

Statistical bulletin

Investment in intangible assets in the UK by industry: 2019

This article provides the working definitions of the intangible assets for which the ONS publishes experimental estimates of investment in the market sector and own account production. In addition, we present experimental estimates of investment in intangible assets by industry at the Standard Industrial Classification 2007 (SIC) Division level.

Contact:
Eurydice Fotopoulou
nfa-development@ons.gov.uk
+44 2075 928646

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1 . Main points

- Investment in intangible assets was £168.7bn in 2019, £8.5bn higher than investment in tangible assets in the same period (current prices).
- The largest capitalised intangible asset was computer software and databases, accounting for £30.7bn of investment in 2019 (current prices).
- The largest uncapitalised intangible asset was organisational capital, attracting £35.7bn of investment in 2019 (current prices).

2 . Investment in intangible assets

We provide experimental estimates for the first time for investment in intangible assets at the 2-digit Standard Industrial Classification 2007 (SIC) Division level for the UK up to 2019.

The intangible assets that are not currently capitalised in the UK National Accounts (uncapitalised) include branding (purchased and own account), design (purchased and own account), financial product innovation, organisational capital (purchased and own account), and firm-specific training. These are in addition to the intellectual property products (IPPs) already capitalised in the UK National Accounts, namely mineral exploration and evaluation, computer software and databases (purchased and own account), entertainment, literary and artistic originals, and finally research and development (R&D).

Figure 1: Volatility in growth rates of intangibles different to that of tangibles after 2010

Rate of change in investment in intangible assets (market sector and own production) compared with the rate of change in investment in tangible assets, UK, 1997 to 2019 (current prices)

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Source: Office for National Statistics - Investment in intangible assets by industry

From 1997 to 2010, investment in tangible and intangible assets appears to be broadly moving in the same direction. However, investment in intangible assets does not appear to follow a cyclical pattern in aggregate level from 2010 onwards when in current prices as opposed to investment in tangible assets. This may in part be because of their shorter asset lives. Although total investment in intangible assets has been growing over the years, investment in intangible assets individually is relatively volatile.

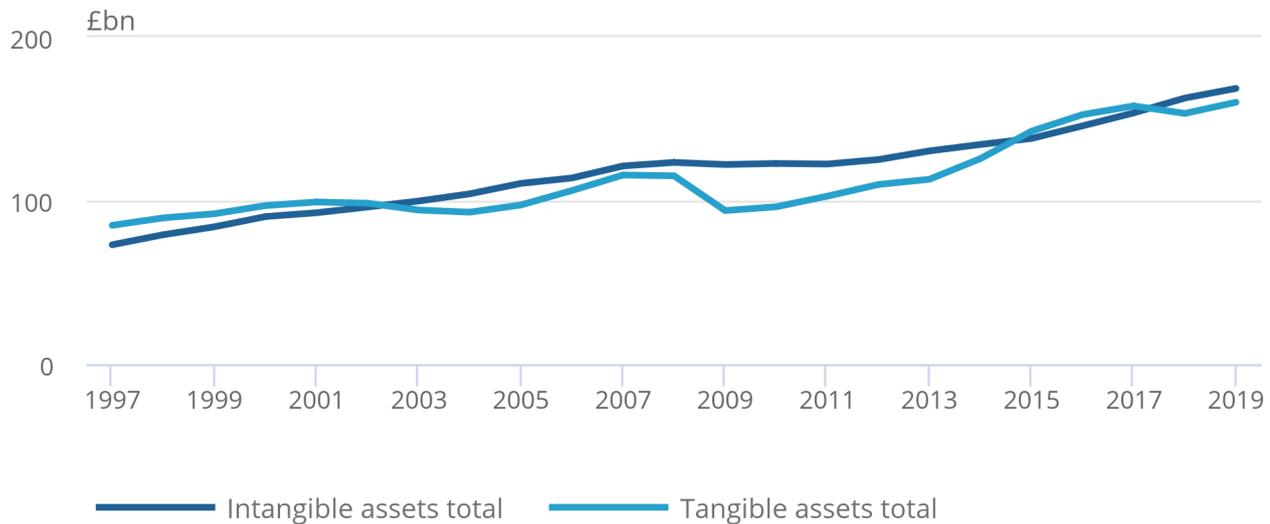
It is likely that the release of investment in intangible assets in constant prices may lead to changes of different nature to those observed here.

Figure 2: Intangible investment higher than tangible from 2002 to 2010 and 2017 to 2019

Total investment in intangible assets (market sector and own production) compared with the total in investment in tangible assets, UK, 1997 to 2019, £bn (current prices)

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Source: Office for National Statistics - Investment in intangible assets by industry

Capitalised intangible assets

The level of capitalised intangible asset investment in 2019 indicates the importance of digitalisation and innovation in a modern economy.

Own account computer software and databases investment increased the most in 2019 (by £748m), while purchased computer software and databases decreased by £19m in the same period. Computer software and databases (total) were the largest category of investment for capitalised intangibles in 2019, reaching around £30.7bn.

The second largest category for investment in capitalised assets was R&D, reaching £24bn, while the lowest level of investment was attracted by mineral exploration and evaluation, at £789m.

The highest level of investment in 2019 across all sectoral divisions was £5bn invested in R&D by the manufacture of motor vehicles, trailers and semi-trailers industry.

The lowest level of investment in 2019 across all sectoral divisions was £3m invested in own account computer software, by the crop and animal production, hunting and related service activities industry.

Uncapitalised intangible assets

Total [organisational capital](#) saw the largest increase in investment in 2019 by around £1.8bn, followed by [firm-specific training](#) at £1.5bn in current prices. The highest level of investment in uncapitalised assets was attracted by organisational capital at £35.7bn. Own account organisational capital accounted for the largest part of it, at £28.5bn in 2019. The lowest level of investment in uncapitalised intangible assets was attracted by [financial product innovation](#) at £2.9bn.

The highest level of investment across all industry divisions in 2019 was £5.4bn, invested in organisational capital by the manufacture of textiles, wearing apparel, leather and leather products industry.

3 . Findings by asset

Entertainment, literary and artistic originals

In 2019, the film, television programming and broadcasting industry invested the most in entertainment, literary and artistic originals, with £4.7bn, while arts, entertainment, libraries, museums, gambling and betting activities invested the least (£381m).

Mineral exploration

Only mining and support services invest in mineral exploration. In 2019 these services invested £789m, an 85% increase (£363m) from the 2018 level.

Research and development

The highest increase in investment in research and development (R&D) in 2019 was 13% by the manufacture of other non-metallic mineral products industry, while the largest decrease was 56% by the rental and leasing industry. The highest investment, £5bn, was by the manufacture of motor vehicles, trailers and semi-trailers industry. The lowest amount invested was £50m by the rental and leasing industry.

Purchased computer software and databases

The highest investment in purchased computer software and databases in 2019 was around £1.1bn by the retail trade industry, while the lowest was £8m by the paper and paper products manufacturing industry.

Own account computer software and databases

In 2019, own account computer software and databases investment increased by £748m. The industry investing the most in this asset was legal and accounting activities, with £2bn invested. The largest percentage increase (albeit small in absolute value) in investment for this asset in the year to 2019 was 23%, or £4m, by the film, television programming and broadcasting industry. The largest percentage decline in investment in this same period was 5% by the manufacture of basic pharmaceutical products and pharmaceutical preparations industry, equivalent to £4m.

Purchased branding

In 2019, the retail trade industry invested the most in purchased branding, with £3.4bn. The electrical equipment manufacturing industry had the largest percentage decline in investment, by 32%.

Own account branding

In 2019, investment by the film, television programming and broadcasting industry in own account branding decreased the most, by 42% (£40m). The highest amount of investment in own account branding was £1.1bn by wholesale trade industry, while the manufacture of coke and refined petroleum products industry invested the least with £3m.

Purchased design

In 2019, the highest level of investment in purchased design was £2.4bn by the construction industry, while the largest percentage increase (193%) was by the accommodation and food and beverage services industry (£29m). The largest percentage decrease in investment (87%) was by the membership organisations industry.

Own account design

Investment in own account design by the telecommunications industry increased 256% in 2019 (£87m), but the industry with the highest level of investment in own account design was computer programming and information service activities, with £285m.

Purchased organisational capital

The highest investment in purchased organisational capital in 2019 was £2.9bn by the financial services sector.

Own account organisational capital

The largest percentage increase in investment of own account organisational capital in 2019 was 101% (£8m) by the forestry and logging industry. The highest investment was £5.4bn by the manufacture of textiles, wearing apparel, leather and leather products industry. The largest percentage decrease was 38% by manufacture of basic pharmaceutical products and pharmaceutical preparations, declining £52m. The lowest investment was £15m, by the manufacture of coke and refined petroleum products industry.

Financial product innovation

Investment in financial product innovation by the financial services industry decreased by 14% in 2019 to £1.2bn, however this remained the highest level of investment across all industries. The biggest percentage increase was 14% by the insurance industry, whose investment in 2019 was £560m. The activities auxiliary to financial services and insurance activities industry invested around £1.1bn in 2019.

4 . Improving our estimates

Based on user feedback we plan to improve our estimations on firm-specific training investment by looking at alternative sources and improved modelling. A detailed discussion of the methodology and assumptions will be published in 2022, alongside plans to further refine the estimates, while addressing known concerns about the challenges faced when measuring intangibles, such as potential double-counting (see [strengths and limitations](#)). We will endeavour to produce the current 2-digit SIC Division level estimates annually, including at constant prices. The latter will provide a more accurate picture of the changes we observe.

Contribution to the development of other estimates

Such work will form a key component in the Spectrum framework, which seeks to deliver a more complete economic story than is provided by using measures of GDP alone. The initial Spectrum framework by [Heys, Martin and Mkandawire \(2019\)](#) was refined by [Bucknall, Christie, Heys and Taylor \(2021\)](#) who also published empirical estimates of welfare. Within the framework, investment in previously uncapitalised intangible assets feeds into estimates of augmented gross domestic income (GDI+). Consumption of intangible assets, both those capitalised and uncapitalised, comprise part of augmented net national disposable income (NNDI+).

In addition, the Office for National Statistics (ONS) 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.

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.

5 . Data

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

Dataset | Released 01 December 2021

Investment in intangible assets by industrial sector, at 2-digit SIC Division level, in current prices from 1992 to 2019.

6 . Glossary

Branding (own account and purchased)

Current experimental estimates of investment in branding cover a proportion of market sector expenditure on advertising and market research. Purchased branding measurements use intermediate consumption and gross fixed capital formation (GFCF) data on advertising and market research services (classification of products by activity (CPA) category 73) from the Office for National Statistics' (ONS) supply and use tables and turnover data for both the advertising and market research industries from the Annual Business Survey (ABS). Own account estimates use the sum-of-costs approach with the Annual Survey of Hours and Earnings (ASHE) data for relevant occupations.

Design (own account and purchased)

Experimental ONS estimates of design follow the academic literature in measuring "architectural and engineering design". The primary data sources for purchased investment in design are intermediate consumption and GFCF in architectural and engineering activities (CPA category 71), obtained from the [supply and use tables](#) published by the ONS. To measure own account investment in design, a sum-of-costs approach is adopted, using ASHE to identify those working in design occupations and estimate the cost of work that leads to long-lived design assets.

More generally, design work can include a much wider variety of activities, from aesthetic activities such as fashion design and interior design, through to service design. Since April 2021, the ONS' estimates have also included the turnover of the specialised design industry as an additional data source, as a further step towards including a broader range of activities.

Financial product innovation

Financial product innovation (FPI) was proposed by [Corrado, Hulten and Sichel](#) in 2005 as research and development (R&D) in finance, a form of non-scientific R&D, broadly defined as an estimate of the spending for new product development by financial services and insurance firms. According to the [Frascati Manual](#), an activity must be novel, creative, uncertain, systematic, and reproducible to qualify as R&D. The creation of new products in finance could satisfy these criteria. Since then, discussion around FPI has broadened to recognise the importance of other factors in the innovation process, such as software, marketing, and training. Innovation - in finance but also more generally - can encompass the implementation of knowledge or products that are not novel in general but may be new to the firm. The ONS' estimates of FPI use a sum-of-costs method with ASHE data, using the wages of economists, statisticians and researchers in the finance and insurance industries.

Firm-specific training

Firm-specific training relates to the "know-how" that is not transferable between companies, for example, the knowledge needed to use bespoke software. The act of providing training is considered a service within the SNA but can be viewed as investment in acquisition of knowledge and skills. In experimental measures, a sum-of-costs approach covering the cost of training staff (both in terms of direct training costs and the cost of employees' time spent on training) is used to estimate the value of knowledge and skills acquired, assuming perfect markets where firms spend up to the value acquired.

Organisational capital (own account and purchased)

Investment in organisational capital is generally considered to be investment into the structures and management practices of organisations intended to increase productivity and efficiency. There is no single accepted definition however, and some literature considers organisational capital to be a much broader concept. Experimental ONS estimates measure purchased investment in organisational capital as intermediate consumption and GFCF in management consulting services (CPA category 70), and the sum-of-costs approach using ASHE is employed to estimate own account investment.

7 . Measuring the data

Notes on measurement

In this publication we were not able to produce new constant price estimates for intangible investment because of ongoing improvement in deflator methodology for intangible assets at this level of granularity. We expect to publish these in spring 2022.

Total software intangible investment estimates include a high level of suppression and so there is a small difference between the total and the sum of purchased and own account software intangible investment.

The published estimates exclude the non-market sector (Standard Industrial Classification 2007 (SIC) 84-88). Real estate activities (L) are excluded from own account branding, design and organisational capital because of imputed rental, for consistency with previous estimates.

Estimates on firm-specific training intangible investment at 2-digit SIC Division level were initially included in this publication, but because of a lack of updated microdata, it was not possible to estimate them accurately. Therefore, these will be released at a later date. Firm-specific training investment is included at calculations of totals for consistency.

Quality

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

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in [Investment in intangible assets in the UK - 2018](#).

8 . Strengths and limitations

Strengths

This dataset presents for the first time estimates of investment in intangible assets in the UK, up to 2019, at 2-digit Standard Industrial Classification 2007 (SIC) level. This will enable data users to have a better understanding of the dynamics of different sectors in the economy, as well as the distribution of investment.

Limitations

The proposed, currently uncapitalised, intangible assets lack internationally agreed definitions within the System of National Accounts (SNA), but they have clear descriptions in the experimental statistics published in the UK. In combination with the conceptual similarities between assets, this can increase the risk of double counting, where investment may be recorded under multiple asset categories.

There are currently numerous debates around incorporating data itself, in addition to databases, as an asset into the SNA. It is argued that the same data can be used in multiple database and software applications to deliver services, help develop new products, or be sold on to third parties.

In terms of non-produced intangibles, goodwill and licences must also be considered. Goodwill is the difference between the value of assets of a company and its valuation, normally driven by the sum of uncapitalised assets that remain unaccounted for. Similarly, a licence to use an asset has an economic value and is within the asset boundary under certain conditions, regardless of whether the asset is or not.

There is a practical challenge in treating current data on intermediate consumption appropriately to align with the concepts when it is used to measure investment in intangible assets. The Office for National Statistics (ONS) has already undertaken substantial work in this area, implementing adjustments to exclude short-lived expenditure and costs, which do not contribute to the creation of an intangible asset.

9 . Related links

[Investment in intangible assets in the UK: 2018](#)

Bulletin and dataset | 7 April 2021

Experimental estimates of investment in a broad set of intangible assets, in current and constant prices.

[Developing experimental estimates of investment in intangible assets in the UK: 2016](#)

Article | 6 February 2019

Update on development work to measure intangible assets (knowledge assets) beyond those in the national accounts, and updated estimates of investment to 2016.

Martin, J. (2019). [Measuring the Other Half: New Measures of Intangible Investment from the ONS](#). National Institute Economic Review, 249, R17-R29.

Journal Article | Released August 2019

Methodological review