Office for National Statistics

Article

Experimental regional gross fixed capital formation (GFCF) estimates by asset type, UK: 1997 to 2022

Gross fixed capital formation estimates broken down by asset type, international territorial levels and local authority districts.

Contact:
Qamran Hussain and Kris Johannsson
regionalcapital@ons.gov.uk
+441633 455643

Release date:
8 December 2023

Next release:
To be announced

Notice

1 May 2024

This article page was created in error and will not be updated. You can find the latest data and analysis in the Experimental regional gross fixed capital formation (GFCF) estimates by asset type, UK article series and the accompanying dataset.

Table of contents

1 . Main points

- Estimates of regional gross fixed capital formation (GFCF) for buildings and structures now use several new data sources to better reflect the regional breakdown of data sources used in the national accounts.
- Increased asset detail of regional GFCF is available with dwellings, and other buildings and structures separated, as well as geographic detail by local authority district.
- London had more GFCF than any other region from 1997 for other buildings and structures, and from 2009 for dwellings; however, GFCF for other buildings and structures in London has grown at a slower rate over the last 10 years than most other regions.
- Since 2017, the North West has seen the largest growth in GFCF of dwellings in current prices (59%).
- The North East, Northern Ireland, and Yorkshire and The Humber had the largest growth since 2017 in other buildings and structures in current prices (40%).
- We are looking to make further improvements so that we can publish estimates of regional capital in the future.

2 . Analysis

Overview

The Department for Levelling Up, Housing and Communities (DLUHC) White Paper identifies six "capitals" that impact spatial disparity. Gross fixed capital formation (GFCF) captures "physical capital", which includes produced assets such as buildings, machinery, and transport equipment. Some elements of "intangible capital" are also captured within "intellectual property products", which includes "software and databases", "research and development" and "entertainment, literature or artistic originals".

Physical and intangible capital can impact on spatial disparity as they are inputs into the production process and impact upon productivity, which is closely related to living standards.

GFCF measures the flow of capital in a given period of time and this contributes to the stock of capital. Where GFCF exceeds the depreciation and retirement of existing capital, net capital formation will be positive, resulting in an increase in the net capital stock. As well as measuring the value of capital stock, it is possible to measure the flow of capital services, which are more heavily weighted to shorter-lived assets.

Our article Estimates of regional GFCF by asset was first published in May 2022. The Economic Statistics Centre of Excellence (ESCOE) article New Insights on Regional Capital Investment in the UK, 1997 to 2019' provides further analysis of regional capital estimates including an exploration of the relationship between investment, hours worked and gross value added (GVA).

New regional GFCF estimates are available for buildings and structures, which accounted for over half of GFCF (57%) and 79% of net capital stock in 2022. Updated estimates for tangible assets other than buildings and intellectual property products will be published in 2024.

The Eurostat Manual on regional accounts method (PDF, 1.3MB) (2013) provides guidance on how GFCF should be allocated across regions. For buildings and structures this will align to its location, except where there is not significant labour input. An example of structures without significant labour input are offshore wind turbines, and to be consistent with GVA these are allocated to the location of the onshore maintenance base.

Estimates are published in current prices and are therefore not directly comparable across regions, as construction costs are typically higher in some regions: for example, because of differences in labour costs.

This is an experimental release, and we are constantly looking to improve the methods used to produce regional estimates of GFCF.

Dwellings

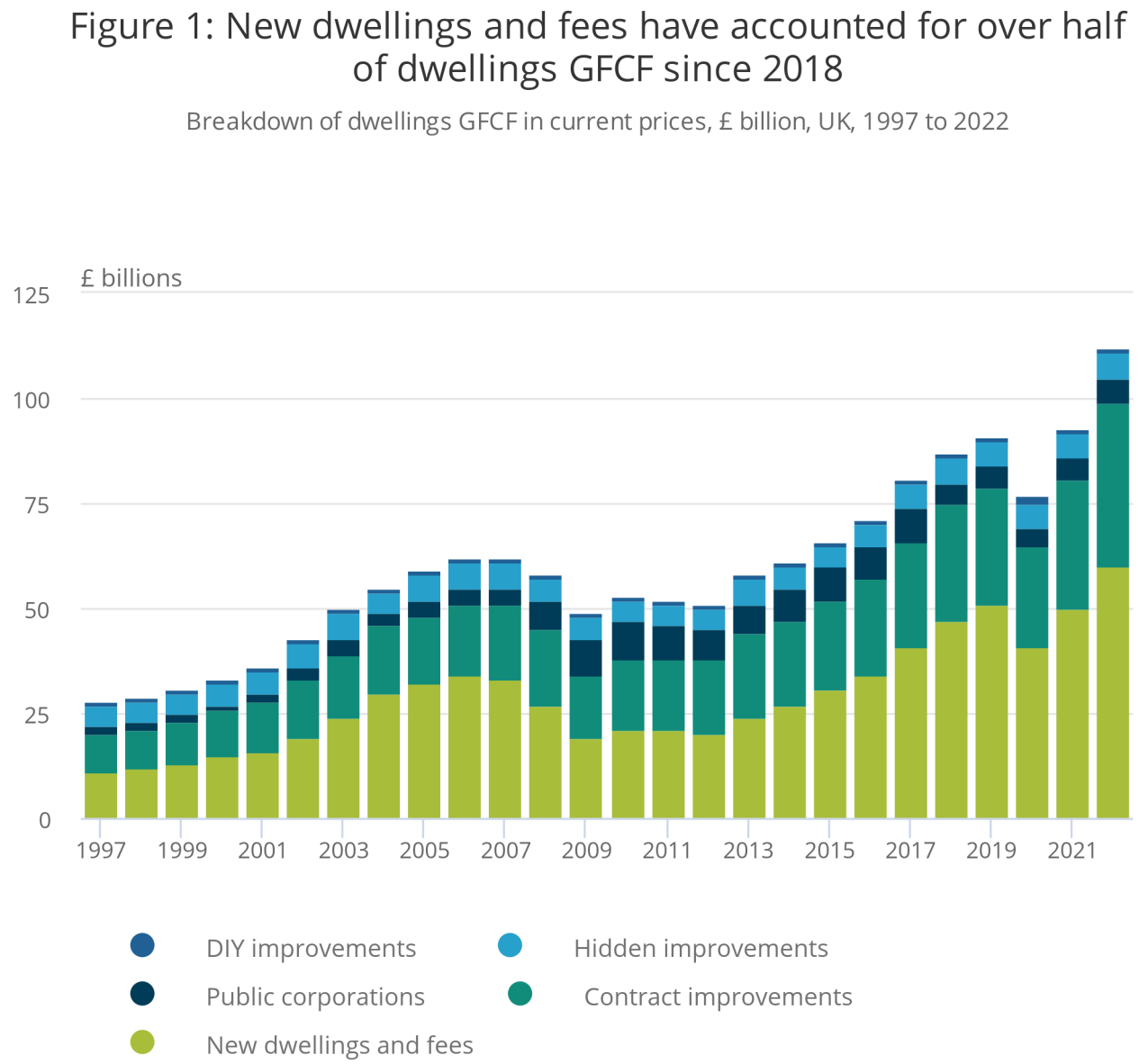
In 2022, "new dwellings and fees" accounted for 53% of GFCF in dwellings, the fifth consecutive year new dwellings were estimated to have contributed over half of investment in dwellings. The Construction Output Survey is used to produce national estimates of GFCF, but as the survey respondents are construction companies it does not capture where the work is done. As with sub-national construction output estimates Barbour ABI new orders data is modelled to "produce regional estimates of capital expenditure from 2010 onwards.

Contract improvements capture improvements to dwellings made by those within the Construction Output Survey sample, which includes construction companies and self-employed workers that are Value Added Tax (VAT) registered. The Construction Output Survey allocates work to the location of the respondent and in most cases it is likely that improvements will be carried out in the same International Territorial Level (ITL1) region as the company is based. Estimates for lower-level geographies assume equal expenditure on contract improvements per dwelling. In future we may want to consider other data sources to better understand factors that might affect regional expenditure on improvements, such as the Living Costs and Food Survey and using lower-level regional data from the Construction Output Survey.

In 2022, both public corporations GFCF and hidden improvements accounted for 6% of GFCF in dwellings. Regional estimates of public corporations GFCF are captured through reported capital expenditure from local authorities. Hidden improvements account for work by the self-employed not within the sample of the construction output survey and use ITL2 estimates of mixed income.

Figure 1: New dwellings and fees have accounted for over half of dwellings GFCF since 2018

Breakdown of dwellings GFCF in current prices, £ billion, UK, 1997 to 2022

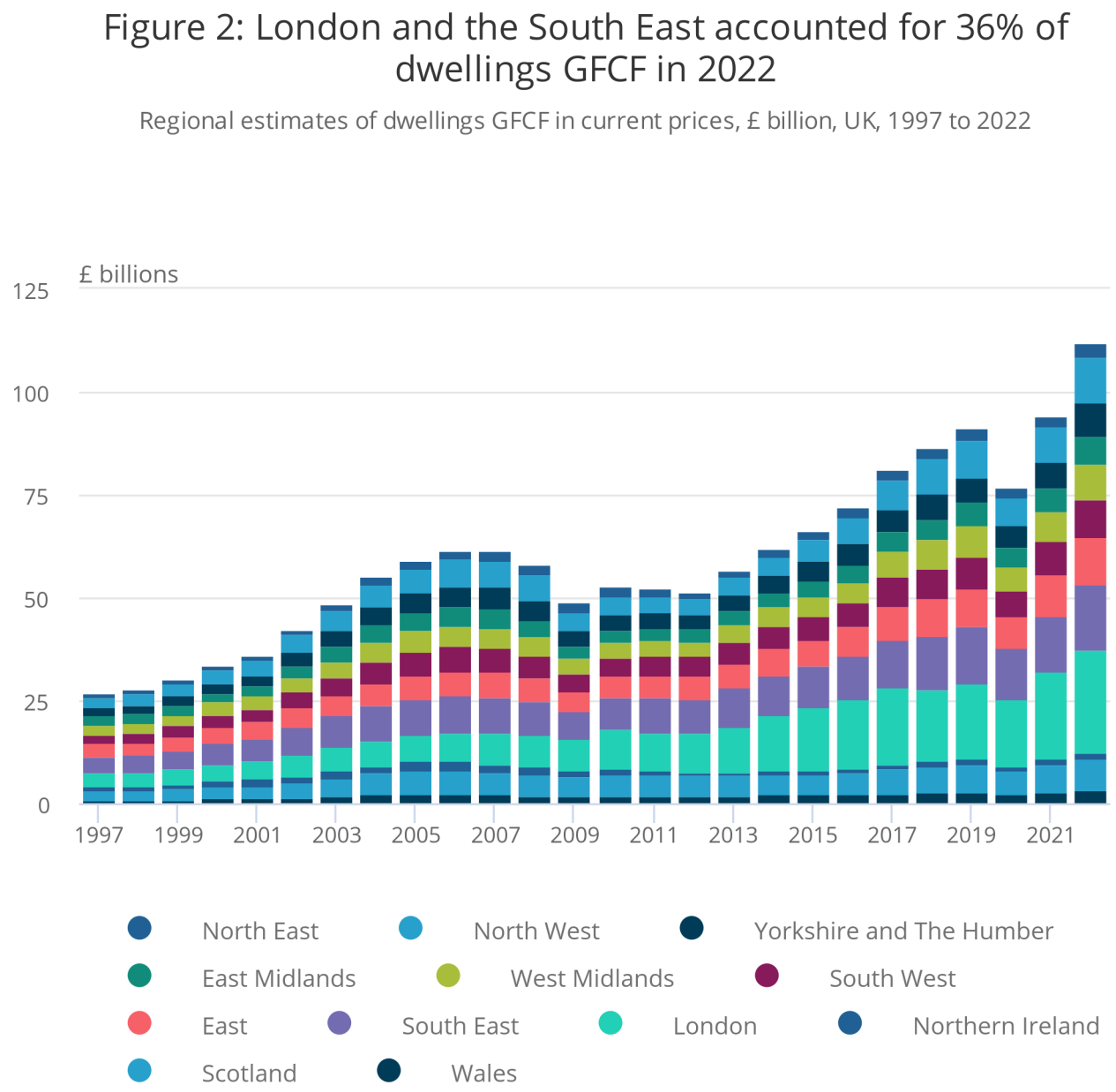


Source: Gross fixed capital formation from the Office for National Statistics

The population of London and the South East is 27% of the UK, which compares with 36% of dwellings GFCF in the UK. The North West has seen the largest increase in investment in dwellings over the last five years, increasing by 59% in current prices from £11 billion.

Figure 2: London and the South East accounted for 36% of dwellings GFCF in 2022

Regional estimates of dwellings GFCF in current prices, £ billion, UK, 1997 to 2022



Source: Gross fixed capital formation from the Office for National Statistics

It is possible to produce regional estimates of capital stocks for dwellings, but we will not publish these until further improvements are made. Producing estimates for net capital stocks for assets with a long asset life is very challenging as this relies on accurate estimates of investment and price indices for a long period of time. Furthermore, it is necessary for retirement and depreciation profiles to reflect reality, with limited empirical evidence.

The data and coding are available so that users can see what regional capital estimates can be derived from regional GFCF estimates and assumptions used to calculate capital stocks. As regional deflators are not available, this uses national deflators, which means that price differences between regions are not captured.

The longer a dwelling has been in the net capital stock, the more challenging it is to accurately capture the building's value as this measurement requires correctly capturing the original GFCF, construction price changes, depreciation, retirement, and improvements that extend the assets life. By contrast, a new dwelling only needs the correct estimation of capital expenditure.

Currently around 45% of net capital stock can be attributed to new dwellings from 1997 onwards, when this reflects around a fifth of the housing stock. This suggests that the value of dwellings built before 1997 are much lower and warrants further investigation.

Other buildings and structures

New other buildings and structures not covered in other categories represented 49% of GFCF in 2022. UK estimates of GFCF use the Quarterly Acquisitions and Disposals of Capital Assets Survey (QCAS) to capture private sector capital expenditure on buildings and structures, with total estimates of GFCF benchmarked to the Annual Business Survey. The survey does not ask respondents to break down expenditure on new and existing buildings and structures, so the construction output estimates are used to calculate a breakdown between new work and major improvements.

As with dwellings new orders, Barbour ABI data are used to produce regional estimates of GFCF for new other buildings and structures by modelling expenditure across the timescale of each project. To account for capital expenditure related to the oil and gas industry, currently we assume that Extra-Regio capital expenditure (for those parts of the national economic territory not directly part of a single region) is in line with regional gross value added in the mining and quarrying industry. We will look to investigate new data sources on the geographic breakdown of capital expenditure in the mining and quarrying industry in the future.

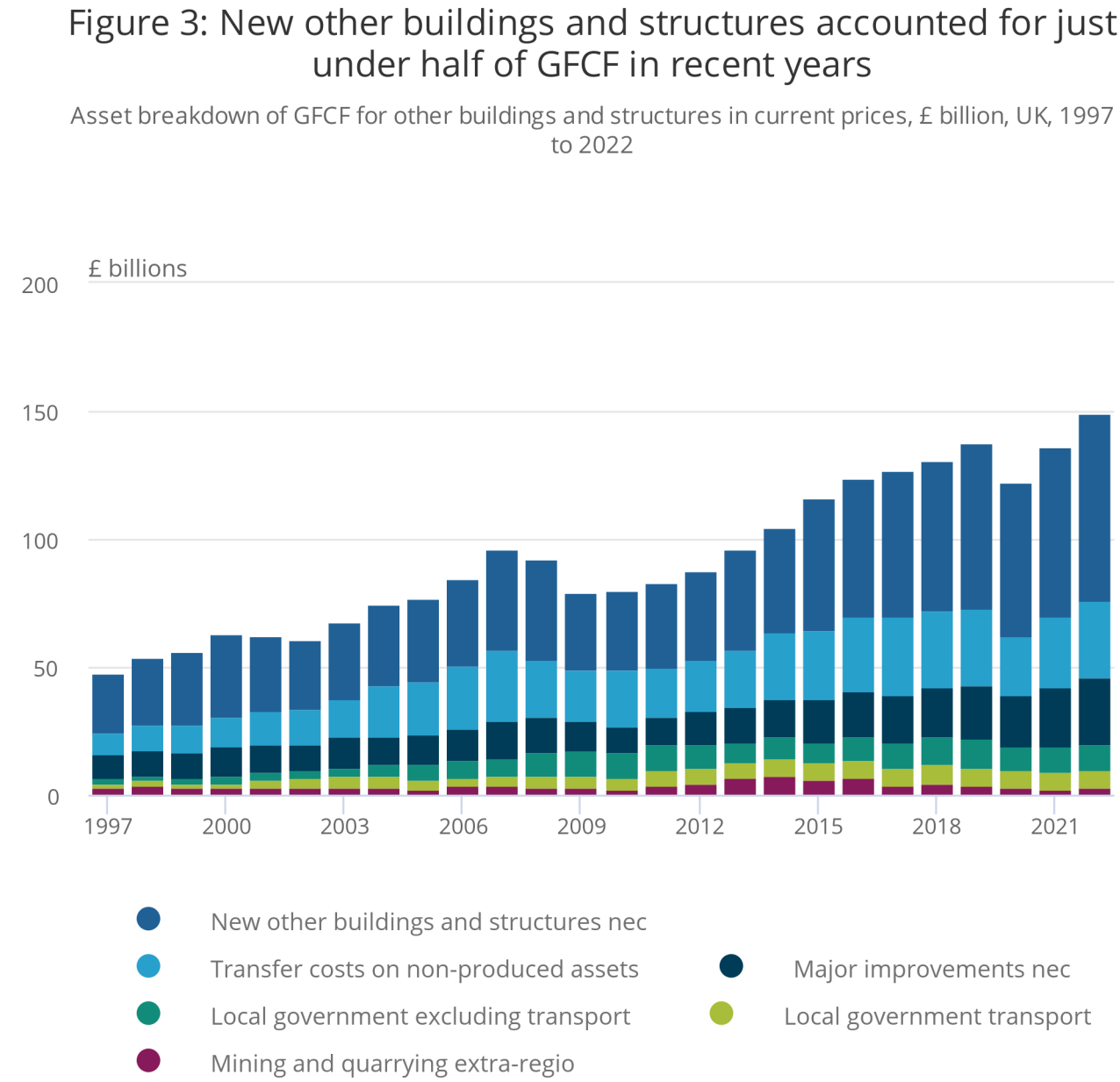
Transfer costs associated with the transfer of non-produced assets are allocated to land improvements in line with the System of National Accounts (2008) (PDF, 9.3MB) and these include those related to both dwellings, and other buildings and structures. Stamp Duty is allocated to regions using regional HM Revenue and Customs (HMRC) Stamp Duty receipts data, and professional fees, such as conveyancing and estate agents' fees, use HM Land Revenue price paid data to calculate regional estimates consistently with national accounts.

Major improvements account for 18% of GFCF in 2022 and are estimated using the Construction Output Survey at International Territorial Level 1 (ITL1). Valuation Office Agency data on floorspace are used to produce estimates for lower-level geographies for England. As with contract improvements we will look to explore the possibility of using data to identify where the capital expenditure takes place using the Annual Business Survey rather than assuming the construction firm is working in the same region as it is located.

Local government regional estimates use published data on local government capital expenditure, which represented 12% of GFCF in 2022.

Figure 3: New other buildings and structures accounted for just under half of GFCF in recent years

Asset breakdown of GFCF for other buildings and structures in current prices, £ billion, UK, 1997 to 2022

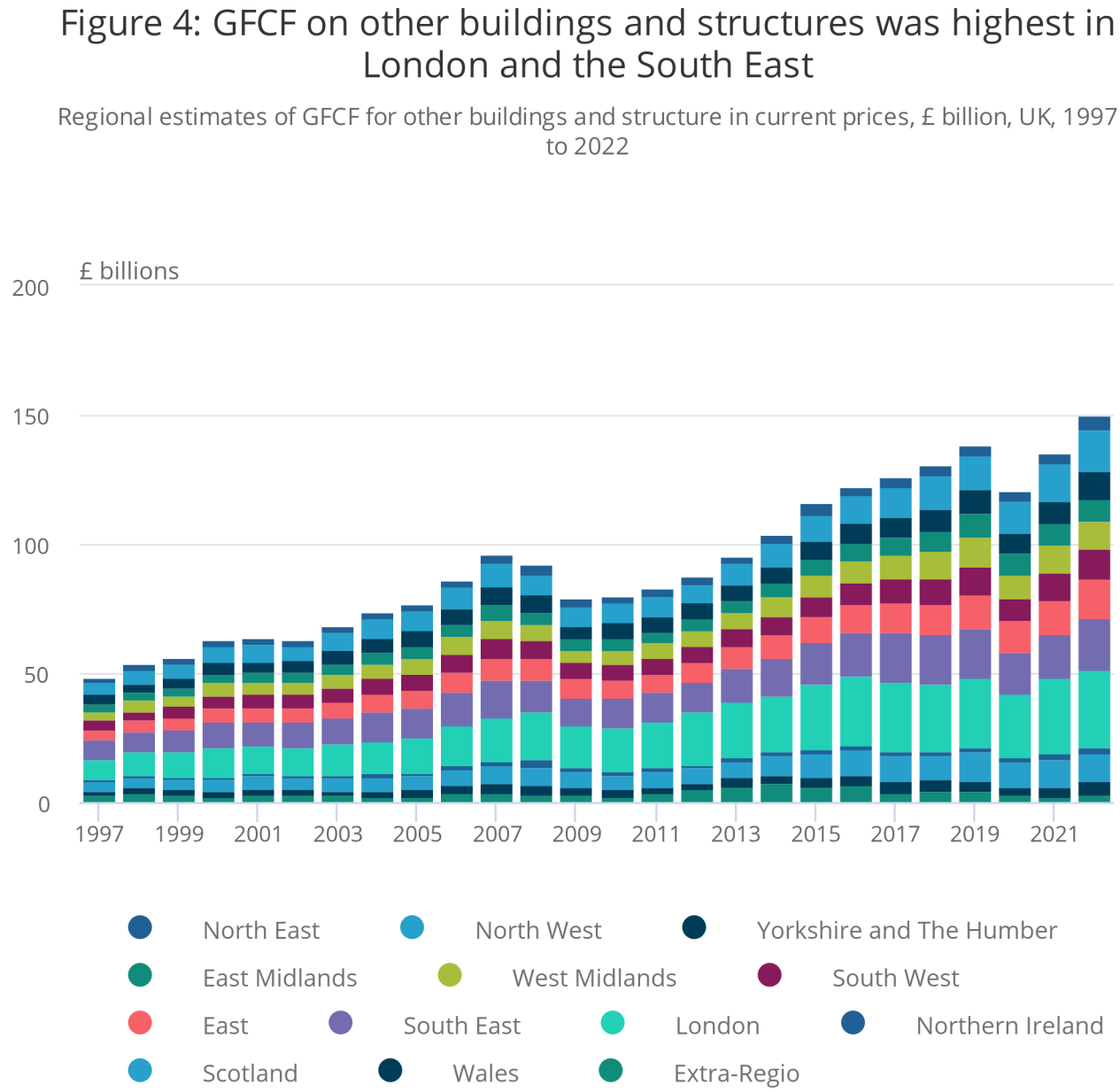


Source: Gross fixed capital formation from the Office for National Statistics

In 2022, London and the South East accounted for one-third of GFCF in other buildings and structures, which has fallen from 37% in 2012. Since 2017, the North East, Northern Ireland, and Yorkshire and The Humber have seen the fastest growth in GFCF for other buildings and structures in current prices (40% increase).

Figure 4: GFCF on other buildings and structures was highest in London and the South East

Regional estimates of GFCF for other buildings and structure in current prices, £ billion, UK, 1997 to 2022



Source: Gross fixed capital formation from the Office for National Statistics

GFCF in other buildings and structures varies within ITL1 regions as well as between different regions. Estimates of investment in other buildings and structures (this excludes transfer costs on non-produced assets) per hours worked shows the flow of investment compared with labour inputs.

Figure 5: Investment per hours worked varies considerably within ITL1 regions

Annual investment per hours worked by local authority, UK, 2010 to 2021

Downloac

Only transfer costs for non-produced assets have the necessary detail available to produce capital estimates from GFCF from 1997 to 2022. Further work is required to estimate GFCF with more granular detail to reflect differences in depreciation profiles and price changes.

Methods improvements

"Buildings and structures" estimates are now broken down into "dwellings" and "other buildings and structures". Regional data sources are used to reflect the data sources used in the national accounts to produce UK estimates of GFCF.

There are now estimates down to local authority districts in the most recent years, as well as for International Territorial Levels (ITLs).

Improvements include the use of additional data sources:

- Construction Output Survey data on major improvements for other buildings and structures
- Local authority capital expenditure data
- HMRC regional estimates for Stamp Duty
- HM Land Registry price paid data used for professional fees related to the transfer costs on non-produced assets
- Regional construction industry mixed income estimates are used to produce regional estimates of capital expenditure for work done by the self-employed that are not VAT registered

New buildings and structures accounts for 52% of GFCF for buildings and structures in 2022. This continues to use Barbour ABI data on new construction orders, which provides details on project values, location and timescales. We have also made improvements in the use of Barbour ABI data in regional GFCF estimates, for instance, accounting for changes made to new construction projects worth over £50 million.

A full breakdown of data sources used can be found in the Regional GFCF Quality and Methodology Information (QMI), or in the "Asset and data sources" worksheet of the regional GFCF dataset.

Revisions

Regional GFCF estimate are benchmarked to national accounts estimates included in the latest Blue Book. Further details on the revisions to UK estimates of GFCF in Blue Book 2023 can be found in the Business investment bulletin.

The region with the largest upward revisions to GFCF in buildings and structures is Extra-Regio, which now accounts for a substantial amount of investment in the "mining and quarrying" industry relating to the North Sea.

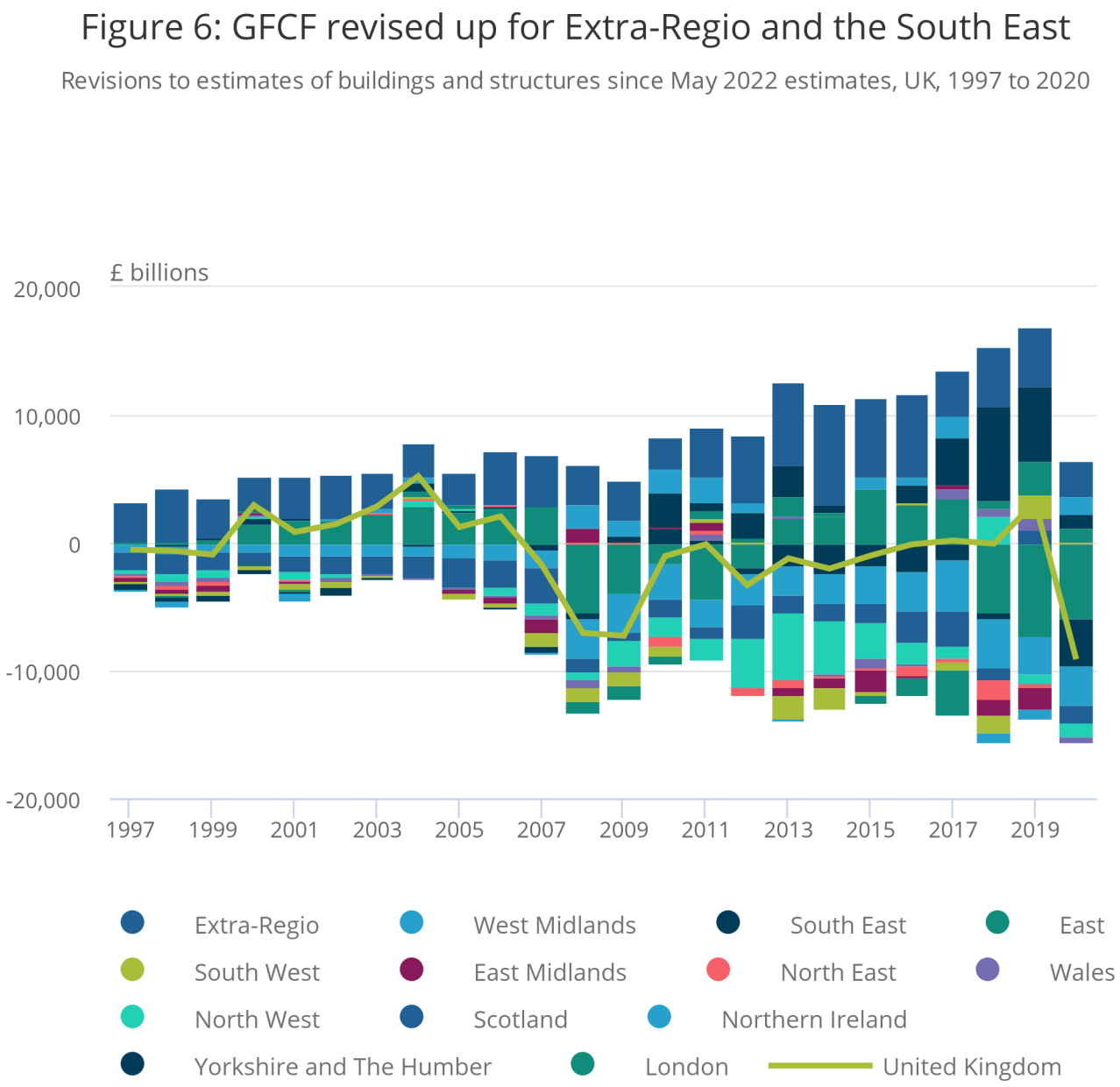
GFCF in the South-East has been revised up from 2008, which reflects using new data sources for major improvements to other buildings and structures, and transfer costs for non-produced assets.

Estimates for Northern Ireland have been revised downwards, with Northern Ireland construction output data used to benchmark estimates of buildings and structures. This has reduced the differences between ONS regional estimates of GFCF and Northern Ireland Statistics and Research Agency's (NISRA's) GFCF estimates in the Northern Ireland Supply Use Tables.

Estimates of GFCF for buildings and structures for London are less volatile than previous estimates and this can be seen with upward revisions in some periods and downward revisions in other periods. This is as a result of improvements made to measuring new buildings and structures, which are now more closely aligned to sub-national construction output estimates.

Figure 6: GFCF revised up for Extra-Regio and the South East

Revisions to estimates of buildings and structures since May 2022 estimates, UK, 1997 to 2020



Source: Gross fixed capital formation from the Office for National Statistics

3 . Regional gross fixed capital formation data

Experimental regional gross fixed capital formation (GFCF) estimates by asset type, UK
Dataset | Released 8 December 2023
Experimental regional gross fixed capital formation (GFCF) split by asset type, 1997 to 2022. Estimates of regional capital for "buildings and structures" are broken down by asset detail from International Territorial Level (ITL) regions 1 to 3 and by local authority districts.

A dataset containing inputs used to produce capital estimates are available, as well as the coding that calculates estimates of capital from the relevant inputs: for dwellings, local government transport infrastructure and non-produced assets.

4 . Data sources and quality

Further details about the data sources used, strengths and limitations can be found in the Regional GFCF QMI.

5 . Future developments

Estimates of regional gross fixed capital formation for "buildings and structures" (GFCF) will be published on an annual basis in the future. We are working on new regional estimates of tangible assets other than buildings and structures using asset-specific data sources and updated regional estimates of intellectual property products in 2024.

We are also exploring the possibility of producing some experimental regional deflators for buildings and structures to enable the production of constant price estimates and chained volume measures of GFCF.

An industry breakdown of regional estimates was published in the last release, however, this did not accurately reflect industrial differences between regions. We will look to reintroduce industry breakdowns in the future.

We are constantly looking to improve regional estimates of GFCF and are keen to hear from users to understand what future developments they would like to see.

6 . Related links

Capital stocks and fixed capital consumption, UK: 2022
Bulletin | Released 8 December 2023
Annual estimates of the value and types of non-financial assets used in the production of goods or services within the UK economy and their loss in value over time.

Regional gross fixed capital formation QMI
Methodology | Last revised 8 December 2023
Quality and methodology information for regional gross fixed capital formation, with strengths and limitations of the data, methods used, and data uses and users.

7 . Cite this article

Office for National Statistics (ONS), released 8 December 2023, ONS website, article, Experimental regional gross fixed capital formation (GFCF) estimates by asset type, UK: 1997 to 2022