

# Lessons learned for a Global Britain

UK trade in manufacturing, 2000-2019

**Phil Radford** 

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CIVITAS

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## **Author**

Phil Radford is a trade analyst and writer, based in Sydney. He was co-author with Michael Burrage of WTO versus EU: An Assessment of the Relative Merits of UK Trading Relationships, 1999-2018. He was a contributor to Brexit Central in 2019, and has written on trade and security for institutes and news organisations in the Asia-Pacific.

## Acknowledgement

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## Summary

Something strange happened to UK trade in 2019. When the Office for National Statistics (ONS) published its yearly update in February 2020, it transpired that the two-decade compound annual growth rate (CAGR) for manufacturing exports to the European Union (EU) turned negative for the very first time. In other words, adjusting for inflation and extracting the value of precious metals, the real value of UK manufacturing exports to the EU was lower in 2019 than in 2000. In blunt terms, UK manufacturing exports to the EU had not grown in 20 years.

This stagnation is not a Brexit phenomenon. In real terms, manufacturing exports to the EU peaked in 2006–2008, then fell steeply and never fully recovered. The last period of sustained growth in manufacturing exports to the EU was in 1998–1999. So, the last two decades of UK membership of the EU achieved nothing in terms of manufacturing export growth.

Yet, manufacturing is vital to UK trade. In 2019, the 2.9–3 million people who worked in manufacturing throughout the UK delivered 86.9 per cent of the UK's physical goods exports – despite comprising just 9.1 per cent of the workforce. Add in all services, and manufacturing still delivered 45.5 per cent of the UK's total exports in 2019. In terms of tariffs and market regulation, manufacturing is also the sector that is most impacted by the UK's departure

from the Customs Union and Single Market. From 1 January 2021, it is the sector that faces the greatest opportunities in global trade.

And it's in global markets that UK manufacturing is already a quiet achiever. While the UK's EU exports stagnated, manufacturing exports to countries outside the EU grew by 2.6 per cent per year from 2000 onwards. Some sectors put in a stellar performance. The value of UK automotive exports to non-EU markets more than tripled from 2000 to 2019, growing 6.6 per cent per year. Aerospace exports grew by 4.3 per cent per year, and the UK's pharmaceuticals by 5.3 per cent per year.

These growth rates for the UK's auto, aerospace and pharma industries easily outpace the aggregate economic growth rates of the UK's non-EU trade partners over the same period.<sup>3</sup> They demonstrate that some sectors of UK manufacturing are highly competitive in global markets. They are testament to a spirit of endeavour among the UK's globally minded manufacturers. And they effectively rebalanced UK trade away from the EU in the decade and a half that *preceded* the 2016 EU referendum.

Inevitably, there are stark failures in the UK's manufacturing trade, and these provide valuable insights for UK trade policy. Twenty years ago, computers and electronics was the UK's largest manufacturing export sector by far, delivering 24.6 per cent of the total. In 2004, exports crashed and have never recovered. They are now worth less than half their value in 2000, and generate just 9.4 per cent of UK manufacturing exports.

More strangely, the UK's automotive exports to the EU also hit a wall, despite enjoying seamless, tariff-free access to protected EU markets. In real terms, the value of motor vehicle and parts exports to the EU peaked in 2007 and were

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worth less in 2019 than in 2000. Meanwhile, imports from the EU accelerated after 2009. The resulting –£29.6 billion sector deficit is now so big it swallows the *entire* £18.2 billion surplus that the UK earns on trade in financial services with the EU. The sector-by-sector analysis in this report is full of such surprises.

One of those surprises is that the EU's own slow economic growth is not to blame for poor export performance – at least not entirely. As the end of chapter 1 will show, UK manufacturing exports underperformed the EU 27's economic growth rate by an average 1.4 percentage points (ppts) per year during the period 2000–2019. Exports to the UK's non-EU partners also underperformed those partners' GDP growth rates, but by a far smaller amount. In comparative terms, UK manufacturing exports grew faster in non-EU markets, even after the EU's slow economic growth is taken into account.<sup>4</sup>

But the biggest surprise relates to the comparative performance of individual UK sectors. This report shows there was no link between the supposed benefits that the Customs Union and Single Market delivered to a particular manufacturing sector, and the export performance of that sector in EU markets. If anything, the opposite is true. The UK's fastest growing manufacturing exports of the past 20 years – aerospace and pharmaceuticals – received zero or minimal assistance from the EU Customs Union and Single Market. And the sectors where the Customs Union and Single Market had the greatest impact – food, chemicals and basic metals – were either small or slow-growing, or both.

One characteristic of UK-EU trade stands out bold as brass: all of the sectors that were heavily impacted by the EU Customs Union and Single Market generated large and growing deficits. The UK's motor vehicles sector took the chequered flag. And this deficit problem isn't going away. The December 23rd UK–EU trade agreement essentially maintains the trade relationships that created these deficits. So, while the risks of a sudden dislocation of UK–EU trade were avoided, chronic problems remain – which the UK's independent trade policy will now have to address.

A sector-by-sector analysis of UK manufacturing trade between 2000 and 2019 reveals other unlikely trends.

- 1. Seamless, tariff-free trade with the EU worked better on imports than exports. With imports growing a full 2.6 ppts faster than exports to the EU, the UK's deficit with the EU in manufactured goods has grown steadily, from –£14.4 billion to –£103.4 billion in 2019.
- 2. The imbalance between export and import growth rates in UK-EU trade has created a series of captive markets in the UK. This trait is pronounced in UK trade in motor vehicles, machinery, chemicals, steel, pharmaceuticals, food and beverages. The new UK-EU trade deal will entrench these trends rather than abate them.
- 3. There is no way that trade in services with the EU can compensate for the UK's deficits in manufacturing trade. Exports of services to the EU grew just 0.6 ppts faster than imports from 2000 and from a smaller base. A new deal on UK–EU trade in Financial Services would help contain rising deficits but could not reverse them.
- 4. Small companies are powering export growth in some of the UK's best performing sectors. The number of companies involved in the aerospace, pharmaceuticals, food and beverages sectors has increased dramatically over the past 20 years, and these are four of the UK's five best-performing sectors in global markets.

- 5. The Customs Union and Single Market did not encourage specialisation in UK manufacturing, nor in UK trade generally. The only sector where exports to the EU increased faster than imports was aerospace, which was the sector that was least impacted by the Customs Union and Single Market. The prime objective of UK participation in the Customs Union and Single Market was not attained at least during the final two decades of UK membership.
- 6. Continued tariff-free, quota-free trade with the EU means that the UK's fastest growing manufacturing exports are under threat as investment moves to the EU. The UK's premium auto and pharmaceuticals sectors which both generate large surpluses in non-EU trade are already suffering as companies move production to Germany, Slovakia, Austria, Ireland and elsewhere in continental Europe.

This report unfolds the 20-year evolution of UK manufacturing trade in thirteen chapters. It analyses the performance of each of the UK's top 10 manufacturing industries during the final two decades of the UK's membership of the EU. It relies principally on ONS trade data up to the end of 2019, published in February 2020. It also uses economic data gathered for the ONS Annual Business Survey (ABS) up to the end of 2018, published in May 2020.

**Chapter 1** will set the UK's manufacturing trade in proportion and perspective. It shows how UK manufacturing contributes to the UK's overall goods exports, which include agriculture and energy. It shows the relative size of the UK's manufacturing exports and how they compare to services exports. Chapter 1 will identify the UK's top 10 manufacturing export sectors in 2019, and track how

those sectors fared over 20 years. It will show whether their contribution to UK trade grew or shrank.

Chapters 2–11 will step through each of the UK's top 10 manufacturing export sectors in turn and describe how they have performed in EU and non-EU markets from 2000–2019. This is the heart of the UK's manufacturing-export story. The chapters will examine employment and turnover in each sector, what products are made and where, and the extent to which each sector is dependent on trade. And it will assess the degree to which the Customs Union and Single Market provided a commercial advantage in EU markets, and whether trade performance from 2000–2019 reflected those advantages.

Chapter 12 will bring all the sectoral performance data together for easy comparison. It shows how UK manufacturing exports pivoted decisively away from EU markets in the two decades before the UK's exit from the Customs Union. It shows how trade deficits are concentrated in EU trade, and in the sectors that were supposed to benefit most from membership of the Customs Union and Single Market. And it shows the inexorable result: a steadily worsening EU trade deficit, the causes of which the UK must now confront, or watch its global exports whither too.

Chapter 13 presents eight observations gleaned from the UK's track record in the EU and global markets over 20 years. These observations should help policymakers to reassess the UK's strategic trade interests now that the UK has sovereign control over policy. The chapter includes 10 policy suggestions that support 'levelling up' policies by identifying industries and subsectors outside London that have already proved competitive in global markets.

### SUMMARY

The chapter will also point out why an over-reliance on economic forecasts constitute a grave threat to a proper understanding of the UK's export trade. And it shows why the UK should have no fear of diverging rapidly from EU standards and regulations now that the country has left the Customs Union.

Note on data. Unless stated, all manufacturing data used here is drawn from the Office for National Statistics Global Accounts Series, published in February 2020. This computes trade values on a balance of payments basis, according to standard industry classifications (SIC). Where CAGRs have been calculated, and time-series charts presented, data has been deflated to 2016 values using ONS' differential export and import deflators. Given the extreme trade in nonmonetary gold which occurred during 2019, all trade in precious metals has been extracted from this analysis, unless otherwise stated. This has the effect of extracting a whole subcategory of basic metals from the analysis, including silver, platinum, palladium, ruthenium and processed uranium, as well as non-monetary gold. Exports of these precious metals were worth £24.3 billion in 2019, approximately £10 billion in 2011–2018, and £2.5 to £7 billion from 2000 to 2010. Extracting precious metals slightly lowers the UK's long-term manufacturing CAGRs, in particular to non-EU markets. To aid comparison, data is principally categorised according to EU trade (which was largely seamless and totally tariff free from 2000) and non-EU trade, of which approximately fourfifths was conducted predominantly on WTO terms during the 20-year period beginning in 2000 (see Chapter 1).

## Introduction

One assumption has underpinned all discussion on UK trade since the 2016 referendum on EU membership: that the UK already enjoyed an optimal trade arrangement with the EU.

The assumption is deeply embedded in UK Government policy. Since UK companies enjoyed seamless, tariff free access to EU markets, it made sense to try to retain that relationship. Economic forecasters agreed. Supported by well-established economic theory, multiple organisations – including the UK Treasury – forecast increasing degrees of harm to UK trade the more that the UK pulled away from the Customs Union, the Single Market and tariff-free trade. For the UK, a World Trade Organization (WTO) exit was always a second-best option. The result was the EU–UK Trade and Cooperation Agreement, which preserves tariff-free, quota free trade with the EU.

But what if the theory that underpins this deal is wrong? What if the £90 billion-plus deficit that the UK regularly clocks up in its trade in goods with the EU is a sign of chronic problems in UK trade with the EU? What if seamless trade with the EU benefited imports more than exports? What if factors other than tariffs and harmonised regulation have a far greater impact on how UK trade evolves? What if the UK's new trade deal with the EU perpetuates problems, creates no new opportunities and constrains UK trade policy from pursuing the UK's global best interests?

This study puts theory to the test. It examines the actual performance of UK trade inside and outside the EU over the final 20 years of UK membership of the EU. It is based on a comprehensive analysis of UK trade data from 2000 to 2019 published by the Office for National Statistics (ONS). It focuses minutely on 10 manufacturing sectors that together delivered 79.2 per cent of all UK manufacturing exports in 2019.

To understand what really drives UK exports, the study tracks performance in EU and global markets. It assesses the relative advantages that each sector enjoyed thanks to UK membership of the Customs Union and Single Market. The study shows how UK manufacturers turned decisively towards global markets in the decade *before* the 2016 referendum. And it illuminates where tariffs, harmonised regulation and geographical proximity improved the comparative performance of UK manufacturing exports – and where they didn't.

Each of these 10 manufacturing sectors has a different story to tell. Some, like motor vehicles and food products, were hugely impacted by the EU's external tariff policy and the opportunity to sell freely into a huge and heavily protected EU market. And yet these two sectors performed quite differently from each other over the course of 20 years. Some sectors, like aerospace and pharmaceuticals, gained relatively little from the Customs Union and Single Market. Yet, comparatively, they performed extremely well in EU markets.

Delve deeper and fascinating insights occur. For example, UK premium motor vehicles, such as Range Rovers, MINIs and Bentleys, have proved wildly successful in global markets. The popularity of these and other British marques with global customers is the biggest success story of the past 20 years. The growth rate of UK motor vehicles exports

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outside the EU – at 6.6 per cent per year – is the fastest of any sector. Yet auto exports to the EU have gone backwards.

Then there's the subtleties. UK exports of consumer electronics and consumer electrical goods crashed during this period – especially in EU markets. But pockets of global competitiveness emerged. Industrial equipment makers in these sectors prospered, for example the makers of measuring and testing equipment, and electric motors. Scotch whisky exports grew well in global markets; in EU markets, however, Scotch export growth paled in comparison to import growth of US-made Bourbon.

By comparing the 20-year performance of UK exports and imports to EU and non-EU markets – and by assessing the relative benefits of EU membership for each sector – this study makes five critical observations.

- That there was no link between the supposed benefits of the Customs Union and Single Market and the relative performance of UK manufacturing exports from 2000–2019.
- That the only sectors where the Customs Union and Single Market did have a positive effect on UK exports were either small or slow-growing, or both.
- That the UK's *most successful* exporters prospered where the supposed advantages of the Customs Union and Single Market were either *absent* or at their *weakest*.
- That all the UK's top 10 manufacturing export sectors grew faster in non-EU markets, and that the faster GDP growth rates among those global trade partners only partly explains the gap in performance.
- That importers appeared to benefit from the Customs Union and Single Market far more than exporters, and the resulting deficits are now entrenched in UK–EU trade.

All these observations are counterintuitive, but they are derived from an exhaustive analysis of trade data that covers the last two decades. And the analysis is supplemented by data drawn from the ONS' Annual Business Survey, which sets out what each UK manufacturing sector actually produces, how many people are involved and what value added is delivered to the UK economy. With these two data sets, analysed side-by-side, it's possible to see which UK manufacturing sectors have prospered, which have stumbled, and where success in UK trade actually comes from.

This study should help sharpen UK trade policy. It highlights some exceptional success stories in UK exports over the past 20 years, including in premium UK motor vehicles, aerospace components, industrial electronics, and – until 2012 – pharmaceuticals. It indicates that entrepreneurship, great design, niche engineering and the agility of small enterprises trump the influence of tariffs, proximity and regulatory harmonisation in all bar two sectors. It also shows that high research spending guarantees nothing.

This study includes policy suggestions that could help spread prosperity more evenly across the UK. Manufacturing contributes a steady 87 per cent of UK goods exports, and this study shows that there are pockets of globally competitive manufacturing spread right across the country. Many export successes – like premium auto manufacturing – occur in areas where levelling up strategies need to have an impact. UK trade policy has the opportunity to back companies that are already global winners.

But this study also highlights grave risks.

1. The new EU trade deal threatens investment in UK automotive manufacturing. The scale of subsidies in the EU's auto industries has led to a consistent net drain in

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investment to EU plants. The steady rise in the UK–EU deficit in trade in automotive goods from -£7.7 billion (current prices) in 2000 to -£29.6 billion is evidence of this trait, which is now impacting the UK's luxury marques.

- 2. UK pharmaceutical manufacturing is also under threat from EU competitors. The UK's overall exports grew at a cracking 4.1 per cent CAGR for 20 years, but exports to the EU peaked back in 2008. Manufacturing left the UK for elsewhere in the EU from 2009 onwards, and found an especially friendly home in the Irish Republic. Offshoring in pharmaceuticals, aided by tax incentives, now threatens the UK's global exports as well as security of supply.
- 3. The UK is now a captive market for EU manufacturing in multiple sectors. Tariff-free trade enabled EU suppliers to maintain or increase market share of UK imports in most sectors, including autos, machinery, chemicals, pharmaceuticals, basic metals, food products and beverages. Unless the UK changes the way it trades with the EU which it fundamentally hasn't then the captive market effect will continue to imprint itself in UK trade.
- 4. Last, that seamless, tariff-free trade with the EU failed to deliver the benefits of liberal free trade to the UK during the past 20 years and is unlikely to do so in the future. Plenty of UK manufacturing sectors saw exports to the EU stall or fall over the past 20 years. Only one large sector, aerospace, delivered a corresponding rise in exports, and that sector was the one least impacted by EU membership. In EU trade, imports universally outpaced exports. Only in global trade did UK manufacturing display specialisation and achieve a healthy balance.

### LESSONS LEARNED FOR A GLOBAL BRITAIN

UK trade policy was effectively dormant for 47 years. Today it is alive again. For now, the UK has preserved tariff-free trade with the EU and embarked on a course of liberalising trade with the rest of the world. But to get policy right, the UK Government should take a long, hard look at how UK trade actually performs. In sector after sector, actual export performance fails to match expectations. Assumptions are contradicted.

In reality, UK manufacturers set course for a 'Global Britain' 20 years ago. Their performance shows that UK companies succeed despite multiple barriers to global trade. UK policymaking has some proven successes to embrace. But the 20-year performance of UK manufacturing also demonstrates that exports failed to make headway where trade was seamless. This matters because current UK–EU trade arrangements will be subject to constant challenge. The deal's risks will become apparent; its liabilities ingrained. The question of how much that deal is worth will never go away.

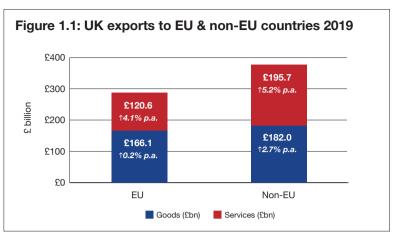
## 1.

## The big picture

To understand the role of manufacturing in UK trade over the past 20 years, it's easiest to start with the big picture.

The UK's worldwide exports can be divided into four similar-sized groups: exports of goods and services to EU countries; and exports of goods and services to non-EU countries. UK services exports to non-EU markets were worth £195.7 billion in 2019. They comprised the UK's largest export grouping, having just overtaken goods exports to non-EU markets, worth £182 billion (minus the value of precious metals). The next biggest bloc of exports was goods exports to the EU, worth £166.1 billion in 2019, followed by services exports to the EU worth £120.6 billion.

So much for size, what about growth? Exports of services to non-EU countries grew by a compound annual growth rate (CAGR) of 5.2 per cent from 2000–2019, while services exports to the EU grew slightly more slowly, by 4.1 per cent per year. Meanwhile, goods exports to non-EU countries increased at a respectable 3.1 per cent per year, or 2.7 per cent per year if all precious metals are excluded. In contrast, goods exports to EU countries barely grew at all, with a CAGR of just 0.2 per cent. As already noted, the CAGR for *manufacturing* exports to the EU is actually just below zero, and the difference is due to the fact that oil and gas exports are not counted as manufacturing.



Source: Goods, ONS Balance of Payments CP Series, Quarter 4, published in February 2020; Services, ONS, Balance of Payments, Export Trade in Services, November 2020.

The interplay of these four, 20-year CAGRs – shown in italics above – radically changed the shape of UK trade in the two decades to 2020. Twenty years ago, UK goods exports to the EU (the bottom left-hand block) was easily the UK's largest type of export trade. They accounted for 40.1 per cent of all UK exports, goods and services. In 2019, they delivered just 25 per cent. This is a precipitous decline. But note: the UK–EU goods that make up that bottom left-hand block represents the entirety of the exports that the UK conducted within the Customs Union, and almost all that the UK conducted within the Single Market.

And so, the first paradox of the UK's EU trade: despite the great theoretical advantages of seamless EU trade, the exports it principally impacted were indisputably the UK's worst-performing in the two decades to 2020.

It's a different story entirely with imports, however. Excluding precious metals, the UK's goods imports from the EU grew faster than from non-EU trade partners, by a CAGR of 2.7 per cent compared to 2.3 per cent. This leads

### THE BIG PICTURE

to an uncomfortable phenomenon. In the UK's trade with countries outside the EU, the growth rates of goods imports and exports was almost identical: 2.3 per cent for imports, 2.7 per cent for exports. So, trade growth was balanced. Within the EU, the CAGR of goods imports from 2000–2019 dramatically outpaced exports, by 2.51 ppts. And therein lies a long-term liability that the new UK–EU trade agreement won't address, but UK trade policy cannot avoid.

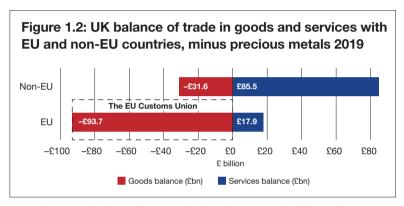
## EU trade in goods: stagnant exports and surging imports

The difference between the CAGR of goods imports from the EU (2.7 per cent) and exports to the EU (0.2 per cent) is 2.51 percentage points (ppts). Innocuous over one year, its effect over 20 years was pernicious. It resulted in UK–EU trade in goods becoming profoundly imbalanced. In 2000, the UK's goods trade with the EU was in deficit by just £10.5 billion (minus precious metals, 2019 prices). By 2019, this deficit had grown by a factor of almost 9, to £93.7 billion. The picture deteriorates when confined to manufactured goods. Trade in energy drops out of the equation and the deficit increases to £103.4 billion for 2019. Only the UK's £13.5 billion of net crude oil exports to the EU help narrow the deficit – for now.

Meanwhile, the deficit on the UK's non-EU goods trade is less than one-third the size, at £31.6 billion. And that deficit is stable, since the long-term growth rate of imports (2.3 per cent) only marginally undershoots the growth of exports (2.7 per cent). More importantly, it's easily paid for by the whacking £85.5 billion surplus that the UK earns on its trade in services outside the EU. The UK's £17.9 billion surplus on trade in services with the EU literally pales in comparison.

And so, to the second paradox of UK trade: the portion of UK trade that should principally benefit from the Customs

Union and Single Market is also a net drag on the UK economy. A near-zero goods export growth rate matched with a 2.7 per cent import growth rate created a £93.7 billion deficit by 2019. The UK's £17.9 billion surplus on EU services cannot remotely cover this black hole and if trends continue, it never will. The net result was a £77 billion deficit on EU trade in 2019.



Source: Goods, ONS Balance of Payments CP Series, Quarter 4, published in February 2020; Services, ONS, Balance of Payments, Export Trade in Services, November 2020.

In global terms, this deficit with the EU is a very large number. In 2018, the UK's £68 billion deficit in overall trade with the EU (goods plus services) was worse, per capita, than the US' overall deficit with China: US\$1,365 per head for UK–EU versus US\$1,164 for US–China.<sup>6</sup> That the former resulted in a broad political consensus to retain free trade with the EU while the latter provoked a trade war is one of the deep mysteries of international trade politics.

As of September 2020, nothing has changed. According to the Economist Intelligence Unit, the UK is forecast to incur a larger current account deficit than the US in 2020 (2.3 per cent of GDP, compared to the US' 1.7 per cent). For some years up to the end of 2020, the UK regularly appeared as the worst current-account performer among major economies

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on the back-page economics table of The Economist. The cause was the UK's trade within the EU Customs Union.

## Global trade: healthy by comparison

In contrast, the UK's trade outside the EU was vigorous and balanced during the 2000–2019 period. With goods exports and imports growing at nearly the same rate, the goods-trade deficit oscillated from £30–50 billion. If the calculation is restricted to manufacturing, the deficit narrows to just £16.8 billion in 2019. This is because the UK is a net agriculture and energy importer with countries outside the EU. And as already noted, in non-EU trade the UK's huge surplus in services easily pays for the goods deficits, leaving the UK with an overall £53.8 billion surplus in 2019.

So, the UK's trade settings before exiting the Customs Union were at odds with long-term results. After 2000, seamless two-way access to EU markets resulted in stagnating goods exports and galloping imports. This is not what a successful trade policy is designed to accomplish. And incidentally, it's the reverse of what a traditional French-style mercantilist trade policy is designed to achieve. Meanwhile, the UK's trade outside the EU gained a far better result — and four-fifths of that trade was conducted primarily under WTO rules (see pages 18–21).

These observations matter because the UK's new trade agreement with the EU doesn't liberate the UK from long-term risks. Continued tariff-free, quota-free trade with the EU means the trends embedded in UK trade in the last two decades will persist unless a substantive change in policy occurs. Goods imports from the EU are growing 2.6 ppts faster per year than exports, while exports of services to the EU are growing just 0.6 ppts faster than imports. With financial services not protected in the UK–EU trade

agreement, this 0.6 ppts margin in export growth over import growth in services trade will likely fall. This means the overall UK–EU trade deficit is set to widen.

Steadily expanding deficits occur in all bar one of the UK's major manufacturing export sectors. Some of these deficits are huge, and each will be examined in chapters 2–11. They signal a profound asymmetry in UK–EU trade at a deep, sectoral level. The causes of these deficits will need to be addressed at some point, or the wisdom of tariff-free, quotafree trade with the EU will become a political issue. And one of the supreme oddities of the UK's exit from the EU is that – so far – no senior political figure has seriously questioned the desirability of tariff-free trade with the EU.

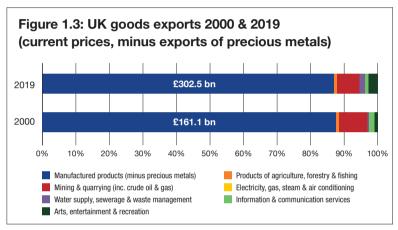
## Manufacturing

So much for trade in goods: how much does manufacturing contribute? With precious metals extracted from the mix, a breakdown looks like this. In 2019, 86.9 per cent of UK goods exports were manufactured goods. This proportion barely shifted in 20 years, having stood at 87.6 per cent in 2000. The remainder is mostly agriculture and resources commodities – of which some are impacted by tariffs, although the most valuable are not.

'Mining and quarrying' is the UK's most valuable *non*-manufacturing goods export category, although 'energy' is a more apt description. In 2019, approximately £22 billion of the £23 billion-worth of these exports comprised crude oil or gas, which are not subject to tariffs globally. That said, the value of energy exports is volatile. In the long term, the UK's oil and gas exports are declining and imports are rising.

The UK's agriculture and fisheries sector delivers a sliver of exports, worth just £3.4 billion in 2019. This is just over one per cent of UK goods exports, although food products –

which count as manufacturing – are worth about five times more. UK agriculture and fisheries exports are not volatile, but their value will rise slowly as the UK's fisheries increase the overall proportion of catch from UK waters that is landed and processed on-shore. Currently, exports of fisheries and aquaculture from the UK are worth £1.2 billion, with just under two-thirds going to EU markets (see Chapter 9). 10



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

## Where policymakers fear to tread

The prime purpose of this report is to understand how different manufacturing sectors have fared under differing trade relationships over the past 20 years. This is a vitally important topic because most sectors are now experiencing sustained change. Some sectors are more impacted by global tariffs than others. Scotch whisky encounters massive tariffs, especially when exports head east. Motor vehicles enjoyed a preferential market in the EU, courtesy of the 9–10 per cent auto tariffs imposed by the EU. Other sectors, like aerospace, gained nothing from the Customs Union because products are almost always traded tariff-free around the world.

Looking at trade sector by sector allows analysts to ask big questions. For example: are these variations in tariff rates in global trade reflected in the comparative growth rates of each manufacturing sector, inside and outside the EU? Did a tariff advantage inside the EU translate into faster comparative export growth?

Similarly, the relevance of EU market regulation varies sector by sector. Aerospace is – in effect – globally regulated, while food production is dominated by EU regulation. But did the theoretical advantage of harmonised EU regulation translate into faster export growth to EU markets? Did UK food exports, for example, grow faster in EU markets as compared to sectors where there was no benefit of harmonised regulation?

It's the comparative, sector-by-sector approach that makes this report unique. Most academic studies look at across-the-board trade performance. Economic forecasting models do not differentiate between the performance of individual UK sectors, such as cars or chemicals. Gravity Theory – which suggests trade expands more quickly between countries that are close together – takes no account of the fact that some UK goods are easier to transport than others. But UK trade is nuanced and varied. Some goods are sold bulk, others are brands. And performance changes over time. In pharmaceuticals, for example, exports performed well in the first decade of this study (2000–2009) and poorly thereafter. Multiple factors impact export performance. Only by analysing each sector does a realistic assessment emerge.

Most industry associations have published their own analysis of UK trade and the challenges and opportunities of an exit from the Customs Union. But no single study has put all the sectors into one analysis, using a single consistent

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set of data, and with a performance analysis stretching over a single period of time. By doing so, this research aims to bring perspective and proportion to UK trade analysis – and at the precise moment when the UK Government has regained the power to formulate policy.

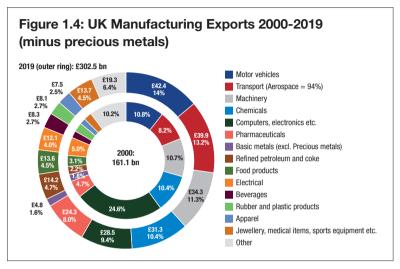
## What a difference 20 years makes

First, perspective. The composition of the UK's manufacturing exports has not changed much in 20 years. The 10 sectors that made up the bulk of the UK's manufacturing exports 20 years ago are the same that occupy the top 10 slots today. But the relative value of individual sectors has changed drastically. And it's here that UK trade starts to tell a fascinating tale.

Gaining export share were pharmaceuticals (4.7 per cent to eight per cent of manufacturing exports), aerospace (8.2 per cent to 13.2 per cent) and automotive sectors (10.8 per cent to 14 per cent). Already some insights emerge. The two fastest-growing – pharmaceuticals and aerospace – produce goods that were traded almost entirely tariff-free around the world under WTO rules during this period. This means that their success is unconnected with the ability of UK companies to trade tariff-free with the EU. They benefited from the EU's membership of the WTO, not the UK's membership of the EU.

Similarly, the emergence of the UK's auto sector as the country's premier export industry is an entirely non-EU affair. Exports *outside* the EU leapt a staggering 234 per cent in real terms from 2000–2019. They crisply overtook EU exports back in 2012 and are now worth 30 per cent more. Meanwhile, motor exports to the EU actually fell in value. This occurred despite the fact that UK-built autos enjoyed a substantial tariff advantage in EU markets. It also occurred

despite automotive regulation falling under the jurisdiction of the Single Market, thereby providing UK-made autos with an in-built advantage in EU markets. The forensics of this car smash are presented in Chapter 2.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

The biggest change in UK trade since 2000 is the dramatic fall in the value of UK exports of computers and electronics. Twenty years ago, they delivered 24.6 per cent of UK manufacturing exports; in 2019, just 9.4 per cent. The crash occurred after 2006. UK exports of electronics components, telecommunications equipment, computers, circuit boards and other electronic accessories simply collapsed. By 2019, exports to the EU had fallen by 65 per cent, and to non-EU countries by 27 per cent. The post-mortem on this sector occurs in Chapter 6.

The travails of UK trade in electronics makes for cautionary reading. Twenty years ago, the fact that electronics delivered one-quarter of manufacturing exports made UK trade look distinctly high-tech. Then the sector got savaged. This shows

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how fast an export industry can whither. It also shows that trade moves in mysterious ways – or in some cases at right angles. The computer and electronics industry is now dominated by manufacturing based in the Asia-Pacific. Yet it was the UK's exports to the EU that crashed, while UK exports *outside* the EU held up comparatively well. The answer to this oddity lies in the UK's success in industrial, as opposed to consumer, electronics.

Elsewhere, sectors that appeared frayed have flourished. Twenty years ago, who would have thought that the mechanical equipment industry – with all its Victorian heritage – would have surpassed the UK's flash, electronics sector as an export powerhouse? Yet it has. In value terms, machinery exports elbowed past their electronics counterparts in 2007, and outsold those circuit-board specialists by £5.8 billion in 2019. The root cause of the UK's prowess in machinery is unearthed in Chapter 4.

The UK's beverages sector is small but fizzing. Having delivered 1.9 per cent of UK manufacturing exports in 2000, it now delivers 2.7 per cent, with every prospect of even faster growth. In this case, a rise in exports is largely due to the popularity and proliferation of distilled drinks, mostly Scotch whisky and English gin. Exports to global markets leapt 96.5 per cent in real terms, despite up to half of non-EU exports going to high tariff markets in the Middle East, India and the Asia-Pacific. And another quirk: Scotch sales to the EU lolled along at a CAGR of just 1.3 per cent whilst getting thrashed by imports of Bourbon from the US. This odd result is examined in Chapter 11.

## UK's top 10 sectors: three metrics to watch out for

Chapters 2–11 will step through the UK's top 10 manufacturing export sectors, with corresponding graphs

and data for each sector. This enables the performance of each sector to be compared with the rest of UK manufacturing. To aid analysis, readers should keep three factors in mind:

- WTO rules and the UK's non-EU trade. Approximately four-fifths of the trade described here as 'non-EU' was conducted predominantly under WTO rules from 2000–2019. Thus, 'non-EU' trade is almost synonymous with 'WTO' trade.
- Relative economic growth rates of EU/non-EU partners. The UK's slow export growth rate cannot be solely attributed to the slow growth of the EU 27 economies, as measured by GDP. The numbers to look out for are 1.4 per cent (the CAGR of the EU 27's GDP during this period) and 3.3 per cent (the CAGR of the UK's top 40 non-EU trade partners' GDP).
- Comparative performance between UK sectors. One way to test whether the theoretical advantage of EU membership translated into export success is to compare the difference in EU/non-EU growth rates for each sector with the average for manufacturing exports. The 'comparative performance' test will be explained below.

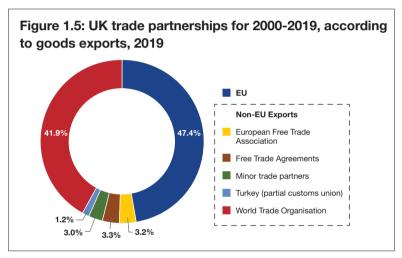
## WTO rules and UK's non-EU trade

From 2000 onwards, UK trade outside the EU was conducted overwhelmingly under terms governed by membership of the WTO, or what's called 'WTO rules'. For example, six of the UK's top 10, non-EU, export trade partners in 2019 were countries with whom the UK has traded almost entirely on WTO terms since 2000.

A list of the UK's top 30 goods export partners – plus the type of trade partnership (EU, WTO and so forth) – is

#### THE BIG PICTURE

presented in Appendix B. From the top,<sup>11</sup> these export partners were: the US (32.3 per cent of non-EU goods exports in 2019); China, WTO since 2001 (12.9 per cent); Hong Kong (4.3 per cent); Switzerland, European Free Trade Association (EFTA) (3.8 per cent); Japan (3.6 per cent); the United Arab Emirates (UAE) (2.9 per cent); Canada, free trade agreement (FTA) since 2017, therefore classed as WTO for this study (2.8 per cent); Singapore, WTO (2.7 per cent); India WTO/GSP (2.3 per cent); and South Korea, free trade agreement (FTA) since 2011 (2.1 per cent).



Source: ONS UK Trade in Goods – All Countries – Annual Exports (Balance of Payments series), January 2021. Values for US, China, UAE, Switzerland, South Korea, Turkey, Germany and other countries are adjusted to extract estimates for trade in precious metals, including non-monetary gold. See Appendix B.

Note: This chart uses 2019 goods exports data, and divides values between groups of countries depending on how UK predominantly traded with each country from 2000-2019.

From ONS 'by country' data, exports to the UK's top 40 export trade partners outside the EU accounted for more than 94.3 per cent of the UK's non-EU exports in 2019 (see Appendix B). With just 3 per cent of UK exports uncategorised, the distribution of UK trade looked like this:

- Countries and economies with whom the UK traded predominantly under WTO rules. These partners took 41.9 per cent of UK goods exports, or 79.6 per cent of the UK's non-EU goods-export trade in 2019. The top 10 were the US, China, Hong Kong, Japan, the UAE, Canada, India, Singapore and Australia (see Appendix B). Major adjustments were made to account for trade in non-monetary gold, especially with China and the UAE.
- Countries with whom the UK had a free trade agreement (FTA). These partners took 3.3 per cent of UK goods exports, or 6.3 per cent of non-EU exports. This category included South Korea, South Africa, Mexico, Egypt, Israel, Morocco and Chile. The Canada and Japan FTAs were signed too late in the 20-year period to justify inclusion in the FTA sector for a 20-year analysis. Korea was included since exports accelerated quicky after the 2011 FTA was signed. These FTA's reduce or eliminate tariffs on UK trade.
- Countries within the European Free Trade Association. EFTA countries took 3.2 per cent of UK goods exports, or 6.1 per cent of the UK's non-EU exports. This group comprises Switzerland, Norway, Iceland and Liechtenstein, with Switzerland taking almost two-thirds of exports. Swiss—UK trade in gold is huge, and a £4 billion adjustment was made to the calculations for 2019 (See Appendix B). Most trade with EFTA members is seamless because many sectors maintain regulatory alignment with EU rules.
- Turkey's hybrid customs took 1.2 per cent of UK goods exports, or 2.3 per cent of non-EU exports. This customs union provides for tariff-free trade in most nonagricultural goods.

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The remaining, minor trade partners comprise a mix of WTO and FTA partners, and Commonwealth countries with whom the UK trades under Generalised Systems of Preferences (GSP) terms. GSP terms allowed imports from developing countries into the UK essentially free of tariffs.

So, four-fifths of the trade classified here as 'non-EU' refers *in practice* to trade that was conducted predominantly under WTO rules from 2000–2019. Incidentally, ONS data reveals that goods exported to that WTO trade sub-group grew slightly faster than the average non-EU growth rate during 2000–2019, by 0.23 ppts. This largely reflects the fact that during this period, the UK did not have FTAs with fast-growing economies in Asia. It's also worth noting that some industry sectors are more WTO-oriented than others. The UK's energy trade is skewed towards EFTA because Norway is a principal UK supplier.

Nevertheless, in subsequent chapters where goods exports are referred to as 'non-EU', this means overwhelmingly 'WTO rules', and the average ratio is 79.6 per cent. And for exports, 'non-EU' CAGRs slightly understate WTO CAGRs.

## Relative growth rates of EU/non-EU economies

This report supports the assertion that the slow growth of European economies is not solely to blame for a poor export performance in the EU. As demonstrated with Michael Burrage in WTO versus EU: An assessment of the relative merits of UK's trade relationships, 1999–2018, the CAGR of UK goods exports<sup>12</sup> to WTO partners exceeded those partners' own GDP growth rates by an average 0.3 ppts for the period 1999–2018, while goods exports to the EU lagged EU economic growth rates by 0.76 ppts. This implied that UK goods exports outperformed GDP in non-EU markets, but underperformed in EU markets, from 1999–2018.

This report shows a similar discrepancy. The CAGR values for manufacturing exports are lower, principally because all precious metals have been extracted from the mix and not just estimates for non-monetary gold. This removes approximately £4.5–5 billion of exports which are valuable manufacturing exports, including platinum and processed uranium. Also, rapid trade growth in 1999 falls out of the calculations. This tips the CAGR for exports to non-EU manufacturing countries to slightly below non-EU GDP growth. But the spread between the CAGR of EU exports and non-EU exports is precisely the same as in the Burrage and Radford study. Exports to non-EU economies grew precisely 2.6 ppts faster than to EU economies.

This 2.6 ppts difference between EU/non-EU *export* growth rates is deeply curious because it's wider than the difference between EU/non-EU GDP growth rates over the same period. Using World Bank constant US\$ data for 2019,<sup>13</sup> the CAGR of GDP among the UK's top 40 non-EU trade partners was 3.26 per cent from 2000 to 2019. Using the same World Bank data, the CAGR of GDP among the EU 27 during the same period was 1.43 per cent. This isn't a surprise to anyone. It's an accepted fact of the world economy that the EU is relatively slow growing.

But that difference in EU/non-EU GDP growth rates doesn't match the far greater difference in export growth rates. In terms of GDP, the UK's non-EU trade partners grew 1.83 ppts faster than the UK's EU trade partners from 2000 to 2019. But the UK's *exports* to non-EU trade partners grew 2.63 ppts faster than exports to EU partners over the same period. In other words, after discounting for the differences in economic growth rates, manufacturing exports to the UK's non-EU partners still grew 0.8 ppts faster per year than to EU partners.

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This statistical quirk is a trade analysis bombshell. What it means is that despite seamless, tariff-free access to EU markets, UK manufacturing exports performed comparatively better outside the EU than in it from 2000 onwards – even after differences in economic growth are taken into account.

This observation is confirmed in the sector-by-sector analysis that follows. In six out of 10 sectors, UK manufacturing exports to EU markets grew more slowly than the CAGR of the EU 27 economies over the period 2000–2019. In only four sectors did UK export growth rates outpace EU economies': transport/aerospace goods, pharmaceuticals, food products and beverages. Strange to say, the first two sectors – transport/aerospace and pharmaceuticals – were the two sectors that gained the least advantage from the UK's EU membership out of the 10 sectors analysed here. And deciding whether the beverages sector did benefit overall from EU membership is a fiendish calculation.

The 0.8 ppts discrepancy between export and GDP growth rates is the clearest possible indication that slow GDP growth in the EU is not the principal cause of slow export growth to EU markets. Something else was going on. To see what, it's helpful to keep those two GDP growth rate numbers in mind during the sector-by-sector analysis:

- 1.4 per cent, which is the rate at which the EU 27 economies grew from 2000–2019; and
- 3.3 per cent, which is the equivalent number for non-EU partners.

Ideally, export growth rates could be compared against the growth of each sector's markets in different countries. That analysis lies beyond the scope of this research – at least for most sectors. Nevertheless, an export CAGR under 1.4 per cent for EU markets tends to indicate that UK exports underperformed in the EU from 2000–2019. An export CAGR above 3.3 per cent in *non*-EU markets suggests UK exports were highly competitive in global markets. When both happen together, that suggests something very strange indeed was going on. And in the UK's auto sector, it was.

## Comparative performance of UK sectors

To evaluate the impact of the Customs Union and Single Market on trade in each manufacturing sector, a 'comparative performance' test was devised. The objective is to assess whether the theoretical advantage of seamless, tariff-free trade really did translate into enhanced export performance.

The idea behind the performance test is straightforward. The Customs Union and Single Market impacted different sectors to differing degrees: food products – massively; aerospace – hardly at all. If the Customs Union and Single Market genuinely benefited exports in any given sector, then it should be apparent from that sector's export performance as compared to other sectors. In other words, the sectors that benefited strongly from the Customs Union and Single Market should see exports to EU markets grow faster than those sectors that didn't benefit or benefited just slightly.

To work, the test needs a benchmark against which export growth rates can be compared. The comparison can't rely on absolute export growth rates themselves because some sectors grow faster than others. Pharma grew faster than food, for instance. But the test can rely on the average 2.63 ppts that separates the CAGR of exports to EU and non-EU countries. That 2.63 ppts difference can be used as a benchmark for comparative performance.

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The test works like this: those sectors that are *most* impacted by the Customs Union (via protective tariffs) and the Single Market (via harmonised regulation) *should* be those where the 2.63 ppts difference between EU and non-EU CAGR narrows, because that sector enjoys special preferences in EU markets *as compared to other export sectors*. Conversely, those sectors that gain little or no preferential access to EU markets should be the ones where the differential exceeds 2.63 ppts. And since that 2.63 ppts is an average, and since the sectors analysed here cover 79.2 per cent manufacturing exports, the sectors have to balance as they fall one side or the other of that average.

Two examples illustrate how the test works in practice. The EU's tariffs on food imports are typically its highest. This gave UK food exporters a highly protected market within the EU, which they did not enjoy outside the EU. And this is also a sector where EU regulation is pervasive. Therefore, if UK exporters genuinely benefited from EU harmonised regulation and a large, rigorously protected market, this should be one sector where UK exports to EU markets performed well compared to EU exports in other sectors. The 2.63 ppts average difference between EU and non-EU export growth rates *should* narrow.

And so it does. Exports to non-EU markets still grew faster than to the EU (by 4.3 per cent p.a. to 2.9 per cent p.a.), but the *difference* between the two narrowed from the manufacturing-wide average of 2.63 ppts to just 1.4 ppts. So far, so good. That narrowing difference between EU and non-EU export growth rates is a signal that this was a sector where the Customs Union and Single Market exerted a positive effect. Comparatively, food-products exports to the EU performed well.

Conversely, in transport/aerospace one would anticipate the reverse. WTO members eliminated tariffs on aerospace goods in 1980, so UK-manufactured aerospace parts enjoyed no commercial advantage in EU markets. And regulation is, in effect, global. This is largely because the European Aviation Safety Agency collaborates with the US Federal Aviation Administration on certifications. In practical terms, there is no competitive gain for UK aerospace goods in being part of the Single Market because US-made aerospace parts are not discriminated against within the EU.

Consequently, aerospace is one of those sectors where the 2.63 ppts average differential *should* widen. But in this case, mysteriously, it does not. Actually, UK aerospace exports to the EU grew quickly in absolute and comparative terms. They grew by 3 per cent per year to the EU from 2000–2019, as compared to 4.3 per cent CAGR for the rest of the world. That 1.3 ppts difference is even narrower than for food products (1.4 ppts), when it should be considerably wider than the 2.6 ppts average. This implies that in a sector where UK exports to the EU have performed – comparatively – very well indeed, they have done so *despite* the fact that the Customs Union and Single Market gave them little or zero help.

This CAGR test may seem a finnicky diversion. But it seeks to answer a fundamental question: 'did the Customs Union and Single Market deliver measurable benefits to UK manufacturing exports?' In theory, of course they did since they removed taxation and regulatory barriers. But in practice the evidence is scanty. Stagnant EU exports and huge deficits are a clear warning that the Customs Union and Single Market did not deliver the results that UK membership of the EU was supposed to deliver. But the core question can only be answered by comparing the actual performance of each sector with the benefits each sector was supposed to have gained within the EU.

Knowing the value of seamless trade with the EU is more

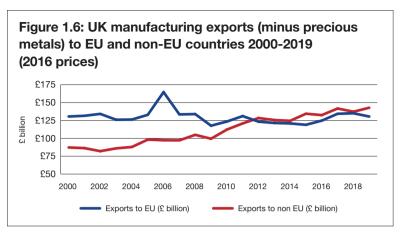
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important than ever. For the moment, the UK has exited the Customs Union with a deal that should minimise dislocation to trade. But as a sovereign trade power, the UK will find itself constantly asking the question: 'What is it worth to us to maintain free trade with the EU?' Fresh opportunities, global risks, political conflicts and emerging technologies will batter away at the current bargain. The EU will always maintain 'tariff-free, quota-free access' as a trump card in any negotiation. For the UK to make the most of its freedom, the country needs to know when it can walk away.

The comparative performance test will be developed in a follow-up annex to this report. This will extend the analysis to the UK's top 14 export sectors, covering 93.6 per cent of UK manufacturing exports in 2019. It will assign quantitative values to the apparent benefit that the 14 sectors derived from seamless, tariff-free access to EU markets. Then it will statistically correlate the results. The study provides the most damning evidence so far that the Customs Union and Single Market exerted no positive, measurable benefit on UK manufacturing exports over the final 20 years of the UK's membership of the EU.

## The dramatic rise of UK's global manufacturing exports

Before starting on the sector-by-sector analysis, it helps to grasp the broad sweep of UK manufacturing exports over the past 20 years. Back in 2000, manufacturing exports to countries outside the EU were worth just 67 per cent of exports to the EU. After a decade of fairly steady growth, they superseded EU exports in 2012. After that, they grew at a more moderate pace, though kept ahead of EU exports in value. In 2019, the value of manufacturing exports to non-EU countries was worth £13.6 billion more than exports to EU countries.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices)

It's not possible to characterise the trajectory of EU exports in one, crisp sentence. Discounting for inflation, the value of UK manufacturing exports to the EU in 2019 was almost exactly what it had been 20 years before. But in general terms, exports fell. According to ONS data, the value of manufacturing exports to EU peaked in 2006 – though the data that year is distorted by exceptional exports of communications equipment. Nevertheless, the average annual value of manufacturing exports to the EU during the decade 2010–2019 was actually lower than in the decade 2000–2009 (£126.3 billion to £133.1 billion in 2016 prices). In real terms, manufacturing exports to the EU have been in decline for over a decade. And that decline set in before the referendum on EU membership.

In contrast, UK manufacturing easily outperformed in global markets from 2000–2019. This is the key lesson learned for UK trade analysts. Even after discounting for faster GDP growth rates outside the EU, UK manufacturing still performed better in global markets as compared to the EU. And even within the EU, the sectors that performed

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the best were the ones that were least impacted by the Customs Union and Single Market. How this happened will gradually unfold as this study steps through the fortunes of the UK's top 10 export sectors in the final two decades of UK membership of the EU.

## Motor vehicles & parts

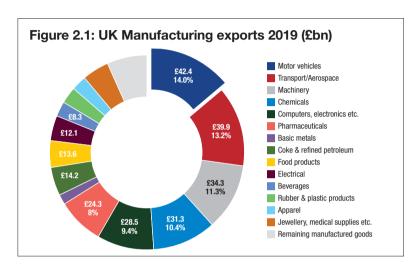


Table 2.1

UK exports of motor vehicles & parts	2019	CAGR 2000–2019
To EU countries	£18.5 bn	-0.1%
To non-EU countries	£23.9 bn	6.6%
Total	£42.4 bn	2.6%

UK imports of motor vehicles & parts	2019	CAGR 2000–2019
From EU countries	£48.1 bn	2.9%
From non-EU countries	£9.8 bn	3.5%
Total	£57.9bn	3.0%

Trade in motor vehicles & parts, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	10.8%	14.0%
Balance EU	−£7.7 bn	-£29.6 bn
Balance non-EU	£1.1 bn	£14.1 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Current price

## The UK motor-vehicle industry

In 2018, the UK auto industry directly employed 167,000 people<sup>15</sup> and generated a turnover of £78.7 billion. This makes motor manufacturing the UK's second-largest industry. In value terms, it generates almost as much revenue in UK as food production, although it employs less than half the number of people (see Appendix A). Its emergence as the UK's biggest manufacturing export industry is a recent phenomenon. Back in 2000, exports were worth less than half the computers and electronics sector, and at level pegging with machinery or chemicals. But rapid growth from 2009 powered it into pole position. In 2019, exports of motor vehicles and parts was worth £42.4 billion, which was £2.5 billion more than the UK's next biggest export sector – aerospace.

For those with memories of the 1970s and 80s, the fact that the UK's motor industry is both fast-growing and globally competitive will come as quite a shock. But in an astonishing U-turn, the UK's motor industry now produces motor vehicles that are popular overseas, and UK auto designers are global trend setters. In UK factories, turnover rose from £50.5 billion (£58.4 billion in 2018 prices) in 2008 to £78.7 billion in 2018, according to ONS data. This is the fastest rise in turnover of any of the 10 manufacturing sectors analysed here. Gross value-added (GVA) – which is output minus cost of inputs – rose from £10 billion (£11.9 billion in 2018 prices) to £15.3 billion over the same period.

This GVA metric is an important metric throughout this report. In this case, the rise in GVA means that the actual value of activity in the motor industry grew almost as fast as turnover. It means that higher output or revenue in the car industry isn't disguising a dramatic rise in imported components.

One especially bright indicator in the automotive sector is productivity growth. The UK industry association for manufacturing, Make UK, reckons productivity grew more strongly in the UK's auto sector after 2009 than in any other major manufacturing sector. ONS data supports the assertion. The rise in GVA from 2008 to 2018 (29 per cent, in real terms) was accompanied by an actual fall in the number employed. What's more, motor manufacturing appears set for expansion. Make UK calculates it receives 22 per cent of research and development (R&D) investment in UK manufacturing, placing the sector second only to pharmaceuticals. 17

The 2,400-odd companies that supply parts to auto factories appear to be competitive as well. According to The Society of Motor Manufacturers and Traders (SMMT), the proportion of UK-built cars that originates in UK manufacturing has increased from 36 per cent in 2011 to 44 per cent in 2019. This indicates that productivity increases observed in the UK motor industry over the past decade extend deep into supply chains and are not confined to the car makers themselves.

The sector is moderately dependent on trade as compared to other manufacturing sectors. The SMMT claims that 81 per cent of UK-made vehicles were exported in 2019.<sup>19</sup> The proportion in terms of value appears lower, however. Using ONS 2018 data, including from its ABS survey, the value of exports was the equivalent of 56.1 per cent of the value of turnover that year. This is fairly middle-of-the-road for UK manufacturing. Export ratios for pharmaceuticals and aerospace are far higher.

But unlike 20 years ago, the UK is now a growing carexporting country. According to Make UK, the country is now the world's ninth-largest car exporter, with exports to

Asia rising particularly fast.<sup>20</sup> That's quite a turnaround. As will be seen, this success is mostly due to premium British marques.

#### What does the UK make and where?

According to SMMT, approximately 1.3 million cars rolled off UK production lines in 2019, and 2.5 million engines were winched off. The industry also accounted for approximately 78,000 commercial vehicles. Vehicle manufacturing itself is the single biggest activity in the industry, contributing £62.7 billion to the £78.7 billion of sectoral turnover. Making the coachwork (or car bodies) contribution £3.2 billion, while the manufacture of other parts, such as powertrains and accessories, accounted for £12.7 billion. Making the electrical and electronic components used in cars is a declining activity. In 2018, this sub-sector accounted for just £256 million of output, having decreased by more than two-thirds since 2008.

One critical aspect to the industry is its volatility. According to SMMT, in 2016 output topped 1.7 million cars, which was 400,000 more than in 2019. Making cars and carparts is a high-risk business, and – unlike say aerospace or food products – a statistics roller-coaster. However, there is one clear trend in UK car manufacturing that is highly relevant to trade: the comparative success of luxury British marques in global markets. This group includes many brands, but the most prominent are Range Rover, MINI, Bentley and Rolls-Royce. The popularity of luxury British brands helped to skew UK exports away from the EU and towards global markets during the period covered by this research.

The geography of British motor manufacturing is rooted in its history. In this case, the UK's auto makers remain anchored to the traditional metal-bashing districts of the West Midlands – and specifically Coventry, Solihull, Wolverhampton and Castle Bromwich. According to Make UK, 50 per cent of the industry is in the West Midlands,<sup>23</sup> and new investment in electric vehicles (EVs) means the West Midlands will likely retain pole position in the short term.

Coventry's role is vital. It is the location of Jaguar Land-Rover's (JLR's) headquarters and home to the company's niche Special Vehicle Operations centre, while two principal engineering centres are located just to the south. Nearby is the Warwickshire Manufacturing Group (WMG), which is an academic department of the University of Warwick. The WMG is important because it kept the spiritual flame of UK auto design and manufacturing alive during its late-twentieth century death spiral. The WMG is genuinely successful as a university-industry bridge.

Other car-manufacturing centres include: Hailwood near Liverpool (also JLR); Ellesmere Port (Vauxhall); Oxford (MINI); Sunderland, Derby and Swindon (respectively Nissan, Toyota and Honda); Crewe (Bentley); Goodwood (Rolls-Royce Motor Cars); Hethel in Norfolk (Lotus); and Gaydon, South Warwickshire (Aston Martin). All bar the last is foreign owned; and Aston Martin anyhow enjoys a lively turnover in ownership.

Commercial vehicles is a slightly different story. Scotland-based Alexander Dennis makes buses in Falkirk and Guildford and has plants around the world. The company was bought by the Canadian NFI Group in May 2019. But the UK's biggest truck maker, Lancashire-based Leyland, is also foreign owned, in this case by US truck maker Paccar. Foreign ownership is a critical feature of UK auto manufacturing. It is these overseas enterprises – with their introduced work practices, management skills and access to

investment capital – that have revived and now sustain UK motor manufacturing.

Personality has also played its part. The UK's auto industry would not be garnering global awards without the design genius of JLR's Ian Callum, or an executive board at JLR that was largely cherry-picked from Germany's car industry. And a 21-gun industrial salute goes to the founder of the WMG, Professor Kumar Bhattacharyya. In a 50-year career devoted to motor manufacturing, Bhattacharyya brokered the academic and commercial partnerships that underwrote the technological end of the Midlands motor-vehicle renaissance. This courageous and determined engineer never lost faith in UK motor manufacturing and committed his professional life to it.

Motorsports is also a catalyst for skills development. The SMMT reports that motorsports in the UK sustains an astonishing 25,000 engineers. And the trend towards bespoke and hand-crafted vehicles is also reflected in trade. Ultra-luxury marques like Bentley and Rolls-Royce are more-or-less hand crafted and made to customer spec. Even JLR produces bespoke models at its Special Vehicles Operations on the old Peugeot site at Ryton, outside Coventry. This is essentially an export business and UK carmakers have proved exceptionally successful at it. The higher end a vehicle gets, the more likely the customer is to be outside Europe altogether.

So, UK motor manufacturing has had a two-decade renaissance, especially at the luxury end of the business. With the combined passion of designers, engineers, academics, and craftsmen and women – plus the deep pockets of investors from Japan, India and Germany – the ghosts of Longbridge and British Leyland have been firmly laid to rest.

#### Trade: EU versus non-EU

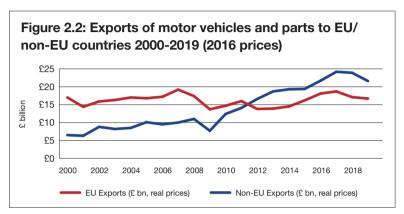
Domestic success has translated into export triumph. In real terms, the export of motor vehicles and parts grew by 63 per cent in the two decades from 2000. This powered the auto sector to the top of the UK's manufacturing export league table, as its share grew from 10.8 per cent of manufacturing exports in 2000 to 14 per cent in 2019.

This export renaissance owes nothing to EU markets, however. Despite preferential access to the EU, UK auto exports to EU countries in 2019 were actually lower than in 2000 in real terms (see below). And the intervening period reveals an unsettling trend. Adjusting for inflation, the average value of exports to the EU for 2010–2019 was £16 billion (in 2016 prices), which is half a billion pounds *lower* than the equivalent average for 2000–2009, at £16.5 billion. Depending on how far back you want to go, UK auto exports to EU markets are either firmly parked or gently rolling backwards.

Meanwhile, in the non-seamless world of non-EU trade, UK exports leapt ahead by a staggering 234 per cent. In 2000, exports outside the EU were worth one-third of EU exports; in 2019 they were worth £5.5 billion more. This means that *all* of the growth in motor-vehicle exports since 2000 is attributable to markets outside the EU.

This one-sided turnaround is rarely commented upon by the auto industry. The SMMT routinely emphasises the importance of EU trade in its publications.<sup>25</sup> For example, it reports that 54.8 per cent of cars exported from the UK went to the EU in 2019.<sup>26</sup> This gives the impression that the EU remains the UK's dominant market. As ONS data makes clear, the EU took just 43.5 per cent of the *value* of exports of vehicles and parts in 2019. And the ONS data also makes clear that this proportion is briskly declining (see 'Long

term trends', below). This sharp decline in the relative value of EU export trade is absent from SMMT communications, yet it's the most obvious trend in the UK's trade in motor vehicles.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices)

The reason why ONS data and SMMT reports give divergent impressions is that the UK sells different models into different markets. While the UK exports predominantly mass-market models to the EU (Hondas, Nissans and so forth), global markets are hungry for premium marques – which are far more expensive and increasingly customised. Sadly, UK-made Japanese brands don't captivate European drivers to anything like the same extent. EU drivers purchase more UK cars than the rest of the world, but they are cheaper models that cost a lot less.

It's an entirely different story with imports, however. From 2000, imports of motor vehicles and parts from EU suppliers grew by a CAGR of 2.9 per cent. This is quite an impressive growth rate. It exceeds the average rate of growth of manufacturing imports into the UK (2.3 per cent per year). It also exceeds the UK's own economic growth

rate over that period (1.75 per cent per year). While imports from non-EU countries grew faster at 3.5 per cent per year, the value of non-EU imports is tiny by comparison: it reached just £9.8 billion, or one-fifth of value of imports from the EU in 2019.

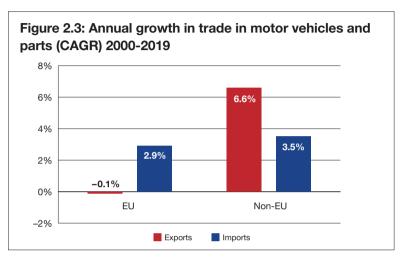
With £48.1 billion-worth of auto imports from the EU in 2019, the UK's motor vehicles sector clocks up the UK's biggest import bill. And £48.1 billion is a huge number in trade terms. It is currently double the value of food products that the UK imports from the EU (see Chapter 9). It's the biggest number that appears in exports or imports of any sector across UK trade in goods or services.

There is an inevitable and malign consequence when static exports combine with huge and fast-growing EU imports. In 2000, the UK's deficit in autos with the EU stood at -£7.7 billion. Growing relentlessly over two decades, it reached -£29.6 billion in 2019. This is also a huge number in UK trade. It is easily the UK's largest sectoral deficit. And it is sufficient to write off the £18.2 billion surplus that the UK generated in its trade in financial services with the EU in 2019. In fact, the UK's entire services surplus with the EU was only £17.9 billion in 2019, which shows how far UK–EU trade in motor vehicles impacts the flow of wealth across borders.

## Trade relations and the UK's comparative performance

From 2000 to 2019, the CAGR of the UK's automotive exports to EU markets was -0.1 per cent. The CAGR for exports *outside* the EU was 6.6 per cent. The difference between the two, at 6.7 ppts overall, is the most extreme in all UK trade. And while it may not sound much, repeated every year for 20 years, it's the difference between exports shrinking by 2.1 per cent (to the EU) and growing by 234 per cent (to non-EU countries). But the real surprise is that this has happened

in one of the sectors where UK manufacturers should have most benefited from membership of the Customs Union and Single Market.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

Under the EU's Common External Tariff (CET) schedule, UK motor exports gained a 9–10 per cent tariff advantage in EU markets as against non-EU auto manufacturers throughout the 2000–2019 period. This is the highest average CET rate for a major manufacturing sector outside of food products. Beyond the EU, many major economies also impose tariffs on motor vehicles. China imposes tariffs of 15 per cent, though the US historically maintains low or zero-percent tariff. Motor vehicles is also a sector where EU regulations are unified and impactful. If evidence is needed, consider JLR's 2013 decision to stop making the classic 'Defender' Land Rover at Solihull, owing to EU emissions regulations.<sup>27</sup> This indicates that in the auto sector, EU law genuinely defines the market, in the sense that it governs what products can and can't be made.

If membership of the Customs Union and participation in the Single Market genuinely benefited UK manufacturing exports, then this should be one of those sectors where the difference between the UK's EU and non-EU export growth tightens from the 2.6 ppts average. UK motors get preferential access to EU markets, whereas in other sectors there is a level playing field and exports must compete equally with global suppliers. Also, and unlike say in aerospace, there are major tariffs to navigate outside the EU.

But the result goes powerfully against expectations. Instead of narrowing from the average 2.6 ppts difference in EU/non-EU export growth rates, that 6.7 ppts difference represents a radical divergence in performance. In other words: despite the fact that UK auto exporters gained highly preferential terms in EU markets, their export performance in EU markets was terrible compared to other sectors. Actually, it was the worst comparative export performance of any of the UK's top manufacturing sectors, *despite* the substantial benefits of seamless trade with the EU.

This is easily the most perverse finding in this report. Exports *outside* the EU grew at twice the pace of those markets' aggregate GDP growth rate (CAGR of 6.6 per cent as compared to 3.3 per cent), while exports to EU markets drastically undershot those economies' own much lower GDP growth (CAGR of -0.1 per cent to 1.4 per cent). That it should have happened in a sector where the Customs Union and Single Market had a major commercial impact is inexplicable in terms of conventional trade theory.

## Long-term trends

Perhaps events on the ground can shed some light. As the UK's import CAGRs suggest, the most notable structural trend in UK auto manufacturing since 2000 is the progressive

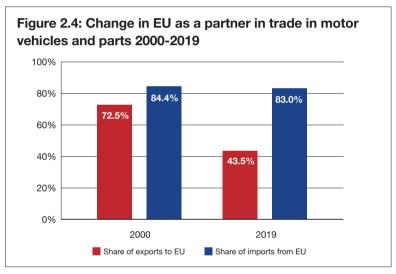
offshoring of production from the UK to elsewhere in the EU – principally Germany, Spain, Austria and the Netherlands – as well as Turkey. Importantly, this trend is now affecting the UK's premium marques. BMW, owner of the MINI, now produces over one-third of its MINI vehicles at VDL Nedcar in Born, Netherlands. Jaguar-Land Rover commenced production of its Jaguar E-pace and I-pace models at a Magna Steyr plant in Graz, Austria. Some models of Range Rover Discoverys – and the re-born Defenders – are being assembled not in Solihull, but at a €1 billion plant at Nitra in Slovakia.

Importantly, the decisions to offshore MINI production, close the Solihull Defender production line, and open the new JLR factor in Slovakia all predate the 2016 referendum.

As production drifted from UK factories to elsewhere in the EU, models that used to be produced in the UK are now registering as imports. In 2000, auto imports from the EU were just £25 billion (in 2016 prices). In 2019, they reached £48.1 billion – and as an import total for a single sector, that latter figure is in a class of its own. What's more, there was no compensating upsurge of investment in the opposite direction. The evidence for this is the fact that the UK–EU deficit in motor vehicles and parts tripled from –£7.7 billion (in current prices) in 2000 to –£29.6 billion during this period. If investment was flowing in the opposite direction (that is, from the elsewhere in the EU into the UK) then that deficit would have stabilised or shrunk.

In blunt terms, whatever success British brands had in the EU post-2009 failed to compensate for the fact that EU customers were clearly not driving UK-made Nissans, Hondas and Toyotas off continental forecourts with any zest. Nor were EU-based car plants incorporating UK-made parts or engines in EU-made vehicles at sufficient pace to reverse the downward trend in the net deficit.

In terms of global market share, the end result was brutal. EU manufacturing – and German car companies in particular<sup>28</sup> – retained a vice-like grip on the UK's auto imports during this period. In 2019, the EU supplied 83 per cent of auto imports into UK, which was only fractionally down from the 84.4 per cent it supplied in 2000. The picture in exports is wildly different. In 2000, the EU took 72.5 per cent of UK auto exports; by 2019, this had plummeted to just 43.5 per cent.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

This divergence in market share for imports and exports is the so-called 'captive market' effect. This is the term used to describe what happens when the EU retains or increases its dominance as a supplier of UK imports, while taking ever fewer UK exports. Incidentally, the decline in the EU as an export market since 2000 – by 29 ppts – is the fastest of any sector analysed in this report. The only reason that the UK's auto export industry appears healthy is the near

quadrupling in exports to non-EU countries since 2000. And this success is now imperilled as UK premium marques shift production to the EU.

Why has investment shifted? One obvious reason is the combination of the Customs Union and state subsidies. Conscious of the value generated in local supply chains, governments are easily persuaded by car makers to subsidise new investment in factories. And this process is often repeated when models need a refresh. This means EU governments compete against each other to attract investment by providing subsidies. These subsidies are especially large in Germany. In 2017, the German newspaper, *Handelsblatt*, reported – on the basis of German Government data – that German carmakers had received more than €115 *billion* of public money in the preceding decade.<sup>29</sup> Participation in the Customs Union meant that these heavily subsidised EU-built vehicles could then be imported seamlessly back into the UK.

Subsidies are endemic across the EU and encourage UK brands to shift production to continental Europe. When Jaguar-Land Rover was deciding where to build its new Discovery and Defender models in 2015, the Slovak Government offered it a €125 million state-aid grant.³0 This grant was legal and was subsequently approved by the European Commission (EC).³¹ Offshoring impacts trade in a double sense. Today, a UK driver who buys the new Range Rover Defender³² buys an import, less the value of the Wolverhampton-made engine and other UK parts. So, the UK's imports from the EU increase. But a US buyer purchases a Slovak export, not a UK one, which means the UK's non-EU exports fall.

In this way, offshoring to the EU is now directly impacting the UK's global trade. This trend for offshoring

in the manufacture of premium marques partly explains why UK production and exports to non-EU markets dipped from 2017. This is a phenomenon that recurs in the UK's pharmaceuticals industry (see Chapter 7). It's a clear warning sign that two of the UK's three most successful global export industries are heading for trouble. It's a trend that UK trade policy will now have to confront.

The threat is serious. From initial analysis, it appears the new UK–EU trade deal will increase the captive market effect in the auto industry by enforcing a preference for EU-made car parts. The rules of origin (RoO) requirements for UK motor vehicles have been framed to ensure that to qualify for tariff-free status, UK-based car makers will have to ensure that a high proportion of motor-car content is sourced from either the UK or EU – what's called 'bilateral cumulation'. For electric vehicles and batteries, a gently increasing RoO scale means that content sourced from the UK or EU will have to rise from 45 per cent in 2021 to 60 per cent over the coming decade.<sup>33</sup> Thus, the EU will secure for itself an everhigher portion of the UK's imports of auto-parts.

Attempts by the UK to include parts from outside the EU, especially Japan and Turkey, were allegedly rejected during negotiations for the trade deal. If successful, these attempts would have enabled the UK to globalise its car production more effectively. In particular, they would have given UK manufacturers freedom to source car batteries from the cheapest global suppliers, increasing the competitiveness of UK electric vehicle (EV) manufacturing. But that's not happened. The RoO in the new trade deal will entrench the dominance of EU parts suppliers in UK auto manufacturing and enforce existing trends. That 83 per cent dependence on the EU for imports—already the highest of any manufacturing sector—will likely increase in the coming decade.

So, a review of the UK's auto trade since 2000 leads to a blunt and unlikely conclusion. Membership of the Customs Union and Single Market failed to stimulate UK exports to the EU in an industry where UK manufacturing proved itself highly competitive in global markets. Stagnant exports to the EU – plus the 6.7 ppts differential in growth rates – is the evidence. Yet tariff-free trade and regulatory alignment also facilitated a dramatic rise in imports from the EU. The evidence for this is the rising deficit in cars and auto parts, from –£7.7 billion in 2000 to –£29.6 billion in 2019. The new UK–EU trade treaty will entrench the long-term trends behind this imbalance, not abate them.

The principal factor driving the UK trade in motors is the net flow of investment to EU-based manufacturing plants. And a major factor in investment choices is the subsidies that EU governments give to car makers and automotive suppliers. The net result is that UK automotive exports to the EU are now in long-term decline. Exports to global markets, which were once stellar, are stalling. This is hardly the picture presented by the SMMT. But the data speaks for itself. The UK will need to confront those subsidies or revise its EU trade relations in motor vehicles. If it does neither, then the most successful British global export industry of the past 20 years will skid silently across the channel.

# Transport equipment and aerospace

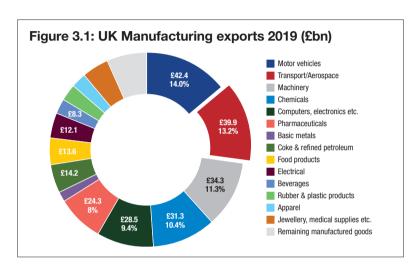


Table 3.1

Exports of transport & aerospace	2019	CAGR 2000–2019
To EU countries	£13.9 bn	3.0%
To non-EU countries	£26.0 bn	4.3%
Total	£39.9 bn	3.8%

Imports of transport & aerospace	2019	CAGR 2000–2019
From EU countries	£9.2 bn	3.4%
From non-EU countries	£19.4 bn	3.1%
Total	£28.6 bn	3.2%

Trade in transport & aerospace, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	8.2%	13.2%
Balance EU	£1.76 bn	£4.7 bn
Balance non-EU	−£0.04 bn	£6.6 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Current prices.

## The UK transport equipment and aerospace industry

The UK's second-largest export sector is termed 'Other transport equipment' in the ONS standard industry classification system. In trade terms, this means aerospace. In 2019, aerospace contributed 92.9 per cent of the value of exports in this category. So, in this report, the term 'aerospace' will be used as shorthand. Products in this sector mostly consists of wings and turbojet engines for civilian aircraft, and a wide array of aerospace components. The only significant non-aerospace goods are motorbikes and bicycles. And this rump of non-aerospace goods will soon erode further as Leicester's Triumph Motorcycles shifts the remainder of its volume UK manufacturing to Thailand.<sup>34</sup>

Across the UK, the aerospace industry employs 93,000 people, with a turnover of £27.9 billion in 2018. The UK's aerospace industry body, ADS, estimates the value of specifically space-related production at just over one-sixth the total. It also reckons there is a 75:25 split in terms of civil-military output. For Gross value added (GVA) reached £6.7 billion in 2018, or approximately two-thirds the GVA of the auto industry. Spending on R&D is also high, reaching £1.7 billion in 2018. As a sector, the UK aerospace industry is the third-largest spender on R&D after the pharmaceutical and motor vehicle sectors.

Like the UK's luxury auto sector, the aerospace sector is increasing its share of UK manufacturing activity. Industry bodies estimate it grew from contributing just 3.9 per cent of UK manufacturing in 2006 to 5.6 per cent in 2016.<sup>37</sup> Tellingly, exports grew even faster – from contributing 8.2 per cent of the UK's manufacturing exports in 2000 to 13.2 per cent in 2020. This is extremely rapid, and only pharmaceuticals grew faster. According to Make UK, the UK now has the second-largest aerospace industry in the

world and the UK is the world's fourth largest aerospace exporter.<sup>38</sup>

Currently, the aerospace industry is probably the UK's *most* trade dependent. Exports of purely aerospace-related equipment reached £33.5 billion in 2018, which is the equivalent of 120 per cent of domestic output in that year. It may seem odd that the value of exports exceeds the apparent value of domestic production, but the phenomenon occurs for several reasons. The principal reason is that the value of goods increases from the moment they leave a factory to the moment they are onboard at a port or airport of departure. Besides carriage and export costs, mark-ups are also added. Another reason is straightforward trade. Some goods are imported, re-packaged and re-exported without further manufacturing input. This is a trait of UK trade in pharmaceuticals.

Nevertheless, trade intensity in UK aerospace is more or less stratospheric. Make UK estimates that in 2019, 47 per cent of total supply into production was imported.<sup>39</sup> The aerospace industry body, ADS, reckons a staggering 94 per cent of the physical output of the UK aerospace industry is exported. This is easily the highest export ratio of any UK sector.<sup>40</sup>

## What does the UK make and where?

Like the auto industry, most products are easy to picture. The industry is dominated by the manufacture of parts for aircraft. Aircraft wings are made for Airbus airliners at Broughton in North Wales and Filton near Bristol. Turbojet engines and their constituent parts are made by Rolls-Royce at Derby and other sites across the UK, including Inchinnan, just west of Glasgow. Military jet engines are assembled in Bristol. Rolls-Royce earns itself a special mention as one of the UK's very few, large, world-class engineering

companies. Before coronavirus sent demand into a nosedive, the company employed 22,000 people in the UK alone.

UK companies also manufacture a spectacular array of niche aerospace parts, including landing gear, safety belts and de-icing equipment.<sup>41</sup> Northern Ireland hosts several aerospace factories, notably the former Bombardier plant in Belfast, and Thompson Aero Seating in Portadown. Although products fall under a different categorisation, the UK is also a leader in avionics and aviation sensors. Companies in this sub-sector include Meggitt, Thales UK, Qinetiq and Ultra Electronics – and they are all world leaders.

One unlikely feature of UK aerospace is a high degree of small-scale entrepreneurship. For example, the small privately owned company, Martin-Baker, is probably the world leader in ejector seats. In Oxfordshire, Reaction Engines Limited is apparently on the cusp of creating a single-stage-to-orbit engine that would lower the cost of launching and retrieving satellites. And the UK appears to have gained global leadership in many space-related technologies. ADS claims that 40 per cent of all small satellites currently in orbit were manufactured in the UK.<sup>42</sup> Nanosatellites that are no bigger than microwave ovens are now manufactured in Glasgow.<sup>43</sup>

The number of enterprises involved in aerospace has itself rocketed. The UK government reckons that the total number of businesses quadrupled in number from 2008 to 2015.<sup>44</sup> More conservative estimates put the total number of enterprises at 2,356 in 2018, with all transport-related enterprises included.

So, the UK's aerospace manufacturing industry is entrepreneurial and characterised by small-scale innovation despite being dominated by two behemoths (Airbus and Rolls-Royce). The fact that the aerospace sector combines

fast-growing exports and a fast-growing number of businesses makes it important to emphasise the role of small and medium-sized enterprises (SMEs) in contemporary manufacturing. In corporate terms, atomisation is underway. Small businesses are proving adept at integrating into global supply chains. And the proliferation of SMEs exactly fits the trend of agile, export-minded SMEs described by Marcus Gibson in *Britain's Export Boom*.<sup>45</sup>

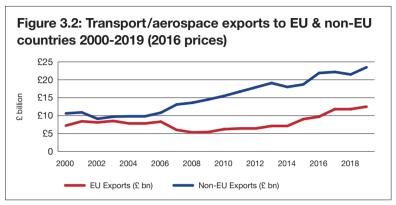
### Trade: EU versus non-EU

In terms of exports, aerospace is the UK's second fastest-growing manufacturing sector. The value of exports grew by 103 per cent in real terms from 2000. Only the pharmaceuticals sector grew faster. As a proportion of the UK's manufacturing exports, aerospace's share climbed steadily from 8.2 per cent in 2000 to 13.2 per cent in 2019.

Tellingly, aerospace is also the UK's least EU-orientated export industry. Taking an average for 2017–2019, almost exactly two-thirds of exports went to non-EU markets. Currently, the US and Canada account for 23.1 per cent of exports, while the EU currently accounts for just 34.8 per cent of exports. This is the lowest export share of any major UK manufacturing sector. Only the beverages sector comes close – with just 36.7 per cent of exports going to the EU. That too is one of the UK's fastest growing export sectors.

A global orientation in UK aerospace is the result of divergent trends in UK trade. Since 2000, exports grew more quickly outside the EU than in it, at 4.3 per cent per year as opposed to three per cent per year in EU markets. From 2002, that growth was fairly consistent. Industry sources reveal where this growth came from. Since 2002, exports to emerging markets grew particularly fast: to the Middle East and Africa by a factor of five, and to the Asia-Pacific by

a factor of 2.5.46 The former was the result of sales to fast-expanding Gulf airlines.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

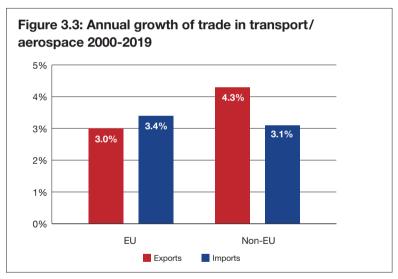
In absolute terms, the EU provided a solid market for UK exports in the two-decades to 2019. Exports hovered at around £8 billion from 2001 to 2006, sank for three years until 2009, then began a long slow climb to 2019 that resulted in an overall 2.8 per cent CAGR. This compares extremely well to the 20-year CAGRs of exports to the EU in most other manufacturing sectors. In absolute terms, only the UK's pharmaceuticals and food products performed better in the EU.

## Trade relations and comparative performance

When looking at comparative performance, the UK's aerospace sector hits trade-theory turbulence. It gains no commercial advantage from the Customs Union and is only tangentially impacted by the Single Market. Under WTO rules, there are no tariffs on commercial aircraft or aircraft parts — a long standing multilateral agreement signed under the General Agreement on Tariffs and Trade (GATT) in 1980. Only recently has the US gained rulings at the WTO that allow it to impose tariffs on aircraft that contain UK-

made parts. Until now, aerospace has – in tariff terms – remained a level global playing field.

Meanwhile, civil regulatory codes are, in effect, set globally, largely through collaboration between the US Federal Aviation Authority and various EU bodies. <sup>47</sup> In effect, there is one global standard for civil aerospace products, and this is common sense given the products perpetually move across borders. Consequently, there is no clear, competitive advantage to UK aerospace exporters from membership of either the Customs Union or Single Market. UK aerospace companies do not get preferential treatment inside the Custom Union, nor is the Single Market an easy first-stage haven for aerospace exporters.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices)

And yet the pattern of growth is the opposite to what would be expected if the Customs Union and Single Market had an overall positive impact on UK exports. In motor vehicles, UK exports easily outperformed in non-EU markets,

even though the UK gained substantial advantages in its EU trade as compared to other markets. Here, the UK enjoys zero competitive advantage in EU markets, and yet exports to the EU performed comparatively well. The difference between non-EU and EU CAGRs is just 1.3 ppts (4.3 per cent minus 3 per cent). To apply the 2.6 ppts average as a yardstick, the UK's EU exports beat the average by a curiously large 1.3 ppts.

This result is totally counterintuitive. To put the comparison a different way, the CAGR of aerospace exports to the EU ended up just 1.3 ppts short of the CAGR of exports to non-EU markets. That turns out to be the best comparative performance of any sector in this report. In no other sector did EU exports get so close to the growth rates of exports to global markets. Which means that in the sector where the Customs Union and Single Market provided *least* advantage to UK exporters to EU, UK exporters – comparatively – performed best (see Chapter 12).

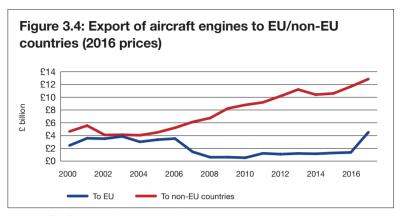
What are the principal influences on trade in aerospace? The question is easier to answer for this sector than others because the bulk of the story can be told with reference to just two companies: Airbus and Rolls-Royce Plc. For Airbus' UK plants, export growth is tied directly to the success of Airbus aircraft in global markets. Currently, the UK is sole-supplier for the wings of all European-made Airbus aircraft except the A220.<sup>48</sup> What appears to keep production of Airbus wings in the UK is the UK Government's willingness to provide 'launch aid' for each new model of Airbus aircraft. This launch aid is a form of risk-sharing subsidy. It means, in effect, that debts incurred in developing new airline models are underwritten, and only paid back if the model is a commercial success.

The sums involved are large. UK taxpayers contributed £530 million to development of the A380 'super-jumbo'

aircraft, and £200 million towards the development of its turbofan engines. The early termination of A380 production means that those sums will not be fully recouped.<sup>49</sup> Thus launch aid becomes subsidy. Nevertheless, what drives trade is clear: the willingness of UK governments to provide taxpayer support to ensure continued participation in a European industrial program.

Rolls-Royce is a slightly different story. In 2017, the export of aeroengines contributed five per cent of the UK's entire goods exports, and Rolls-Royce is the world's second largest aeroengine manufacturers after US-based GE. Almost uniquely for a large UK engineering company, the UK has no direct European competitor within the EU. GE is the only one-on-one global competitor for wide-fan civil turbojets, which is Rolls' principal civil product line. With no direct EU competitor, it might be casually assumed that the UK would outperform in European markets.

The opposite is the case. ONS data was reconfigured in 2018 to eliminate engines as a sub-category for this sector. But up until that date, the data shows an extremely poor performance for UK civil aerospace engine exports to the EU. The answer lies in commercial analysis. After 2000, wide-fan Rolls-Royce engines were rarely selected by principal European airlines where Boeing or Airbus enabled a choice between rival engine suppliers. With the partial exception of Lufthansa, European airlines tended to purchase US-built products where a choice existed, or US-French collaborations, such as the CFM range. This resulted in a horrible export performance for Rolls-Royce in EU markets until production of the A350 kicked off in 2015. Rolls-Royce is the sole engine supplier for the A350, and European airlines like the aircraft.

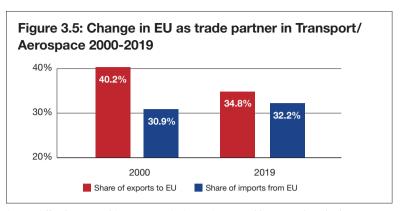


Source: Office for National Statistics BoP CP Series, 2018.

Industrial factors play a role in this decision making. Rolls-Royce has major engineering operations in Germany at Dahlwitz, and French aero-engine maker SAFRAN has a long-standing commercial collaborative agreement with GE, resulting in the CFM range. This partly reflects aircraft-purchasing decisions by Lufthansa and Air France-KLM. But the point is an important one in understanding what does and does not drive UK trade. In a sector where the UK holds definitive competitive advantage in Europe, European customers demonstrated a preference for US-made goods. And the same trait is observable in defence procurement where no domestic industrial interest is present.

## Long term trends

The end result is clear from the change in the market share of UK trade since 2000. Despite the UK's engineering prowess, the EU became a steadily less important trade partner. In 2000, the EU took 40.2 per cent of UK exports; in 2019 it was 34.8 per cent and falling slowly. Meanwhile, the EU's share of UK imports mildly crept up.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

The most prominent factors in trade outcomes in this sector can be readily identified. They are government subsidy, and the preferences – industrial, commercial, technical and strategic – that induced EU airlines and defence procurement agencies to generally select US-built products over UK-built products where a straight choice existed.

But the vital point is this: the UK's second biggest export industry was, in hard point of commercial fact, totally unimpacted by tariffs and received next-to-zero benefit from the Single Market. And in one half of the sector where the UK encountered little competition from EU suppliers – in aeroengines – EU airlines demonstrated a marked preference for US-made products anyway. By an unfortunate mischance, the Customs Union and Single Market happened to be absent in the one industry where they could have most benefited UK manufacturing.

In terms of long-term trends, UK aviation manufacturing should flourish in the coming decade – presuming civil aviation recovers to pre-pandemic levels. The emergence of unmanned air vehicles (UAVs) in civil and defence aviation is a cardinal development. The UK should profit from this

## TRANSPORT EQUIPMENT AND AEROSPACE

because of the skills available across the UK aerospace industry. Widespread expertise in advanced composites, avionics, aeronautical design, artificial intelligence and propulsion technologies should give British design teams a natural, leading edge.

But the biggest advantage will come from the way that the initiative in UAV development looks set to pass from huge global companies to mid-sized companies and startups. Small companies will be able to design, engineer, integrate and prototype UAVs – and they will be far more agile about it than lumbering giants like Airbus and Boeing. And the export spirit of the UK's SME culture, as described by Gibson, gives the UK a national competitive advantage. This shift in favour of smaller companies should allow UK entrepreneurship to shine – in a way it hasn't since they heady days of 1950s Farnborough. With the commercial stage set perfectly for the UK's private aviation entrepreneurs, the UK has a clear shot at global export leadership in aviation.

# 4.

# Machinery

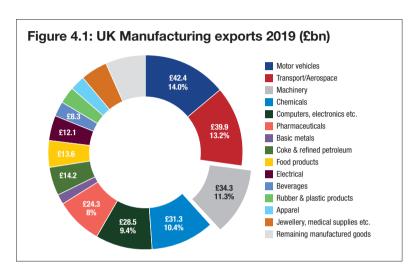


Table 4.1

Exports of machinery	2019	CAGR 2000–2019
To EU countries	£14.5 bn	0.7%
To non-EU countries	£19.8 bn	2.2%
Total	£34.3 bn	1.5%

Imports of machinery	2019	CAGR 2000–2019
From EU countries	£21.0 bn	3.3%
From non-EU countries	£14.1 bn	1.7%
Total	£35.2 bn	2.6%

Trade in machinery, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	10.7%	11.3%
Balance EU	£0.3 bn	−£6.6 bn
Balance non-EU	£1.3 bn	£5.7 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Current prices.

# The UK machinery industry

The UK's mechanical equipment, or 'machinery' industry, is huge. It employed 190,000 people in 2018, placing it ahead of the UK's auto and aerospace sectors, at least in terms of direct employees. At £39.5 billion, total industry turnover was lower than in the auto industry and slightly higher than in aerospace. Unlike those two sectors, however, the machinery industry is spectacularly varied. It covers – in no particular order – pumps and turbines, lifting and handling equipment (such as conveyor belts and forklift trucks), ventilation equipment, mining and quarrying equipment, and construction equipment.

Parts of the UK's mechanical equipment sector are highly successful. According to the UK's industry body, the Construction Equipment Association (CEA), the UK's construction equipment industry was Europe's largest in 2018, alone accounting for £13 billion of sales.<sup>51</sup> Another successful sub-sector is the pumps and turbines used to transport gas and oil through pipelines in the energy sector. Critically, mechanical equipment is largely an intermediate sector. This means its products are typically used by other parts of industry and businesses, with only three per cent of output going to final consumers.<sup>52</sup>

Gross value added (GVA) is high at £12.9 billion, or 84 per cent of the GVA in the auto industry. This means that the UK's machinery industry is almost as valuable to the country as the motor vehicle industry, though it lacks the political and media voice that derives from having a single related set of products. Impressively, UK machinery makers still just about rank as major global players. According to Make UK, in 2015 the UK could still claim to be the world's eighth largest producer of mechanical equipment.<sup>53</sup>

Like aerospace, trade in machinery is largely free of tariffs and non-tariff barriers (NTBs). Neither inside nor outside the EU do countries tend to skew markets in favour of domestic producers. Most governments are savvy enough to realise that placing tariffs and NTBs on capital goods that help build infrastructure – or manage farms, or extract resources, or build vehicles – is simply a tax on their own wealth creation. In addition, it's common for there to be only a handful of global suppliers in many machinery subsectors, such as earth-removers or gas pipeline pumps. Therefore, EU and global tariffs on machinery are either very low or non-existent.

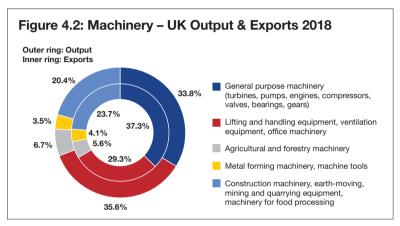
Low global barriers to trade help explain why the UK's machinery industry is – like aerospace – highly trade-centric. In 2018, exports were worth the equivalent of 83.2 per cent of UK turnover: far higher than for autos; not much lower than for aerospace. The inputs into the machinery industry include metal products (including basic iron and steel), other mechanical equipment, electrical equipment, electronics, rubber and plastics. <sup>54</sup> According to manufacturing body Make UK, 44 per cent of these inputs into the UK machinery sector are imported. <sup>55</sup> Meanwhile, 43 per cent of overall demand comes for overseas customers. <sup>56</sup> This is moderately high by UK sector standards.

## What does the UK make and where?

The output of the UK's 7,600 machinery manufacturers falls into three broad sub-sectors. 'General purpose machinery' includes turbines, engines, pumps and compressors, and these goods delivered 33.8 per cent of the sector's output in 2018.<sup>57</sup> Two representative companies would be Glasgow-based Wier Group, which is built around a core pumps business; and Rolls-Royce Plc, whose aeroengines are

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reconfigured to impel natural gas through pipelines. This part of the industry is heavily reliant on the global energy sector, which explains why exports to the Middle East are strong. Sadly, very little is currently occupied with the fast-growing renewable energy sector. For example, the power generators used in the UK's offshore wind turbines are exclusively imported.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020; ONS, Annual Business Survey 2018, May 2020. Note values are for 2018, the latest year available for the ABS. Export ratios for 2019 vary slightly.

A further 20.4 per cent of the machinery sector's output is delivered by the 'earth-moving and construction equipment' sub-sector. This grouping generated approximately £8.1 billion in revenue in 2018. Step forward JCB, another of the UK's large, global engineering companies. Staffordshire-based JCB exports approximately £1.35 billion of machinery per year<sup>58</sup> from its 11 UK-based factories (out of 23 world-wide). It is also highly innovative, for example winning the 2019 MacRobert Award from the Royal Academy of Engineering for creating the world's first volume-manufactured electric digger.<sup>59</sup> Other companies in this subsector include mining equipment manufacturers that

make articulated dump trucks, and the companies that make quarrying and crushing equipment, some of which are located in Northern Ireland.

Third is a disparate group of products that consist of lifting and handling equipment (worth £4.4 billion) and heating, cooling and ventilation equipment (with an annual turnover of £4.2 billion). Forklift trucks used to be a major constituent of this sub-sector. With the demise of Lancer-Boss to its German archrival, the UK's largest manufacturer is US-based Hyster – with a production plant in Craigavon, also in Northern Ireland. Despite the 7,600-odd companies in the sector being spread liberally across the UK, the echoes of Birmingham's heavy metal history still reverberate. The West Midlands accounts for 17.2 per cent of turnover in the machinery sector, which is the highest portion of any region in the UK. The East of England comes a close second.  $^{60}$ 

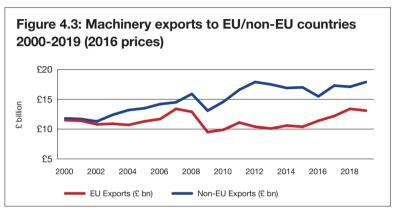
## Trade: EU versus non-EU

Machinery exports grew very modestly from 2000–2019. With a CAGR of 1.5 per cent across all markets, or 33 per cent overall, machinery was one of the UK's slower-growing export sectors. Parts of it are highly cyclical. The turbines and compressors sub-sector is dependent on energy projects, so that's dependent on global energy prices. The construction and earth-moving equipment sub-sector is dependent on building and infrastructure projects, so that's dependent on investment cycles and government spending patterns.

Nevertheless, there is a clear divergence in the performance of exports to EU and non-EU markets. Just taking the years 2000 and 2019 into account, exports to the EU grew by a CAGR of 0.7 per cent. This slightly flatters the data, however, as the chart below indicates. From 2000, exports to the EU dipped and then looped up to a peak in 2007, before

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almost halving in value and executing an even slower loop up to the same peak 11 years later. Little was achieved. The average annual value of exports to the EU in 2000–2009 was £11.4 billion (2016 prices), while the average value in 2010–2019 was £11.3 billion. In the long-term, exports to the EU went nowhere in 20 years.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

In contrast, exports of machinery to non-EU markets recovered almost immediately from the 2009 downturn. Although growth was flat after 2012, machinery exports still outperformed in global markets. The average value of machinery exports to non-EU countries in 2017–19 was £5.8 billion higher than the average for 2000–2002, an increase of 50 per cent. The result is that global exports clearly outran EU exports. In 2000, machinery exports to non-EU markets were worth the same as exports to the EU. Twenty years later they were worth 36.9 per cent more. For some of the intervening period they were worth double.

There is a curious echo here of Rolls-Royce's lack of success in the EU. The UK is a global leader in construction machinery, and just like Rolls-Royce, JCB has no direct

competitor in the EU, at least in terms of global brand. The US' Caterpillar and Japan's Komatsu are JCB's nearest rivals. Yet it is striking that the absence of a direct competitor appears *not* to have given JCB any commercial advantage in EU markets. Exports of construction equipment ('special purpose machinery' in ONS classifications) to the EU declined by four per cent in real terms from 2000–2019, whereas exports to non-EU markets grew by 13 per cent. Admittedly, with zero tariffs on most capital goods, there could never be much of a preferential market for construction machinery in the EU anyway. So, in some ways, it's just another case of: 'Bad luck again, Britain'.

But that's not quite all there is to it. Regulatory protectionism is a known tactic in global trade. The EU could have crafted a regulatory regime that preferences UK-built construction equipment, but it appears not to have done so. Possibly the UK's representatives in Brussels thought that skewing the EU construction-equipment market in favour of home products was not part of their job. Possibly, this trait was not shared by their counterparts when acting for other sectors. Only a fair-minded investigation will tell, though the point when it mattered has passed.

Still, trade in construction equipment conformed to a pattern that repeats across UK industry. In short, this pattern suggests that sub-sectors in which UK manufacturing companies are highly competitive happen not to derive obvious commercial or regulatory advantage from membership of the Customs Union and Single Market. Aero-engines is another example, and so is Scotch whisky. It's beyond this scope of this study to suggest whether this pattern emerges from sheer misfortune or a failure to grasp political opportunities inside the EU. But the pattern repeats. And it partly explains the unlikely conclusion of this entire study.

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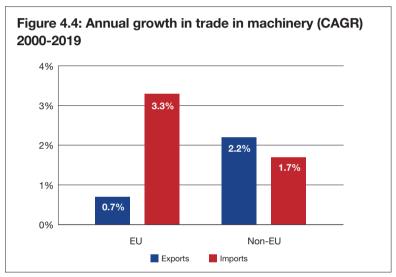
Looking more broadly, the trade body Make UK has researched the markets in which UK machinery makers have proved successful. Analysing data from 2000–2017,<sup>61</sup> it reports that exports to the Middle East and Africa grew fastest (by almost 120 per cent) to reach £2.4 billion-worth in 2017; exports to Latin America and the Caribbean grew at just over 100 per cent to reach £0.7 billion; and exports to Asia grew by almost 100 per cent to reach £5.3 billion. Very crudely, this reflects the strength of sales of energy-related pumps and turbines to the Middle East; quarrying and mining material to South America; and construction equipment to Asia.

# Trade relations and comparative performance

One trend that does stand out in trade in machinery is the distribution of import and export CAGRs across EU and non-EU markets. A pattern commences in this sector that repeats across virtually all other sectors until it finds ultimate expression in the performance of UK manufacturing as a whole. The pattern is exactly as appears below. The fastest growing UK trade since 2000 was imports from the EU (in this case, with a CAGR of 3.3 per cent), while the slowest growing trade was exports to the EU (0.7 per cent per year). Exports and imports to and from non-EU markets hovered between the two, with exports growing marginally faster than imports. This is the defining pattern of UK manufacturing trade since 2000. It's what drives the 'captive market' effect described in Chapter 2.

Back to the comparative performance test. The UK's third-biggest export sector, like aerospace, is one where membership of the Customs Union should have been only fractionally beneficial. As noted, governments tend to avoid taxing the means of increasing their own productivity, and

tariffs rarely rise above two per cent for the various goods in each of the sub-sectors. A previous Civitas publication estimates that the effective EU tariff rate for UK exporters in this sector would be 1.7 per cent,<sup>62</sup> which is very low by manufacturing standards. For many of the UK's machinery exporters – especially in earth-moving machinery – both EU and global tariff rates are so small that the movement of exchange rates exerts a far larger commercial impact.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020

Similarly, harmonised EU regulation in machinery is unlikely to confer much benefit since the number of actual producers is so low. Across the principal sub-sectors where the UK is active – from forklift trucks and pumps to construction equipment manufacturing – the benefit of having uniquely EU regulation would appear limited. The ostensible point of the Single Market is to align regulation so that producers in one country can automatically sell in another. If there are less than a handful of producers to

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begin with – or in some cases just one – then the utility of single market regulation all but disappears.

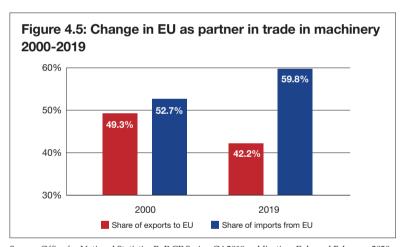
Yet again, the comparative performance test returns a perverse result. UK exports outside the EU grew modestly well, but the difference between EU and non-EU CAGRS was just 1.5 ppts. This is 1.1 ppts *narrower* than the average 2.6 ppts differential, but in a market where the Customs Union and Single Market offered very limited commercial benefit. In other words, despite extremely limited assistance from the Customs Union and Single Market, machinery exports performed comparatively well in EU markets and far better than the average across UK manufacturing.

Incidentally, this result would not hold if the test were conducted for the periods 2000–2010 to 2000–2015. Between 2010 and 2015, exports to non-EU countries were approximately double exports to the EU. In other words, export growth to non-EU countries *did* comparatively outperform the average for a while between 2010 and 2015. But for the majority of time spans within the 2000–2019 time period, the conclusion would be the same, and exports to the EU were, comparatively, strong.

This means that for the UK's three biggest export industries, there is a direct, inverse relationship between the apparent benefits of the Customs Union and Single Market, and the comparative performance of UK exports into the EU. In absolute and comparative terms, machinery and aerospace exports to the EU outperformed automotive exports to the EU after 2000. This is despite the fact that auto exporters gained major tariff and regulatory benefits from the Customs Union and Single Market, while aerospace and machinery exporters did not.

# Long-term trends

The standout feature of trade in machinery is not the surprise closeness in EU/non-EU growth rates, but the structural difference between the import and export growth rates. Imports from the EU grew 2.6 ppts faster per year than exports. The result over 20 years was a game-changer for machinery manufacturing in the UK. In 2000, UK trade in machinery looked healthy. The value of machinery exported by the UK to the EU roughly equalled imports, and the net result was a £265 million surplus. From the standpoint of 2000, the UK's machinery manufacturers had fair prospects: UK companies had strong established positions in global markets, with exports shared equally between EU and non-EU countries.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

Twenty years later this balance is deranged. Trade with the EU become distorted by that grinding 2.6 ppts differential between exports to and imports from the EU – and the added factor that imports from the EU also outstripped imports from global suppliers. The result was a steady application

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of that captive market effect. EU companies gained share among UK imports (from 52.7 per cent in 2000 to 59.8 per cent in 2019) while EU markets provide a shrinking share of the UK's exports (from 49.3 per cent down to 42.2 per cent).

The inevitable result was to turn a minor EU trade surplus into a substantial £6.6 billion deficit. This was the UK's fifth-largest sector deficit with the EU in 2019, and its growth was steady. Meanwhile, the UK's non-EU trade developed in the opposite direction. Global exports delivered a marginal £1.3 billion surplus in 2000 and a healthy £5.7 billion one in 2019.

The determinants of this captive-market pattern escape the author. Far more research is needed, including whether the machinery that the UK exports to non-EU countries is different from the machinery it exports to the EU. Possibly, German machinery manufacturers are outcompeting UK rivals with the same deftness with which they outcompete global machinery makers. Since German producers account for 30.6 per cent of intra-EU trade in machinery, 63 the presumption seems a fair one. And note: according to Eurostat data, that is the highest proportion of intra-EU trade gained by any EU member state in any of the EU's five largest internally traded sectors.

Consequently, this may be a sector where the UK is straightforwardly outcompeted within the EU. Perhaps for that reason, UK machinery companies have, over the past two decades, re-oriented to products that are more competitive in global markets. An alternative explanation – cited by the construction industry – is that while finished exports are skewed to non-EU markets, companies are more reliant on the EU for components. If this assertion is correct, then competitive exports to non-EU markets are directly related to seamless, tariff-free imports from the EU.

Either way, the Customs Union and Single Market

## LESSONS LEARNED FOR A GLOBAL BRITAIN

delivered no observable benefit to the UK's machinery sector. Exports to the EU grew at 0.7 per cent per year, or half the rate of EU economies themselves, and stagnated anyway after 2007. Meanwhile, imports from the EU grew at 3.3 per cent per year, which was far faster than the UK economy or imports from outside the EU. The result is that a modest surplus in 2000 grew into a hefty £6.6 billion deficit. As with the UK's auto sector, the big winners in UK trade in mechanical equipment from 2000–2019 were EU-based companies.

# Chemicals

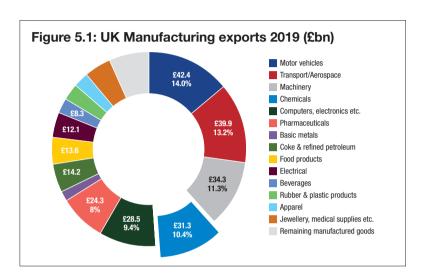


Table 5.1

Exports of chemicals	2019	CAGR 2000–2019
To EU countries	£16.9 bn	0.6%
To non-EU countries	£14.5 bn	1.9%
Total	£31.3 bn	1.2%

Imports of chemicals	2019	CAGR 2000–2019
From EU countries	£21.6 bn	2.3%
From non-EU countries	£8.9 bn	1.6%
Total	£30.5 bn	2.1%

Trade in chemicals, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	10.4%	10.4%
Balance EU	-£0.3 bn	–£4.7 bn
Balance non-EU	£1.9 bn	£5.5 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Current prices.

## The UK chemicals industry

After excluding all pharmaceuticals – which are analysed separately in Chapter 7 – the UK chemicals industry is still huge. Employing 110,000 people its turnover was £35.4 billion in 2018, making it fractionally larger than the UK's aerospace sector. Output is closely related to the UK's hydrocarbon industry. Petrochemicals, plastics and synthetics make up 32 per cent of industry turnover, and the rest is a vast range of substances from paints, glues and cleaning agents to dyes, fertilisers and explosives. The sector is highly energy intensive. It consumes roughly 11.9 per cent of energy demand across UK manufacturing, 64 and only the basic metals sector consumes more. As with basic metals, high UK power costs impact competitiveness.

According to industry sources, the chemicals sector has remained a roughly stable component of UK manufacturing since 2000.<sup>65</sup> ONS data shows a slightly different picture, with total turnover falling from £41.9 billion in 2008 (current prices) to a low of £29.4 billion in 2015, before recovering to £35.4 billion in 2018. Since this trajectory neatly traces – with a brief lag – UK crude oil production over the same period,<sup>66</sup> it can be inferred that the UK's oil output is the main driver of changes in output in the UK's chemicals sector – especially the manufacture of synthetic rubber and plastics. GVA for the chemicals sector is high at £10.4 billion, which is just shy of the UK's machinery sector.

Efficiency and competitiveness are hard to gauge. Manufacturing industry body Make UK assesses that from 2009–2017, the UK's chemicals industry exhibited the highest productivity growth of any UK sector, except for motor vehicles.<sup>67</sup> This may be slightly overstating the case. According to ONS data, employment declined by approximately 13 per cent in the decade from 2008, while

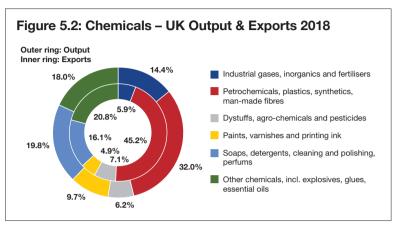
GVA declined by 14.6 per cent in real terms. This implies a decline in productivity. High power costs haven't helped. In 2019, non-household energy costs in the UK exceeded those in Germany by more than 16.7 per cent, those in France by 22.9 per cent, and those in the Netherlands by 49.6 per cent, according to Eurostat data. UK power prices were double those in the US. 9

The chemicals sector is fairly trade dependent compared to the rest of UK manufacturing. Exports were worth the equivalent of 84.4 per cent of industry turnover in 2018, which is lower than for the machinery sector. In global terms, however, the UK is not a major player in chemicals, ranking 21st in output according to industry sources. And long-term prospects look shaky. The inexorable rise of renewables and electric vehicles – plus low oil prices and a growing offshore wind industry – means UK hydrocarbon production faces multiple political, commercial and environmental headwinds. To put the point a different way: in the coming decade, the UK may deftly transition its energy industry away from hydrocarbons and inadvertently eliminate a third of its chemicals industry.

## What does the UK make and where?

The North West is the cauldron of the UK's chemical's industry – especially the areas around Ellesmere Port, Runcorn and Rocksavage. The reasons are historic: easy access to salt, limestone and coal set the foundations for companies such as Lever Brothers and later ICI. Today, 26 per cent of the industry's UK turnover is in this area. There are three other centres of chemicals production, all in Scotland and the North, and all with connections to the energy industry. They are: Grangemouth on the Firth of Forth, with its gigantic refinery; Teesside – especially Wilton

and Billingham – for explosives; and the Humber between Immingham and Grimsby, which produces petrochemicals fertilisers and plastics.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020; ONS, Annual Business Survey 2018, May 2020. Note values are for 2018, the latest year available for the ABS. Export ratios for 2019 vary slightly.

As noted, petrochemicals make up just under one-third of the sector's output, namely plastics and synthetic rubber. Soaps, detergents, cleaning and polishing preparation, perfumes and toiletries made up another 19.8 per cent in 2018. Paints, varnishes, coatings, printing inks and mastics contributed a further 9.7 per cent of the sector – and these products form the most consumer-facing aspect of an otherwise industry-orientated sector. Dyestuffs and agrochemicals or pesticides delivered another 6.2 per cent of sector output. Inorganic chemicals, which are used to make fertilisers, are also industrially sold, and delievered 14.4 per cent of output.

## Trade: EU versus non-EU

Analysing trade in UK chemicals goods is hazardous because neither the origin of imports nor the destination of exports is quite what is seems. In short, this is an industry where the so-called 'Rotterdam Effect' is operable. This is the phenomenon that trade with the Netherlands appears magnified since goods are shipped through Rotterdam on their way to third countries, or on their way to the UK from original producers. In this case, the 'Rotterdam-Antwerp effect' is a better descriptor. In physical terms, 25.5 per cent of the UK's global intake arrives from either the Netherlands or Belgium, and 15.1 per cent of exports go to those countries,<sup>71</sup> according to Make UK and customs data. These numbers are both high in comparison to other sectors. Therefore, it is possible that the proportion of exports and imports attributed to the EU are both overstated.

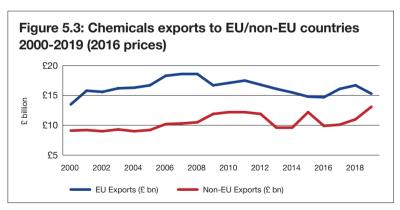
But by how much? Analysts frequently refer to the Rotterdam Effect without attempting to quantify the impact or isolate the sectors involved. ONS research from 2015 suggested that the degree of overstatement of EU exports/imports owing to the Rotterdam Effect was in the region of 4.3/4.2 ppts as a share of UK exports/imports.<sup>72</sup> Given that trade in fuels is known to be subject to data distortion, and the high proportion of petrochemicals in UK–EU chemicals trade, it seems possible that current data may overstate the proportion of total UK trade transacted with the EU by slightly more than 4.3 ppts. This still leaves chemicals as one of the three most EU-centric sectors in UK manufacturing.

Like the auto industry, the mix of products that the UK exports and imports does not mirror domestic manufacturing. For example, in 2018 petrochemicals delivered 44.1 per cent of chemicals imports and 45.2 per cent of chemicals exports. Both are far higher than the 32 per cent of output that petrochemicals contribute to chemicals manufacturing in that year. According to industry sources, a distinct feature

of this trade is the manufacturing of plastics from imported petrochemicals. The manufacture of plastics and synthetic rubber alone generated a turnover of £7 billion in 2018.

Given the overall decline in the UK's oil production since 2000, the UK's chemicals exports have done well to maintain a steady contribution to the UK's export mix, at 10.4 per cent. That said, imported hydrocarbons likely displaced UK-produced inputs in domestic chemicals-making during this period as UK hydrocarbon production fell.

Looking at total trade, exports grew at an unremarkable CAGR of 1.2 per cent from 2000–2019. This is just a shade under the growth rate for UK manufacturing exports as a whole. But the standout feature of UK trade in chemicals is how EU-centric it remained. Even after subtracting, say, 4 ppts for the Rotterdam effect, chemicals remained one of just three sectors where UK exports to the EU were still worth as much or more than exports to other countries (the others are basic metals and food products). In this case, perhaps distance does matter as a factor in trade. Either that, or the Single Market and Customs Union were finally exerting a positive impact.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

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As with other sectors, the fact that EU exports were bumpy but broadly flat means that headline CAGRs can be misleading. The average value of exports to the EU from 2010–2019 was marginally lower than the average value of exports from 2000–2009, by £441 million (in 2016 prices). This implies that exports to the EU were in long-term decline. As with other sectors – notably motor vehicles, machinery, pharmaceuticals and basic metals – exports to the EU rose fairly strongly up to an inflection point somewhere between 2007 and 2010, after which they fell and failed to recover thereafter.

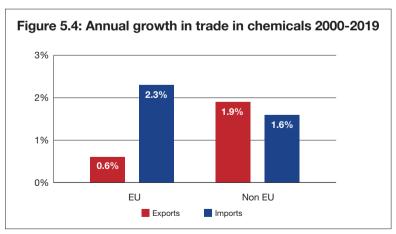
There are pockets of high performance. For example, UK exports of paints and cleaning equipment to EU countries rose by a CAGR of 2.1 per cent from 2000, and by a blistering 6.4 per cent to non-EU countries. Combined, these exports were worth a steady £6.3 billion per year by 2019. Otherwise, the non-EU trade picture is one of EU exports slowly rising and becoming erratic post-2012, but gradually approaching the level of EU exports.

# Trade relations and comparative performance.

Chemicals is one sector where orthodox trade theory should prevail. This is because chemicals are difficult to transport, so trade with neighbours has a built-in advantage. As noted, almost half of the UK's exports in this sector are petrochemicals, of which half again are organic basic chemicals. Thus, the principle exported products of the UK chemical industry are not just voluminous and weighty, but hazardous to the environment and dangerous to humans. Shipment, transhipment and storage are all comparatively costly. Therefore, this is one sector where one central strand of trade economics – Gravity Theory – should have weight.

Chemicals is also a sector where the Single Market should shine. Regulatory requirements abound, not just in production but transportation. For consumer products, labelling requirements are ubiquitous – and paints and cleaning products alone accounted for £6.3 billion of UK exports in 2019. At the time of writing, the UK was part of the EU REACH system, which manages human and environmental protection regulation across the EU. According to industry sources, 70 per cent of chemicals manufacturers said they were directly impacted by REACH.<sup>73</sup> The system was introduced in 2007 – coincidentally the year *before* exports of chemicals to the EU began to decline – but exports of paints and inks to the EU did continue to grow post 2007.

Nevertheless, the UK Chemicals Industry Association asserts that it would cost the industry more than £1 billion to duplicate the REACH database.<sup>74</sup> This implies the database has genuine value beyond convenience, and it is said to particularly benefit small businesses by reducing product registration costs. With UK industry aligned to a specifically EU system of market regulation, the putative advantage of participation in the Single Market should be moderately high.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices)

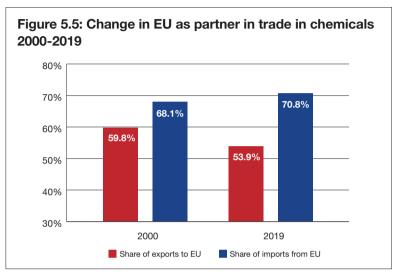
The third reason why the performance of the UK's chemicals sector should reflect orthodox trade theory is that tariffs are mid-range and one half of exports are sold bulk. The Common External Tariff (CET) varies significantly between different groups of chemicals, from 2.6 per cent for inorganic chemicals; 3.1 per cent on soaps; 3.8 per cent on organic chemicals; up to 6.1 per cent for plastics; 6.3 per cent for explosives; and 7.2 per cent for glues. With a 4.7 per cent tariff on miscellaneous chemical products, 75 a sector average of four to five per cent appears likely. This isn't food or cars territory, but it does ensure that exporters gain the sort of preferential access to EU markets that is commercially significant – especially if traders are dealing in bulk commodities.

And for the first time in this sectoral analysis, the comparative performance test returns a positive result. Exports to non-EU markets still grew faster than to EU markets, by 1.9 per cent per year compared to 0.6 per cent. But the difference between the two CAGRs is just 1.3 ppts, or half the average for manufacturing as a whole. And the CAGRs do reflect the overall trade picture because despite the bumpiness, non-EU exports only hesitantly gained on EU exports after 2000. This is not the normal trajectory for UK manufacturing sectors. So, chemicals is a tepid win for the assertion that UK manufacturing benefited from UK membership of the Customs Union and Single Market.

# Long term trends

Nevertheless, here again is that pattern of a high CAGR for EU imports, a low CAGR for EU exports, and non-EU trade sitting in the middle. The result is another mild dose of the captive market effect. The EU was a declining market for UK chemicals exports, while the UK became increasingly

dependent on the EU for imports. After 2000, the EU's share of the UK's exports fell from 59.8 per cent to 53.9 per cent, while the EU as a source of imports grew from 68.1 per cent to 70.8 per cent.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

The UK's balance in chemicals trade also took a hit. Back in 2000, the UK's deficit with the EU was just £270 million. But that corrosive 1.7 ppts difference in the CAGR of imports (2.3 per cent) and the rate of exports (0.6 per cent) did its silent work and created another hefty trade deficit – this time of £4.7 billion. Meanwhile, the opposite effect is observed with the UK's non-EU trade. The UK's surplus swelled gently from £1.9 billion in 2000 (current prices) to £5.5 billion in 2016.

Despite the unsettling long-term trends, the comparative analysis of the CAGRs of exports shows that in the chemicals sector at least, EU markets performed comparatively well. This observation has important implications. During the

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course of research, it became a struggle to find even a few instances where the strong, theoretical advantages of seamless trade with the EU translated into hard statistical evidence of a sector outperforming expectations. But here, at last, is one.

It's taken a rare combination of factors for theory to translate into practice: close market proximity of difficult-to-transport goods, where pervasive but unified regulation provides seamless access to a market that is otherwise protected by moderate tariffs. But at least the UK officials and members of the European Parliament who have shaped the Single Market over the past four and a half decades can claim a modest success for UK manufacturing.

This success, however, comes in one of the UK's slowest-growing sectors. As will be seen, it exemplifies an unfortunate trait in UK-EU trade – that those few sectors that do appear to benefit from UK participation in the Customs Union and Single Market are either small or poor-performers. This could be mischance. It's hard to foretell which UK industries will be export successes. But the comparative performance results so far trigger a vital question: how vigorously or wisely did UK representatives in the EU extend UK industrial interests into the Single Market and EU trade policy if those sectors where a positive impact was achieved were those sectors that least benefited the UK?

Still, for advocates of Gravity Theory, the experience of the UK's chemicals sector provides a ray of practical hope that being close to a market does indeed increase exports — so long as the goods involved are commoditised, bulky and lethal.

# Computers and electronics

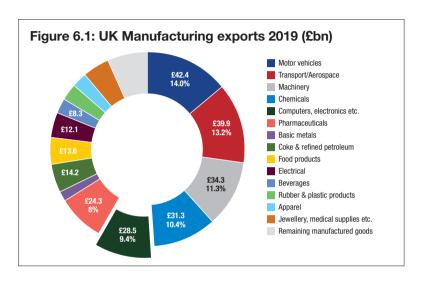


Table 6.1

Exports of computers & electronics	2019	CAGR 2000–2019
To EU countries	£13.4 bn	-5.4%
To non-EU countries	£15.1 bn	-1.7%
Total	£28.5 bn	-3.8%

Imports of computers & electronics	2019	CAGR 2000–2019
From EU countries	£22.4 bn	-1.6%
From non-EU countries	£30.9 bn	0.9%
Total	£53.2 bn	-0.3%

	2000	
Trade in computers & electronics, 2000 & 2019	(current prices)	2019
Percentage of manufacturing exports	24.6%	9.4%
Balance EU	£3.9 bn	−£8.9 bn
Balance non-EU	–£5.1 bn	–£15.8 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Current prices.

## The UK computers and electronics industry

The UK's electronics sector employed 121,000 people in 2018. It had a turnover of £23 billion and generated a gross value added of £9.9 billion, which make it somewhat smaller than the chemicals sector – according to both metrics. Like the machinery sector, its output is massively varied. The UK's electronics industry creates literally thousands of different products from circuit boards, computers and consumer electronics to network communications equipment. It includes clocks, measuring devices and medical imaging equipment.

Today, the electronics sector is the UK's sixth or seventh largest manufacturing industry, but it used to be far bigger. Back in the late 1990s, computers and electronics contributed seven to eight per cent of UK manufacturing. He was 2018, they delivered just 4.7 per cent. The manufacturing side of computers and electronics was already in decline in the late 1990s, but the bursting of the 'dot-com' bubble in 2001 delivered an electronic coup de grâce. This event triggered a collapse in the manufacturing of semi-conductors, circuit boards and transistors, as well as computing equipment and consumer electronics. Manufacturing went overseas, mostly to the Asia-Pacific. As the costs of building chip factories rocketed, Taiwan became the global leader in microchip manufacturing. This resulted in a near wipe-out in UK manufacturing of microchips and electronics.

Nevertheless, the smart end of many supply chains stayed in the UK. Today, the UK's competitive advantage in computing materiel is in research and development (R&D) and semi-conductor design. ARM is a global top-three designer of processors for smartphones, which it licences to global manufacturers. According to manufacturing industry body Make UK, which cites the

UK's National Microelectronics Institute, the UK is home to more independent semi-conductor design companies than anywhere else in Europe.<sup>78</sup> The UK also accounts for half of Europe's market in application-specific integrated circuit design, and two-fifths of Europe's independent electronics design.<sup>79</sup> Physical manufacturing may occur elsewhere, but UK technology engineering still accounts for a premium slice of the computer/electronics supply chain.

Today's UK computers and electronics industry stands out from its 1990s predecessor in two other ways. First, it is dominated by small companies. Over 6,000 companies operate in this sector, which is the third highest total in UK manufacturing, and 93 per cent of them employ fewer than five people.<sup>80</sup> Second, there is a very high degree of foreign ownership. US companies are easily ahead, with a 44 per cent share of foreign ownership in 2015.<sup>81</sup>

There are electronics sub-sectors where the UK has performed well since 2000. For example, the UK is a major manufacturer of measuring and testing equipment, typically for industrial customers. GVA in this subsector grew by roughly 21 per cent in real terms from 2008 to 2018. The manufacture of electronic medical equipment is also in rude good health, with the number of companies involved growing from 81 to 138 in the decade to 2018.

Judging trade dependency is hard because production has been erratic. After collapsing from 2003–2007, exports remained fairly stable and were worth 117 per cent of domestic revenue in 2018. This relatively high figure is misleading since a large portion of exports had previously been imported. Industry sources reckon that the UK's current electronics industry imports approximately 50 per cent of the materiel it consumes, making it the most import-dependent of any manufacturing sector.<sup>82</sup> Meanwhile,

approximately 26 per cent of output is exported, making it one of the least export-dependent sectors.<sup>83</sup>

As in autos, the big story is with imports. In 2019, electronics imports came in at a whacking £53.2 billion. Fortunately for the UK, the price of most products in this sector runs according to Moore's Law. This is a projection that suggests the number of transistors in a computing chip doubles every 18–24 months. In effect, it means that even though computers and electronics devices get smarter, prices remain stable. And sure enough, the value of the UK's total imports held very steady throughout the 2000–2019 period. Nevertheless, £53.2 billion is still a big number. In 2019, it was almost as much as UK drivers spent on foreign automotive goods, and more than UK consumers spent on foreign food.

## What does the UK make and where?

London and the South East dominates in the electronics sector – with one-third of all manufacturing. The East of England is next, with 14.4 per cent, and the remainder is scattered across the UK. In terms of product split, the UK's core computing and electronics group of products generated £5 billion in revenue in 2018, or 21.7 per cent of the sector's output. This core comprises two sub-sectors. The manufacturing of computers and peripheral equipment – which includes desktops, laptops, printers, keyboards and monitors – contributed £2 billion. Electronics components – including semiconductors, transistors and switches – clocked up another £2.9 billion. Value-added is concentrated in the latter.

While output has fallen steeply since 2000, both subsectors staged minor recoveries after 2013–14. Today, there are niche suppliers in the semi-conductor industry. Cardiff

has grown a chip-making cluster. For example, IQE makes advanced semi-conductor wafer products, mostly for communications devices. Newport Wafer Fab, established in 2017, is a manufacturer of silicon wafers for other electronics manufacturers. These appear successful operations, but tiny compared to anything in Taiwan.

Holding sectoral centre stage in UK electronics today is the manufacture of measuring, testing and navigation equipment. This sub-sector was worth £11.9 billion, or 51.9 per cent of sector revenue in 2018, and about the same proportion of value-added. Prowess is not a complete surprise. British horology has an illustrious past, and this sub-sector includes 81 watch and clock makers. Most measuring instruments are for industrial use, however. Products include emission-testing equipment, hydronic (or water-heating) controls, consumption metres, radar and GPS equipment, and motion detectors. In this sub-sector, turnover and GVA both rose strongly in the decade 2008–2018, while employment crept up. This implies the sector is healthy and productivity is rising.

Worth £3.1 billion, communications equipment manufacturing is just about holding its own and contributes 13.4 per cent to sectoral output. Products range from telephony to transmitting and receiving antennae. Turnover and GVA fell in sync by approximately one-quarter from 2008, before staging a partial recovery by 2018. But the number of companies in this sub-sector is steadily falling. As most citizens realise, the UK is highly dependent on imported communications equipment to build and maintain its networks. Imports are highly erratic, but generally grew over the two-decades period and touched £16.9 billion in 2019, or 31.7 per cent of total imports in this sector.

Meanwhile, the manufacturing of consumer electronics

## COMPUTERS AND ELECTRONICS

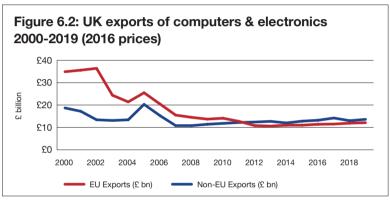
contributes just 2.8 per cent of turnover. Imports were worth £5.6 billion in 2019, with around half of imports made in Asia or the US. This still leaves the EU as the source of approximately half the total value of imported consumer electronics in 2019. It shows that global trade in consumer electronics is not necessarily dominated by Asian manufacturing.

One sub-sector remains – medical electronics. Back in 2008, the UK manufactured just £368 million-worth of irradiation, electro-medical and electro-therapeutic goods. This has since shot up to £1.5 billion-worth in 2018, employing perhaps 4,500 people. The number of companies in this field has also risen quickly, from 81 in 2008 to 138 in 2018. A related field, optical instruments and photographic equipment, has successfully made the jump to digital media with output rising strongly. This sub-sector now generates £869 million of revenue.

## Trade: EU versus non-EU

The collapse of UK manufacturing in computers and electronics post-2001 had a gruesome impact on UK trade. Back in 2000, computers and electronics was the UK's largest export sector by far, generating almost one-quarter – or 24.6 per cent – of all UK manufacturing exports. By 2019, the figure was just 9.9 per cent. The sector's composition today is quite different. Exports of electronics components and boards, and computing and communications equipment used to deliver 81 per cent of exports; now it's just 44 per cent. UK-made measuring and testing equipment delivered just 12 per cent of sectoral exports 20 years ago; in 2019 it delivered 39.2 per cent of exports.

What's curious, though, is where the pain hit home. The falls in UK manufacturing were faithfully reflected in UK exports, but the impact in EU markets was far more severe, as the chart below shows. After 2000, exports to the EU plummeted from £34.9 billion (in 2016 prices) to £12.2 billion in 2019, wiping out a nominal £3.9 billion surplus and creating an –£8.9 billion deficit in 2019. This is easily the most disastrous 20-year turn in any UK sector. The UK's non-EU markets fared better, or at least not so badly. The average value of exports from 2007–2019 to non-EU countries was just £5 billion or so below the average value for 2000–2005.



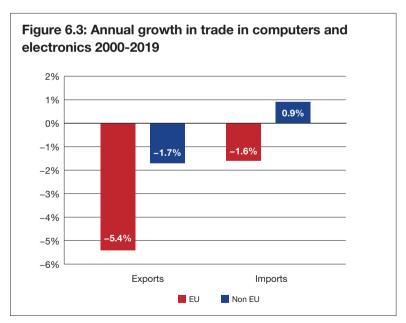
Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices). Note: Data for 2006 has been omitted from the above chart, as values for trade in communications equipment with EU became highly volatile in that year. Exports of communications are reported as rising from £5.9 billion in 2005 to £23.3 billion, before dropping back to £1.8 billion in 2007. Suspiciously, imports of the same line item rose by £7 billion in 2005 and then £12 billion in 2006, before falling to nearly £4-5 billion per year thereafter. This implies a one-off trade in approximately £17-19 billion of communications equipment.

Non-EU markets have maintained a slight edge on the EU since 2012. According to industry sources, <sup>84</sup> exports are well distributed, with the US taking 15.5 per cent of total exports in 2017, and China and Hong Kong taking a combined 7.5 per cent. The high-performing measuring, testing and navigation sub-sector is working magic in global markets. In the UK's non-EU exports, that sub-sector contributed 47.9 per cent of total sector exports in 2019, but just 29.4 per cent of sector exports in EU markets. So, the one electronics

sub-sector that performed well from 2000 primarily owes its success to non-EU markets. This is noteworthy. It implies that the EU is less receptive to successful UK electronics than global markets.

# Trade relations and comparative performance

Does this sector go for or against expectation in terms of the impact of Customs Union benefits and Single Market participation? The answer is a heavily qualified 'for'. The main reason is that this is a low-tariff sector. Other than cameras, most electronics goods were not protected by a tariff within the CET schedule during this period, and in 2000, 56 per cent of goods exported in this sector were either electronics components or computers and accessories. Meanwhile, measuring and testing equipment, along with photographic equipment, attract a tariff of 1.3 per cent.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

Possibly regulation is a different matter since consumer regulation would impact the seamlessness of exports to EU markets. But the proportion of consumer goods in the export mix after 2005 was negligible, and a shift from consumer to industrial exports is the most obvious trait in the trade data. Today, the UK's computer and electronics industry mostly sells to other businesses or hospitals. On the assumption that EU regulation for industrial electronics is mostly set nationally, it seems safe to conclude that UK companies in this sector enjoy minimal commercial benefit from harmonised EU markets.

With minimal tariffs and a low regulatory impact from the Single Market, this should be one sector where the difference between EU and non-EU export growth rates exceed 2.6 ppts. It does, though in a strange way because exports to EU and non-EU markets both fell. Nevertheless, the difference between exports to EU countries and non-EU countries is wide, at 3.7 ppts. With little benefit from the Customs Union/Single Market, exports outside the EU did in fact perform far better than exports to the EU, though 'far less disastrously' better suits the figures. It's a win for the comparative performance test – though clearly not for UK manufacturing.

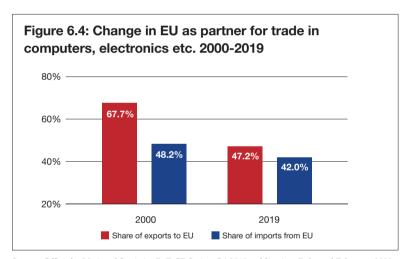
# Long-term trends

It is a curiosity of the UK's trade in electronics that in an industry where Asia-Pacific manufacturing is pre-eminent, it was exports to the EU that got clobbered. Possibly, as the UK's design-centric electronics industry moved up the value chain, they found more receptive markets in the Asia-Pacific than in the EU. Perhaps the sub-sector that performed best – measuring and testing equipment – involves products so niche they are 'born global'. This means that the goods

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involved are so specialised they were specifically designed for global markets.

Whatever the case, the EU became drastically less vital to the UK's computers and electronics trade over the last 20 years of EU membership. The EU, which once took 67.7 per cent of the UK's most valuable export sector, now takes just 47.2 per cent of a much diminished one. And the collapse occurred principally in the computers and peripherals subsector (desktops, laptops, printers and so forth). Unusually, the EU also lost market share of UK imports. In this case, digital hunger for electronics made in Asia-Pacific ensured that the EU's share of imports fell from 48.2 per cent to 42 per cent.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

There is a silver lining. The UK's measuring and testing sub-sector increased exports to non-EU markets by a CAGR of 5.2 per cent during this period. This is very fast for UK exports. In 2020, total exports reached £11.2 billion, with £7.2 billion – or 64.6 per cent of exports – going to non-EU markets. This means exports are worth the equivalent of

89.7 per cent of turnover in this specific sub-sector, which is high by UK sectoral standards. In non-EU markets, the UK scores a hefty £1.7 billion surplus, and this too is a high achievement for a small sub-sector. These metrics imply that the UK's measuring instruments sub-sector is thriving because it is an export sector.

Incidentally, this two-thirds/one-third ratio as between non-EU/EU exports appears to repeat in sub-sectors where UK manufacturing is competitive and exports are fast growing. Electric motors is another (see Chapter 11). Aerospace and beverages also conform to the rule. For strategic trade analysts, this may indicate a rough direction of travel for the global distribution of highly competitive UK exports. In other words, while UK manufacturing exports had a 52:48 split in terms of non-EU/EU distribution in 2019, the persistent ratio for new or successful export sub-sectors is more like 65:35. Trade lags, but that's the global ratio towards which many globally competitive UK exports seem to be heading.

Aside from that, the sector triggers a few general points about trade, free trade areas and open markets. In itself, a collapse in exports in one particular sector is neither surprising nor bad. Trade should result in specialisation and free trade should expedite the change. If the Customs Union and Single Market genuinely operated as a free trade area – and that's the point of a free trade area in liberal economics – then they should have helped the UK to specialise in those sectors where the UK had a competitive advantage at the expense of others where it did not. So, UK policymakers should not inherently be worried that exports in one sector collapsed.

What the UK should have been worried about is the absence of any compensating growth. There is no major

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manufacturing sector where UK exports to the EU shot up by a CAGR of five to six per cent over 20 years, which is the rate at which computers and electronics exports to the EU fell year by year. The Customs Union and Single Market did not open up EU markets to any new areas of UK industry, or allow new areas of specialisation to expand rapidly in a huge, open market. There was no industrial *quid pro quo*. If the Customs Union and Single Market had a liberal economic purpose, then it failed UK manufacturing.

# **Pharmaceuticals**

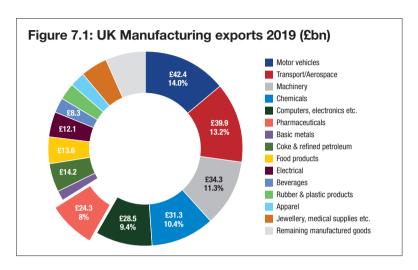


Table 7.1

Exports of pharmaceuticals	2019	CAGR 2000–2019
To EU countries	£9.9 bn	2.8%
To non-EU countries	£14.5 bn	5.3%
Total	£24.3 bn	4.1%

Imports of pharmaceuticals	2019	CAGR 2000–2019
From EU countries	£20.0 bn	5.3%
From non-EU countries	£4.9 bn	4.2%
Total	£24.9 bn	5.1%

Trade in pharmaceuticals, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	4.7%	8.0%
Balance EU	-£1.5 bn	-£10.1 bn
Balance non-EU	£2.0 bn	£9.6 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

# The UK pharmaceuticals industry

At sixth spot in the UK's export league table is pharmaceuticals. In 2018, the sector employed 43,000 people, generating a turnover of £20.4 billion. This makes pharmaceuticals a slightly smaller industry than computers and electronics. And like that sector, GVA in pharmaceuticals is also relatively small, at £7.9 billion. Although a star performer, pharmaceuticals has had a rough ride since 2000. Having grown extremely quickly up to 2008, the sector went into rapid decline from 2009–2014 and has been in steady convalescence ever since, with turnover fluctuating wildly. Unlike other sectors, this weakness in domestic production is directly attributable to how the UK trades with the EU.

In simplistic terms, the UK pharma industry began a drastic process of offshoring production in 2008, which involved global pharmaceutical companies closing UK factories. Three examples would be Pfizer's 2011 closure of its Viagra-creating R&D centre at Sandwich; Sanofi's 2012 closure of its Newcastle plant; and Novartis' 2014 closure of its Horsham factory.

Ireland was a major beneficiary of this offshoring process, though the European Chemical Industry Council (CEFIC) notes that other European countries also benefited, as well as India, China, and Singapore. Repossibly Belgium and the Netherlands were beneficiaries too, because by the end of 2019, these countries also accounted for a large share of the UK's EU pharma imports. In that year, the Netherlands supplied 23 per cent of the UK's total pharmaceutical imports. GSK – which billed itself as the world's largest vaccine manufacturer until 2019 – concentrates its vaccine manufacturing in Belgium, recluding at a gigantic facility at Wavre.

The result of steady offshoring from 2009 onwards was that (pre-pandemic, at least) the UK's pharmaceutical

manufacturing industry was only modestly sized compared to most countries in Europe. According to Eurostat data,<sup>88</sup> the UK's pharmaceuticals manufacturing – valued at €20.6 billion in 2017 – was worth less than half of Switzerland's (€44.9 billion), two-thirds of Italy's (€31.2 billion) and Germany's (€30.6 billion), and slightly less than France's (€21.9 billion). Tellingly, it was barely bigger than Ireland's (€19.3 billion).

The competitiveness of UK pharma manufacturing also looked shaky. Using Eurostat data, the Association of British Pharmaceuticals Companies reckons that GVA per worker fell from double the EU average in 2008 (before the offshoring process began) to little more than half in 2016.<sup>89</sup> ONS data is more forgiving, but not much. It reports that by 2018, both value-add and employment were back where they were in 2008, with value-add having taken a big dip in between. Compared to other sectors this is a poor performance. It implies a level of productivity best described as dead moderate.

The UK's pharma sector remains highly research focussed. According to analysis by Make UK, the UK pharmaceuticals sector receives more R&D investment than any other sector, with 27 per cent of the total for manufacturing in 2016. But back in 2010, the UK pharmaceuticals industry received an estimated 40 per cent of manufacturing R&D. And note this huge input of R&D spending occurred just as manufacturing began to move offshore. This indicates that in the pharmaceuticals industry, UK manufacturing was not the automatic beneficiary of high levels of R&D.

Still, pre-pandemic R&D spending on pharmaceuticals remained high compared to other EU countries. According to European industry-association data, the UK only just lagged behind Germany and Switzerland – though these

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numbers take no account of the surge in spending that occurred in R&D and manufacturing plant during 2020.<sup>91</sup>

Estimating trade dependency is hazardous because large volumes of pharmaceuticals are imported into the UK, repackaged and then exported. This means the raw export data tends to inflate the value that exports deliver to UK. In 2018, for example, exports worth £25 billion equated to 122.5 per cent of sector turnover: that is, UK exported pharmaceuticals that were worth far more than the nominal value of pharmaceuticals actually produced in the UK. This is unusual, even accounting for the value-add of repackaging, profits, and all transport and export costs involved in taking a good to its port of departure. The industry reckons that 41.2 per cent of what's actually made in the UK is exported. This estimate is probably a good guide in a difficult-to-measure sector. It would make pharmaceuticals the UK's third most export-dependent manufacturing sector.

## What does the UK make and where?

In recent decades, the focus of the UK's pharmaceuticals industry has dispersed from the northern heartlands of the UK's chemicals industry – where it began – to the South East and elsewhere around the UK. This migration is apparent in both research and production. Change is brisk, however. Many factories in the South East closed during the great, post-2008 offshoring.

The industry is fairly concentrated commercially, with AstraZeneca and GlaxoSmithKline by far the UK's two largest pharmaceuticals companies. However, the market size of pharma companies changes rapidly as revenue from blockbuster drugs swells company balance sheets, then revenue dries up as drugs come off patent. Meanwhile, small pharma companies with successful treatments are bought out

by majors, and so the cycle starts again. According to the ONS, the total number of companies engaged in pharmaceuticals manufacturing almost doubled, from 376 in 2008 to 645 in 2018. This is a steep rise by UK manufacturing standards.

Clustering around research centres and life sciences hubs is now a major trait of the pharmaceuticals industry. AstraZeneca's 2015 relocation to Cambridge is a prime example. According to AstraZenaca, Cambridge is now home to 440 life sciences and healthcare organisations that employ 19,000 people.<sup>93</sup> Since 2016, three major companies have invested in research hubs in the UK since Denmark's Novo Nordisk, Germany's Qiagen and MSD (known as 'Merck' in North America) committed over £1 billion to research hubs in the UK in 2017.<sup>94</sup>

In terms of actual products, the making of basic pharmaceutical products has almost entirely moved overseas. This category includes medicinally active substances – such as antibiotics and basic vitamins – that are subsequently used in preparations. For example, UK-dispensed paracetamol is mostly made in India with ingredients from China. The manufacture of basic pharmaceuticals was worth just £1.9 billion in 2018, or 10 per cent of sectoral output.

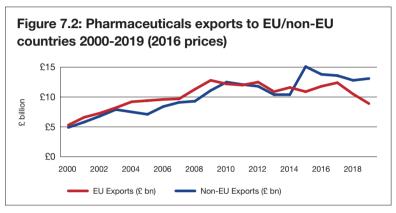
The rest of the goods in this sector, or 90 per cent, consist of pharmaceutical preparations. This broad category includes thousands of medicines, vaccines, contraceptives, diagnostic preparations – including radioactive diagnostic – and various types of waddings and bandages. Today, this preparations category dominates UK trade in pharmaceuticals. It made up 86 per cent of global exports in 2019 and 84 per cent of imports.

## Trade: EU versus non-EU

The pharmaceuticals sector provides a cautionary tale for how trade with the EU can turn toxic very quickly. In

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absolute terms, pharmaceuticals is still a star performer. Overall, exports grew by 116 per cent in real terms from 2000, with a CAGR of 4.14 per cent. Worth just 4.7 per cent of UK manufacturing exports in 2000, pharmaceuticals contributed eight per cent by 2019. This is excellent growth – the fastest of any of the UK's top 10 manufacturing export sectors. But on closer examination, the picture soon clouds.

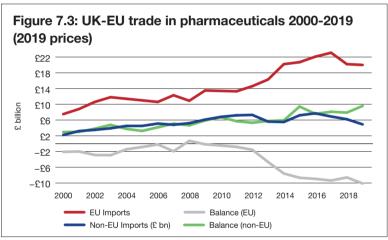


Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

Up to 2009, exports to EU and non-EU markets both grew very strongly, more than doubling in a decade. Then – as the off-shoring process swung in – export growth abruptly stalled. Exports to EU and non-EU countries fell gently from 2010–2014. At this point exports closely track UK production, as UK domestic manufacturing fell from a high of £18.7 billion in 2010 (current prices) to a low of £13.4 billion in 2015. From 2015 onwards, a recovery in domestic production commenced, with UK production increasing erratically to £20.4 billion in 2018. The recovery in production is reflected in non-EU exports, which leapfrogged EU exports in 2015 then kept their edge. But exports to EU countries never regained their 2009 high. Exports fell sharply in 2017 and

2018. At the end of 2019, they were worth less – in real terms – than in 2004. This is a disastrous performance.

The cause is clear from the chart below. From 2011, EU imports surged. From 2012, a huge deficit opened in the UK's trade with the EU. Up until 2009, UK–EU trade in pharmaceuticals was fairly balanced, and in 2008 the UK even registered a surplus. But from 2011–2017, imports from the EU almost doubled. With a slight lag, this is the period when UK production fell, and so did exports. EU imports displaced UK production. Hence the vast, new £10 billion-per-year deficit (the grey line, below).



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices). Balances calculated from current prices, with export deflator used for surpluses and import deflator for deficits.

Critically, this pattern does not repeat in the UK's global trade. Imports from outside the EU grew steadily from 2000 to 2012, but then stalled – at exactly the time the UK's imports from the EU rocketed. The effect was that the UK's net surplus in non-EU trade continued to grow through this period from £2 billion in 2000, to £5.7 billion in 2010, and to £9.6 billion in 2019. This is the clearest possible evidence that EU-based

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manufacturing was the chief beneficiary of the offshoring that occurred in the UK pharmaceuticals industry post-2008.

As we shall see below, the EU now accounts for over 80.4 per cent of the UK's pharmaceuticals imports, which is far, far higher than the 58.6 per cent average in UK manufacturing. Meanwhile, the EU takes just 40.6 per cent of UK pharmaceutical exports, which is far below the 47.8 per cent average. Along with autos, this makes pharmaceuticals the most severely imbalanced of UK–EU trade relationships. And it happened because pharmaceutical manufacturing migrated from the UK to elsewhere in the EU from 2009 to 2015.

To some extent, the Rotterdam/Antwerp effect may be playing tricks, disguising imports from India, say, as imports from the Netherlands. The subject is relevant to pharmaceuticals because according to ONS data, the Netherlands is the UK's predominant supplier of medicinal and pharmaceuticals goods, with Dutch imports worth double those from Germany, or about 23 per cent. This is an unusually high proportion for UK–EU trade, though the Netherlands is indeed home to a very large pharmaceuticals and life sciences industry.

One import source is easy to identify. Ireland's trade statistics show that the Republic has sprouted an enormous pharmaceuticals export industry, which generated 44 per cent of Ireland's exports in 2016, according to Ireland's Central Statistics Office. According to the Irish Pharmaceutical Association, Ireland is now the largest net exporter of pharmaceuticals in the EU. And according to UK customs data, medicinal and pharmaceuticals make up 16 per cent of the Republic's exports to the UK. This makes it easily Ireland's principal export earner in Ireland–UK goods trade, worth £2.2 billion in 2019.

Like Singapore and Switzerland, Ireland embraced pharmaceuticals as a strategic industry. But Ireland's success has been disastrous for the UK. For example, when Pfizer closed its Sandwich centre in 2011, with the loss of over 2,400 jobs, 100 it was Ringaskiddy in County Cork that benefited. And the relative attractiveness of Ireland as a destination for investment by global pharma as compared to the UK is easily the biggest challenge facing trade in UK pharmaceuticals. Despite being the UK's fastest growing export industry of the past two decades, pharma exports to the EU are now falling while surging imports generate a huge trade deficit.

# Trade relations and comparative performance

What have trade relations to do with this result? Theoretically, EU membership has had only a slender impact on trade in pharmaceuticals, though the impact did increase from 2000–2019. As with transport/aerospace, the Customs Union is of no direct commercial benefit to most UK exports in this sector. Most major developed economies that are members of the WTO abolished tariffs on finished pharmaceuticals via the Pharmaceutical Tariff Elimination Agreement (PTEA) which came into force in 1995. This agreement applies to members of the EU.

There is a slight catch, though. The PTEA doesn't cover all pharmaceuticals goods, and the PTEA list of tariff-free goods has not been updated since 2010. 101 Also, PTEA does not cover active pharmaceutical ingredients (APIs). This means that some UK pharmaceuticals and API exports did start to benefit from the Customs Union by avoiding a tariff of approximately 4–6.5 per cent that they would otherwise incur if UK were trading with the EU under WTO rules. 102 And APIs can cross borders several times, compounding the potential cost addons of cross-border trade.

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But compared to other sectors, the advantage conferred by membership of the Customs Union appears minimal. APIs comprise just 10 per cent of UK pharma exports. And whatever the proportion of UK exports not covered by the PTEA today, it's indisputable that that the fastest rise in UK pharmaceutical exports occurred in the period pre-2010. This was the period when the PTEA list included all finished pharmaceutical goods, and therefore Customs Union membership delivered no advantage.

Perversely, the period when UK membership of the Customs Union progressively began to confer a benefit on some UK pharma exports to EU – post 2010 – was simultaneously the period when exports ground to a halt. It includes the year – 2015 – when non-EU exports decisively overtook exports to the EU.

Seamless access is not much of a factor either – at least compared to other sectors. UK-based production may well have benefited from the various licensing regimes administered by the European Medicines Agency (EMA) from its founding in 1995, but the EU has not created anything approaching a single market for pharmaceuticals, so the impact is probably slight. There is a centralised authorisation procedure for medicines which delivers authorisation across the EU. It is mandatory for biotech medicine, and it became mandatory for medicines that contain new active ingredients in 2005, and for advanced therapies in 2009. But according to the EMA, "The majority of medicines sold within the EU do not fall within the scope of the centralised procedure but are authorised by national competent authorities in the member states." <sup>103</sup>

And even if the EMA and its authorisation processes did confer solid benefit, they can't carry much value if their effect is easily replicable. The EU imports more pharmaceuticals from Switzerland than any other non-EU country in the world, <sup>104</sup> including the US – and the US supplies 31 per cent of all EU pharmaceutical imports. Switzerland maintains its own regulatory authority for pharmaceuticals, and trade with the EU is based on mutual recognition arrangements. These arrangements are rooted in historic trade agreements, <sup>105</sup> but its unarguable that non-EU Switzerland has developed an almighty pharma export industry with the EU, despite not being part of the Single Market.

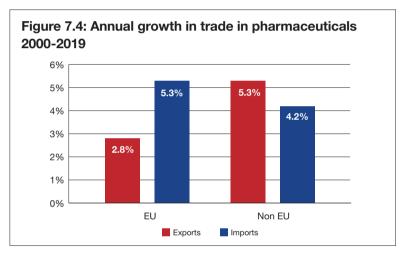
One further point is germane. The EU's centralised process for authorising medicines is a benefit that also extends to countries and companies outside the EU. For example, the BioNTech–Pfizer Covid-19 vaccine was assessed by the EMA for licensing across the EU and the European Economic Area (minus Switzerland). When approval was given, the benefit of centralised authorisation accrued to both BioNTech and Pfizer. This is despite the fact that the company that is manufacturing and commercialising the drug – Pfizer – is based in the US. So, Pfizer got the benefit of a single authorisation that applied to 30 countries, without the US being any part of the regulatory regime.

In other words, one feature of the Single Market is that it provides benefits to companies and countries *outside* the EU, but without imposing costs on them. It's partly for this reason that the Single Market is popular, politically, with countries who are not members. It's convenient for them, too. Some of the procedural benefits created by the Single Market will still accrue to UK companies that export across the EU, even though UK will no longer be a member.

What does this mean for the comparative performance test? Clearly making a judgement on the comparative benefit enjoyed by UK pharma companies while the

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UK was in the EU is more tricky than usual. Some of the benefits were either replicable by non-EU countries (as for Switzerland) or accrued externally anyway (as for US-based Pfizer). Compared to other sectors, the benefits appear low: the tariff advantage only applied to a small portion of exports, and the regulatory advantage did not apply to most medicines. If proof is wanting, it's to be found in the trade data of small countries like Israel and Singapore that have built major pharma export businesses in EU markets.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

More to the point, the tariff and regulatory advantages of EU membership expanded after 2000. But as these supposed benefits accumulated, UK exports to the EU deteriorated. By 2019, pharma exports had returned to the same inflation-adjusted value they held in 2004. If the Customs Union and Single Market did exert a significant impact on UK exports to the EU – and on UK production – then the evidence suggests strongly it was a negative one. At the very least, these crosscurrents imply that the EMA and the Single

Market were not the principal factors in how the UK's trade evolved with the EU during this period.

So, with minimal tariff advantage and a questionable degree of positive regulatory impact, this is clearly one sector that should 'outperform' in non-EU markets as compared to EU markets. And yet the comparative performance metric comes in – just – below expectations. Exports to non-EU countries grew by 5.3 per cent per year; exports to non-EU markets grew by 2.8 per cent per year. The difference of 2.53 ppts is very slightly under the 2.63 ppts average for UK manufacturing.

This is very odd. Compared to other sectors, UK pharmaceutical manufacturing enjoyed only marginally preferential access to EU markets during this period. So, compared to other sectors, exports to non-EU countries *should* have grown much faster than to EU countries. They didn't, and they especially didn't in the decade up to 2010 when the great offshoring began. The CAGRs of EU and non-EU exports only diverged after 2014, as the admittedly slender benefits of the Customs Union and Single Market increased. This means the sector must be marked down as having delivered another perverse result. In other words: UK exports of pharmaceuticals from 2000–2019 did not behave in the way they should have, if the Customs Union and Single Market exerted an overall positive impact on UK manufacturing exports.

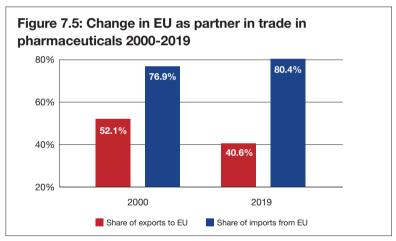
# Long term trends

As already noted, UK trade in pharmaceuticals is acutely imbalanced. After 2010, the EU's overall share of UK pharmaceutical exports went into rapid decline. The EU took 52.1 per cent of UK exports in 2000 and just 40.6 per cent in 2019. Meanwhile, the EU's share of imports rose

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gently. It was already extraordinarily high in 2000, at 76.9 per cent. But it carried on climbing to 80.4 per cent by 2019 – thanks to offshoring and the subsequent acceleration of imports from EU.

The distribution of UK trade in pharmaceuticals in 2019 represents a grisly outcome for the UK. It means that in the UK's fastest-growing export sector, the UK remained a captive market to imports from the EU in 2019 – even though the EU took a swiftly declining portion of UK exports. It is on a par with the UK's auto industry, where the EU supplied 83 per cent of imports but took just 44 per cent of exports. Neither result is a fluke. They are both the result of ingrained trends, and manufacturing leaving the UK well before 2016 and then setting up shop elsewhere in the EU.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

Fortunately, the industry is primed for structural change. The anticipated rise of personalised medicine – where treatments are tailored to the genetics of the patient – will see manufacturing having to cater to individualised treatments. It's not clear at what stage in the manufacturing

process this individualisation will need to occur, but it's likely that at least some of the supply chain will move closer to the patient. If UK manufacturing is nimble, the country could become a leader in this evolution. And the UK should be. The rapid rise in the number of pharmaceuticals companies in the UK should translate into corporate agility. Meanwhile, the UK is in a strong position to pioneer the supply-chain shift because the public services consume 30 per cent of the sector's output, either via the NHS or via over-the-counter services. <sup>107</sup> This puts the government in a position of exceptional market power.

Also, the coronavirus pandemic is changing official attitudes to manufacturing supply chains. Even before the AstraZeneca vaccine succeeded in clinical trials, the UK Government had committed to "... investing in the UK's sovereign manufacturing capability to ensure that at the point a vaccine or drug-based treatment is developed it can be manufactured at scale as quickly as possible." By expressing support for expanding the capacity of the UK's new Vaccines Manufacturing and Innovation Centre (VMIC) in Oxfordshire, the UK Government signalled that 'security of supply' considerations are an increasing factor in manufacturing policy. If the VMIC can contract the lead times between variant detection and vaccine production, then the UK could quickly re-establish itself as a hub for global vaccine manufacturing.

Aside from clinical trends and current events, there's a common-sense reason for optimism. For obvious reasons, pharmaceuticals is one of the most heavily regulated sectors within global trade. All jurisdictions have tight regulations and enforcement is usually scrupulous. And yet that diversity of regulatory jurisdictions has not stopped UK pharma companies from growing exports to a huge diversity

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of global markets by an exhilarating 5.3 per cent per year, and almost tripling the real value of exports to non-EU markets in just two decades. This is a terrific performance – outshone only by the UK's gleaming auto marques.

This performance delivers a pointed lesson to trade analysts and negotiators. While regulatory alignment and broad mutual-recognition agreements *sound* like a valuable asset in trade relations, in practice, they may count for very little. If a company has a product that will sell well in other markets, it will get the product licensed, then export it. By nature, businesses adapt. The 5.3 per cent CAGR that UK pharma companies racked up in non-EU markets since 2000 shows British pharma companies do this very well. But pharmaceuticals companies based in Ireland do it even better.

The challenge for policymakers is keeping the pharmaceuticals manufacturing industry in the UK to begin with. The failure to retain investment in the UK from 2009–2014 allowed plants in the EU to displace UK manufacturing. That offshoring arrested export growth and accelerated imports. So far as Ireland is concerned, corporate taxation rates are often cited as the principal cause of offshoring, although professional services company PwC also flags Ireland's tax treaty network and the availability of R&D credits. 109

The relative success of UK-based vaccine research and the setting up of UK-based vaccine manufacturing during 2020 may encourage the UK Government to take active steps to keep UK pharma manufacturing in the UK. New factors are in play. Before 2020, security of supply was never a major issue in trade in pharmaceuticals; by February 2021, it clearly was. Practical politics is forcing pharma manufacturing back into the UK, although only in one usually minor field – vaccines.

### LESSONS LEARNED FOR A GLOBAL BRITAIN

Outside of current events, a brutal warning attaches to the medical notes of the UK's otherwise sickly pharma sector. The UK Government can negotiate all the regulatory alignment it likes with the EU, but manufacturing and exports won't revive until it makes the UK a comparatively more attractive destination for investment in pharmaceuticals manufacturing than Ireland, the Netherlands and Belgium.

# **Basic** metals

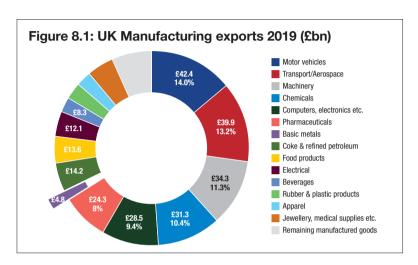


Table 8.1

Exports of basic metals (minus precious metals)	2019	CAGR 2000–2019
To EU countries	£2.8 bn	-0.2%
To non-EU countries	£2.0 bn	1.5%
Total	£4.8 bn	0.4%

Imports of basic metals (minus precious metals)	2019	CAGR 2000–2019
From EU countries	£4.3 bn	2.3%
From non-EU countries	£2.0 bn	3.6%
Total	£6.4 bn	2.7%

Trade in basic metals (minus precious metals) 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	1.8%	1.6%
Balance EU	−£0.1 bn	–£1.5 bn
Balance non-EU	£0.2 bn	−£0.1 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. **Note:** Trade in basic metals is usually the UK's seventh largest ... that is, in any ordinary year. In 2018, for example, the UK exported £16.5 billion of basic metals: less than the pharmaceuticals sector; more than the food sector. But 2019 was no ordinary year. Exports of

#### LESSONS LEARNED FOR A GLOBAL BRITAIN

precious metals leapt from £11.5 billion-worth to £24.4 billion. Imports of precious metals also shot, also by £13 billion. The culprit was trade in non-monetary gold. Vast amounts of it began to wash through UK trade accounts without adding value to UK manufacturing. The ONS does not provide per-country data on trade in gold and only broad data on trade in precious metals. This makes it impossible to neatly extract the value of gold from the trade data without also extracting the value of all precious metals, which includes silver, platinum, palladium, enriched uranium and ruthenium. And this is why the value of trade in all precious metals was stripped out of the trade data in this report. This chapter will primarily focus on what's left – iron and steel.

# The UK basic metals industry

In 2018, turnover in the UK's basic metals sector was £17.4 billion, and the sector employed about 71,000 people. Of this, £7.6 billion was from the manufacture of basic iron and steel and other ferro alloys, which employed 26,000 people. The manufacturing or processing of precious metals added £6.1 billion to the mix and employed 22,000 people. Approximately 48 per cent of this precious metals sub-sector is aluminium, copper, lead, zinc and tin. The rest includes production of gold, silver, platinum and palladium, and the processing of nuclear fuel.

Gross value added for the sector as a whole was £3.8 billion in 2018, with GVA for basic iron and steel output contributing almost one third, at £1.1 billion. This means that the UK's metals industry is now a relatively minor activity in UK manufacturing. In value-add terms, it's approximately half the size of the UK's beverages industry. GVA for precious metals, which includes gold, was £1.4 billion in 2018. This is a valuable sub-sector for UK manufacturing. But it has to be removed from UK trade analysis because most trade in precious metals is unconnected with any manufacturing process. For example, the value of precious metals exports in 2018 was almost triple the value of domestic output (£15.5 billion to £6.1 billion), which far exceeds all other sectors.

The steel industry has had a grim time since 2000. According to industry association, UK Steel, output dropped

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from about 15 million tonnes in 2000 to approximately 8 million tonnes in 2018. The World Steel Organisation puts UK output at a slightly lower 7.3 million tonnes for 2018, and this places the UK well down the rankings of global steel producers, at the Number 22 slot. France produced twice as much steel in 2018, and Germany almost six times as much. Steel manufacturing is struggling and there are no silver linings in the sector. Manufacturing of tubes and pipes recently halved in value, and aluminium dropped by a quarter; manufacturing of copper, lead, tin and zinc also fell over the past decade.

Imports are partly to blame. The UK imported £3.4 billion of basic iron and steel in 2000 (2016 prices) and £5.6 billion in 2019 (also in 2016 prices). This is not a huge increase given the halving in UK output from 1998 to 2018. Imports fluctuated within a fairly tight band throughout this period, and between £5–7 billion from 2004 onwards. Nevertheless, by 2019, the UK was a solid net importer of basic steel – which it mostly wasn't from 2000–2010. This, together with low demand from the rest of UK industry, resulted in declining output over the past decade.

A potent factor in falling production is low competitiveness owing to the high cost of power. UK Steel estimates the cost of power for the steel industry in the UK at approximately £65/MWh, as opposed to just over £40/MWh in Germany and £30/MWh in France. 113

More difficult to quantify is the impact of subsidies. In terms of industry-wide subsidies, the UK definitely operates at a disadvantage. According to a European Commission (EC) scorecard for 2018, the UK spent less on state aid than any other major EU economy, at just 0.34 per cent of GDP.<sup>114</sup> The French Government was judged to expend 0.79 per cent of GDP on subsidies, which is just over the EU average. But

at 1.45 per cent of GDP, the rate of subsidies in Germany is over four times the UK's. 115

How much subsidy flows into steel is not clear, but some of it arrives in the form of low-cost energy. According to the same EC source, 82 per cent of state subsidies in Germany were devoted to environmental protection and energy saving in 2018, which indicates that the German steel industry may gain a significant advantage via subsidised power. The UK's *Financial Times* certainly thinks so. In 2016, the *Financial Times* reported that the German Government had recently given subsidies worth over €9 billion to its most intensive energy users, claiming: "Germany has handed over 40 times more in energy subsidies to heavy industry since 2013 than the UK, highlighting one reason why British steelmakers are in such trouble."<sup>116</sup>

Interestingly, the UK's principal trade association, UK Steel, has also pointed the finger at the EU's energy-subsidy regime, stating: 'In numerous cases where the UK has attempted to provide reductions in energy costs to the steel industry, and others, the EU Commission has delayed the process and insisted upon an overly constricted, and ultimately unnecessary, interpretation of state aid guidelines."<sup>117</sup> Though the association called for continued free trade with the EU in May 2020, it pointedly called for autonomy in state aid and subsidies in line with WTO provisions.<sup>118</sup> This implies that UK Steel was less a fan of close EU integration than most UK trade associations.

### What does the UK make and where?

The UK's iron and steel industry is concentrated in a few locations of great historical resonance. Two surviving integrated steel plants sprawl across Port Talbot in South Wales and Scunthorpe in north Lincolnshire. In 2018, these

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plants produced approximately 5.7 million tonnes of oxygen steel<sup>119</sup> – so-called, because it involves blasting oxygen into pig iron to turn it into steel. The output is supplied to industry in strip products or slab form. The Scunthorpe plant (at time of writing owned by British Steel, which in turn was owned by Chinese industrial group, Jingye) produces rails and sleepers for the railway industry; beams and columns for the construction industry; components for the mining industry and materials-handling manufacturers; and wire rods. The Port Talbot works – with easily the largest workforce – manufactures hot and cold rolled steel for engineering companies, including, especially, for the UK's auto industry. <sup>120</sup> It also supplies steel products for UK construction.

In 2018, a further 1.6 million tonnes of steel came from two electric arc furnaces in Yorkshire – Sheffield Forgemasters and the Liberty plant at Rotherham. The Rotherham plant produces a portfolio of precision steel goods, including tubes and pipes. With the most illustrious name in the sector, Sheffield Forgemasters is famed for casting complex parts for the nuclear and defence industries and for the UK's offshore energy sector. Another firm, CESLA UK – also based in South Wales – specialises in reinforced bars and other components for the construction industry, as well as wire rods for general engineering uses.<sup>121</sup>

Within the core iron and steel industry, approximately 10,000 are employed in Yorkshire and the Humber region, and 8,500 in Wales. Approximately 4,000 are employed in the West Midlands in smaller-scale manufacturing operations. 122

The UK steel industry is fairly trade intensive. According to UK Steel, approximately 44 per cent of the 7.9 million tonnes of steel produced in the UK currently is exported.<sup>123</sup>

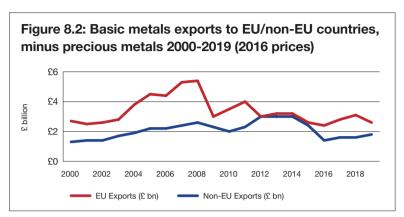
The UK specialises in rod and rail steel products, which comprise a high proportion of UK steel exports. <sup>124</sup> UK industry consumes about 9.4 million tonnes of steel per year. The UK construction industry is by far the biggest taker, absorbing 5.7 million tonnes – and that's also where 61 per cent of UK-made steel ends up. <sup>125</sup> According to UK Steel, this means that approximately half of the steel used in the UK construction industry is made in the UK. <sup>126</sup>

The rest of UK industry consumes about 3.7 million tonnes of steel per year, and just under half of that is supplied from UK mills. 127 The automotive industry purchases about seven per cent of steel consumption, and about five per cent goes to machinery and engineering customers, and another five per cent to packaging. The remaining 21 per cent goes to a variety of customers. Shipbuilding is intermittently a major customer, although entirely dependent on naval demand. The near total collapse of civil shipbuilding in the UK since the 1970s is responsible for much of the drop in UK demand for steel. The top five global steel producers today – a group that includes China, Japan and Korea – between them build the bulk of world shipping.

### Trade: EU versus non-EU

Since the referendum, most manufacturing trade associations have stressed the importance of EU trade without reference to imports, long-term export trends or the comparative performance of non-EU exports. The steel industry is no different, though in this case the EU really is centre stage. Since 2000, exports to the EU have consistently exceeded exports to global markets. From 2004–2008, exports to the EU were worth approximately double. In 2019, 59.2 per cent of UK exports of basic iron and steel products went to EU countries, although this proportion has fluctuated since

2009. UK Steel reckons that 30 per cent of UK steel output is sold into the EU.<sup>128</sup>



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

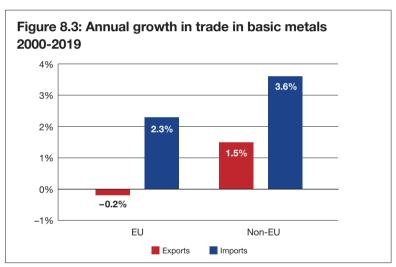
In terms of non-EU markets, the US takes approximately 13 per cent of exports by value. Turkey is also a major export partner taking eight to nine per cent of exports by volume – and the UK had tariff-free access to the Turkish market in late 2020. But overall, the picture is fairly bleak. Despite good growth from 2000–2008, especially in EU markets, export trajectories since 2009 have been declining or remained flat. In real terms, exports in 2019 were almost precisely where they were 20 years before. Imports rose, but not by much. Imports from both EU and non-EU countries were about £1 billion higher in 2019 than they were in 2000.

# Trade relations and comparative performance

Judging the two-decade performance of exports to the EU and to non-EU countries is hard. Neither moved in any obvious direction. Exports to the EU were fractionally lower than they were in 2000; exports to non-EU countries were marginally higher. Between those dates, exports fluctuated.

Given the flat growth for this sector, the per-decade assessment is more insightful. In 2016 values, exports to EU countries averaged £3.7 billion to EU markets from 2000–2009, and £3 billion from 2010–2019. This indicates that exports essentially fell over the two-decade period.

Non-EU exports put on a better show, though from a lower level. These averaged £1.9 billion from 2000–2009 and £2.2 billion from 2010–2019. Consequently, although EU exports performed extremely well from 2003–2008, they did not hold their gains and in a poor race non-EU exports performed marginally better.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

Was this to be expected, given the relative advantages of trading inside the Custom Union and Single Market? Here the question becomes fiendishly difficult because, in steel, the question is not just whether the Customs Union and Single Market rules were impactful, but whether on balance they were both impactful *and* beneficial.

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The EU has abolished steel tariffs on its WTO trade, but it maintains safeguards in the form of import quotas. These quotas have impacted trade, especially over the past five years. Trade in steel is highly political. Both the EU and the US have imposed safeguards on imports of steel in the past decade. While the UK was in the Customs Union, only the EU could take effective countermeasures against the perceived abuse of international steel markets – for example, by the alleged dumping of under-priced steel. Whether the EU acted in the UK's interest is open to debate.

For example, the UK steel industry *might* have benefited greatly from EU membership had the European Commission been more aggressive in its use of trade defence instruments (TDIs), such as anti-dumping measures on Chinese-produced steel in 2015–16. During this period, low-cost Chinese-produced steel became prevalent on world markets, <sup>131</sup> and UK trade bodies requested protection. <sup>132</sup> The US acted vigorously and increased tariffs on Chinese cold-rolled steel from 266 per cent to 522 per cent.

That the EU refrained from doing so is an insufficiently examined question in European political economy. But if the EU had imposed anti-dumping measures, then Germany's huge metal-manufacturing industries would have been deprived of a source of low-cost steel. Then again, so would UK car makers. This is possibly one reason why the UK's then Business Secretary, Sajid Javid, also opposed changes that would have permitted an increase in EU duties. Increased EU duties would have protected UK steel manufacturing from competition that was perceived to be unfair, but at a cost to other UK manufacturers.

Nevertheless, the question remains: should UK steel have theoretically benefited from UK membership of the Customs Union? The fact that trade in steel is open to sudden, tradedistorting measures suggests the raw power of membership of a huge Customs Union should have been an advantage to the UK. But when it was needed, EU power wasn't necessarily deployed in the interests of UK industry, or – more precisely – to the advantage of the UK's steel industry. On the perception that bargaining clout is probably a bigger influencer in trade than the EU's zero tariff, it is safer to judge that membership *should* have benefited the UK. In that case, the comparative performance test succeeds with this sector, with a divergence in EU/non-EU export CAGRS of just 1.7 ppts.

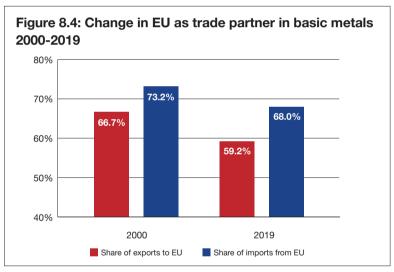
But the takeaway point here is that subsuming trade policy within a Customs Union carried a clear downside risk. The Customs Union may have prevented the UK from protecting its domestic steel industry from 2015 onwards if the UK Government believed there was a net advantage to keeping UK steel prices high. We will never know. But among the gritty survivors of the UK's toughest manufacturing industry, employees probably reckon that their industry is better off out of the EU Customs Union so that their own (UK) government is in control of retaliatory trade controls. Presumably, the industry reckons that UK officials will likely prove more amenable to their needs than the opaque trade-policy formulators of Brussels.

### Future trends

As noted, the UK's trade in steel is still highly EU-centric, with EU markets consistently taking more than 50 per cent of exports over the past decade. What's more, EU producers still deliver 68 per cent of imports. But the two-decade trend is towards greater trade with global steel producers and markets. Whether the UK decides to liberalise trade in steel will be a litmus test of its commitment to free trade.

### BASIC METALS

For example, if the UK adopts a policy of protecting the specialised steel that the UK produces and encouraging global imports for the rest, then the proportion of imports sourced from the EU will fall rapidly. But this decision will involve immensely difficult calculations on the part of the UK Government. The UK's trade policy could pit the interests of UK car makers and the desire to revive shipbuilding against the interests of the UK steel industry. And policy on UK steel manufacturing can't avoid price-of-energy issues, and the question of who should bear the cost of developing renewable energy sources within the UK grid.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

Currently, UK power customers are subsidising new renewable energy generation via high power costs. Over in the EU, state subsidies are lowering energy costs for the UK's industrial competitors. This means there is no easy fix for UK steel's biggest headache. Efficiency gains from the giant 12–14 MW wind turbines now being planted on the Hornsea Reef and Dogger Bank may eventually tip

the energy-price scales in the UK's favour. But opinions are divided over when this inflection point will happen – and only time will tell. Until it does, UK steel will operate at a cost disadvantage to EU competitors. Along with the chemicals industry, it carries a heavy burden for the UK's rapid transition to renewable power.

One potential saviour is recycling. A huge volume of scrap is now emerging into steel-recycling markets as the buildings erected in the UK's blitzed-out, post-war cities are demolished. According to some estimates, the volume of steel available for recycling is set to triple over the coming three decades. This can be recycled though electric arc furnaces, which are the type used at Sheffield and Rotherham. Julian Allwood of Cambridge University has pointed out that, with a dose of innovation, much of this scrap could be recycled into high-value product, and that this provides a potentially profitable future for the UK's troubled steel industry. The scrap could be recycled into high-value product, and

These are potentially shiny prospects. The UK currently exports more ferrous scrap than any country in Europe – 8.7 million tonnes in 2018 – while importing just 0.4 million tonnes. At the time of writing, the Liberty Steel group in Rotherham appeared set to double its output by using its electric arc furnaces to recycle steel, so the strategy looks commercially viable. If it is successful and this plant becomes proficient at recycling – including for higher-grade steel products – then the UK's current £1.6 billion deficit in iron and steel products would likely diminish. But if the Government wants the UK to become genuinely competitive in steel, it must find a way to reduce the cost of industrial power.

# Food products

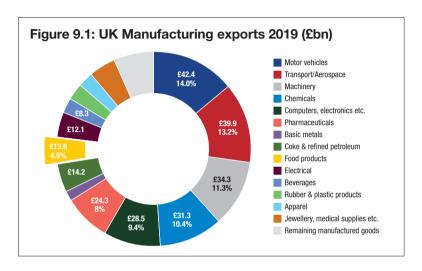


Table 9.1

Exports of food products	2019	CAGR 2000–2019
To EU countries	£9.2 bn	2.9%
To non-EU countries	£4.4 bn	4.3%
Total	£13.6 bn	3.3%

Imports of food products	2019	CAGR 2000–2019
From EU countries	£24.2 bn	4.9%
From non-EU countries	£7.4 bn	2.4%
Total	£31.6 bn	4.2%

Trade in food products, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	3.1%	4.5%
Balance EU	−£3.5 bn	-£14.9 bn
Balance non-EU	−£2.1 bn	-£3.0 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. **Note:** Although the UK's coke and refined petroleum industry is the UK's next largest export earner, the sector is not one of the 10 analysed in this series. At £2 billion in 2018, its GVA – its

output minus costs of inputs – was one third of the UK's beverages sector. It employs just 2.8 percent of the number engaged in the UK's food industry (see Appendix A). It has therefore been omitted in favour of larger industries.

# The UK food products industry

The UK's food products industry is easily the country's largest. It includes all the goods that involve processing agricultural produce or fisheries and aquaculture, and it currently employs 387,000 people. In employment terms, this makes it approximately twice as large as the UK's auto sector. In 2018 the sector generated £83.8 billion in turnover, but GVA was just £21.6 billion. By this latter metric, the industry is only 41 per cent larger than the UK's auto sector.

Like the auto sector, the food products industry is growing as a share of UK manufacturing. Add in UK beverages, and the sector's overall GVA grew from 13 per cent of total manufacturing GVA in 1999 to 16 per cent in 2019.<sup>137</sup> According to the ONS, 1,800 new enterprises were created in the food sector from 2008 to 2018. This supports the observation that the proliferation of SMEs is a defining characteristic in some areas of UK manufacturing.

While the export growth rates for UK food products look impressive (see below), they underperform global trade growth. The UK's Food and Drinks Federation (FDF) reports that global food export markets grew by seven per cent per year from 2006–2015, while ONS data says UK exports grew by 3.3 per cent per year after 2000. The UK had just 2.2 per cent market share of global food exports in 2015. This is far behind all other comparable, large economies.

Trade *is* a big part of the food industry, but in a heavily asymmetric way. In 2018, exports were worth the equivalent of just 15.8 per cent of the UK's food sector output. This is easily the lowest ratio of any major manufacturing sector. Most companies do engage in exports – 93 per cent according

### FOOD PRODUCTS

to the FDF<sup>140</sup> – but for the majority, exports were worth less than 10 per cent of turnover.

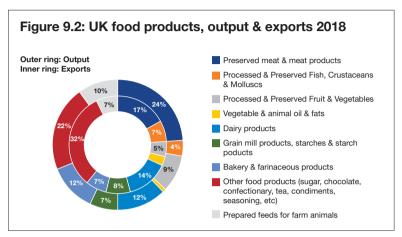
It's a vastly different story with imports, however. The UK is currently the world's fourth-biggest food importer.<sup>141</sup> Adding food-product imports to general agricultural imports (which includes fisheries and foodstuffs that are not processed), the UK imported £44.3 billion of foodstuffs in 2019. This makes foodstuffs the UK's third-largest import sector after cars and electronics. The UK has been heavily dependent on imported food ever since the Industrial Revolution, and now is no different. According to the FDF, the UK currently imports 48 per cent of its citizens' daily diet.<sup>142</sup>

## What does the UK make and where?

The UK's food manufacturing sector is spread evenly across the country and dominated by small businesses. According to the FDF, approximately 96 per cent of the 8,300 businesses in the sector employ fewer than 250 people. 143 Owing to shifts in consumer taste such as localism and food traceability, the trend towards small businesses is increasing. This is partly because the opportunities for branding, marketing, retailing and delivering via online platforms are all growing, enabling food producers to nurture customers directly. These factors are important to trade because they are opening world markets to small, premium UK producers.

The UK industry covers the full breadth of food production. The most valuable is meat processing and preservation, which was worth £19.7 billion in 2018, or 23.5 per cent of the total. Next comes bakery and starch-based foods, at £10.1 billion (12 per cent). Dairy, including cheeses, was worth £9.7 billion (11.6 per cent). Animal feeds, including pet food, was worth £8.2 billion (9.8 per cent). Chocolates

and confectionary pulled in £3.7 billion (4.4 per cent), while fruit and vegetable products sold £2.3 billion (2.7 per cent of the sector).

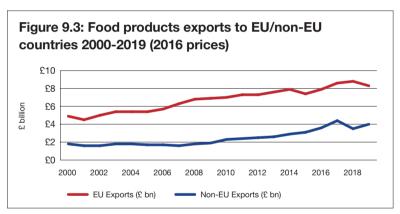


Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020; ONS, Annual Business Survey 2018, May 2020. Note values are for 2018, the latest year available for the ABS. Export ratios for 2019 vary slightly.

The UK's seafood industry is far from evenly spread, with 60 per cent concentrated in Humberside and the Grampian region of Scotland. Given the size of the UK's waters, the processing of fish, crustaceans and molluscs generated a surprisingly small £3.1 billion of activity in 2018. This is just 3.7 per cent of the UK's food manufacturing sector. But turnover is misleading. For example, in 2018, seafood-processing alone employed around 14,000 people, which is about one-third of the number employed in the UK's entire pharmaceuticals manufacturing industry. Add in fishing itself, and employment rises to 25,000. Also, fishing is an industry multiplier. It sustains boatbuilding, tackle manufacturing, chandlery and boat maintenance. A steady revival in UK fishing is likely to have multiple knock-on effects across manufacturing.

### Trade: EU versus non-EU

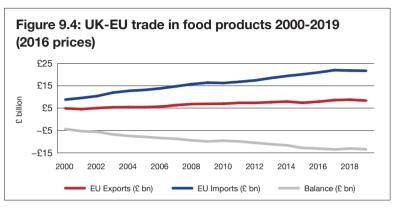
UK trade in food products is dominated by the EU – and that remained consistent throughout the 2000–2019 period. In terms of markets, approximately 21.4 per cent of the UK's food products cross the Irish sea to the Republic, and 20 per cent cross the Channel to France. A further 12.4 per cent go to Germany, 3.5 per cent to the Netherlands, and just 2.9 per cent to the US. This last number is important because it is far smaller than the 15–20 per cent of exports the US typically take from the UK's manufacturing sectors. Americans are not big buyers of British food, whereas the EU has dominated UK food exports for the past 20 years.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

As mentioned, the UK has not come close to growing sufficient food for its population since the early nineteenth century. So, what should focus trade-oriented minds is not exports, but imports. After all, the goal of trade policy is not merely to maximise the value of exports, but to secure for UK consumers the best global produce at the cheapest price. And with food imports, analysts are dealing with very large numbers. At £44.3 billion, food and agricultural imports

comprised almost one-tenth (9.4 per cent) of the value of all UK goods imports in 2019. And what's unsettling about that is that 70.2 per cent of it comes from the EU, which is – bar, say, Japan and Switzerland – the most-costly food-producing region on earth.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

Back in 2000, the UK imported £7.1 billion of food products from the EU and £3.4 billion from outside the EU (current prices). While the latter edged steadily higher, the former soared. UK consumers gorged themselves on EU foodstuffs: imports rose by a rollicking 4.9 per cent per year, which is twice the pace of import growth from elsewhere. The result was an explosion in the sector's EU deficit. Back in 2000, the UK's deficit in food produce with the EU was a modest –£3.53 billion. In 2019 it reached –£14.9 billion. And it will carry on growing unless the UK fundamentally changes the way it trades in foodstuffs.

The trade outcomes for the UK's fish sub-sector are even more curious because there's a new deficit to explain away. Up until 2005, the UK had a sizeable surplus with the EU in processed fish, crustaceans and molluscs. By 2019, however,

#### FOOD PRODUCTS

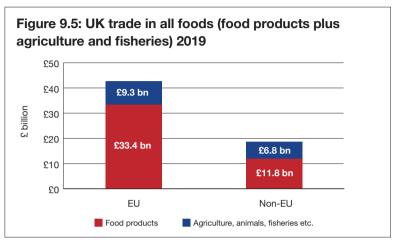
the UK *imported* 37.3 per cent more seafood from the EU than the UK sent in the opposite direction: £660 million of seafood exports compared to £906 million of seafood imports. This may be the result of fish being caught in UK waters by continental trawlers and then sold back to the UK. Only the industry can say. But a rising deficit with the EU after 2005 implies that the root cause was not the Common Fisheries Policy *per se*, but the way it was implemented.

UK fisheries had more luck in global markets. Exports rose by an exhilarating 6.6 per cent per year from 2000, albeit from a tiny base. In 2000, UK exports of processed fish, crustaceans and molluscs to markets outside the EU were worth just 21 per cent of the value of exports to the EU, or £102 million in 2016 prices. In 2019, they were worth 43 per cent of EU exports, or £259 million in 2016 prices. This indicates that the UK has good prospects for expanding seafood exports outside the EU now it has left the Common Fisheries Policy.

The global distribution for UK trade in food alters little if agriculture and raw fish are added to the mix (see below) – adding just £9.3 billion to the UK's EU trade, and £6.8 billion to UK's non-EU trade. Again, both are heavily weighted towards imports. In agricultural produce – as opposed to food products – trade with the EU generated a £4.5 billion deficit, and non-EU trade a £4.8 billion deficit.

Putting food products and agriculture and fisheries together, the UK's import dependence is clear (see Table 9.2 below). In total, the UK imported £31.1 billion of food products and agriculture from the EU in 2019, as compared to just £13.2 billion from elsewhere. Exports barely make a dent in these totals. The resulting deficits were -£19.4 billion for EU trade and -£7.8 billion for trade outside the EU. Put together, the overall deficit in UK trade in food products

and agriculture was –£27.2 billion in 2019. This falls just shy of the UK's annual EU deficit in motor vehicles.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

Table 9.2

Value of trade in food products & agriculture (2019)	EU	Non-EU	World
Exports	£11.6 bn	£5.4 bn	£17.1 bn
Imports	£31.1 bn	£13.2 bn	£44.3 bn
Total	£42.7 bn	£18.6 bn	£61.4 bn
Deficit	-£19.4 bn	–£7.8 bn	−£27.2 bn
Percentage	69.6%	30.4%	/

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

The UK's current dependence on food from Europe is historically unnatural. Since the repeal of the corn laws in 1846, UK governments have made access to cheap food a cardinal point of UK trade policy. And historically, cheap food came to the UK from outside Europe – notably the US, Canada, South America and the Antipodes. Attempts by Conservatives in the first half of the twentieth century to give preference to Britain's imperial partners foundered on the precept that the UK's industrial population deserved

#### FOOD PRODUCTS

cheap food, and any form of preference would increase the price of food.

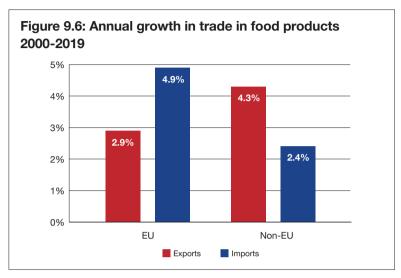
Even when the UK abandoned free trade in 1932, some foodstuffs were exempted. Protection for UK agriculture was introduced in ways that tried to limit increases in food prices. In trade deals, the British Government bartered access to UK food markets in return for better access for UK industry. The real turning point in UK food-trade policy only arrived with entry into the Common Market in 1973. By withdrawing UK agriculture and food trade into a protectionist bloc, the UK turned a deeply ingrained trade policy on its head. One hundred years ago, UK consumers bought the cheapest food on global markets. By 2019, they did the opposite.

## Trade relations and comparative performance

With food products, analysts reach the sector where the Customs Union and Single Market exerted their maximum impact on UK trade. With food and agriculture quotas queering the tariff-rate pitch, gaining a straightforward metric of EU protective tariffs is impossible. But calculations by Justin Protts, previously published by Civitas, show a range of estimated tariff rates that UK exporters would have had to pay if the UK had not been a member of the Customs Union. These include: 37.8 per cent for meats; 39.4 per cent for dairy; 31.6 per cent for confectionary; and 25.5 per cent for bakery. 148

Protected by ultra-high tariffs, UK food exporters enjoyed a greater commercial advantage in EU markets than any other export sector during the 2000–2019 period. And since food regulation is intense and currently harmonised, the putative advantage of inclusion within the Single Market should have been enormous. With food markets around the world highly protected and subject to quotas, UK

food producers should – comparatively – have performed exceptionally well in the EU.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

And the results partly match expectations. With the terms on which UK trades so heavily stacked in the EU's favour, it's extremely odd that exports *outside* the EU still grew faster – by 4.3 per cent per year, as opposed to 2.9 per cent to the EU. And yet it appears the Customs Union and Single Market did have a positive effect. The difference between the export growth rates – at 1.4 ppts – is more than one ppts tighter than the average. In other words, UK exports of food products to the EU grew quickly when compared to exports to EU in other sectors.

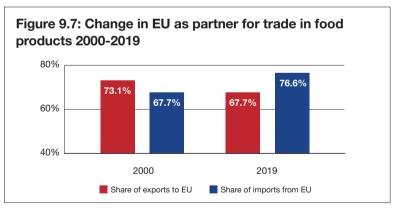
True to form, the Customs Union proved more efficacious for goods moving in the opposite direction. With imports from the EU growing at a cracking 4.9 per cent per year, and imports from non-EU countries growing at just 2.4 per cent per year, the difference – 2.5 ppts – is huge. It is worth

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remembering that the *average* difference between import growth rates from EU and non-EU countries was just 0.6 ppts in the EU's favour during the 2000–2019 period. And this huge 2.5 ppts difference in import growth rates in favour of the EU occurred in the one sector where it is least advantageous to UK consumers, because there's cheaper food to be bought elsewhere.

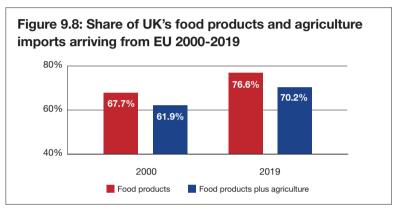
## Long-term trends

With trade policy skewed heavily in favour of EU food and agriculture, the long-term trend in UK food products matches other sectors, only more so. From supplying 67.7 per cent of the UK's food product imports in 2000, EU suppliers expanded market share to supply 76.6 per cent of UK imports in 2019. This is the third-highest EU import ratio among UK manufacturing sectors after autos and pharma. In another neat demonstration of the 'captive market' effect, the EU's share of UK exports dropped even as its share of UK imports grew.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020

Adding in agriculture to the food-product mix flattens the ratio slightly. This is because UK imports of agricultural produce are almost evenly split between EU and non-EU countries. Nevertheless, UK dependence on EU-sourced food and agriculture rose inexorably from 61.9 per cent in 2000 to 70.2 per cent in 2019. And in defiance of Gravity Theory (see above), exports moved in the opposite direction. From 2000–2019, the EU's portion of UK food exports slid gently from 73.1 per cent to 67.7 per cent – or 72.8 per cent to 68.2 if you add in agricultural produce and fish.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020

In terms of import-dependence on the EU, the UK's food-products industry closely resembles the UK's auto industry. They are the most heavily protected manufacturing sectors in terms of tariffs, and are both subject to intense, EU-specific market regulation. In both sectors, EU countries supply a gigantic share of UK imports: 83 per cent for autos; 77 per cent for food products. And in both sectors, the UK incurs enormous deficits: –£29.6 billion for autos; –£14.9 billion for food products. This is quite a coincidence. It means that in the two sectors where membership of the EU had the greatest impact on UK businesses, the outcome for UK manufacturing was extraordinary in terms of skewing imports towards the EU and generating big deficits.

#### FOOD PRODUCTS

But what of the future? Exiting the Customs Union should have a bigger impact on the UK's food industry than on any other sector. This is simply because the UK currently charges very high tariffs on food imports from the cheapest food-growing places in the world, while engaging in free trade with the world's most expensive agri producers. Of course, consumer tastes may not change. Premium European foods will still be popular. But from New Zealand to South America and the Middle East, premium food production is on the rise, and open trade will bring alternatives to UK supermarket shelves at cheaper prices.

The UK food-manufacturing industry has a vast amount to gain from seeing the price of its agricultural ingredients fall. Even if UK farming remains resistant to free trade – which it always has been – this is one sector where its influence should take a back seat. By a huge margin, the UK is a net importer of food and agricultural produce. And food manufacturing is easily the UK's largest industry. The UK's strategic free-trade interest should be clear.

For exporters, great opportunities beckon. The number of enterprises in multiple food-products sub-sectors is growing strongly. Combine that entrepreneurial trend with the magic of e-commence and a rising middle class in countries like India and China, and vast new markets are emerging. Within the past decade, it has become feasible for small independent premium producers in developed countries to bypass existing distribution and marketing channels and sell almost direct to consumers across the world. The rise of national stores on e-commerce platforms, such as Amazon India, heralds a revolution for premium food producers.

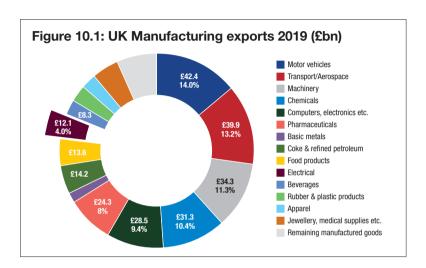
More than in any other manufacturing sector, the patterns of trade in food products are changing, and the UK's exit from the Customs Union is propitious. There has probably

### LESSONS LEARNED FOR A GLOBAL BRITAIN

never been a time in recent history where global markets were more accessible to independent food producers with a great brand. And what starts with UK cheese, biscuits, salmon and crisps could end – who knows where?

# 10.

# **Electrical goods**



**Table 10.1** 

Exports of electrical goods	2019	CAGR 2000–2019
To EU countries	£5.7 bn	-1.0%
To non-EU countries	£6.4 bn	1.3%
Total	£12.1 bn	0.0%

Imports of electrical goods	2019	CAGR 2000–2019
From EU countries	£10.0 bn	2.2%
From non-EU countries	£12.0 bn	2.5%
Total	£22.0 bn	2.4%

Trade in electrical goods, 2000 & 2019	2000 (current prices)	2019
Percentage of manufacturing exports	5.0%	4.0%
Balance EU	−£0.1 bn	−£4.3 bn
Balance non-EU	−£2.0 bn	–£5.6 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

## The UK electrical goods industry

The manufacture of electrical goods is a declining sector of the UK economy and UK exports. But it is still big, and parts of it are very successful. In 2018, the sector employed 79,000 people and generated a turnover of £13.6 billion. In overall size, this places the UK's electrical goods sector mid-way between the pharmaceuticals and basic metals industries, with a GVA of £4.7 billion in 2018. The industry includes approximately 3,000 companies that make a huge range of goods, from power generators to stylish toasters.

There are two basic groupings within the electrical goods sector: industrial and consumer. The industrial side has never properly recovered from the dismemberment of GEC in the mid-1990s. Its historic core – the British Thomson-Houston transformer factories at Rugby – staggers on today as part of the US conglomerate GE, dependent on naval contracts. More successfully, there are hundreds of mid-sized companies that produce electric motors, transformers and control equipment – predominantly for commercial customers.

The consumer side of the UK's electrical goods manufacturing has gone much the same way as consumer electronics. The 2000–2019 period is liberally studded with factory closures: Hotpoint departed Llandudno and Dyson set up in Malaysia. Russell Hobbs has gone to China, and Morphy Richards also now manufactures in the Far East. What remains – as in electronics – is the smart end of engineering design. Dyson's campus near Malmsbury is a prime example. Besides this consumer sub-sector, there are hundreds of companies that make batteries, wiring devices, fibre-optic cables and other electric cables.

UK-based electrical goods makers are heavily dependent on trade. In 2018, exports were worth the equivalent of

#### ELECTRICAL GOODS

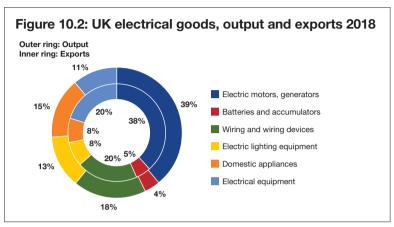
88.1 per cent of total revenue, although in real terms the value of exports hasn't budged in two decades. This is why electrical goods have a declining share of UK goods exports, down from five per cent in 2000 to four per cent in 2020. It is beyond the scope of this paper to capture and analyse the value generated by UK-based engineering companies (like Dyson, Russell Hobbs or Triumph Motorcycles) that predominantly manufacture overseas. But as in electronics, it is a growing characteristic of UK manufacturing that sustains entrepreneurs and engineering jobs in the UK.

### What does the UK make and where?

The UK electrical goods sector has no geographical centre and its products are diverse. The largest share – at 39.1 per cent – is a sub-sector that makes electric motors, transformers, generators and distribution equipment. GE Power Conversion's operations at Rugby are the most prominent, although GE attempted to move operations to France in 2018. This plant produces electric motors for frigates and destroyers. Products in the motors sub-sector are used in a growing variety of end-products, from chair lifts and mobility scooters to materials-handling equipment. Since 2008, this motor-generator and controls sub-sector has achieved approximately £5.5 billion in domestic revenue per year, although value add is gently falling.

In terms of domestic appliances, mere vestiges are left in the UK. With an output of £1.9 billion, the traditional home-appliances sub-sector contributes just 14.5 per cent to the sector. Dualit, the toaster-maker, still makes its 'Classic' range at Crawley in East Sussex. The UK's lighting manufacturers turn out £1.8 billion of equipment – some of which is industrial, some high-end domestic fittings. And there are still entrepreneurs willing to have a fresh go. In

2015, family owned Ebac – previously known for its dehumidifiers – revived washing machine manufacturing in the UK from its factory at Newton Aycliffe.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020; ONS, Annual Business Survey 2018, May 2020. Note values are for 2018, the latest year available for the ABS. Export ratios for 2019 vary slightly.

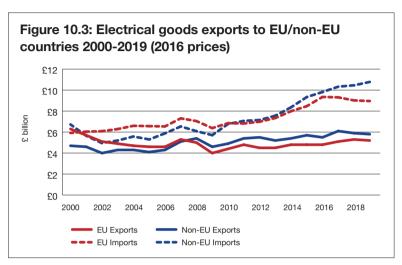
One pocket of quiet achievement is the UK's hi-fi and audio sector. Approximately 70 companies around the country sustain a global reputation for top-end speakers and amplifiers. And the sector is fairly nimble. UK brands of speakers are now finding their way into motor vehicles manufactured around the world. A more silent winner is the UK's cabling and wiring sector. Obscure it may be, but the manufacture of electric, electronic and fibre-optic cabling generates an impressive £2.4 billion in revenue per year.

### Trade: EU versus non-EU

The export performance of the electrical goods sectors was almost dead flat during the 2000–2019 period, with little discernible change. Exports to the EU declined in real terms after 2000 and were quietly overtaken by non-EU exports during 2008. Imports grew much faster. From 2002, imports

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from outside the EU grew slightly faster than imports from within the EU, repeating the UK's experience in trade in electronics.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

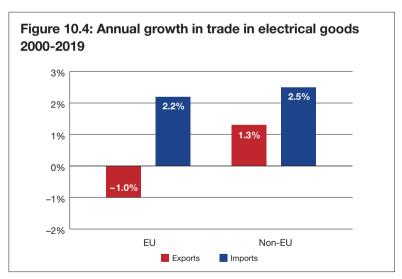
Looking beneath the surface, the proportion of electric motors and generators in the UK's export mix increased slightly after 2000 – from 34 per cent to 38 per cent. This implies that UK companies are more competitive in these than in other electrical goods. Exports of domestic appliances remained stable – at just 8.5 per cent of sectoral trade. Meanwhile, imports of domestic appliances soared to just over £5 billion, with three-fifths arriving from non-EU countries.

Tellingly, the successful motors and transformers subsector performed better in global markets than in EU ones. Exports outside the EU were worth £2.8 billion in 2019. Today this subsector delivers 44.2 per cent of the UK's non-EU electrical exports, compared to just 30 per cent of sectoral exports to the EU. And global markets take a larger-than-average share of exports: 62.2 per cent versus 37.8 per

cent to the EU. These ratios give one further nudge to the idea that where the UK has a competitive manufacturing sector, the proportion of exports going to non-EU markets rises towards two-thirds.

## Trade relations and comparative performance

How does the sector stack up in terms of comparative performance? Electrical goods generally attract low tariffs under the CET: from vacuum cleaners at 1.7 per cent, to shavers at 2.2 per cent, lighting equipment at 2.7 per cent, and batteries at 4.7 per cent. But consumer goods are a minor constituent of the sector. Electric motors attract a fairly uniform 2.7 per cent – and that appears a reasonable average for the sector. This implies that UK producers enjoy a low level of commercial preference in EU markets as compared to global competitors.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

With so few exports sold in retail, it's hard to quantify the theoretical advantage of harmonised electrical goods

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regulation for UK producers. Presumably, Single Market legislation is more prominent for domestic appliances than for industrial products, since EU consumer legislation is stringent. With output skewed more towards the industrial, it seems fair to assume that the impact of Single Market legislation on this sector is moderate compared to other UK sectors.

As with steel, it's not clear that just because the EU had an impact in the industry, that the impact was necessarily positive for UK companies. Mr James Dyson wouldn't say so. In 2013, he began a legal campaign against EU regulation – claiming labelling protocols discriminated against his company's technology.<sup>151</sup> And since Mr Dyson eventually won his case,<sup>152</sup> this is an appropriate point to suggest that while unified regulation may in theory create a level playing field for manufactures, it can also be abused by vested interests to discriminate against competitors.

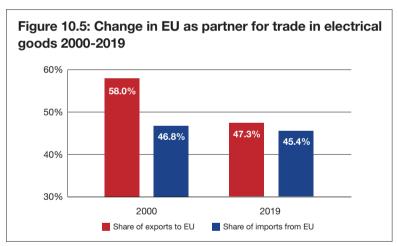
This is quite literally a 'take home' lesson for the UK as it exits the rule-making organs of the EU Single Market. The power to determine regulation in manufacturing requires transparency. Otherwise, the process is liable to hijacking by powerful commercial lobbies that seek to frame regulations to suit their products and discriminate against others. In essence, this was what the Dyson case was about. MPs will need to consider how they inure themselves to the vested interests of major manufacturers. Otherwise, large manufacturers will inevitably start to rig the UK internal market in their own favour.

As for the comparative performance test, the results come in close to expectations. Given the prominence of industrial as opposed to consumer goods in the UK's electrical goods exports, the Customs Union and Single Market probably exerted only a moderate-to-low influence on UK exports.

This implies that this should be one sector where non-EU exports out-perform EU exports by more than the 2.6 ppts average. They don't, but at 2.3 ppts the results are close.

## Long term trends

Looking to the future, the sector appears to have very little to gain or lose from a change in trading relations with the EU. However EU regulations impacted trade, they did not prevent UK exports of electrical goods from declining in absolute terms from 2000 to 2019. Nor did they prevent EU markets from taking a shrinking proportion of UK exports. In 2000, the EU countries took 58 per cent of exports in this sector; in 2019 they took 47.3 per cent.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

The UK's comparatively successful motor and transformer sub-sector faces brightening prospects. For the moment, the future of GE Power Conversion at Rugby looks secure, with a contract to supply advanced induction motors for the Korean Navy's KDDX destroyer program. <sup>153</sup> Canada and Australia have purchased the UK's Type 26 frigate

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design and are set to build 24 vessels between them. GE's Rugby facility is ideally placed to supply these two navies, since both navies will purchase the Rolls-Royce engine configurations installed in the Royal Navy versions of the frigate.<sup>154</sup>

More broadly, the imminent arrival of electric vehicles (EV) will dramatically increase demand for electric motors, and the UK already has a globally competitive electric motor industry. In 2019, UK manufacturers in this subsector exported £4.5 billion of goods per year, and while the 20-year CAGR was just 0.9 per cent, this was still 0.9 ppts faster than the rest of the sector.

With good commercial acumen and old-fashioned risk-taking, the skills that have helped the electric motors sub-sector to survive may be honed to build a powerful sister industry for the UK's auto industry. Time will tell. Currently the UK's electric vehicle (EV) industry looks likely to set up shop in Coventry. The state-funded UK Battery Industrialisation Centre is being set up next to Coventry Airport, near JLR's HQ – and that site is now the West Midlands' pick for a Gigafactory site. Meanwhile, Nissan is already producing the EV 'Leaf' model at Sunderland, and BMW is manufacturing EV MINIs at Cowley in Oxford.

Hopes of an EV-powered transition should be high. At the time of writing, Norfolk-based Equipmake was planning to rapidly expand production of its patented permanent magnet motors to become a tier-one supplier to the auto industry. The ambitions of companies like Equipmake shows there is a natural connection between the UK's current electric motor industry and the UK's future car industry. New entrants are also appearing. In December 2020, start-up Britishvolt announced plans to build a £2.6 billion factory at Blyth in Northumbria. The energy intensive Gigafactory

will tap into the renewable power supply of North Sea wind turbines. This is probably a smart location play, as the low-emission rating of batteries is liable to become a major non-tariff barrier in future trade.

But the new UK–EU trade agreement may shortly make life difficult for UK EV battery manufacturing. This is because it will progressively force manufacturers to source battery components, like cathode material, from the UK or EU instead of lower-cost producers in Asia. According to industry sources, the proportion of EV batteries that must be made from UK or EU materials will have to rise substantially for new UK vehicles to pass rules of origin thresholds spelt out in the UK–EU trade deal. This may well encourage car makers to invest in a UK EV battery supply chain. More likely, the deal will force UK vehicle makers to purchase EU-made battery materials instead. This is because state subsidies are now cascading into the EU's EV industry – and therein lies the risk.

In January 2021, the EU Commission Vice President, Maros Sefcovic, announced that the EU had approved €2.9 billion in subsidies for EV battery manufacturing. <sup>159</sup> This was on top of €3.2 billion of subsidies approved in 2019. The vehicle for these subsidies is the European Battery Innovation scheme, which is now set to distribute funding to 42 companies in 12 EU countries. For the new UK–EU trade deal to encourage EV battery production in the UK, the Government will have to over-power that almighty tug of subsidies that keeps swerving investment decision-making away from British auto factories and into continental Europe. This means countering EU subsidies with hefty British ones.

In this respect, the signing of the UK-EU trade deal was a moment of truth. Just as for the wider auto industry, the UK had a choice: whether to break free of the EU and open

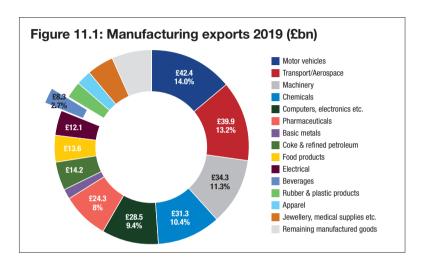
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UK manufacturing to cheap components from around the world and try to be globally competitive without subsidies; or alternatively, it could retain free trade with the EU, but only at the cost of tying UK manufacturing into EU supply chains. The former course required tariffs to protect jobs or some other forms of non-tariff barrier; the latter required UK subsidies to counteract EU ones. The former course meant businesses and consumers footing the bill in terms of higher prices; the latter would leave taxpayers on the hook. But someone would have to pay. Thanks to subsidies, the new UK–EU free trade area creates a steeply un-level playing field in everything connected with cars.

The dilemma won't go away. The UK Government appears serious about the UK developing a battery manufacturing industry for UK car-making. It has promised support worth £500 million up to 2024 to support large-scale EV battery manufacturing in the Midlands and the North East. <sup>160</sup> If successful, this will transform the UK's electrical goods manufacturing sector. But the new UK–EU trade deal means taxpayers will have to bear ongoing costs. And the bills will steadily mount.

# 11.

# Beverages



**Table 11.1** 

Exports of beverages	2019	CAGR 2000–2019
To EU countries	£3.0 bn	2.0%
To non-EU countries	£5.2 bn	3.7%
Total	£8.3 bn	3.0%

Imports of beverages	2019	CAGR 2000–2019
From EU countries	£5.3 bn	3.3%
From non-EU countries	£1.7 bn	1.6%
Total	£6.9 bn	2.8%

	2000	
Trade in beverages, 2000 & 2019	(current prices)	2019
Percentage of manufacturing exports	1.9%	2.7%
Balance EU	−£0.7 bn	−£2.2 bn
Balance non-EU	£0.8 bn	£3.6 bn

Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

## The UK beverages industry

Last, and absolutely not least, is the UK beverages sector. It employed about 46,000 people in 2018 and generated a turnover of £22 billion. This makes the beverages sector roughly the same size as the UK's pharmaceuticals industry. The sector's principal products are beer, soft drinks and distilled beverages – in that order. The UK's resurgence as a wine producer has yet to make an impact on these three colossal sub-sectors, generating just £289 million in revenue in 2018. Still, the hectic pace of vine-planting in southern England means UK sparkling wine is still at the very start of its ascent.

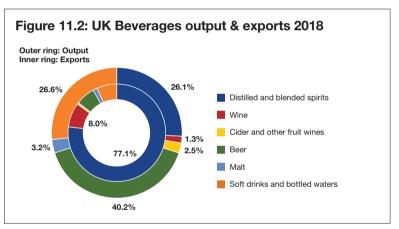
One reason for optimism is the spirit of entrepreneurialism that's apparent across the industry. The number of companies that make drinks in the UK has rocketed over the past decade – from 953 in 2008 to 2,425 in 2018. This rate of increase is unmatched in any other sector. In a process that partially resembles how pharmaceuticals emerge, boutique players establish their brand, gain a discrete market, then sell up to major drinks companies who do the hard yards of mass distribution. As also in pharmaceuticals, the process is never-ending as the stock of start-ups continually refreshes itself.

The UK beverages industry is often twinned with the UK's food industry, but in terms of competitiveness, the two are in a different league. In 2019, the UK was the world's third-largest drinks exporter,<sup>161</sup> while in food exports the UK comes in 22nd. And while the UK's food trade earns the nation a thwacking deficit, beverages earn a neat £1.4 billion surplus. In comparative terms, the beverages sector is not particularly trade-dependent; in 2018, exports contributed the equivalent of just 36.1 per cent of sector turnover. But that's for one simple reason: foreigners don't like British

beer. What foreigners do like, however, is English gin, and they will pay through the nose for Scottish whisky.

### What does the UK make and where?

The UK's 1,850 breweries are scattered across the country – and that number appears to be doubling approximately every 10 years. Between them they produce approximately 7,500 different beers – and that number is accelerating too. Turnover is huge, at £8.9 billion in 2018. Manufacturers of soft drinks, including bottled waters, generate a further £5.9 billion, while the manufacture of cider and non-grape wines adds another £559 million to domestic production.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020; ONS, Annual Business Survey 2018, May 2020. Note values are for 2018, the latest year available for the ABS. Export ratios for 2019 vary slightly.

What matters to overseas trade, however, is the UK's various distillery businesses, whose turnover rose from £3.6 billion in 2008 to £5.7 billion in 2018 (in current prices). This is a thriving industry. The actual number of distilleries businesses in the UK shot up from 104 in 2008 to 580 in 2018 – largely owing to a craze for English gin. But while gin is primarily a domestic-consumption business, whisky is export-

led, with overseas sales worth about eight times the value of gin sales. According to the Scotch Whisky Association (SWA), Scotland's 133 distilleries employ 10,000 people, of whom approximately 7,000 live in rural Scotland. Currently there are 22 million casks of Scotch maturing in warehouses, waiting to find their way onto high-paying global markets.

Gin is currently experiencing a boom. According to The Wine and Spirit Trade Association (WSTA), a rejuvenated taste for juniper distillate apparently took off in 2013. Since 2016, the traditional tipple of England's urban working class has experienced heady, double-digit growth. Strange to say, England now has more distilleries than Scotland. And while exports are less valuable, England's creative gin distillers have begun to turn heads in overseas markets. According to HMRC data cited by WSTA (which is calculated differently to ONS data), exports reached £672 million in 2019.

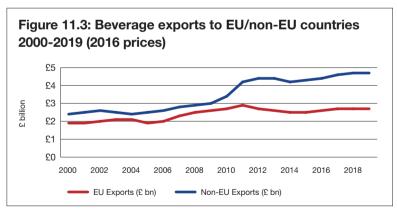
### Trade: EU versus non-EU

Before analysing trade patterns, it is critical to appreciate major asymmetries in tariff schedules for distilled beverages. This is because approximately 77 per cent of the UK's beverages exports are distilled drinks, and this ratio remained fairly constant throughout the 2000–2019 period. Wildly differing tariff rates around the world make any calculation of EU-derived benefits a highly nuanced affair. In short, world trade in distilled, alcoholic beverages is highly complex.

As a rule, tariffs on distilled beverages are high for bottles heading east and low for bottles heading west. Access to Scotch's biggest overseas market, the US, was tariff free until the imposition of a 25 per cent tariff in October 2019 as part of the US–EU trade war. <sup>166</sup> The Middle East and Asia

is a different story. India has the highest tariffs at 150 per cent; the Gulf Cooperation Council, 100 per cent; Pakistan, 90 per cent; and Thailand, 60 per cent. Then again, local duties on alcoholic drinks are also high, and this can have as large an impact on sale prices as tariffs. This is why wine is expensive – even in free-trade Singapore. Thus, the playing field encountered by UK whisky and gin exporters outside the EU is very uneven.

Have UK distillers had a protected market in the EU to fall back on? Not really. The EU only began to protect the EU market in distilled beverages in 2018, when it imposed a 25 per cent tariff on US bourbon, which in turn helped trigger a reciprocal 25 per cent US tariff on Scotch in 2019. Until 2018, Scottish whisky makers accessed EU markets on the same terms as their chief competitors, US bourbon distillers. The fact that whisky was not protected by the EU is itself odd. EU viticulture is most certainly protected against most new world wines – except those from Chile and, to an extent, South Africa.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices).

The export growth story for UK beverages is fascinating. For the first decade, 2000–2009, exports to EU and non-EU markets maintained a rough parity. From 2010, however, exports to the EU slid while exports to the rest of the world soared. By 2019, non-EU exports were worth a steady 70–73 per cent more that exports to the EU. Looking more narrowly at distilled beverages, exports to EU markets grew by just 1.3 per cent per year over the two-decade period, which just undershoots the general benchmark of the 1.4 per cent annual economic growth among the UK's ex-EU partners. Meanwhile, exports of distilled beverages outside the EU grew by 3.6 per cent per year, outpacing the UK's non-EU trade partner GDP growth.

According to the SWA, Asian markets are helping to power this non-EU export growth. India imported £166 million-worth of Scotch in 2019, a rise of 19.7 per cent on 2018 – this despite hideous tariffs and heavy local duties. Meanwhile, Taiwan imported £205 million of Scotch in 2019, up 22 per cent on 2018; and Japan £147 million, up 16.1 per cent. With the US taking over £1 billion in 2019, this means six out of the UK's top 10 markets for Scotch are now outside the EU. And the fastest growing markets are in South Asia and the Asia-Pacific region, where the UK's FTAs were limited to Korea (2011) and Japan (2019) during the period under study.

The lacklustre performance of Scotch whisky in EU markets suggests that membership was not as helpful to Scottish manufacturing as might be supposed. In 2017, the SWA cited EU laws affecting labelling, spirit drink definitions and bottle sizes as having had "a positive impact on the business environment across the Single Market." <sup>169</sup> But realistically, how advantageous can this regulation be if it results in a 1.3 per cent CAGR in exports? And the kicker

is that US-based bourbon suppliers who comply with the same regulations dramatically outcompeted Scotch Whisky in EU sales. In 'It's Quite OK to Walk Away' (2017), Michael Burrage calculated that from 1993–2015, exports of Scotch to EU markets increased by just 39.3 per cent, but exports of Bourbon from US to the EU increased by 437 per cent.<sup>170</sup>

This brutal insight begs an obvious question: what has Scotland's most famous export gained from seamless access to EU markets? There was no tariff advantage for Scottish distillers in the EU, and clearly distillers in Kentucky weren't overly taxed by having to conform to EU rules. And in global markets, the EU's trade policy did little to open potentially valuable markets. In 2017, the SWA estimated that bilateral deals negotiated by the EU benefited just 10 per cent of Scotch whisky exports.<sup>171</sup>

Could it be that the EU's negotiating 'muscle' in negotiating FTAs helped with the 10 per cent that *did* gain better terms? The evidence suggests not. The Japan–EU Economic Partnership Agreement entered into force in February 2019. This agreement was important for Scotland because it finally eliminated tariffs faced by Scotch whisky exports in one of its top 10 markets. <sup>172</sup> But in September 2020, UK trade negotiators replicated this access in the UK–Japan Comprehensive Economic Partnerships Agreement <sup>173</sup> *and* increased protection for Scottish geographical indicators at the same time. <sup>174</sup>

This is a neat demonstration of why the 'EU negotiating muscle' idea works better in theory than in practice. In theory, of course the EU is negotiating with counterparties that want access to its huge markets. But in practice, the UK achieved the same access for Scotch whisky in Japan and South Korea as the EU, but negotiating by itself. In practice, the EU failed to focus on the two massive markets that could

have boosted Scotch exports – India and China. And in practice, UK negotiators are far more attuned to the interests of Scotland, because politically they don't have a choice.

Then there's the downside side to EU custodianship of trade policy. In 2018, the EU got itself involved in trade war with the US, triggered by conflicts overs subsidies to aircraft makers. Scotch whisky got caught in the crossfire. The EU provoked the US by putting tariffs on Bourbon, and Scotch distillers were then handed a 25 per cent tariff on exports to their biggest overseas market. This hit Scottish exports directly, and it happened because the Scotch whisky industry was being used as a pawn in a gigantic transatlantic tussle between the EU and the US over how Airbus secures its investment capital.

So, while the EU could, in theory, have greatly benefited the Scotch Whisky industry since 2000, its impact has been minor. A review of tariff rates, EU regulation, trade agreements and trade policy indicates that the Scotch whisky industry gained little from EU membership – though it *could* have all been different.

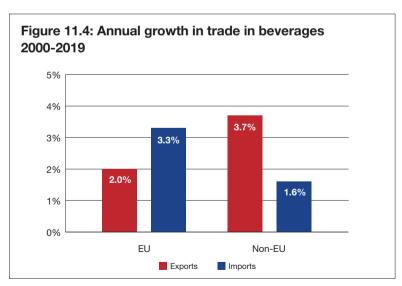
## Trade relations and comparative performance

The point of the comparative performance test is to see if there is any connection between the supposed benefits of the EU Customs Union and Single Market and the actual performance a sector has achieved in EU markets. But for multiple reasons, it's difficult to assess whether EU membership was beneficial to the beverages sector – even in theory.

From the preceding analysis of trade in Scotch whisky – the dominant export in this sector – it appears that most exporters had the potential to benefit from the Customs Union and Single Market, but, in practice, that theoretical

assistance didn't amount to much. Whether the UK was in or out of the EU during this period, Scotch and gin exporters would not have paid tariffs, since the CET on both was zero. Therefore, there was no direct advantage in being in the EU. Should global tariffs have suppressed non-EU sales? Globally the picture is mixed: generally zero tariffs heading west; generally huge tariffs heading east. Since there's a rough balance between the two, the answer is 'partly'.

With regulation, again it's a hard call. Have Single Market rules truly benefited centuries old Scotch distillers? The SWA liked EU rules on bottling and labelling. But if regulatory alignment within the Single Market delivered a competitive advantage for Scotch, how come US bourbon increased sales in EU markets 10 times faster from 1993–2015? If it exists, the advantage must be slender. So, on balance, the verdict for market regulation is that it did *not* confer substantive advantage on UK exporters, at least not for Scotland's flagship export.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices)

And so to export growth patterns. In terms of trade performance, beverages resembles the familiar pattern. Exports to the EU grew at two per cent per year. This was just over half the pace of exports to global markets, at 3.7 per cent per year. Meanwhile, imports from the EU grew twice as fast as imports from outside the EU: 3.3 per cent compared to 1.6 per cent. This is the captive market effect in full swing.

Wine is partly to blame. In 2019, the UK imported £2.3 billion-worth of wine from the EU, and only £1.1 billion from 'New World' vineyards. The proportion of imported wine that arrives from the EU remained high for the last decade – at roughly 2:1. This enabled the EU to retain the UK as another near-captive market to EU producers. And while EU tariffs are low for cheaper wines, so are margins. This means even a small differential in market price is sufficient to deter non-EU producers from trying to gain a stable foothold in UK stores. Incidentally, the effect of tariff protection increases towards the premium end of the market, which is why relatively few premium New World wines make it on to off-licence shelves.

As may be foreseen, the fact that imports from the EU comfortably outpaced exports over two decades means the EU deficit gently deteriorated: from -£842 million in 2000 to -£2.2 billion in 2019. Meanwhile, the chipper 2.1 ppts difference between the UK's exports and imports with global markets means the UK racks up another cheery surplus on its non-EU trade, worth £3.6 billion in 2019. This is almost entirely thanks to Scotch whisky. Outside the EU, distilled alcoholic beverages make up 81 per cent of the UK's beverages exports.

Now for the comparative performance test. Given the above assessments, the CAGRs for trade in the UK's

beverages are mildly perverse. With limited advantage in EU markets, beverages should be one sector where non-EU exports outpaced EU exports by more than the average 2.6 ppts. They didn't – the gap is just 1.7 ppts. Narrow the field to just the output of the UK's distilleries – where EU membership had a bigger impact – and the result tightens. Non-EU exports of distilled beverages grew by a CAGR of 3.6 per cent, while for EU markets the CAGR was just 1.3 per cent. At 2.3 ppts, the difference is just short of the 2.6 ppts average across UK manufacturing.

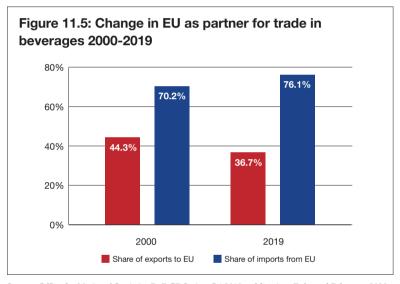
This is a marginal fail result for the comparative performance test. But the test itself is not straightforward because tariffs are highly variable, and because EU trade policy had a mixed impact on prospects for Scotch in global markets. Possibly the result would have been different if the EU had been more energetic in protecting Scotch in EU markets, or in prizing open global markets on behalf of Scotch distillers. But it wasn't.

Stepping away from comparative performance, the raw figures for the UK's beverages exports are mildly depressing. In absolute terms, this sector stumbled in the EU. Scotch whisky is indisputably a world-class product, popular in global markets despite huge tariffs. Yet, exports to the EU grew by just 1.3 per cent per year from 2000–2019. This was even slower than the average growth rate of EU economies. And for most of that time, EU imports of US bourbon grew up to 10 times faster. For Scottish distillers, the UK's final years in the Customs Union should leave a very sour taste.

## Long term trends

The long-term trends in UK beverages trade conform to the classic 'captive market' pattern. The EU declined as a market for UK beverages exports, from taking 44.3 per cent in 2000

to 36.7 per cent in 2019. This is low by UK–EU standards. Only the aerospace sector sends a lower proportion of its exports to EU markets. Meanwhile, the EU increased its share of UK beverages imports from 70.2 per cent to 76.1 per cent. The beverages sector thereby joined the UK's food, pharma and car industries as one where the EU supplied more than three quarters of all imports. This is the captive market effect in rude good health. And it happened in one of the UK's most globally successful industries.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020.

Given the scale of tariffs in many major markets, an independent UK trade policy has enormous scope to increase beverages exports. India is the world's biggest whisky market in volume terms (though purists may quibble at classifying molasses-distilled beverages as whisky). With tariffs currently at 150 per cent, the opportunity in India is gigantic. Yet even with these huge tariff barriers, India is still Scotch's seventh-largest global market by value, clocking up

£166 million in Scotch sales in 2019. In 2018–19 sales grew 19.7 per cent, <sup>175</sup> which shows what India's new middle class is prepared to pay.

Opening India's whisky market will be extremely difficult. India tends not to liberalise trade with countries that aren't immediate neighbours. But if the UK can use its £6.4 billion trade deficit with India to negotiate improved access for Scotch, then exports will soar.

In summary, UK trade policy should make the beverages sector a priority. Distilled beverages make up 77.1 per cent of sector exports, and trade in distilled beverages is hugely distorted by tariffs. This means there is huge scope for negotiating down significant barriers to trade. A policy that focussed on removing those tariffs would be backing winners. The UK's 580 distilleries have already proved they can grow exports in difficult markets. Scottish exports will boom if British trade negotiators are focused and British diplomats are skilful. If UK trade negotiators fail, then competitors from Japan, Tasmania and Kentucky will mould the tastes of tens of millions of new customers in Asian markets. That would mark a strategic defeat for UK trade. It would imply UK trade negotiators are not up to the task of running an independent trade policy.

# 12.

# Sector comparisons

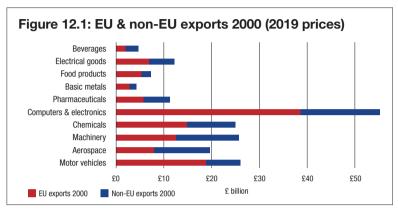
This chapter compares data from across all ten manufacturing sectors for direct comparisons of export trade values, growth rates and deficits. These 10 sectors delivered 79.2 per cent of manufacturing exports in 2019, and 68.8 per cent of all goods exports (minus precious metals).

### Hats off to the Midlands and the North

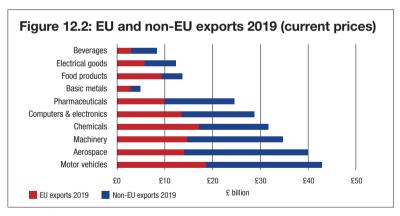
Twenty years ago, the UK's manufacturing exports were EU-centric and heavily dependent on electronics. Now they are neither. Worth £25.8 billion in 2000 (£38.6 billion in 2019 prices), exports of computers and electronics to the EU were worth *almost* the combined value of the UK's non-EU exports of motor vehicles, aerospace, machinery and chemicals in that year (see Figure 12.1 below). Meanwhile, EU exports outsold non-EU exports in eight of the UK's top 10 manufacturing export sectors. Only in aerospace and beverages had the UK's global or non-EU exports pulled ahead. Also noteworthy is the UK's auto exports. Twenty years ago, exports were on a par with aerospace, machinery and chemicals, and the EU took three quarters of them.

Flash forward 20 years and the picture is vastly different. Only in two sectors do EU markets still take the majority of UK manufacturing exports – chemicals and food. In all the rest, the UK's non-EU exports are now more valuable.

Happily, the UK's export profile is also more balanced. And it's obvious who the UK has to thank: the global exporters in the UK's auto, aerospace, machinery, chemicals and pharmaceuticals industry.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2019 prices). 'Basic metals' excludes precious metals.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. 'Basic metals' excludes precious metals.

The two charts above have a geographical significance. From the sectoral analysis, it is clear that the centre of gravity of the UK's manufacturing exports has shifted north.

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The South East has lost out as exports of computers and electronics collapsed and pharmaceutical manufacturing went offshore. In contrast, the UK's top-performing export industries today are concentrated in the West Midlands (motor vehicles and machinery), Derby/the South West/North Wales (aerospace), and the North West/Humber/Tyne (chemicals and pharmaceuticals).

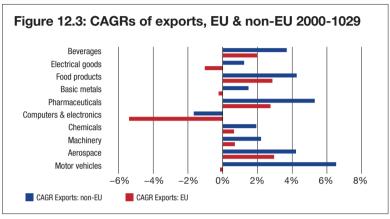
The way these regional exporters pivoted to global markets since 2000 is stunning. During the two decades when UK exporters enjoyed seamless, tariff-free access to a huge economy right on their doorstep, they instead turned to global markets for growth and found it. UK businesses turned decisively *away* from EU markets in the years before the UK exited the Customs Union and before the UK voted to leave the EU.

## The odd pace of export growth in EU markets

The second observation is that export growth outside the EU *universally* outpaced growth inside it. This means the Single Market did not operate as a free trade area should, with one sector doing well in EU markets to make up for another doing poorly. There was no *quid pro quo* for falling EU exports of computers, cars or domestic appliances. Exports of pharmaceuticals, aerospace and premium vehicles all grew strongly in global markets, but none actually excelled in EU markets. The Single Market and Customs Union area did not encourage specialisation in manufacturing across the EU – at least not in the UK. As a free trade area, the Customs Union failed the UK.

As noted in Chapter 1, slow export growth in EU markets cannot be blamed on the slow growth of EU economies. This can be deduced from comparing the GDP growth rates of the UK's EU and non-EU export partners. For the period 2000–

2019, UK manufacturing exports to non-EU trade partners undershoots those trade partners' own GDP growth by 0.63 ppts. But the undershoot for EU exports as against EU GDP growth is 1.43 ppts. Those underperformances narrow if calculations include energy, agriculture and precious metals, but the mystifying underperformance of EU exports remains.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Deflators: ONS export and import deflators, March 2020 (2016 base prices). 'Basic metals' excludes precious metals.

This means the UK's export woes in the EU cannot be laid at the door of slack EU economies. Something else was going on. And the troubling aspect for policymakers is that the UK has just committed to continued tariff-free trade with the EU. Sadly, few industry associations are openly questioning why UK exports to the EU consistently underperform. Outside the steel industry, few industry associations comment critically on the real value of EU-wide regulations or tariff free trade, nor do they compare performance across EU and non-EU markets. Yet these same industry bodies are now becoming powerful trade lobby groups in the UK.

#### A strange succession of deficits

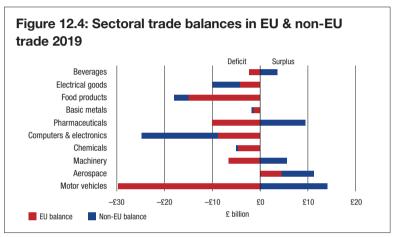
The third characteristic of UK–EU trade is the direct consequence of stagnant growth and surging imports. Over the past two decades, huge sectoral deficits began to accumulate in EU trade. In only one sector – aerospace – did UK trade achieve a steady trade surplus with the EU. Of the UK's four £10 billion-plus deficits in 2019, three were with the EU – in food products, computers and electronics, and motor vehicles. A relentless slide towards increased deficits occurred in every sector except aerospace.

The near uniformity of growing deficits is the strangest aspect to the UK's final decades of EU membership. As noted above, the creation of a free trade area with consistent market rules is supposed to trigger specialisation. Each country is supposed to specialise in what it manufactures most efficiently, while importing more of what it doesn't. The benefits of specialisation are thereby mutualised. Arguably this liberal economic outcome was the objective that Prime Minister Margaret Thatcher aimed at when urging the creation of the Single Market in the 1980s.

But the magic of free trade just didn't happen for the UK from 2000–2019. All sectors bar one generated growing deficits with the EU as imports outpaced exports by an average 2.6 ppts per year. Damningly, the one sector where the UK *did* score a surplus on EU trade and where exports grew strongest (aerospace) was the sector *least* impacted by the Customs Union and Single Market. In itself, this is an indictment of the UK's record inside the EU Customs Union.

In the UK's non-EU trade, however, half of the sectors analysed here generated a surplus before the pandemic deranged trade. At £14.1 billion, the surplus in global trade in motor vehicles was spectacular. In many cases, the goods that performed well in global markets were precisely the

same goods that performed poorly in EU markets. Rolls-Royce turbojets are the supreme example, Scotch is another. In other cases, the UK appeared to sell different goods into different markets. For example, the UK's auto exports outside the EU consisted mostly of premium marques, while the UK's EU exports were dominated by Nissan, Honda and Toyota. The former performed well, the latter did not.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. 'Basic metals' excludes precious metals.

The above chart highlights a risk. The large surpluses generated in non-EU trade by motor vehicles and pharmaceuticals are now vital to the UK's overall trade balance. Yet in both sectors, manufacturers began moving investment to other EU countries, especially from around 2009. And in both sectors, exports to *non-EU* markets began to dip at the end of the two-decade period. In the case of autos, this offshoring moved up a gear into the UK's premium marques, with Jaguars, Range Rovers and MINIs all having commenced production elsewhere in the EU during the past decade (respectively in Graz, Austria; Nitra, Slovakia; and Limburg, Netherlands). Meanwhile, global

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pharma decamped too, including to the Republic of Ireland, but also to Belgium and the Netherlands.

These investment trends in the motor vehicles and pharmaceuticals industries predated the 2016 referendum, though their effects on non-EU exports have only recently become apparent.

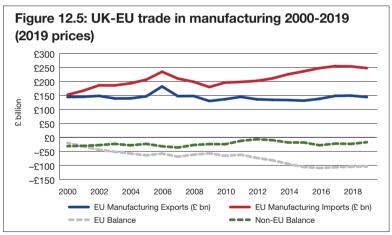
This offshoring trend is a direct threat to the prospects for Global Britain. The UK's new free-trade arrangements with the EU won't change the pattern of investment in motor vehicles and pharma unless the UK does something novel. Quick thinking is urgent. Non-EU auto exports skidded in 2017–2018 (when Jaguar-Land Rover's Nitra plant in Slovakia revved up), and non-EU pharma exports have stuttered since 2016. The UK may just have avoided a severe dislocation to trade with the December 2020 deal. But huge risks remain. Offshoring trends became entrenched while the UK was a member of the Customs Union, and the UK Government has just agreed to continue tariff-free trade with the EU. If the UK Government does nothing, then the UK's most-valuable global export growth will likely get hammered during the coming decade.

## That inexorable imbalance in manufacturing trade

The net effect of stagnant exports and healthy imports on EU trade is predictably grim. A trade relationship that was in balance in 2000 inexorably deteriorated as imports outpaced exports in every manufacturing sector bar one, and by an average of 2.6 ppts. The result is the UK's current huge trade deficit in manufactured goods with the EU, which reached £103.4 billion in 2019 (excluding precious metals).

The story in the UK's non-EU trade is quite different. In all sectors bar computers and electronics, basic metals and electrical goods, exports to non-EU countries grew faster than imports – on average by 0.62 ppts. The result: across all manufacturing sectors the overall non-EU deficit held steady over 20 years and marginally fell from £22.6 billion to £16.8 billion.

To put these numbers into perspective: the UK's manufacturing deficit with the EU, at £103.4 billion, is now *five times* larger than the surplus that the UK earns on EU trade in financial services, at £18.2 billion. Meanwhile, the deficit on the UK's manufacturing trade with countries outside the EU is tiny in comparison. At just £16.8 billion, it's far less than the £22.9 billion surplus that the UK earned on the equivalent financial services trade outside the EU. And it's a fraction of the overall £85.5 billion surplus that the UK earns overall in non-EU services trade.



Source: Office for National Statistics BoP CP Series, Q4 2019 publication. Released February 2020. Balances calculated from current prices, then deflated using the ONS import deflator.

And note, a poor export performance inside the EU is not a reflection of the competitiveness of UK manufacturing. If it were, then the UK's flagship export sectors would not be growing rapidly in global, or non-EU markets: autos, at a CAGR of 6.6 per cent; aerospace, at a CAGR of 4.3 per cent;

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pharmaceuticals, at a CAGR of 5.3 per cent; and beverages, at a CAGR of 3.7 per cent. All of these sectors have outpaced the aggregate GDP growth rates of the UK's non-EU export partners (3.3 per cent), which serves as a rough benchmark for performance. This success is a testament to the success of thousands of UK manufacturers who pivoted from the EU to global markets from 2000 onwards.

## The comparative performance of UK export sectors

Finally, there's the performance test. This metric was designed to gauge whether the Customs Union and Single Market exerted a positive impact on exports in UK manufacturing sectors. The test worked on the following assumption: if the Customs Union provided a sector with meaningful tariff advantage in any give sector, and if Single Market regulation was both impactful and beneficial, then the growth rate of exports to the EU in that sector should be faster compared to the export growth to non-EU countries – so long as tariffs and regulation were the principal determinants of trade performance in that sector.

The 2.63 ppts average difference in EU/non-EU growth rates served as the benchmark. If the difference between EU and non-EU export growth rates for a particular sector was smaller than 2.63 ppts, that was an indication that exports to the EU had grown relatively quickly in that sector. Conversely, if the difference between EU and non-EU growth rates was wider than 2.63 ppts, that was an indication that exports to the EU had grown relatively slowly in that particular sector, compared to EU exports in other sectors.

Table 12.1 collects the results from chapters 2–11. The comparative performance percentage is simply the CAGR of exports to non-EU markets from 2000–2019 minus the CAGR rate of exports to the EU. For example, exports of

transport/aerospace goods outside the EU grew by 4.27 per cent per year, and exports to EU countries grew by three per cent per year. So, the comparative performance score is 1.27 ppts. All the values in the comparative performance column are positive, since no sector saw exports grow faster inside the EU than outside it.

Remember too, the 'practical benefit' column is comparative. The 'low' verdict for pharmaceuticals doesn't mean the Single Market and Customs Union were irrelevant to trade in pharmaceuticals; it means that the combined effect of tariffs and harmonised regulation delivered a low degree of preferential access to EU markets as compared to the other nine sectors.

Put together: four sectors passed the test; four sectors failed the test; and two marginally failed (see Table 12.1). This might look like a balanced verdict. It is not. If the Customs Union and Single Market genuinely and positively impacted the performance of UK manufacturing exports, then most sectors should pass the test. Instead, there is no obvious correlation. And the kicker is that the test shows a negative result in the sectors that most matter – big industries that are fast growing. This is clear from the two right-hand columns. The test only worked in industries that are slow-growing, small, or in decline.

From the top, the biggest underperformance in EU trade was in the UK's largest manufacturing export sector – motor vehicles. From 2000, non-EU exports grew 6.6 per cent per year in real terms, while EU exports declined by -0.1 per cent per year in real terms. That's a staggering 6.9 ppts disparity in EU/non-EU export performance. It is easily the widest of any UK sector. And it occurred despite the fact that high tariffs and harmonised regulation should have made the EU a super-preferential market in which to sell cars and

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**Table 12.1** 

Manufacturing Sector	Comparative Performance (ppts): CAGR non-EU growth minus CAGR EU growth (2000-2019)	Practical benefit of Customs Union and Single Market	Pass or fail the comparative performance test	Overall CAGR of exports (2000- 2019)	% of manufacturing exports in 2019
1. Motor vehicles	+6.67	high	fail	2.6%	14.0%
2. Transport/aerospace	+1.27	very low	fail	3.8%	13.2%
3. Machinery	+1.53	wol	fail	1.5%	11.3%
4. Chemicals	+1.29	medium	pass	1.2%	10.4%
5. Computers, electronics	+3.74	wol	pass	-3.8%	9.4%
6. Pharmaceuticals	+2.53	low	fail	4.1%	8.0%
7. Basic metals	+1.71	medium	pass	0.4%	1.6%
8. Food products	+1.43	very high	pass	3.3%	4.5%
9. Electrical	+2.28	medium	marginal fail	0.0%	4.0%
10. Beverages	+1.71	low	marginal fail	3.0%	2.7%
All Manufacturing	+2.63			1.2%	

automotive parts. Only the food sector accessed EU markets on more beneficial terms. This result is totally perverse.

Second, transport/aerospace. In comparative terms, this sector gained the least benefit from UK membership of the Customs Union and Single Market. Yet with a narrow 1.27 ppts difference in growth rates, exports to the EU grew comparatively faster than in *any other* UK sector. Again, this result is perverse. It means that, comparatively speaking, the UK manufacturing sector that performed best in the EU was the sector where the EU itself had the least impact on trade.

The UK's machinery sector – still delivering 11.3 per cent of UK manufacturing exports – also performed comparatively well in the EU, with just 1.53 ppts separating EU/non-EU growth rates. This makes machinery another major industry that gained little benefit from the Customs Union/Single Market, but which performed better in EU markets as compared to other sectors, like autos, that enjoyed substantial benefits in protected EU markets. This means that for the UK's top three manufacturing sectors, the supposed commercial impact of the Customs Union and Single Market was inversely proportional to the comparative performance of UK exporters in EU trade.

It's not till the chemicals sector is reached that the comparative performance test delivers an 'as-expected' result. Comparatively, exports grew well. Sadly, for the UK, this is a slow-growing export sector. Strategically, the benefits of EU membership were hitting the wrong spot. The test also gives a positive result for the computers & electronics sector, but that sector was in steep decline for the middle years of this study. It's a fast-shrinking contributor to UK's export mix. In fact, the only sector where the Customs Union and Single Market appear to give a positive boost to a sector that is actually growing strongly is food

#### SECTOR COMPARISONS

products. And food products delivered just 4.5 per cent of UK manufacturing exports in 2019.

In summary: the only sectors where exports to the EU performed comparatively well from 2000–2019 were either slow-growing or small, or both. And of the UK's fastest growing major sectors – autos, aerospace and pharma – the first didn't grow at all in EU markets, despite powerful preferential treatment, and the other two grew quickly in EU markets despite gaining minimal preferential treatment compared to all other sectors. Across the UK's biggest manufacturing sectors, there was no obvious link between the supposed benefits of the Customs Union and Single Market, and the comparative performance of UK exports.

A statistical analysis of the export performance of the UK's top 14 manufacturing sectors is imminent – and will be published by Civitas. This short study will increase the proportion of manufacturing goods covered from 79.2 per cent in this report to 93.6 per cent. The analysis will include a statistical correlation of comparative performance. Until then, this 10-sector analysis shows that, overall, the Customs Union and Single Market failed to benefit UK manufacturing exports.

Imports was a different story. The Customs Union and Single Market may or may not be responsible for the captive-market effect that afflicts UK–EU trade in autos, machinery, chemicals, pharmaceuticals, steel, food and beverages. The massive deficits and EU-dependence that exists in the UK's auto and food trade (both heavily impacted by the Customs Union/Single Market) are balanced by the massive EU deficits and import dependence in pharmaceuticals and beverages (where the effect of the Customs Union/Single Market were comparatively weak). Only further study will reveal if there is a causative link.

#### LESSONS LEARNED FOR A GLOBAL BRITAIN

But for exports, the verdict on the UK's last decades in the EU is damning. In absolute terms, all UK manufacturing exports performed better outside the EU than in it from 2000–2019. But in comparative terms too, UK manufacturing exports performed better outside the Customs Union and Single Market, or where its impact was weakest. And that's a paradox that should rivet the attention of UK economists.

## 13.

## **Observations & policy options**

In January 2021, the UK became an independent trading nation for the first time since 1972. To help Government devise policy that will support UK manufacturing and increase exports, this section will summarise observations on UK trade over the past 20 years and suggest policies based on established trends.

#### Observations

The following observations are summarised from the analysis of the UK's top 10 exporting sectors in chapters 2–11. They are based on the actual and comparative performance of UK manufacturing export sectors from 2000–2019. These observations should help dispel long-held assumptions about the value of seamless, tariff-free trade with the EU during the UK's final two decades in the EU Customs Union and Single Market.

1. There was no link between the supposed benefits of the Customs Union and Single Market, and the comparative performance of UK manufacturing exports from 2000–2019. The few manufacturing sectors where the Customs Union and Single Market did exert a positive impact on UK exports were either small or slow-growing (food and chemicals). Meanwhile, the sector where UK exports performed comparatively the best in

the EU (aerospace) derived zero or minimal advantage from the Customs Union and Single Market.

- 2. The Customs Union and Single Market delivered zero export growth for UK motor vehicles. In real terms, auto exports to the EU declined between 2000 and 2019, despite the advantage of a market protected by 9–10 per cent tariffs and harmonised regulation. Exports outside the EU grew by 234 per cent, or a staggering 6.6 per cent per year, and are now worth 30 per cent more. In theory, only the food sector enjoyed greater advantages in the EU markets, yet the auto sector's comparative performance was easily the worst in this study. Investment left the UK for continental Europe, lured by state subsidies.
- 3. Some UK manufacturing sectors are already highly competitive in global markets. Exports of autos, aerospace, beverages, pharma and food products to non-EU markets have all outpaced the average GDP growth rate of the UK's non-EU trade partners. These are the manufacturing sectors where the UK's global prospects are brightest. Meanwhile, UK exports to EU markets underperformed EU GDP growth rates in motor vehicles, machinery, chemicals, computers, steel and Scotch. These are the sectors that UK analysts need to worry about, because the new UK–EU trade deal will entrench existing trends.
- 4. The Customs Union and Single Market worked better on imports than exports. Manufacturing imports from the EU grew at 2.6 per cent per year from 2000–2019. This was 0.9 ppts faster than UK economic growth during those years; 0.6 ppts faster than imports from outside the EU; and a full 2.6 ppts faster than exports to the EU which didn't grow at all. The net effect was an increase

in the EU's domination of UK imports, and a steady widening of the UK–EU trade deficit in manufacturing, from –£19.8 billion (2019 prices) to –£103.4 billion in 2019.

- 5. The imbalance between export and import growth rates in UK-EU trade has created a series of captive markets in the UK. Since 2000, a curious pattern has emerged in UK trade whereby the EU takes an ever-smaller share of UK exports, but supplies an ever-growing share of UK imports. This trait is pronounced in UK trade in motor vehicles, machinery, chemicals, steel, pharmaceuticals, food and beverages. The new UK-EU trade deal will entrench the trends that created these captive markets unless the UK swiftly liberalises trade with major trade partners in the global economy.
- 6. There is no way that trade in services with the EU can compensate for the UK's entrenched deficits in manufacturing trade, even if exports of services continued on pre-departure terms. Imports of manufactured goods from the EU grew 2.6 ppts per year faster than exports from 2000–2019. But exports of services to the EU grew just 0.6 ppts faster than imports and from a smaller base. A new deal on UK–EU trade in Financial Services would help contain rising deficits, but it would have to drastically improve access for UK companies to arrest deficit growth. In 2019, the UK's surplus on trade in services with the EU was just £17.9 billion, while the UK's deficit in trade in motor vehicles and parts was –£29.6 billion.
- 7. Since 2000, UK exporters have turned away from the EU and found growth in global markets. UK exporters have performed far better in global markets trading on WTO rules than in the EU within the Customs Union.

This is true in absolute terms, and also when measuring export growth rates against growth in trade-partner GDP. This implies the UK does not need to rush to sign imbalanced trade deals for the sake of appearing to liberalise trade. The UK would do better to fix EU trade first.

- 8. Small companies are powering export growth in some of the UK's best performing sectors. The number of companies involved in the aerospace, pharmaceuticals, food and beverages sectors has increased dramatically over the past 20 years. During this period, these four sectors clocked up excellent export CAGRs outside the EU: of 4.3 per cent, 5.3 per cent, 4.3 per cent, and 3.7 per cent respectively. This supports the observation made by Marcus Gibson that the UK is experiencing an SME-powered export boom. It means attempts to increase exports should focus on what will reduce challenges for small companies in these sectors.
- 9. The Customs Union and Single Market did not encourage specialisation in UK manufacturing, or in UK trade generally. The theoretical benefit of a free trade area is that it encourages sectors to specialise. This didn't happen for UK manufacturing in the EU from 2000–2019. The only sector where exports to the EU increased faster than imports was aerospace, which was the sector that was least impacted by the Customs Union and Single Market. In practice if not in theory the UK's central, strategic trade policy was a failure, at least for the final two decades of EU membership.
- 10. Continued tariff-free, quota-free trade with the EU means that the UK's fastest growing manufacturing exports are under threat as investment moves to the

EU. The UK's premium auto and pharma sectors – which both generate large surpluses in non-EU trade – are already suffering as companies move production to Germany, Slovakia, Austria, Ireland and elsewhere in continental Europe. This trend predates the EU referendum and will likely continue as the UK–EU trade deal does nothing to change the trade dynamics that encouraged disinvestment from 2009 onwards. If the UK Government does nothing, then the UK's most successful export industries of the past two decades will see global exports decline.

These observations should inject rigour into UK trade policy. But the observations also have profound implications for trade theory and those economists whose forecasts have dominated debate on UK trade since 2016. If there is no correlation between tariffs, harmonised regulation and seamless access on the one hand, and actual export performance on the other, then economists' forecasting models need heavy recalibration. Neatly subtracting percentage points of growth from projections of future growth according to ease of access and tariff barriers works beautifully in theory. But trade doesn't work that way. In practice, UK exports have moved in response to other impulses.

From a detailed review of the UK's largest sectors, it appears that the decisive factors in the growth of UK exports over the past 20 years have been: movements in investment (autos and pharma); subsidies (autos, aerospace); taxation (pharma); entrepreneurship (aerospace, machinery, beverages); and resident skills (aerospace, pharma). There are also sectors where oil production (chemicals) and the cost of power (chemicals and steel) directly impact UK

manufacturing and trade. There are sectors where high global tariffs simply don't matter at all (autos, and beverages, to a degree), and only a few where tariffs, regulatory access and proximity have effected a positive comparative performance (chemicals and food products). If trade-forecasting models cannot accommodate these varying influences across specific sectors, then they are hardly fit for purpose.

## Policy proposals

So, what could the UK do to learn the lessons of the past 20 years, and seize the opportunities of an exit from the Customs Union and divergence from the Single Market?

#### 1. Autos, tariffs and subsidies

Car makers have crisply demonstrated a reverse link between seamless, tariff-free trade and actual export performance in the UK's auto trade. In real terms, exports of motor vehicles and auto parts to the EU were worth less in 2019 than in 2000, and peaked back in 2007. Outside the EU, exports more than tripled. The tariff wall around EU markets – and seamless access within it – allowed investment to move freely across borders. Attracted by huge state subsidies in fellow EU countries, car companies switched production to car plants in the continental EU. The result was a –£29.6 billion deficit in 2019, which is growing steadily.

The new trade agreement with the EU means that this trend will continue unless UK governments do something to stop it. What's more, the new rules of origin requirements on electric vehicles and their batteries will likely exacerbate the captive market effect. This means the EU will retain or increase its share of UK auto imports (currently 83 per cent) while taking a smaller share of UK auto exports (currently 43.5 per cent).

If UK governments do nothing, then more UK auto

manufacturing will sidle across the channel to heavily subsidised plants in the EU. This has already happened to premium British brands, such as MINIs, Jaguars and Range Rovers. Competing with European subsidies will be expensive, given the scale of subsidy in the German car industry and huge additional sums injected into European industry during the 2020 pandemic lockdowns.

But without the option of protective tariffs, UK governments will have to compete on subsidy. With seamless EU trade set to continue, car companies will play governments off against each other each time investment is required for a new model. The UK could not prevent this practice while in the EU. It won't be able to stop it from outside either. UK taxpayers will have to foot the bill to keep premium marques in England and sustain the UK's most successful global export industry. The alternative is a decisive break, either by exiting the UK–EU trade deal or by introducing new auto regulation that discriminates in favour of UK-made auto parts.

#### 2. Pharmaceuticals and tax

Chapter 7 showed that the UK's fastest growing export industry of the past 20 years is now on a dangerous downward trajectory. And the crash in UK electronics exports from 2006 shows how far a major export industry can fall. In real terms, pharmaceuticals exports to the EU have now sunk below the level they reached in 2004. Since 2015, non-EU exports have also fallen. The UK has global leadership in research in multiple areas of pharmaceuticals and biopharma; but UK manufacturing is losing the opportunity that this leadership creates.

To revive export growth, the UK Government needs to understand how the Irish Government lured pharmaceuticals

industry to its shores, and then trump that policy. This may mean corporation tax breaks, or an effective equivalent. It might mean changes to intellectual property laws or tax treaties. It may mean using NHS purchasing power to force production from Ireland back to the UK to guarantee security of supply of certain clinical activities, like testing. But if the UK does not improve on what Ireland did in the early 2000s, then the pharma manufacturing industry will continue to die, and the UK will lose its second largest *non-EU* manufacturing trade surplus.

## 3. Aerospace and unmanned air vehicles (UAVs)

To sustain the UK's position as a top aerospace exporter, the UK should seek global leadership in UAV design and production. As noted in the relevant chapter, all the required components exist already, and the sector displays excellent innovation and entrepreneurship. Step behind the two aerospace behemoths – Airbus and Rolls-Royce – and UK aerospace is powered by a fast-growing band of SMEs with stunning technologies and engineering talent. Aerospace was the UK's second-fastest growing export industry from 2000–2019. UK aerospace has proven its global competitiveness.

One policy option is to make the UK the top host nation for annual international contests for unmanned air vehicles (UAVs). The idea has historical credentials. For example, the Schneider Trophy was a series of international, seaplane air-speed competitions held between 1913 and 1931. It attracted the attention of the Southampton based Supermarine company, which attracted the talents of R.J. Mitchell. From that combination, the Spitfire ensued.

The competition formula is applicable today because the ability to design, manufacture and test a UAV has fallen

back within the scope of modest-sized teams with modest engineering resources. Getting a new UAV into the air now takes less than a year. In contrast, the RAF's new strike/fighter, the F-35, took more than a decade.

The UK could take a global lead by inaugurating a global annual UAV contest. Speed, endurance, power and manoeuvrability rules would be framed to suit UK defence procurement. This would trigger the interest of domestic and global design teams, especially if category winners automatically gained contracts with UK forces, including the navy and the army.

There is an excellent precedent for sports competitions acting as triggers for UK manufacturing – motorsports. Currently, UK motorsports sustain 41,000 jobs according to industry sources, of which around 90 per cent involve work for export. <sup>176</sup> By basing competitive UAV design in the UK, the UK would likely trigger a Formula 1 effect, where competitive events nurture auto-engineering talent, which feed directly into the technical prowess of the wider industry.

## 4. Focus on small enterprises

Today, many companies are 'born global'. For example, companies in the technology sector – such as cyber security, fintech and medtech – create products that are so niche they are only commercially viable when sold to a global customer base. Meanwhile, the opportunities for SMEs to export globally have been transformed over the past decade. Search marketing and social media enable small companies to find and cultivate niche audiences in remote markets. And e-commerce platforms such as Amazon and eBay enable SMEs to channel products to emerging-market countries. As trade partners, these e-commerce platforms

absorb much of the export risk that previously only major companies could sustain.

In combination, these three factors – hyper-specialisation, digital marketing and e-commerce – transform export prospects for small enterprise. This means that policies that support successful SME growth have the potential to impact the UK's export trade more rapidly than ever before. In his recent analysis of UK's SME-powered export boom, Marcus Gibson reckoned the UK's Smart Award Scheme to be 'one of the world's most successful wealth-creation schemes'.<sup>177</sup> It provides grants for research, developing proofs of concept, and development projects.

This analysis indicates that small scale entrepreneurialism has demonstrated global competitive advantage in the UK's aerospace, pharmaceuticals, food and beverages sectors. Consequently, the Smart Award Scheme is likely to find SMEs with the best prospects for increasing UK exports if it focusses attention on these sectors.

## 5. Liquid gold

If there's one reformed trade relationship that could radically boost exports, it's the UK's with India. And this is thanks to a single product – whisky. Estimates vary, but in volume terms, India's whisky market is said to be three times as big as the US',<sup>178</sup> and responsible for 48 per cent of global consumption.<sup>179</sup> The Indian whisky market is also growing fast, at over seven per cent per year from 2010/11 to 2016/17, according to some reports.<sup>180</sup>

Currently, India's whisky market is almost entirely satiated by domestic whisky distilled from molasses. But tastes are moving relentlessly upmarket. India's fast-growing middle class is changing consumption patterns in food and beverages.

In a world where tariffs have only a moderate impact on UK trade, India's 150 per cent import tariff is trade-defining. Lowering that tariff will require a diplomatic triumph or a massive concession on something India badly wants. India is highly immune to attempts at trade liberalisation, and its November 2019 withdrawal from the trans-Asia Regional Comprehensive Economic Partnership shows this impulse remains strong. Getting preferential terms for Scotch whisky in India will be an almighty challenge.

The UK has one major advantage in trade talks: it doesn't want access to India's agricultural markets, which India protects and controls. Visas may be attractive, but Indian IT professionals may prefer California over London or Edinburgh. Securing preferential access to India's whisky market will be a gigantic task, possibly requiring numerous political, diplomatic and security trade-offs. But no other bilateral trade liberalisation measure would increase exports as fast for a single product as tariff-free access for Scotch whisky in India.

## 6. Premium foods

Though small, the premium end of the UK's food products sector has a great future on global markets. The evidence for this is recent performance. Despite steep global tariffs, the UK's food exporters increased exports to non-EU markets by a CAGR of 4.3 per cent, which is 1.4 ppts faster than the average for UK exports in non-EU markets. This implies that some of the foodstuffs the UK is exporting – from biscuits, jam and cheese to smoked salmon – are highly competitive in global markets.

But times are changing for exporters of food brands. As already noted, the emergence of e-commerce platforms in countries like China and India have transformed the capacity of entrepreneurs to project brands into developing countries, communicate with customers and create new markets. What's more, Asian markets are hungry for premium produce made to high environmental standards. Export industries built by food producers in Australia and New Zealand prove the point. For example, Australia sells organic beef from its outback channel country to markets stretching from Thailand to the Gulf, precisely because global consumers trust Australian food and agricultural standards.

As the UK exits the Common Agricultural Policy, there are opportunities for UK farming and agriculture to evolve in ways that were impossible even a decade ago. Small-scale farms and independent food producers can become exporters by building a brand and cultivating direct connections with global customers who value food traceability.

One way to increase global reach for small food and agri producers is via a 'Five to Fifty' export program. The idea was conceived in post-war Japan. Its basic premise was that a company that was already exporting to five countries had demonstrated it had a globally competitive product. This made it a viable candidate for government support. The Japanese Government then stepped in and helped the company grow its global export markets to fifty. The program worked because it didn't require officials to 'pick winners'. Competitiveness and export acumen were already apparent.

A 'Five to Fifty' approach would particularly suit the food products and beverages exporters because there are over 10,700 separate business across the two sectors. This means there are plenty of candidates to choose from, and the scheme can concentrate on helping those small producers refine their digital marketing capabilities.

#### 7. Trade body interests

One way to avoid bad trade policy is to check the growth of vested interests. With trade policy now in UK political hands, vested interest will become an increased hazard for UK politicians. Lobby groups have already decamped from Brussels to London. Neither the UK media nor Parliament proved adept at critically challenging assertions made by UK industry associations during 2020 when UK–EU trade negotiations were under way. Claims that thousands of jobs depended on a particular trade relationship were frequently taken at face value. But to be effective, the UK's political class needs to become less naïve. So does its media.

The UK industry auto body, The Society of Motor Manufacturers and Traders (SMMT), will serve as an example. As already noted, this organisation called repeatedly for the continuation of free access to EU markets after the 2016 referendum. Its communications were crafted to demonstrate the vital importance of seamless trade to automotive supply chains. The impression was given that unless the UK continued free trade with the EU, then car manufacturing would shift decisively to continental Europe.

The SMMT has now won that debate. Tariff-free trade between the UK and EU in automotive parts and vehicles will continue, subject to rules of origin conditions that will increasingly tie UK car makers to EU auto supplies. But throughout the EU-related debate, SMMT communications entirely missed the most glaring aspects of UK–EU trade in motor vehicles and parts, namely:

 That the value of exports of cars and auto parts to the EU peaked back in 2007 and are now either stagnant or in long-term decline.

- That as exporters, the auto industry's performance in EU markets since 2000 is worse than every other major sector

   bar electronics and electrical goods.
- That the only successful element in UK–EU trade in automotive goods is in *imports*, which grew by 2.9 per cent p.a. from 2000.
- That export success for UK motor vehicles since 2000 is entirely due to markets *outside* the EU, where sales grew by 6.6 per cent – which is faster than the export growth rates achieved in any other sector.
- That regardless of the number of cars sold into EU markets, the actual value of exports of UK automotive goods to global markets overtook exports to the EU back in 2012.
- That the 2000–2019 period marks a steady drift in investment away from the UK to continental Europe. The indisputable evidence for this is an auto sector deficit with the EU that rose from –£7.7 billion in 2000 (or approximately –10.5 billion in 2019 prices) to –£29.6 billion in 2019.

The SMMT doesn't comment on how investment has moved away from the UK, and the growing number of premium marques – including MINI Countrymans and Range Rover Discoverys – that are assembled in European plants. But as its name suggests, The Society of Motor Manufacturers and Traders has an interest in keeping imports seamless. Auto manufacturers and traders want the freedom to source supplies from as many countries as possible so long they are able to move those parts freely across borders.

And there's the rub. The idea of a single, seamless market in motor cars and auto parts sounds noble, liberal and progressive. But when fresh investment is in the offing, so are invitations for subsidies. The practice is endemic, especially in Germany. As noted, in 2017 the German newspaper *Handelsblatt* reported − on the basis of German Government data − that German carmakers had received more than €115 billion of public money in the preceding decade. This is a gigantic sum. JLR got just €125 million of Slovak state aid to relocate Land Rover Discovery and Defender production from Solihull to Nitra in Eastern Europe; a decision made in 2015 that impacted an estimated 3,000 jobs. So, subsidies encourage manufacturing to move overseas while the Customs Union enables the end product to be imported back into the UK free of charge.

To judge it harshly, what the Single Market and Customs Union actually created was an open licence for car companies to play governments off against each other for state aid whenever a new model was about to depart the drawing board. With gigantic amounts of industrial subsidy deranging competition, free trade in motor vehicles actually operates – on one level at least – as a device for extracting cash from taxpayers, with car workers held as hostages. Whatever it is called, it was a game that the UK kept losing while it stayed in the Customs Union. That –£29.6 billion sectoral deficit is the evidence. As things stand, the UK will carry on losing that game courtesy of continued free trade in motor vehicles and subsidies that accelerated through the pandemic.

If the SMMT cared *most* about UK jobs, it would acknowledge that the UK's trade deficit with the EU in vehicles and parts grew relentlessly from -£7.7 billion in 2000 to -£29.6 billion in 2019. It would suggest how to get those lost jobs back. It's done no such thing. The SMMT warned that carmakers would move production to

continental plants in the event of a WTO trade arrangement when that's precisely what occurred when the UK was a member of the Customs Union. An ultra-crude calculation suggests that the £18.6 billion (real prices) jump in the auto sector's EU deficit since 2000 equates to at least 20,950 jobs moving across the Channel.<sup>184</sup>

Sadly, the SMMT's plangent devotion to seamless UK–EU trade went largely unchallenged. The trade deal was signed. The UK's auto sector is now locked into an EU trade area that is inherently protectionist. It is also a trade area that is wide open to abuse by car companies who can move production where they want according to which government gives them the most subsidy. To keep production in the UK, UK governments will have to continually outbid individual EU governments. In auto terms, the deal will cost tax-payers dear. And it's unlikely to do UK manufacturing much good either, as the history of UK manufacturing makes plain. Above all, it's a chilling demonstration of the power of those interests.

## 8. The value of tariff-free, quota free trade

It will be months before the practical implications of the UK–EU trade agreement become apparent. Strategically, the UK has decided to compromise on certain elements of trade control and fisheries ownership in order to minimise the disruption of its exit from the Customs Union and Single Market. The prospect of severe dislocation in EU trade from a rapid adjustment to WTO terms proved sufficiently unattractive to force the UK into a deal, parts of which are deeply unpopular and potentially unsustainable. Perhaps December 2020 was just too fraught a moment in the UK to execute a clean break. Historians won't know for many decades.

#### **OBSERVATIONS & POLICY OPTIONS**

But the perceived value of tariff-free, quota-free trade with the EU will now become a major issue of political life. The new UK–EU trade agreement has been structured such that the UK is free to diverge from Single Market regulation. But one way or another – in one sector or another – continued free access will depend on alignment. Rules of origin clauses will be used to swerve manufacturing procurement in favour of EU suppliers. UK Governments cannot avoid the resulting dilemma: either to tie UK industry into a protectionist, heavily subsidised EU trade area, or alternatively allow UK industries to break free, source components cheaply from global markets, and try to compete globally without subsidies.

UK trade negotiations with the EU will be never-ending. The EU will seek to barter the UK's free access to its markets against conformity with EU rules and industrial objectives. But UK manufacturing may change quickly, and so will its interests if the UK genuinely embraces free trade. Some challenges are inevitable. An imposed customs border between Northern Ireland and Great Britain will likely become unenforceable, but the EU has already hung UK–EU trade relations on its preferred solution to the UK–EU border in Ireland.

So, the core question will never go away: 'what is the actual value of tariff-free, quota-free access to EU markets for UK manufacturing?' The conclusion from this research: not much.

There is no evidence that seamless, tariff-free trade with the EU increased UK manufacturing exports from 2000– 2019, except in export sectors that were either small (food products) or slow-growing (chemicals). In absolute terms, exports grew faster to non-EU markets in every major manufacturing sector – and differences in GDP growth rates

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do not cover the gap. In comparative terms, UK exports grew fastest where the impact of the Customs Union and Single market was weakest. So, as the UK embarks on a new era of independent trade policy, one lesson should be learned from the past 20 years: the UK has nothing to fear from pursuing its own best interests in markets around the world.

## Appendix A

Table A.1

Description	Number of enterprises	Total turnover £bn	GVA¹ £bn	Employment <sup>2</sup> (1000s)
Manufacturing	138,198	570.1	169.8	2,576
Motor vehicles and parts	3,426	78.7	15.3	167
Transport equipment/Aerospace	2,356	36.8	10.1	141
Machinery	7,639	39.5	12.9	190
Chemicals	2,961	35.4	10.4	110
Computers and electronics	6,033	23.0	9.9	121
Pharmaceuticals	645	20.4	7.9	43
Coke and refined petroleum	117	38.5	2.0	11
Food products	8,290	83.7	21.6	387
Electrical equipment	2,997	13.6	4.7	79
Beverages	2,425	22.0	7.1	46
Rubber and plastics	5,693	24.6	8.5	185*
Basic metals	1,792	17.4	3.8	71
Apparel	3,951	2.7	1.0	22

Office for National Statistics, Annual Business Survey, 15 May 2020. (Data year, 2018).

<sup>&</sup>lt;sup>1</sup>Gross Value Added at approximate basic prices

<sup>&</sup>lt;sup>2</sup> Average during the year \* 2017

## Appendix B

Table B.1: Goods export growth rates by partner group, 2000-2019. (minus precious metals)

Trade partnership type	Goods Export Growth 2000-2019 %	CAGR Goods Exports 2000-2019	% of 2019 non-EU goods exports	% UK goods exports 2019
WT0	69.1%	2.8%	79.6%	41.9%
EFTA	34.1%	1.6%	6.1%	3.2%
Turkey	41.5%	1.8%	2.34%	1.2%
FTA	26.7%	1.3%	6.3%	3.3%
Total: UK's Top 40 non-EU Partners	62.0%	2.6%	94.3%	49.6%
Other Non-EU	99.9%	3.7%	5.7%	3.0%
Total EU	-0.6%	0.0%	N/A	47.4%

The data used for per-country analysis is from ONS UK Trade in Goods, All Countries, Seasonally Adjusted.

Note: Slight discrepancies in CAGRs as compared to chapter 1 are due to different methods for extracting the value of non-monetary gold. The general method for this paper was to extract the value of precious metals from all data. This 'per country' data set however, makes this approach impossible. Instead, estimates for trade in precious metals have been subtracted from the 2019 values for each country. (See Table B.3). This leads to a very slightly lower level of goods export CAGRs.'

Table B.2: Goods export growth rates per country: UK's top 30 export partners in 2019 (minus precious metals)

UK trade partner	Goods export value 2000 £bn (2016 prices)	Goods export value 2019 £bn (2016 prices)	CAGR 2000- 2019	% of global goods exports in 2019	Trading terms
United States*	45.1	60.1	1.5%	17.0%	WT0
Germany	34.1	35.9	0.3%	10.2%	Customs Union
Netherlands	22.4	24.2	0.4%	6.9%	Customs Union
France	27.7	24.2	-0.7%	6.8%	Customs Union
China	2.6	24.0	12.5%	6.8%	WT0 (Since 2001)
Ireland	19.4	21.6	0.6%	6.1%	Customs Union
Belgium	14.8	12.7	-0.8%	3.6%	Customs Union
Italy	12.7	9.9	-1.3%	2.8%	Customs Union
Spain	12.4	10.2	-1.0%	2.9%	Customs Union
Hong Kong	4.3	7.9	3.3%	2.2%	WT0
Switzerland	4.8	7.0	2.0%	2.0%	EFTA
Japan	6.0	6.6	0.5%	1.9%	WTO (FTA from 2019)
United Arab Emirates	2.4	5.4	4.4%	1.5%	WT0
Canada	4.9	5.2	0.4%	1.5%	WTO (CETA from 2017)
Singapore	2.6	5.0	3.6%	1.4%	WT0
Sweden	6.3	5.0	-1.3%	1.4%	Customs Union
Turkey	3.1	4.4	1.8%	1.2%	Non-agri Customs Union
India	3.4	4.2	1.1%	1.2%	WTO (Standard GSP)
South Korea	1.9	4.0	3.9%	1.1%	FTA since 2011
Australia	3.8	4.0	0.4%	1.1%	WT0
Norway	3.4	4.0	0.9%	1.1%	EFTA
Saudi Arabia	2.2	3.2	2.1%	0.9%	WTO
Russia	1.1	2.7	5.0%	0.8%	WT0
Denmark	3.5	2.7	-1.4%	0.8%	Customs Union
Qatar	0.2	2.6	14.3%	0.7%	WT0
Brazil	1.2	2.0	2.8%	0.6%	WT0
South Africa	2.2	1.9	-0.8%	0.5%	TDCA 1999, comp'd 2012

<sup>\*</sup>Including Puerto Rico.

Source: ONS, Trade in Goods – All Countries – Annual Exports. Accessed January 15 2021. Adjustments made for estimates of exports of precious metals in 2019, see Table B.3 below. Deflated to 2016 prices using ONS export deflator.

#### Adjustments for trade in gold & precious metals in 2019

Estimates for precious metals have been extracted from trade data using two sources: ONS Trade in Precious Metals, BoP CP SA, accessed February 2020; and ONS Trade in Goods Country by Commodity, accessed February 2020. This definition of precious metals includes non-monetary gold, silver, platinum and palladium. The estimates of precious metals are made possible because over twenty years, exports of unspecified goods (which are delineated per-country) closely track exports of precious metals (which are not). In 2019, the value of unspecified goods exports shot up by £12.9 billion and exports of precious metals £12.5 billion. Trade is erratic for both, but the latter undershoots the former by an average of £1.5 billion per year over the last four years, with the difference in 2019 only slightly wider than usual. The ratio of precious metals to unspecified goods reached 86 per cent in 2019, after the surge in exports. This 86 per cent ratio has therefore been used to estimate the value of precious metals exports per country. The results closely match expectations. For example, exports of all precious metals to non-EU countries jumped £12.3 billion in 2019 according to ONS manufacturing data, and according to the estimates opposite, the total for all precious metals in 2019 just exceeded GBP 14 billion. This fits neatly with ONS precious metals data that reports total precious metals exports of £1.7 billion for 2018. That said, the below figures remain estimates, but they have been calculated in a way that makes them consistent with the BoP data used throughout this study.

#### APPENDIX B

Table B.3: Estimates for UK exports of precious metals, 2019

Countries	Exports Precious Metals £ bn	Imports Precious Metals £ bn
Switzerland	4.00	3.70
China	6.19	5.60
Turkey	1.02	1.13
United States	0.24	3.00
United Arab Emirates	1.62	1.12
Japan	0.09	0.06
South Korea	0.14	0.04
Hong Kong	0.56	0.04
Canada	0.42	0.03
Australia	0.42	0.03
Singapore	0.42	0.03
Saudi Arabia	0.14	0.01
India	0.28	0.02
Total here	13.29	14.82
Total non-EU	13.49	15.07
Belgium	0.01	0.01
France	0.05	0.06
Germany	0.13	0.35
Ireland	0.03	0.04
Spain	0.28	0.28
Total EU	0.58	0.85

Source: ONS, Trade in Goods, Country by Commodity, February, 2020. Data for unspecified goods, lines 29,153 to 29,389. Also, ONS, Trade in Goods, Precious Metals, BoP, CP, SA, February, 2020.

# Appendix C

Table C.1: Compound annual growth rates for principal UK manufacturing sectors, 2000-2019, and performance against EU 27 and UK GDP growth rates

Manufacturing Sector	CAGR exports to EU	Performance against EU 27 GDP 000-2019 (CAGR 1.43%)	CAGR imports from EU	Performance against UK GDP 2000-2019 (CAGR 1.75%)
1. Motor vehicles	-0.1%	-1.54	2.9%	1.16
2. Transport/aerospace	3.0%	1.57	3.4%	1.68
3. Machinery	0.7%	-0.74	3.3%	1.57
4. Chemicals	0.6%	-0.78	2.3%	0.52
5. Computers, electronics etc.	-5.4%	-6.83	-1.6%	-3.31
6. Pharmaceuticals	2.8%	1.36	5.3%	3.56
7. Basic metals	-0.2%	-1.64	2.3%	0.52
8. Refined petroleum & coke	1.8%	0.36	5.9%	4.11
9. Food products	2.9%	1.45	4.9%	3.11
10. Electrical	-1.0%	-2.45	2.2%	0.46
11. Beverages	2.0%	0.60	3.3%	1.52
12. Rubber & Plastics	1.0%	-0.39	3.0%	1.23
13. Apparel	3.9%	2.50	3.6%	1.84
14. Jewellery, medical etc	4.1%	2.67	6.4%	4.66
All Manufacturing	-0.001%	-1.43	2.58%	0.83

Source: ONS BoP CP Series, Q4 2019 publication. Released February 2020. ONS export and import deflators applied, 2016 base prices. GDO data: The World Bank IBRD-IDA data based. Accessed June 2020.  $\underline{\text{Link}}$ 

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- 2 All data on UK goods trade is taken from ONS, Balance of Payments CP Series, Quarter 4, published in February 2020. All data on UK services trade is taken from ONS, Trade in Services, Balance of Payments, time series, published in November 2020. All compound annual grow rate calculations are made using ONS' 2020 export/import deflators, which use a 2016 base. Values of all precious metals including non-monetary gold have been extracted from manufacturing data, following high volumes of trade during late 2019.
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## Chapter 1

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- 8 Mercantilism is the trade theory that suggests an optimal economic policy should maximise exports and minimise imports.

- 9 For example, sales of salmon to Korea rose from next to zero to US\$1.7 million in 2017. See UK Chambers of Commerce in Korea, Link.
- 10 See chapter 9 (Food Products) on page 123.
- 11 These figures exclude the estimated value of exports of gold, silver, platinum and palladium. The following adjustments for exports the above precious metals was: Switzerland £4 billion; China £6.2 billion; Turkey £1 billion; UAE, £1.6 billion, Hong Kong £600 million; Canada, Australia and Singapore £400 million each, and India £300 million. These values are interpolated from ONS Trade in Goods, Precious Metals BoP CP SA; and ONS Trade in Goods Country by Commodity, Data for Unspecified Goods, lines 29,153 to 29,389. Both accessed in February 2020.
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ontrary to common perception, this analysis of the UK's top ten manufacturing sectors shows that the real value of exports to the EU was lower in 2019 than in 2000 – after adjusting for inflation and extracting the value of precious metals. Neither is this stagnation a Brexit phenomenon. As trade analyst, Phil Radford shows, UK manufacturing exports pivoted decisively away from EU markets in the two decades before the UK's exit from the Customs Union.

Critically, this study shows that manufacturing is vital to UK trade. It delivered 88 per cent of UK goods exports in 2000, and 87 per cent two decades later. In global markets, UK manufacturing is already a quiet achiever. While the UK's EU exports stagnated, manufacturing exports to countries outside the EU grew by 2.6 per cent per year from 2000 onwards – with some sectors enjoying a stellar performance. The growth rates for the UK's automotive, aerospace and pharmaceutical exports easily outpace the aggregate economic growth rates of the UK's non-EU trade partners over the same period.

Some specific sectors of UK manufacturing are highly competitive in global markets. They are testament, Radford finds, to a spirit of endeavour among the UK's globally-minded manufacturers. The report also identifies the stark failures in the UK's manufacturing trade, providing valuable insights into UK trade policy. And it asserts that there is no connection between the apparent benefits of seamless, tariff-free trade with the EU, and the actual export performance of UK manufacturing sectors.

The author's sector-by-sector analysis of UK manufacturing trade shows that the imbalance between export and import growth rates in UK-EU trade has created a series of 'captive markets' in certain sectors in the UK – and that the new UK-EU trade deal could entrench past trends rather than abate them. Neither can we assume that trade in services with the EU can compensate for the UK's deficits in manufacturing trade. The report concludes with several policy recommendations to support 'levelling up' policies, by identifying industries and subsectors outside London that have already proved competitive in global markets.

