

International trade in UK nations, regions and cities QMI

Quality and Methodology Information (QMI) report for our Subnational trade estimates release, detailing the strengths and limitations of the data, methods used, and data uses and users.

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1 . Output information

- National Statistic: No
- Frequency: Annual
- How compiled: Various surveys and third-party data
- Geographic coverage: International territorial level (ITL) 3 and city region

2 . About this Quality and Methodology Information report

This quality and methodology information report contains information on the quality characteristics of the data (including the European Statistical System five dimensions of quality), as well as the methods used to create it.

The information in this report will help you:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- decide suitable uses for the data
- reduce the risk of misusing data

3 . Important points about subnational trade data

- Trade is measured through both imports and exports of goods and services.
- The quality of the HM Revenue and Customs (HMRC) source data for trade in goods is high in terms of the comprehensiveness and coverage.
- Trade in services estimates are sourced mainly from survey data, but also a variety of administrative sources.
- When examining the trade in goods data, precious metals (high-value, low-volume products) are allocated to the "unknown" region as they can skew figures in regions such as London.

HMRC also publishes regional trade statistics (RTS), showing trade at summary product and country level, split by UK regions and devolved administrations. These aggregate estimates will differ slightly from those published by us on a [Balance of payments \(BoP\)](#) basis, as HMRC publish on an [international merchandise trade statistics \(IMTS\)](#) basis.

4 . Quality summary

Overview

This annual experimental dataset estimates import and export activity within regions to an international territorial level (ITL) 3 or combined authority level. These data are further broken down by industry and partner country for trade in services, and by industry and whether they are an EU member for trade in goods.

The total trade balance is calculated as total exports less imports. The trade balance is an estimate of the net position of the region or nation, describing whether it exports more than it imports (a trade surplus) or imports more than it exports (a trade deficit).

The subnational trade publication was developed to provide a breakdown of UK trade to a regional level. The International Monetary Fund's (IMF's) balance of payments manual sixth edition (BPM6) describes the goods and services account as overseas transactions in items that are outcomes of production activities.

5 . Quality characteristics of the subnational trade data

Relevance

Subnational trade was developed to help users understand regional trading patterns. More users have requested regional trade estimates since the announcement of EU exit and in 2019, the government's levelling up agenda.

The UK economic territory excludes the Channel Islands and the Isle of Man, which have their own fiscal and monetary authorities. All information in the subnational trade publication is on a balance of payments (BoP) basis.

The main users of the subnational trade publication are:

- Department for International Trade (DIT)
- Cabinet Office
- Department for Levelling Up
- Housing and Communities (DLUHC)
- devolved governments
- local authorities
- city regions
- academics

They primarily use the data to inform decisions on trade policy and promotion of trade.

Timeliness and punctuality

We publish annual subnational trade output around one and a half years after the end of the reference period. The delay is because of dependencies on source data that become available two months prior to publication.

Accuracy

There is no simple way to measure the accuracy of subnational trade statistics (the extent to which they measure the underlying "true" value for a particular period).

We mainly source trade in goods estimates from HM Revenue and Customs (HMRC). They collect the raw data, and automatic corrections are built into their computer systems to cope with certain common types of error, such as invalid codes. There are credibility checks on the trade data for value and quantity.

Trade in services estimates have been derived from surveys and other sources. Results should be treated with caution, because they are likely to be less reliable than those for trade in goods. While quarterly estimates produced by our national trade in services team rely on a smaller sample size, the subnational output uses data from a larger annual dataset, so are considered better quality. Further information is available in our [UK trade QMI](#). Apportionment at lower geographical levels is particularly difficult and causes uncertainty at a subnational level. Apportionment is used in the absence of accurate trade data at this level.

International trade in services (ITIS) data is not sampled at a regional level. Sample sizes at the lower regional levels can change a lot between years and lead to volatility in estimates, particularly at the international territorial level (ITL) 2 and 3 levels.

Non-sampling errors are difficult to quantify and include errors of coverage, measurement, processing, and non-response. To limit processing errors, we carry out quality assurance and have automated checks to identify errors.

Coherence and comparability

HMRC publishes regional trade statistics (RTS). Like their overseas trade statistics (OTS) figures, these are compiled on an international merchandise trade statistics (IMTS) basis, but the subnational trade figures produced by the Office for National Statistics (ONS) are on a BoP basis. Different methodologies contribute to the compilation of each set of statistics, but the main one is that RTS are compiled based on goods physically entering or leaving the UK, while the ONS subnational trade statistics are produced on a change of economic ownership basis. RTS data exclude non-monetary gold.

Regional trade estimates are also compiled by the devolved administrations. We are working to understand the differences between methodologies of the devolved administrations' estimates of regional trade.

Preliminary findings show that some disparities are because of survey and administrative data and weighting methodologies; further work is ongoing.

As an experimental output, there are differences in methods between publications. We aim to move production of these estimates onto a strategic ONS platform to produce a consistent time series. This will improve comparability of the output.

Concepts and definitions

Our [UK Trade glossary](#) and [Balance of payments glossary](#) are available.

6 . Methods used to produce the subnational trade data

Data sources

International trade In Services (ITIS)

The major survey source for many of the services categories is the International Trade in Services (ITIS) Survey. The ITIS Survey of businesses covers total exports and imports of services broken down by 52 products and the country of destination and origin.

The sample size is 22,500 businesses annually. The sampling methodology comprises a large component from businesses sampled from the Inter-Departmental Business Register (IDBR). These businesses belong to industries with a higher likelihood of trading overseas and include activities such as computer services, the performing arts, wholesaling and sport. This is supplemented with information from the Annual Business Survey (ABS).

The question asks the contributor to indicate if international trade in services is undertaken and the total value. There is a consistent element of the survey that comes from contributors known to have international trade in services; these are called the known traders. These can remain in annual ITIS, or if they grow large enough, can be transferred to quarterly ITIS. Further information is available in our [ITIS QMI](#).

International Passenger Survey

Data from the International Passenger Survey (IPS) are the main source for travel services, making up around 8% of total trade. For data prior to the 2020 reference year, all travel services data was sourced from IPS.

The IPS was suspended from 16 March 2020 to 18 January 2021 because of the coronavirus (COVID-19) pandemic. We are investigating alternative ways to continue measuring these services.

We have worked with the Office for National Statistics (ONS) Data Science Campus to create new estimates using alternative data sources for the 2020 reference year. The data sources that have been used include the Civil Aviation Authority, Eurotunnel, the Consumer Prices Index including owner occupiers' housing costs (CPIH), airline stock figures, and aggregated and anonymised foreign-issued card spend processed through Barclays point-of-sale (POS) and "card-not present" channels.

We will keep developing methods used to produce these estimates over the coming year and any improvements may result in larger than usual revisions for travel services.

UK trade in services: service type by partner country, non-seasonally adjusted

Trade in services by partner country statistics are an aggregate of multiple administrative and survey data sources.

The major survey source for many of the services categories is the International Trade in Services (ITIS) survey, which is used alongside sources such as the International Passenger Survey (IPS), and administrative sources including data from:

- Civil Aviation Authority (CAA)
- Ministry of Defence
- Commercial Bar Association
- Baltic Exchange
- British Airways Authority (BAA)
- National Air Transport Service (NATS)
- Gatwick Airport
- Manchester Airport
- Gambling Commission

Aggregated trade in services data then go through a "balancing" process, using previous years' supply and use tables to reconcile product-level data across national accounts.

Country-level estimates are produced once a quarter, using geography-level information from all data sources noted above, or their nearest proxy. This geography data is used to create a "pattern file", which is used to disaggregate trade in services data across countries.

Trade in Goods by Industry

The trade in goods by industry dataset is compiled by combining data from HM Revenue and Customs (HMRC) and data from the IDBR.

The data linked the IDBR with HMRC trader data Value Added Tax (VAT) units. The VAT unit was derived from each business' unique nine-digit VAT unit code. This approach filters the IDBR so that each business would be identified with a single industry. The VAT unit codes were then linked with the trade in goods microdata from HMRC, allocating trade to industries.

Linking the data in this way assumes that a trader operates in a single industry. While this may hold for simple firms, for more complex firms who have operations spanning multiple industries, the matching method used in this release will provide a more accurate apportionment of trade values to industry.

More recently, experimental data incorporates the linking methodology used within our [UK trade in goods and productivity article](#). In cases where trader code can link to VAT units with more than one enterprise group, we allocate the trade to the enterprise group with the greatest total employment. For each enterprise group, all lower-level VAT units, reporting units, and enterprise units associated with the enterprise are grouped together.

Trade values are linked to the VAT unit in the same way as in the previous iteration. However, for complex businesses operating in multiple industries, the trade value for the given VAT unit is apportioned between the associated reporting units. Trade is allocated to the enterprise group via the VAT unit, then apportioned between reporting units using an employment weight for that reporting unit out of the entire VAT unit. The employment weight is adjusted according to a product-industry intensity score, which adjusts the employment weight to minimise irregular product-industry associations. The values associated with these reporting units are then assigned to the associated industry.

In a very small number of cases, matching between the datasets was not possible; in these instances, this trade is not included within the dataset. In 2017, this represented 0.1% of total goods exports and 0.2% of imports. We are continuing to develop methods to allocate these cases of unmatched.

Following matching, data are aggregated for each global region, country, direction of trade, year, commodity and industry. HMRC data, which are on a combined nomenclature (CN) basis, are mapped to the [Standard International Trade Classification \(SITC\)](#) and aggregated to the two-digit level. Industries are also aggregated to the Standard Industrial Classification (SIC) two-digit level.

HMRC trade data are collected on an overseas trade statistics (OTS) basis (the physical movement of goods). Trade figures within the balance of payments (BoP) are based on the change of economic ownership (sometimes goods move across a border but do not change economic ownership, so are not considered to be an export or import in BoP). Adjustments are applied to the data so that they are consistent with the BoP and the wider UK National Accounts. Additional coverage and valuation adjustments are made to ensure estimates are consistent with BoP (more information is available in the How the output is created section). Following this, we attribute countries to regions such as the EU and non-EU, before constraining to currently published estimates.

HMRC data

Data from HMRC are the main data source for trade in goods, making up over 90% of trade in goods value. The ONS has worked closely with HMRC to prepare for the change in collection of customs data that occurred at the end of the EU exit transition period in December 2020. To maintain the quality of the data, we have worked with HMRC to ensure our processes are robust and we only reflect changes in the economic trends. Further information can be found in our [Impact of EU exit on the collection and compilation of UK trade statistics article](#). This change effects data from the 2021 reference period onward.

How the output is created

Subnational trade in services

Data from our Service type by partner country dataset is the starting point for the subnational trade in services output and gives a total trade in services picture that is consistent with the UK National Accounts, and we constrain to these totals.

To regionalise this national data, an apportionment method is used.

We use the [ITIS](#) alongside the Service type by partner country dataset to apportion trade value to the level of the local unit of a business (such as a shop, warehouse or office) from the level of the reporting unit (the comprised entity from which data are collected, often a head office or administrative site).

Data sourced from ITIS cover approximately half of trade value and exclude information on products related to the travel, transport and banking sectors (finance and insurance). ITIS data, which are collected at the reporting unit level, are apportioned to the local level using employment data from the IDBR as a proxy for tradeable activity. We currently use employment as a proxy variable, operating under the assumption that the size of a business and how many employees it has are likely related to the amount of trade the business conducts. This may not be the best assumption to use; however, work is continuing to develop an appropriate methodology.

A proportionate amount of value reported in ITIS, calculated by dividing the number of employees in each local unit by the total number of employees in the whole reporting unit, is allocated to each local unit within the business. Value is then aggregated from each local unit to create totals for each geographic breakdown (international territorial level (ITL) 1, ITL 2, ITL 3 and city region) and each industry breakdown. Data at the local authority level are not sufficiently robust in terms of quality and statistical disclosure; therefore, ITL 3 and city region are the lowest levels of geography at which we can currently estimate.

For trade not covered by ITIS and instead accounted for by other sources, we use similar approaches. Analysis conducted at the national level provides estimates of trade from each industry not sourced from ITIS. It is not possible to allocate this to specific businesses; therefore, it makes use of a proportionate mapping approach to convert values of imports from product categories into industries. More about this methodology can be found in our [UK trade in services by industry, country and commodity: 2016 to 2018](#) article, published 28 February 2020.

Financial trade is first broken down from the national level to ITL 1 level using data sourced from the Bank of England on financial activity. Value is then broken down from ITL 1 level to local level using employment figures from the Business Register and Employment Survey (BRES) as a proxy for trade related business activity. The proportion of employment in financial industries in each local authority is applied to the values of financial imports in each ITL 1 area to break results down from regional to local level.

Exports of services trade related to travel are possible to allocate to industries located in the UK, as it is money spent by visitors to the UK in UK businesses. However, it is not possible to allocate travel imports to specific industries, as it is money spent by UK residents abroad at foreign businesses. This means value is not associated with industries in the UK and we must present travel related service imports as a separate category apart from the standard industries.

For values of imports that are not sourced from the It is or not related to financial products or travel services, we use employment value from the Business Register and Employment Survey (BRES) to break down from a national-level directly to local level for each remaining industry division.

Once service import value is allocated for each industry, including travel, and for each relevant subnational geography, estimates are constrained to match our Service type by partner country dataset. This ensures subnational estimates are consistent with the UK BoP and with other national accounts publications. As a data adjustment technique, constraining forces breakdowns of values to match known totals, meaning that resultant outputs may no longer match their constituent component calculations. However, it means that subnational outputs will be consistent with UK-level figures for each combination of industry and country of origin.

Data for gambling services

There are cases where we have not been able to allocate to a specific region. For 2020, this includes gambling imports. We have therefore created an "unknown region" for services trade to account for these cases.

Subnational trade in goods

The starting point for the Trade in goods subnational dataset is the Trade in goods by industry low level dataset. The trade in goods industry dataset is on a reporting unit basis, which has been produced by linking the HMRC microdata to IDBR. This dataset gives a total trade in goods picture that is consistent with the UK National Accounts and we constrain to these totals.

To produce subnational estimates, the trade in goods industry dataset is linked to IDBR to apportion to local unit level, utilising their postcodes while maintaining the SIC of the reporting unit for consistency with the existing trade in goods by industry publication. We also constrain our estimates to these totals.

The BoP statistics of trade in goods that we compile are derived principally from data provided by HMRC on the physical goods exported from and imported to the UK. However, such data are on a different basis from that required for BoP statistics. To conform to the International Monetary Fund (IMF) definition, we must exclude transactions that do not involve a change in ownership and so we make both positive and negative adjustments as appropriate. Furthermore, since the value required for BoP is the value of goods at the point of export (at the customs border of the exporting country) as opposed to the value as they arrive in the UK (as HMRC measures), estimates of the freight and insurance costs of transporting the goods to the UK are deducted from the values submitted by HMRC.

The basic data are obtained from two different sources. For trade with non-EU countries, and EU exports, the trade statistics unit in HMRC receives detailed customs data for imports and exports of goods. This system is known as Extrastat, with coverage being close to 100% by the end of the month following the month of trade. For EU imports, traders whose annual value of arrivals and/or dispatches that exceeds the given thresholds are required to provide an Intrastat declaration each month, showing full details of their arrivals and dispatches during the month. These thresholds are reviewed annually. The threshold for arrivals has been set at £600,000, to capture a reduced coverage of 95% of trade by value. The threshold for dispatches has been set at £250,000 to maintain coverage at 97%.

Unless otherwise specified, data within this bulletin are in current prices. This means they have not been adjusted to remove the effects of inflation.

Trade asymmetries

These data are our best estimates of bilateral UK trade flows, compiled following internationally agreed standards and using a wide range of robust data sources. However, in some cases, alternative estimates of bilateral trade flows are available from the statistical agencies for the relevant countries or through central databases such as [UN Comtrade](#). Differences between estimates are known as trade asymmetries and are a known aspect of international trade statistics, affecting bilateral estimates across the globe, not just in the UK.

We are heavily engaged in analysis of these asymmetries, developing strong relationships with other countries to understand, explain and potentially reduce them. On a national level, we have published a [series of analyses showing comparisons and the relative strengths of different estimates](#), which users may wish to reference to better understand the quality of our bilateral trade estimates.

Precious metals

In line with international standards, the ONS's trade statistics contain the UK's exports and imports of non-monetary gold.

Because a significant amount of the world's trade in non-monetary gold takes place on the London markets, this trade would have a large impact on the subnational estimates for this region. We therefore allocate non-monetary gold to an "unknown" region to avoid this misrepresentation of London's trade. Data on non-monetary gold and other precious metals are obtained from the Bank of England (BoE), who provide a balanced figure (exports less imports). We attribute the balanced data to either exports or imports, depending on whether the data are positive (exports are greater than imports) or negative (exports are less than imports), respectively. Once received from the BoE, the ONS smooths the precious metals data to ensure individual responses cannot be disclosed.

More information about [the ONS's recording of non-monetary gold](#) is available.

Statistical disclosure control

The [Statistical Disclosure Control Policy](#) sets out the standards for safeguarding the information provided to us in confidence. Disclosure control refers to the methods that reduce the risk that confidential information is published in any official statistics. These methods are applied if ethical, practical or legal considerations require the data to be protected. Disclosure control involves modifying data so that the risk of identifying individuals is reduced, but at the same time attempts to find a balance between improving confidentiality protection and maintaining an acceptable level of quality in the published data.

These modifications mean that some cells will be suppressed to maintain confidentiality.

At lower geographical levels, the likelihood of identifying individuals is increased and so the number of suppressed cells will increase. We have therefore tried to limit the number of suppressed cells by reducing or grouping together industries.

Statistical disclosure control is applied to the subnational trade data before publication. All data used to compile the trade statistics are used in-line with statutory obligations. We follow the rules of the feeder sources. For example:

- HMRC states that the disclosive nature of their data requires them to aggregate potential disclosive data to a higher level of detail so that inference on individual businesses cannot be made
- ITIS explains to their respondents that data are treated with confidentiality under legal requirement (the Statistics of Trade Act) and disclosure rules are applied to the data
- IPS explains to their respondents that the information provided is treated as strictly confidential as directed by the Code of Practice

Regional trade estimates are also published by other government departments such as HMRC, the Scottish Government, the Northern Ireland Statistics and Research Agency (NISRA) and the Welsh Government. These are collected, processed and compiled in different ways and so these departments may be able to publish estimates that are suppressed in our output.

Assessment of user needs and perceptions

In addition to following international guidance, further steps are taken to ensure the subnational trade bulletin is relevant to its users. Regular monthly meetings are held with the devolved administrations, HMRC, the Department for International Trade (DIT) and ONS' subnational statistics division to address any issues with the data, answer questions that users may have and feed in user requirements. This ensures that the output is relevant to wider users and that any issues are brought to our attention.

We regularly receive data requests through our mailbox subnational.trade@ons.gov.uk. These feed into our user requirement and development plan.

To reach a wider audience, subnational trade is part of the ONS economic forum and also holds user events as part of Global Trade and Investment (GTI) division's wider user engagement strategy.

7 . Other information

Our subnational trade statistical bulletins are published on our website.

The subnational outputs from the 2019 reference year meet dataset accessibility requirements.

Commodity-level subnational trade data, prior to the balance of payments (BoP) adjustments, are available from HM Revenue and Customs (HMRC) on their trade statistics website.

Individuals essential for production and publication, quality assurance and operational purposes have access to the data at 9:30am, 24 hours before publication. This is in accordance with the [Code of Practice for Statistics](#).

For information regarding conditions of access to data, please refer to our:

- [Terms and conditions \(for data on the website\)](#)
- [Accessibility statement](#)

General enquiries about subnational trade series, compilation methods, quality information or difficulties finding the latest figures can be emailed to subnational.trade@ons.gov.uk.

In addition to this Quality and Methodology Information report, further information on source datasets can be found in various sections of our UK trade statistical bulletin and on the [UK trade guidance and methodology page](#).