The Design Economy

The value of design to the UK

Appendix 1: Technical appendix

All analysis in this report is based on the most recent data available at the time of writing. The latest available data for some indicators (firm counts and employment) relates to 2014, while the latest for other indicators (GVA, turnover and exports) relates to 2013. The data sources used are primarily those used in the Creative Industries Economic Estimates, published by the Department for Culture, Media and Sport (DCMS)[1].

The methodology for this research is designed to reflect that used by DCMS

This technical appendix outlines the processes used for each analysis reported through this report.

[1]gov.uk/government/statistics/creative-industries-economic-estimates-january-2015

↗ Identifying designers

To identify the occupations of those working in design, we reviewed a range of existing literature and consulted with key stakeholders across design. Using these outcomes we worked through a process of review and selection of best fit Standard Occupational Classification (SOC) codes to identify designers within ONS data, who are counted in the analysis regardless of the industrial sector they work in.

Table 1: Detailed breakdown of design occupations

Design subsector	SOC	SOC description	Example designer
Architecture and built environment	2121	Civil engineers	Building engineer, structural engineer
	2431	Architects	Architect, architectural consultant, landscape architect
	2432	Town planning officers	Planning officer, town planner
	2435	Chartered architectural technologists	Architectural technologist
	3121	Architectural and town planning technicians	Architectural assistant, construction planner
	3122	Draughtspersons	CAD operator, cartographer
	5113	Gardeners and landscape gardeners*	Garden designer, gardener, landscape gardener
Design (multidisciplinary)	3422	Product, clothing and related designers	Fashion designer, product designer, interaction designer
Design (advertising)	2473	Advertising accounts managers and creative directors	Advertising manager, campaign manager, brand identity
Design (craft)	5211	Smiths and forge workers	Blacksmith, farrier
	5411	Weavers and knitters	Carpet weaver, knitwear manufacturer
	5441	Glass and ceramics makers, decorators and finishers	Glass blower, potter
	5442	Furniture makers and other craft woodworkers	Antiques restorer, cabinet maker
	5449	Other skilled trades n.e.c.	Engraver, goldsmith

Design (digital)	2135	IT business analysts, architects and systems designers	Business analyst, systems analyst, technical architect
	2136	Programmers and software development professionals	Database developer, games programmer, software engineer
	2137	Web design and development professionals	Internet developer, web designer, user interface designer
Design (clothing)	5414	Tailors and dressmakers	Fabric cutter, tailor
Design (graphic)	3411	Artists*	Illustrator, portrait painter, sculptor
	3421	Graphic designers	Graphic artist, graphic designer
Design (product and industrial)	2122	Mechanical engineers	Aerospace engineer, automotive engineer
	2126	Design and development engineers	Design engineer, research and development engineer
	2129	Engineering professionals n.e.c.*	Metallurgist, project engineer

*Subject to the following exclusions: Employment/value in SOC 5113 is only included only where this occurs within SIC 71.11 and 81.30. Employment/value in SOC 3411 is only where people are working outside of SIC 90.03 and excludes those working in an educational setting. Employment/value in SOC 2129 is only included for those working in product and industrial manufacturing industries (SIC 13-32), other creative industries (as per the DCMS definition) or those identified as design industries)

↗ Identifying design industries

The approach to identifying industries follows the methodology used by the DCMS. Having identified the relevant design occupations we then assessed how many people were employed in those occupations in different industries (using Standard Industrial Classification (SIC) codes). Where there was a high concentration or 'intensity' of designers, the industry is considered to be a design industry. We used the same intensity threshold as the DCMS; 30% or more of the workforce in an industry must be employed in a design occupation in order for it to be considered a design industry.

Table 2: Detailed breakdown of design industries

Design subsector	SIC	SIC description	Example design business
Architecture and built environment	71.11	Architectural activities	Building design and drafting, eco design
Design (multidisciplinary)	74.10	Specialised design activities	Fashion design, sustainable design, industrial design
Design (craft)	23.41	Manufacture of ceramic household and ornamental articles	Ceramic tableware
	32.12	Manufacture of jewellery and related articles	Jewellery or watches, production of precious stones
Design (digital)	58.21	Publishing of computer games	Computer game design and publishing
	58.29	Other software publishing	Software publishing
	62.01	Computer programming activities	Designing structure and content of software, user interface design
Design (clothing)	14.19	Manufacture of other wearing apparel and accessories	Accessories
Design (product and industrial)	16.29	Manufacture of other products of wood etc.	Furniture design
	26.40	Manufacture of consumer electronics	Electronic home entertainment equipment

Further detail on the approach defining design is available in a working paper released at the start of the study: provide link (or document to download).

↗ Counting firms across the design economy

Firm counts are taken from the UK Business Counts, a public version of the Inter-Departmental Business Register (IDBR) available from Nomis. The IDBR is a comprehensive dataset of UK businesses, compiled by the Office for National Statistics (ONS), which covers 99% of UK economic activity. It holds records of approximately 2.1m businesses. It does not cover very small businesses without VAT or PAYE schemes (self-employed individuals and businesses with low turnover and without employees); some non-profit making organisations are also not included.

Data on firms are only available by SIC code and as such can only be provided for Design Industries.

↗ Calculating design employment

Employment estimates are taken from several versions of the Annual Population Survey (APS). The APS is the largest ONS household survey, and is based on the Labour Force Survey but includes a boosted sample designed to provide greater reliability at smaller geographical levels. Each survey includes around 130–140,000 individuals who are in employment (either employed or self-employed).

The report uses APS microdata, analysed using SPSS. Employment estimates include main jobs and second jobs. Estimates are weighted using the appropriate variables in each APS dataset.

↗ Financial calculations

Turnover and gross value added estimates are taken from several versions of the Annual Business Survey (ABS). The measure of gross value added used in this report is approximate gross value added (GVA), which is the measure recommended by the ONS when analysis at a detailed industrial level is required.

The ABS is the key ONS survey for understanding the detailed structure and performance of businesses across the UK, and is one of the main sources of business information in the UK National Accounts. Around 47–49,000 businesses are surveyed each year. Because the survey sample is taken from the IDBR, the survey only includes businesses with VAT and/or PAYE schemes. In addition, the ABS covers only the non-financial business economy. It includes the production, construction, distribution and service industries, and represents about two-thirds of the UK economy in terms of GVA.

↗ Turnover

Turnover estimates include design industries only. Turnover is measured in current prices (ie, figures are not adjusted for inflation).

↗ Gross value added & productivity

GVA measures the contribution to the economy of each individual producer, industry or sector in the United Kingdom. GVA is closely linked to the more commonly used Gross Domestic Product (GDP):

GVA + taxes on products – subsidies on products = GDP

The ABS provides GVA figures for design industries only. This is apportioned to design and non-design occupations on the basis of their share of gross earnings in design industries. The earnings data used in this analysis are taken from the APS. Similarly, an estimate of the contribution to GVA of designers employed outside design industries is based on their share of gross earnings (derived from the APS). GVA is measured in current prices (ie, estimates are not adjusted for inflation).Productivity figures are calculated by dividing GVA estimates by employment.

The ABS measure of GVA is approximate Gross Value Added (aGVA), which is produced outside of the National Accounts framework. It can be used as an approximation to GVA, or in its own right as a measure of business performance. aGVA is the preferred measure of GVA when information at a very low level of industrial detail is required and is the measure used by the DCMS in the Creative Industries Economic Estimates.

aGVA covers the UK NonFinancial Business Economy, a subset of the whole economy that excludes large parts of agriculture, all of public administration and defence, publicly provided healthcare and education, and the financial sector. It accounts for approximately two thirds of the UK economy in terms of Gross Value Added.

↗ Exports

Export estimates are taken from the ONS International Trade in Services (ITIS) data and the UN Commodity Trade Statistics database (Comtrade).

ITIS collects data on UK resident companies' international transactions in services, combining data from survey and administrative sources. It provides data used by ONS to measure the UK's balance of payments and gross domestic product, as well as in input-output supply and use tables. ITIS is the only source used by DCMS to measure exports from the creative industries (the DCMS Creative Industries Economic Estimates cover service exports only).

Annual estimates from ITIS combine a quarterly survey (of around 1,100 businesses) and an annual survey (of around 14,500 businesses). ITIS data does not cover travel, transport, banking/financial institutions, higher education, charities and much of the legal profession.

Comtrade provides detailed global trade data. It is a repository of official trade statistics from countries around the world, including the UK. We use Comtrade to provide estimates of the value of design in the export of goods from the UK, to supplement service export estimates from ITIS.

As with GVA estimates, the design value of goods and services exports in non-design industries is apportioned based on the share of earnings in design occupations in these industries. The earnings data used in this analysis are taken from the APS.

Total UK export figures quoted in this report are the sum of goods export estimates from Comtrade and service export estimates from ITIS. These are not directly comparable to export figures in the UK Balance of Payments which include estimates for sectors not included in ITIS, derived from other sources such as the International Passenger Survey.

↗ Identifying clusters

Cluster analysis combines firm counts, firm LQs, employment estimates and employment LQs for each location. Each of these four measures is ranked, and an average rank score calculated for each location. This average score is then itself ranked to give the overall concentration rank used in the analysis. Emerging clusters are identified by calculating the change in overall concentration rank between 2010 and 2014.

↗ Identifying design-active firms

Design-active firms are identified using criteria agreed with Design Council and the project steering group. Given the nature of the study it was necessary to focus on those measures by which it was possible to identify firms from open-source lists. The criteria used are:

– Firms which have accessed support from the Design Council's Designing Demand programme

– Top graduate employers for engineering, design and manufacturing graduates

– Firms registering new designs with the Intellectual Property Office

– Firms which have applied to the Intellectual Property Office for patents

– The top 50 firms which have registered trademarks with the Intellectual Property Office in 2014

– Firms who have won or been shortlisted for Design Business Association (DBA) Design Effectiveness Awards 2011–2015

Financial data for each of the firms identified was extracted from Trends Business Research's unique business database 'Trends Central Resource', and validated by comparing with Companies House records. This validation process was to ensure accuracy, and completeness in capturing all of the firms' activities. This resulted in a list of 52 firms, spread across the sectors of interest. Performance in these firms was compared against sector averages based on data from the ABS and APS.

⬈ Making international comparisons

Conducting an international comparison of the design sector is challenging. This is because countries have different definitions of design, national figures are unavailable or outdated, or data points are just not comparable. These limitations, also acknowledged in the International Design Scoreboard, make it difficult to have a conclusive international comparison. Nonetheless we can still have some strong indications on the performance of the UK sector internationally. This also provides a solid case for further research to be undertaken in international comparisons of design sectors

The following datasets were used for international comparisons:

– To compare different countries in terms of design registrations, data was analysed from the WIPO IP Statistics Data Center

– For comparisons of exports, the United Nations Conference on Trade and Development (UNCTAD) data was used

– For comparisons on business use of design, the European Commission's Innobarometer 2015 was used

⬈ Overlap between 'design economy' and 'creative economy' SIC definitions

Table 3 and 4 provide a detailed breakdown of how the methodology for this report overlaps with that used by DCMS for the Creative Industries Economic Estimates.

Table 3: Overlap between 'design economy' and 'creative economy' SIC definitions

SIC	SIC description	In design economy?	In creative economy?
14.19	Manufacture of other wearing apparel and accessories	Yes	
16.29	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	Yes	
23.41	Manufacture of ceramic household and ornamental articles	Yes	
26.40	Manufacture of consumer electronics	Yes	
32.12	Manufacture of jewellery and related articles	Yes	Yes
58.11	Report publishing		Yes
58.12	Publishing of directories and mailing lists		Yes
58.13	Publishing of newspapers		Yes
58.14	Publishing of journals and periodicals		Yes

58.19	Other publishing activities		Yes
58.21	Publishing of computer games	Yes	Yes
58.29	Other software publishing	Yes	Yes
59.11	Motion picture, video and television programme production activities		Yes
59.12	Motion picture, video and television programme post-production		Yes
59.13	Motion picture, video and television programme distribution		Yes
59.14	Motion picture projection activities		Yes
59.20	Sound recording and music publishing activities		Yes
60.10	Radio broadcasting		Yes
60.20	Television programming and broadcasting activities		Yes
62.01	Computer programming activities	Yes	Yes
62.02	Computer consultancy activities		Yes
70.21	Public relations and communication activities		Yes
71.11	Architectural activities	Yes	Yes
73.11	Advertising agencies		Yes
73.12	Media representation		Yes
74.10	Specialised design activities	Yes	Yes
74.20	Photographic activities		Yes
74.30	Translation and interpretation activities		Yes
85.52	Cultural education		Yes
90.01	Performing arts		Yes
90.02	Support activities to performing arts		Yes
90.03	Artistic creation		Yes
90.04	Operation of arts facilities		Yes
91.01	Library and archive activities		Yes
91.02	Museum activities		Yes

Table 4: Overlap between design economy and creative economy SOC definitions

SOC	SOC description	In design economy?	In creative economy?
1132	Marketing and sales directors		Yes
1134	Advertising and public relations directors		Yes
1136	Information technology and telecommunications directors		Yes
2121	Civil engineers	Yes	
2122	Mechanical engineers	Yes	
2126	Design and development engineers	Yes	
2129	Engineering professionals n.e.c.	Yes*	
2135	IT business analysts, architects and systems designers	Yes	Yes
2136	Programmers and software development professionals	Yes	Yes
2137	Web design and development professionals	Yes	Yes
2431	Architects	Yes	Yes
2432	Town planning officers	Yes	Yes
2435	Chartered architectural technologists	Yes	Yes
2451	Librarians		Yes
2452	Archivists and curators		Yes
2471	Journalists, newspaper and periodical editors		Yes
2472	Public relations professionals		Yes
2473	Advertising accounts managers and creative directors	Yes	Yes
3121	Architectural and town planning technicians	Yes	Yes
3122	Draughtspersons	Yes	
3411	Artists	Yes*	Yes
3412	Authors, writers and translators		Yes
3413	Actors, entertainers and presenters		Yes
3414	Dancers and choreographers		Yes

3415	Musicians		Yes
3416	Arts officers, producers and directors		Yes
3417	Photographers, audio-visual and broadcasting equipment operators		Yes
3421	Graphic designers	Yes	Yes
3422	Product, clothing and related designers	Yes	Yes
3543	Marketing associate professionals		Yes
5113	Gardeners and landscape gardeners	Yes*	
5211	Smiths and forge workers	Yes	Yes
5411	Weavers and knitters	Yes	Yes
5414	Tailors and dressmakers	Yes	
5441	Glass and ceramics makers, decorators and finishers	Yes	Yes
5442	Furniture makers and other craft woodworkers	Yes	Yes
5449	Other skilled trades n.e.c.	Yes	Yes

* Subject to the following exclusions: Employment/value in SOC 5113 is included only where this occurs within SIC 71.11 and 81.30. Employment/value in SOC 3411 is included only where people are working outside of SIC 90.03 and excludes those working in an educational setting. Employment/value in SOC 2129 is only included for those working in product and industrial manufacturing industries (SIC 13-32), other creative industries (as per the DCMS definition) or those identified as design industries.