

UK Innovation Survey 2017: Northern Ireland Results

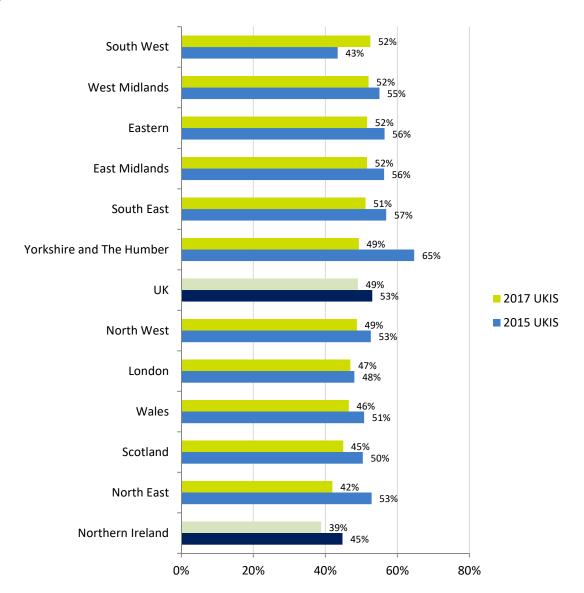
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Key Points

- Thirty-nine per cent of enterprises in NI were estimated to be innovation active in the three year period 2014-16 (down from 45% in 2012-14¹). This is lower than the equivalent UK figure of 49% (down from 53% in 2012-14).
- At 39%, NI was estimated to be the least innovation active country in the UK. When comparing with Great Britain (GB) regions, NI was also the least innovation active region in 2014-2016 (second least innovative active in 2012-2014).
- In NI, large enterprises with 250 or more employees were more likely to engage in some sort of innovation activity with 58% estimated to be innovation active, compared to 38% of SMEs². The same was true in the UK as a whole where 63% of large enterprises were innovation active compared to 49% of UK SMEs.
- The difference between the proportions of enterprises that were product innovators in NI (17%) and the UK (24%) and process innovators (NI: 10%, UK: 16%) during 2014-16, remained similar compared to 2012-14.
- Manufacture of electrical and optical equipment had the highest proportion of innovation active enterprises (74%) followed by motion picture and video production (71%), Construction has the least number of innovation active enterprises in NI at 23 per cent (down from 45 per cent in 2012-14).
- The most commonly reported innovation investments were in the acquisitions of computer software followed by Internal R&D.
- Replacing outdated products or processes was the main factor driving innovation in NI and the UK as a whole. Enterprises reporting no innovation were the most likely to respond that there was no need due to market conditions.

Figure 1 below shows the rate of innovation activity for businesses across the countries and regions of the UK.

Figure 1: Rate of innovation active businesses - country and regional innovation patterns



¹The 2015 UK and NI figures provided in the previous NI publication were revised by BEIS in October 2018. Full revisions can be accessed at https://www.gov.uk/government/collections/community-innovation-survey

²SMEs are defined in this report as having 10-249 employees. They may be part of an enterprise group.

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1 Introduction and Context

The UK Innovation Survey (UKIS) provides a range of information related to innovation activity among enterprises, and includes information on the extent of innovation activity, the impact of innovation on businesses and the barriers to innovation.

This report presents results from the Northern Ireland (NI) element of the UKIS 2017, covering the three-year period from 2014 to 2016. The survey was conducted by the Office of National Statistics (ONS) and the main report containing the UK-level results was produced by the Department for Business, Energy and Industrial Strategy (BEIS)³. This is part of a wider European Community Innovation Survey (CIS) and is the tenth such survey, with the previous survey being undertaken in 2015⁴. EU-wide results will be published once national results are available.

Business innovation is a vital ingredient in raising the productivity, competitiveness and growth potential of modern economies. It is a key objective for the Northern Ireland Executive to encourage NI businesses to become more innovative and the key actions to achieve this are set out in the Innovation Strategy for Northern Ireland 2014-2025⁵. The importance of business innovation is also reflected in the Draft Programme for Government Framework 2016-21.⁶

The CIS complements other indicators of innovation by providing a regular snapshot of innovation inputs and outputs and the constraints faced by NI businesses in their innovation efforts, across the range of industries and business enterprises. It has the additional benefit of providing the basis for some comparisons with other European countries.

The survey samples enterprises with 10 or more employees in sections B to N of the Standard Industrial Classification (SIC) 2007. This is the forth survey using a sample based on SIC 2007, which enables a more consistent comparison with the 2011, 2013 and 2015 survey data in the time series. Further information relating to coverage and sampling is contained in the Background Notes section.

With 558 of the 1294 enterprises selected responding, the NI element of the survey had a response rate of 43% (At the UK level a response rate of 43% was also achieved). In order to be representative, the responses have been weighted back to the population and this is reflected in the results shown throughout the publication.

³ https://www.gov.uk/government/statistics/uk-innovation-survey-2017-main-report

⁴ The 2015 survey covers 2012-14

⁵ https://www.economy-ni.gov.uk/publications/northern-ireland-innovation-strategy

⁶ https://www.northernireland.gov.uk/sites/default/files/consultations/newnigov/draft-pfg-framework-2016-21.pdf

1.1 Definitions

The UK definition of innovation follows the EU-wide definition adopted by Eurostat. This definition of 'innovation active' includes any of the activities described below that enterprises were engaged in during the survey period:

- 1. Introduction of a new or significantly improved product (good or service) or process;
- 2. Engagement in innovation projects not yet complete or abandoned;
- 3. New and significantly improved forms of organisation, business structures or practices and marketing concepts or strategies;
- 4. Activities in areas such as internal research and development, training, acquisition of external knowledge or machinery and equipment linked to innovation activities;

This definition excludes expenditure and activities related to innovation.

For the purpose of the UK innovation survey and in line with the European-wide Community innovation survey a business that has engaged in any of the activities 1 to 3 is defined as 'innovation active'.

For the purpose of this report a business that has engaged in any of the activities described in points 1 to 4 above is defined as a **'broader innovator'**. We define a **'wider innovator'** as a business that has engaged in the activity described in point 3.

2 Summary and Commentary

2.1 Innovation activity

The results of the 2017 UKIS and revised results from the 2015 UKIS show that 39% of NI enterprises were estimated to be innovation active in 2014-16. The equivalent UK figure was 49% in 2014-16.

Table 1: Proportion of enterprises engaging in innovation activity, by size and type of activity

	Size of Enterprise					
Type of Activity	SN	IEs	Large		Д	/II
	NI %	UK%	NI %	UK%	NI %	UK%
2017						
Innovation active	38	49	58	63	39	49
Broader innovator	39	50	60	65	40	50
Product Innovator	17	24	24	30	17	24
of which (share with new-to-market products)	26	33	26	37	26	33
Process innovator	10	16	20	23	10	16
of which (share with new-to-industry processes)	*	24	*	25	20	24
Abandoned activities	2	4	11	8	3	4
On-going activities	13	16	26	28	13	17
Innovation-related expenditure	33	44	57	58	34	44
Both product AND process innovator	6	9	11	13	6	10
Either product OR process innovator	21	30	33	39	21	30
2015						
Innovation active	44	53	66	61	45	53
Broader innovator	45	54	66	62	46	54
Product Innovator	13	19	26	27	14	19
of which (share with new-to-market products)	35	31	33	39	35	31
Process innovator	9	13	20	20	9	13
of which (share with new-to-industry	*	26	*	24	29	26
Abandoned activities	4	4	10	7	4	4
On-going activities	18	17	26	24	18	17
Innovation-related expenditure	39	43	56	50	40	44
Both product AND process innovator	5	8	17	13	6	8
Either product OR process innovator	17	24	29	34	17	24
	•					

^{* =} Cells have been suppressed to protect confidentiality

Comparisons between the 2015 and 2017 surveys (Table 1) indicate that the proportion of firms in NI engaged in innovation activity have decreased over the period. Forty-five per cent of businesses were innovation active in 2012-14, falling to 39% during 2014-16. Comparable figures for the UK have also decreased over the period, from 53% in 2012-14 to 49% in 2014-16.

Table 1 shows that large enterprises with 250 or more employees were more likely to engage in some sort of innovation activity, with 58% innovation active (66% in 2015), compared to 38% (2015: 44%) of SMEs. This was also the case at UK level, with 63% of large enterprises innovation active (61% in 2015) compared to 49% (2015: 53%) of SMEs.

The difference between the proportions of enterprises that were product innovators in NI (17%) and the UK (24%) and process innovators (NI, 10 % and the UK 16 %) during 2014-16, remained similar when compared to 2012-14.

3% of NI and 4% UK enterprises had projects during the period to develop product or process innovations that had to be abandoned before the end of 2016, while 13% of NI enterprises (UK: 17%) had innovation projects that were ongoing at the end of 2016. Thirty-four per cent of NI and 44% of UK enterprises had some innovation-related expenditure during 2014-16, showing that businesses recognise the need to allocate resources to innovation.

Computer software 18% Internal R&D 15% Training for innovative activities 12% Computer hardware 11% Advanced machinery 9% All forms of design 6% Acquisition of extrenal R&D 6% Acquisition of external knowledge 3% Changes to marketing methods 3% Launch advertising 1% Changes to product or service design 1% Market research 1% 10% 15% 20% 0% 5%

Figure 2: Breakdown of innovation activities by type of investment – all enterprises

As shown in Figure 2 the most commonly reported activities were in the acquisitions of computer software followed by internal R&D. Computer software was also ranked as the highest expenditure category in the 2015 survey.

2.2 Innovation by industry type

Table 2: Innovation active businesses by industry over two survey periods (percentage of all enterprises)

	Year						
Industry	2017		2015		Percentage point change		
	NI %	UK%	NI %	UK%	NI	UK	
Production and Construction Sector							
Manufacture of electrical and optical equipment	74	74	87	71	-13	3	
Fuels, chemicals, plastic, metals and minerals	60	56	53	64	7	-8	
Manufacturing not elsewhere classified	58	56	61	59	-4	-2	
Manufacture of Transport equipment	60	67	84	70	-24	-3	
Food, clothing, wood, paper, publishing & printing		58	51	61	2	-3	
Electricity, gas and water supply		43	67	47	-31	-4	
Construction		44	45	46	-21	-2	
Mining and quarrying	*	45	*	48	*	-3	
Distribution and Services Sector							
Real estate, renting and business activities	45	54	52	55	-7	-1	
Financial intermediation	49	50	70	59	-20	-9	
Transport, storage and communication	41	47	42	50	-1	-3	
Wholesale trade (including cars and bikes)	46	51	42	54	4	-3	
Retail trade (excluding cars and bikes)		45	33	48	-1	-4	
Hotels and restaurants		37	38	47	-14	-10	
Motion Picture and Video Production	71	44	*	51	*	-7	
ALL INDUSTRIES	39	49	45	53	-6	-4	

Note: Figures may not add due to rounding

As shown in Table 2, the percentage of firms reported to be innovation active varied considerably across industrial and commercial sectors. In the production and construction sector, manufacture of electrical and optical equipment had the highest proportion of innovation active enterprises (74%) followed by Fuels, chemicals, plastic, metals and minerals and manufacture of transport equipment (both 60%).

In the distribution and services sector, motion picture and video production had the highest proportion of innovation active enterprises (71%), whilst hotels and restaurants had the lowest at 24%. In the UK as a whole, Real estate, renting and business activities was also the most innovative sector n the distribution and services sector (54%).

^{* =} Cells have been suppressed to protect confidentiality

2.3 Factors driving innovation

Businesses defined as 'broader innovators⁷' were asked to rank a variety of drivers for innovating on a scale from no impact to low, medium or high impact. Table 4 shows the proportion of businesses that had rated 'high' in each of the innovation factors presented to them. The proportion of respondents who answered 'high' in each category is shown in Table 3.

Table 3: Innovation factors (percentage of all broader innovators rating "high")

			Siz	ze of e	nterpri	se	
	Factor			Large		All	
				NI	UK	NI	UK
	Improving quality of goods or services	36	42	52	46	37	42
	Increasing range of goods or services	30	28	25	29	30	28
Product- related	Entering new markets	23	20	26	21	23	20
	Increasing market share	33	30	37	37	34	30
	Improving flexibility of production or service provision	20	22	39	25	20	22
Process	Improving capacity for producing goods or services	19	23	32	25	20	23
-related	Reducing costs per unit produced or service provided	15	22	32	28	16	23
Product and	Replacing outdated products or processes	41	39	50	41	41	39
Process related	Increasing value added	27	32	29	36	27	32
	Meeting regulatory requirements	18	26	30	30	19	26
Other	Reducing environmental impacts	5	14	24	19	6	15
	Improving health and safety	16	18	29	22	16	18

Similar to findings from the 2015 survey, in general, product-related factors were more often cited than process factors at both NI and UK level. 41% of NI and 39% of UK respondents rated replacing outdated products or processes as highly important, confirming a strongly customer-focused approach to innovation. Improving quality of goods or services, increasing the range of goods or services and increasing market were also widely reported drivers.

⁷ The difference between businesses defined as 'Broader Innovators' and 'Innovation Active' businesses is the inclusion of the responses provided for the expenditure and activities linked to innovation. In other words, 'Broader Innovators' are the innovation active businesses that also provide information regarding their R&D related investments.

In NI and the UK, the most commonly reported driver for innovation in large enterprises was 'Improving quality of goods or services', this was also true for SMEs in the UK. Whereas for SMEs in NI, 'replacing outdated products or processes' was reported as the main driver for innovation.

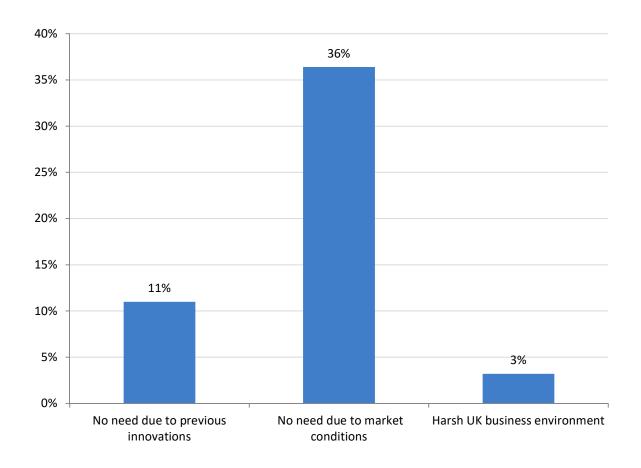
The least cited factor in NI was reducing environmental impacts, with only 6% of respondents rating the factor as highly important. This was also the case for the UK with just 15% of respondents rating the factor as highly important.

2.4 Constraints on innovation

Businesses that reported having no innovation activity during the survey period were asked to indicate why it had not been necessary or possible to innovate. They were offered the response categories presented in Figure 3 alongside a response category saying 'none of these apply'.

Forty-nine per cent said that none applied in their case. 36% said there was no need due to market conditions, while 11% felt that there was no need due to previous innovations. 3% said there were factors with the UK business environment constraining innovation.

Figure 3: Reasons why enterprises did not innovate during 2014 - 2016 (non innovative firms only)



2.5 Sources of information and co-operation for innovation

Introducing innovation is an increasingly complex process, requiring the co-ordination of multiple inputs. It is therefore important to know how far enterprises engage with external sources of technology and other innovation-related knowledge and information. Businesses can gain guidance, advice or even inspiration for their prospective innovation projects from a variety of both public and private sources.

Respondents were asked to rank a number of potential information sources on a scale from 'no relationship' to 'high importance'. The proportion which answered 'high' in each category is shown in Table 4. These sources are:

- **Internal:** from within the enterprise itself or from other enterprises within the enterprise group;
- **Market:** from suppliers, customers, clients, consultants, competitors, other businesses, commercial laboratories or private research and development institutes;
- **Institutional:** from the public sector such as government research organisations and universities; or
- Other: from conferences, trade fairs, exhibitions, scientific journals, trade/technical publications, professional or industry associations or technical, industry or service standards.

SMEs and large enterprises in NI and the UK reported internal and market sources as most important for information on innovation. This suggests that enterprises tend to rely on their own experience and knowledge coupled with information from suppliers, customers and clients.

In NI, 56% of respondents felt their own experience and knowledge was a highly important source of information during 2014-16, compared to the equivalent UK figure of 48%. Both figures are higher than that reported in the 2015 survey; 43% for NI and 47% for the UK.

Similar to the 2015 survey period, institutional sources were considered to be of lowest importance among NI and UK enterprises. 3% of both UK and NI businesses mentioned 'government or public research institutes' while 5% of NI and 3% of UK cited 'universities or other higher education institutions'.

Table 4: Enterprises rating Information sources as of 'high' importance (percentage of respondents)

		Size of enterprise						
Information source	SMEs		Large		А	.II		
	NI	UK	NI	UK	NI	U K		
Internal								
Within the business or within the enterprise group	56	48	60	55	56	48		
Market								
Clients or customers from private sector		27	26	28	18	27		
Clients or customers from public sector		13	10	15	7	13		
Suppliers of equipment, materials, services or software		28	38	28	33	28		
Competitors or other business in the industry	8	19	16	19	9	19		
Consultants, commercial laboratories or private research & development institutes		5	8	8	8	5		
Institutional								
Universities or other higher education institutions	*	3	*	3	5	3		
Government or public research institutes	*	3	*	4	3	3		
Other								
Technical, industry or service standards	9	12	9	14	9	12		
Conferences, trade fairs or exhibitions	3	7	7	7	4	7		
Professional and industry associations	*	9	*	9	7	9		
Scientific journals and trade/technical publications		3	*	3	1	3		

^{* =} Cells have been suppressed to protect confidentiality

2.6 Innovation Co-Operation

Fifty-one per cent of collaborative, broader innovators reported co-operation arrangements compared to 50% in 2012-14.

As shown in Table 5, among innovators who collaborated, 76% had agreements that operated at a local/regional level (compared to 72% in the 2015 survey).

The percentage of enterprises in NI which reported co-operation activity showed some change by geography over the year. Co-operation with Local Partners (within the UK) increased by 4 percentage points to 76% and with All Other Countries decreased by 11 percentage point to 5%. Co-operation activity with the UK increased by 9 percentage points to 53%.

The most frequent partners for co-operation among NI broader innovating enterprises were suppliers of equipment, materials, services or software (83%). The least likely co-operation arrangement in NI was with government or public research institutes (38% of collaborative, broader innovation active businesses).

Table 5: Co-operation partners (percentage of collaborative, broader innovation active businesses)

		Geograp	hy of co-o _l	peration	
Type of partner	Local/ Regional within the UK	UK	Other Europe	All other countries	Any
Suppliers of equipment, materials, services or software	47	38	13	3	83
Clients or customers from the private sector	51	29	11	3	68
Clients or customers from the public sector	34	17	3	1	47
Other businesses within the enterprise group	37	30	12	3	68
Competitors or other businesses within the industry	30	28	5	2	53
Universities or other higher education institutions	26	14	1	1	39
Consultants, commercial labs or private R&D institutes	31	21	4	1	49
Government or public research institutes	22	16	*	*	38
Any	76	53	23	5	100

^{* =} Cells have been suppressed to protect confidentiality

2.7 Non-technological or wider forms of innovation

Innovation is not wholly about the development or use of technology or other forms of product or process change. Enterprises can also change their behaviour or business strategies to make themselves more competitive, often in conjunction with product or process innovation, but also as an independent means of improving competitiveness. For the 2017 survey, wider innovators are included in the 'innovation active' definition (see section 1 for more details).

Enterprises were asked whether they had made major changes to their business structure and practices in the three-year period 2014-2016. Headline results are summarised in Table 6.

Over a quarter (28%) of NI businesses engaged in one or more types of non-technological innovation over the 2017 survey period. Just under a quarter (23%) mentioned the implementation of new business practices for organising procedures.

Like the 2015 survey, a greater proportion of large enterprises engaged in one or more of these changes (NI: 35% of large enterprises compared to 28% of SMEs). In the UK the same was true with 44% of large enterprises compared to 36% of SMEs engaged in wider innovation activities.

Table 6: Enterprises that introduced wider forms of innovation (percentage of respondents)

Forms of innovation		Size of enterprise							
		SMEs		Large		All .			
	NI	UK	NI	UK	NI	UK			
Wider innovator (any of changes below)	28	36	35	44	28	36			
New method organising external relationships	3	10	12	13	3	10			
New business practices	23	23	27	31	23	23			
Changes to marketing concept or strategies	6	13	15	14	6	13			
New method organising work responsibilities	11	19	14	24	11	19			

2.8 Regional variation and historical changes

Table 7: Rate of innovation active businesses - country and regional innovation patterns

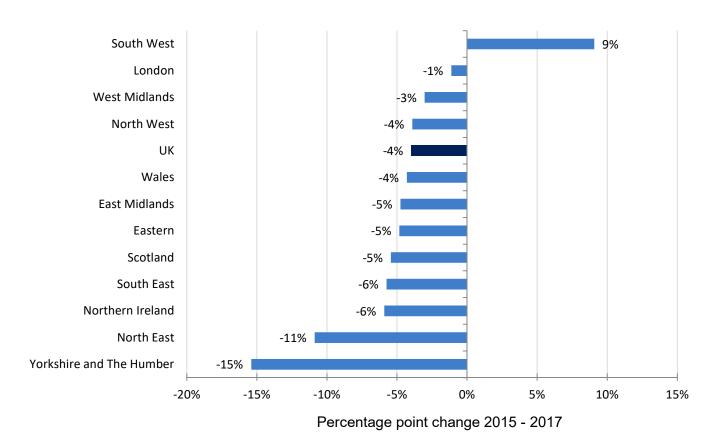
Country or region	2017	2015	Percentage point change
South West	52	43	9
West Midlands	52	55	-3
Eastern	52	56	-5
East Midlands	52	56	-5
South East	51	57	-6
Yorkshire and The Humber	49	65	-15
UK	49	53	-4
North West	49	53	-4
London	47	48	-1
Wales	46	51	-4
Scotland	45	50	-5
North East	42	53	-11
Northern Ireland	39	45	-6

Note: Figures may not add due to rounding

Table 7 above shows the rate of innovation activity for businesses across the countries and regions of the UK. Results for 2017 displayed notable regional variations to the 2015 Survey, ranging from a high of 52% in South West, West Midlands, Eastern and East Midlands to a low of 39% in Northern Ireland.

Figure 4 shows that the proportion of innovation for all regions and countries decreased notably since the 2015 survey, with the exception of the South West. Northern Ireland decreased by six percentage points (from 45% to 39% of innovation active businesses), and is now the least innovative region of the UK.

Figure 4: 2015 – 2017 percentage point change in innovation active businesses - country and regional innovation patterns



2.9 Comparisons with the 2015 survey

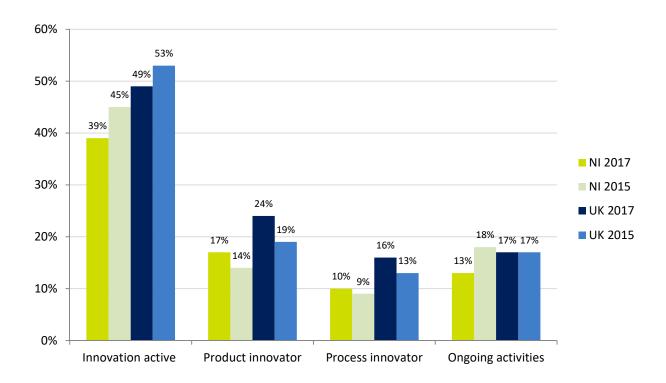
Figure 5 compares headline statistics from the 2017 UK innovation survey (referencing 2014-16) and the 2015 survey (2012-14).

The proportion of innovation active enterprises in NI over this period has decreased from 45% to 39%. Comparable figures for the UK have also decreased over the period, from 53% to 49%.

When innovation activity is examined by its component parts, the proportion of NI enterprises reporting product innovations has increased slightly from 14% in 2012-14 to 17% in 2014-16.

Enterprises reporting process innovations also increased slightly with 10% of responding NI firms indicating that they had engaged in these activities in 2014-16 compared to 9% in the previous survey period.

Figure 5: Comparison of 2015 and 2017 Surveys: proportion of innovating enterprises (percentage of respondents)



3 Background Notes

3.1 Methodology

This report presents findings from the Northern Ireland element of the UK Innovation Survey (UKIS), which was conducted by ONS. The UKIS is part of a wider Community Innovation Survey (CIS) covering EU countries. The survey is based on a core questionnaire developed by the European Commission (Eurostat) and Member States. This is the tenth iteration of the survey (CIS10). CIS9, covering the period 2012 to 2014, was carried out in 2015 and the results form part of various EU benchmarking exercises for international comparisons (see http://ec.europa.eu/growth/access-to-finance).

The UK Innovation Survey 2017 surveyed 1,294 enterprises in NI. The survey was voluntary and conducted primarily through an electronic questionnaire and telephone interview for businesses that had not yet completed an online response. This is a change from previous surveys which were primarily conducted via postal questionnaires.

3.2 Coverage and sampling

The 2017 survey sampled enterprises with 10 or more employees in sections B to N of the Standard Industrial Classification (SIC) 2007.

The sample is a stratified design drawn from the Inter-Departmental Business Register (IDBR) with Neyman allocation used to determine the sample size in each stratum. Overall, roughly fifteen per cent of the target population is sampled.

Stratification was based on three variables:

- i.) Region All regions and countries in the UK (9 Standard Regions in England plus Scotland, Wales and Northern Ireland)
- ii.) SIC Division This was the fourth time survey data was collected using a sample based on SIC 2007. The groups included are as follows:

SIC 05-09	Mining and quarrying
SIC 10-18	Manufacture of food, clothing, wood, paper, publishing, printing
SIC 19-25	Manufacture of fuels, chemicals, plastic, metals and minerals
SIC 26-28	Manufacture of electrical and optical equipment
SIC 29-30	Manufacture of transport equipment
SIC 31-33	Manufacture: not elsewhere classified
SIC 35-39	Electricity, gas and water supply
SIC 41-43	Construction
SIC 45-46	Wholesale trade (including cars & bikes)
SIC 47	Retail trade (excluding cars & bikes)
SIC 49-52	Transport
SIC 53	Post and courier activities
SIC 55-56	Hotels & restaurants
SIC 58, 62&63	Computer and related activities/ICT

SIC 59-60 Motion picture, video and TV programme production/programming &

broadcasting

SIC 61 Telecommunications
SIC 64-66 Financial intermediation
SIC 68 Real estate activities

SIC 69,70,75,76,78-83 Other services not elsewhere classified

SIC 71.1 Architectural and engineering activities and related technical consultancy

SIC 71.2 Clinical testing and analysis

SIC 72 Research and experimental development on social sciences and

humanities

SIC 73 Advertising and market research

SIC 74 Other professional, scientific and technical activities

SIC 77 Renting of machinery, equipment, personal and household goods

iii.) Business Size:

Small: 10-49 employees

Medium: 50-99 employees Medium: 100-249 employees

Large: 250+ employees

Additionally, to ensure representativeness, a census for all large firms (250+ employees) is taken.

The majority of the survey questions are concerned with innovation through new and improved products and processes (technological) and with the investments that develop and implement them along with changes in business structures, management and marketing practices (non-technological innovation).

The methodology, statistical annex, sample details and first UK-level findings from CIS 10 can be found on the UK Department for Business, Energy and Industrial Strategy website at the following link:

https://www.gov.uk/government/statistics/uk-innovation-survey-2017-main-report

All results are grossed up to the business population, and all figures quoted relate to the UK Innovation Survey 2017 unless stated otherwise.

3.3 Response and weighting

The questionnaires from the initial survey was distributed on 20 February 2017.

Of the 1,294 enterprises selected, 558 valid responses were received, to give a response rate of 43%. The population and achieved sample are summarised in Table 8.

The composition of the 2017 achieved sample comprises a higher percentage of large firms (13% of returned forms) than the last survey (7%).

The results in this report are based on weighted data in order to be representative of the population of businesses. The responses were weighted back to the population using the inverse sampling proportion in each stratum, that is, the weight attributed to each enterprise was the number of enterprises in the population divided by the number of responses in that stratum.

Please note that as with all sample surveys, the estimates provided in this publication are subject to an associated degree of sampling error.

Table 8: Summary of sample frame (number of enterprises)

Entire	populati	on	Returned sample		
SMEs	Large	All	SMEs	All	
6222	176	6398	483	75	558

(i) Future Publications

The 2019 UK Community Innovation Survey headline results for the reporting period 2016-2018 (CIS 11) will be published in summer 2019, with the main report due later that year.

The 2019 CIS Northern Ireland results bulletin for the reporting period 2016-2018 (CIS 11) will be published July 2020.

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