

Statistical bulletin

# Investment in intangible assets in the UK: 2021

Estimates of investment, both purchased and own account production, of intangible assets, and developmental estimates of investment in intangible assets by industry. These are official statistics in development.

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## Table of contents

1. [Main points](#)
2. [Total investment in intangible assets in the UK in 2021](#)
3. [Investment by asset in 2021](#)
4. [Investment by industry in 2021](#)
5. [Investment in intangible assets data](#)
6. [Glossary](#)
7. [Measuring the data](#)
8. [Strengths and limitations](#)
9. [Future developments](#)
10. [Related links](#)
11. [Cite this statistical bulletin](#)

# 1 . Main points

- Investment in intangible assets was £185.5 billion in 2021, £28.5 billion higher than investment in tangible assets, such as machinery and buildings, in the same period.
- Investment in intangible assets grew £9.4 billion in 2021, following a fall in investment during the coronavirus (COVID-19) pandemic-affected 2020.
- The largest capitalised intangible asset in 2021 was own account software, accounting for £25.9 billion of investment.
- The largest uncapitalised intangible asset in 2021 was firm-specific training, accounting for £34.7 billion of investment.
- The manufacturing industry was the biggest investor in intangible assets in 2021 with most of this investment (47.6%) going to research and development (R&D).
- The largest positive change in investment in 2021 was in purchased branding, which rose by £2.7 billion (14.7%), while the largest fall in investment was in own account design, which fell by £0.4 billion (9.3%).

## 2 . Total investment in intangible assets in the UK in 2021

Intangible assets include products such as software and databases, research and development (R&D), mineral exploration, and artistic originals, as recorded in the UK National Accounts (capitalised). These are collectively referred to as intellectual property products (IPP). However, there is an additional set of intangible assets, such as branding, financial product innovation, firm-specific training, and design, that are not included in the UK National Accounts. These are referred to as “uncapitalised intangible assets.” This bulletin discusses both capitalised and uncapitalised intangibles.

Investment in intangible assets increased by 5.3% to £185.5 billion in 2021. This was the largest annual percentage increase since 2017 (5.8%). This follows a 1.0% fall in 2020, as the coronavirus (COVID-19) pandemic affected UK businesses’ investment opportunities.

Meanwhile, investment in tangible assets increased by 6.5% to £157.1 billion in 2021, following a sharp 12.1% fall in pandemic-affected 2020.

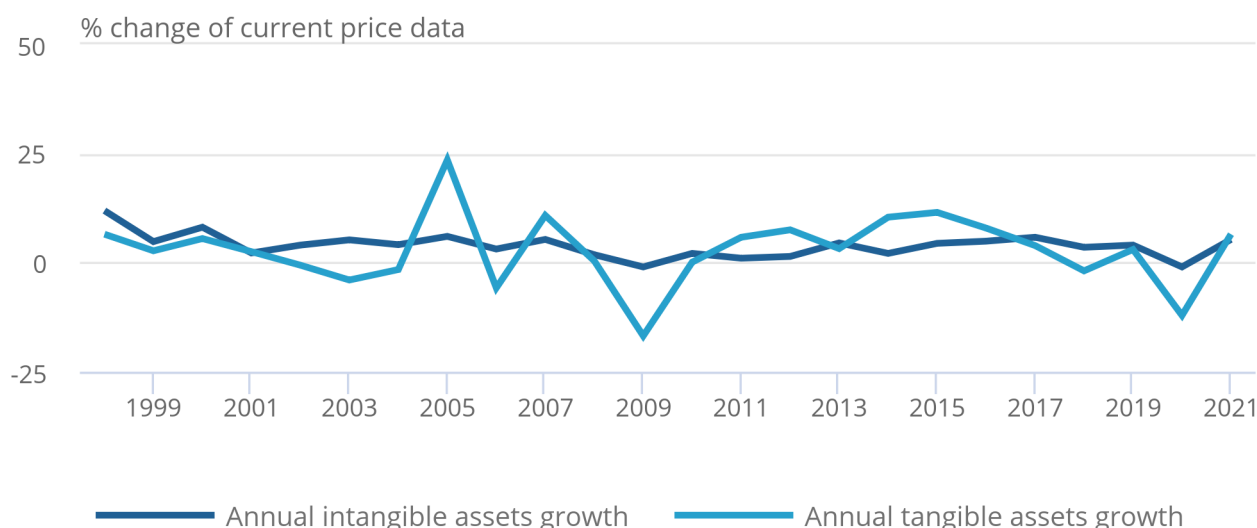
The 6.5% increase seen in investment in tangible assets represented the first time since 2016 that tangible investment grew at a faster rate than investment in intangible assets (Figure 1).

### Figure 1: The annual percentage growth of investment in intangible assets is less volatile compared with tangible assets

Annual percentage growth of investment in intangible assets compared with the annual percentage growth of investment in tangible assets, UK, 1998 to 2021, current prices

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Annual percentage growth of investment in intangible assets compared with the annual percentage growth of investment in tangible assets, UK, 1998 to 2021, current prices



Source: Investment in intangible assets in the UK from the Office for National Statistics

Investment in intangible assets is less vulnerable to economic shocks compared with that in tangible assets throughout the period examined in our data, 1997 to 2021 (Figure 2). However, with the addition of 2021 investment data, we can now see that the pandemic appears to have delivered a short-term reduction in UK expenditure on both tangible and intangible assets in 2020 with investment in both asset types falling for the first time since 2009, when the global financial crisis affected UK investment, before recovering in 2021.

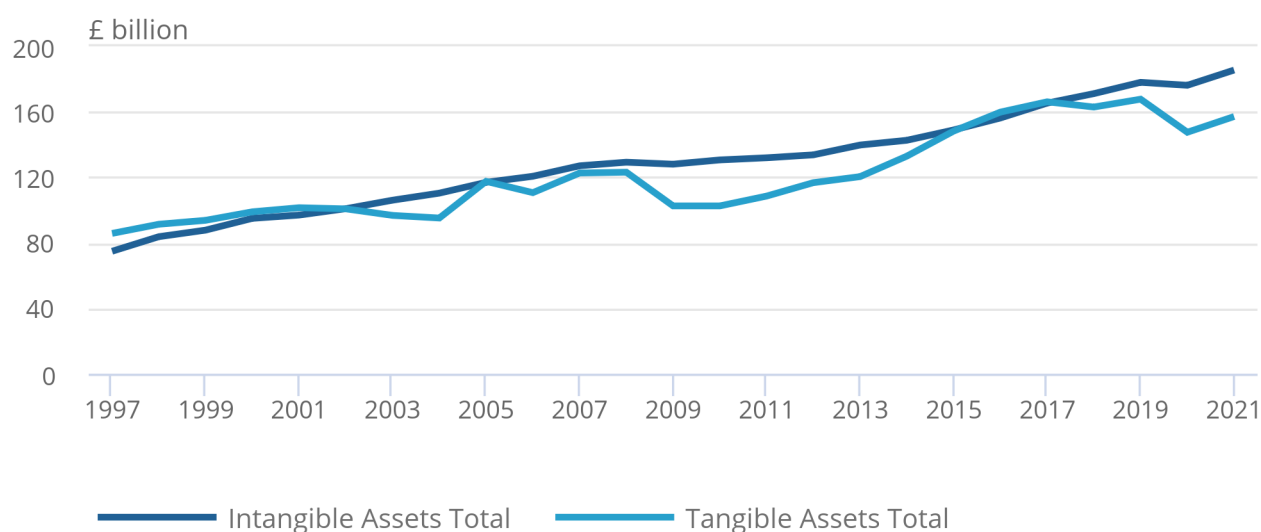
The 2021 data highlight a reversal of the restricted investment undertaken in the previous year, with both tangible (6.5%) and intangible (5.3%) assets seeing the largest annual increase in investment since 2016 and 2017, respectively.

## Figure 2: Intangible investment continued to be higher than tangible investment in 2021

Total investment in intangible assets (purchased and own production) compared with the total investment in tangible assets, UK, 1997 to 2021, £ billion, current prices

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Total investment in intangible assets (purchased and own production) compared with the total investment in tangible assets, UK, 1997 to 2021, £ billion, current prices



Source: Investment in intangible assets in the UK from the Office for National Statistics

When disaggregating intangible assets, we see similar investment behaviour between capitalised intellectual property products (IPP) and uncapitalised intangible assets in 2021, when compared with the previous year (Figure 3).

Investment in capitalised intangible assets included in the UK National Accounts (IPP) grew by 4.7% annually, and investment in uncapitalised intangibles grew by 5.7%.

Within capitalised intangible assets, except for own account software, all asset types saw an annual increase in investment in 2021, including a £1.8 billion increase in purchased software (13.7%). Overall, capitalised investment increased by £3.4 billion.

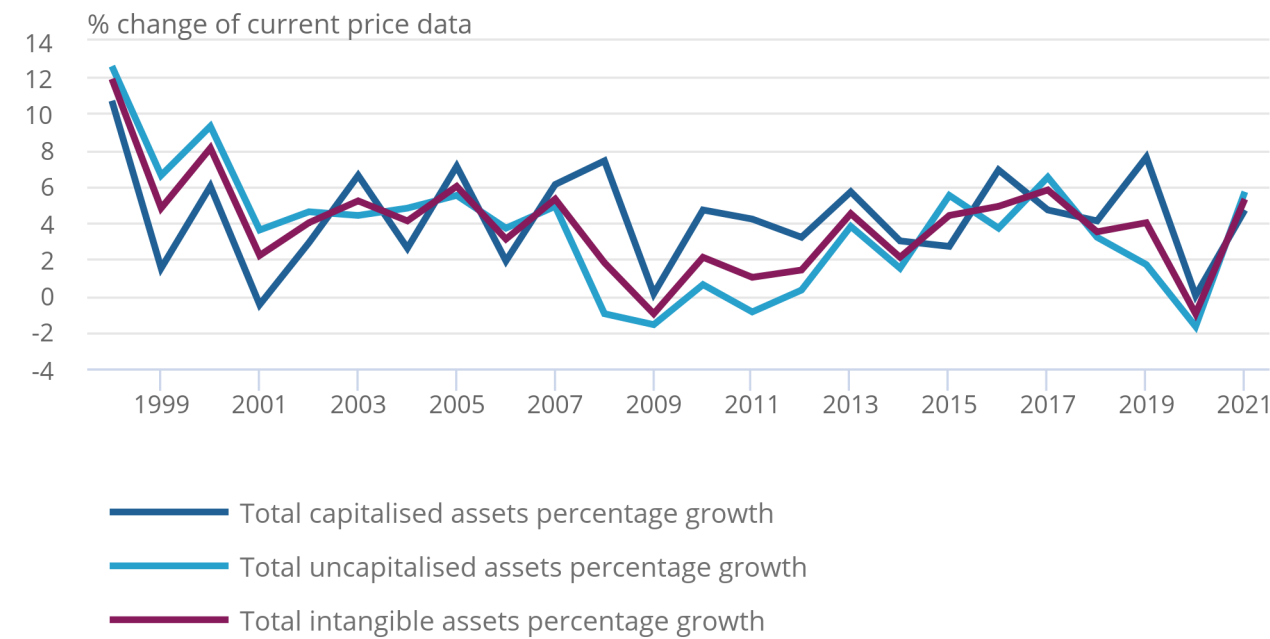
Investment in uncapitalised intangible assets showed falls in three areas in 2021: own account organisational capital, own account design and own account branding. However, these decreases in investment were more than offset by strong investment in other areas including purchased branding (£2.7 billion) and firm-specific training (£2.4 billion), leading to an overall increase in uncapitalised investment of £6.0 billion.

Figure 3: Capitalised and uncapitalised intangible investment increased in 2021

Annual percentage growth of investment in capitalised and uncapitalised intangible assets, UK, 1998 to 2021

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Annual percentage growth of investment in capitalised and uncapitalised intangible assets, UK, 1998 to 2021



Source: Investment in intangible assets in the UK from the Office for National Statistics

### 3 . Investment by asset in 2021

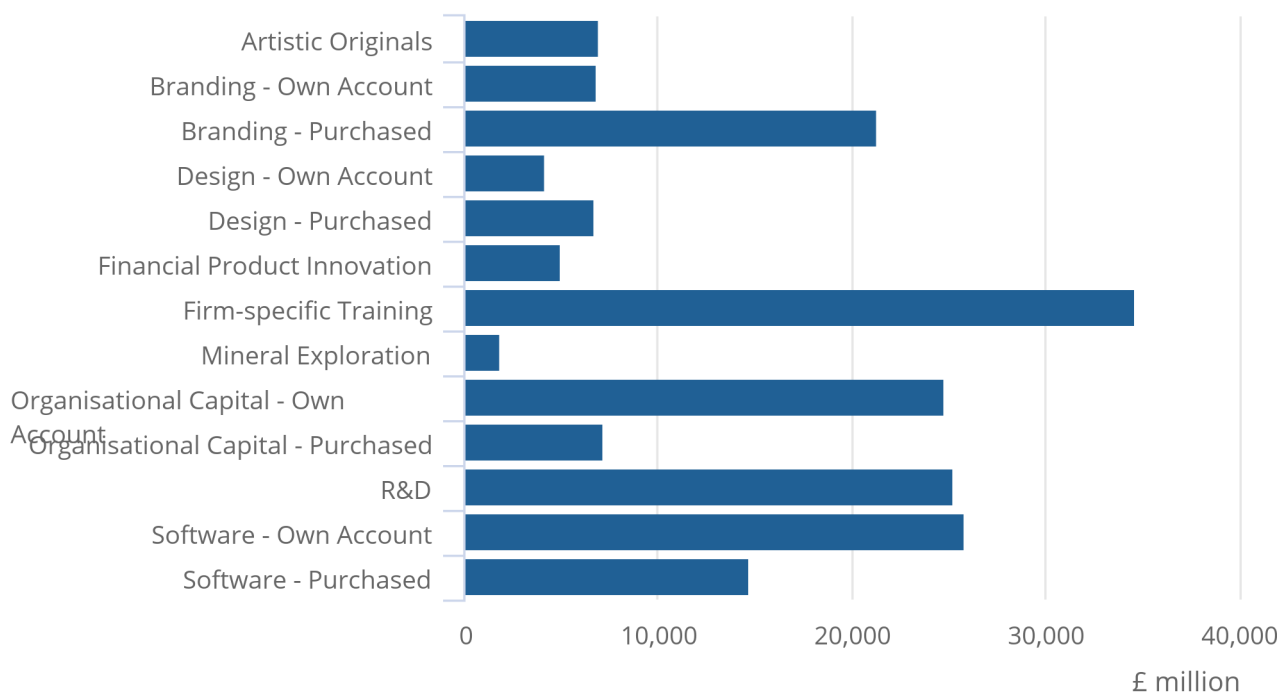
Figure 4 shows the level of intangible investment by asset in 2021.

**Figure 4: Intangible investment was largest in training, own account software, and research and development in 2021**

Intangible investment by asset, current price, £ million, UK, 2021

Figure 4: Intangible investment was largest in training, own account software, and research and development in 2021

Intangible investment by asset, current price, £ million, UK, 2021



Source: Investment in intangible assets in the UK from the Office for National Statistics

#### Entertainment, literary and artistic originals

The film, television programming and broadcasting industry invested the most in entertainment, literary and artistic originals in 2021, with £5.2 billion invested. Of the three industries with investment in this area, the arts and entertainment industry invested the least (£0.4 billion).

#### Mineral exploration

Investment in mineral exploration saw an 80.9% annual growth in 2021, to reach £1.9 billion, which is the highest value of mineral exploration seen across the data time series (1997 to 2021). Although mineral exploration has generally followed a cyclical growth cycle, we have now seen three years of consecutive growth.

## Research and development (R&D)

The highest investment in R&D in 2021, £5.4 billion, was by the manufacture of motor vehicles, trailers and semi-trailers industry. The manufacture of basic pharmaceutical products and pharmaceutical preparations was the second-highest investing industry at £3.9 billion. This was also the industry with the highest annual increase in investment in R&D in 2021 of £0.2 billion (5.9%).

## Total computer software and databases

Software and databases (purchased and own account combined), remained the largest area for intangible asset investment (£40.6 billion) in 2021, a position it has held since 2018.

## Purchased computer software and databases

Across all industries, investment in purchased computer software and databases reached a record £14.8 billion in 2021. The highest investment in purchased computer software and databases in 2021 was £1.9 billion by the wholesale trade industry, followed by the telecommunications industry with investment totalling £1.7 billion.

## Own account computer software and databases

Total investment in own account computer software and databases fell £0.4 billion annually to £25.9 billion in 2021, reflecting lower investment across several industries.

Offsetting the increased investment it made in purchased computer software and databases, the telecommunications industry saw the largest year-on-year drop in 2021 in investment in own account computer software and databases of £0.3 billion. Only one industry, publishing activities, increased its annual investment by more than £0.1 billion.

## Total branding

The largest annual increase in investment in 2021 was seen in branding (both purchased and own account), which increased by £2.7 billion (10.6%), to reach a record £28.1 billion.

## Purchased branding

Purchased branding investment also rose £2.7 billion in 2021 in comparison with 2020. Two-thirds of this increased investment came from retail trade, with the industry's investment increasing 52.2% on the year to reach £5.3 billion. This could be in response to pent-up consumer demand from the coronavirus (COVID-19) pandemic in 2020, with retail businesses investing more in advertising to capture this perceived delayed demand.

Conversely, the largest annual fall in investment in purchased branding was in computer programming and information service activities, declining £0.5 billion in 2021, when compared with 2020.

## Own account branding

Total investment in own account branding, where a business develops its own branding assets, showed almost no change in 2021 compared with 2020, remaining at £6.8 billion.

The wholesale trade industry remained the largest investor in this asset, increasing its investment to £1.2 billion from £1.1 billion in 2020.

## Total design

Investment in design (purchased and own account combined) saw a modest increase of £0.1 billion (1.2%) in 2021 when compared with the previous year.

## Purchased design

Investment in purchased design rose £0.6 billion (9.0%) in 2021. The construction industry remained the largest investor in this asset (£2.6 billion). Construction invested nearly four times more in purchased design than the next-highest industry, mining and support services (£0.7 billion).

The largest increase in investment in 2021 came from the land transport industry (£0.2 billion).

## Own account design

Own account design saw a £0.4 billion (9.3%) drop in investment in 2021. This was the largest fall in investment since 2011 (£0.6 billion, 15.1%).

In the latest year, four industries saw drops in investment of over £0.1 billion: manufacturers of computer, electronic and optical products; manufacturers of machinery and equipment not elsewhere classified (n.e.c.); manufacturers of other transport equipment; and telecommunications.

## Total organisational capital

Investment in organisational capital (purchased and own account combined) increased by £0.5 billion (1.4%) in 2021 to £32.1 billion.

## Purchased organisational capital

Investment in purchased organisational capital in 2021 was £7.2 billion, a £0.5 billion (7.9%) increase on 2020. Despite a small fall in investment in 2021 (£0.1 billion), the financial service activities industry remained the largest investor in this asset (£2.4 billion). It invested over twice as much in purchased organisational capital than the next-highest industry, computer programming and information service activities (£0.9 billion).

## Own account organisational capital

The continued high levels of investment in the latest year in own account organisational capital indicate that businesses continue to make intensive use of technologies already available to them to address the operational challenges presented by the pandemic in 2020 and 2021.

The wholesale trade industry became the largest investor in this asset in 2021 with an annual increase of £0.5 billion (28.2%) to reach investment of £2.5 billion, replacing financial service activities (£2.4 billion). Financial service activities had previously been the highest investor in own account organisational capital from 1997, when our records begin, to 2020.

## Financial product innovation (FPI)

Investment in FPI in 2021 showed a £0.3 billion (7.6%) increase, extending the growth in FPI investment seen since 2016.

The financial service activities industry is the largest investor in FPI, providing over 60% of the total investment seen (£3.0 billion) in 2021. It saw a £0.3 billion increase in investment in the latest year while insurance, reinsurance and pension funding saw a £0.1 billion increase compared with the previous year. Meanwhile, the activities auxiliary to financial services and insurance activities industry saw a fall in investment in FPI (£0.1 billion).

## Training

Following the inclusion of updated Employer Skills Survey data, from the Department for Education, firm-specific training is now the highest individual investment asset at £34.7 billion. Training saw a decline in investment in 2019 and 2020, with the latter likely to have been affected by the pandemic. However, as the UK adapted to new ways of delivering training, such as via virtual platforms, firm-specific training in 2021 reached a level not seen since 2017, when it stood at £35.4 billion.



## 4 . Investment by industry in 2021

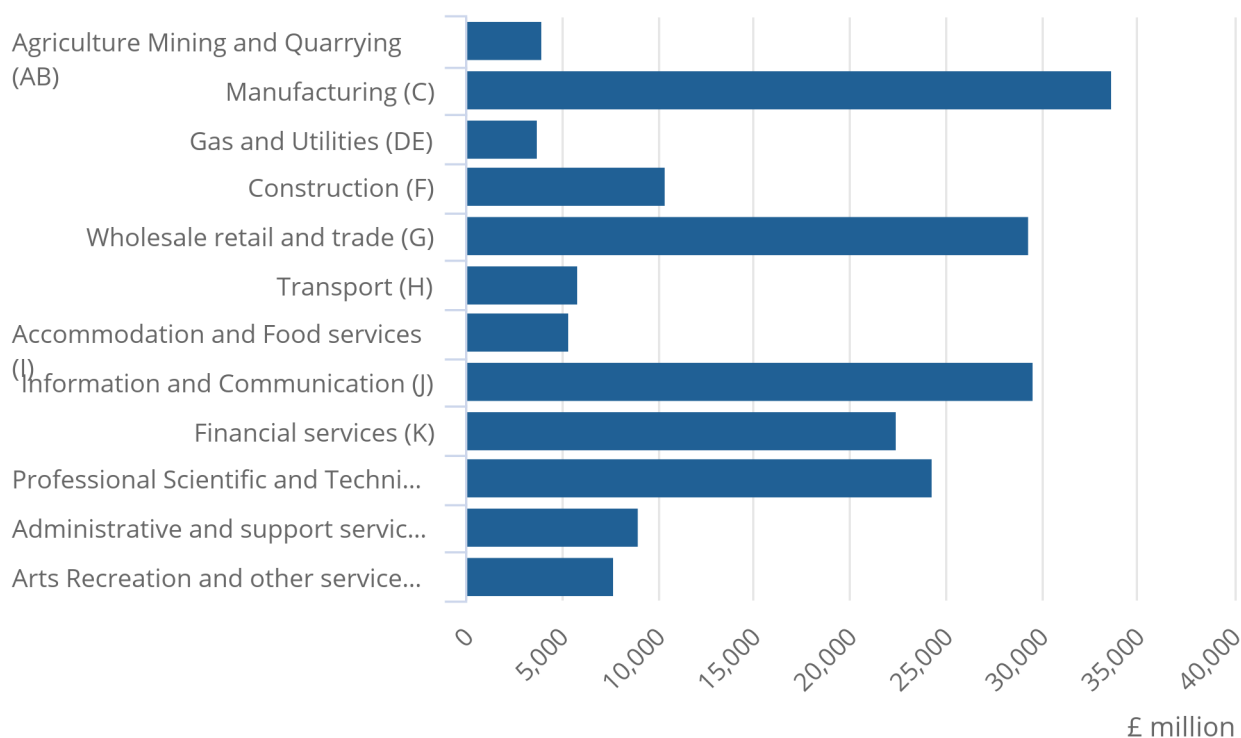
The manufacturing industry led investment in intangible assets in 2021, investing £33.7 billion, followed by the information and communication industry at £29.6 billion, and the wholesale, retail and trade industry at £29.3 billion.

**Figure 5: Manufacturing, information and communication, and wholesale, retail and trade were the largest investing industries in intangibles in 2021**

Intangible investment by industry, current prices, £ million, 2021

Figure 5: Manufacturing, information and communication, and wholesale, retail and trade were the largest investing industries in intangibles in 2021

Intangible investment by industry, current prices, £ million, 2021



Source: Investment in intangible assets in the UK from the Office for National Statistics

In 2021, 47.6% of the intangible assets investment by the largest investing industry, manufacturing, was in research and development (R&D). Manufacturers also invested strongly in a broad base of other intangible assets including total software and databases, total branding, total organisational capital and firm-specific training. Investment in each of these exceeded £3.0 billion in 2021.

Similarly, investment in the information and communication, and wholesale, retail and trade industries was spread across a wide number of intangible assets in 2021. Both invested strongly in software and databases (purchased and own account), branding (purchased and own account), and organisational capital (purchased and own account) in the latest period. The information and communication industry also invested heavily in artistic originals (£6.5 billion), reflecting one of the industry's primary outputs: the production and distribution of information and cultural products.

The lowest level of intangible investment was seen in the gas and utilities (£3.8 billion) and agriculture, mining and quarrying (£4.0 billion) industries. However, it should be noted that these are relatively small industries in the UK both in terms of employee numbers and output.

### **Figure 6: Manufacturing invested mostly in research and development (R&D); information and communication invested mostly in artistic originals**

Intangible investment by industry and asset, current prices, £ million, UK, 2021

[Download the data](#)

## **5 . Investment in intangible assets data**

[Investment in intangible assets in the UK](#)

Dataset | Released 23 April 2024

Estimates of investment, both purchased and own account production, of intangible assets, annual data. These are official statistics in development.

## **6 . Glossary**

A detailed glossary of the working definitions of the assets in this publication can be found in our [Investment in intangible assets in the UK by industry: 2019 bulletin](#).

## **7 . Measuring the data**

## Notes on measurement

Estimates include a degree of suppression, so there may be a small difference between the totals presented across the tables of the [accompanying dataset](#).

The published estimates in this bulletin exclude the non-market sector (Standard Industrial Classification 2007 (SIC) 84 to 88). In addition, to ensure there is consistency with previous estimates, real estate activities (L) are excluded from our own account investment estimates because we exclude imputed rental from our definition of market sector investment, given that this is a form of investment for “own use” only.

Following the release of [Employer Skills Survey \(ESS\) data for 2022](#) by the Department for Education, firm-specific training investment data have been reintroduced with this bulletin, having been removed for our December 2022 bulletin. Compensation of employees data, taken from the Office for National Statistics’s (ONS’s) [Input-output supply and use tables](#), are used to interpolate ESS in years where data are not available.

Estimates of research and development (R&D) exclude estimates from the ONS’s [recent Business enterprise research and development, UK: 2022 publication](#). Instead, our R&D estimates are consistent with gross fixed capital formation (GFCF) data presented in [UK National Accounts, The Blue Book: 2023](#).

The 2021 estimates for own account branding, design, organisational capital and financial production innovation (FPI) have been produced using 2023 Annual Survey of Hours and Earnings (ASHE) data used in the production of the ONS’s [Employee earnings in the UK: 2023](#) publication. The occupations used to produce investment in intangible assets are as defined by the [Standard Occupational Classification \(SOC\) 2020](#). SOC is a common classification of occupational information for the UK. SOC 2020 was initially used for revised 2021 ASHE estimates and provisional 2022 ASHE estimates.

In line with this, we have reconsidered the SOC 2010 occupation list we use to produce relevant estimates for 2011 to 2020 inclusive, adding additional codes where the SOC 2020 occupation list suggested contributing occupations to the own account investment activity we present had previously been excluded.

## Quality

The estimates in this bulletin and dataset are based on developmental data and are subject to revision.

More quality and methodological information on strengths, limitations, appropriate uses, and how the data were created is available in our [earlier publications](#). A Quality and Methodology Information (QMI) report for this release will be published by mid-2024.

In addition, we will continue to work with the international community, sharing insight and experience in contribution to revisions of the System of National Accounts (SNA) and other guidance, including the expansion of the definition of capitalised and uncapitalised intangible assets.

In the production of the dataset presented in this bulletin, we have identified an error in the presentation of own account investment estimates for organisational capital in the manufacture of textiles, wearing apparel, leather and leather products industry in our [Investment in intangible assets in the UK: 2020 bulletin](#). This has been addressed within the estimates presented in this publication.

In taking on [Employer Skills Survey \(ESS\) data for 2022](#) by the Department for Education, we have amended our processing for 2007 to 2009 data, aligning our new data with estimates published by the ONS before December 2021.

## Official statistics in development

These statistics are labelled as “official statistics in development”. Until September 2023, these were called “experimental statistics”. Read more about the change in the [guide to official statistics in development](#).

We are developing how we collect and produce the data to improve the quality of these statistics. Once the developments are complete, we will review the statistics with the Statistics Head of Profession. We will decide whether the statistics are of sufficient quality and value to be published as official statistics, or whether further development is needed. Production may be stopped if they are not of sufficient quality or value. Users will be informed of the outcome and any changes.

User feedback is crucial in informing our work. Please send any questions or comments on the development of these statistics to [nfa-development@ons.gov.uk](mailto:nfa-development@ons.gov.uk).

## 8 . Strengths and limitations

### Strengths

The latest publication accounts for revisions to several sources used in our estimation of both purchased and own account tangible and intangible investment. As such, estimates presented include updated methodological and survey collection data from each source.

The following source revisions have been included in our current estimates:

Office for National Statistics:

- Business investment (revisions 1997 to 2020), including updates for a number of data sources for own-account software data
- Supply and Use (revisions 1997 to 2020)
- Annual Business Survey (revisions 2019 to 2020)
- Annual Purchases Survey (revisions 2019 to 2020)

Department for Education:

- Employee Skills Survey (revisions 2011 to 2019)

### Limitations

In this bulletin we were not able to produce new constant price estimates for intangible investment because of ongoing improvement in deflator methodology for intangible assets.

The timeliness of estimates presented in this bulletin and accompanying dataset is controlled by the availability of our existing data sources. For example, purchased and own account intangible investment use estimates presented in ONS's [Input-output supply and use tables](#), with the most recent year presented being 2021. As part of our future workplan, we will investigate the incorporation of consistent, timely estimates and statistical modelling to extend the data available in future publications.

Pending a review of own account intangible investment historical methods and data, estimates before 2011 in this bulletin have been produced by benchmarking previously published estimates to newly estimated 2011 data. This means that growth rates in most own account data presented will match those for data published in previous bulletins.

## 9 . Future developments

Estimates of investment in intangible assets are under regular review as part of both the UK's and international partners' work to improve the methodology underpinning these data as well as expanding the definitions used.

Domestically, work continues to develop methods for "data" as an investment asset. Estimates of this activity will be presented in a future release of this bulletin.

In addition, we continue to review the list of occupations and time factors used in our sum of costs estimates of own account intangible investment, including work to review the relationship between Standard Occupational Classification (SOC) schemes. Developments in this area will also be presented in a future release of this bulletin.

As discussed in [Section 8: Strengths and limitations](#) above, we will investigate the introduction of more timely source estimates and statistical modelling to extend the data available in future publications.

Finally, work is ongoing to improve our deflator methodology so that we can produce new constant price estimates for intangible investment in a future bulletin.

## 10 . Related links

### [Investment in intangible assets in the UK by industry: 2019](#)

Bulletin | Released 1 December 2021

Developmental estimates of investment in intangible assets by industry at the Standard Industrial Classification 2007 (SIC) division level.

### [Investment in intangible assets in the UK: 2020](#)

Bulletin | Released 15 December 2022

Developmental estimates of investment in intangible assets in the UK from 1997 to 2020, presented by asset category and industrial sector.

### [UK inclusive income: 2005 to 2021](#)

Bulletin | Released 9 April 2024

Estimates of sustainable economic progress encompassing a broad range of economic activities, such as unpaid household services, ecosystem services, and intangible assets.

## 11 . Cite this statistical bulletin

Office for National Statistics (ONS), released 23 April 2024, ONS website, statistical bulletin, [Investment in intangible assets in the UK: 2021](#)