Article

Disaggregating UK annual subnational gross value added (GVA) to lower levels of geography: 1998 to 2020

Introducing the flexible geography project designed to provide statistics for user-defined areas of the UK.

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1 . Main points

- This iteration of experimental gross value added (GVA) estimates has produced data at Lower-Layer Super Output Area (LSOA), Data Zone (DZ) and Super Output Area (SOA) levels.

- Most of the LSOA, DZ and SOA GVA time series show upward trends, but there are distinct changes for some between 2019 and 2020 because of the impact of the coronavirus (COVID-19) pandemic.

- Labour productivity measured as GVA per job filled for travel to work areas (TTWA) was below the UK average in all TTWA within the major urban areas of the north and midlands of England.

- Labour productivity was above the UK average in 73 towns and cities in 2020, 53 of which were in the South East or East of England regions.

These are Experimental Statistics. We advise caution when using the data as the methods are currently under review. Data are in current prices, not constant prices. We do not recommend comparing LSOA, DZ, or SOA data with each other at the individual level. Read more in Section 3 and Section 7.

2 . Overview of experimental gross value added statistics

Gross value added (GVA) is a standard measure of the economic activity taking place in an area. It reflects the value of goods and services produced, less the cost of any inputs used up in that production process.

GVA comprises the majority of gross domestic product (GDP), only excluding taxes and subsidies on products (such as Value Added Tax and duty on fuel or alcohol).

GVA for the UK as a whole is measured by the UK National Accounts and published each year in the annual Blue Book. The GVA is then broken down to individual countries, regions, and local authority districts. These experimental statistics continue the disaggregation of GVA figures to the smallest geographic areas possible, so they can be used as "building blocks" to create any area of interest across the UK.

3 . GVA estimates at lower levels of geography

We first published gross value added (GVA) estimates for lower levels of geography in December 2021 as part of our Disaggregating annual subnational gross value added (GVA) to lower levels of geography: 1998 to 2019 article.

In this release, after addressing the risk of disclosure, we publish data for Lower-layer Super Output Areas (LSOA, England and Wales), Data Zones (DZ, Scotland) and Super Output Areas (SOA, Northern Ireland) for the first time. Previously, these data could only be accessed via the Office for National Statistics' Secure Research Service.

Advantages of publishing GVA estimates at lower levels of geography

Throughout this publication, we refer to LSOA, DZ and SOA data as the "building blocks" of standard geographic areas. Publishing building blocks data means users can map their own geographies for analysis, giving them much greater flexibility. We publish the lookup tables that users need to produce their own geographic areas.

Comparability at lower levels of geography

We discourage comparisons between the data at the most granular level. This is because, at that level, the data are more volatile than for larger geographies.

Some small areas contain mainly (or exclusively) households, and others contain heavy industry. Other areas are predominantly urban or rural. We do not recommend comparing individual LSOA, DZ and SOA data directly. Instead, we advise using the building blocks to build larger geographic areas for analysis. The fewer LSOA, DZ and SOA you use, the lower the accuracy of the estimates.

The LSOA, DZ and SOA geographies are defined differently, which calls for caution when comparing or interpreting the statistics. We do not advise direct comparison across countries. However, the higher-level geographies can be compared.

4 . Impact of the coronavirus (COVID-19) pandemic

The coronavirus (COVID-19) pandemic adversely affected output in 2020. Analysis of the building blocks' gross value added (GVA) time series for the period 1998 to 2020 mostly shows upward trends. There are distinct changes to some time series between 2019 and 2020, reflecting the impact of the coronavirus (COVID-19) pandemic on national output.

The impact varied across UK regions and industries as stated in our Regional economic activity by gross domestic product, UK: 1998 to 2020 bulletin.

The varying impacts of COVID-19 on GVA at Lower-layer Super Output Area (LSOA), Data Zone (DZ) and Super Output Area (SOA) level are partly explained by the variations in the geographical distribution of industries. For example, areas that were dominated by accommodation and food services, and arts, entertainment and recreation activities were more adversely affected by coronavirus than others. This was a result of the measures that were introduced to reduce the spread of the virus, which reduced the industries' economic activities. The measures included temporary closures and travel restrictions.

5 . Using the data

The experimental gross value added estimates consist of two datasets. Each dataset has a lookup table that details how the Lower-layer Super Output Area (LSOA), Data Zones (DZ) and Super Output Area (SOA) data are nested in local authorities, international territorial level (ITL) 1 regions and other geographies.

We show how the building blocks data can be analysed by using two examples. The first example aggregates the building blocks data to travel to work areas (TTWA). The second example aggregates the building blocks to towns and cities.

Gross value added (GVA) estimates for travel to work areas

We use TTWA to illustrate the flexibility of the data we produce. TTWA are useful geographies for exploring labour productivity data as they are built to approximate self-contained labour market areas. They aim to reflect areas where most people both live and work and that have relatively low levels of in- or out-commuting.

Productivity (GVA per job filled) at travel to work area level

Productivity numbers for TTWA are calculated as GVA per job filled (UK gross value added (GVA) and productivity estimates for other geographies, Table 2), and are illustrated in Figure 1. TTWA productivity jobs are calculated by disaggregating local authority productivity jobs using employment data from the Business Register and Employment Survey to LSOA and DZ level. These are then aggregated to create TTWA productivity jobs for Great Britain. Northern Ireland jobs at SOA level are produced in the same way and provided to us by the Northern Ireland Statistical Research Agency.

The building blocks data are also aggregated to TTWA and subsequently GVA per job filled is calculated. The final productivity data are smoothed using a weighted moving average. This is to reduce volatility arising from smaller sample surveys.

Figure 1 shows that labour productivity is below the UK average in all TTWA within the major urban areas of the north and midlands of England.

The most productive TTWA are mainly located on well-connected transport routes in the south of England, in particular motorway and rail routes heading to and from London, with a large town or small city as a focal point.

Figure 1: Gross value added (GVA) per job filled in travel to work areas for the period 2009 to 2020

GVA per job filled estimates for travel to work areas, UK, 2009 to 2020

Download the data

.xlsx

London TTWA had the highest GVA per filled job in 2020, at 43% above the UK average. This was followed by Slough and Heathrow TTWA and Reading TTWA, which were both 35% above the UK average.

Labour productivity was lowest in rural TTWA or those with only small towns in relatively isolated locations, such as coastal areas. The TTWA with the lowest labour productivity were Newton and Welshpool, Bideford, and Brecon, which were 40%, 44% and 46% below the UK average, respectively.

GVA estimates for towns and cities

Towns are the built-up areas, or subdivisions, with a population between 5,000 and 225,000, at the 2011 Census. Cities are built-up areas or subdivisions with a population over 225,000 usual residents. Towns and cities in Scotland are based on localities. In Northern Ireland, they are based on settlements. This publication covers 385 towns and cities.

Productivity (GVA per job filled) for towns and cities

We apply the same approach used to calculate GVA per job filled for travel to work areas to produce GVA per job filled for towns and cities. Towns' productivity data exclude those with a population below 25,000 or where there is not a sufficiently clear best-fit between towns and LSOA, DZ and SOA boundaries.

Figure 2 shows the productivity index of the towns and cities in the UK, grouped by ITL1 regions and countries.

Figure 2: Weybridge in the South East had the highest productivity of towns and cities in the UK, and Harpenden in the East of England the lowest

GVA per job filled for towns and cities in the UK grouped by ITL1 regions and countries, smoothed, 2020, UK average=100

Download the data

Weybridge in the South East had the highest productivity per job filled index (241.5 equivalent to £140,200) in 2020. This was almost five times more than the index for Harpenden in the East of England (52.1, equivalent to £30,200), which was the lowest ranked town.

In 2020, productivity per job filled was above the UK average (£58,100) in 73 towns and cities, 53 of which were located in the South East or East of England regions. Most towns and cities had labour productivity below the UK average in all ITL1 regions and countries. In Wales and Northern Ireland, all towns were in this category.

6 . Data

UK small area gross value added (GVA) estimates
Dataset | Released 24 January 2023
UK small areas GVA estimates for Lower-layer Super Output Areas, Data Zones, and Super Output Areas. Users can create their own bespoke areas using the building blocks data.

UK gross value added (GVA) and productivity estimates for other geographies
Dataset | Released 24 January 2023
The GVA estimates for other geographic areas show the flexibility of building blocks data in mapping non-census geographies.

7 . Data sources and quality

We use 2011 Census geography to create the building blocks. There are data quality issues that users must consider.

Use of current prices

Data in this article are in current prices. If you use the data to calculate growth rates, you must be aware that such growth rates are driven by both volume and prices changes. You can send any queries about the use and interpretation of the statistics to subnational@ons.gov.uk.

Local authority-level GVA statistics

The local authority-level gross value added (GVA) statistics used in this publication were revised in our Regional gross value added (balanced) by industry: local authorities by ITL1 region dataset in May 2022. The lower-level geography GVA estimates are based on these latest figures.

VAT turnover data

The Value Added Tax (VAT) turnover data forming the main basis for apportioning local authority-level GVA was produced using an improved VAT data pipeline in 2022. This creates differences between the 2021 and 2023 figures.

Apportionment of imputed rent

The apportionment of imputed rent to Lower-layer Super Output Area (LSOA), Data Zone (DZ) and Super Output Area (SOA) level is based on median house prices data. Median house prices better reflect the variations in the imputed rent values around the country.

Treating the risk of disclosure in LSOA, DZ and SOA data

The building blocks data have a risk of being disclosive. The risk is associated with enterprise or industry economic dominance in some LSOA, DZ and SOA.

We have taken steps to mask the data to reduce the risk of disclosure. We developed a method to detect and treat data where the building blocks contain a dominant business. The methodology relies on averaging the GVA over other nearby LSOA, DZ and SOA to conceal the dominant enterprise through perturbation, while maintaining the sum total of GVA within any given Middle Super Output Area (MSOA) or equivalent geographies. This helps to ensure that estimates for a bespoke area constructed by users will be unaffected by the disclosure treatment. The disclosure method has led to some spikes in the data at LSOA level, which is why we recommend comparing several LSOAs aggregated together. We do not publish industry-level data because of the higher risk of disclosure in small local areas.

In addition to disclosure control, it should be noted that GVA is an economic construct that is not collected directly from firms. It is estimated by combining several different variables from surveys and administrative data sources. Regional GVA is compiled twice, using independent methods, which are then balanced according to statistical quality measures. Small area estimates are compiled using auxiliary variables to break down higher-level totals and are, therefore, constrained to those totals. Based on the methods used to produce the estimates, deriving precise business enterprise GVA values is not possible.

8 . Future developments

We continue to explore ways of improving the method for apportioning gross value added (GVA) to lower levels of geography. Improved and more standardised apportionment methods will help us to increase the variety of granular statistics that we can produce.

The 2021 consultation process showed that users want us to explore industry disaggregation of GVA. We know that at building blocks level, this will be disclosive. We continue to investigate how we can publish granular industry data without being disclosive.

The consultation also identified additional statistics that users want us to produce. We are currently conducting exploratory work on disaggregating local authority level gross disposable household income (GDHI) to building blocks level. This will be followed by exploration of household final consumption expenditure.

The Office for National Statistics (ONS) continues to update the Subnational indicators explorer (interactive tool) with each iteration, adding more indicators to it.

We encourage users of these statistics to tell us whether the statistics are meeting their needs adequately. If you have any outstanding needs that you would like us to prioritise, please email subnational@ons.gov.uk.

9 . Related links

Regional gross value added (GVA) (balanced) by industry: local authorities by ITL1 region
Dataset | Released 30 May 2022
Annual estimates of balanced UK regional gross value added (GVA(B)). Current price estimates for local authority districts, London boroughs, unitary authorities, and Scottish Council areas, with a detailed industry breakdown.

UK small area gross value added (GVA) estimates
Dataset | Released 13 December 2021
The breaking down of GVA to lower-level geographies represents a significant improvement in granularity. The data are available in the Secure Research Service.

UK gross value added (GVA) and productivity estimates for other geographies
Dataset | Released 13 December 2021
Estimated GVA for other user-specified geographies, for the period 1998 to 2019. Productivity estimates for TTWA and towns and cities for the period 2009 to 2019.

Subnational Indicators Explorer: September 2022
Interactive tool | Released 14 September 2022
Compare a local authority and the UK average (median) local authority by different indicators, such as weekly pay and healthy life expectancy. You can also add and compare up to three additional local authorities.

Employees in the UK: provisional results 2020
Article | Released 29 September 2022
Number of employees in the UK, full-time and part-time, by sector, industry, country and English region from the Business Register and Employment Survey (BRES).

ONS Open Geography portal: Census Lookups
Portal | Last updated 22 July 2022
The ONS Open Geography portal provides free and open access to the definitive source of geographic products, web applications, story maps, services, and APIs. All content is available under the Open Government Licence v3.0, except where otherwise stated.

10 . Cite this article

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