



# Asymmetries in International Trade in Goods Statistics: UK measured against non-EU partner countries, 2017 to 2019

## About this release

This release includes commentary on the asymmetries between the UK and the UK's top trading partners. Detailed tables of the asymmetries can be found at [www.uktradeinfo.com](http://www.uktradeinfo.com)

## In this publication

1. Introduction, p.2
  2. Trade in goods asymmetries between the UK's largest trading partners by trade value, 2017 to 2019, p.3
  3. Trade in goods asymmetries between the UK and each of its largest trading partners by trade value, 2017 to 2019, p.6
  4. A chapter breakdown of trade in goods asymmetries between the UK and its largest trading partners by trade value, 2017 to 2019, p.9
- Annex 1. Methodology, p.12

## Summary

- This release includes commentary on the asymmetries between the UK and the UK's top trading partners.
- Asymmetries are the differences between the published trade statistics of the reporting country and its partner countries. Each country collects data on their own international trade-in-goods for both imports and exports. Theoretically, the 'mirror flow' collected by the partner countries should match, i.e. one country's export should mirror the partner country's import. In reality, it is often the case that the figures do not match and this is referred to as 'asymmetry'.
- The total absolute asymmetry in 2019 between UK-reported exports from the UK's 20 largest non-EU trading partners and their reported imports from the UK was \$30.2 billion. The total absolute asymmetry was \$24.6 billion in 2017 and \$25.9 billion in 2018.
- The total absolute asymmetry in 2019 between UK-reported imports from the UK's largest non-EU trading partners and their reported exports to the UK was \$30.2 billion. The total absolute asymmetry was \$32.3 billion in 2017 and \$31.5 billion in 2018.

Coverage: United Kingdom  
Theme: Business and Energy  
Released: 17th November 2021  
Next release: May 2022

Website: <https://www.uktradeinfo.com>  
Email: [uktradeinfo@hmrc.gov.uk](mailto:uktradeinfo@hmrc.gov.uk)  
Statistical contact: H. Mansfield  
Media contact: HMRC Press Office [news.desk@hmrc.gov.uk](mailto:news.desk@hmrc.gov.uk)

# 1. Introduction

Asymmetries are the differences between the published trade statistics of the reporting country and its partner countries. Each country collects data on their own international trade-in-goods for both imports and exports. Theoretically, the 'mirror flow' collected by the partner countries should match, i.e. one country's export should mirror the partner country's import. In reality, it is often the case that the figures do not match and this is referred to as 'asymmetry'.

For example, there may be a difference between what the United Kingdom (UK) records as imports from China and what China records as exports to the UK. This difference or asymmetry can be measured. Further information on how asymmetries are measured can be found in Annex 1: Measures of asymmetry.

There are numerous reasons for the occurrence of asymmetries, such as methodological discrepancies and misclassification of commodities among others. For more information on the causes of asymmetries, see HMRC's 2012 'Overview of Asymmetries' paper which can be found [here](#).

This paper is an asymmetry study covering trade in goods between the UK and its 20 largest non-EU partner countries (measured by total value of imports and exports) for the calendar years 2017, 2018, and 2019. The data used in the compilation of this report has been extracted from the United Nations International Trade Statistics [Database](#). Therefore, all figures are in USD (\$), as provided by UN Comtrade, for comparability. Additional tables supporting this paper can be found in the accompanying statistical dataset.

International trade-in-goods data detailing trade between the UK and non-EU countries are collected from UK Customs entries made by importing and exporting businesses via the Customs Handling of Import and Export Freight (CHIEF) system. This data is provided to UN Comtrade on a monthly basis and an average annual exchange rate is applied on an annual basis. This calculation weights the monthly rate with the monthly volume of trade for each country's dataset.

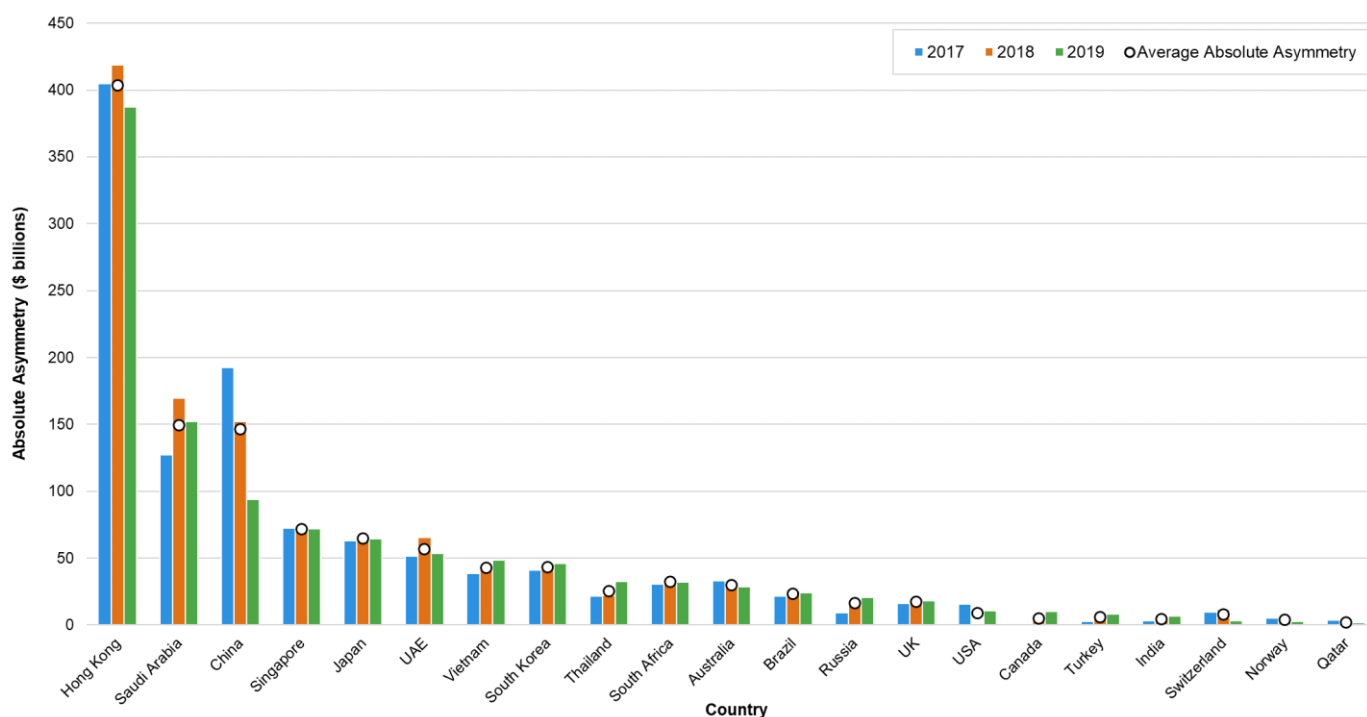
There are numerous measurements of asymmetries – in this report we will be using absolute asymmetry and share of absolute total asymmetry, and in the detailed dataset we will include relative asymmetry for expert users. To understand the definitions, calculations, and significance of each of these measurements, please see the explanations provided in Annex 1.

## 2. Trade in goods asymmetries between the UK's largest trading partners by trade value, 2017 to 2019

This section explores the asymmetries of the UK's top 20 trading partners by total import and export value in 2019 (according to the available data from the UN Comtrade database), comparing each partner's trade flow against the mirror flow of the other 19 partner countries plus the UK. For example, Switzerland's reported imports from the UK's top 20 block against exports to Switzerland reported by the UK's top 20 block. This is shown in the diagram below.



**Graph 1: Exports: Absolute asymmetries between the UK's 20 largest non-EU trading partners 2017 to 2019, sorted largest to smallest by 2019 export value.**



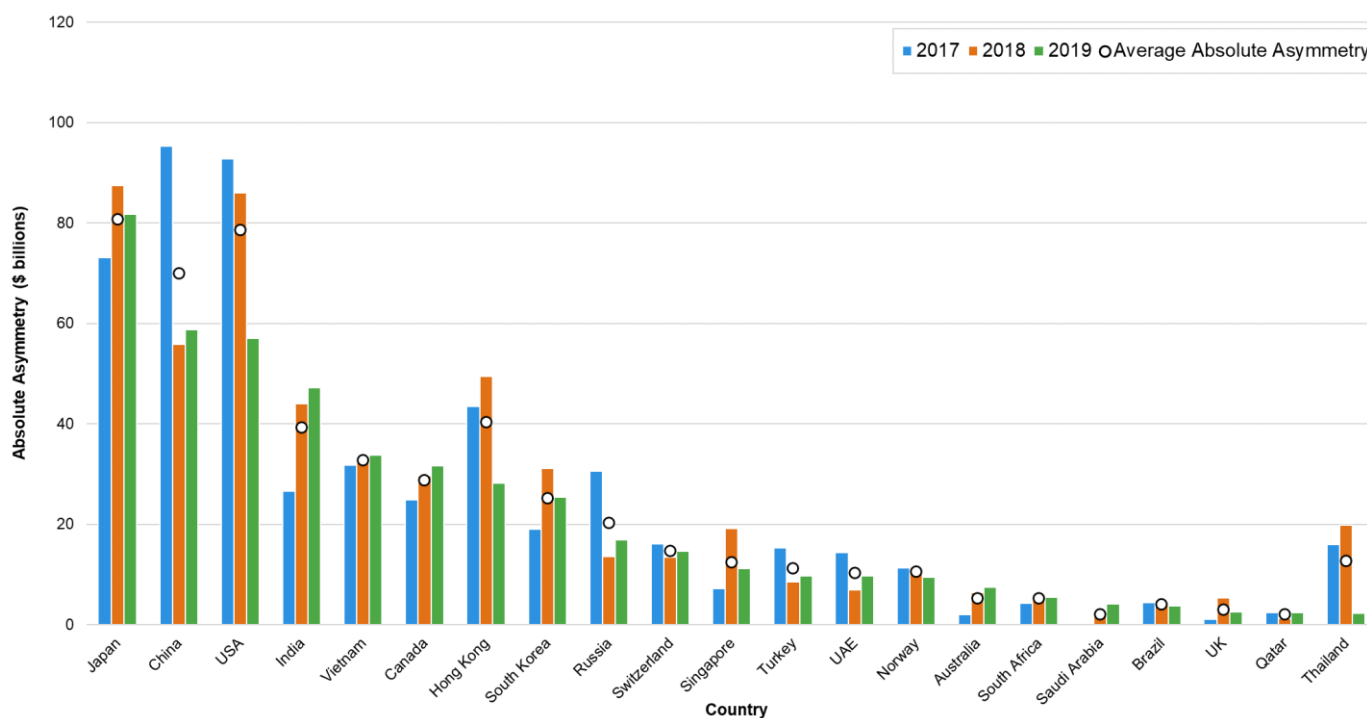
The absolute asymmetries between the UK's largest non-EU trading partners on the export flow 2017 to 2019 are as follows:

- Hong Kong had the largest absolute asymmetry in 2019 at \$387 billion, despite experiencing a decrease over the 3 years, down from \$405 billion in 2017 and \$419 billion in 2018.
- Saudi Arabia had the 2nd largest absolute asymmetry in 2019 at \$152 billion. It experienced the largest increase over the 3 years up from \$127 billion in 2017, but down from \$170 billion in 2018.
- China had the 3rd largest absolute asymmetry in 2019 at \$93.9 billion. It experienced the largest decrease over the 3 years, down from \$192 billion in 2017 and \$152 billion in 2018.

The average annual trade values compared with the average absolute asymmetries between the UK's largest non-EU trading partners on the export flow 2017 to 2019 are as follows:

- Hong Kong had the largest average absolute asymmetry despite having only the 4th largest average export value. On average, it contributed 7.6% (\$461 billion) of the total export value but 35% (\$404 billion) of the total absolute asymmetry.
- The USA, on average, contributed 14% (\$873 billion) of the total export value but only 0.8% (\$9.1 billion) of the total absolute asymmetry.
- China had the largest average export value but only the 3rd largest average absolute asymmetry. On average, it contributed 25% (\$1,542 billion) of the total export value but only 13% (\$146 billion) of the total absolute asymmetry.

**Graph 2: Imports: Absolute asymmetries between the UK's 20 largest non-EU trading partners 2017 to 2019, sorted largest to smallest by 2019 import value.**



The absolute asymmetries between the UK's largest non-EU trading partners on the import flow 2017 to 2019 are as follows:

- Japan had the largest absolute asymmetry in 2019 at \$81.7 billion. It experienced the 2nd largest increase over the 3 years, up from \$73.2 billion in 2017 but down from \$87.5 billion in 2018.
- China had the 2nd largest absolute asymmetry in 2019 at \$58.7 billion. It experienced the largest decrease over the 3 years, down from \$95.3 billion in 2017 but up from \$55.8 billion in 2018.
- The USA had the 3rd largest absolute asymmetry in 2019 at \$57.1 billion. It experienced the 2nd largest decrease over the 3 years, down from \$92.8 billion in 2017 and \$86.1 billion in 2018.
- India had the 4th largest absolute asymmetry in 2019 at \$47.3 billion. It experienced the largest increase over the 3 years, up from \$26.6 billion in 2017 and \$44.0 billion in 2018.

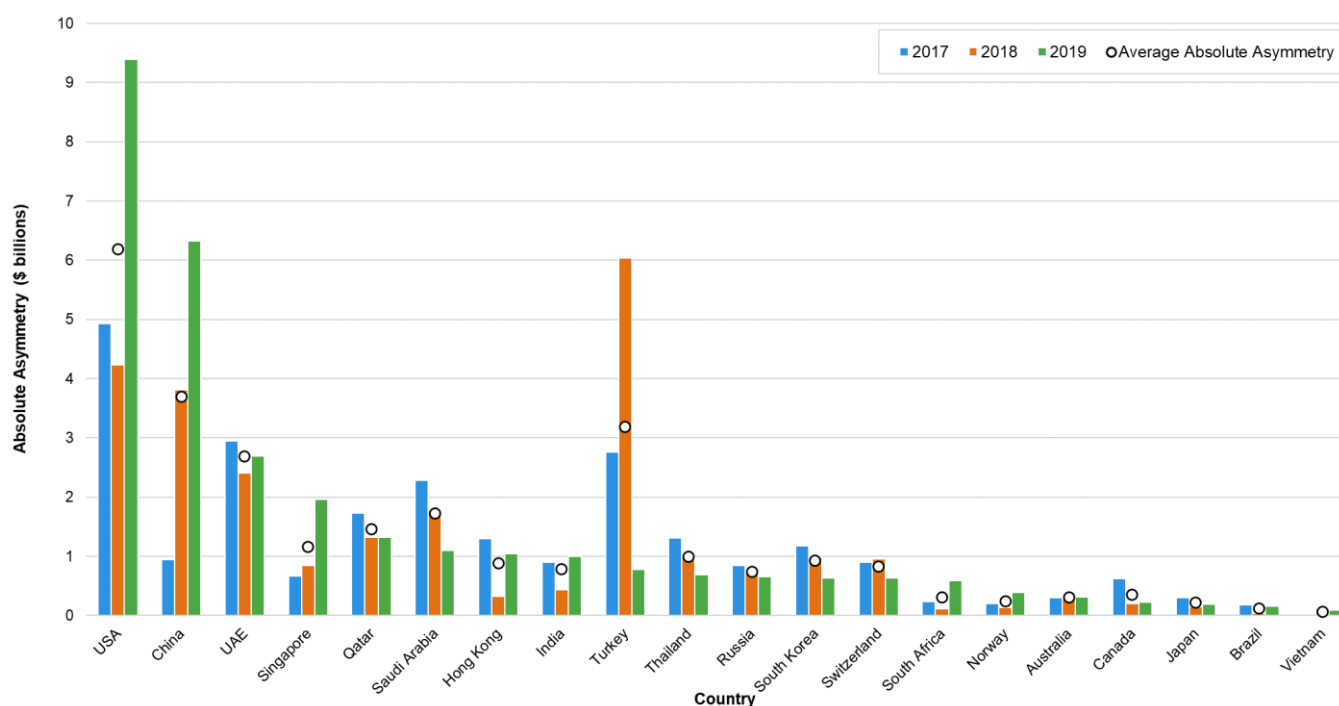
The average annual trade values compared with average absolute asymmetries between the UK's largest non-EU trading partners on the import flow 2017 to 2019 are as follows:

- The USA had the largest average import value but only the 2nd largest average absolute asymmetry. On average, it contributed 23% (\$1,452 billion) of the total import value but only 15% (\$78.6 billion) of the total absolute asymmetry.
- Japan had the largest average absolute asymmetry but only the 3rd largest average import value. On average, it contributed 8.1% (\$508 billion) of the total import value but 16% (\$80.8 billion) of the total absolute asymmetry.
- The UK, on average, contributed 4.3% (\$267 billion) of the total import value but only 0.6% (\$3.0 billion) of the total absolute asymmetry.

### 3. Trade in goods asymmetries between the UK and each of its largest trading partners by trade value, 2017 to 2019

This section explores the asymmetries between the UK and its largest non-EU trading partners by trade value. Where the last section looked at each country and measured the asymmetries between each partner and the block as a whole, this section is focused on the UK compared with each of its trading partners.

**Graph 3: Exports: The UK's absolute asymmetries with its 20 largest non-EU trading partners 2017 to 2019, sorted largest to smallest by 2019 export value.**



The UK's absolute asymmetries with its 20 largest non-EU trading partners on the export flow 2017 to 2019 are as follows:

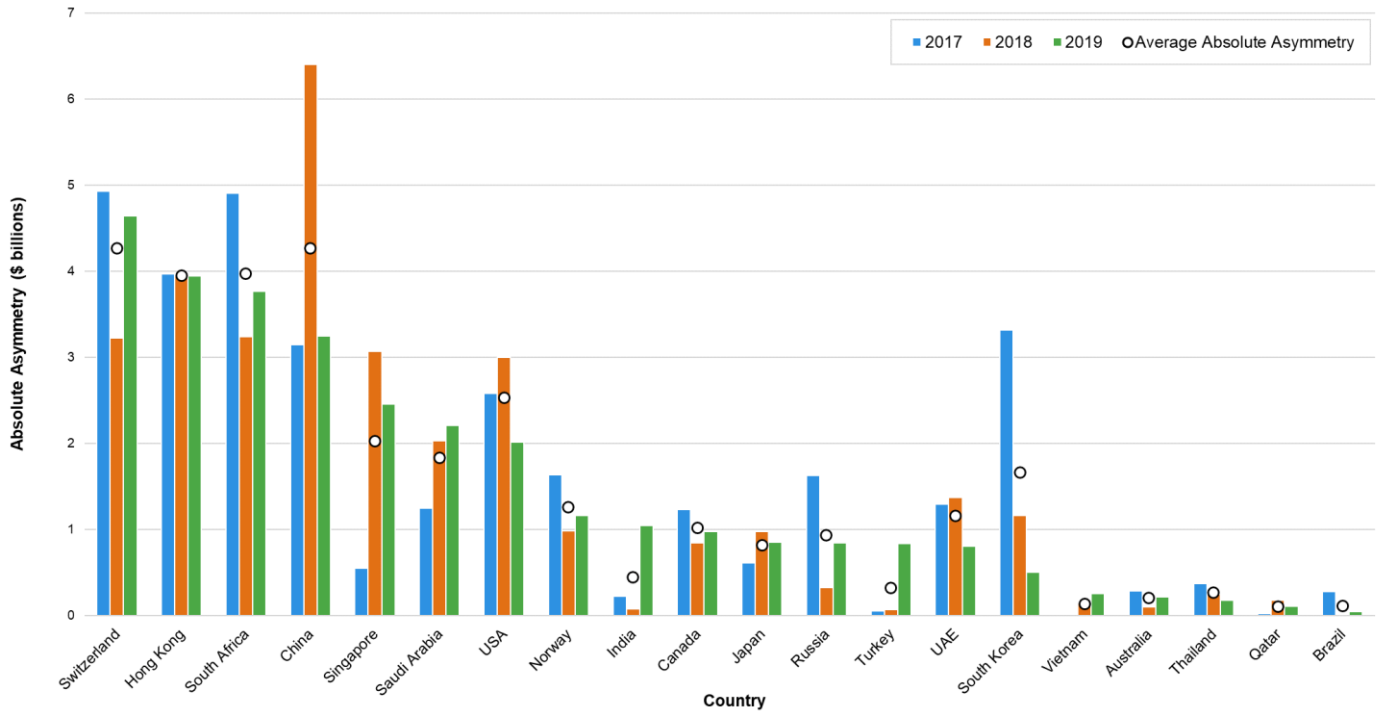
- In 2017 the UK's total absolute asymmetry for exports was \$24.6 billion. In 2018 this increased to \$25.9 billion and in 2019 it further increased to \$30.2 billion.
- The USA had the largest absolute asymmetry with the UK in 2019 at \$9.4 billion. It experienced the 2nd largest increase over the 3 years, up from \$4.9 billion in 2017 and \$4.2 billion in 2018.
- China had the 2nd largest absolute asymmetry with the UK in 2019 at \$6.3 billion. It experienced the largest increase over the 3 years, up from \$0.9 billion in 2017 and £3.8 billion in 2018.
- Turkey experienced the largest decrease over the 3 years, down to \$0.8 billion from \$2.8 billion in 2017 and \$6.0 billion in 2018.

The average annual trade values compared with the average absolute asymmetries between the UK and its 20 largest non-EU trading partners on the export flow, 2017 to 2019 are as follows:

- The USA had the largest average export value and the largest average absolute asymmetry. On average, it contributed 32% (\$66.2 billion) of the total export value but only 23% (\$6.2 billion) of the total absolute asymmetry.
- Turkey, on average, contributed 4.8% (\$9.9 billion) of the total export value but 12% (\$3.2 billion) of the total absolute asymmetry.

- Switzerland, on average, contributed 9.9% (\$20.5 billion) of the total export value but only 3.1% (\$0.8 billion) of the total absolute asymmetry.

**Graph 4: Imports: The UK's absolute asymmetries with its 20 largest non-EU trading partners 2017 to 2019, sorted largest to smallest by 2019 import value.**



The UK's absolute asymmetries with its 20 largest non-EU trading partners on the import flow 2017 to 2019 are as follows:

- In 2017, the UK's total absolute asymmetry for imports was £32.3 billion. In 2018 this decreased to \$31.5 billion and in 2019 it further decreased to \$30.2 billion.
- Switzerland had the largest absolute asymmetry with the UK in 2019 at \$4.6 billion. It experienced a decrease over the 3 years, down from \$4.9 billion in 2017 but up from \$3.2 billion in 2018.
- South Korea experienced the largest decrease in absolute asymmetry with the UK over the 3 years, down to \$0.5 billion in 2019 from \$3.3 billion in 2017 and \$1.2 billion in 2018.
- Singapore experienced the largest increase in absolute asymmetry with the UK over the 3 years, up to \$2.5 billion in 2019 from \$0.6 billion in 2017 but down from \$3.1 billion in 2018.

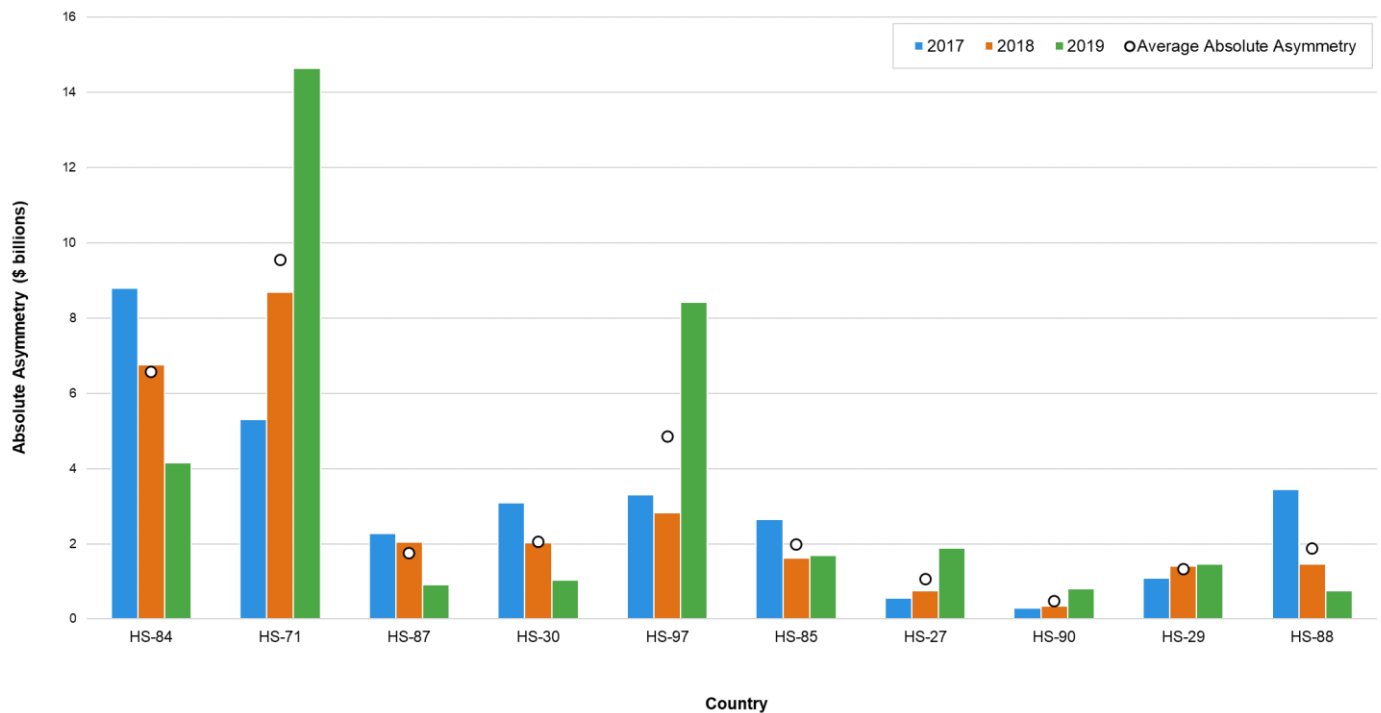
The average annual trade values compared with their average absolute asymmetries between the UK and its 20 largest non-EU trading partners on the import flow, 2017 to 2019 are as follows:

- The USA, on average, contributed 24% (\$63.1 billion) of the total import value but only 8.1% (\$2.5 billion) of the total absolute asymmetry.
- Hong Kong, on average, contributed 1.5% (\$4.1 billion) of the total import value but 13% (\$4.0 billion) of the total absolute asymmetry.
- China, on average, contributed 24% (\$62.9 billion) of the total import value but only 14% (\$4.3 billion) of the total absolute asymmetry.



## 4. A HS chapter breakdown of trade in goods asymmetries between the UK and its largest trading partners by trade value, 2017 to 2019

**Graph 5: Exports: The UK's absolute asymmetries 2017 to 2019 with its 20 largest non-EU trading partners within its 10 largest HS chapters of 2019, sorted largest to smallest by 2019 export value.**



The UK's absolute asymmetries by HS chapter with its 20 largest non-EU trading partners on the export flow 2017 to 2019 are as follows:

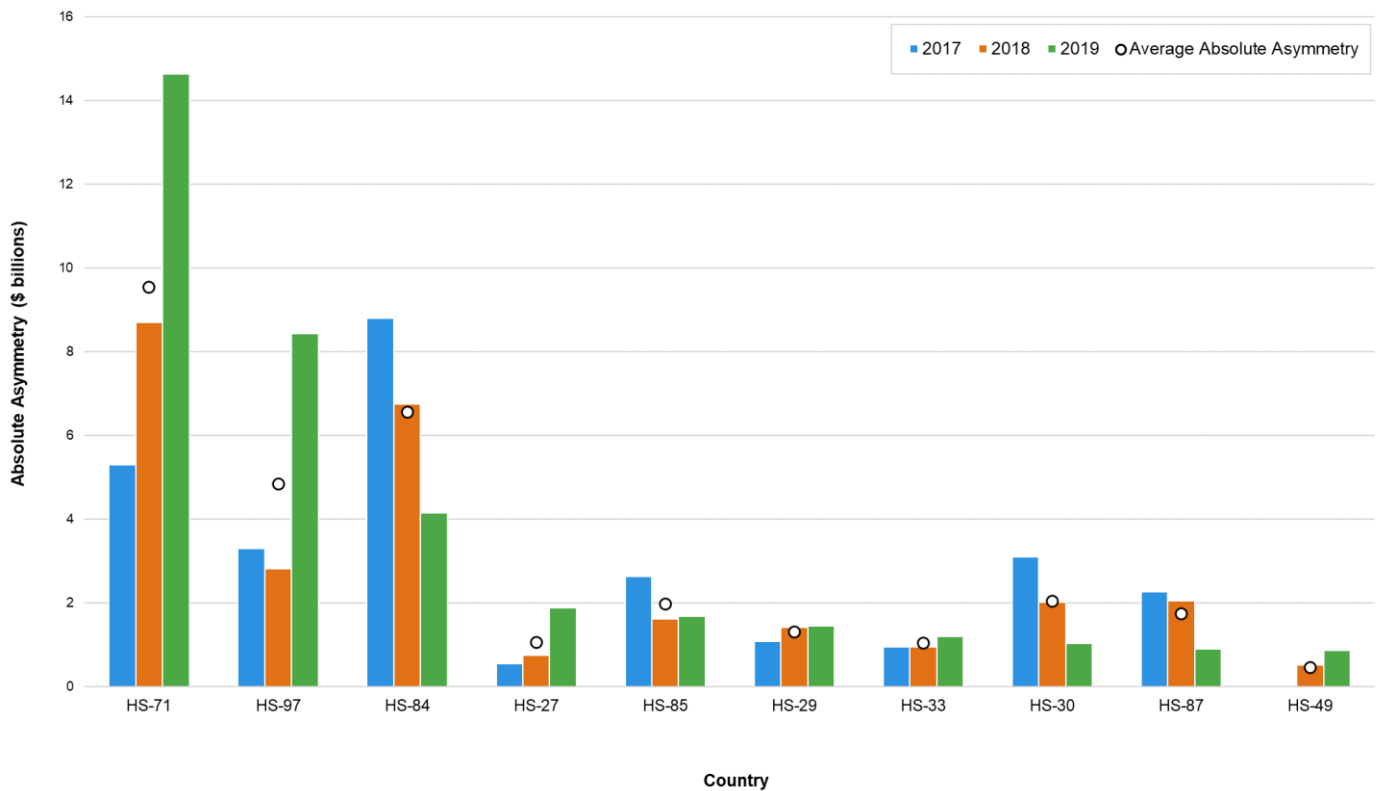
- In 2017, the total absolute asymmetry for all chapters was \$38.5 billion. In 2018 this decreased to \$35.6 billion but in 2019 it increased to \$44.4 billion.
- Chapter 71 (Precious Metals) had the largest absolute asymmetry in 2019 at \$14.6 billion. It experienced the largest increase over the 3 years, up from \$5.3 billion in 2017 and \$8.7 billion in 2018.
- Chapter 97 (Art and Antiques) had the 2nd largest absolute asymmetry in 2019 at \$8.4 billion. It experienced the 2nd largest increase over the 3 years, up from \$3.3 billion in 2017 and \$2.8 billion in 2018.
- Chapter 84 (Mechanical Appliances) had the 3rd largest absolute asymmetry in 2019 at \$4.2 billion. It experienced the largest decrease over the 3 years, down from \$8.8 billion in 2017 and \$6.8 billion in 2018.

The average annual trade value compared with absolute asymmetry by HS chapter between the UK and its 20 largest non-EU trading partners on the export flow 2017 to 2019 are as follows:

- Chapter 87 (Motor Vehicles), on average, contributed 12% (25.4 billion) of the total export value but 4.4% (\$1.7 billion) of the total absolute asymmetry.

- Chapter 71 (Precious Metals), on average, contributed 16% (\$32.5 billion) of the total export value but only 24% (\$9.5 billion) of the total absolute asymmetry.
- Chapter 97 (Art and Antiques), on average, contributed 4.0% (\$8.2 billion) of the total export value but only 12% (\$4.8 billion) of the total absolute asymmetry.

**Graph 6: Imports: The UK's absolute asymmetries 2017 to 2019 with its 20 largest non-EU trading partners within its 10 largest HS chapters of 2019, sorted largest to smallest by 2019 import value.**



The UK's absolute asymmetries by HS chapter with its 20 largest non-EU trading partners on the import flow 2017 to 2019 are as follows:

- Chapter 84 (Mechanical Appliances) had the largest absolute asymmetry in 2019 at \$11.4 billion. It experienced the 2nd largest increase over the 3 years, up from \$10.2 billion in 2017 and \$9.7 billion in 2018.
- Chapter 88 (Aircraft) had the 2nd largest absolute asymmetry in 2019 at \$8.0 billion. It experienced the largest increase over the 3 years, up from \$3.1 billion in 2017 but down from \$9.2 billion in 2018.
- Chapter 89 (Ships, Boats, and Floating Structures) experienced the largest decrease in absolute asymmetry over the 3 years, down to \$1.2 billion in 2019 from \$3.7 billion in 2017 and \$1.8 billion in 2018.

The average annual trade value compared with absolute asymmetry by HS chapter between the UK and its 20 largest non-EU trading partners on the import flow 2017 to 2019 are as follows:

- Chapter 71 (Precious Metals), on average, contributed 18% (\$48.4 billion) of the total import value but only 6.9% (\$3.4 billion) of the total absolute asymmetry.
- Chapter 88 (Aircraft), on average, contributed 2.4% (\$6.3 billion) of the total import value but 14% (\$6.7 billion) of the total absolute asymmetry.
- Chapter 84 (Mechanical Appliances), on average, contributed 14% (\$38.1 billion) of the total import value but 21% (\$10.4 billion) of the total absolute asymmetry.

# Annex 1: Methodology

## Annex 1.1. Measures of Asymmetry

There are two types of asymmetries for trade in goods that are referred to in this report: the **imports asymmetry** and the **exports asymmetry**.

The **imports asymmetry** is the difference between the declarant country's imports from the partner country and the partner country's exports to the declarant country. If this asymmetry is positive it means that the declarant country's imports from the partner country are greater than the partner country's exports to the declarant country.

The **exports asymmetry** is the difference between the declarant country's exports to the partner country and the partner country's imports from the declarant country. If this asymmetry is positive it means that the declarant country's exports to the partner country are greater than the partner country's imports from the declarant country.

As an example, the UK's imports asymmetry with China is the difference between what the UK records as imports from China and what China records as exports to the UK. If the value of UK imports minus China exports is negative, it suggests that the UK is recording less goods as received from China, than China is recording as exported to the UK.

If we use D to represent the declarant country and P to represent the partner country, we can set out the main indicators used to calculate the asymmetry. Note that for the purposes of this report the UK will always be the declarant.

### (1) Absolute Asymmetry:

$$= | \text{Value (D)} - \text{Value (P)} |$$

This is the absolute difference between the value of recorded by the declarant and their partner country (mirror value) irrespective of which is greater.

### (2) Relative Asymmetry (%):

$$= \frac{\text{Value (D)} - \text{Value (P)}}{0.5 (\text{Value (D)} + \text{Value (P)})} \times 100$$

The relative asymmetry looks at the difference between the value reported by the declarant country and the value reported by the partner country with respect to the mean of those two flows. This method makes no assumption about which value (D or P) is the correct value and instead looks at the asymmetry with respect to the average of the two values shown in percent.

If a reporting country has a positive relative asymmetry, this means that they reported more trade than their partner country. If a reporting country has a negative relative asymmetry, this means that they reported less trade than their partner country.

For example, Country A reports \$100 billion in imports from Country B while Country B reports \$120 billion in exports to Country A. The relative asymmetry here is 18.2%. This means that, relative to the average between the two countries, they differ by 18.2%. Country A has reported 9.1% less trade than the average and Country B has reported 9.1% more trade than the average.

Relative asymmetry measurements have not been included in this commentary however they can be found in the accompanying detailed dataset for expert users.

### **(3) Share of Total Absolute Asymmetry (%):**

$$= \frac{| \text{Value (D)} - \text{Value (P)} |}{\sum | \text{Value (D)} - \text{Value (P)} |} \times 100$$

This percentage dictates the contribution a country or HS<sup>1</sup> Chapter is having on the absolute total of the asymmetries within a certain flow, e.g. Chapter 45 may be responsible for 10 per cent of the total UK imports asymmetry.

## **Annex 1.2. Non-International Trade Data**

For the analysis in Section 2 (Trade in goods asymmetries between the UK's largest trading partners by trade value, 2016 to 2018), data was downloaded from UN Comtrade in which all 21 partner countries were entered in both the 'Reporter' and 'Partner' query fields.

In the resultant data output files were several lines of data in which the 'Reporter' and 'Partner' were the same country.

These entries would inherently and inaccurately contribute to the total asymmetry for the affected country because there is no mirror flow against which it would be compared. Therefore, all such lines of data were removed before analysis took place.

## **Annex 1.3. Chapter 99 Adjustments and Omission from Analysis**

The following is a quote taken from the 'Help > Limitations' section of the UN Comtrade website:

"The values of the reported detailed commodity data do not necessarily sum up to the total trade value for a given country dataset. Due to confidentiality, countries may not report some of its detailed trade. This trade will – however – be included at the higher commodity level and in the total trade value. For instance, trade data not reported for a specific 6-digit HS code will be included in the total trade and may be included in the 2-digit HS chapter. Similar situations could occur for other commodity classifications. Detailed data processed after 1. January 2006 and published in HS will sum up to the respective totals due to the introduction of adjustment items with commodity code 9999 and 999999."

This indicates that for all post-2006 data, the total reported trade by a country should match the sum of the chapter totals reported by that country. This was not always the case in the data we downloaded, with numerous small differences and two large differences.

We followed the method indicated above and added all such differences to each country's chapter 99 totals.

Resultantly, we omitted chapter 99 from all analysis in Section 4 (A chapter breakdown of trade in goods asymmetries between the UK and its largest trading partners by trade value, 2016 to 2018). This is because it does not represent an actual group of commodities being traded but rather acts as a 'catch all' for suppressed or otherwise non-specified trade.

---

<sup>1</sup> HS Chapter as defined in the UN Comtrade database