and leverage its strength in services, May 2024. [Link](#)

86. The numbers were £394.8 bn (goods) versus £469.8 bn. ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1 and UK trade in services: service type by partner country, non-seasonally adjusted Q4 2023

87. Rolls Royce Annual Report, 2023. Pages 2 and 3.

88. Along with JLR and BAE Systems and Airbus. Around half of Rolls’ workforce is based overseas.

89. Rolls Royce Investor Presentation, March 2024. Page 23. This was up from 54% in 2012.

LTSA payments are tied to actual flying hours: ‘Large Engine Flying Hours’ (LEFHs), in Rolls’ terms. This meant Rolls’ revenue plummeted.

Table 2: Rolls Royce flying hours and revenue alongside ‘engineering services’ and ‘maintenance and repair’ exports, 2019 - 2023

Rolls Royce	2019	2020	2021	2022	2023
RR: Large Engine Flying Hours (LEFH) vs 2019	100%	43%	58% ⁹⁰	65%	88%
RR: Revenue Civil Aerospace (£bn, 2019 prices)	8.1	4.8	4.3	5.1	6.2
Exports: Engineering services (£bn, 2019 prices)*	7.4	6.4	5.4	5.5	8.4
Exports: Maintenance and repair (£bn, 2019 prices)**	3.6	2.7	3.0	3.1	3.4

*Source: Rolls Royce Annual Reports, 2019 to 2023; ONS UK trade in services: service type by partner country, non-seasonally adjusted Q4 2023. Deflated using 1) UK GDP deflator for RR revenue, 2) ONS IDEF Services deflator. * Engineering Services’ (EBOP 10.3.1.2); ** ‘maintenance and repair’ (EBOP 2).*

The dive in Rolls’ revenue is set out above in Table 2, along with flying hours as a percentage of flying hours in 2019. Included are two line-items from UK services accounts: ‘Engineering Services’ and ‘Maintenance and repair’. These are the two principal categories under which revenue from Rolls’ LTSA is logged in national accounts, according to advice from ONS.⁹¹ Values are adjusted to 2019 prices.

The table shows the explicit link between Rolls Royce revenue from flying hours and services exports, though note that transactions may be logged in adjacent years and some maintenance operations are executed by offshore entities⁹². In short, the table shows:

- 1. Rolls Royce’s engine flying hours crashed to 43% of 2019 hours in the first year of the pandemic.** 2021 was almost equally bad, and in 2022, engine hours were still less than two-thirds of 2019 values. In 2023, they had still not fully recovered.
- 2. The impact on Rolls’ revenue from civil aerospace was almost equally dramatic.** Revenue plunged from £8.1 billion in 2019 to just £4.8 billion in 2020. It declined further in 2021 (likely due to falling engine deliveries⁹³) but surged back in 2023.
- 3. This dive and recovery in revenues finds its way into UK services accounts in at least two places:** engineering services, and maintenance and repair.⁹⁴ Exports fell by £1.9 billion in 2020,

91. ONS has advised the author that export revenue from Rolls Royce service agreements will likely accrue in these two accounts.

92. These include HAECO in Hong Kong, SIA Engineering in Singapore (where Rolls also assembles turbofans), and Mubadala in the UAE.

93. Rolls Royce Annual Report, page 26 “Original Equipment deliveries were low across the industry, with reduced build rates as aircraft deliveries were rescheduled.”

94. These line items have been identified on advice from ONS.

90. LEFHs for 2021 is absent from RR published material, but it can be calculated from changes in LEFHs reported in 2022. RR Annual Report, February 2022.

£2.6 billion in 2021 and £2.3 billion in 2022. They then bounced back last year.

British engineering is a services star

What this means is that analysts need to consider several factors when interpreting UK trade data. Firstly, a chunk of our most advanced engineering exports has quietly shifted onto our services exports account. On its own, Rolls does not constitute a colossal shift. But at around £5 billion-worth of exports, the number is not small either. It is more than the UK's entire exports of agricultural goods, for example.⁹⁵

The Rolls data also means our goods exports are not as weak as the headline figures suggest. Those who worry that services exports don't deliver quite the same value-add as goods exports would be more relaxed if they realised that around £5 billion of UK services exports comprise some of the most complex engineering executed in British factories. The goods are just sold in a different way.

Rolls' sales strategy cannot explain the recent, rapid recovery in services exports. In real terms (and using a GDP deflator) Rolls' income from civil aerospace is still £1.9 billion down on 2019 values. This means Rolls is still a major drag on services exports.

But the principle is what matters. The two line-items in the table above (engineering services, and maintenance and repair services) combined delivered a hefty £14.5 billion of services exports in 2023, in current prices. This is a big number: if it were a goods category, it would be our eighth-biggest export sector. If Rolls' business model has evolved to sell its engines mostly as a service, then it is likely other engineers are doing the same. And the result of that is that UK goods exports are likely to be substantially bigger than headline data suggests.

As for identity, the most likely candidates are machinery exporters. Most UK machinery exports are either engaged in power generation equipment, pumps and valves, or construction and mining equipment. And the one key fact that's important about this sector is how well it survived the pandemic – in all countries. In the UK, exports only substantially dipped in 2020, and were already ahead of 2019 values by 2024 – at least in EU markets.

Engineering lifts services exports

And so back to the services growth rates. In the ONS data, 'Engineering services' (10.3.1.2 in ONS' services categorisation) is the larger of the two line-items where Rolls' exports accrue, and exports were worth £10.4 billion in 2023. In real terms exports have risen by 13% since 2019. And this is where trade analysts can begin to join statistical dots.

In its analysis, OBR observes that: "two-thirds of the growth in services trade volumes since 2019 has been driven by the 'other business services' sector."⁹⁶ This is precisely the sector to which engineering services belongs. And at 13% growth since 2019, it is dead on-track with the overall growth of services

95. Agriculture exports were worth £3.8 billion in 2023, according to ONS.

96. OBR: Economic and Fiscal Outlook, March 2024. Page 39.

exports. In other words, engineering services are part the exceptional services growth that's been identified by OBR (in its March Outlook) and by John Springford.

Is the scale of Engineering Services sufficient to impact the results? At £10.4 billion, engineering services exports are nowhere near as valuable as business and management consultancy exports, which form part of the same category. But they are worth significantly more than our legal services exports, at £7.1 billion (10.2.1.1) and our accounting services exports, at £4.6 billion⁹⁷(10.2.1.2). They are also significantly more skewed to non-EU markets (80%).

Lastly, there's the question of the various forms in which UK engineering expertise is exported. For example, until 2023, Triumph Motorbikes had steadily reduced the proportion of its bikes that were made in the UK, whilst concentrating production in Thailand.⁹⁸ Yet the high-value engineering activities remain in the UK. This means Triumph is an exporter of engineering skills of which only a fraction appears in UK goods-export data. Similarly, the UK's Formula 1 teams contain some of the most advanced auto engineering skills in the UK. But the consultancy work they undertake accrues as a services export.

This means there is a growing slice of indirect UK engineering exports that fail to appear in goods export data, but which find their way into multiple subsectors of services exports. For the moment, this is a grossly under-researched aspect of UK trade.

Brace for take-off

This analysis can only explain a part of the health of UK services exports, but it is an important insight for the future. This is because engineering services exports are set to grow very quickly.

The reason is the coming boom in aviation. Rolls-Royce has forecast an annual increase of 7–9% in aircraft powered by its turbofans through the remainder of the decade.⁹⁹ The company is expanding capacity at its Derby engine factory by 40% to cope. The increased capacity will come online in 2025. This industrial expansion is a huge gain for UK exports of advanced engineering. And yet most of the export revenue will only gradually find its way – after about one year's delay – onto our services exports account, and then payments will extend over decades.

This observation is critical to the interpretation of trade data over the next few years. Exports of 'other business services' will now grow very rapidly, and they are already growing fast. This will further accelerate the UK's services exports growth and its divergence from goods exports. And note, the recent spurt in services has already propelled the UK up a startling three places in global rankings since 2021 to become the world's 4th biggest exporter, according to UNCTAD.¹⁰⁰

Reliance on services exports is a source of worry to many, who fear that services exports aren't quite as solid or sustainable as goods exports. But as it turns out, a growing chunk of these services exports consist of imaginatively sold engineering. And as a sub-sector, it is about to do

97. ONS: UK trade in services: service type by partner country, non-seasonally adjusted Q4 2023.

98. Triumph decided to re-commence production of mainstream models at Hinkley in March 2022 (Tiger 900, Speed Triple and Rocket III). This was in response to soaring demand from European markets. British Motorcyclists Federation, Triumph to make many more bikes in the UK. March, 2022. [Link](#)

99. Rolls Royce: Rolls-Royce announces investment in large engine assembly, test and shop visit capacity. March 2024, [Link](#)

100. Chartered Institute of Export and International Trade, April 2024. [Link](#)

spectacularly well. By 2028, one of the UK's fastest-growing sources of services exports will be Trent XWB engines hanging off the wings of Airbus A350s.

6. Paradoxes explained

The analytical flaws identified in this paper help explain several paradoxes in UK trade data. The most important is why – until now – UK goods exports to EU markets have performed no worse than exports to non-EU markets since 2019.¹⁰¹ This has flummoxed a fair few commentators who are looking to trade data to confirm pre-held theoretical positions.

In his paper, ‘Brexit four years on: answers to two trade paradoxes.’¹⁰² John Springford specifically addresses the point. He observes that ‘Goods exports to the EU have tracked those to the rest of the world, despite new trade barriers being imposed on the former but not the latter.’ As the latest trade data for 2024 has just shown, this unexpected trait persists to this day.

Springford’s answer to this paradox is that UK goods exports to the EU would have outpaced those to the rest of the world if the UK had remained a member of the EU – and that the UK missed out on a ‘boom’ in intra-EU trade. Catherine McBride noted the paradox in her IEA paper¹⁰³ but in his social media rebuttal in November 2023, Professor Portes remarked McBride was saying ‘nothing new’ on the topic.

UK shortfalls in exports: the big picture

A straightforward way to approach this paradox is to chart export shortfalls since 2021, sector by sector, and see which occurred in EU markets and which in non-EU markets. This is a water-tight approach. Whatever has impacted UK exports since 2019 must be logged in one sector or another. So, the distribution of losses must be captured somewhere in a comprehensive sectoral analysis that divides exports as between EU and non-EU markets.

Charts 11 to 14 depict sectoral shortfalls in UK goods exports for four successive years: 2021, 2022, 2023 and 2024 with all values compared to exports in 2019. Energy is excluded because it would show gigantic fluctuations in exports (mostly re-exports) to the EU that delivered almost zero value added to the UK. Shortfalls in red depict shortfalls in exports to non-EU markets; shortfalls in blue, EU markets. The sectors are arranged in order of overall impact, so the sectors that incurred the biggest ‘hit’ to exports are at the bottom.

Values are deflated by sector. The deflators were supplied on request by the ONS for the purpose of accounting for price rises in specific export sectors. They are delineated by top-level SITC sector, rather than the SIC classifications used by this paper, so some sectors (say machinery and transport equipment) are deflated using the same series. However, these sectoral deflators enable analysts to isolate the recent and rapid price

101.ONS: UK trade: June 2024. Figure 1: Imports from and exports to both EU and non-EU countries increased in June 2024. [Link](#)

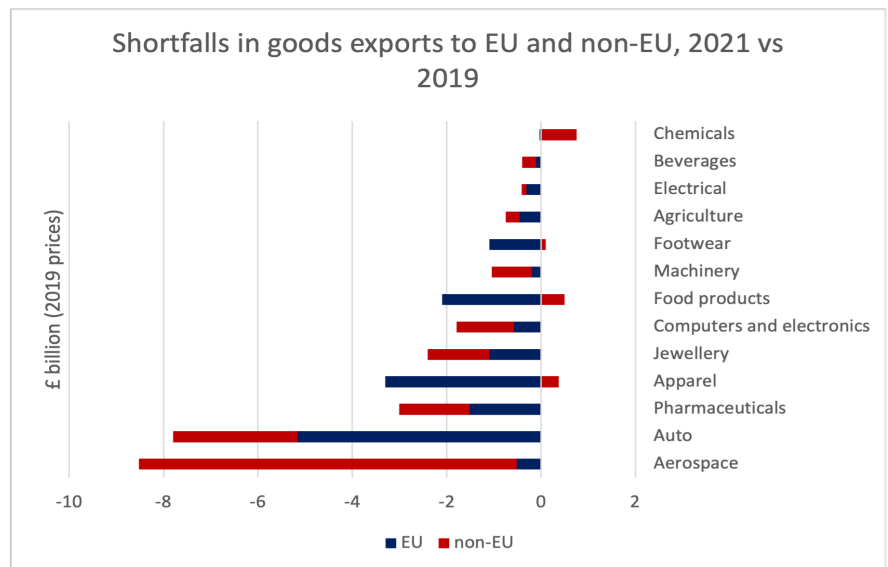
102.Springford, Brexit four years on: answers to two trade paradoxes. [Link](#)

103.McBride, Has Brexit Really Harmed UK Trade. IEA, November 2023. [Link](#)

rises experienced by the energy and food sectors from the more subdued inflation that impacted other sectors.

The charts have a slight bias towards under-reporting export shortfalls to non-EU markets. As pointed out, exports to EU markets were almost flat pre-Brexit. Thus, the assumption that exports would not have grown anyway post 2020 is a reasonable one. However, exports to global markets did grow, and in some cases (automotive) very quickly. This chart takes no account of this trend growth foregone. And so, it slightly understates the ‘hits’ in those global markets.

The first thing to note is that the charts change dramatically between 2021 and 2023. That says something important in itself. It means that the sectors dragging down UK export performance have changed over time. And that implies that whatever is hurting UK trade is not monocausal.



Source: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4. Published February 2025. Deflated using differential ONS IDEF export market deflators for EU and non-EU markets. Energy is excluded.

First, the impacts for 2021. In total – as Springford observes – export shortfalls are evenly balanced as between EU and non-EU markets. But the distribution between sectors varies spectacularly.

- **Auto and aerospace dominate export shortfalls in 2021.** The combined impact was £16.3 billion (2019 prices), or 53% of the total. So, half the negative impact on UK exports in 2021 was concentrated in just two industries, which were subjected to emphatic global downturns.
- **In autos, the negative impact divided two-thirds/one-third in favour of EU.** This is significant. This implies that EU exports did

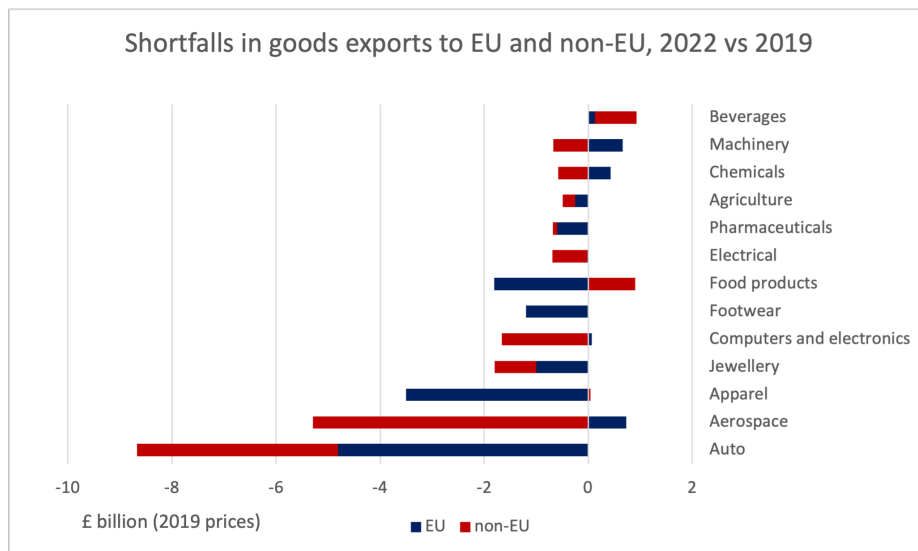
suffer disproportionately to non-EU exports in 2021.

- **However, a big shortfall in auto exports to the EU were balanced by a huge shortfall in aerospace exports to non-EU countries.** This is mostly because the UK's aerospace exports are already two-thirds 'global'¹⁰⁴, but also because military exports (which did well) skew towards EU.
- **Shortfalls in pharmaceuticals, computers and jewellery were evenly matched** as between EU and non-EU markets. However, exports of pharma and computers /electronics are stagnating or declining. So balanced shortfalls were predictable.
- **EU-dominating shortfalls occurred in apparel, footwear, food products and agriculture.** All four categories include re-exports, although the food and agriculture sectors also figure prominently as UK sectors worst hit by Brexit.
- **In machinery the largest shortfall is in exports to non-EU markets.** This is slightly more than could be expected, given non-EU markets account for 57% of exports.
- **The fall in jewellery exports was partly attributable to a one-off jump in 2019.** Exports in 2019 shot up by around £800 million from the average for 2015 to 2018.

In summary, the reasons exports to EU and non-EU markets suffered equally in 2021 was because losses in exports of apparel, footwear, food and agriculture to the EU were balanced by a collapse in aerospace exports to global markets. In almost all other sectors, losses were spread roughly evenly between EU and non-EU markets, and the two largest 'balanced shortfall' sectors were sectors with a declining share of UK exports.

104. An average 67% of the UK's aerospace exports went to non-EU markets from 2015 to 2019.

...and for 2022



Source: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4. Published February 2025. Deflated using differential ONS IDEF export market deflators for EU and non-EU markets. Energy is excluded.

The results for 2022 differed subtly. Autos and aerospace still account for more than half of the total shortfalls: £13.2 billion out of £23.3 of shortfalls across our 13 biggest sectors. This time, however, auto takes the lead, thanks to a surge in exports of aerospace exports to the EU. In summary:

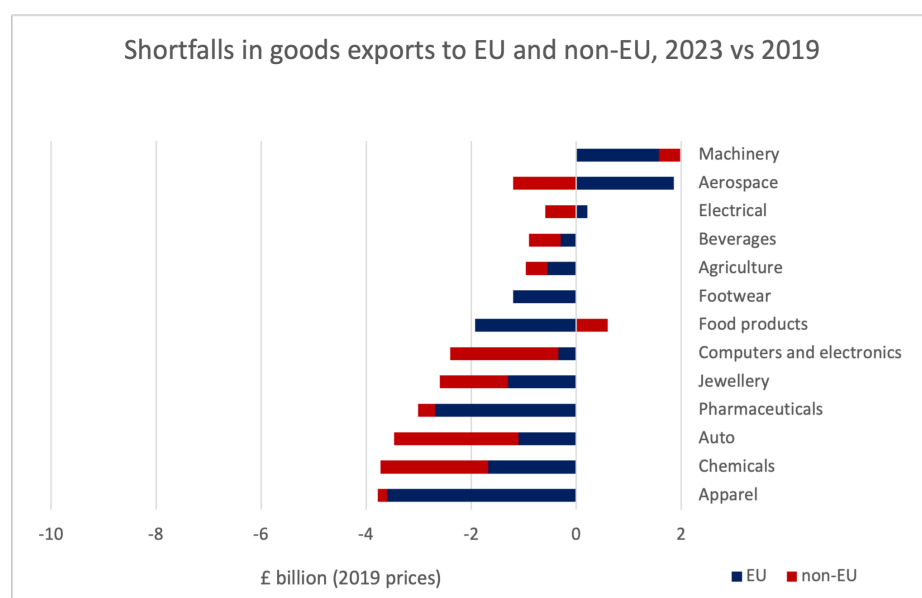
- **In 2022, losses between EU and non-EU markets in autos are more evenly balanced.** Shortfalls are still skewed towards EU markets, although the EU only takes around two-fifths of exports. This could imply a slight Brexit impact.
- **The single worst ‘hit’ is still aerospace exports to global markets (-£5.3 billion).** This reflects cancellations or delivery deferrals among global airlines.
- **Apparel is now the second worst-hit export sector, with exports to the EU down £3.5 billion.** This is due to the elimination of re-exports from trade data (see Chapter 3)
- **The three worst-hit export sectors for EU markets are apparel, food products and footwear in that order.** What’s more, in these sectors losses *only* occur in EU markets. This strongly implies a Brexit-related impact – although these are also the three sectors where re-exports are most prevalent (see Chapter 3).

It is possible that Brexit was a factor in the shortfall in exports of motor

vehicles, since EU markets took a bigger hit than non-EU markets, despite being worth less. But 2022 was also the year supply chain dislocation plagued the European auto industry – specifically the supply of microchips. In response, auto makers everywhere prioritised premium vehicles. In the UK’s case this automatically preferred production for global markets, to the detriment of EU markets.

As for the rest, losses in exports in apparel, food products and footwear are standout EU casualties, but are balanced by the continuing, huge hit to UK aerospace exports to global markets. Half of the impacted sectors saw losses equally balanced as between EU and non-EU sectors. Again, the two most prominent of these (pharma, computers and electronics) are export industries that are in comparative export decline.

...and for 2023



Source: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4. Published February 2025.

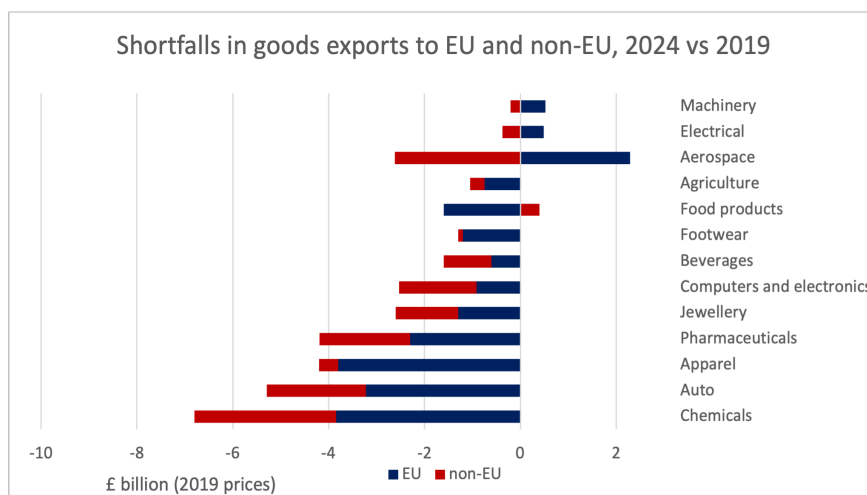
Deflated using differential ONS IDEF export market deflators for EU and non-EU markets. Energy is excluded.

By 2023, the picture looks radically different. Exports of motor vehicles and aerospace have begun to recover: aerospace especially. Boeing increased deliveries by 48 aircraft; Airbus by 74. Across all sectors, losses again balance out as between EU and non-EU markets.

- **In 2023, the chemicals sector delivered the biggest shortfall in UK exports**, with losses spread evenly between EU and non-EU markets. This was predictable given the well-documented difficulties of UK’s chemicals industry. (see Chapter 2.)

- **The three big EU ‘losers’ are now firmly established as apparel, food and footwear,** and shortfalls more or less match the preceding years. However, in 2023, exports of pharmaceuticals to the EU fell by £2.7 billion. This may be the start of a fresh Brexit impact, but the sector has been struggling for over a decade in EU and non-EU markets.
- **Shortfalls in half the export sectors – including agriculture – are evenly matched as between EU and non-EU markets.** They are the same subsectors as 2022. This implies, if it does not prove, that the root cause of shortfalls in multiple sectors is not Brexit.
- **Shortfalls in auto exports are now weighted towards non-EU markets.** This implies that if Brexit was a cause of lower auto exports in 2021 and 2022, that impact has now dissipated. However, it is also true that the restricted supply of microchips abated.

... and 2024



Source: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4. Published February 2025. Deflated using differential ONS IDEF export market deflators for EU and non-EU markets. Energy is excluded.

As for the 2024 data, there is almost no change in the profile of shortfalls, which again balance each other out. Chemicals now deliver the biggest sectoral ‘hit’ to UK exports, but auto exports also dropped steeply in 2024, thanks to retooling at UK assembly lines and poor market conditions in the EU. According to the SMMT, car exports were down 15.5% in terms of units.¹⁰⁵ Thanks to that persistent upward shift in per-unit value (plus exports of vans) the value decline in auto exports was lower, at 9%.

105.SMMT: Manufacturing Data. December 2024. Accessed February 2025. [Link](#)

- **Exports of chemicals continue to decline.** Shortfalls are slightly skewed towards EU markets, which take 62% of exports (up from 57% in 2019). Exports of petrochemicals alone dropped by more than £4 billion compared to 2023. This reflects continued falling UK oil production during 2024.¹⁰⁶
- **Exports of autos deteriorated sharply, with losses skewed towards EU.** The chief culprit is Nissan, whose output dropped by 13% in 2024. Around 70% of Sunderland’s output is exported; mostly to the EU. Sunderland’s output mimicked Nissan plants in the US and China.¹⁰⁷
- **Pharmaceuticals exports have also slipped, though this time in non-EU markets.** This implies that offshoring is impacting the UK’s non-EU markets. Until now, most of the impact of offshoring in UK pharma manufacturing has been apparent in UK-EU trade.
- **The big hits in UK-EU exports are apparel, food products, footwear and agriculture.** Exports of apparel to the EU fell slightly in 2024; food exports to the EU rose. Exports of footwear and agriculture remained approximately the same.
- **Renewed turbulence for global aerospace exports.** Exports to non-EU markets lurched downwards, again. This deterioration reflects reduced aircraft deliveries from Boeing, where output slipped from 528 airliners in 2023 to 348 in 2024.¹⁰⁸

The data for autos is concerning, but also inevitable given re-tooling and re-investment at UK assembly lines and the decline in EV adoption in EU markets. But the data for 2024 also shows the pivot to high-end autos in action. Our exports of mass-market models were hit hardest, while production and exports of premium vehicles performed comparatively well.¹⁰⁹

Lastly, in February 2025, the ONS made one critical adjustment to historical trade data. This will impact the conclusions of multiple studies of UK-EU trade conducted in 2023 and 2024.

What’s happened is that ONS has discovered just over £10 billion-worth of natural gas exports to the EU in 2022 that were missing in previous editions of the trade data.¹¹⁰ This is a very sizeable adjustment. Alone, it adds just over 5% to the total for UK goods exports to the EU for 2022. Curiously, ONS did not adjust import data for natural gas in 2022, which means this is not just £10 billion-worth of re-exports, which would have delivered little value-added to UK exports.

Causation: a sectoral calculation

The charts above provide a detailed, data-driven explanation for why exports to non-EU countries have performed equally as poorly as exports to the EU since Brexit.

1. **Autos and aerospace caused most of the damage.** The dominant impacts on UK exports in 2021 and 2022 were global downturns

106. UK Department for Energy Security and Net Zero, Energy Trends, July to September 2024. Pp. 6.

107. Nissan production volumes fell 13% in the US and 15% in China. Nissan production and sales exports, December 2024. [Link](#)

108. The Boeing Company: Boeing announces fourth quarter deliveries. January 2025. [Link](#)

109. JLR reported record Q3 revenues in January 2024, with Y-o-Y revenues flat. JLR Media Centre, January 2025. [Link](#) Rolls Royce Motor Cars also report record sales in 2024.

110. In the trade data published on February 2025, the ONS reports UK exports of natural gas to the EU of £18.2 billion during 2022. In its data published in July 2024, the figure was £7.4 billion for 2022.

in the autos and aerospace industries. This hit both EU and non-EU exports. Auto exports to the EU have slightly underperformed exports to global markets, thanks to multiple non-Brexit related factors. Aerospace exports to non-EU countries have dramatically underperformed.

2. **The big losers from Brexit are small export sectors.** The sectors where exports to EU have been disproportionately hit are apparel, agriculture, food and footwear. But re-exports account for the shortfalls in apparel and footwear, as well as some exports of food and agriculture. And in any case, these four sectors delivered just 7.7% of UK goods exports in 2019 (minus precious metals). By comparison, auto alone delivers 13–14%.
3. **Growing aerospace exports to the EU balance losses elsewhere.** Aerospace exports to the EU are now £2.3 billion higher than in 2019 (in 2019 prices) thanks to a ramp up in parts supplies to Airbus. Meanwhile exports to non-EU markets are £2.6 billion lower, partly owing to lower aircraft deliveries at Boeing. (Aerospace exports specifically to the US were still down 27% in 2023.¹¹¹) This divergence helps balance Brexit-related losses elsewhere.
4. **Declining industries generate balanced shortfalls.** In most other sectors, losses are approximately balanced as between EU and non-EU sectors. The most prominent are industries that are either stagnant or in decline anyway, such as chemicals, pharmaceuticals and electronics.

Springford asserted that the reason why exports to EU and non-EU markets have performed equally poorly since Brexit is because the UK missed out on a mini-boom in intra-EU trade. This assertion may be correct, but it relies on conjecture. And it is worth noting that if accurate, it would have required UK's exports to the EU to buck a 25-year trend and suddenly grow faster than our exports to non-EU markets.

The above analysis offers a more straightforward explanation.

UK goods exports to EU countries are no worse than to non-EU countries since Brexit because multiple, negative impacts across major sectors ultimately balance each other out. Brexit-related losses in food, apparel, footwear and agriculture are balanced by a pivot to EU markets in aerospace. As for the rest, shortfalls mostly result from industrial decline – in particular in chemicals, pharmaceuticals and electronics. These impact all markets, fairly equally.

111. UK exports of HS88 to the US were worth US\$3.1 billion in 2019, and US\$2.2 billion in 2023 (2019 prices). UN Comtrade, Accessed February 2025.

7. The OBR and the modelled impacts of Brexit on UK GDP

This analysis is highly relevant to the OBR. This is because the OBR's assessment of UK trade feeds directly its assessment of Brexit's impact on GDP, and the OBR's forecasts for GDP is a building block of public policy. The problem is this: the flaws in trade analysis identified in this paper appear to undermine the way that the OBR tracks UK trade performance. And if that's true, then the OBR's forecast for long-term GDP will be unduly negative.

Trade volumes and slow growth

During 2024, the OBR set out its analysis of the impact of Brexit on UK trade in its March edition of the Economic and Fiscal Outlook.¹¹² In this publication, the OBR forecasts changes in UK trade in terms of volumes. These appeared to be well below trend.

- In March, the ONS predicted export volumes will grow by just 0.3% p.a. from 2024 to 2028 and import volumes by 1.0% p.a.¹¹³
- In October, the ONS increased its forecast for exports, from 0.3% to 0.5% p.a. for the period 2025 to 2029, this followed an upgrade from 0.2% in November 2023.

The first difficulty is the reliance on volumetric measures. As shown in Chapter 1, volumes are an inherently unsafe metric for exports in an economy where producers are moving towards high-value/low-volume goods. In our most valuable export industry – automotive goods – a switch from value-based analysis to volumetric analysis delivers a divergence in export performance of 26 pts in just a five-year period.

The second difficulty is the values themselves. Current estimates appear strangely low by historical standards as measured in value – and ultimately, values in trade are the only metric that matters.

- A projected 0.5% growth rate for exports is far below the average for UK goods exports for 2000-2019, which was 1.6%.¹¹⁴
- Meanwhile, the balance of UK goods exports is shifting relentlessly towards faster-growing non-EU markets, and these markets now account for more than 50% of exports.

So where do these export forecast numbers come from? The OBR says

112.OBR. Economic and Fiscal Outlook, March 2024.

113.OBR. Economic and Fiscal Outlook, March 2024, page 37.

114.Excluding precious metals. ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1. Deflated using the whole world goods export deflator, precious metals excluded.

its forecasts are “usually derived mechanically from our forecasts for imports growth in each global region.”¹¹⁵ This is a combination of demand growth in export markets, and UK market share.

The issue here is responsiveness. As chapter 6 shows, almost half of the negative impact on UK exports from 2021 to 2023 was attributable to external shocks in just two UK export sectors: autos and aerospace. In the case of autos this had nothing to do with falls in demand from export markets but constraints on production. In fact, premium UK car producers ended up with giant backlogs of orders. JLR’s order book reached an astonishing 200,000 vehicles in April 2023,¹¹⁶ which was about six months-worth of production.

In aerospace, demand has rocketed since mid-2023. As of late 2024, Airbus has an order book for 717 A350 airliners¹¹⁷, which contain a higher proportion of UK value add of any major aircraft since Concorde. Sadly, the UK auto recovery will likely remain in low gear until well into 2025.¹¹⁸ Remember, however: our exports of automotive goods into non-EU markets grew by 8.2% per year from 2000 to 2019¹¹⁹, and these global markets now account for around 61% of total exports.

So, the issue is this: the OBR now forecasts that the long-term growth rate of UK exports will be one-third of what it was pre-2020. This is despite the fact that the principal factors that led to export contraction in 2020-2023 were global in origin and will unwind at some point. In aerospace and premium autos, the challenge is demand growth that UK industry is struggling to meet.

Next step: trade intensity

The OBR bundles lower growth in exports and imports into its preferred metric for trade performance: trade intensity. “Weak growth in imports and exports over the medium term partly reflect the continuing impact of Brexit, which we expect to reduce the overall trade intensity of the UK economy by 15 per cent in the long term.”¹²⁰

But trade intensity is where the interpretive challenge becomes acute. The metric itself is straightforward: exports plus imports as a percentage of GDP. Interpreting changes in trade intensity is not so straightforward, however. This is because changes can be triggered by multiple factors, and only some of them are indicative of lower economic activity.

- **Re-exports artificially inflate the trade intensity metric**, since they add to import and export tallies, without necessarily delivering much value-add to the UK economy.
- **When re-exports drop out of trade data, they cause a drop in the trade intensity metric**, without necessarily reflecting any meaningful change in UK economic activity.

To reflect a change in UK economic activity, the trade intensity metric would need to exclude the import and export tallies for re-exported goods in multiple sectors, not just the apparel and footwear sectors analysed here (estimated at £9-10 billion). These other sectors include, food products,

115.OBR: World Economy and Drivers of UK Exports. Accessed December 2024. [Link](#)

116.JLR: JLR sales rise in fourth quarter. April 2023. [Link](#)

117.Airbus: Orders and Deliveries, October 2024. [Link](#).

118.At time of writing, output in the UK auto industry was in decline; partly owing to re-tooling for transition to EVs at multiple plants. However, demand for premium vehicles is either static or rising.

119.ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1. Released, July 2024. Deflated using ONS IDEF deflators for world exports of SITC7, Machinery and Transport Equipment.

120.OBR. Economic and Fiscal Outlook, March 2024. Page 37.

agriculture goods (nuts, tropical fruits etc), jewellery, sports goods and pharmaceuticals.

So far, the OBR assesses that UK trade intensity has diverged by 3.4 ppts from our G7 peers.¹²¹ But our trade intensity was bound to lag others', simply because of re-exports and the unfortunate fact that global shocks hit our two biggest export industries.

The impact of trade on GDP

The trade intensity metric also matters because it is how the OBR makes the methodological transition from lower trade to lower economic growth:

“We assume that the resulting reduction in the trade intensity of GDP will lead to a 4 per cent reduction in the potential productivity of the UK economy (relative to remaining in the EU), with the full effect felt after 15 years.”¹²²

The OBR has supplied the author with a fuller explanation of this linkage: “A decline in trade intensity plausibly lowers productivity because trade, among other channels, fosters competition and allows countries to specialise in activities where they are relatively more efficient.”

The methodology behind this linkage appears to depend on OBR assessments of a range of models back in October 2018¹²³, when it published a discussion paper on the topic.¹²⁴ As recently pointed out by Julian Jessop¹²⁵ (and Catherine McBride in her paper) the 4% number is the work of external economists and many of the studies involved data from a period when the final format of Brexit was still unknown. Some of the models estimated an impact of less than 4% and could not include the potential benefits of liberalised trade with countries outside the EU.

Nevertheless, the critical linkage between trade intensity and productivity breaks down if lower trade intensity is the result of lower re-exports (as described in Chapter 3) or temporary factors (as described in Chapter 2).

- **By definition, re-exports cannot impact UK specialisation or productivity:** the goods arrive in UK ports; they depart from UK ports. Trade intensity is lower, but it cannot impact UK productivity, because re-exports aren't going to change anyone's commercial behaviour in the domestic economy.
- **Almost half the falls in the period 2020–2022 were in autos and aerospace, and the root cause of that was global shocks.** Imports in those industries also fell dramatically (in autos, by more than £10 billion). So that, too, contributed to lower trade intensity. This drop was not symptomatic of import substitution – which would impact specialisation – but of global industries in temporary disarray.

In short, a part – or perhaps most – of the lower trade intensity the UK is currently experiencing, is happening in a way that will not translate into lower productivity. The link between lower trade intensity and lower

121.OBR. Economic and Fiscal Outlook, March 2024. Page 38.

122.OBR. Economic and Fiscal Outlook, March 2024. Page 38.

123.OBR: Brexit and the OBR's forecasts, October 2018. Page 44, 2.71.

124.OBR: Brexit and the OBR's forecasts, October 2018.

125.Daily Telegraphy: No, Brexit is not costing Britain £100bn a year. Jessop, December, 2024, [Link](#).

productivity is therefore broken. And so, while OBR might look at its trade intensity reading and surmise its productivity forecasts are on track, what it is actually getting is a sort of ‘false positive’ reading, that doesn’t mean quite what it thinks it means.

OBR and doppelgängers

Lastly, there is the issue of how the OBR verifies that its current trade analysis matches its own, long-term forecasts.

Back in 2018, the OBR suggested that it would use doppelgänger models to measure the degree to which the UK’s trade outcomes matched its long-term forecast of a 15% reduction in trade intensity. This is exactly what OBR has done, though it appears to rely on external studies for validation. It asserts that: “our assumptions about the impact of Brexit appear to be broadly on track and recently published studies are also broadly consistent with these estimates.”¹²⁶ In 2024, the OBR cited three:

- **Springford, J.**, *Brexit, four years on: answers to two trade paradoxes*, January 2024.
- **NIESR**, *Revisiting the effect of Brexit*, November 2023
- **Goldman Sachs, UK**: *The structural and cyclical costs of Brexit*, February 2024¹²⁷

So, how do those external publications stand up to issues raised in this paper?

Both the Springford paper and the Goldman Sachs study relied on doppelgänger models. The former had calculated a 4–5% hit to UK GDP to date in a preceding paper, and the Goldman Sachs study estimated an impact on GDP of 5%. As already noted, however, both studies risk over-estimating the Brexit impact if the doppelgängers fail to take account of two specific factors: first, the UK’s over-exposure to global downturns in our two biggest export industries since 2020; and second, the UK’s comparative export underperformance in EU markets prior to 2020.

The NIESR paper is more conservative. It projects a 5–6% hit to UK GDP by 2035. It modelled several factors: declines in trade with the EU, a reduction in productivity, and a permanent reduction in willingness to invest in the United Kingdom. ‘Willingness to invest’ is the weak spot. This paper shows what happened to our two biggest export industries – autos and aerospace – from 2020 to 2022 in terms of output. But the impact on investment was far, far worse.

- **Automotive:** The UK suffered an understandable investment holiday in auto manufacturing from 2016 until Parliament agreed the TCA with the EU. Then in 2020, the pandemic hit production, and supply chain dislocation extended into 2022. When investment in the UK auto sector resumed in 2023 – which is when the big marques committed to assembling specific models in the UK – it arrived like a gigantic adrenalin shot. In 2023 alone,

126.OBR: Economic and Fiscal Outlook, March 2024. Page 40.

127.Curiously, the Goldman Sachs paper appears to no longer be available online.

auto investment in the UK hit £23.7 billion.¹²⁸ This sum exceeded investment during the previous seven years combined, according to the SMMT.

- **Aerospace:** Investment in the UK aerospace supply chain virtually froze from mid-2020 for three years, as airlines parked aircraft. Forecasts predicted traffic would not return to 2019 levels until the end of the decade; a view that only changed after the Paris Airshow (mid-2023). Since then, aircraft orders have rocketed (see above). This has triggered a surge in re-investment as the UK aerospace industry tries to expand to meet Airbus' vertiginous ramp-up in production.¹²⁹

A paper published in November 2023 cannot hope to have captured the scale of this investment rebound. In essence, the NIESR approach is flawed because two of the UK's three-biggest manufacturing industries¹³⁰ have just experienced a wild gyration in their investment cycles, and it will take time to appreciate the new steady-state in both.

Time to redo the sums

The OBR always knew it would be hard to track the impact of Brexit-related trade barriers on GDP. Back in 2018, it projected that doppelgänger analyses might help. But to its credit, the OBR added a prescient qualification: "this will probably become less reliable over time as the growth in the countries used to produce the synthetic UK are more likely to diverge from the UK for reasons other than Brexit."¹³¹

This paper sets out some of those divergences. Specifically, it shows how UK export performance was bound to diverge from peer economies, thanks to the UK's unique export profile (the prominence of autos and aerospace), re-exports (apparel, footwear and food) and industries that are in decline in the UK but thriving globally – in particular energy and pharmaceuticals.

This paper should also help the OBR refine its methodology. Volumes are not a safe basis for calculating trade because of a rapid shift into high-value/low-volume manufacturing. Meanwhile, the disappearance of re-exports had reduced volumes in some trade categories, predictably, to nil. And temporary falls in UK auto and aerospace production hit imports as well as exports, since components for both are imported.

The key point is trade intensity. This metric was pre-set to fall, but in a way that will not automatically impact productivity or specialisation. This means the presumed direct link between lower trade intensity and lower GDP is broken. This observation doesn't make the OBR's job any easier, but it should help the OBR to refine its methodology. It should also help the OBR avoid the dangers of confirmation bias.

128.SMMT: UK Auto makes one million vehicles and welcomes £23.7 billion investment boost. January 2024, [Link](#)

129.Airbus aims to increase monthly production of the A350 from 3-4 per month in 2024, to 12 in 2028.

130.Food products is UK's biggest manufacturing industry, but it is a small export sector: typically, 5% of the total.

131.OBR: Brexit and the OBR's forecasts, October 2018. Page 43, 2.70

Conclusion

This paper analyses five ways that UK trade analysis is deficient, or misinterprets the data. But are these flaws sufficient to explain all or part of Brexit's supposed impact on UK goods exports?

The answer is a qualified 'yes'. Four of the flaws identified in this paper (Chapters 1 to 4) will directly impact assessments of lower UK exports to the EU. Added together they appear sufficient to account for most of the reported 15% hit to UK exports for since Brexit.

- 1. Value versus volume.** The UK's auto industry is our biggest exporter, delivering 13% of exports in 2019. The difference between a volume and a value-based assessment of export performance from 2019 to 2023 is 26 ppts. So, this discrepancy on its own has the heft to shift an aggregate volumetric assessment of UK export performance by around 3-4 ppts.
- 2. Autos and aerospace.** These two sectors dominated export shortfalls in 2020, 2021 and 2022. The combined 'hit' to global exports in 2021 delivered a 5.4% fall in UK goods exports as compared to 2019, and a 3.9% fall in 2022. As Chapter 2 shows, the causes were global, with Brexit exerting at best a minor and transient effect on auto exports.
- 3. Re-exports.** At their peak in 2017, exports of apparel and footwear hit £9.2 billion, or 2.7% of all UK goods exports. With re-exports out of the customs tallies, exports fell to just £5 billion in 2022 and 2023, or 1.3% of UK goods exports. So, the disappearance of clothing re-exports *alone* appears to account for a 1.3 ppts fall in UK goods exports.
- 4. Pre-Brexit underperformance.** Even before the UK left the EU, our goods exports to EU markets underperformed exports from countries such as the US, Switzerland and Canada by 2.5 to 3 ppts per year. So, if the UK had stayed in the EU, our exports would likely have underperformed other, similar countries by 7– 9 ppts after just three years.
- 5. Goods sold as services.** Rolls Royce turbofans are sold at a discount, whilst most revenue is generated via service agreements. This means export value mostly accrues on the UK services account. Currently this impacts a small proportion of UK exports, worth up to £5 billion or the equivalent of 1.4% of goods exports. But this will start to climb quickly as Rolls ramps up production of XWB engines for the Airbus A350.

Cumulatively, these flaws or insights are more than sufficient to impact aggregate assessments of UK trade. The above points are just instances, however. The issue with values/volumes extends across UK manufacturing. And re-exports are – or were – common in multiple UK sectors, not just apparel.¹³²

What should trigger academic concern are the omissions in recent papers. Of the publications quoted here, none point out the sharp, global downturns in our two biggest export industries. None cite pre-Brexit declines in specific industries. None comment on the shift in UK exports to high value/low volume goods. To be fair, the Aston Business School *does* acknowledge that some textile goods could be re-exports,¹³³ but it goes on to include them in its calculations anyway.

In some cases, errors undermine analysis. The Aston Business School claims the auto sector delivered £94 billion in exports in 2022,¹³⁴ which is a miscalculation.¹³⁵ Similarly, the paper's claim that 78% of UK-assembled vehicles go to EU markets¹³⁶ is erroneous, whatever metric is used.^{137,138}

Counterfactuals and common sense

As for doppelgänger analyses, the core problem is how the counterfactuals are constructed. If they do not factor-in the UK's in-built, pre-Brexit export underperformance in EU markets – of around 2.5 to 3 ppts p.a., – then they are not news. All they do is employ a complex formulae to rediscover something that Michael Burrage observed and reported on back in 2017.

But there is a deeper irony at play. It was precisely because of the UK's chronic export underperformance in EU markets that Michael Burrage and some of his colleagues urged the UK Government to think carefully before negotiating a continuity trade agreement with the EU. The worry then, as now, was that existing pathologies in UK–EU trade would be transmitted straight into post-Brexit trade, with the same predictable consequences: slow growth and huge deficits. This is not the fault of UK negotiators. They achieved precisely what the UK Government asked – and Parliament demanded. It just means the outcome is more familiar than commentators realise.

Below is a summary of the data presented in Chapter 6 that identifies the principal sectors where the UK currently incurs shortfalls in exports to the EU, as compared to export values in 2019. As is clear from table below, the sectors involved are either heavily weighted with re-exports or belong to industries that are in decline. This means shortfalls appear in non-EU trade as well.

132. The chart created by Aston Business School to highlight the UK's worst export shortfalls by 2-digit HS codes (Page 55) is, inadvertently, an excellent guide to goods not made in the UK. Predictably, the scatter diagram is dominated by textiles and food.

133. Aston Business School. *Brexit Unbound*. Page 17

134. Aston Business School: *Brexit Unbound*, page 15

135. Most likely, the authors have added imports to exports. ONS data for 2022 for vehicles (29.1), would give a total of £76 billion. Exports for the auto industry alone were £38.6 billion in that year.

136. Aston Business School: *Brexit Unbound*, page 15. The authors cite the UN Comtrade database and the years 2019 to 2022.

137. This number sits 17 ppts beyond the SM-MT's number, itself reliant on a volume metric. The number also appears inconsistent with the source data the authors reference. The authors claim this as an average for the years 2019 to 2022 and cite UN Comtrade as the source data. For the year 2019, UN Comtrade data indicates that 38% of vehicle exports (HS8703) by value went to EU markets – which is approximately the same the number derived from ONS data – and 53% by volume. For 2020, the numbers are 36% and 48%.

138. In no sector does the EU account for more than three-quarters of UK exports.

Table 3: Principal sectoral falls in UK goods exports to the EU, 2024 versus 2019 (2019 prices)

Sector	Real-prices shortfall in exports to the EU, 2024 versus 2019	Most likely explanation
Chemicals (SIC 20)	£3.8 billion	Long-term decline of UK chemicals industry. Similar shortfall in non-EU exports.
Apparel (SIC 14)	£3.8 billion	Elimination of re-exports from trade data.
Autos (SIC 29)	£3.2 billion	Poor trading conditions especially in the EU; exports to non-EU markets down £2 billion.
Apparel (SIC 14)	£3.8 billion	Elimination of re-exports from trade data.
Pharmaceuticals (SIC 21)	£2.3 billion	Long-term decline since 2009, owing to offshoring. Possible partial Brexit impact.
Food products (SIC10)	£1.6 billion	Customs impact on supply chains, plus elimination of re-exports.
Jewellery (SIC 32.1)	£1.3 billion	£800m spike in 2019 data. Matching non-EU shortfall. Barriers due to hallmark recognition
Footwear (SIC15.2)	£1.2 billion	Elimination of re-exports from trade data.
Computers and electronics (SIC 26)	£910million	Sectoral decline, except in measuring and testing equipment. Larger falls in exports to non-EU markets.
Agriculture (SIC 1)	£750 million	Customs barriers and elimination of re-exports. Exports to non-EU markets also down.

Source: ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q4, February 2025. De-flated using ONS IDEF export market deflators for EU markets. Energy is excluded.

By the end of 2024, the two exports sectors with the worst post-Brexit performance were chemicals and apparel. Given apparel is a far smaller export sector, that’s the prime casualty.

- The £3.8 billion shortfall in apparel exports are due entirely or almost entirely to the disappearance of re-exports in UK – EU trade data.
- The £3.8 billion shortfall in chemicals exports is unsurprising, given industrial decline. This is due partly to energy costs, plus reduced energy production in the North Sea. Non-EU exports register a similar decline.

The re-export factor is also the cause of lower footwear exports and is definitely present in food and agriculture to an unquantified degree. It may also be an operative in sports goods and some pharmaceuticals. The disappearance of scores of categories of food re-exports – including tropical fruits and nuts – helps explain the sharp reduction in what economists call the ‘extensive’ margin of trade.

Otherwise, two other industries stand out in the data for 2024, but for differing reasons:

- **Auto exports are down in all markets.** 2024 was a poor year for UK auto production and exports, partly thanks to re-tooling at UK assembly plants and sluggish demand in Europe. If Brexit is having an impact, it is likely to be slight. Exports to non-EU markets also underperformed in every year since 2021, but the industry is inexorably pivoting towards exports of premium, customised marques to non-EU markets.
- **Pharmaceutical exports are down in all markets.** However, exports to the EU stagnated from 2009 onwards and commenced a steady decline from 2015. The decline is predictable given the uncompetitiveness of the UK as an investment destination for pharmaceutical manufacturing plants. This is now spilling over into non-EU exports.

A deeper analysis will inevitably uncover subsectors where exports to EU markets are down by a few hundred million pounds. However, these subsectors cannot remotely compare to the £5 – £10 billion per year hits to our auto and aerospace sectors in 2020, 2021 and 2022, during those industries’ global downturns. And they are insufficient alone to deliver a sustained 15% drop in UK goods exports to the EU.

Sector tallies imply a low Brexit impact on exports

So, what’s actually going on?

Up to now, the export shortfalls in sectors where the goods are mostly made in the UK, and where non-EU exports remain healthy, add up to around £3 billion. This includes £1.6 billion of food products and £750 million of agriculture. Note, however, re-exports still need to be extracted from these totals, and the UK has now banned the export of live animals. Then there is jewellery and art. Once that £800 million blip from 2019 is removed, it looks as if up to £500 million of jewellery and art exports may

have fallen victim to Brexit – though why non-EU exports have also fallen remains a mystery. Nevertheless, there are well documented instance of UK jewellery exporters being unable to export to France and Spain, so the sector deserves inclusion.¹³⁹

Then there's the sectors where Brexit might be to blame for some portion of a shortfall, but the sectors themselves were already in industrial decline and comparable shortfalls appear in non-EU trade. This means a small portion of the £2.3 billion fall in pharma exports might be attributable to Brexit, and possible a small portion of the £3.8 billion shortfall in chemicals, although in 2024, shortfalls in chemicals exports to non-EU markets were proportionately greater. In both cases, however, exports are set to fall heavily in the short-term because of offshoring in pharma manufacturing, high power costs in the chemicals industry, and the decline in UK petrochemicals.

Far more work is required to extricate re-exports from the trade data before a sectoral approach can deliver a reliable estimate of the impact of Brexit on UK exports. Food, pharma and chemicals deserve special scrutiny. Nevertheless, it is impossible to reconcile estimates of a 15% fall in exports with current sectoral tallies. A 15% fall in exports from 2019 implies an almost £24 billion shortfall in exports to the EU as compared to 2019.¹⁴⁰ But nothing approaching that figure emerges from the table above in the sectors where Brexit is plausibly a factor – *even if analysts include all falls in food and agriculture and a modest allocation for pharma and autos, and minor sectors such as toys, games and sports goods.*

A thorough sectoral appraisal would likely deliver a figure closer to the most recent non-doppelganger assessment – from the London School of Economics – which produced a figure of 6%, and probably some way below it.¹⁴¹

The costs of customs

If consensus forecasts on Brexit's impact on trade do start to fall – and this paper suggests they should – then it begs the question of why analysts assumed the TCA could be responsible for a major fall in UK exports. After all, UK exporters have retained tariff-free, quota-free access to EU markets. And UK market regulation is – at this stage – still in near-perfect alignment with the Single Market. The biggest thing that's changed in UK-EU trade is the imposition of customs processes. And yet customs is a normal, regular activity for exporters across the rest of the world.

Back in 2018, the head of HMRC, John Thompson, forecast the burden on UK-EU trade of switching to a new 'Streamlined Customs Arrangement' would be £17–20 billion.¹⁴² But the basis for that forecast has already unravelled. An analysis by Briefings for Britain conducted in 2023 revealed that HMRC had over-estimated by a factor of six the total number of new customs declarations that would need to be completed. The analysis also suggest a comprehensive over-estimation of the cost of customs compliance, including RoO compliance.¹⁴³

This in itself raises a serious issue: why did HMRC never evolve a

139. Financial Times. Brexit brings hallmark havoc to UK jewellers, July 2021. [Link](#)

140. In 2019 prices. Exports to EU minus precious metals and energy were £159 billion in 2019 (2019 prices)

141. London School of Economics: Deep Integration and trade: UK Firms in the wake of Brexit. December 2024, [Link](#). The LSE eschewed trade data altogether and conducted a 'firm-level analysis'.

142. HMRC submission to the Treasury Select Committee, 4 June 2018. Page 4. [Link](#)

143. Customs Costs Post-Brexit: HMRC's claims prove to be wildly exaggerated. Briefings for Britain, March 2023. [Link](#)

compelling theory of change, with regards to the cost of Brexit. After all, the point of the TCA was to preserve tariff-free, quota-free trade with the EU. It is not clear even now why the actual terms of the TCA should be expected to exert such a major impact on trade. This analysis suggests it hasn't to any major extent except in food, agriculture, fisheries, and minor sectors. Actually, a sectoral analysis indicates the TCA has achieved almost precisely what its negotiators hoped for.

The factors that should command attention

The most likely diagnosis for current trade underperformance is that other factors – domestic and international – have exerted a far more powerful impact on UK trade than the imposition of customs processes on UK-EU trade. The international factors have already been described. But domestic policy makers should be alert to the severe impacts of domestic constraints on UK exports. This analysis points to three in particular.

- **The impact on UK trade of energy dependence.** Our deficits in trade in energy (hydrocarbons plus electricity) shot up from an average of £5.3 billion in 2015–2019 to £32.8 billion in 2022, £25.7 billion in 2023, and £21.4 billion in 2024¹⁴⁴. Nothing in UK trade data even remotely compares to these 'hits' to UK trade or prosperity
- **The high cost of industrial energy in the UK and its impact on chemicals exports.** Most analyses now report that the UK has the highest industrial energy costs of any major European economy.¹⁴⁵ This appears to be a major factor behind declines in chemicals exports, which now tops the shortfalls list.
- **The un-competitiveness of UK pharma manufacturing.** Exports stalled after growing by 9% p.a. from 2000 to 2009. Manufacturing has offshored, drawn by lower corporate taxation in other jurisdictions. Ireland's pharma exports hit €78 billion in 2023.¹⁴⁶ This is 2.5 times our own.¹⁴⁷

The risk for UK policy makers is that faulty estimates of Brexit's impact on UK trade distract attention from malign influences that originate closer to home. True, the UK Government cannot revive the global auto or aerospace industries. But it can act to reduce energy dependence, lower the cost of industrial power, and make the UK a more tax-competitive jurisdiction. This analysis indicates that each of these objectives would, if successful, transform UK trade, especially in chemicals and pharmaceuticals. Success would more than compensate for the genuine Brexit-related losses identified in this paper.

Next steps

The most urgent issue in all UK trade analysis is to figure out why UK exports performed so poorly in EU markets before we left the Customs Union, because that will largely determine what happens now. Appendix

144. Current prices. Note, these deficits have decreased following ONS revisions in January 2025.

145. See for example, IEA: We're number one ... in unaffordable electricity. October 2024. [Link](#)

146. Central Statistical Office (Ireland); Goods Exports and Imports 2023. [Link](#) Accessed January 2025.

147. Note, this is not due to re-exports. UN Comtrade reports Irish exports of Pharmaceuticals (HS30) of US\$72 billion for 2023, and imports of just US\$13 billion.

A includes the author's high-level explanation of the UK's historic underperformance in EU markets, based on analysis of sectoral growth rates from 2000 to 2019.

Without knowing why UK exports performed poorly before 2020, analysts are unlikely to grasp the root cause of underperforming exports now. And if analysts don't understand that, actions to improve UK exports are bound to be misguided.

- **By re-engaging with the EU, the UK Government may entrench an unhealthy trade relationship.** Prior to Brexit, seamless UK-EU trade delivered stagnant exports, rapid import growth, and a £96 billion annual deficit.
- **Efforts to improve UK-EU trade in food or chemicals are unlikely to deliver a meaningful boost to exports.** So far, the sectors that have been impacted by Brexit are minor contributors to UK exports, so the benefits of 'improved' trade relations are likely to be minimal.
- **Without better insight, analysts will severely over-estimate the impact of Brexit** and customs process on UK exports to the EU. This will undermine UK strategic policy towards the EU and other countries.

Diligent sectoral analysis is an urgent task. The Labour Government now needs to decide how to 'get closer' to the EU and what it is prepared to sacrifice to gain an FTA with the US. But pursuing closer EU ties and a US trade deal may lead to irreconcilable positions. If that happens, what's going to guide ministerial priorities?

Unless deficiencies in UK trade analysis are corrected, the UK Government will never understand the costs and opportunities of a free trade deal with the US, or closer alignment with the EU – or indeed the long-term strategic interests of UK trade.

Appendix A: The root cause of poor, pre-Brexit export performance

This analysis begs an obvious question: why did UK exports to the EU Single Market underperform virtually every other country in the period before Brexit? After all, UK exporters had the benefits of the Single Market and participation in a Customs Union that eliminated tariffs and non-tariff barriers to trade.

One explanation is that the progressive liberalisation of external trade by the EU benefited non-EU members, while this had no effect on trade between the UK and the EU. But Chapter 4 examined this potential explanation and found multiple instances where UK exports underperformed other countries' where external liberalisations could not have been a factor.

- Switzerland's exports already enjoyed tariff-free, quota-free trade with the EU, and yet Switzerland's export growth to the EU easily surpassed the UK's (by around 4 ppts).
- Intra-EU export growth rates among founder members of the Single Market far exceeded the UK's, though they matched the growth rates achieved by US exporters to the EU.
- And the UK's export growth rate to Germany, France, Italy and Spain undershot bilateral growth rates from Germany to her principal EU trade partners, and France to her principal EU trade partners – by around 2 to 3 ppts.

This paper cannot provide a comprehensive answer to this question. But the sectoral approach adopted in this paper indicates any attempt to address this paradox has to progress sector by sector through the UK's principal export industries. This is because:

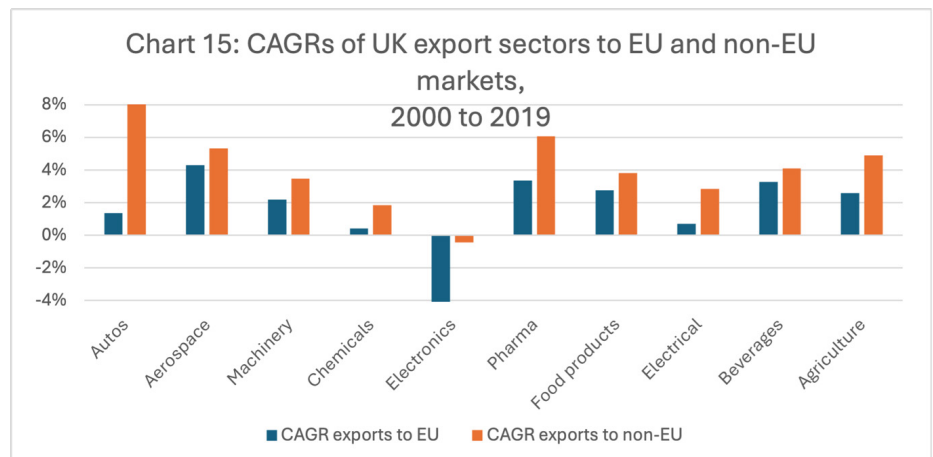
- 1. Different sectors behave very differently in international trade.** As chapter 2 shows, a country's aggregate export performance is the result of widely diverging and sometimes contradictory sectoral outcomes. This means aggregate data hides critical trends.
- 2. The impact of the EU Single Market and the Customs Union varied by sector.** In some sectors – say, food – high tariffs and extensive regulation on production, labelling and transport meant

the putative benefits of EU membership were high. In aerospace – with no tariffs and global regulation – the benefits of EU membership were negligible.

Comparative export performance

As pointed out above, the benefits of the Single Market and Customs Union were spread unevenly across UK export sectors, with food and agriculture having the most to gain, and aerospace probably the least. This unevenness is analytically quite handy. If the Single Market and Customs Union genuinely did deliver benefits to specific sectors, then long-term growth rates of exports to the EU in that sector should rise in comparison to exports to non-EU markets. And vice-versa.

The following chart plots the CAGRs of exports in ten UK sectors over the period 2000 to 2019. These include the UK’s nine biggest export sectors in 2019 plus agriculture, which should have benefited hugely from the UK’s EU membership. In total, these 10 sectors accounted for 73% of UK goods export in 2019 (minus precious metals, and oil, gas and electricity). With almost three-quarters of the total, therefore, they capture most of what’s happened in UK goods exports.



Source: ONS: UK Trade in goods by Classification of Product by Activity, time series dataset, Quarterly and Annual up to and including 2024 Q1, July 2024. Deflated using global ONS IDEF export market deflators, according to SITC categorisations.

The sectors are arranged left to right in order of their contribution to total UK goods exports. So, autos, aerospace, and machinery each deliver around 12-14% of the total. After electronics, however, the categories reduce in size quite briskly. Pharmaceuticals deliver 8% of exports; food products just 5%; and agriculture 1%.

First, two broad observations that help explain why our exports to the EU underperformed other countries’. The chart above shows that our two worst-performing export industries since 2000 – across all markets –

have been electronics and chemicals.

- **Our biggest export industry in 2000 – electronics – has collapsed.** Back in 2000, computers and electronics delivered 24% of UK goods exports. Now it is just 9%. Exports specifically of computing and communication equipment plummeted from 2002 to 2007.
- **Our huge chemicals industry is in decline, and this has impacted exports.** Before 2009, chemicals was generally our next-most valuable export industry after electronics. In 2009, chemicals' share of UK exports peaked at 13% before starting a steady decline.

Back in 2000, the electronics and chemicals sectors delivered 34% of UK goods exports. Now they deliver just 19%. So, part of the explanation is simply that our two most-valuable export industries from 20 years ago (delivering more than one-third of goods exports) unfortunately entered decline.

Comparative performance in UK's top export sectors

This doesn't explain why the Single Market and Customs Union failed the UK, however. The single most startling aspect to the chart above is how exports to EU markets underperformed in *every single major export sector*. This even includes food and agriculture – where tariffs and regulatory alignment delivered the biggest comparative benefit. So, what was going on?

As noted above, a sectoral approach has the great benefit of illuminating whether the supposed benefits of the Single Market and Customs Union translated into strong comparative performance. The key to this is the difference – or spread – between EU and non-EU growth rates.

Consider: in those sectors where the Single Market and Customs Union delivered a major advantage to UK exporters (as compared to exporters from non-EU countries) then exports should have performed comparatively well – since exporters had comparative benefit in EU markets. So, the spread between EU and non-EU growth rates should narrow. Conversely if exporters in any give sector gained little from the EU, common sense suggests these should be the sectors that comparatively underperform in EU markets. The spread should widen.

But there is no clear correlation, and this is a vital insight.¹⁴⁸ It implies that the Single Market and Customs Union were *not* dominant impacts on the evolution of UK exports from 2000 to 2019. It implies that other influences exerted a stronger effect than the Single Market or Customs Union, or that other countries proved more adept at utilising the benefits.

1. **Automotive.** At 6.8 ppts, the spread between EU and non-EU export growth rates is by far the widest in all UK trade. This is utterly counter-intuitive. UK exports to the EU benefited from a relatively high tariff wall (9–10%) and stringent EU market regulation – say,

148. The author published a correlation of comparative benefit and comparative performance in the 2021 publication: *Two Tests for UK Trade*. Civitas, 2021.

on emissions. However, exports to the EU performed abysmally in absolute and comparative terms. Manufacturers shifted production to the continent and the Customs Union permitted them to import freely back into the UK. Hence a UK–EU trade deficit in automotive goods that rose from £7.4 billion in 2020 to £30.3 billion in 2019 (2019 prices). High and unmatched subsidies in other EU countries are the obvious causative factor.¹⁴⁹

2. **Aerospace.** With little to be gained from EU membership, comparative performance in aerospace exports should be low. Again, the reverse is true. Exports to the EU performed exceptionally in absolute and comparative terms. The spread between CAGRs is just 1 ppt. In other words, from 2000 onwards aerospace put in the best performance in EU markets of any UK export sector, despite having the least to gain from EU membership.
3. **Machinery.** Again, UK exporters had relatively little to gain from EU membership. Most items in this sector are capital goods, so tariffs are extremely low. Equally, single market regulation is of little advantage, because exporters have few competitors (think JCB, Caterpillar, and Rolls Royce’s industrial or marine turbines). And yet, exports to the EU did comparatively well, reaching within 1.3 ppts of exports to non-EU markets.
4. **Chemicals.** The chemicals industry should have benefited substantially from EU membership. The EU’s protective tariffs were moderately strong, at around 5%, and the scope of Single Market regulation was relatively strong.¹⁵⁰ In this case, the results conform to expectations. The CAGR of EU exports grew to within 1.4 ppts of non-EU exports. Sadly, however, this was a stagnant – and now declining – export sector for the UK, thanks in part to high comparative industrial energy costs, and declining North Sea production.
5. **Electronics and computing.** The comparative benefit of Single Market legislation and tariffs on trade in this sector is quite low – which is fortunate because otherwise the EU would have ground to a technological halt. This appears to be reflected in the wide spread in growth rates. Incidentally, the relative success of exporters in non-EU markets is due to fast-growing exports of measuring and testing equipment (Renishaw, would be an example).
6. **Pharmaceuticals.** The figures for this sector are misleading, since all the growth occurred before 2009. Since then, exports to both EU and non-EU markets have stagnated or entered rapid decline. As with autos, the most obvious cause is offshoring. With autos, the apparent trigger was huge subsidies elsewhere in the EU. With pharma, the lure appears to be low corporate tax rates: Ireland being the obvious, gigantic, beneficiary.
7. **Food products.** This should be the sector that most benefited from EU membership – and the data suggests it did perform well. Exports to the EU grew at an above-average rate – CAGR of 2.8%

149. For example, in 2015, the Slovak Government provided JLR with €125 million to move production of the Land Rover Defender from Solihull in the West Midlands to Nitra, in Slovakia.

150. Numerous studies have attempted to quantify the impact of Single Market regulation. They include: Veld, *The Economic Benefits of the Single Market in Link Goods and Service*, (European Commission), page 808; Berden and Francoise 2015: *Quantifying non-tariff measures for TTIP*; page 10.

– and came within just 1.1 ppts of matching exports to non-EU markets. This was almost the best comparative performance of all UK sectors. However, food exports are comparatively small, and account for just 5% of UK goods exports.

8. **Electrical goods.** Most UK exports in this sector are industrial, rather than consumer goods. Most analysts have assessed the impact of tariffs to be moderate to low, and so UK exporters gained little from tariff-free access to the Single Market. The CAGRs appear to bear this out, with the spread just fractionally above the average.
9. **Beverages.** Whisky is easily the most valuable good in the UK beverages export sector. Some countries place very high tariffs on whisky; the EU did not. So Scotch whisky producers gained little advantage in EU markets. Exports to the EU performed comparatively well, although still lagged 0.8ppts behind exports to global markets. And US whiskey exports to the EU grew far faster.
10. **Agriculture.** Like food, this should be a sector where UK exports grew much faster in EU markets than in global markets, given high tariff barriers and ubiquitous, intensive market regulation. In absolute terms, exports did grow quickly. Perversely, however, exports to global markets grew faster still. The drawback, however, is scale. Agriculture is a tiny export industry for the UK, delivering just 1.2% of UK goods exports.

The core reasons for export underperformance in EU markets

Given these 10 sectors encompassed 73% of UK goods exports (in 2019) they must capture the core of UK export underperformance in EU. The following four observations are offered as a broad, top-level explanation for the comparative failure of the Single Market and Customs Union to stimulate export growth in the final 20 years of the UK's membership of the EU.

- **The Single Market's benefits were ill-matched to UK's export profile.** The UK export sectors that had the most to gain from the Single Market and the Customs Union were – unfortunately for us – either small (food, agriculture), in decline (chemicals) or suffered from high levels of subsidies in other countries (automotive).
- **The Single Market did not deliver comparative benefits to our best export industries.** The sectors in which UK companies are highly competitive – notably aerospace, construction and power machinery, and beverages – gained little or nothing from UK membership, either because tariffs/market regulation were low-impact, or because the EU chose not to protect those goods. This helps explain why US bourbon outsold Scotch whisky in the

EU.¹⁵¹

- **The UK's single biggest export industry in 2000 – computers and electronics – collapsed.** This helps to explain why the UK's export performance generally underperforms other countries'. The stagnation and decline of our chemicals industry is also a drag on exports, and this is partly related to our declining domestic hydrocarbon production. Note: these two industries delivered 34% of goods exports in 2000, and they are our two worst-performing.
- **The UK has lost competitive advantage in pharmaceuticals manufacturing.** Pharmaceuticals could easily have become the UK's biggest export sector. Growth rates from 2000 to 2009 were unsurpassed (9.8% p.a. in EU markets; 9.2% p.a. in non-EU markets), and pharma receives the highest percentage of investment in research and development of any UK manufacturing sector.¹⁵² But global pharma has decamped. In Ireland's case, the lure is low corporation taxation.¹⁵³

This paper can only offer a cursory answer to what should be the biggest question in trade economics in the UK. But the above four points at least provide an outline answer.

If the UK had been a major exporter of food, fisheries and agriculture – or if our chemicals industry was healthy – then our aggregate exports to the EU would have grown comparatively more quickly. If the UK Government had provided subsidies to auto manufacturing on the same scale as in 2023–24, then auto exports to the EU would have soared. If the EU had somehow provided protection for UK-built capital goods, including aero-engines, machinery and whisky, then those sectors would have outperformed. And if the UK had remained a tax-competitive base for pharma manufacturing, then Ireland's stupendous export success would have occurred on UK soil.

But none of these things is true.

151. Burrage: It's Quite OK to Walk Away. Civitas, 2017. Page 41

152. The Manufacturing Technologies Association (MTA) estimates that pharma accounts for 36% of total R&D spending – far ahead of automotive (20%) and aerospace (8%). R&D Statistics 2023 – UK and Europe. Accessed January 2023. [Link](#)

153. Radford: The Case for Low Corporate Taxation: Lessons from the Pharmaceutical industry. November 2022. [Link](#)

Appendix B : CAGRs of UK goods exports in major sectors, 2000 to 2019

Table 4: CAGRs of UK goods exports in major sectors, 2000 - 2019

Sector	CAGR exports to EU	CAGR exports to non-EU	Spread
Autos	1.4%	8.2%	6.8%
Aerospace	4.3%	5.3%	1.0%
Machinery	2.2%	3.5%	1.3%
Chemicals	0.4%	1.9%	1.4%
Electronics	-4.1%	-0.5%	3.7%
Pharmaceuticals	3.4%	6.1%	2.7%
Food products	2.8%	3.8%	1.1%
Electrical	0.7%	2.8%	2.1%
Beverages	3.3%	4.1%	0.8%
Agriculture	2.6%	4.9%	2.3%
All goods	0.4%	2.5%	2.1%

Source: ONS, UK Trade in goods by Classification of Product by Activity, times series dataset, Quarterly and Annual up to and including 2024 Q1. Deflated using ONS IDEF deflator series, per EU and non-EU markets for SITC classifications. Excludes precious metals and energy.



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