



Scottish Government
Riaghaltas na h-Alba
gov.scot

Business Enterprise Research and Development Scotland 2018



A National Statistics publication for Scotland

BUSINESS AND ENERGY

BUSINESS AND ENERGY

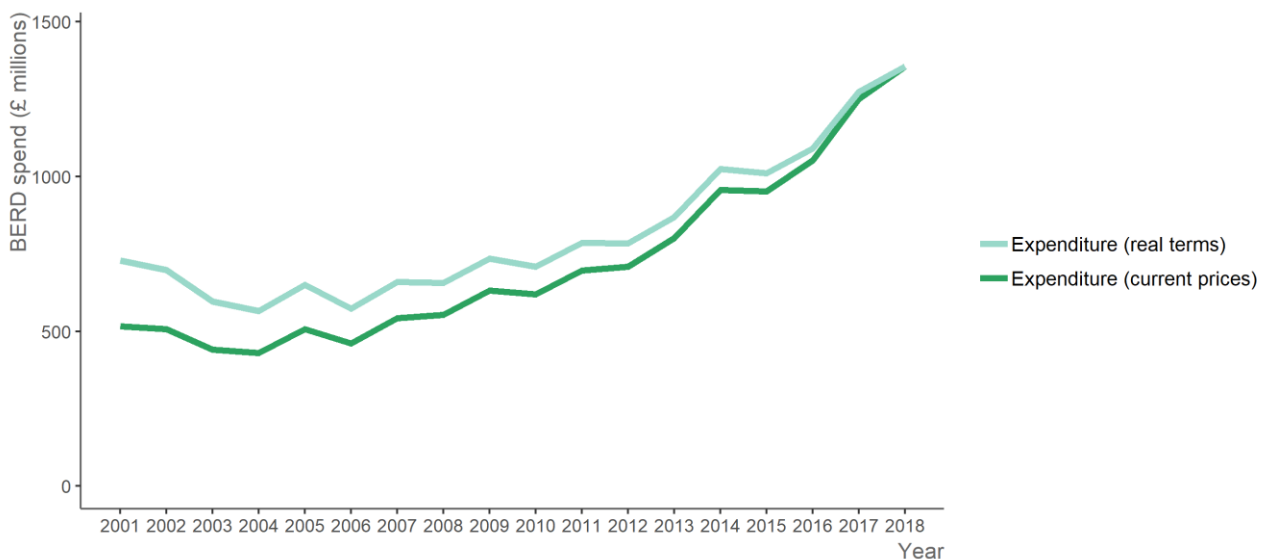
Business Enterprise Research and Development Scotland 2018

Release Date: 5 March 2020

Key Points

- Business Enterprise Research and Development (BERD) expenditure in Scotland reached £1.356 billion in 2018, which is the highest in the series.
- Between 2017 and 2018, BERD expenditure in Scotland increased by 6.4% in real terms, which was greater than the 3.9% increase for the UK as a whole.
- Since 2007, BERD expenditure in Scotland has increased by 105.7% in real terms, more than three times the rate of growth for the UK as whole (up 31.5% since 2007).
- BERD expenditure represented 0.83% of Scottish GDP in 2018; the comparable figure was 1.16% for the UK.
- Over the latest year, R&D spending on Manufacturing and Service product groups increased by 11.7% and 5.8% respectively, whereas for Other products, R&D spending decreased by 23.2% in real terms.
- In 2018, businesses in Scotland employed 14,747 R&D staff, 11.0% more than in 2017 and the highest number in the series.

Figure 1. BERD expenditure in Scotland has increased each year since 2015



About this publication

This publication presents estimates of business expenditure and employment relating to research and development (R&D) performed by businesses operating in Scotland in 2018, as well as revisions to previously published data for 2016 and 2017. The data in this release are sourced from the Business Enterprise Research and Development (BERD) survey conducted by the Office for National Statistics (ONS).

In this publication, BERD is measured by the expenditure on R&D carried out by the business. This is regarded as a more accurate measure of R&D than the funding received by a business for R&D work, as not all of these funds received may be used for R&D.

This publication reports on R&D expenditure in businesses in Scotland irrespective of the country of residence of the ultimate owner or users of the R&D produced.

The BERD survey follows the definition of research and development proposed by the Organisation for Economic Cooperation and Development (OECD) and published in the ‘Frascati’ Manual. According to the manual, R&D is defined as:

“creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge”. R&D must contain an appreciable amount of novelty.

BERD contributes to Scotland’s Gross Expenditure on Research and Development (GERD), which forms the basis of the National Indicator: ‘Spend on Research and Development’. Gross Expenditure on Research and Development (GERD) comprises R&D undertaken by the Business Enterprise (BERD), Higher Education (HERD), Government (GoveRD) and Private-Non-Profit (PNP) sectors. The figures for GERD will become available in spring 2020.¹

Further information on Scottish R&D activity and the full set of tables are available at: <https://www.gov.scot/collections/business-and-innovation-statistics/>

Further details of definitions, coverage and methodology can be found in the [Background Notes](#)

¹ Information on the range of targets and indicators which comprise the National Performance Framework can be found on at: <https://nationalperformance.gov.scot>

Contents

Key Points.....	1
About this publication.....	2
Contents	3
BERD expenditure increased over the latest year.....	4
BERD expenditure was highest on Manufacturing and Services products	4
BERD spend was highest in the Professional, scientific and technical activities industry sector	5
The growth sectors accounted for almost two thirds of Scottish BERD spending.	6
Scottish BERD employment reached the highest level in the series.....	7
Businesses' own funds represented the largest source of BERD funding	8
Average expenditure on R&D was highest within large businesses	9
Over half of R&D expenditure in Scotland was by foreign-owned businesses....	10
Businesses located in the City of Edinburgh accounted for more than a third of all Scottish BERD spending	11
BERD expenditure in Scotland has increased faster than in the UK.....	13
Scotland ranked eighth out of the twelve UK regions for BERD expenditure as a share of GDP in 2018	13
Background Notes	15
Definition of R&D	15
Sampling and Regional Estimates.....	15
Coverage	16
Product groups	16
Discontinuities in the data.....	17
Employment.....	17
Real terms	17
Time period for which the results relate.....	17
Revisions Policy.....	18
Latest Revisions	18
Sampling variability.....	18
Analysis of R&D expenditure by SMEs (small and medium sized enterprises).....	19
Code of Practice for Official Statistics	19
Uses.....	20
User Engagement.....	20
Data Tables	21

BERD expenditure increased over the latest year

Business Enterprise Research and Development (BERD) expenditure in Scotland reached £1.356 billion in 2018, up 6.4% (+£82 million) in real terms from 2017, making it the highest in the series (which began in 2001). Over the longer term, BERD expenditure in Scotland has increased by 105.7% in real terms since 2007.

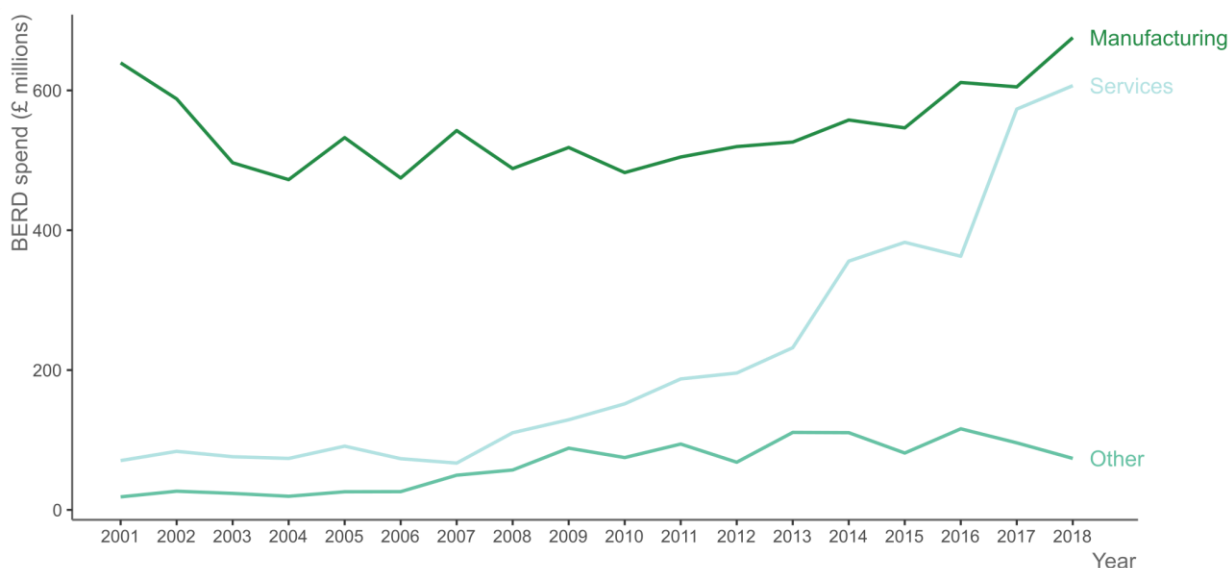
In 2018, BERD spending represented 0.83% of GDP in Scotland, which was a slight increase from 0.79% in 2017 and up from 0.45% in 2007.

R&D spending in Scotland can fluctuate considerably year on year, especially given that it is concentrated in a small number of large businesses. In 2018, five businesses accounted for over a third of all Scottish BERD spending (35.5%). This is a sizeable share of the total R&D expenditure but is a small reduction from 2017 (37.7%) and represents a fall in dominance of the top businesses since 2001 when the top five businesses accounted for just over half of Scottish BERD expenditure.

BERD expenditure was highest on Manufacturing and Services products

In 2018, as in recent years, BERD expenditure in Scotland was split mainly between Manufacturing products (49.8%) and Services products (44.8%). Since 2007, R&D spending on Services products has increased rapidly, but R&D expenditure on Manufacturing products remains higher, as it has since the series began in 2001 (Figure 2). Over the latest year, R&D spending on Manufacturing and Service product groups increased by 11.7% (+£70 million) and 5.8% (+£34 million) respectively, whereas for Other products, R&D spending decreased by 23.2% (-£22 million) in real terms.

Figure 2. BERD spending on Manufacturing and Service products increased in Scotland between 2017 and 2018



The rise in spending on Manufacturing products was driven by increased spending on ‘Precision instruments and optical products’ (+£21 million) and ‘Other manufactured goods’ (+£14 million).

Among Services products, ‘Miscellaneous business activities; Technical testing and analysis’ contributed considerably to the real terms increase with around £19 million more being spent on R&D in 2018 than in 2017 (+5.9%).

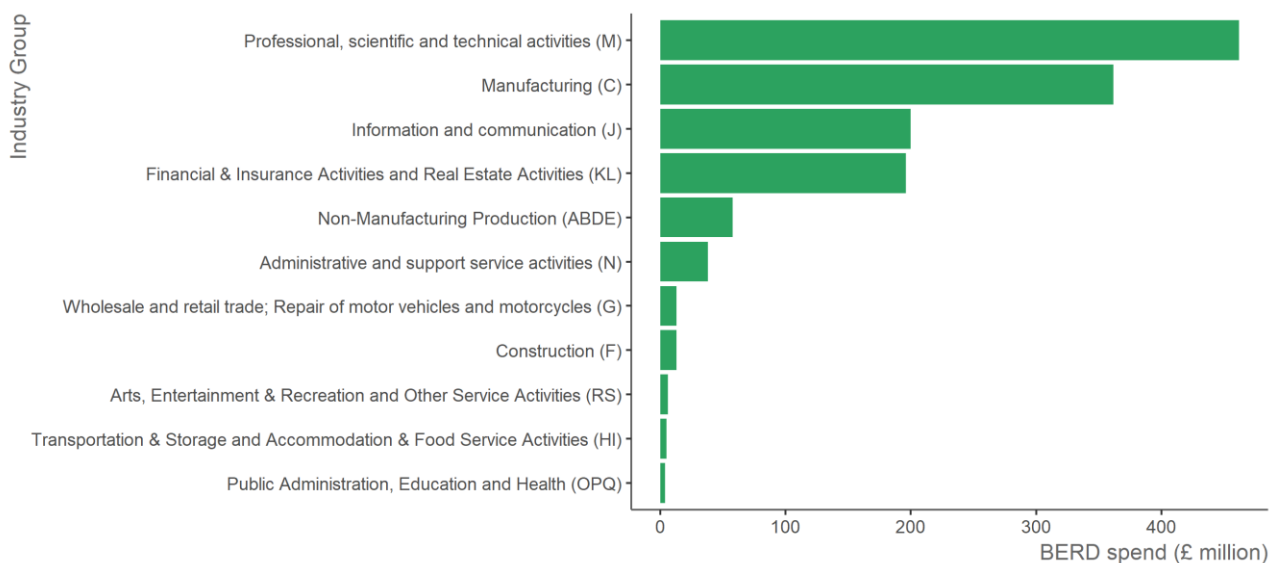
The recent decline in BERD spending in real terms on Other products was driven by decreases for ‘Agriculture, hunting and forestry; Fishing’ (-£8 million), ‘Extractive Industries’ (-£7 million) and ‘Electricity, gas and water supply’ (-£7 million) between 2017 and 2018.

BERD spend was highest in the Professional, scientific and technical activities industry sector

Note that estimates of research and development (R&D) expenditure by industry and product group are not the same. Businesses may report significant R&D in product groups that are different to the main classification of their business according to the [Standard Industrial Classification \(SIC\)](#). More information about the concepts of product groups and SIC codes can be found in the [UK Business Enterprise Research and Development Quality and Methodology Information \(QMI\)](#) report.

In 2018, BERD expenditure in the Professional, scientific and technical activities sector (Section M) (£462 million) accounted for over a third (34.1%) of the Scottish total. Manufacturing (Section C) ranked second (£361 million) and accounted for over a quarter of the Scottish total (26.7%) (Figure 3).

Figure 3. Professional, scientific and technical activities and Manufacturing had the highest BERD spend in Scotland in 2018



In 2018, Scientific Research and Development (within Section M) was by far the most research intensive division in Scotland with BERD spending accounting for 19.5% of turnover. Manufacture of Computer, Electronic and Optical Products and Other Manufacturing (both within Section C) were the next most research intensive divisions with BERD spend accounting for 8.24% and 6.31% of turnover respectively.

The growth sectors accounted for almost two thirds of Scottish BERD spending

[Scotland's Economic Strategy](#) identified the following industry groups as key growth sectors where Scotland has a distinct comparative advantage:

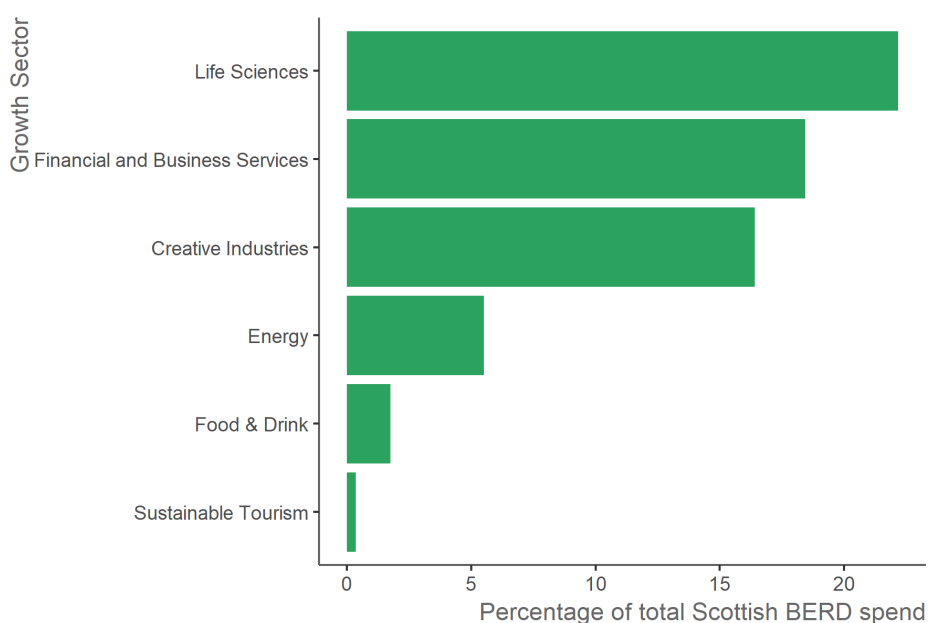
- Food & Drink (including agriculture & fisheries)
- Creative Industries (including digital)
- Sustainable Tourism
- Energy (including renewables)
- Financial & Business Services
- Life Sciences

The growth sectors accounted for a large proportion of total BERD expenditure in Scotland in 2018 (64.7%). In 2018, Life Sciences had the highest BERD expenditure of the six Growth Sectors (£301 million), as it has since 2009 when the

series began (Figure 4). Financial and Business Services (£250 million) ranked second among the Growth Sectors in terms of BERD expenditure and experienced the largest increase between 2017 and 2018. In 2018, Life Sciences accounted for over a fifth (22.2%) of total Scottish BERD spend and Financial and Business Services accounted for 18.4%.

Life Sciences also had the highest number of BERD employees, accounting for a fifth of all Scottish BERD employees (20.4%). Despite a 30.1% increase in the BERD employment between 2017 and 2018, Financial and Business Services ranked third among the Growth Sectors in terms of BERD jobs, whereas Creative Industries had the second highest level of BERD employment.

Figure 4. Life Sciences accounted for the highest proportion of BERD spending among the six Scottish Growth Sectors

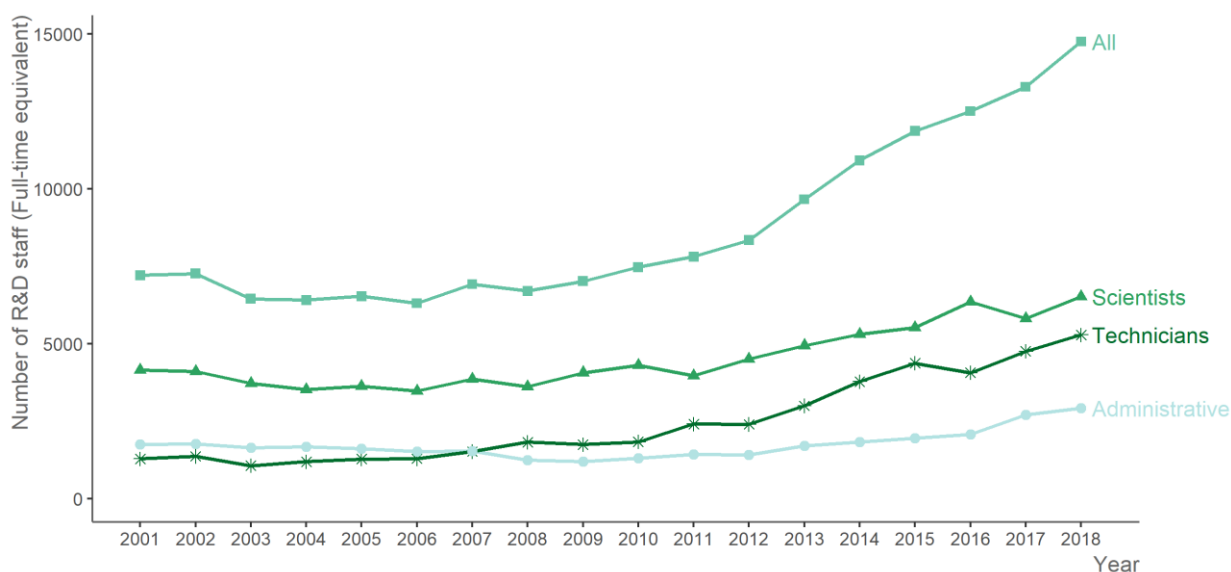


Scottish BERD employment reached the highest level in the series

In 2018, businesses in Scotland employed 14,747 R&D staff, 11.0% more than in 2017, and the highest number in the series (which began in 2001). There were more than twice as many R&D employees in 2018 as there were in 2001 in Scotland, and the number has risen every year since 2008 (Figure 5).

The relative proportions of the three types of R&D staff have changed since 2001. In 2001, over half of all R&D staff were Scientists and engineers (58%) and less than a fifth (18%) were Technicians, laboratory assistants and draughtsmen. Between 2001 and 2018, the number of technicians increased the most, so that in 2018 over a third of all R&D staff in Scotland were technicians.

Figure 5. The number of all types of BERD jobs increased in Scotland over the latest year



While the number of BERD employees has increased in Scotland in recent years, so has overall employment. Therefore, part of the growth in employment on BERD may reflect the wider growth in total employment in Scotland. However, in 2018, R&D staff in businesses represented 0.56% of total Scottish employment (16+ years)², which is a slightly greater proportion than in 2017 (0.50%), and this proportion has increased every year since 2008 (0.26%), indicating that the number of people working on R&D in businesses has grown faster than employment in general.

In 2018, there were more BERD staff working on Services products (48.5%) than on Manufacturing (46.4%) or Other products (5.1%). Similar to the pattern seen for BERD expenditure, both the Manufacturing and Services product groups experienced increases in BERD staff between 2017 and 2018 (up 10.9% and 16.3% respectively), whereas BERD employment decreased over the latest year for 'Other' product groups (-22.7%).

Businesses' own funds represented the largest source of BERD funding

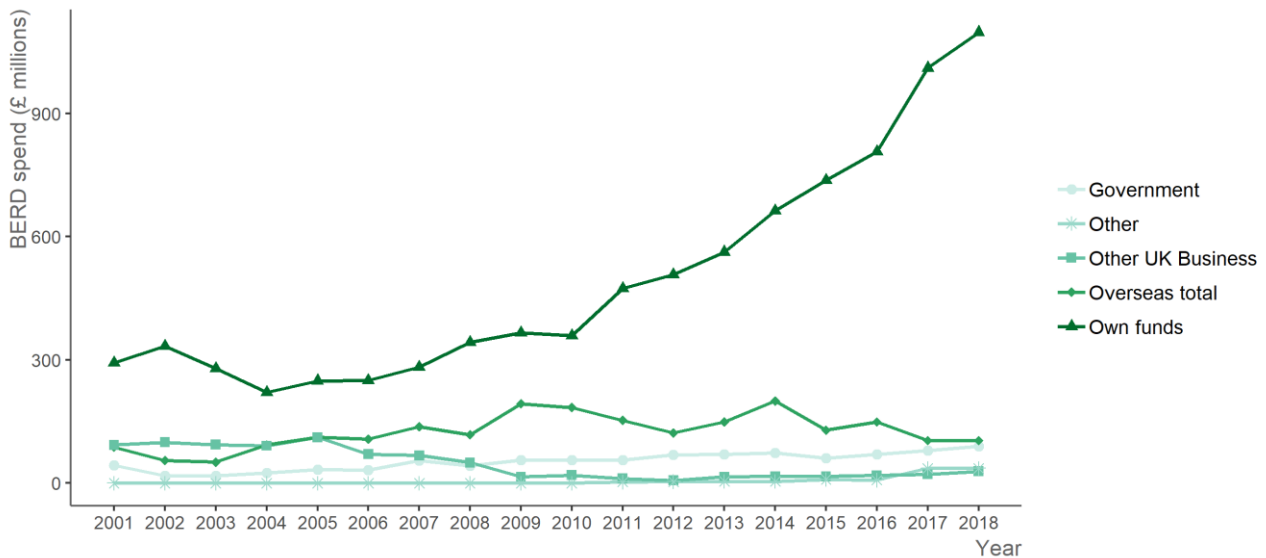
Since the series began in 2001, businesses' own funds have always represented the largest source of funding for R&D in businesses in Scotland. However since 2010, this has greatly increased – in 2010 businesses' own funds represented 58% of funds, growing to 81% in 2018 (Figure 6).

The proportion of overseas funding for R&D in businesses, which was the second largest source of funding for R&D in businesses in Scotland in 2018, has shown a general downward trend over recent years. In 2009, overseas funding accounted

² Number of people aged 16+ in employment (residence based), Annual Population Survey (Jan-Dec)

for 31% of all BERD expenditure in Scotland, whereas by 2018 it had decreased to 8% (Figure 6).

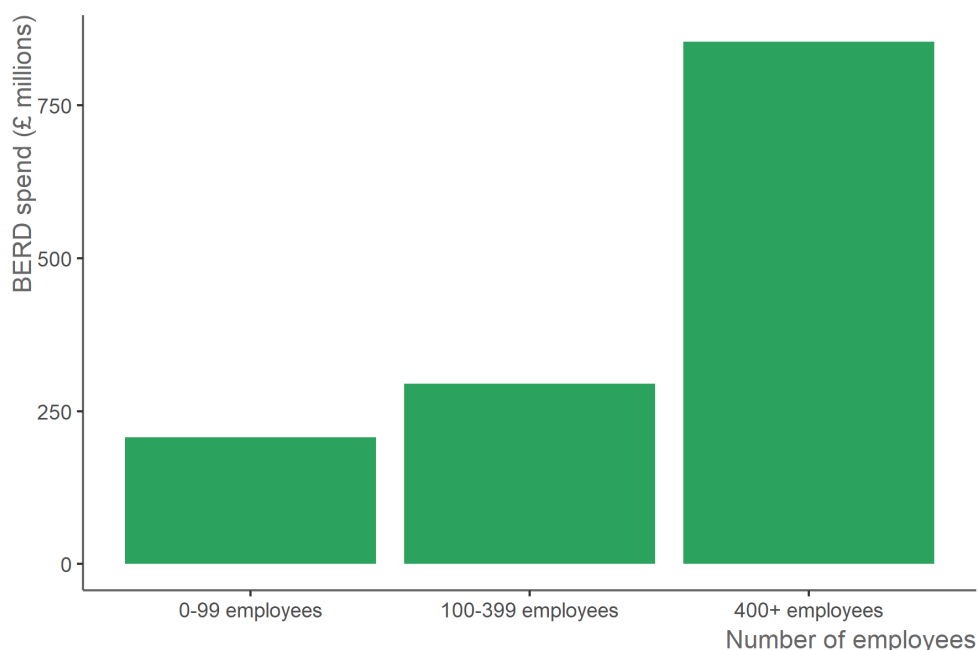
Figure 6. Businesses' own funds has been the fastest growing source of funds for BERD in Scotland



Average expenditure on R&D was highest within large businesses

In 2018, as in the previous years, there were fewer large businesses performing R&D, but they spent more: approximately 115 businesses with 400 or more employees performed R&D in Scotland, compared to 3,360 businesses with less than 100 employees. Businesses with 400 or more employees accounted for nearly two thirds of BERD expenditure (63.0%), whereas the more numerous smaller businesses (less than 100 employees) accounted for just 15.3% (Figure 7). As follows, businesses with 400 or more employees had a much higher average expenditure on R&D (£7.5 million per business) than businesses with less than 100 employees (£61 thousand per business).

Figure 7. Large businesses (400+ employees) accounted for almost two thirds of BERD expenditure in Scotland



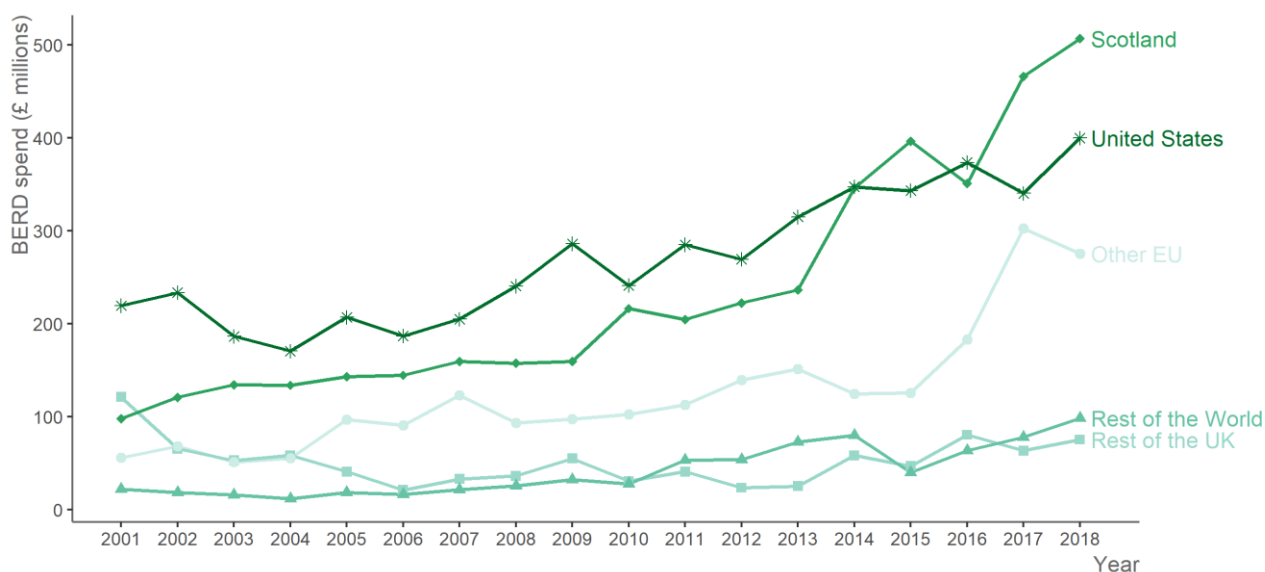
Spending on each of the broad product groups also varied between businesses of different sizes: the largest share of R&D spending in the smaller businesses (less than 100 employees) was on Services products (71.8%), whereas in businesses with 100-399 employees it was on Manufacturing products (71.3%).

Over half of R&D expenditure in Scotland was by foreign-owned businesses

Over half of R&D expenditure in Scotland was by foreign-owned business (57.0%) in 2018. Over the latest year BERD spending increased for all business ownership regions except for EU countries (excluding the UK), which experienced a decline (Figure 8).

Scottish-owned businesses accounted for 37.4% of Scottish BERD spending in 2018. United States-owned businesses accounted for the second highest proportion of Scottish BERD spending in 2018 (29.5%) (Figure 8).

Figure 8. United States-owned businesses accounted for the second largest proportion of BERD expenditure in Scotland in 2018

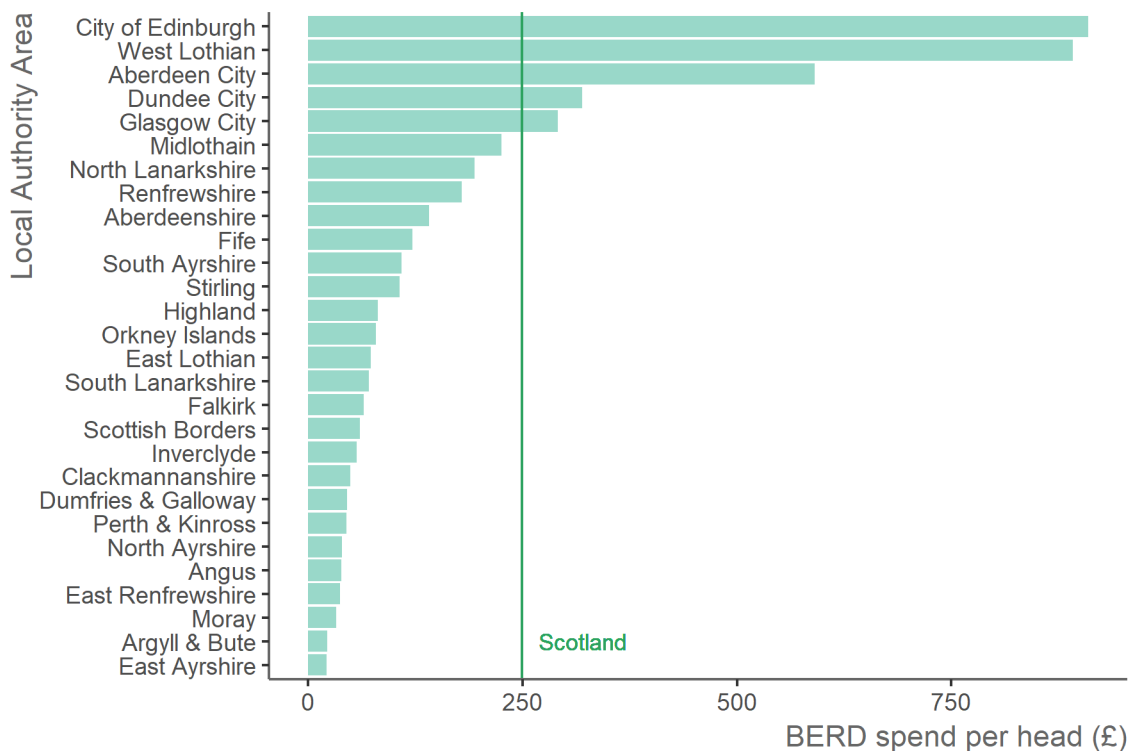


Businesses located in the City of Edinburgh accounted for more than a third of all Scottish BERD spending

Business spending on R&D in Scotland is not evenly distributed across the country: among the 32 local authority areas, City of Edinburgh was top, accounting for over a third of BERD expenditure in 2018 (34.8%). Businesses in Glasgow City and West Lothian accounted for a further 13.5% and 12.0% respectively. Together businesses in these three local authority areas comprised nearly two thirds of the total Scottish BERD expenditure (60.2%).

It is expected that more populated areas would have higher BERD spend than sparsely populated areas overall, so an alternative way of looking at the level of BERD spending between local authority areas is to calculate BERD spend per person. In 2018, businesses in the City of Edinburgh spent more per person than any other local authority area (£910) and West Lothian was a close second (£892) (Figure 10).

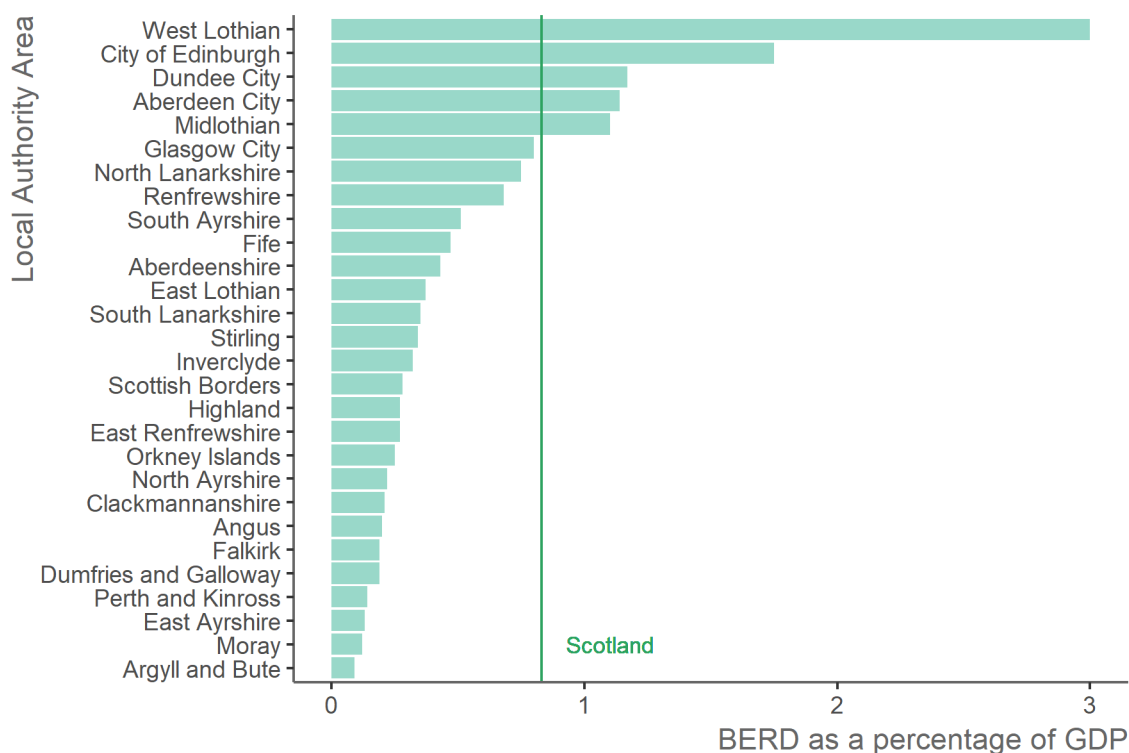
Figure 10. City of Edinburgh and West Lothian are top in terms of BERD spend per head of population in 2018



In 2018, BERD expenditure as a percentage of GDP was highest in West Lothian, where BERD spend accounted for 2.99% of GDP. City of Edinburgh ranked second among the local authority areas in terms of BERD spend as a percentage of GDP (1.75%). Dundee City, Aberdeen City and Midlothian were the only other Scottish local authority areas where BERD spend as a percentage of GDP was higher than the Scottish average (0.83%; Figure 11).

In terms of BERD employment, City of Edinburgh accounted for 28.5% of the Scottish total and Aberdeen City ranked second among the local authority areas with 11.2%.

Figure 11. BERD expenditure as a percentage of GDP was higher than the Scottish average in five local authority areas



BERD expenditure in Scotland has increased faster than in the UK

Scottish BERD expenditure makes up a relatively small proportion of the total UK BERD expenditure: in 2018, it accounted for 5.4%.

Over the latest year, BERD spend in Scotland experienced a greater increase than in the UK: 6.4% increase in real terms in Scotland vs 3.9% in the UK. Over the longer term, R&D spending by businesses in Scotland has also increased more rapidly than in the UK: in real terms Scottish BERD spend increased by 105.7% between 2007 and 2018, whereas in the UK BERD spending increased by 31.5%.

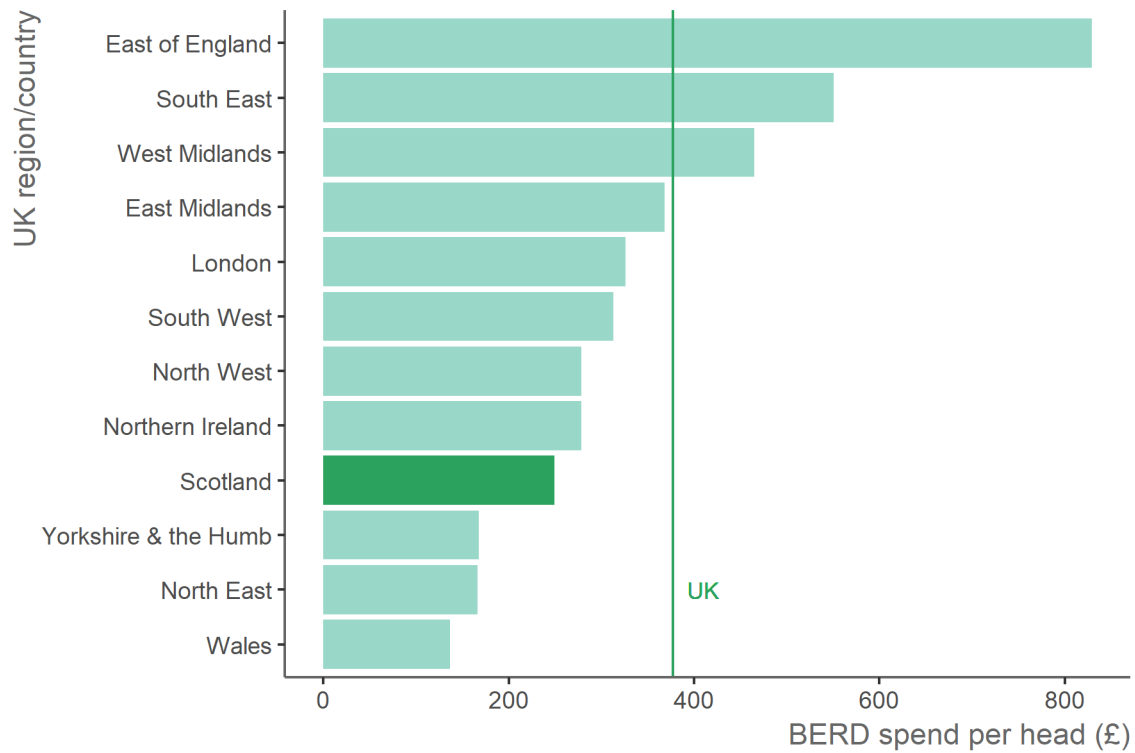
In 2018, BERD spend per person in Scotland was lower than for the UK (£249 vs £377). Similarly, BERD expenditure as a share of GDP in Scotland was lower than for the UK (0.83% vs 1.16%).

Scotland ranked eighth out of the twelve UK regions for BERD expenditure as a share of GDP in 2018

A large proportion of the UK’s business spending on R&D occurs in the East of England and the South East: these two regions had the highest BERD expenditure and the highest BERD spend per person in 2018. As in 2017, Scotland ranked eighth out of the twelve UK regions in terms of BERD spending as a share of GDP in 2018.

R&D spending per person was over three times higher in the East of England than in Scotland (£829 vs £249). Only Yorkshire and the Humber, North East and Wales had a lower spend per person than Scotland in 2018 (Figure 12).

Figure 12. Scotland ranked ninth out of the twelve UK regions for BERD spend per head of population in 2018



Background Notes

Definition of R&D

1. While R&D is often thought of as synonymous with high-tech firms that are on the cutting edge of new technology, many established consumer goods companies spend large sums of money, on a systematic basis, improving existing products.
2. The activities that are classified as R&D differ from company to company, but there are two basic models. In one model, the primary function of R&D is to develop new products. In the second model, the primary function of R&D is to discover and create new knowledge about scientific and technological topics with the purpose of uncovering and enabling development of new products, processes, and services.
3. The majority of the data presented in this release are sourced from the Business Enterprise R&D (BERD) survey conducted by the Office for National Statistics (ONS).
4. The ONS BERD survey follows the definition of research and development proposed by the Organisation for Economic Cooperation and Development (OECD) and published in the 'Frascati' Manual. According to the manual, R&D is defined as:
5. "creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge". R&D must contain an appreciable amount of novelty.
6. The Frascati Manual was originally written by, and for, the experts in OECD member countries that collect and issue national data on R&D. The definitions provided in this manual are internationally accepted and now serve as a common language for designing, collecting and using R&D data.

Sampling and Regional Estimates

7. The ONS BERD survey is an annual sample survey based on a continually updated register of R&D performers. The ONS 2018 BERD Statistical Bulletin is available at:

<https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/latest>

8. The Northern Ireland Research and Development 2018 statistics are published at:

<https://www.nisra.gov.uk/statistics/business-statistics/research-and-development>

9. The UK sample size is approximately 5,500 businesses (4,000 in GB and 1,500 in NI) - the response rate is normally around 92%. For Great Britain, a stratified random sample is used where the strata are defined as:

- businesses that have previously reported R&D expenditure above a threshold (greater than around £5.7 million (referred to as “large R&D performers”)).

- the remaining businesses identified as (or potential) R&D performers (referred to as “smaller R&D performers”) are allocated into strata using their employment and industry product group

10. The large R&D performers account for around 80% of total expenditure. Each of these large R&D performers is asked to name all the sites at which the business performed R&D and to estimate the R&D spend at that site, this expenditure is then allocated to the appropriate region. Regional data for the smaller R&D performers are estimated from sample returns.

11. A summary quality report for the ONS BERD survey is available at:
<https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/methodologies/ukbusinessenterpriseresearchanddevelopmentsurveyqmi>

Coverage

12. BERD includes business enterprise R&D performed in Scotland irrespective of the residence of the ultimate owner.

13. BERD excludes R&D funded by Scottish businesses that is performed overseas.

14. BERD excludes R&D carried out by higher education or government (including government departments, agencies and non-departmental public bodies; local authorities; and private non-profit organisations). Public corporations are counted as business enterprises.

15. Gross expenditure on R&D in Scotland in 2018 performed by all sectors of the economy (i.e. business, higher education and government) will be reported separately in spring 2020.

Product groups

16. The 400 large R&D performers are asked to select the industry product groups that best describe the type of R&D activities they undertake. In 2009, these product groups were updated to better reflect the new Standard Industrial Classification (SIC 2007) codes. For the smaller R&D performers, no product group data are collected in the BERD survey. However, the business' Standard Industrial Classification (SIC) codes are known from the Inter-Departmental Business Register (IDBR) and the assumption is made that the R&D expenditure is for the detailed product group corresponding to that SIC. This approach must be regarded as approximate since, in practice, an individual business can perform R&D for a range of product groups.

17. The introduction of SIC 2007 in the 2009 survey resulted in some businesses' R&D moving to a different product group than previously published. The largest impact was for businesses with Publishing activities, as these moved out of the manufacturing sector to be included under Miscellaneous business activities. There was an increase in the Other manufactured goods product group due to businesses being reclassified from Textiles, clothing and leather products, Pulp and paper products, Rubber and plastic products, Fabricated metal products, Machinery and equipment and Precision instruments and optical products.

18. The broad product groups, which consist of aggregations of the detailed product groups, were refined and expanded in 2002 in order to more accurately categorise the data within the manufacturing and services. Since 2011, sewerage and waste management is included in the Other total, when previously it was included in manufacturing.

Discontinuities in the data

19. The BERD survey questionnaire was redesigned from the 2007 survey to better reflect user needs and to address concerns about data quality and difficulty in completion. While the changes are an improvement, they could have an impact on the comparability of the data returned. Unfortunately, it is not possible to measure this impact.

Employment

20. Employment is calculated by respondents to the ONS BERD survey on the basis of 'full-time equivalent' staff average over the year. The categories of employment used are:

- Researchers (scientists and engineers) – engaged in the conception or creation of new knowledge, products, methods and systems
- Technicians – perform scientific and technical tasks normally under the supervision of researchers
- Other (administrative) – support staff including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects

Real terms

21. The cash values are converted to real terms using Treasury GDP deflators. The deflators are available at:

<https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-september-2019-quarterly-national-accounts>

Time period for which the results relate

22. Respondents to the ONS BERD survey were asked to make a return for the calendar year 2018 or the nearest 12 month period for which figures were available. Data for all years published were collected on the same basis.

Revisions Policy

23. BERD Scotland follows the Revisions Policy for the ONS BERD results – the latest (year t) results are provisional until two years later (year t+2).

Latest Revisions

24. The 2016 and 2017 data have been revised to take account of company misreporting and late returns.

25. One indication of the reliability of the main indicators in this release can be obtained by monitoring the size of revisions. Table 1 records the size and pattern of revisions that have occurred since 2012.

Table 1: Revisions between first publication and most recent estimate, figures in thousands

Year		Year in which data was published						Change in expenditure between first and latest estimate	
		2012	2013	2014	2015	2016	2017		2018
Year the data relates to	2012	£706,804	£709,047	£708,662					£1,858
	2013		£797,704	£896,528	£801,043				£3,339
	2014			£905,193	£874,020	£957,080			£51,887
	2015				£870,863	£952,626	£952,625		£81,762
	2016					£1,072,134	£1,074,544	£1,052,052	-£20,082
	2017						£1,247,278	£1,250,453	£3,175
	2018							£1,355,924	

26. There was a large revision in the 2015 data between the 2015 publication and the 2016 publication, which was partly due to a large increase in expenditure in the 'Miscellaneous business activities; Technical testing and analysis' Service product group.

Sampling variability

27. The estimates in this publication are based on a stratified sample drawn from the population of businesses known to actually perform R&D or are likely to be R&D performers. As with any sample survey, the R&D survey is subject to two types of possible errors:

- Sampling errors, due to only a sample of the population being surveyed. The difference between the estimates derived from the sample and value that would be obtained from a census is referred to as the sampling error. The Business Enterprise Research and Development Survey has provided standard errors information in the past but the methodology for estimation of the standard errors used to measure these is currently under review.
- Non-sampling errors – these include factors such as population coverage misreporting and non-response bias; these errors are

generally hard to quantify, because of the problems ensuring that businesses adhere to Frascati R&D definitions.

Analysis of R&D expenditure by SMEs (small and medium sized enterprises)

28. A table giving estimates of R&D expenditure by SMEs has been included. The SME definition used is that under European Commission Recommendation (2003/361/EC) of 1 January 2003, in which SMEs are defined as enterprises with less than 250 employees. In addition, a criterion of independence is used to exclude enterprises that are part of a larger enterprise group, so that only true SMEs are evaluated. This criterion is important in the context of R&D estimates, given that R&D activity is often carried out by smaller businesses which form part of larger, sometimes multinational businesses.

29. To apply the SME definition, historic information on business ownership has been obtained using that currently held on the IDBR. Caution should therefore be used in making comparisons over time.

Code of Practice for Official Statistics

30. This is a National Statistics publication. It has been produced to the high professional standards set out in the Code of Practice for Official Statistics.

31. In 2012, the Scottish Government Research and Development statistical publications were assessed by the United Kingdom Statistics Authority (UKSA) for compliance against the Code of Practice for Official Statistics. Details of the assessment are available at:

<https://www.statisticsauthority.gov.uk/archive/assessment/assessment/assessment-reports/assessment-report-189---statistics-on-scottish-businesses-and-research-and-development.pdf>

32. The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs
- are well explained and readily accessible
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

33. A UKSA assessment was also carried out for the ONS Research and Development statistical publications in 2012. Details of the assessment are available at:

<https://www.statisticsauthority.gov.uk/archive/assessment/assessment/assessment-reports/assessment-report-218---statistics-on-research-and-development.pdf>

Uses

34. Information from the Scottish BERD publication is used by the Scottish Government to monitor performance and inform economic policy. Some of the external users of R&D statistics published by the Scottish Government include the Enterprise Networks and Local Authorities. More information on uses can be found in the on-line [Research and Development Data Sources, Suitability and Uses Note](#).

User Engagement

35. If you would like to be kept informed about on-going developments with regards to the Scottish BERD publication and future releases of R&D data, please register to receive updates via [ScotStat](#) (under Economy topic pick R&D and Innovation).

36. There is also the ScotStat Scottish Economic Statistics Consultation Group (SESCG) – more information on the group is available at:

<https://www.gov.scot/groups/scottish-economic-statistics-consultation-group/>

If you would like to join SESCAG or provide feedback on the Scottish BERD publication, please contact us at:

Business and Innovation Statistics, Office of the Chief Economic Adviser, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU

Telephone: 0131 244 6813

Email: industrystatistics@gov.scot

37. There is also an ONS-led user community that may be of interest to R&D users. Details of this are available at the Business and Trade Statistics Community on the [StatsUserNet](#) website.

BUSINESS ENTERPRISE RESEARCH AND DEVELOPMENT SCOTLAND 2018

Table	Time Trend	Description
Table 1A	2001-2018	Expenditure on R&D performed within businesses in Scotland: Broad Product Groups in Current Prices
Table 1B	2001-2018	Expenditure on R&D performed within businesses in Scotland: Broad Product Groups in Real Terms (2018 prices)
Table 2A	2001-2018	Expenditure on R&D performed within businesses in Scotland: Detailed Product Groups
Table 2B	2001-2018	Expenditure on R&D performed within businesses in Scotland: Detailed Product Groups (2018 prices)
Table 3	2001-2018	Current and capital expenditure on R&D performed within businesses in Scotland
Table 4 2016	2016	Current and capital expenditure on R&D performed within businesses in Scotland: Broad Product Groups
Table 4 2017	2017	Current and capital expenditure on R&D performed within businesses in Scotland: Broad Product Groups
Table 4 2018	2018	Current and capital expenditure on R&D performed within businesses in Scotland: Broad Product Groups
Table 5 2016	2016	Current expenditure on R&D performed within businesses in Scotland: Broad Product Groups
Table 5 2017	2017	Current expenditure on R&D performed within businesses in Scotland: Broad Product Groups
Table 5 2018	2018	Current expenditure on R&D performed within businesses in Scotland: Broad Product Groups
Table 6 2016	2016	Extramural expenditure on R&D by businesses performing R&D in Scotland: Broad Product Groups
Table 6 2017	2017	Extramural expenditure on R&D by businesses performing R&D in Scotland: Broad Product Groups
Table 6 2018	2018	Extramural expenditure on R&D by businesses performing R&D in Scotland: Broad Product Groups
Table 7	2001-2018	Sources of funds for R&D performed within businesses in Scotland
Table 8 2016	2016	Sources of funds for R&D performed within businesses in Scotland: Broad Product Groups
Table 8 2017	2017	Sources of funds for R&D performed within businesses in Scotland: Broad Product Groups
Table 8 2018	2018	Sources of funds for R&D performed within businesses in Scotland: Broad Product Groups
Table 9A	2001-2018	Expenditure on R&D performed within businesses in Scotland: Local Authority Level
Table 9B	2001-2018	Employment on R&D performed within businesses in Scotland: Local Authority Level
Table 9C	2001-2018	Expenditure on R&D performed within businesses in Scotland as a percentage of GDP: Local Authority Level
Table 10 2016	2016	Expenditure on R&D performed within businesses in Scotland: Local Authority by Main Sectors
Table 10 2017	2017	Expenditure on R&D performed within businesses in Scotland: Local Authority by Main Sectors
Table 10 2018	2018	Expenditure on R&D performed within businesses in Scotland: Local Authority by Main Sectors
Table 11	2018	Expenditure on R&D performed in businesses by Government Office Region: Per head of population
Table 12	2001-2018	Expenditure on R&D performed in businesses by Government Office Region: Current prices
Table 13	2009-2018	Expenditure on R&D performed within businesses in Scotland by Broad Industry Group
Table 14	2001-2018	Employment on R&D performed within businesses in Scotland
Table 15 2016	2016	Employment on R&D performed within businesses in Scotland: Broad Product Groups
Table 15 2017	2017	Employment on R&D performed within businesses in Scotland: Broad Product Groups
Table 15 2018	2018	Employment on R&D performed within businesses in Scotland: Broad Product Groups
Table 16 2016	2016	Expenditure on civil and defence R&D performed within businesses in Scotland: Broad Product Groups
Table 16 2017	2017	Expenditure on civil and defence R&D performed within businesses in Scotland: Broad Product Groups
Table 16 2018	2018	Expenditure on civil and defence R&D performed within businesses in Scotland: Broad Product Groups
Table 17	2001-2018	Employment on civil and defence R&D performed within businesses in Scotland
Table 18 2016	2016	Expenditure on R&D performed within businesses in Scotland by total UK company employment sizebands: Broad Product Groups
Table 18 2017	2017	Expenditure on R&D performed within businesses in Scotland by total UK company employment sizebands: Broad Product Groups
Table 18 2018	2018	Expenditure on R&D performed within businesses in Scotland by total UK company employment sizebands: Broad Product Groups
Table 19 2016	2016	Employment on R&D performed within businesses in Scotland by total UK company employment sizebands: Broad Product Groups
Table 19 2017	2017	Employment on R&D performed within businesses in Scotland by total UK company employment sizebands: Broad Product Groups
Table 19 2018	2018	Employment on R&D performed within businesses in Scotland by total UK company employment sizebands: Broad Product Groups
Table 20 2016	2016	Number of businesses performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups
Table 20 2017	2017	Number of businesses performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups
Table 20 2018	2018	Number of businesses performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups
Table 21 2016	2016	Average expenditure spend on R&D within businesses performing R&D in Scotland by total UK company employment sizebands: Broad Product Groups
Table 21 2017	2017	Average expenditure spend on R&D within businesses performing R&D in Scotland by total UK company employment sizebands: Broad Product Groups
Table 21 2018	2018	Average expenditure spend on R&D within businesses performing R&D in Scotland by total UK company employment sizebands: Broad Product Groups
Table 22	2001-2018	Expenditure and employment on R&D performed within businesses in Scotland by country of ownership of business performing R&D
Table 23 2016	2016	Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Groups
Table 23 2017	2017	Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Groups
Table 23 2018	2018	Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Groups
Table 24 2016	2016	Number of businesses performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups
Table 24 2017	2017	Number of businesses performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups
Table 24 2018	2018	Number of businesses performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups
Table 25 2016	2016	Average expenditure spend on R&D within businesses performing R&D in Scotland country of ownership of business performing R&D: Broad Product Groups
Table 25 2017	2017	Average expenditure spend on R&D within businesses performing R&D in Scotland country of ownership of business performing R&D: Broad Product Groups
Table 25 2018	2018	Average expenditure spend on R&D within businesses performing R&D in Scotland country of ownership of business performing R&D: Broad Product Groups
Table 26	2009-2018	Expenditure on R&D performed within businesses in Scotland: Growth Sector
Table 27	2009-2018	Employment on R&D performed within businesses in Scotland: Growth Sector
Table 28	2006-2018	Expenditure on R&D performed in Businesses in Scotland by small and medium size enterprises
Table 29 2016	2016	Expenditure and Employment on R&D Performed in UK Businesses: Top 100 Enterprise Groups
Table 29 2017	2017	Expenditure and Employment on R&D Performed in UK Businesses: Top 100 Enterprise Groups
Table 29 2018	2018	Expenditure and Employment on R&D Performed in UK Businesses: Top 100 Enterprise Groups
Table 30	2010-2018	BERD expenditure as a share of turnover within businesses in Scotland: Sector and Division

Table 1A
Expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2001 to 2018¹
Current Prices

	£ thousands																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Manufacturing	453,440	426,576	367,555	359,558	415,191	380,637	446,654	412,160	444,825	421,098	447,288	469,945	485,035	521,278	515,138	590,030	593,752	675,505
Chemicals	180,469	177,405	160,126	153,483	173,096	136,059	154,602	156,282	169,397	155,658	123,997	127,844	136,716	158,840	167,441	166,551	178,812	179,878
Mechanical Engineering	51,819	63,272	48,285	53,665	23,264	21,491	26,850	19,037	27,278	..	33,854	24,923	42,358	39,555	47,058	39,256	49,692	60,186
Electrical Machinery	57,695	64,960	48,230	56,770	98,006	92,531	110,326	111,954	108,353	106,122	106,133	124,135	151,144	173,465	155,152	220,681	214,894	246,226
Transport Equipment & Aerospace	3,779	4,916	6,245	6,998	6,528	5,031	10,149	5,381	15,738	..	7,268	9,787	7,080	6,681	11,689	26,127	27,867	34,404
Other Manufacturing	159,678	116,023	104,670	88,642	114,298	125,525	144,727	119,506	124,059	124,966	176,037	183,257	147,737	142,736	133,798	137,415	122,487	154,812
Services	50,016	60,757	56,272	56,017	71,053	58,705	55,100	93,185	110,596	132,397	165,980	177,043	213,851	332,568	360,819	350,108	562,603	606,803
Other	13,213	19,377	17,438	14,804	20,215	20,914	40,843	48,165	75,744	65,323	83,430	61,673	102,156	103,234	76,669	111,914	94,098	73,616
Agriculture, hunting & forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,249	8,254	12,717	4,701
Extractive industries	11,270	17,701	14,701	12,225	18,227	19,136	30,958	34,007	53,805	38,560	54,607	33,878	58,118	49,005	38,395	61,339	39,848	33,869
Electricity, gas & water supply; Waste management ²	..	..	..	..	..	..	..	..	..	..	..	..	22,354	30,588	19,945	24,590	20,121	12,242
Construction	..	..	..	1,556	1,085	327	485	..	999	350	1,441	9,380	..	..	12,080	17,732	21,413	22,805
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details
2. From 2009 onwards. Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other Manufacturing
3. r denotes revised figures
4. .. denotes disclosive value
5. - denotes nil figures unavailable or too small to display
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 1B
Expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2001 to 2018¹
In Real Terms (2018 prices²)

	£ thousands																	
	2001 ^r	2002 ^r	2003 ^r	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^r	2009 ^r	2010 ^r	2011 ^r	2012 ^r	2013 ^r	2014 ^r	2015 ^r	2016 ^r	2017 ^r	2018
Manufacturing	639,390	587,863	496,540	472,369	532,476	474,682	542,579	488,219	518,365	482,452	504,754	519,620	526,153	557,681	546,407	611,370	605,011	675,505
Chemicals	254,477	244,481	216,319	201,638	221,993	169,675	187,805	185,122	197,402	178,338	139,928	141,358	148,306	169,933	177,605	172,575	182,203	179,878
Mechanical Engineering	73,069	87,195	65,230	70,502	29,836	26,801	32,616	22,550	31,788	..	38,203	27,557	45,949	42,317	49,914	40,676	50,634	60,186
Electrical Machinery	81,355	89,521	65,155	74,582	125,691	115,393	134,020	132,614	126,266	121,584	119,769	137,257	163,957	185,579	164,570	228,662	218,969	246,226
Transport Equipment & Aerospace	5,329	6,775	8,437	9,194	8,372	6,274	12,329	6,374	18,340	..	8,202	10,822	7,680	7,148	12,399	27,072	28,395	34,404
Other Manufacturing	225,160	159,891	141,402	116,453	146,585	156,539	175,809	141,559	144,569	143,174	198,654	202,628	160,261	152,704	141,919	142,385	124,810	154,812
Services	70,527	83,729	76,019	73,592	91,124	73,209	66,934	110,381	128,880	151,687	187,305	195,757	231,980	355,793	382,721	362,771	573,272	606,803
Other	18,631	26,703	23,557	19,449	25,925	26,081	49,615	57,053	88,266	74,841	94,149	68,192	110,816	110,443	81,323	115,962	95,882	73,616
Agriculture, hunting & forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,628	8,553	12,958	4,701
Extractive industries	15,892	24,394	19,860	16,061	23,376	23,864	37,607	40,283	62,700	44,178	61,623	37,459	63,045	52,427	40,726	63,557	40,604	33,869
Electricity, gas & water supply; Waste management ³	..	..	..	..	..	..	..	..	..	..	..	..	24,249	32,724	21,156	25,479	20,503	12,242
Construction	..	..	..	2,044	1,391	408	589	..	1,164	401	1,626	10,372	..	..	12,813	18,373	21,819	22,805
Grand Total	728,548	698,295	596,117	565,410	649,525	573,971	659,126	655,653	735,511	708,980	786,208	783,571	868,951	1,023,917	1,010,449	1,090,102	1,274,165	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details

2. HM Treasury GDP deflators are used to convert the data to 2018 prices

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waster management, when previously it was included in Other Manufacturing

4. r denotes revised figures

5. .. Denotes disclosive value

6. - denotes nil figures unavailable or too small to display

7. Totals may not sum due to rounding

[Return to Index](#)

Table 2A
Expenditure on R&D performed within businesses in Scotland: Current Prices
Detailed Product Groups, 2001 to 2018¹

	£ thousands																	% of 2018	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ²	2017 ³	2018	Total
Manufacturing																			
Food products and beverages; Tobacco products	2,367	6,147	3,120	3,762	5,176	7,490	7,689	7,000	9,871	9,919	15,517	13,514	18,040	16,397	12,555	23,755	24,069	21,551	1.6%
Textiles, clothing and leather products	1,461	1,357	1,754	5,661	946	1,217	2,246	1,257	1,085	1,925	2,086	3,883	3,313	6,050	5,268	2,590	4,954	4,537	0.3%
Pulp, paper and paper products; Printing, Wood and straw products	..	775	1,855	2,075	1,520	1,157	3,023	2,646	1,363	1,767	887	1,979	2,718	2,344	2,362	3,118	4,025	2,825	0.2%
Refined petroleum products and coke oven products	..	..	..	..	..	..	..	..	..	..	..	..	..	..	460	..	..	..	..
Chemicals and chemical products	27,315	18,996	16,065	16,742	13,942	11,208	11,917	7,270	4,886	9,436	6,557	6,645	..	..	..	50,562	15,154	16,049	1.2%
Pharmaceuticals	153,154	158,409	144,062	136,741	159,154	124,851	142,685	149,012	164,510	146,222	117,439	121,199	..	..	..	115,989	163,658	163,829	12.1%
Rubber and plastic products	1,141	2,304	4,551	1,584	2,989	3,183	3,268	3,761	3,448	4,752	4,450	4,467	4,799	5,079	7,633	8,175	5,099	6,719	0.5%
Other non-metallic mineral products	..	..	..	..	1,107	648	661	68	633	620	570	532	..	782	481	607	..	1,180	0.1%
Casting of iron and steel	..	594	..	..	..	..	..	..	..	..	..	..	145	336	..	..	..	..	..
Non-ferrous metals	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	452	378	..	..
Fabricated metal products except machinery and equipment	5,381	8,619	5,372	3,976	3,740	3,522	5,505	3,857	7,956	5,265	11,602	4,831	13,528	7,111	7,169	6,061	14,102	..	..
Machinery and equipment	46,438	54,653	42,913	49,689	19,523	17,969	21,345	15,179	19,322	21,159	22,252	20,091	28,830	32,444	39,889	33,195	35,590	..	..
Computers and peripheral equipment	3,497	4,016	1,409	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Electrical equipment	20,142	15,682	6,662	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Consumer electronics and communication equipment	34,056	45,262	40,158	41,096	48,056	43,440	44,404	51,586	56,352	60,943	66,193	74,490	94,836	111,155	100,368	136,900	135,235	144,117	10.6%
Precision instruments and optical products; photographic equipment	150,745	103,408	90,645	73,580	99,677	110,680	123,872	103,251	98,851	90,123	126,655	130,603	93,524	72,991	63,204	83,259	61,396	83,489	6.2%
Motor vehicles and parts	2,474	2,222	4,498	1,998	3,828	2,944	6,258	2,302	1,990	3,332	..	4,182	..	1,931	3,406	18,054	9,978	8,979	0.7%
Other transport equipment	..	..	..	1,270	904	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Shipbuilding	..	..	..	..	..	..	1,596	..	..	..	2,971	2,474	..	..	..	..	..	..	..
Aerospace	..	..	..	..	..	..	..	..	11,524	..	..	3,131	3,078	3,234	6,605	6,219	9,497	11,970	0.9%
Other manufactured goods	1,536	883	1,219	834	2,451	864	1,239	901	8,189	14,944	22,285	26,710	24,756	38,236	40,557	13,578	17,721	32,521	2.4%
Sewerage, waste management, remediation activities ²	..	..	..	..	..	34	108	35	..	..	..	..	..	..	..	..	..	..	..
Services																			
Wholesale and retail trade	1,500	3,138	1,422	2,380	2,567	4,085	753	5,369	6,954	10,732	10,797	8,805	5,786	8,041	11,004	18,380	19,104	13,387	1.0%
Transport and storage, incl. postal and courier activities	..	..	..	..	291	..	..	..	..	399	3,200	..	708	..	..	..	2,017	3,041	0.2%
Telecommunications	..	..	..	10,454	..	..	..	..	4,586	1,513	2,566	..	1,706	1,497	10,626	..	3,386	5,160	0.4%
Miscellaneous business activities; Technical testing and analysis	9,963	13,822	9,697	10,974	18,762	12,773	15,194	31,018	32,242	38,553	44,305	55,883	76,227	140,468	131,635	123,350	310,960	335,654	24.8%
Computer programming and information services activities	16,283	18,281	21,301	25,587	27,574	24,911	25,143	30,190	33,981	32,350	46,187	71,749	67,658	74,665	86,573	40,761	51,294	61,941	4.6%
Software development ⁷	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56,648	71,637	79,684	5.9%
Research and development services	15,324	18,672	17,543	9,899	9,411	5,189	6,284	24,396	30,414	45,108	54,968	36,602	44,565	46,503	57,264	62,560	55,801	60,578	4.5%
Public administration	..	1,531	1,016	2,182	1,993	3,350	2,716	799	..	3,741	3,957	2,832	17,201	..	..	40,887	48,404	47,356	3.5%
Other																			
Agriculture, hunting and forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,249	8,254	12,717	4,701	0.3%
Extractive Industries	11,270	17,701	14,701	12,225	18,227	19,136	30,958	34,007	53,805	38,560	54,607	33,878	58,118	49,005	38,395	61,339	39,848	33,869	2.5%
Electricity, gas and water supply	..	..	..	..	..	..	..	..	..	..	..	..	..	29,894	19,224	24,304	17,412	10,472	0.8%
Sewerage, waste management, remediation activities	..	..	..	..	..	..	..	..	..	435	..	..	..	695	721	286	2,708	1,771	0.1%
Construction	..	..	..	1,556	1,085	327	485	..	999	350	1,441	9,380	..	..	12,080	17,732	21,413	22,805	1.7%
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924	100.0%

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. ¹ denotes revised figures.
4. .. denotes disclosive value.
5. - denotes nil. figures unavailable or too small to display.
6. Totals may not sum due to rounding
7. Prior to 2016 Software development was included in Computer programming and information services activities

Table 2B
Expenditure on R&D performed within businesses in Scotland: in Real terms (2018 prices)
Detailed Product Groups, 2001 to 2018¹

	£ thousands																	% of 2018 Total		
	2001 ^f	2002 ^f	2003 ^f	2004 ^f	2005 ^f	2006 ^f	2007 ^f	2008 ^f	2009 ^f	2010 ^f	2011 ^f	2012 ^f	2013 ^f	2014 ^f	2015 ^f	2016 ^f	2017 ^f	2018		
Manufacturing																				
Food products and beverages; Tobacco products	3,338	8,471	4,215	4,942	6,638	9,341	9,340	8,292	11,503	11,364	17,511	14,942	19,569	17,542	13,317	24,614	24,525	21,551	1.6%	
Textiles, clothing and leather products	2,060	1,870	2,370	7,437	1,213	1,518	2,728	1,489	1,264	2,205	2,354	4,293	3,594	6,472	5,588	2,684	5,048	4,537	0.3%	
Pulp, paper and paper products; Printing, Wood and straw products	..	1,068	2,506	2,726	1,949	1,443	3,672	3,134	1,588	2,024	1,001	2,188	2,948	2,508	2,505	3,231	4,101	2,825	0.2%	
Refined petroleum products and coke oven products	-	..	..	..	..	..	..	..	..	..	..	..	..	..	488	..	..	..	..
Chemicals and chemical products	38,517	26,178	21,703	21,995	17,880	13,977	14,476	8,612	5,694	10,811	7,399	7,347	52,391	15,441	16,049	1.2%
Pharmaceuticals	215,960	218,303	194,617	179,643	204,112	155,698	173,329	176,510	191,707	167,527	132,527	134,010	120,184	166,761	163,829	12.1%
Rubber and plastic products	1,609	3,175	6,148	2,081	3,833	3,969	3,970	4,455	4,018	5,444	5,022	4,939	5,206	5,434	8,096	8,471	5,196	6,719	0.5%	
Other non-metallic mineral products	1,420	808	803	81	738	710	643	588	..	837	510	629	..	1,180	..	0.1%
Casting of iron and steel	..	819	157	359
Non-ferrous metals	468	385
Fabricated metal products except machinery and equipment	7,588	11,878	7,257	5,223	4,796	4,392	6,687	4,569	9,271	6,032	13,093	5,342	14,675	7,608	7,604	6,280	14,369
Machinery and equipment	65,482	75,317	57,972	65,279	25,038	22,409	25,929	17,980	22,516	24,242	25,111	22,215	31,274	34,710	42,310	34,396	36,265
Computers and peripheral equipment	4,931	5,534	1,903
Electrical equipment	28,402	21,611	9,000
Consumer electronics and communication equipment	48,022	62,375	54,251	53,990	61,631	54,173	53,940	61,106	65,668	69,822	74,697	82,364	102,876	118,917	106,460	141,851	137,799	144,117	10.8%	
Precision instruments and optical products; photographic equipment	212,564	142,506	122,455	96,666	127,834	138,026	150,475	122,305	115,193	103,254	142,927	144,408	101,452	78,088	67,040	86,270	62,560	83,489	6.2%	
Motor vehicles and parts	3,489	3,062	6,076	2,625	4,909	3,671	7,602	2,727	2,319	3,817	..	4,624	..	2,066	3,613	18,707	10,167	8,979	0.7%	
Other transport equipment	1,637	1,138
Shipbuilding	1,939	1,960	..	3,040	3,353	2,736
Aerospace	..	..	..	..	..	..	..	..	13,429	..	..	3,462	3,339	3,460	7,006	6,444	9,677	11,970	0.9%
Other manufactured goods	2,166	1,217	1,647	1,096	3,143	1,077	1,505	1,067	9,543	17,121	25,148	29,533	26,855	40,906	43,019	14,069	18,057	32,521	2.4%	
Sewerage, waste management, remediation activities ²	-	42	131	41
Services																				
Wholesale and retail trade	2,115	4,324	1,921	3,127	3,292	5,094	915	6,360	8,104	12,296	12,184	9,736	6,277	8,603	11,672	19,045	19,466	13,387	1.0%	
Transport and storage, incl. postal and courier activities	..	..	..	..	373	..	..	..	..	457	3,611	..	768	..	..	..	2,055	3,041	0.2%
Telecommunications	..	..	..	..	13,407	..	..	..	5,344	1,733	2,896	..	1,851	1,602	11,271	..	3,450	5,160	0.4%
Miscellaneous business activities; Technical testing and analysis	14,049	19,048	13,100	14,417	24,062	15,929	18,457	36,742	37,572	44,170	49,997	61,790	82,689	150,278	139,625	127,811	316,857	335,654	24.8%	
Computer programming and information services activities	22,960	25,193	28,776	33,615	35,363	31,066	30,543	35,761	39,599	37,063	52,121	79,333	73,394	79,879	91,828	42,235	52,267	61,941	4.6%	
Software development ⁷	58,697	72,995	79,684	5.9%
Research and development services	21,608	25,732	23,699	13,005	12,069	6,471	7,634	28,898	35,442	51,680	62,030	40,471	48,343	49,751	60,740	64,823	56,859	60,578	4.5%	
Public administration	..	2,110	1,373	2,867	2,556	4,178	3,299	946	..	4,286	4,465	3,131	18,659	..	..	42,366	49,322	47,356	3.5%
Other																				
Agriculture, hunting and forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,628	8,553	12,958	4,701	0.3%
Extractive Industries	15,892	24,394	19,860	16,061	23,376	23,864	37,607	40,283	62,700	44,178	61,623	37,459	63,045	52,427	40,726	63,557	40,604	33,869	2.5%	
Electricity, gas and water supply	..	..	..	..	..	..	..	..	..	..	..	..	..	31,982	20,391	25,183	17,742	10,472	0.8%
Sewerage, waste management, remediation activities	..	..	..	..	..	..	..	..	..	498	..	..	..	744	765	296	2,759	1,771	0.1%
Construction	..	..	..	2,044	1,391	408	589	..	1,164	401	1,626	10,372	..	..	12,813	18,373	21,819	22,805	1.7%
Grand Total	728,548	698,295	596,117	565,410	649,525	573,971	659,126	655,653	735,511	708,980	786,208	783,571	868,951	1,023,917	1,010,449	1,090,102	1,274,165	1,355,924	100.0%	

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. ^f denotes revised figures.
4. .. denotes disclosive value.
5. - denotes nil. figures unavailable or too small to display.
6. Totals may not sum due to rounding
7. Prior to 2016 Software development was included in Computer programming and information services activities

[Return to Index](#)

Table 3
Current and capital expenditure on R&D performed within businesses in Scotland:
2001 to 2018¹

	£ thousands																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Capital total	54,202	34,621	20,569	31,116	40,739	33,175	31,589	34,052	50,185	45,121	42,670	38,372	42,110	91,677	64,792	92,062	155,509	154,590
of which:																		
Land and buildings	19,833	11,235	2,538	4,104	9,029	6,842	5,101	5,630	10,945	5,372	7,782	4,987	7,590	13,242	9,139	17,560	9,531	9,258
Plant and machinery	34,369	23,386	18,030	27,012	31,710	26,333	26,488	28,423	39,240	39,749	34,888	33,385	34,520	78,434	55,652	74,502	145,978	145,332
Current total	462,467	472,088	420,696	399,262	465,720	427,080	511,007	519,458	580,980	573,697	654,028	670,289	758,933	865,403	887,833	959,990	1,094,943	1,201,334
of which:																		
Salaries and wages	217,373	229,791	219,788	224,042	259,707	220,549	268,298	273,265	292,642	321,573	335,641	365,657	416,374	510,606	532,605	524,185	570,969	621,304
Other	245,094	242,298	200,908	175,221	206,013	206,531	242,708	246,193	288,338	252,124	318,387	304,633	342,558	354,797	355,228	435,805	523,974	580,030
Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. r denotes revised figures.
3. Totals may not sum due to rounding.

[Return to Index](#)

Table 4 (2016)
Current and capital expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2016^{r,2}

£ thousands					
	Capital Expenditure	Current Expenditure			Total
		Salaries and Wages	Other	Total	
Manufacturing	50,147	258,717	281,166	539,883	590,030
Chemicals	8,239	68,976	89,336	158,312	166,551
Mechanical engineering	2,782	19,391	17,082	36,474	39,256
Electrical machinery	31,662	99,756	89,263	189,019	220,681
Transport equipment & aerospace	1,580	11,340	13,208	24,548	26,127
Other manufacturing	5,884	59,254	72,277	131,531	137,415
Services	30,614	211,545	107,949	319,494	350,108
Other	11,301	53,923	46,690	100,613	111,914
Agriculture, hunting & forestry; Fishing	736	2,625	4,892	7,518	8,254
Extractive industries	3,208	37,004	21,127	58,131	61,339
Electricity, gas & waste supply; waste management ³	6,535	8,759	9,296	18,055	24,590
Construction	822	5,535	11,375	16,909	17,732
Grand Total	92,062	524,185	435,805	959,990	1,052,052

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 4 (2017)
Current and capital expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2017^{r,2}

	Capital Expenditure	Current Expenditure			Total
		Salaries and Wages	Other	Total	
Manufacturing	36,462	261,277	296,013	557,289	593,752
Chemicals	2,270	66,390	110,153	176,543	178,812
Mechanical engineering	2,501	26,448	20,743	47,191	49,692
Electrical machinery	24,410	101,547	88,936	190,484	214,894
Transport equipment & aerospace	1,278	11,739	14,850	26,589	27,867
Other manufacturing	6,003	55,153	61,330	116,483	122,487
Services	111,618	265,897	185,087	450,984	562,603
Other	7,429	43,795	42,874	86,670	94,098
Agriculture, hunting & forestry; Fishing	1,160	3,551	8,007	11,557	12,717
Extractive industries	193	18,574	21,081	39,655	39,848
Electricity, gas & waste supply; waste management ³	5,022	10,616	4,482	15,098	20,121
Construction	1,054	11,054	9,304	20,359	21,413
Grand Total	155,509	570,969	523,974	1,094,943	1,250,453

£ thousands

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 4 (2018)
Current and capital expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2018¹

£ thousands					
	Capital Expenditure	Current Expenditure			Total
		Salaries and Wages	Other	Total	
Manufacturing	38,478	292,380	344,648	637,028	675,505
Chemicals	2,504	65,735	111,639	177,374	179,878
Mechanical engineering	3,510	30,925	25,750	56,675	60,186
Electrical machinery	22,630	115,401	108,195	223,596	246,226
Transport equipment & aerospace	1,409	13,295	19,700	32,995	34,404
Other manufacturing	8,425	67,024	79,363	146,387	154,812
Services	111,225	295,805	199,772	495,578	606,803
Other	4,887	33,119	35,610	68,729	73,616
Agriculture, hunting & forestry; Fishing	287	1,406	3,008	4,413	4,701
Extractive industries	93	17,057	16,719	33,775	33,869
Electricity, gas & waste supply; waste management ³	2,745	5,264	4,234	9,497	12,242
Construction	1,761	9,393	11,651	21,043	22,805
Grand Total	154,590	621,304	580,030	1,201,334	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 5 (2016)
Current expenditure on R&D performed within business in Scotland:
Broad Product Groups, 2016^{r,2}

	Current Expenditure			£ thousands
	Basic Research	Applied Research	Experimental Development	Total
Manufacturing	13,938	266,308	259,637	539,883
Chemicals	2,528	57,964	97,820	158,312
Mechanical engineering	2,344	17,955	16,175	36,474
Electrical machinery	828	108,822	79,369	189,019
Transport equipment & aerospace	959	16,960	6,628	24,548
Other manufacturing	7,279	64,607	59,644	131,531
Services	52,976	143,947	122,571	319,494
Other	5,598	55,927	39,088	100,613
Agriculture, hunting & forestry; Fishing	..	..	5,253	7,518
Extractive industries	3,547	45,831	8,753	58,131
Electricity, gas & waste supply; waste management ³	..	..	16,346	18,055
Construction	1,274	6,899	8,736	16,909
Grand Total	72,512	466,182	421,295	959,990

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum to rounding.

[Return to Index](#)

Table 5 (2017)
Current expenditure on R&D performed within business in Scotland:
Broad Product Groups, 2017^{r,2}

	£ thousands			
	Current Expenditure			Total
	Basic Research	Applied Research	Experimental Development	
Manufacturing	12,762	255,013	289,514	557,289
Chemicals	..	45,376	..	176,543
Mechanical engineering	2,036	25,020	20,135	47,191
Electrical machinery	454	117,838	72,191	190,484
Transport equipment & aerospace	..	10,715	..	26,589
Other manufacturing	8,368	56,064	52,051	116,483
Services	72,462	180,818	197,705	450,984
Other	4,310	40,535	41,825	86,670
Agriculture, hunting & forestry; Fishing	..	3,489	..	11,557
Extractive industries	3,823	22,414	13,418	39,655
Electricity, gas & waste supply; waste management ³	193	2,083	12,823	15,098
Construction	..	12,549	..	20,359
Grand Total	89,533	476,366	529,044	1,094,943

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum to rounding.

[Return to Index](#)

Table 5 (2018)
Current expenditure on R&D performed within business in Scotland:
Broad Product Groups, 2018²

	Current Expenditure			£ thousands
	Basic Research	Applied Research	Experimental Development	Total
Manufacturing	14,250	286,235	336,542	637,028
Chemicals	462	44,078	132,834	177,374
Mechanical engineering	2,182	30,600	23,894	56,675
Electrical machinery	591	126,046	96,959	223,596
Transport equipment & aerospace	2,403	17,092	13,500	32,995
Other manufacturing	8,613	68,419	69,355	146,387
Services	73,986	195,615	225,977	495,578
Other	4,817	28,460	35,452	68,729
Agriculture, hunting & forestry; Fishing	0	1,525	2,888	4,413
Extractive industries	3,708	16,390	13,677	33,775
Electricity, gas & waste supply; waste management ³	240	585	8,672	9,497
Construction	869	9,960	10,215	21,043
Grand Total	93,053	510,310	597,971	1,201,334

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.
2. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.
3. .. Denotes disclosive value.
4. - denotes nil. Figures unavailable or too small to display.

[Return to Index](#)

Table 6 (2016)
Extramural expenditure on R&D by businesses performing R&D in Scotland:
Broad Product Groups, 2016^{r,2}

	£ thousands		
	United Kingdom	Overseas	Total
Manufacturing	17,385	144,645	162,029
Chemicals	808	2,600	3,408
Mechanical engineering	4,682	4,837	9,519
Electrical machinery	216	133,446	133,662
Transport equipment & aerospace	381	424	805
Other manufacturing	11,298	3,338	14,636
Services	11,295	23,824	35,119
Other	5,848	3,670	9,519
Agriculture, hunting & forestry; Fishing	1,952	1,261	3,213
Extractive industries	3,229	1,471	4,701
Electricity, gas & water supply; waste management ³	..	..	..
Construction	..	..	..
Grand Total	34,528	172,139	206,667

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum to rounding.

[Return to Index](#)

Table 6 (2017)
Extramural expenditure on R&D by businesses performing R&D in Scotland:
Broad Product Groups, 2017^{r,2}

	£ thousands		
	United Kingdom	Overseas	Total
Manufacturing	18,253	188,169	206,422
Chemicals	684	2,353	3,037
Mechanical engineering	..	..	..
Electrical machinery	..	..	..
Transport equipment & aerospace	702	979	1,681
Other manufacturing	1,553	3,285	4,838
Services	4,167	20,430	24,597
Other	4,081	4,713	8,793
Agriculture, hunting & forestry; Fishing	2,530	1,726	4,256
Extractive industries	1,513	2,827	4,340
Electricity, gas & water supply; waste management ³	..	..	..
Construction	..	..	..
Grand Total	26,501	213,311	239,812

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. denotes disclosive value.

5. - denotes nil, figures unavailable or too small to display.

6. Totals may not sum to rounding.

[Return to Index](#)

Table 6 (2018)
Extramural expenditure on R&D by businesses performing R&D in Scotland:
Broad Product Groups, 2018¹

	£ thousands		
	United Kingdom	Overseas	Total
Manufacturing	21,673	202,245	223,919
Chemicals	301	2,254	2,555
Mechanical engineering	4,679	3,191	7,870
Electrical machinery	..	..	207,117
Transport equipment & aerospace	..	..	894
Other manufacturing	2,357	3,125	5,482
Services	8,330	21,374	29,704
Other	6,812	4,714	11,526
Agriculture, hunting & forestry; Fishing	..	..	..
Extractive industries	..	..	..
Electricity, gas & water supply; waste management ²	..	..	4,055
Construction	216	65	281
Grand Total	36,815	228,334	265,149

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
3. .. denotes disclosive value.
4. - denotes nil, figures unavailable or too small to display.
5. Totals may not sum to rounding.

[Return to Index](#)

Table 7
Sources of funds for R&D performed within businesses in Scotland:
2001 to 2018

	£ thousands																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Government	43,406	18,313	17,531	25,197	33,184	32,237	54,705	42,590	56,313	56,681	56,205	68,981	70,040	73,699	61,163	70,087	79,136	90,116
Overseas total	87,683	55,399	51,007	92,876	112,310	107,117	137,725	117,880	193,502	183,991	152,968	122,048	149,240	199,482	129,001	149,019	103,627	103,727
of which:																		
European Commission grants	2,864	4,326	2,148	422	504	526	605	1,206	1,217	2,493	2,865	2,179	2,165	1,396	1,983	3,109	1,361	2,216
Other Overseas	84,819	51,073	48,859	92,454	111,806	106,592	137,120	116,674	192,286	181,498	150,103	119,869	147,074	198,086	127,018	145,909	102,266	101,511
Other UK Business	92,907	99,447	93,765	91,068	111,669	70,575	67,574	49,902	15,635	19,320	11,173	6,753	15,023	16,294	16,296	19,129	21,331	28,674
Own funds	292,454	333,461	278,889	221,169	249,254	250,291	282,431	342,994	365,632	358,759	473,561	507,053	562,444	663,192	737,032	806,313	1,010,445	1,097,247
Other⁴	219	90	71	69	43	34	162	143	83	67	2,791	3,826	4,297	4,413	9,133	7,504	35,913	36,160
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924

	Percentages																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Government	8	4	4	6	7	7	10	8	9	9	8	10	9	8	6	7	6	7
Overseas total	17	11	12	22	22	23	25	21	31	30	22	17	19	21	14	14	8	8
of which:																		
European Commission grants	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Overseas	16	10	11	21	22	23	25	21	30	29	22	17	18	21	13	14	8	7
Other UK Business	18	20	21	21	22	15	12	9	2	3	2	1	2	2	2	2	2	2
Own funds	57	66	63	51	49	54	52	62	58	58	68	72	70	69	77	77	81	81
Other⁴	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	3	3
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. ... denotes disclosive value
3. Totals may not sum due to rounding
4. 'Other' includes funds from other UK businesses, UK Private Non-Profit organisations and Higher Education establishments, and from 2011, international organisations.

[Return to Index](#)

Table 8 (2016)
Sources of funds for R&D performed within businesses in Scotland:
Broad Product Groups, 2016^{r,2}

					£ thousands
Scotland	Government	Overseas	Own Funds	Other UK Business ⁶	Total
Manufacturing	36,085	82,786	460,552	10,607	590,030
Chemicals	..	18,585	146,845	..	166,551
Mechanical engineering	2,372	7,385	28,671	829	39,256
Electrical machinery	..	46,240	156,212	..	220,681
Transport equipment & Aerospace	1,875	1,409	22,498	345	26,127
Other manufacturing	16,867	9,167	106,326	5,054	137,415
Services	24,511	38,858	272,709	14,030	350,108
Other	9,491	27,375	73,053	1,995	111,914
Agriculture, hunting & forestry; Fishing	10	1,102	7,136	7	8,254
Extractive industries	21	19,114	42,201	2	61,339
Electricity, gas & water; waste management ³	..	..	6,942	1,508	24,590
Construction	..	..	16,774	479	17,732
Grand Total	70,087	149,019	806,313	26,633	1,052,052

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display
6. Figures for other UK Business includes funds from other sources and Higher Education Establishments and, from 2011, international organisations.
7. Totals may not sum due to rounding.

[Return to Index](#)

Table 8 (2017)
Sources of funds for R&D performed within businesses in Scotland:
Broad Product Groups, 2017^{r,2}

					£ thousands
Scotland	Government	Overseas	Own Funds	Other UK Business ⁶	Total
Manufacturing	41,830	57,090	453,700	41,131	593,752
Chemicals	92	13,303	165,187	230	178,812
Mechanical engineering	2,151	12,295	34,429	817	49,692
Electrical machinery	14,554	23,686	142,177	34,478	214,894
Transport equipment & Aerospace	5,917	1,806	19,232	912	27,867
Other manufacturing	19,116	6,000	92,675	4,695	122,487
Services	36,594	33,343	480,150	12,516	562,603
Other	712	13,194	76,595	3,598	94,098
Agriculture, hunting & forestry; Fishing	100	7	10,924	1,687	12,717
Extractive industries	94	..	33,170	..	39,848
Electricity, gas & water; waste management ³	63	..	12,485	..	20,121
Construction	455	34	20,015	908	21,413
Grand Total	79,136	103,627	1,010,445	57,245	1,250,453

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display
6. Figures for other UK Business includes funds from other sources and Higher Education Establishments and, from 2011, international organisations.
7. Totals may not sum due to rounding.

[Return to Index](#)

Table 8 (2018)
Sources of funds for R&D performed within businesses in Scotland:
Broad Product Groups, 2018¹

£ thousands					
Scotland	Government	Overseas	Own Funds	Other UK Business ⁵	Total
Manufacturing	52,404	52,099	519,398	51,605	675,505
Chemicals	89	11,594	167,587	607	179,878
Mechanical engineering	3,119	..	46,101	..	60,186
Electrical machinery	23,014	20,306	163,773	39,132	246,226
Transport equipment & Aerospace	4,805	..	22,956	..	34,404
Other manufacturing	21,375	8,065	118,981	6,391	154,812
Services	37,207	40,680	518,131	10,785	606,803
Other	505	10,948	59,719	2,444	73,616
Agriculture, hunting & forestry; Fishing	..	..	3,851	581	4,701
Extractive industries	13	6,262	27,592	2	33,869
Electricity, gas & water; waste management ²	..	..	7,251	751	12,242
Construction	464	206	21,025	1,110	22,805
Grand Total	90,116	103,727	1,097,247	64,834	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
3. .. denotes disclosive value.
4. - denotes nil, figures unavailable or too small to display
5. Figures for other UK Business includes funds from other sources and Higher Education Establishments and, from 2011, international organisations.
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 9A
Expenditure (£ thousands) on R&D performed within businesses in Scotland:
Local Authority Area Level, 2001 to 2018

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^f	2017 ^f	2018	% of 2018 total	2018 per head of population (£)	
Aberdeen City	22,992	29,977	27,918	26,186	36,724	37,507	52,983	54,024	44,094	35,462	71,174	66,222	106,741	158,449	158,121	142,251	123,672	134,388	9.9%	591	
Aberdeenshire	4,660	6,263	4,687	4,435	7,329	5,818	6,671	9,957	34,752	29,071	33,964	19,605	16,696	22,270	19,716	24,162	36,672	36,817	2.7%	141	
Angus	802	..	1,538	2,145	1,960	1,474	2,524	1,240	1,889	3,197	2,155	2,306	2,359	2,977	3,092	3,603	6,455	4,455	0.3%	38	
Argyll & Bute	1,231	1,001	874	..	561	477	525	1,556	1,552	2,423	2,948	..	..	..	1,482	1,721	1,836	1,935	0.1%	22
Clackmannanshire	..	..	..	..	716	658	931	191	..	771	2,941	..	520	2,174	1,964	2,464	2,340	2,516	0.2%	49
Dumfries & Galloway	990	1,791	3,387	1,706	2,264	2,980	3,107	1,972	1,875	2,791	4,534	4,860	4,953	4,964	4,907	5,790	6,692	6,726	0.5%	45	
Dundee City	46,474	55,485	40,048	48,807	42,208	42,197	43,414	45,143	43,708	33,585	35,046	34,894	35,161	35,020	40,913	61,080	38,699	47,498	3.5%	319	
East Ayrshire	1,553	1,346	984	1,602	1,981	2,029	1,525	1,648	1,284	1,017	1,194	1,084	1,285	1,792	..	3,528	3,157	2,642	0.2%	22	
East Dunbartonshire	749	1,150	1,202	774	772	1,010	..	363	..	..	1,119	1,392	1,151	1,213	1,866	2,207	1,895	..	..	..
East Lothian	..	..	..	..	3,995	5,527	..	1,110	1,882	1,494	..	..	1,954	3,066	5,150	4,306	5,993	7,713	0.6%	73
East Renfrewshire	..	..	..	..	1,436	..	905	..	..	1,876	2,486	2,677	2,954	2,904	2,815	3,179	3,591	3,559	0.3%	37
City of Edinburgh	197,708	139,145	130,294	101,188	103,266	106,455	147,550	116,081	136,204	146,087	150,655	178,446	195,021	276,319	254,089	279,858	397,525	471,594	34.8%	910	
Na h-Eileanan Siar
Falkirk	..	12,759	12,574	9,763	7,042	3,843	10,380	6,700	3,587	5,663	5,423	8,356	6,643	8,421	4,453	12,156	10,403	10,360	0.8%	65	
Fife	11,361	13,874	9,631	19,998	23,741	18,029	20,074	22,048	19,716	26,605	27,993	31,170	27,208	23,233	24,284	30,040	29,452	45,179	3.3%	121	
Glasgow City	12,918	19,322	17,167	25,279	25,770	23,724	23,924	31,357	43,897	40,797	66,272	59,829	82,834	77,230	89,387	115,445	204,079	182,458	13.5%	291	
Highland	..	11,849	..	..	..	..	23,319	29,995	..	29,192	44,023	36,470	32,054	28,178	27,125	30,357	22,710	19,228	1.4%	82
Inverclyde	..	..	..	..	..	..	..	7,190	..	..	7,831	5,232	4,608	4,408	4,039	3,297	3,365	4,413	0.3%	56
Midlothian	6,787	23,497	21,292	3,587	2,386	1,775	11,295	19,831	16,609	17,076	13,048	12,554	19,208	29,996	25,204	23,687	18,131	20,627	1.5%	226	
Moray	188	668	507	665	950	664	884	943	1,125	3,385	3,751	3,464	3,693	2,239	1,879	1,639	3,022	3,123	0.2%	33	
North Ayrshire	2,466	696	770	1,803	856	934	2,556	1,805	2,988	2,339	2,771	3,756	3,016	3,123	4,346	4,951	5,158	5,374	0.4%	40	
North Lanarkshire	43,465	54,954	49,382	46,656	65,526	64,103	73,209	80,281	108,208	93,304	48,898	58,115	53,080	62,465	63,883	77,041	63,966	65,991	4.9%	194	
Orkney Islands	..	..	..	..	..	..	..	1,190	1,712	1,078	2,001	..	..	..	..	..	..	1,761	0.1%	79
Perth & Kinross	586	779	524	668	990	956	1,297	720	1,331	1,993	4,318	4,833	2,110	10,689	8,110	8,490	6,584	6,807	0.5%	45	
Renfrewshire	11,176	12,435	9,562	10,123	14,129	11,819	21,919	23,398	27,387	32,533	33,570	23,178	26,699	29,122	19,635	26,694	28,326	31,796	2.3%	179	
Scottish Borders	1,474	1,222	1,317	4,458	1,436	1,913	12,148	4,783	4,564	7,052	5,835	7,571	6,927	5,977	7,160	7,281	7,390	6,996	0.5%	61	
Shetland Islands	..	..	..	..	..	..	..	249	..	..	342	199	..	..	..	..	..	..	..	..
South Ayrshire	..	1,151	..	627	1,130	734	1,977	2,575	9,723	5,046	5,439	7,527	6,732	5,942	5,648	8,676	9,454	12,292	0.9%	109	
South Lanarkshire	25,613	39,874	33,282	28,050	41,889	36,214	27,612	25,741	22,940	16,056	19,473	20,115	17,436	19,868	18,708	29,640	21,987	22,664	1.7%	71	
Stirling	1,160	2,267	1,974	1,791	2,442	1,769	3,653	4,897	6,011	10,618	6,920	8,316	4,560	5,272	4,876	7,146	8,775	10,097	0.7%	107	
West Dunbartonshire	..	4,423	..	2,460	3,192	2,530	2,196	2,453	3,041	..	5,137	3,752	8,193	5,571	10,451	19,119	15,963	..	..	..
West Lothian	59,722	54,622	..	56,807	..	44,625	40,659	51,995	50,192	52,171	83,242	95,570	124,552	121,005	135,611	110,239	159,958	162,429	12.0%	892	
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924	100.0%	249	

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. .. Denotes disclosive value
3. - denotes nil, figures unavailable or too small to display

[Return to Index](#)

Table 9B
Employment on R&D performed within businesses in Scotland:
Local Authority Area Level, 2001 to 2018

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018	% of 2018 total
Aberdeen City	377	436	406	429	475	583	510	479	451	418	730	839	951	1,746	1,593	1,661	1,498	1,650	11.2%
Aberdeenshire	108	168	121	158	225	174	134	151	187	306	348	333	251	301	308	382	519	484	3.3%
Angus	25	..	31	42	47	37	45	28	35	52	59	42	48	61	58	78	99	85	0.6%
Argyll & Bute	25	22	23	..	11	9	10	33	26	35	53	..	..	..	34	37	43	43	0.3%
Clackmannanshire	..	..	..	..	17	17	12	4	..	11	22	..	14	33	43	39	31	30	0.2%
Dumfries & Galloway	24	47	74	37	48	66	55	47	38	60	79	90	86	98	91	118	134	122	0.8%
Dundee City	602	663	586	666	604	575	562	550	486	492	417	359	441	475	606	783	569	702	4.8%
East Ayrshire	37	38	30	42	44	41	33	31	25	21	22	21	22	39	..	87	80	66	0.4%
East Dunbartonshire	17	29	26	19	18	19	..	7	..	..	24	28	28	28	35	37	45	..	..
East Lothian	280	138	..	78	60	72	..	24	163	93	..	..	38	68	87	71	99	139	0.9%
East Renfrewshire	..	..	..	..	23	35	..	..	..	29	56	42	51	53	65	59	67	70	0.5%
City of Edinburgh	2,308	1,627	1,423	1,501	1,251	1,196	1,881	1,529	1,652	1,816	1,560	1,663	1,872	2,644	2,930	2,967	3,380	4,209	28.5%
Na h-Eileanan Siar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Falkirk	306	251	273	182	124	75	128	97	70	97	91	153	135	188	101	145	152	158	1.1%
Fife	259	306	254	285	297	185	214	303	246	286	303	346	339	345	384	376	525	656	4.4%
Glasgow City	227	310	287	441	441	427	371	472	626	643	833	759	1,210	1,048	1,333	1,405	1,539	1,518	10.3%
Highland	103	139	166	128	143	210	179	234	146	149	187	204	219	221	250	260	269	261	1.8%
Inverclyde	..	..	..	..	..	..	59	61	73	63	58	49	47	51	54	54	42	63	0.4%
Midlothian	124	297	256	81	59	33	144	249	175	222	223	200	241	187	246	265	291	301	2.0%
Moray	6	20	17	19	16	18	24	29	31	60	76	61	70	43	46	40	81	85	0.6%
North Ayrshire	40	16	17	36	18	24	50	50	58	60	62	85	85	72	101	98	138	127	0.9%
North Lanarkshire	634	914	670	539	708	666	790	812	896	818	704	747	717	768	800	873	825	874	5.9%
Orkney Islands	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33	0.2%
Perth & Kinross	14	21	14	18	22	25	24	17	26	33	46	48	47	103	101	102	116	99	0.7%
Renfrewshire	203	213	200	194	251	230	462	336	347	269	316	360	372	349	326	343	358	352	2.4%
Scottish Borders	38	30	32	73	38	45	66	92	84	116	108	133	133	134	118	114	151	143	1.0%
Shetland Islands	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Ayrshire	..	31	..	18	23	16	44	44	78	131	98	126	100	97	82	139	140	192	1.3%
South Lanarkshire	393	472	515	359	434	389	290	269	269	237	363	316	324	330	318	369	405	420	2.8%
Stirling	23	51	41	43	45	30	59	72	62	155	77	86	67	96	103	125	138	183	1.2%
West Dunbartonshire	..	64	58	54	53	36	26	37	45	37	41	105	71	72	86	114	125	111	0.8%
West Lothian	900	841	758	844	967	1,009	683	604	637	713	773	1,012	1,627	1,194	1,496	1,328	1,361	1,505	10.2%
Grand Total	7,210	7,269	6,452	6,412	6,537	6,309	6,926	6,703	7,024	7,472	7,810	8,342	9,662	10,914	11,864	12,503	13,290	14,747	100.0%

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. .. Denotes disclosive value

[Return to Index](#)

Table 9C
Expenditure on R&D performed within businesses in Scotland as a percentage of GDP:
Local Authority Area Level, 2001 to 2018

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Aberdeen City	0.36%	0.46%	0.42%	0.38%	0.50%	0.45%	0.57%	0.53%	0.44%	0.34%	0.66%	0.57%	0.85%	1.24%	1.29%	1.27%	1.11%	1.14%
Aberdeenshire	0.11%	0.14%	0.11%	0.10%	0.15%	0.11%	0.11%	0.15%	0.55%	0.45%	0.50%	0.28%	0.22%	0.27%	0.24%	0.30%	0.44%	0.43%
Angus	0.06%	..	0.11%	0.14%	0.12%	0.08%	0.14%	0.07%	0.11%	0.18%	0.12%	0.11%	0.11%	0.13%	0.14%	0.15%	0.30%	0.20%
Argyll and Bute	0.10%	0.08%	0.06%	..	0.04%	0.03%	0.03%	0.09%	0.09%	0.14%	0.16%	..	..	..	0.07%	0.08%	0.08%	0.09%
Clackmannanshire	..	..	..	..	0.09%	0.08%	0.11%	0.02%	..	0.09%	0.33%	..	0.06%	0.22%	0.18%	0.22%	0.21%	0.21%
Dumfries and Galloway	0.05%	0.09%	0.16%	0.08%	0.10%	0.12%	0.12%	0.08%	0.07%	0.11%	0.17%	0.18%	0.17%	0.16%	0.16%	0.18%	0.20%	0.19%
Dundee City	1.96%	2.24%	1.51%	1.75%	1.43%	1.40%	1.40%	1.44%	1.40%	1.05%	1.06%	0.62%	0.83%	0.82%	1.07%	1.59%	0.97%	1.17%
East Ayrshire	0.13%	0.11%	0.07%	0.11%	0.13%	0.13%	0.09%	0.10%	0.08%	0.06%	0.07%	0.06%	0.08%	0.10%	..	0.19%	0.16%	0.13%
East Dunbartonshire	0.07%	0.10%	0.09%	0.05%	0.05%	0.08%	..	0.03%	..	..	0.08%	0.11%	0.09%	0.08%	0.12%	0.14%	0.12%	..
East Lothian	..	..	..	..	0.33%	0.42%	..	0.08%	0.14%	0.11%	..	..	0.12%	0.17%	0.29%	0.23%	0.31%	0.37%
East Renfrewshire	..	..	..	..	0.18%	..	0.11%	..	..	0.22%	0.28%	0.27%	0.27%	0.25%	0.24%	0.27%	0.28%	0.27%
City of Edinburgh	1.67%	1.09%	0.93%	0.67%	0.63%	0.63%	0.81%	0.65%	0.73%	0.81%	0.82%	0.91%	0.95%	1.29%	1.16%	1.17%	1.57%	1.75%
Na h-Eileanan Siar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Falkirk	..	0.50%	0.47%	0.35%	0.22%	0.11%	0.31%	0.19%	0.10%	0.17%	0.15%	0.23%	0.12%	0.15%	0.08%	0.20%	0.22%	0.19%
Fife	0.23%	0.27%	0.18%	0.36%	0.41%	0.29%	0.30%	0.32%	0.30%	0.39%	0.40%	0.46%	0.37%	0.30%	0.31%	0.37%	0.30%	0.47%
Glasgow City	0.10%	0.15%	0.13%	0.17%	0.16%	0.14%	0.14%	0.18%	0.25%	0.24%	0.37%	0.32%	0.43%	0.39%	0.45%	0.55%	0.94%	0.80%
Highland	..	0.32%	..	..	..	..	0.47%	0.59%	..	0.55%	0.79%	0.63%	0.52%	0.45%	0.43%	0.45%	0.32%	0.27%
Inverclyde	..	..	..	..	..	..	..	..	0.56%	..	0.59%	0.40%	0.35%	0.31%	0.29%	0.22%	0.23%	0.32%
Midlothian	0.77%	2.54%	2.21%	0.36%	0.22%	0.16%	1.00%	1.70%	1.48%	1.50%	1.07%	0.98%	1.35%	1.97%	1.57%	1.39%	1.03%	1.10%
Moray	0.01%	0.05%	0.03%	0.04%	0.06%	0.04%	0.05%	0.04%	0.05%	0.16%	0.16%	0.15%	0.16%	0.10%	0.08%	0.07%	0.12%	0.12%
North Ayrshire	0.17%	0.05%	0.05%	0.12%	0.05%	0.05%	0.14%	0.10%	0.16%	0.12%	0.14%	0.19%	0.14%	0.14%	0.19%	0.21%	0.22%	0.22%
North Lanarkshire	0.99%	1.21%	1.03%	0.92%	1.23%	1.15%	1.31%	1.36%	1.87%	1.60%	0.81%	0.91%	0.79%	0.83%	0.85%	0.98%	0.76%	0.75%
Orkney Islands	..	..	..	..	..	..	..	..	0.19%	0.26%	0.16%	0.28%	..	..	..	..	..	0.24%
Perth and Kinross	0.02%	0.03%	0.02%	0.02%	0.03%	0.03%	0.04%	0.02%	0.04%	0.06%	0.12%	0.12%	0.05%	0.23%	0.17%	0.18%	0.14%	0.14%
Renfrewshire	0.41%	0.44%	0.33%	0.33%	0.44%	0.35%	0.65%	0.66%	0.79%	0.93%	0.92%	0.63%	0.70%	0.70%	0.46%	0.64%	0.65%	0.68%
Scottish Borders	0.11%	0.09%	0.09%	0.30%	0.09%	0.12%	0.73%	0.28%	0.27%	0.41%	0.32%	0.41%	0.36%	0.28%	0.34%	0.33%	0.31%	0.28%
Shetland Islands	..	..	..	..	..	..	..	..	..	0.03%	0.04%	0.02%	..	..	..	..	..	..
South Ayrshire	..	0.08%	..	0.04%	0.07%	0.04%	0.11%	0.13%	0.51%	0.26%	0.27%	0.39%	0.35%	0.28%	0.26%	0.38%	0.40%	0.51%
South Lanarkshire	0.73%	1.08%	0.84%	0.68%	0.95%	0.76%	0.57%	0.51%	0.46%	0.33%	0.38%	0.38%	0.31%	0.34%	0.32%	0.48%	0.34%	0.35%
Stirling	0.07%	0.13%	0.10%	0.09%	0.11%	0.08%	0.15%	0.20%	0.25%	0.44%	0.29%	0.33%	0.17%	0.20%	0.18%	0.27%	0.30%	0.34%
West Dunbartonshire	..	0.37%	..	0.18%	0.22%	0.17%	0.14%	0.16%	0.20%	..	0.31%	0.23%	0.50%	0.30%	0.57%	1.01%	0.77%	..
West Lothian	1.27%	1.12%	..	1.03%	..	0.75%	0.65%	0.81%	0.79%	0.80%	1.24%	2.22%	2.98%	2.74%	2.78%	2.21%	3.07%	2.99%
Scotland	0.60%	0.56%	0.46%	0.42%	0.47%	0.40%	0.45%	0.45%	0.51%	0.50%	0.54%	0.53%	0.58%	0.66%	0.65%	0.70%	0.79%	0.83%

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data from 2001 onwards with earlier years due to a government agency reclassification.
2. Market price GDP for Scotland sourced from the Quarterly National Accounts Scotland. Market price GDP for Scotland allocated to Local Authority Areas according to Annual estimates of balanced UK regional gross domestic product (GDP) from the Office for National Statistics (ONS)
3. .. Denotes disclosive value

[Return to Index](#)

Table 10 (2016)
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area by Broad Product Group, 2016^r

	£ thousands			
	Manufacturing	Services	Other ²	Total
Aberdeen City	21,598	56,808	63,844	142,251
Aberdeenshire	10,100	10,251	3,811	24,162
Angus	2,737	..	..	3,603
Argyll & Bute	600	..	..	1,721
Clackmannanshire	..	..	..	2,464
Dumfries & Galloway	3,599	2,003	188	5,790
Dundee City	55,561	..	..	61,080
East Ayrshire	2,586	..	..	3,528
East Dunbartonshire	1,487	..	..	2,207
East Lothian	916	..	..	4,306
East Renfrewshire	..	..	..	3,179
City of Edinburgh	176,086	97,978	5,794	279,858
Na h-Eileanan Siar	..	..	..	..
Falkirk	10,481	..	..	12,156
Fife	17,790	..	..	30,040
Glasgow City	30,753	82,419	2,273	115,445
Highland	24,038	..	..	30,357
Inverclyde	..	..	..	3,297
Midlothian	..	9,764	..	23,687
Moray	1,343	..	..	1,639
North Ayrshire	2,440	..	..	4,951
North Lanarkshire	61,444	..	..	77,041
Orkney Islands	..	..	..	..
Perth & Kinross	1,007	..	..	8,490
Renfrewshire	14,990	..	..	26,694
Scottish Borders	4,958	..	..	7,281
Shetland Islands	..	..	..	..
South Ayrshire	6,373	..	..	8,676
South Lanarkshire	13,711	..	..	29,640
Stirling	2,356	3,688	1,102	7,146
West Dunbartonshire	..	..	..	19,119
West Lothian	84,402	25,248	589	110,239
Grand Total	590,030	350,108	111,914	1,052,052

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. .. Denotes disclosive value
4. - denotes nil. figures unavailable or too small to display.
5. Totals may not sum due to rounding.

[Return to Index](#)

Table 10 (2017)
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area by Broad Product Group, 2017^r

	£ thousands			
	Manufacturing	Services	Other ²	Total
Aberdeen City	23,599	55,529	44,544	123,672
Aberdeenshire	11,969	14,937	9,765	36,672
Angus	3,381	..	..	6,455
Argyll & Bute	..	810	..	1,836
Clackmannanshire	..	273	..	2,340
Dumfries & Galloway	3,993	..	..	6,692
Dundee City	31,280	..	..	38,699
East Ayrshire	..	1,279	..	3,157
East Dunbartonshire	..	899	..	1,895
East Lothian	..	4,669	..	5,993
East Renfrewshire	..	1,336	..	3,591
City of Edinburgh	189,995	199,467	8,063	397,525
Na h-Eileanan Siar	..	..	..	..
Falkirk	8,174	..	..	10,403
Fife	15,212	..	..	29,452
Glasgow City	28,012	174,064	2,003	204,079
Highland	13,795	5,678	3,238	22,710
Inverclyde	..	2,550	..	3,365
Midlothian	8,303	..	..	18,131
Moray	2,094	..	..	3,022
North Ayrshire	2,711	..	..	5,158
North Lanarkshire	52,139	7,966	3,861	63,966
Orkney Islands	..	..	..	..
Perth & Kinross	1,542	..	..	6,584
Renfrewshire	16,994	..	..	28,326
Scottish Borders	5,652	..	..	7,390
Shetland Islands	..	..	..	..
South Ayrshire	7,205	2,091	158	9,454
South Lanarkshire	..	11,323	..	21,987
Stirling	..	3,721	..	8,775
West Dunbartonshire	..	..	..	15,963
West Lothian	..	29,254	..	159,958
Grand Total	593,752	562,603	94,098	1,250,453

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. .. Denotes disclosive value
4. - denotes nil. figures unavailable or too small to display.
5. Totals may not sum due to rounding.

[Return to Index](#)

Table 10 (2018)
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area by Broad Product Group, 2018

	£ thousands			
	Manufacturing	Services	Other ²	Total
Aberdeen City	34,064	68,145	32,180	134,388
Aberdeenshire	11,421	11,750	13,646	36,817
Angus	2,218	1,626	611	4,455
Argyll & Bute	..	1,107	..	1,935
Clackmannanshire	..	..	..	2,516
Dumfries & Galloway	4,521	..	..	6,726
Dundee City	32,724	..	..	47,498
East Ayrshire	..	1,557	..	2,642
East Dunbartonshire	..	..	..	..
East Lothian	..	4,938	..	7,713
East Renfrewshire	..	..	..	3,559
City of Edinburgh	210,650	255,389	5,556	471,594
Na h-Eileanan Siar	..	..	..	..
Falkirk	8,640	..	..	10,360
Fife	32,922	11,513	743	45,179
Glasgow City	33,655	146,631	2,172	182,458
Highland	12,952	..	..	19,228
Inverclyde	1,929	..	..	4,413
Midlothian	..	11,301	..	20,627
Moray	1,957	..	..	3,123
North Ayrshire	3,093	..	..	5,374
North Lanarkshire	56,593	7,450	1,948	65,991
Orkney Islands	..	1,710	..	1,761
Perth & Kinross	1,192	..	..	6,807
Renfrewshire	23,277	..	..	31,796
Scottish Borders	5,086	..	..	6,996
Shetland Islands	..	..	..	..
South Ayrshire	8,697	3,390	205	12,292
South Lanarkshire	17,080	..	..	22,664
Stirling	..	6,286	..	10,097
West Dunbartonshire	..	..	..	..
West Lothian	..	30,951	..	162,429
Grand Total	675,505	606,803	73,616	1,355,924

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. .. Denotes disclosive value
4. - denotes nil. figures unavailable or too small to display.
5. Totals may not sum due to rounding.

[Return to Index](#)

Table 11
Expenditure on R&D performed in businesses by Government Office Region:
Per head of population, 2018

	BERD (£ millions)	BERD per head of population £	BERD as a percentage of GDP	Percentage of UK BERD
East of England	5,141	829	2.71%	20.5%
South East	5,031	551	1.59%	20.1%
West Midlands	2,744	465	1.69%	11.0%
East Midlands	1,769	368	1.39%	7.1%
London	2,906	326	0.59%	11.6%
South West	1,752	313	1.09%	7.0%
North West	2,031	279	0.96%	8.1%
Northern Ireland	524	278	1.05%	2.1%
Scotland	1,356	249	0.83%	5.4%
Yorkshire & the Humber	921	168	0.64%	3.7%
North East	443	167	0.69%	1.8%
Wales	430	137	0.56%	1.7%
UK	25,048	377	1.16%	100.0%

Source: ONS and Scottish Government

Notes:

1. Ranked by BERD per head of population.
2. Totals may not sum due to rounding.
3. Market price GDP for UK regions other than Scotland is estimated based on the UK GDP (Balanced).

[Return to Index](#)

Table 12
Expenditure on R&D performed in businesses by Government Office Region:
Current prices & as a percentage of GDP, 2001 to 2018¹

	Business R&D Expenditure (£million)																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
East of England	2,798	2,650	2,915	2,672	3,718	3,650	3,992	4,182	3,812	3,846	3,639	3,606	4,137	4,094	4,200	4,519	4,677	5,141
West Midlands	760	774	794	758	721	915	995	886	847	886	1,281	1,460	1,684	1,924	2,159	2,345	2,469	2,744
South East	3,212	3,156	3,266	3,125	3,125	3,347	3,515	3,466	3,758	3,798	4,579	4,133	4,288	4,609	4,765	4,728	4,862	5,031
East Midlands	909	974	862	936	1,006	985	1,062	976	992	1,137	1,146	1,218	1,340	1,473	1,528	1,676	1,521	1,769
South West	1,006	1,158	1,221	1,296	1,201	1,232	1,229	1,345	1,349	1,454	1,359	1,367	1,450	1,561	1,475	1,516	1,661	1,752
Northern Ireland	150	149	116	120	148	157	177	171	297	324	352	415	441	359	501	481	508	524
North West	1,582	1,604	1,538	1,739	1,892	1,623	2,021	2,130	1,926	2,074	2,220	1,781	1,835	1,913	2,115	2,389	2,183	2,031
Scotland	517	507	441	430	506	460	543	554	631	619	697	709	801	957	953	1,052	1,250	1,356
North East	125	124	149	257	289	292	331	318	315	308	259	282	323	282	306	312	388	443
Yorkshire and the Humber	319	337	335	343	344	384	436	433	454	488	550	600	660	700	768	771	937	921
London	700	865	669	759	552	882	1,067	1,109	907	877	1,118	1,570	1,291	1,724	1,878	2,351	2,791	2,906
Wales	161	187	200	226	232	216	308	243	243	234	252	268	367	386	368	440	421	430
UK	12,239	12,484	12,505	12,662	13,734	14,144	15,676	15,814	15,532	16,045	17,452	17,409	18,617	19,982	21,018	22,580	23,669	25,048

	Percentage of GDP ²																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
East of England	2.74%	2.46%	2.56%	2.27%	2.97%	2.78%	2.93%	3.06%	2.84%	2.76%	2.57%	2.47%	2.70%	2.56%	2.54%	2.60%	2.56%	2.71%
West Midlands	0.85%	0.82%	0.81%	0.73%	0.67%	0.82%	0.86%	0.77%	0.75%	0.75%	1.04%	1.15%	1.26%	1.40%	1.51%	1.56%	1.59%	1.69%
South East	1.82%	1.69%	1.68%	1.56%	1.47%	1.51%	1.52%	1.48%	1.62%	1.56%	1.82%	1.59%	1.58%	1.64%	1.63%	1.57%	1.58%	1.59%
East Midlands	1.29%	1.32%	1.12%	1.16%	1.18%	1.10%	1.13%	1.04%	1.07%	1.16%	1.14%	1.17%	1.23%	1.32%	1.33%	1.41%	1.24%	1.39%
South West	1.14%	1.24%	1.24%	1.25%	1.10%	1.08%	1.03%	1.11%	1.13%	1.16%	1.06%	1.04%	1.06%	1.10%	1.02%	1.01%	1.07%	1.09%
Northern Ireland	0.54%	0.52%	0.38%	0.37%	0.43%	0.43%	0.47%	0.46%	0.80%	0.86%	0.91%	1.03%	1.06%	0.85%	1.13%	1.03%	1.03%	1.05%
North West	1.36%	1.30%	1.19%	1.28%	1.32%	1.07%	1.28%	1.36%	1.23%	1.27%	1.35%	1.05%	1.04%	1.05%	1.12%	1.22%	1.07%	0.96%
Scotland	0.60%	0.56%	0.46%	0.42%	0.47%	0.40%	0.45%	0.45%	0.51%	0.50%	0.54%	0.53%	0.58%	0.66%	0.65%	0.70%	0.79%	0.83%
North East	0.34%	0.31%	0.35%	0.57%	0.61%	0.59%	0.65%	0.62%	0.62%	0.58%	0.48%	0.51%	0.57%	0.49%	0.52%	0.51%	0.63%	0.69%
Yorkshire and the Humber	0.39%	0.39%	0.36%	0.35%	0.34%	0.36%	0.39%	0.39%	0.41%	0.43%	0.48%	0.51%	0.54%	0.56%	0.59%	0.57%	0.67%	0.64%
London	0.31%	0.36%	0.26%	0.28%	0.19%	0.29%	0.32%	0.33%	0.27%	0.25%	0.31%	0.42%	0.32%	0.41%	0.43%	0.51%	0.58%	0.59%
Wales	0.38%	0.42%	0.42%	0.45%	0.44%	0.39%	0.53%	0.43%	0.43%	0.40%	0.41%	0.42%	0.56%	0.58%	0.54%	0.61%	0.57%	0.56%
UK	1.07%	1.03%	0.98%	0.95%	0.97%	0.95%	1.00%	1.00%	1.00%	0.99%	1.05%	1.01%	1.03%	1.07%	1.09%	1.12%	1.13%	1.16%

Source: ONS and Scottish Government

- Notes:
1. There is a discontinuity between the data from 2001 onwards with earlier years due to a government agency reclassification.
 2. Market price GDP for Scotland sourced from Quarterly National Accounts Scotland. Market price GDP for other UK regions sourced from Annual estimates of balanced UK regional gross domestic product (GDP) from the Office for National Statistics (ONS)
 3. r denotes revised figures
 4. Totals may not sum due to rounding.

[Return to Index](#)

Table 13
Expenditure on R&D performed within businesses in Scotland by Broad Industry Group:
2001 to 2018

Industry Group (SIC 2007 Section(s) ²)	Year									
	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Non-Manufacturing Production (ABDE)	57,705	49,940	64,123	36,057	72,201	60,566	48,607	85,058	70,140	57,859
Manufacturing (C)	251,259	234,176	256,533	274,488	263,164	262,678	265,387	334,709	291,684	361,492
Construction (F)	963	350	1,441	2,859	2,483	5,701	3,234	6,549	10,884	12,944
Wholesale and retail trade; Repair of motor vehicles and motorcycles (G)	72,480	83,489	29,235	8,702	3,879	6,769	8,737	13,435	18,325	13,009
Transportation & Storage and Accommodation & Food Service Activities (HI)	2,128	1,728	5,373	2,330	2,203	3,401	4,604	6,592	4,264	5,021
Information and communication (J)	38,243	33,691	51,650	72,634	80,248	82,997	107,758	174,147	191,041	199,982
Financial & Insurance Activities and Real Estate Activities (KL)	..	..	3,744	4,007	14,519	65,769	57,558	53,769	..	195,912
Professional, scientific and technical activities (M)	193,824	197,850	270,380	294,321	350,054	453,672	433,179	345,383	464,741	461,918
Administrative and support service activities (N)	10,755	10,276	8,475	8,046	7,762	9,964	18,171	23,538	28,281	37,955
Public Administration, Education and Health (OPQ)	..	..	1,657	936	1,357	951	2,624	2,713	..	3,888
Arts, Entertainment & Recreation and Other Service Activities (RS)	1,631	4,141	4,086	4,282	3,172	4,612	2,766	6,160	9,201	5,944
Total	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924

Source: ONS and Scottish Government

Notes:

1. ... Denotes disclosive value.
2. Standard Industrial Classification 2007
3. Totals may not sum due to rounding.
4. r denotes revised figures

[Return to Index](#)

Table 14
Employment on R&D performed within businesses in Scotland:
2001 to 2018

	Full time equivalent																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scientist and engineers	4,152	4,116	3,725	3,528	3,629	3,486	3,860	3,623	4,071	4,310	3,967	4,516	4,948	5,304	5,531	6,350	5,811	6,526
Technicians, laboratory assistants and draughtsmen	1,294	1,373	1,075	1,202	1,288	1,297	1,527	1,829	1,752	1,843	2,413	2,405	3,004	3,781	4,377	4,070	4,763	5,289
Administrative, clerical, industrial and other staff	1,764	1,780	1,652	1,682	1,621	1,526	1,538	1,251	1,201	1,319	1,430	1,421	1,710	1,829	1,956	2,083	2,716	2,932
Grand Total	7,210	7,269	6,452	6,412	6,537	6,309	6,926	6,703	7,024	7,472	7,810	8,342	9,662	10,914	11,864	12,503	13,290	14,747

	Percentages																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scientist and engineers	58	57	58	55	56	55	56	54	58	58	51	54	51	49	47	51	44	44
Technicians, laboratory assistants and draughtsmen	18	19	17	19	20	21	22	27	25	25	31	29	31	35	37	33	36	36
Administrative, clerical, industrial and other staff	24	24	26	26	25	24	22	19	17	18	18	17	18	17	16	17	20	20
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. Totals may not sum due to rounding

[Return to Index](#)

Table 15 (2016)
Employment on R&D performed within businesses in Scotland
Broad Product Groups, 2016^{r,2}

	Full time equivalent			
	Scientists and Engineers	Technicians, Laboratory Assistants and Draughtsmen	Administrative, Clerical and Other	R&D Employment
Manufacturing	3,499	1,364	1,116	5,979
Chemicals	798	459	482	1,739
Mechanical engineering	258	174	162	593
Electrical machinery	1,380	167	98	1,645
Transport equipment & aerospace	169	83	71	323
Other manufacturing	894	480	304	1,679
Services	2,282	2,493	701	5,476
Other	569	213	266	1,048
Agriculture, hunting & forestry; Fishing	30	24	27	81
Extractive industries	363	115	81	559
Electricity, gas & water supply; waste management ³	92	23	21	137
Construction	84	51	136	271
Grand Total	6,350	4,070	2,083	12,503

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.

3. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.

[Return to Index](#)

Table 15 (2017)
Employment on R&D performed within businesses in Scotland
Broad Product Groups, 2017^{r,2}

	Full time equivalent			
	Scientists and Engineers	Technicians, Laboratory Assistants and Draughtsmen	Administrative, Clerical and Other	R&D Employment
Manufacturing	3,174	1,450	1,551	6,174
Chemicals	635	401	434	1,470
Mechanical engineering	361	216	337	914
Electrical machinery	1,238	167	244	1,649
Transport equipment & aerospace	125	76	81	282
Other manufacturing	814	589	456	1,859
Services	2,166	3,073	914	6,152
Other	472	241	252	964
Agriculture, hunting & forestry; Fishing	41	33	37	111
Extractive industries	176	48	24	248
Electricity, gas & water supply; waste management ³	149	56	34	238
Construction	105	104	157	366
Grand Total	5,811	4,763	2,716	13,290

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.

3. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.

[Return to Index](#)

Table 15 (2018)
Employment on R&D performed within businesses in Scotland
Broad Product Groups, 2018¹

	Full time equivalent			
	Scientists and Engineers	Technicians, Laboratory Assistants and Draughtsmen	Administrative, Clerical and Other	R&D Employment
Manufacturing	3,688	1,569	1,589	6,846
Chemicals	670	428	450	1,548
Mechanical engineering	362	293	344	999
Electrical machinery	1,630	156	216	2,001
Transport equipment & aerospace	130	96	56	282
Other manufacturing	896	596	524	2,015
Services	2,537	3,592	1,027	7,156
Other	302	127	316	745
Agriculture, hunting & forestry; Fishing	16	13	13	43
Extractive industries	158	19	29	206
Electricity, gas & water supply; waste management ²	77	45	112	234
Construction	50	51	161	262
Grand Total	6,526	5,289	2,932	14,747

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.

2. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.

[Return to Index](#)

Table 16 (2016)
Expenditure on civil and defence R&D performed within businesses in Scotland:
Broad Product Groups, 2016^{r,2}

Scotland	£ thousands		
	Civil	Defence	Total
Manufacturing	520,210	69,820	590,030
Chemicals	..	..	166,551
Mechanical engineering	34,484	4,772	39,256
Electrical machinery	..	..	220,681
Transport equipment & aerospace	24,181	1,946	26,127
Other manufacturing	100,245	37,170	137,415
Services	..	..	350,108
Other	..	..	111,914
Agriculture, hunting & forestry; Fishing	..	..	8,254
Extractive industries	61,339	-	61,339
Electricity, gas & water supply; waste management ³	24,590	-	24,590
Construction	..	..	17,732
Grand Total	978,836	73,215	1,052,052

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 16 (2017)
Expenditure on civil and defence R&D performed within businesses in Scotland:
Broad Product Groups, 2017^{r,2}

£ thousands

Scotland	Civil	Defence	Total
Manufacturing	529,099	64,652	593,752
Chemicals	178,812	-	178,812
Mechanical engineering	44,043	5,649	49,692
Electrical machinery	..	..	214,894
Transport equipment & aerospace	24,382	3,485	27,867
Other manufacturing	..	..	122,487
Services	..	..	562,603
Other	..	..	94,098
Agriculture, hunting & forestry; Fishing	..	..	12,717
Extractive industries	39,848	-	39,848
Electricity, gas & water supply; waste management ³	20,121	-	20,121
Construction	21,413	-	21,413
Grand Total	1,179,030	71,423	1,250,453

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 16 (2018)
Expenditure on civil and defence R&D performed within businesses in Scotland:
Broad Product Groups, 2018²

			£ thousands
Scotland	Civil	Defence	Total
Manufacturing	579,017	96,489	675,505
Chemicals	..	..	179,878
Mechanical engineering	52,236	7,949	60,186
Electrical machinery	202,619	43,607	246,226
Transport equipment & aerospace	30,432	3,972	34,404
Other manufacturing	..	..	154,812
Services	..	..	606,803
Other Sectors	..	..	73,616
Agriculture, hunting & forestry; Fishing	..	..	4,701
Extractive industries	33,869	-	33,869
Electricity, gas & water supply; waste management ³	12,242	-	12,242
Construction	22,805	-	22,805
Grand Total	1,247,999	107,926	1,355,924

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 17
Employment on civil and defence R&D performed within businesses in Scotland:
2001 to 2018

Civil	Full time equivalent																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scientist and engineers	3,532	3,833	3,446	3,224	3,292	3,131	3,393	3,264	3,660	3,880	3,872	4,407	4,751	5,082	5,287	6,098	5,607	6,243
Technicians, laboratory assistants & draughtsman	1,189	1,301	1,026	1,127	1,225	1,248	1,467	1,762	1,689	1,784	2,351	2,364	2,926	3,647	4,186	3,903	4,597	5,086
Admin, Clerical industrial & Other staff	1,688	1,695	1,626	1,659	1,588	1,503	1,513	1,215	1,157	1,273	1,415	1,399	1,655	1,748	1,863	1,986	2,628	2,811
Grand Total	6,409	6,830	6,098	6,011	6,105	5,882	6,372	6,241	6,507	6,937	7,638	8,170	9,332	10,477	11,336	11,986	12,832	14,140

Civil	Percentages																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scientist and engineers	55	56	57	54	54	53	53	52	56	56	51	54	51	49	47	51	44	44
Technicians, laboratory assistants & draughtsman	19	19	17	19	20	21	23	28	26	26	31	29	31	35	37	33	36	36
Admin, Clerical industrial & Other staff	26	25	27	28	26	26	24	19	18	18	19	17	18	17	16	17	20	20
Grand Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Defence	Full time equivalent																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scientist and engineers	620	283	279	303	336	355	468	358	411	430	95	109	197	222	245	252	204	283
Technicians, laboratory assistants & draughtsman	106	71	49	75	63	49	60	68	63	59	62	41	78	134	191	167	166	203
Admin, Clerical industrial & Other staff	76	85	27	22	33	23	25	36	44	46	15	22	55	81	93	98	89	121
Grand Total	801	439	354	401	432	427	553	462	517	534	172	172	330	437	528	517	459	607

Defence	Percentages																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scientist and engineers	77	64	79	76	78	83	85	78	79	80	55	63	60	51	46	49	45	47
Technicians, laboratory assistants & draughtsman	13	16	14	19	15	11	11	15	12	11	36	24	24	31	36	32	36	33
Admin, Clerical industrial & Other staff	9	19	8	6	8	5	5	8	8	9	9	13	17	19	18	19	19	20
Grand Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: ONS and Scottish Government

- Notes:
1. r denotes revised figures
2. Totals may not sum due to rounding

[Return to Index](#)

Table 18 (2016)
Expenditure on R&D performed within businesses in Scotland by total
UK company employment sizebands: Broad Product Groups, 2016^{r,2}

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	60,029	202,053	327,948	590,030
Chemicals	17,542	26,470	122,538	166,551
Mechanical engineering	10,454	13,975	14,827	39,256
Electrical machinery	14,165	116,902	89,614	220,681
Transport equipment & aerospace	3,390	5,459	17,279	26,127
Other manufacturing	14,478	39,247	83,690	137,415
Services	132,075	39,095	178,937	350,108
Other	4,572	7,239	100,103	111,914
Agriculture, hunting & forestry; Fishing	..	..	3,912	8,254
Extractive industries	..	..	57,987	61,339
Electricity, gas & water supply; waste management ³	..	..	24,525	24,590
Construction	..	..	13,679	17,732
Grand Total	196,676	248,388	606,988	1,052,052

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 18 (2017)
Expenditure on R&D performed within businesses in Scotland by total
UK company employment sizebands: Broad Product Groups, 2017^{r,2}

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	62,098	183,773	347,881	593,752
Chemicals	..	18,793	..	178,812
Mechanical engineering	17,163	15,909	16,620	49,692
Electrical machinery	11,564	110,710	92,620	214,894
Transport equipment & aerospace	..	7,575	..	27,867
Other manufacturing	22,444	30,787	69,255	122,487
Services	142,582	55,826	364,195	562,603
Other	7,312	10,028	76,758	94,098
Agriculture, hunting & forestry; Fishing	..	..	6,220	12,717
Extractive industries	-	2	39,845	39,848
Electricity, gas & water supply; waste management ³	..	..	16,988	20,121
Construction	5,236	2,472	13,704	21,413
Grand Total	211,992	249,627	788,833	1,250,453

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 18 (2018)
Expenditure on R&D performed within businesses in Scotland by total
UK company employment sizebands: Broad Product Groups, 2018¹

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	53,761	209,918	411,827	675,505
Chemicals	..	21,421	..	179,878
Mechanical engineering	15,105	17,121	27,960	60,186
Electrical machinery	9,965	120,468	115,793	246,226
Transport equipment & aerospace	..	7,839	..	34,404
Other manufacturing	21,627	43,069	90,116	154,812
Services	149,028	74,663	383,112	606,803
Other	4,800	9,744	59,073	73,616
Agriculture, hunting & forestry; Fishing	322	..	..	4,701
Extractive industries	-	559	33,310	33,869
Electricity, gas & water supply; waste management ²	473	..	..	12,242
Construction	4,005	5,182	13,618	22,805
Grand Total	207,588	294,325	854,011	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. .. Denotes disclosive value.

4. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 19 (2016)
R&D employment within businesses in Scotland by total UK company
employment sizebands: Broad Product Groups, 2016^{r,2}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	1,164	1,921	2,894	5,979
Chemicals	232	276	1,231	1,739
Mechanical engineering	224	209	160	593
Electrical machinery	204	726	714	1,645
Transport equipment & aerospace	100	67	156	323
Other manufacturing	404	642	633	1,679
Services	2,367	722	2,388	5,476
Other	127	241	680	1,048
Agriculture, hunting & forestry; Fishing	..	..	..	81
Extractive industries	..	..	466	559
Electricity, gas & water supply; waste management ³	..	..	135	137
Construction	29	..	..	271
Grand Total	3,658	2,883	5,962	12,503

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value

5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 19 (2017)
R&D employment within businesses in Scotland by total UK company
employment sizebands: Broad Product Groups, 2017^{r,2}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	1,606	1,701	2,867	6,174
Chemicals	..	215	..	1,470
Mechanical engineering	483	319	112	914
Electrical machinery	282	573	795	1,649
Transport equipment & aerospace	..	81	..	282
Other manufacturing	654	514	691	1,859
Services	2,786	860	2,507	6,152
Other	289	110	565	964
Agriculture, hunting & forestry; Fishing	..	..	23	111
Extractive industries	-	0	248	248
Electricity, gas & water supply; waste management ³	..	..	130	238
Construction	177	26	163	366
Grand Total	4,681	2,671	5,939	13,290

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value

5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 19 (2018)
R&D employment within businesses in Scotland by total UK company
employment sizebands: Broad Product Groups, 2018¹

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	1,499	2,105	3,242	6,846
Chemicals	..	216	..	1,548
Mechanical engineering	517	317	166	999
Electrical machinery	205	824	972	2,001
Transport equipment & aerospace	..	94	..	282
Other manufacturing	638	655	723	2,015
Services	3,086	1,174	2,897	7,156
Other	205	176	364	745
Agriculture, hunting & forestry; Fishing	9	..	..	43
Extractive industries	-	8	198	206
Electricity, gas & water supply; waste management ²	97	..	..	234
Construction	99	80	83	262
Grand Total	4,789	3,454	6,503	14,747

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. .. Denotes disclosive value

4. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Total 20 (2016)

Number of businesses¹ performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups², 2016^{r,3}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	660	155	55	875
Chemicals	50	15	5	65
Mechanical engineering	190	35	10	235
Electrical machinery	65	15	10	85
Transport equipment & aerospace	20	5	5	35
Other manufacturing	335	85	30	450
Services	2,005	115	35	2,155
Other	180	25	20	225
Agriculture, hunting & Forestry; Fishing	30	0	5	30
Extractive industries	15	0	10	30
Electricity, gas & water supply; waste management ⁴	5	0	0	5
Construction	130	25	5	160
Grand Total	2,845	300	115	3,260

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is discontinuity between the date for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. r denotes revised figures.
6. Totals may not sum due to rounding.

[Return to Index](#)

Total 20 (2017)

Number of businesses¹ performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups², 2017^{r,3}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	765	150	60	975
Chemicals	50	15	5	70
Mechanical engineering	235	40	10	290
Electrical machinery	70	10	10	85
Transport equipment & aerospace	30	10	5	45
Other manufacturing	375	80	25	485
Services	2,065	125	40	2,225
Other	235	30	25	290
Agriculture, hunting & Forestry; Fishing	45	0	5	50
Extractive industries	0	5	10	15
Electricity, gas & water supply; waste management ⁴	25	5	5	30
Construction	170	20	5	195
Grand Total	3,065	305	120	3,490

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is discontinuity between the date for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. r denotes revised figures.
6. Totals may not sum due to rounding.

[Return to Index](#)

Total 20 (2018)

Number of businesses¹ performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups², 2018³

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	870	160	60	1,090
Chemicals	60	15	5	75
Mechanical engineering	255	40	15	310
Electrical machinery	70	15	10	95
Transport equipment & aerospace	35	5	5	50
Other manufacturing	450	85	25	565
Services	2,235	125	40	2,400
Other	255	35	20	310
Agriculture, hunting & Forestry; Fishing	50	0	0	55
Extractive industries	0	5	10	10
Electricity, gas & water supply; waste management ⁴	35	5	5	45
Construction	170	25	5	200
Grand Total	3,360	320	115	3,795

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is discontinuity between the date for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. Totals may not sum due to rounding.

[Return to Index](#)

Table 21 (2016)

**Average expenditure on R&D within businesses performing R&D in Scotland
by total UK company employment sizebands: Broad Product Groups¹, 2016^{r,2}**

	£ thousand per business			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	88	1,258	5,927	678
Chemicals	365	1,765	43,223	2,632
Mechanical engineering	53	372	1,810	180
Electrical machinery	221	8,172	13,926	2,791
Transport equipment & aerospace	142	611	2,001	567
Other manufacturing	40	446	2,237	259
Services	66	329	5,390	166
Other	23	256	4,061	442
Agriculture, hunting & Forestry; Fishing	..	..	1,304	258
Extractive industries	..	..	5,799	2,101
Electricity, gas & water supply; waste management ³	..	..	6,987	2,340
Construction	..	..	1,924	107
Grand Total	68	806	5,402	323

Source: ONS and Scottish Government

Notes:

1. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes nil, figures unavailable, too small to display or disclosive value
5. r denotes revised figures.
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 21 (2017)

**Average expenditure on R&D within businesses performing R&D in Scotland
by total UK company employment sizebands: Broad Product Groups¹, 2017^{r,2}**

	£ thousand per business			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	80	1,199	6,221	618
Chemicals	..	1,446	..	2,608
Mechanical engineering	70	331	1,545	167
Electrical machinery	170	11,037	13,015	2,748
Transport equipment & aerospace	..	773	..	819
Other manufacturing	58	396	1,637	201
Services	69	444	9,209	250
Other	31	298	3,296	320
Agriculture, hunting & Forestry; Fishing	..	..	2,073	265
Extractive industries	..	1	4,425	3,404
Electricity, gas & water supply; waste management ³	..	..	4,075	479
Construction	31	100	1,872	104
Grand Total	69	801	6,631	359

Source: ONS and Scottish Government

Notes:

1. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes nil, figures unavailable, too small to display or disclosive value
5. r denotes revised figures.
6. Totals may not sum due to rounding.

[Return to Index](#)

Table 21 (2018)
Average expenditure on R&D within businesses performing R&D in Scotland
by total UK company employment sizebands: Broad Product Groups¹, 2018²

	£ thousand per business			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	61	1,279	7,011	610
Chemicals	..	1,648	..	2,388
Mechanical engineering	58	354	2,154	185
Electrical machinery	136	8,068	17,002	3,017
Transport equipment & aerospace	..	953	..	561
Other manufacturing	48	496	1,970	205
Services	67	589	10,400	258
Other	19	255	3,073	233
Agriculture, hunting & Forestry; Fishing	6	..	..	87
Extractive industries	..	140	4,164	2,822
Electricity, gas & water supply; waste management ³	13	..	..	263
Construction	24	209	2,156	109
Grand Total	61	901	7,480	357

Source: ONS and Scottish Government

Notes:

1. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value, nil, figures unavailable or too small to display
5. Totals may not sum due to rounding.

[Return to Index](#)

Table 22
Expenditure and employment on R&D performed within businesses in Scotland
by country of ownership of business performing R&D: 2001 to 2018

	Expenditure (£ thousands)																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scotland	97,806	120,853	134,314	133,951	143,230	144,736	159,426	157,635	159,635	216,460	204,530	222,480	236,731	346,435	396,307	351,065	466,017	506,947
Rest of the UK	121,207	65,574	52,975	58,381	40,941	21,255	33,139	36,279	55,056	30,729	40,847	23,597	25,294	58,425	46,958	80,606	63,429	75,515
Other EU¹	56,046	68,284	51,490	55,643	96,886	90,983	123,401	93,416	97,713	102,396	112,845	139,433	151,108	124,808	125,836	183,196	302,391	275,273
United States	219,541	233,528	186,564	170,758	207,027	186,996	204,956	240,632	286,219	241,236	285,129	269,396	314,927	347,366	343,358	373,617	340,448	399,850
Rest of the World	22,069	18,471	15,922	11,646	18,375	16,286	21,674	25,548	32,542	27,997	53,347	53,756	72,981	80,045	40,167	63,567	78,168	98,339
Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,625	1,052,052	1,250,453	1,355,924

	Employment																	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Scotland	1,884	2,442	2,309	2,405	2,317	2,175	2,344	2,545	2,519	3,247	3,518	3,686	3,939	5,483	6,315	5,903	7,147	7,537
Rest of the UK	1,544	987	882	721	518	292	246	210	282	226	342	228	632	619	561	809	619	730
Other EU¹	733	842	626	723	1,135	1,049	1,214	1,194	1,180	1,172	907	1,100	1,358	944	1,138	1,465	1,777	1,424
United States	2,724	2,697	2,363	2,333	2,300	2,547	2,785	2,475	2,717	2,412	2,510	2,703	3,015	3,140	3,320	3,618	2,706	3,469
Rest of the World	325	301	273	229	267	246	337	279	326	414	533	624	718	729	530	709	1,042	1,587
Total	7,210	7,269	6,452	6,412	6,537	6,309	6,926	6,703	7,024	7,472	7,810	8,342	9,662	10,914	11,864	12,503	13,290	14,747

Source: ONS and Scottish Government : ONS and Scottish Government

Notes:

1. The Other EU category shows data from the other EU28 countries.
2. r denotes revised figures.
3. Totals may not sum due to rounding.

[Return to Index](#)

Total 23 (2016)

Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Group, 2016^{r,1}

£ thousands

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ³	United States	Rest of the World	
Manufacturing	121,722	58,907	96,495	276,497	36,409	590,030
Chemicals	22,442	..	..	120,544	..	166,551
Mechanical engineering	17,759	..	10,130	..	1,813	39,256
Electrical machinery	35,221	..	42,827	108,084	..	220,681
Transport equipment & aerospace	12,652	..	..	..	..	26,127
Other manufacturing	33,648	11,916	40,857	36,635	14,359	137,415
Services	214,736	18,436	36,317	69,486	11,132	350,108
Other	14,607	3,263	50,384	27,634	16,025	111,914
Agriculture, hunting & forestry; Fishing	..	..	..	..	3,912	8,254
Extractive industries	4,142	..	29,925	23,620	..	61,339
Electricity, gas & water supply; waste management ²	..	..	..	..	..	24,590
Construction	4,472	..	..	..	-	17,732
Grand Total	351,065	80,606	183,196	373,617	63,567	1,052,052

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. The Other EU category shows data from the other EU28 countries.

4. r denotes revised figures.

5. .. Denotes disclosive values.

6. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Total 23 (2017)

Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Group, 2017^{r,1}

£ thousands

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ³	United States	Rest of the World	
Manufacturing	113,927	41,565	135,303	267,476	35,481	593,752
Chemicals	14,799	..	..	..	..	178,812
Mechanical engineering	22,535	536	7,344	16,296	2,979	49,692
Electrical machinery	25,966	..	80,467	..	9,921	214,894
Transport equipment & aerospace	11,358	..	..	3,473	..	27,867
Other manufacturing	39,268	7,405	39,164	19,026	17,624	122,487
Services	333,960	..	130,675	53,559	..	562,603
Other	18,130	..	36,413	19,413	..	94,098
Agriculture, hunting & forestry; Fishing	..	..	..	..	6,220	12,717
Extractive industries	..	..	12,059	15,465	10,599	39,848
Electricity, gas & water supply; waste management ²	5,987	..	..	..	..	20,121
Construction	7,921	..	10,824	..	..	21,413
Grand Total	466,017	63,429	302,391	340,448	78,168	1,250,453

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. The Other EU category shows data from the other EU28 countries.

4. r denotes revised figures.

5. .. Denotes disclosive values.

6. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Total 23 (2018)
Expenditure on R&D performed within businesses in Scotland by country
of ownership of business performing R&D: Broad Product Group, 2018¹

£ thousands

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ³	United States	Rest of the World	
Manufacturing	125,373	50,222	137,868	320,633	41,409	675,505
Chemicals	10,111	..	2,300	164,617	..	179,878
Mechanical engineering	22,221	246	12,333	22,708	2,678	60,186
Electrical machinery	42,026	..	66,863	..	4,956	246,226
Transport equipment & aerospace	10,646	..	8,780	..	..	34,404
Other manufacturing	40,369	11,746	47,592	27,535	27,570	154,812
Services	360,024	20,985	117,569	65,945	42,279	606,803
Other	21,549	4,308	19,836	13,272	14,651	73,616
Agriculture, hunting & forestry; Fishing	..	-	..	..	..	4,701
Extractive industries	..	-	..	11,917	..	33,869
Electricity, gas & water supply; waste management ²	5,649	..	..	..	..	12,242
Construction	9,425	..	..	-	-	22,805
Grand Total	506,947	75,515	275,273	399,850	98,339	1,355,924

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
3. The Other EU category shows data from the other EU28 countries.
4. .. Denotes disclosive values.
5. - denotes nil, figures unavailable or too small to display.

[Return to Index](#)

Table 24 (2016)

Number of businesses¹ performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups², 2016^{r,3}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁵	United States	Rest of the World	
Manufacturing	730	15	40	50	40	875
Chemicals	50	0	5	10	0	65
Mechanical engineering	200	0	10	10	15	235
Electrical machinery	65	0	5	10	5	85
Transport equipment & aerospace	30	0	0	5	0	35
Other manufacturing	390	10	20	15	20	450
Services	2,030	20	35	45	25	2,155
Other	195	5	10	10	10	225
Agriculture, hunting & forestry; Fishing	25	0	0	0	5	30
Extractive industries	10	0	5	5	5	30
Electricity, gas & water supply; waste management ⁴	5	0	0	0	0	5
Construction	155	0	5	0	0	160
Grand Total	2,955	35	90	105	75	3,260

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. The Other EU category shows data from the other EU28 countries.
6. r denotes revised figures.

[Return to Index](#)

Table 24 (2017)

Number of businesses¹ performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups², 2017^{r,3}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁵	United States	Rest of the World	
Manufacturing	805	15	50	55	45	975
Chemicals	50	0	5	10	5	70
Mechanical engineering	240	5	15	15	15	290
Electrical machinery	70	0	10	5	5	85
Transport equipment & aerospace	35	0	5	5	0	45
Other manufacturing	415	10	20	15	25	485
Services	2,070	20	40	45	50	2,225
Other	260	5	15	5	5	290
Agriculture, hunting & forestry; Fishing	40	0	0	0	5	50
Extractive industries	5	0	5	5	5	15
Electricity, gas & water supply; waste management ⁴	30	0	5	0	0	30
Construction	185	5	5	0	0	195
Grand Total	3,140	40	105	105	100	3,490

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. The Other EU category shows data from the other EU28 countries.
6. r denotes revised figures.

[Return to Index](#)

Table 24 (2018)

Number of businesses¹ performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups², 2018³

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁵	United States	Rest of the World	
Manufacturing	910	15	55	60	50	1,090
Chemicals	55	0	5	15	5	75
Mechanical engineering	260	0	10	20	20	310
Electrical machinery	70	0	10	10	5	95
Transport equipment & aerospace	40	5	0	5	0	50
Other manufacturing	485	10	30	15	25	565
Services	2,220	20	45	55	60	2,400
Other	280	5	10	5	5	310
Agriculture, hunting & forestry; Fishing	50	0	0	0	0	55
Extractive industries	5	0	5	5	5	10
Electricity, gas & water supply; waste management ⁴	35	0	0	0	0	45
Construction	190	5	5	0	0	200
Grand Total	3,410	40	110	120	115	3,795

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. The Other EU category shows data from the other EU28 countries.

[Return to Index](#)

Table 25 (2016)

**Average expenditure on R&D within businesses performing R&D in Scotland
by country of ownership of business performing R&D: Broad Product Groups¹, 2016^{r,2}**

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁴	United States	Rest of the World	
Manufacturing	167	4,535	2,357	5,760	910	678
Chemicals	449	..	..	12,054	..	2,632
Mechanical engineering	99	..	740	..	139	180
Electrical machinery	497	..	13,346	13,173	..	2,791
Transport equipment & aerospace	454	..	..	..	..	567
Other manufacturing	87	1,487	992	2,281	756	259
Services	106	995	1,183	1,511	445	166
Other	75	585	3,676	2,763	2,003	442
Agriculture, hunting & forestry; Fishing	..	..	..	..	1,304	258
Extractive industries	345	..	4,216	3,374	..	2,101
Electricity, gas & water supply; waste management ³	..	..	..	..	..	2,340
Construction	29	..	..	..	..	107
Grand Total	119	2,239	2,036	3,592	871	323

Source: ONS and Scottish Government

Notes:

1. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. The Other EU category shows data from the EU28 countries.
5. .. Denotes nil, figures unavailable, too small to display or disclosive values
6. r denotes revised figures

[Return to Index](#)

Table 25 (2017)

**Average expenditure on R&D within businesses performing R&D in Scotland
by country of ownership of business performing R&D: Broad Product Groups¹, 2017^{r,2}**

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁴	United States	Rest of the World	
Manufacturing	141	2,772	2,858	4,955	755	618
Chemicals	290	..	..	..	..	2,608
Mechanical engineering	95	139	303	1,054	186	167
Electrical machinery	382	..	13,313	..	2,480	2,748
Transport equipment & aerospace	334	..	..	695	..	819
Other manufacturing	94	919	664	1,267	766	201
Services	161	..	3,082	1,162	..	250
Other	69	..	2,586	4,853	..	320
Agriculture, hunting & forestry; Fishing	..	..	..	..	2,073	265
Extractive industries	..	..	5,488	5,155	2,650	3,404
Electricity, gas & water supply; waste management ³	214	..	..	..	..	479
Construction	42	..	1,546	..	..	104
Grand Total	148	1,626	2,908	3,274	766	359

Source: ONS and Scottish Government

Notes:

1. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. The Other EU category shows data from the EU28 countries.
5. .. Denotes nil, figures unavailable, too small to display or disclosive values
6. r denotes revised figures

[Return to Index](#)

Table 25 (2018)
Average expenditure on R&D within businesses performing R&D in Scotland
by country of ownership of business performing R&D: Broad Product Groups¹, 2018²

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁴	United States	Rest of the World	
Manufacturing	138	3,051	2,306	5,199	828	610
Chemicals	187	..	575	11,873	..	2,388
Mechanical engineering	86	94	782	1,228	149	185
Electrical machinery	600	..	11,635	..	1,239	3,017
Transport equipment & aerospace	273	..	396	..	..	561
Other manufacturing	83	1,180	291	1,964	1,149	205
Services	162	1,152	2,917	1,212	705	258
Other	76	582	1,768	3,318	2,093	233
Agriculture, hunting & forestry; Fishing	..	..	..	..	..	87
Extractive industries	..	..	..	3,972	..	2,822
Electricity, gas & water supply; waste management ³	153	..	..	..	..	263
Construction	48	..	..	..	..	109
Grand Total	149	1,888	2,502	3,360	841	357

Source: ONS and Scottish Government

Notes:

1. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. The Other EU category shows data from the EU28 countries.
5. .. Denotes nil, figures unavailable, too small to display or disclosive values

[Return to Index](#)

Table 26
Expenditure on R&D performed within businesses in
Scotland
by Growth Sector, 2009-2018

Growth Sector	£ thousands									
	Year									
	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Food & Drink	17,576	20,242	26,771	24,214	22,163	19,310	16,911	..	34,434	23,859
Financial and Business Services	19,067	16,114	..	29,576	..	162,299	154,782	123,995	201,393	249,950
Life Sciences	153,783	171,822	254,130	254,647	270,451	293,393	285,063	264,670	294,839	300,629
Energy (including Renewables)	57,135	49,818	75,030	45,473	89,956	77,038	61,402	95,341	73,524	74,710
Sustainable Tourism (Tourism-related industries)	1,044	3,036	..	3,599	..	3,931	4,538	..	5,857	4,998
Creative Industries (including Digital)	57,386	58,413	70,703	101,732	123,899	140,426	138,850	168,102	204,471	222,532
All Growth Sectors	305,991	319,446	445,615	459,241	563,123	696,398	661,546	689,749	814,517	876,678

Source: ONS and Scottish Government

Notes:

1. .. Denotes disclosive value.
2. r denotes revised figures.
3. Growth sectors are based on Standard Industrial Classification 2007 codes. More information on how the growth sectors are defined is available at:
<https://www.gov.scot/publications/growth-sector-statistics/>
4. Totals may not sum due to rounding.

[Return to Index](#)

Table 27
Employment on R&D performed within businesses in Scotland:
Growth Sector, 2009-2018

Growth Sector	Full-time equivalent									
	Year									
	2009	2010	2011	2012	2013	2014	2015	2016 ^r	2017 ^r	2018
Food & Drink	376	352	496	392	432	314	280	..	541	396
Financial and Business Services	239	223	..	420	..	2,140	2,077	1,614	1,931	2,513
Life Sciences	1,731	1,957	2,324	2,571	2,588	2,767	2,779	2,751	2,912	3,004
Energy (including Renewables)	292	433	602	555	831	516	443	806	570	595
Sustainable Tourism (Tourism-related industries)	19	50	..	68	..	90	92	..	114	96
Creative Industries (including Digital)	799	789	1,012	1,390	1,849	1,555	1,716	1,909	2,346	2,744
All Growth Sectors	3,456	3,804	4,708	5,396	6,491	7,382	7,387	7,599	8,414	9,348

Source: ONS and Scottish Government

Notes:

1. .. Denotes disclosive value.

2. r denotes revised figures.

3. Growth sectors are based on Standard Industrial Classification 2007 codes. More information on how the growth sectors are defined is available at:

<https://www.gov.scot/publications/growth-sector-statistics/>

4. Totals may not sum due to rounding.

[Return to Index](#)

Table 28
Expenditure on R&D performed in Businesses in Scotland:
by small and medium size enterprises¹, 2006-2018

	0 to 249 employees		250 employees and over	Total Expenditure
	Independent SME	Part of larger enterprise group		
2006	26	100	334	460
2007	37	122	384	543
2008	26	152	375	554
2009	55	116	460	631
2010	46	131	441	619
2011	56	149	492	697
2012	75	139	494	709
2013	57	171	573	801
2014	68	233	655	957
2015	87	199	667	953
2016^r	93	210	749	1,052
2017^r	104	219	927	1,250
2018	98	264	993	1,356

£ million

Source: ONS and Scottish Government

1. The definition of SME used is that under the European Commission Recommendation (96/280/EC) of 3 April 1996, in which SMEs are defined as being enterprises with less than 250 employees, and also a criterion of independence is used to exclude enterprises that are part of a larger enterprise group. To apply this definition, historic information on company ownership has been obtained using that currently held on the ONS IDBR. Caution should therefore be used in making comparisons over time.

2. r denotes revised figures.

3. Totals may not sum due to rounding.

[Return to Index](#)

Table 29 (2016)
Expenditure and employment on R&D performed in Businesses in Scotland:
Top 100 Enterprise Groups in terms of expenditure, 2016^{r,2}

	Total Intramural Expenditure (£ thousands)	R&D Employment (Full time equivalent)
TOTAL ALL ENTERPRISES	1,052,052	12,503
Enterprise groups with the largest expenditure on R&D		
Top 5	260,325	2,114
Top 10	397,061	3,509
Top 15	486,309	4,055
Top 20	542,457	4,463
Top 50	719,962	6,524
Top 100	809,412	7,798

Source: ONS and Scottish Government

1. r denotes revised figures

[Return to Index](#)

Table 29 (2017)**Expenditure and employment on R&D performed in Businesses in Scotland:****Top 100 Enterprise Groups in terms of expenditure, 2017^{r,2}**

	Total Intramural Expenditure (£ thousands)	R&D Employment (Full time equivalent)
TOTAL ALL ENTERPRISES	1,250,453	13,290
Enterprise groups with the largest expenditure on R&D		
Top 5	471,516	2,490
Top 10	627,404	4,069
Top 15	693,355	4,460
Top 20	739,553	4,708
Top 50	886,269	6,302
Top 100	972,714	7,302

Source: ONS and Scottish Government

1. r denotes revised figures

[Return to Index](#)

Table 29 (2018)
Expenditure and employment on R&D performed in Businesses in Scotland:
Top 100 Enterprise Groups in terms of expenditure, 2018¹

	Total Intramural Expenditure (£ thousands)	R&D Employment (Full time equivalent)
TOTAL ALL ENTERPRISES	1,355,924	14,747
Enterprise groups with the largest expenditure on R&D		
Top 5	481,535	2,627
Top 10	641,906	4,092
Top 15	719,729	4,565
Top 20	770,492	4,978
Top 50	945,761	6,835
Top 100	1,061,716	8,302

Source: ONS and Scottish Government

[Return to Index](#)

Table 30
BERD expenditure as a share of turnover² in businesses in Scotland:
Sector and Division, 2010-2018

Division/ Section	Description	2010	2011	2012	2013	2014	2015	2016 ³	2017 ⁴	2018
1	Crop and animal production, hunting and related service activities	..	..	..	..	..	..	..	..	..
2	Forestry and Logging	..	..	..	..	..	..	..	..	..
3	Fishing and Aquaculture	..	0.01%	..	..	..	0.17%	0.23%	0.39%	0.15%
A	Agriculture, Forestry and Fishing	..	..	..	..	..	0.11%	0.13%	0.18%	0.07%
5	Mining of Coal and Lignite	..	..	..	..	..	..	..	..	..
6	Extraction of Crude Petroleum and Natural Gas	..	..	..	..	..	..	0.14%	0.14%	0.13%
7	Mining of Metal Ores	..	..	..	..	..	..	..	..	..
8	Other Mining and Quarrying	..	..	..	..	..	..	0.11%	..	..
9	Mining Support Service Activities	0.59%	0.56%	0.26%	0.31%	0.30%	0.20%	0.97%	0.61%	0.55%
B	Mining and Quarrying	0.13%	0.13%	0.05%	0.15%	0.12%	0.13%	0.35%	0.24%	0.22%
10	Manufacture of Food Products	0.07%	0.15%	0.10%	0.17%	0.13%	0.11%	0.18%	0.27%	0.18%
11	Manufacture of Beverages	..	0.12%	0.15%	0.16%	0.12%	0.09%	0.21%	0.12%	0.15%
12	Manufacture of Tobacco Products	..	..	..	..	..	..	..	..	..
13	Manufacture of Textiles	0.34%	0.35%	0.47%	0.43%	0.93%	0.75%	0.39%	0.89%	0.73%
14	Manufacture of Wearing Apparel	..	0.05%	0.37%	0.18%	..	0.44%	..	..	..
15	Manufacture of Leather and Related Products	..	..	..	..	..	..	..	..	..
16	Manufacture of Wood and of Products of Wood and Cork	0.05%	..	0.05%	0.07%	0.06%	0.08%	0.13%	0.12%	0.10%
17	Manufacture of Paper and Paper Products	0.07%	0.06%	0.08%	0.11%	0.13%	0.09%	..	0.14%	..
18	Printing and Reproduction of Recorded Media	..	..	..	..	0.16%	..	..	..	..
19	Manufacture of Coke and Refined Petroleum	..	..	..	..	..	..	..	..	..
20	Manufacture of Chemicals and Chemical Products	0.31%	0.16%	0.17%	..	0.19%	0.70%	1.33%	0.37%	0.44%
21	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations	3.24%	..	..	..	..	4.12%	5.16%	3.31%	3.00%
22	Manufacture of Rubber and Plastic Products	0.34%	0.32%	0.32%	0.32%	0.34%	0.54%	0.60%	0.31%	0.42%
23	Manufacture of Other Non-Metallic Mineral Products	0.10%	0.09%	0.10%	..	0.13%	0.06%	0.08%	..	0.16%
24	Manufacture of Basic Metals	0.20%	..	..	..	0.11%	..	..	..	..
25	Manufacture of Fabricated and Metal Products	0.70%	0.49%	0.32%	0.45%	0.46%	0.61%	0.90%	0.83%	0.83%
26	Manufacture of Computer, Electronic and Optical Products	3.68%	4.86%	6.58%	6.11%	6.83%	6.10%	5.48%	5.55%	8.24%
27	Manufacture of Electrical Equipment	1.14%	0.93%	1.42%	0.55%	0.87%	0.86%	0.68%	..	0.95%
28	Manufacture of Machinery and Equipment Not Elsewhere Classified	2.50%	0.86%	0.77%	0.87%	1.15%	1.52%	2.69%	1.02%	1.39%
29	Manufacture of Motor Vehicles, Trailers and Semi-Trailers	0.73%	0.47%	0.79%	0.53%	0.31%	0.29%	1.50%	1.37%	1.33%
30	Manufacture of Other Transport Equipment	0.18%	0.13%	0.12%	0.16%	0.15%	0.14%	0.17%	0.29%	0.35%
31	Manufacture of Furniture	..	..	0.45%	..	..	0.88%	0.40%	..	..
32	Other Manufacturing	3.50%	4.04%	3.74%	3.19%	2.86%	2.57%	2.60%	3.15%	6.31%
33	Repair and Installation of Machinery and Equipment	..	0.80%	0.65%	0.79%	1.02%	1.05%	0.76%	0.76%	0.51%
C	Manufacturing	0.54%	0.54%	0.76%	0.76%	0.70%	0.75%	0.90%	0.75%	0.93%
35	Electricity, Gas, Steam and Air Conditioning Supply	..	..	..	..	0.07%	0.06%	0.08%	..	..
D	Electricity, gas, steam and air conditioning supply	..	..	..	..	0.07%	0.06%	0.08%	..	..
36	Water Collection, Treatment and Supply	..	..	..	..	..	..	..	..	..
37	Sewerage	..	..	..	..	..	..	..	..	..
38	Waste Collection, Treatment and Disposal Activities; Materials Recovery	0.04%	..	..	..	..	..	..	..	0.12%
39	Remediation Activities and Other Waste Management Services	..	..	..	..	..	..	..	..	..
E	Water supply; Sewerage, waste management and remediation activities	0.02%	0.03%	0.09%	0.06%	0.02%	0.03%	..	..	0.06%
41	Construction of Buildings	0.00%	..	0.01%	0.01%	0.02%	0.01%	0.02%	0.02%	0.02%
42	Civil Engineering	..	..	0.02%	0.01%	0.06%	0.03%	0.08%	0.15%	0.18%
43	Specialised Construction Activities	..	..	0.03%	0.02%	0.03%	0.01%	0.03%	0.04%	0.05%
F	Construction	0.00%	0.01%	0.02%	0.02%	0.03%	0.02%	0.03%	0.05%	0.06%
45	Wholesale and Retail Trade and Repair of Motor Vehicles and Motorcycles	0.01%	..	..	..	0.01%	0.01%	0.03%	0.02%	0.02%
46	Wholesale Trade, Except of Motor Vehicles and Motorcycles	0.38%	0.12%	0.03%	0.01%	0.02%	0.03%	0.03%	0.05%	0.03%
47	Retail Trade, Except of Motor Vehicles and Motorcycles	0.01%	..	..	..	0.00%	0.00%	0.01%	0.01%	0.01%
G	Wholesale and retail trade; Repair of motor vehicles and motorcycles	0.14%	0.05%	0.01%	0.01%	0.01%	0.01%	0.02%	0.03%	0.02%
49	Land Transport and Transport via Pipelines	0.01%	..	..	..	..	..	..	..	..
50	Water Transport	..	..	..	..	..	..	..	..	..
51	Air Transport	..	..	..	..	..	..	..	..	..
52	Warehousing and Support Activities for Transportation	0.00%	0.01%	..	..	0.00%	0.01%	0.00%	0.01%	0.02%
53	Postal and Courier Activities	..	..	..	..	..	..	..	..	..
H	Transportation and storage	0.00%	0.03%	..	..	0.00%	0.01%	0.00%	0.01%	0.02%
55	Accommodation	..	..	..	..	..	..	..	..	..
56	Food and Beverage Service Activities	..	..	..	..	..	..	..	..	..
I	Accommodation and food service activities	0.02%	..	..	..	..	..	..	0.04%	0.04%
58	Publishing Activities	0.07%	..	0.23%	0.17%	0.32%	0.43%	..	..	0.60%
59	Motion Picture, Video and Television Programme Production, Sound Recording and Music Publishing Activities	..	..	0.25%	..	0.12%	0.25%	0.24%	0.20%	0.26%
60	Programming and Broadcasting Activities	..	..	..	..	..	..	..	..	..
61	Telecommunications	..	0.05%	..	..	..	0.29%	0.15%	0.06%	..
62	Computer Programming, Consultancy and Related Activities	1.24%	1.57%	0.92%	0.90%	0.82%	0.74%	1.42%	1.37%	1.41%
63	Information Service Activities	0.32%	1.19%	1.64%	1.65%	4.19%	..	3.88%	2.97%	3.43%
J	Information and communication	0.44%	0.65%	0.64%	0.68%	0.62%	0.70%	1.06%	1.05%	1.10%
64	Financial Service Activities, Except Insurance and Pension Funding	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
65	Insurance, Reinsurance and Pension Funding, Except Compulsory Social Security	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
66	Activities Auxiliary to Financial Services and Insurance Activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
K	Financial and insurance activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
68	Real Estate Activities	..	..	..	..	..	..	..	0.06%	0.08%
L	Real estate activities	..	..	..	..	..	..	..	0.06%	0.08%
69	Legal and Accounting Activities	..	..	..	0.06%	..	..	..	..	0.07%
70	Activities of Head Offices; Management Consultancy Activities	0.06%	0.03%	0.05%	0.05%	0.09%	0.08%	0.42%	..	..
71	Architectural and Engineering Activities; Technical Testing and Analysis	0.73%	0.82%	0.93%	1.12%	1.73%	1.50%	1.02%	0.90%	1.21%
72	Scientific Research and Development	17.07%	23.69%	22.05%	21.62%	29.80%	32.52%	16.78%	19.89%	19.50%
73	Advertising and Market Research	..	..	0.09%	..	0.17%	0.18%	0.10%	..	..
74	Other Professional, Scientific and Technical Activities	..	0.10%	0.10%	0.32%	0.38%	0.26%	0.12%	0.14%	0.23%
75	Veterinary Activities	..	..	..	..	..	..	..	..	0.35%
M	Professional, scientific and technical activities	1.28%	1.68%	1.73%	1.93%	2.38%	2.12%	1.71%	2.37%	2.36%
77	Rental and Leasing Activities	0.34%	0.22%	0.15%	0.11%	0.16%	0.46%	..	0.79%	1.15%
78	Employment Activities	0.02%	..	..	..	..	..	..	..	..
79	Travel Agency, Tour Operator and Other Reservation Service and Related Activities	..	0.06%	0.08%	0.08%	..	..	..	..	..
80	Security and Investigation Activities	..	..	..	..	..	..	0.15%	0.48%	0.77%
81	Services to Building and Landscape Activities	..	0.02%	0.02%	0.04%	..	..	..	0.21%	..
82	Office Administrative, Office Support and Other Business Support Activities	0.05%	..	0.05%	0.05%	..	0.06%	0.05%	0.05%	0.10%
N	Administrative and support service activities	0.10%	0.07%	0.06%	0.06%	0.07%	0.13%	0.18%	0.21%	0.28%
85	Education	..	..	0.03%	..	0.02%	0.02%	0.04%	0.10%	0.07%
P	Education	..	..	0.03%	..	0.02%	0.02%	0.04%	0.10%	0.07%
86	Human Health Activities	..	0.02%	..	..	..	..	0.07%	0.07%	0.05%
87	Residential Care Activities	..	..	..	..	..	..	..	..	..
88	Social Work Activities Without Accommodation	..	..	..	..	..	..	..	..	..
Q	Human health and social work activities	..	0.03%	..	..	0.00%	..	0.02%	0.03%	0.02%
90	Creative, Arts and Entertainment Activities	0.20%	..	..	..	..	..	..	..	0.09%
91	Libraries, Archives, Museums and Other Cultural Activities	..	..	..	..	0.03%	..	..	..	..
92	Gambling and Betting Activities	..	..	..	..	..	..	..	..	..
93	Sports Activities and Amusement and Recreation Activities	..	..	..	..	..	0.01%	..	0.13%	0.07%
R	Arts, entertainment and recreation	0.03%	..	0.02%	..	0.01%	0.01%	..	0.07%	0.04%
94	Activities of Membership Organisations	..	..	..	..	..	..	..	..	..
95	Repair of Computers and Personal Household Goods	0.63%	0.69%	0.52%	0.46%	0.89%	0.46%	0.45%	0.30%	0.25%
96	Other Personal Service Activities	..	..	..	..	..	..	..	..	..
S	Other service activities	0.09%	0.15%	0.12%	0.12%	0.19%	0.10%	0.16%	0.16%	0.12%
All	Grand Total	0.25%	0.27%	0.27%	0.31%	0.35%	0.36%	0.40%	0.46%	0.49%

Source : Scottish Government, ONS (IDBR)

- Notes:
1. .. Denotes disclosive value.
 2. Total Scottish turnover is available in Table 1 at: <https://www.gov.scot/publications/businesses-in-scotland-2019/>
 3. Note that there is a time lag with this data, so for example, 2017 BERD expenditure is divided by 2019 total Scottish turnover
 4. 2019 total Scottish turnover is used for 2018 BERD expenditure
 5. Turnover for financial and insurance activities enterprises are not available on a comparable basis.

[Return to Index](#)

A National Statistics publication for Scotland

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be interpreted to mean that the statistics: meet identified user needs; are produced, managed and disseminated to high standards; and are explained well.

Correspondence and enquiries

For enquiries about this publication please contact:

Marina Curran,
Office of the Chief Economic Adviser,
Telephone: 0131-244-6813,
e-mail: industrystatistics@gov.scot

For general enquiries about Scottish Government statistics please contact:

Office of the Chief Statistician, Telephone: 0131 244 0442,
e-mail: statistics.enquiries@gov.scot

How to access background or source data

The data collected for this statistical bulletin publication>:

- are available in more detail through Statistics.gov.scot
- may be made available on request, subject to consideration of legal and ethical factors. Please contact industrystatistics@gov.scot for further information.
- cannot be made available by Scottish Government for further analysis as Scottish Government is not the data controller.

Complaints and suggestions

If you are not satisfied with our service or have any comments or suggestions, please write to the Chief Statistician, 2W, St Andrews House, Edinburgh, EH1 3DG, Telephone: (0131) 244 0302, e-mail statistics.enquiries@gov.scot.

If you would like to be consulted about statistical collections or receive notification of publications, please register your interest at www2.gov.scot/scotstat

Details of forthcoming publications can be found at:

<https://www2.gov.scot/Topics/Statistics/ForthcomingPubs>

Crown Copyright

You may use or re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. See:

www.nationalarchives.gov.uk/doc/open-government-licence/