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Innovation State of the Nation 2023

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Innovation State of the Nation 2023

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EXECUTIVE SUMMARY

Drawing on data provided by over 2000 UK companies the Innovation State of the Nation Survey provides a detailed and timely view of firms' innovation activity. Data was collected during 2023q1. In each company information was provided by the member of the management team with responsibility for aspects of product/service or business model innovation. Uniquely we provide the first detailed profile of innovation in UK micro-businesses (with 5-9 employees).

The ISNS 2023 survey was conducted at a particularly uncertain time due to continued post-COVID stresses, continuing disruption from Brexit, and the cost of doing business crisis. Despite this, 61.4 per cent of firms reported changes to their products or services during the previous 12 months, with 28.3 per cent suggesting that at least some of their innovation was new to the market. Innovation, both new to the firm and new to the market, was evident across all sectors, sizebands and regions of the UK, with even the smallest micro businesses reporting significant shares of new to the market innovation.

Innovation is strongly associated with both higher sales and employment growth. The average sales growth of innovating firms was 9.7 per cent compared to 2.6 per cent for non-innovators, a difference which was consistent across sectors, sizebands and regions. Qualitative evidence suggests the variety of innovation taking place in UK firms and the diverse routes through 'innovation' of different types can influence growth and productivity.

Among innovators across the UK, investments in R&D, digital technologies and other aspects of intangibles are significant. Collaboration, particularly with supply chain partners and other businesses, also drive much innovation, involving around 40 per cent of innovating companies. Collaboration with universities and other non-corporate partners is much less common - involving only around 7-15 per cent of innovators.

Just over half of all innovating firms reported factors which had constrained their innovation activities. Perhaps unsurprisingly the after-effects of the COVID-19 pandemic (53.8 per cent) and the cost of doing business crisis (51.0 per cent) were the most common barriers experienced by innovating firms. Other factors playing a significant role in constraining innovation were: regulations and legislation (39.5 per cent); uncertain demand (38.2 per cent); lack of skills (35.4 per cent); lack of government support (30.9 per cent); and, lack of finance (30.4 per cent). Among those firms experiencing recruitment issues it was difficulties recruiting technicians (31.2 per cent), engineering staff (20.9 per cent) and graduate-level technicians (18.6 per cent) which were most common.

For those firms not innovating adequate current returns, uncertain demand and the costs of innovation emerged as the key reasons for not engaging with innovation.

Where innovation is being undertaken the predominant source of funding was internal, used by around two-thirds of all innovators. Grant (7.8 per cent) and government loan (6.9 per cent) finance were also significant for some firms with 12.0 per cent of firms also using R&D tax credits. Equity funding was notably more common among frontier (7.4 per cent) than non-frontier firms (3.1 per cent).

Among those firms planning R&D investment over the next 12 months, investment intentions are relatively strong with the majority of firms intending to increase their R&D investments. Overall, 52.1 per cent of firms were planning to increase their level of R&D investment, compared to only 5.8 per cent who are planning to reduce investment, and 42.2% who planned to maintain current levels of R&D investment. Slightly less than half of all firms (44.9 per cent) indicated that they were likely to seek external support either for business development or product and service innovation. Frontier firms, larger businesses, and those in the finance sector were most likely to be in the group of firms seeking such support.

CONTENTS

SECTION 1: THE INNOVATION STATE OF THE NATION SURVEY

1.1 Introduction

The Innovation State of the Nation 2023 Survey (ISNS 23) collected information from over 2,000 companies between November 2022 and February 2023 to provide a detailed and timely view of firms' current innovation activity. Firms were included in the survey if they had more than 5 employees and were not part of the public sector or a not-for-profit company. The aim was to provide a representative view of UK firms' R&D and innovation activity which could help to identify particular challenges and opportunities for policy development and support. The Survey provides insight into firms' current innovation activities and challenges as well as their R&D and innovation plans for 2024. In each company information was provided by the member of the management team with lead responsibility for aspects of product/service or business model innovation.

For the first time we include micro-businesses with 5-9 employees in the Innovation State of the Nation Survey (ISNS). This is a diverse group of businesses from long-established, local manufacturing and services companies, to high potential start-ups and spin-outs. In the past these firms have largely been excluded from innovation surveys and we provide the first consistent view of innovation activity in this group of firms.

The ISNS survey also provides information on themes central to current policy concerns. First, we distinguish between frontier and non-frontier firms, those leading their sectors in terms of technology and those following. This distinction proves important both in terms of the growth and performance of each group but also in terms of the very different innovation challenges which they face. Second, we distinguish between firms in different regions and sizebands providing a detailed understanding of the aspirations and challenges faced by different groups of companies. Third, the data reflects concerns around levelling up, and place-based growth by looking at the links between firms and the local basis for innovation. Finally, we contribute to the discussion on diversity in the innovation landscape by comparing the gender and ethnic composition of firms' innovation teams.

While R&D and innovation are central to current government strategy, innovation decisions have been particularly difficult for individual firms during 2022-23 due to market uncertainty, rising costs, and supply chain disruption. Increasing interest rates which raises the cost of investment also make commitments to R&D and innovation a more difficult decision. Other

longstanding challenges also influence firms' ability to innovate: the availability and cost of innovation finance, skills, and the characteristics of local ecosystems may influence firms' commitment to innovation. All of these factors are addressed in the early Sections of the report. The final Section of the report examines firms' innovation intentions through 2024 in terms of investment, the scale a nature of firms' innovation activity, and their perceived support needs.

We would like to record our gratitude to the individuals who took time to answer the survey on which this report is based. Hopefully, the result is a useful contribution to building a stronger innovation economy across the UK. Future plans include a series of more detailed analyses of the 2023 survey data reported here, and a similar ISNS survey in 2024 which will allow us to compare firms' innovation activity from year to year.

1.2 Organisation of the ISNS report

The remainder of the report is organised as follows:

- Section 2 provides an overview of the respondent companies, their innovation activity and contributing investment, collaboration, and human resources. This section also covers support for innovation and outlines the barriers which firms perceive to their innovation activity.

- Section 3 looks forward and explores firms' innovation and investment intentions over the next year (i.e., 2023-24) along with their perceived need for support in the future.

- Section 4 summarises the key points and outlines next steps in the Innovation State of the Nation project.

The ISNS 2023 fieldwork overview, questionnaire, and data tables are included in a separate Annex document.

SECTION 2: THE BUSINESS INNOVATION LANDSCAPE - AN OVERVIEW

2.1 Overview of Respondents

In this section we provide a brief overview of some of the key characteristics of respondent firms by region, broad sector, sizeband and whether firms are 'frontier' or 'non-frontier' firms. The notion of frontier firms has been popularised by OECD analysis which compares firms at the technological or productivity frontier to other – often smaller – non-frontier firms[1].

Firms' export status has also been linked by previous studies to their level of innovative activity. Exporting provides the basis for 'learning by exporting' and allows firms to increase the returns to innovation by expanding their market reach. In the survey firms were asked a simple question: 'Do you have any customers outside the UK?' Responses are summarised in Figure 2.1. Overall, around 42 per cent of firms reported having non-UK customers, a proportion which was significantly higher among frontier firms and larger companies (Figure 2.1). Firms were also more likely to report having international customers if they were engaged in business service or manufacturing activities. Northern Ireland firms were significantly more likely to report having customers outside the UK compared to all other regions, a reflection of the land border with Ireland.

Growth in sales may be a result of previous innovation but may also be linked to firms' other investment or marketing activities. In the survey firms were asked whether their sales had grown, remained stable of declined in the previous 12 months (in nominal terms). Responses are summarised in Figure 2.2 in terms of mean sales growth within each group of firms. Note here that within each sector, sizeband etc. growth varied significantly around the average, and also that we exclude here around 1% of outlier firms which either reported huge positive or negative growth. Overall, UK firms reported average sales growth of 6.9 per cent. This increased to 11.0 per cent among frontier firms (5.6 per cent, non-frontier), and was highest in large firms and those concentrated in business services and

[1] See Andrews, D., Criscuolo, C., & Ga, P. (2015). *Frontier firms, technology diffusion and public policy: Micro evidence from OECD countries* (OECD Productivity Working Papers, OECD. Also: Miao, Y. Z., Salomon, R. M., & Song, J. (2021). Learning from Technologically Successful Peers: The Convergence of Asian Laggards to the Technology Frontier. *Organization Science*, *32*(1), 210-232.

hotels/catering. The latter in particular may be attributable to post-Covid recovery (Figure 2.2). Interestingly across the whole UK sample average sales growth of innovating firms was 9.7 per cent, significantly above the 2.6 per cent for non-innovators (t=3.98, ρ=0.000), a difference which was consistent across sectors, sizebands and regions (Figure 2.3). Likewise, employment growth was also faster among innovators (15.0 per cent) than non-innovators (11.5 per cent) although this difference was less statistically significant (t=1.77, ρ=0.076), (Figure 2.3).

Figure 2.1: Export status of respondent firms (N=2009)

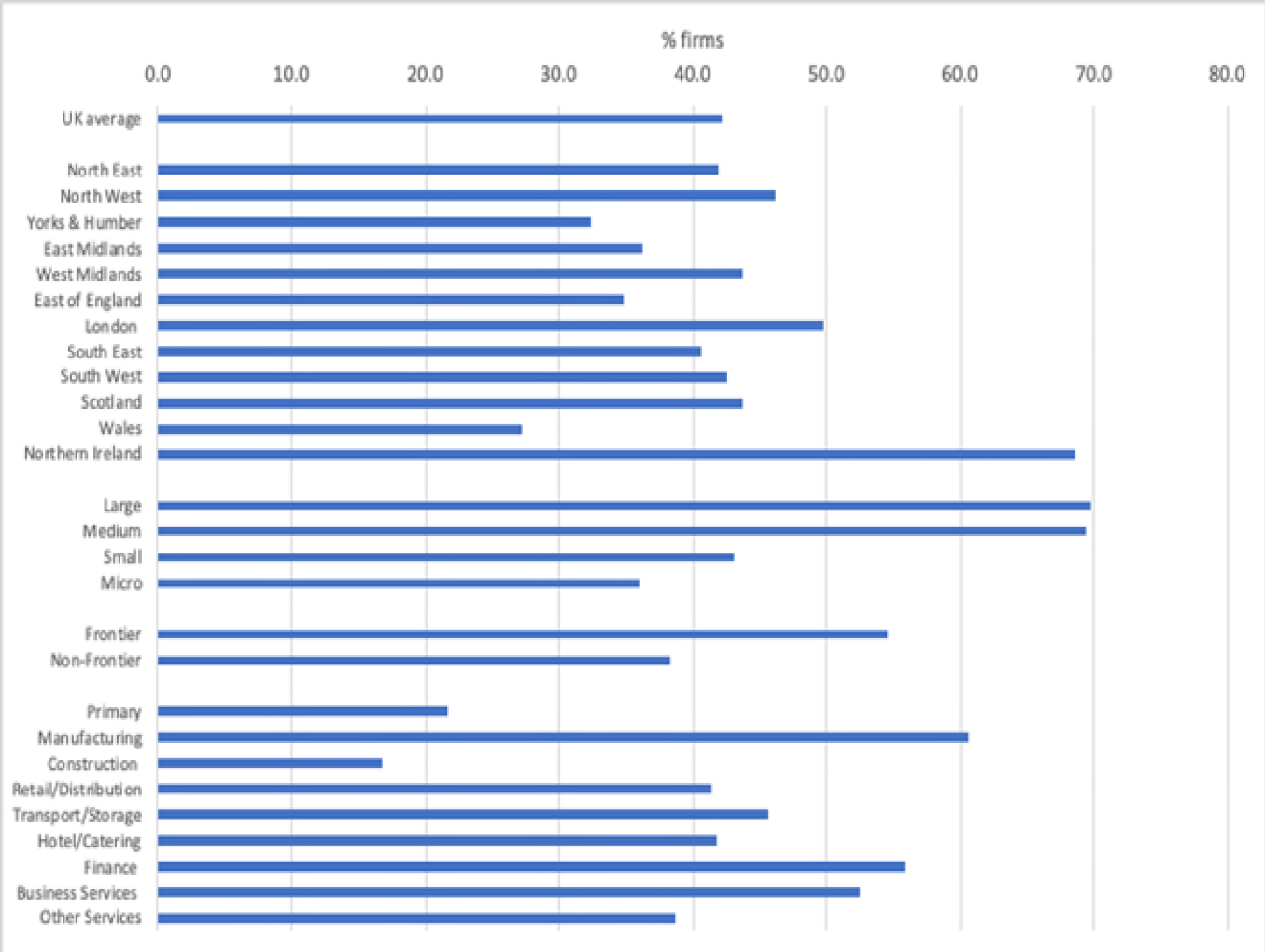


Figure 2.2: Turnover growth of respondent firms (N=1783)

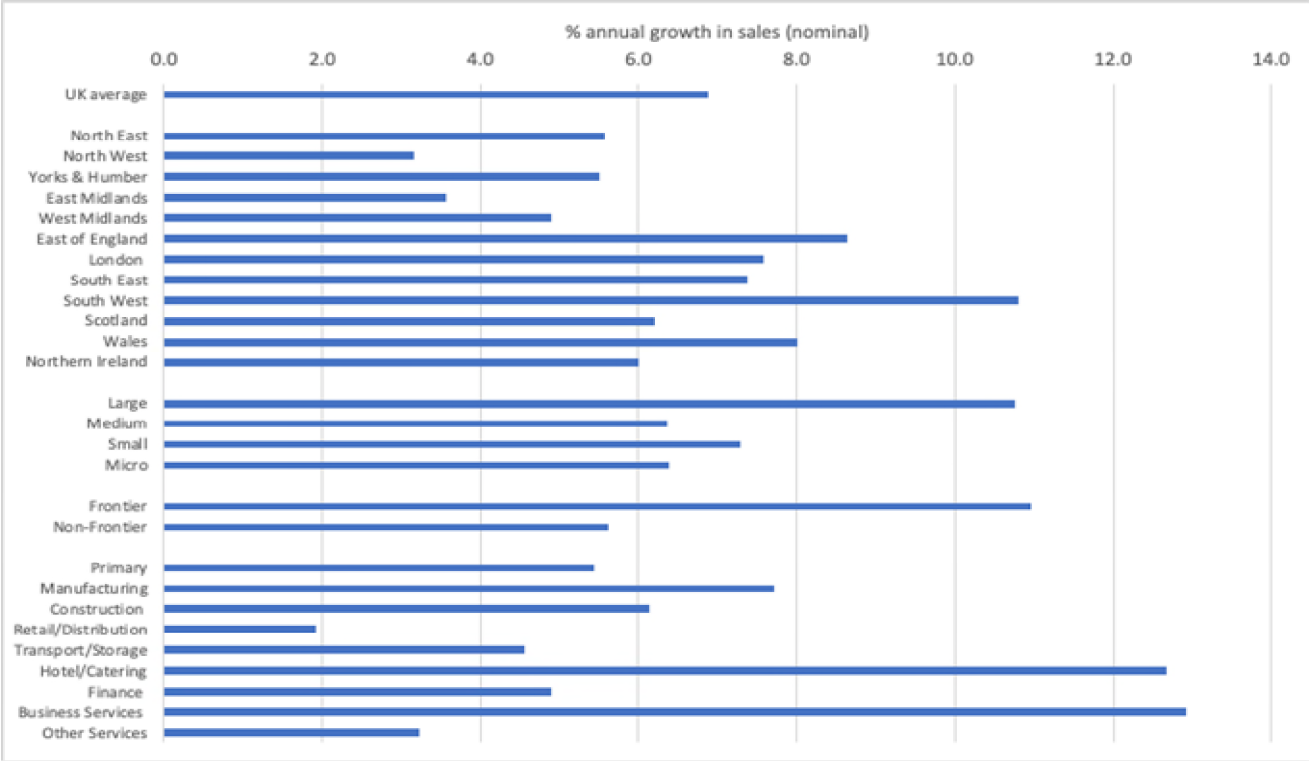
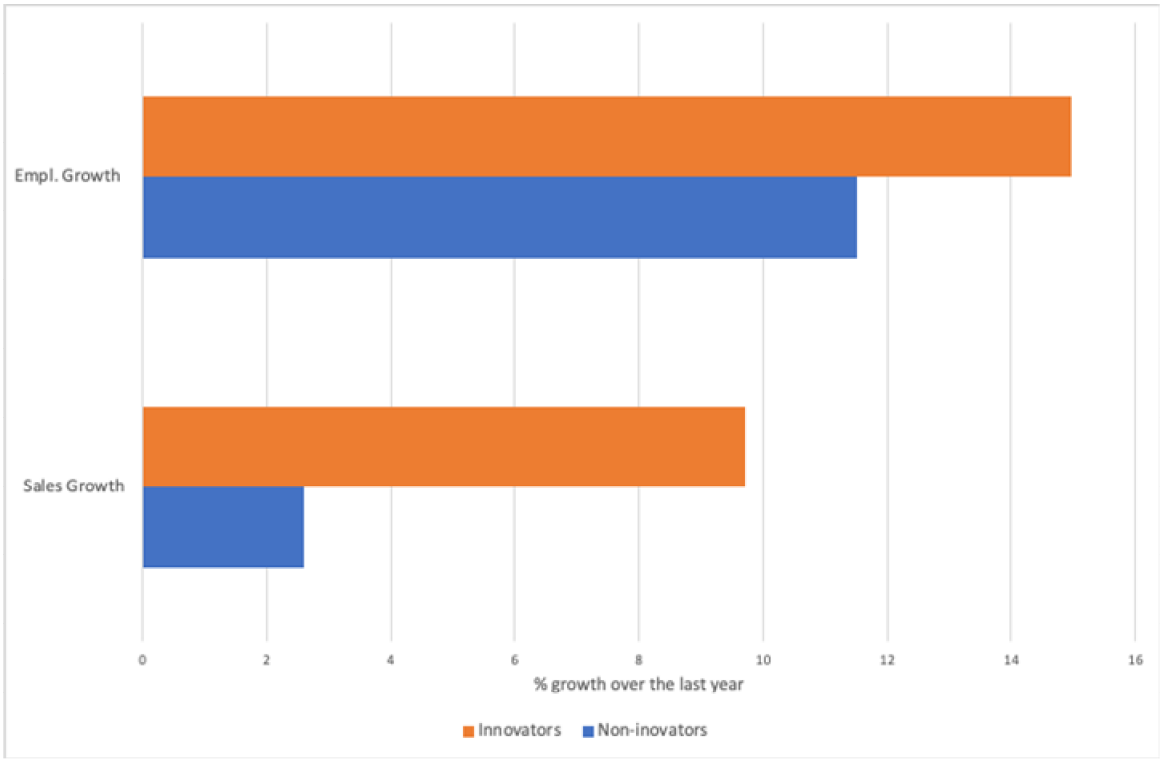


Figure 2.3: Turnover and employment growth of innovating and non-innovating firms (N=1783)



Note: Figure excludes a small number of outliers.

As well as these activity indicators firms were also asked in the survey about their business objectives and how they had aimed to achieve these objectives over the past 12 months. Figures 2.4 and 2.5 summarise firms' responses in each case reporting the percentage of firms which suggested that a particular business objective or means of achieving their objectives was either 'important' or 'very important'. Figure 2.4 emphasises the importance of diverse commercial objectives around efficiency, increasing sales profit margins and cash flow with slightly lower numbers of firms emphasising environmental and social objectives. Figure 2.5 emphasises the role of increasing sales as a means of achieving these objectives alongside product/service, process innovation and digital adoption.

Figure 2.4: Business objectives over year prior to the survey (% firms) (N=2015)

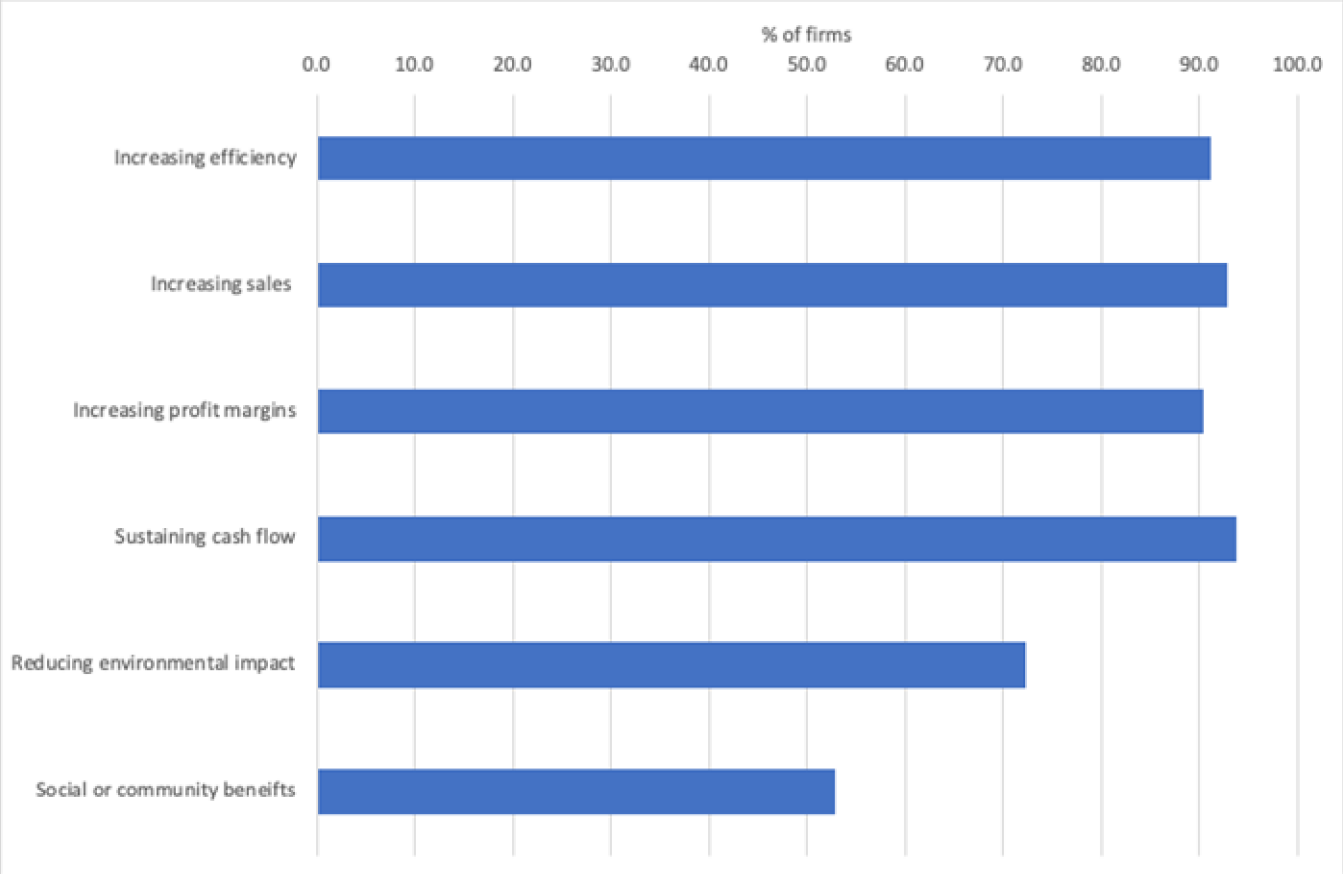
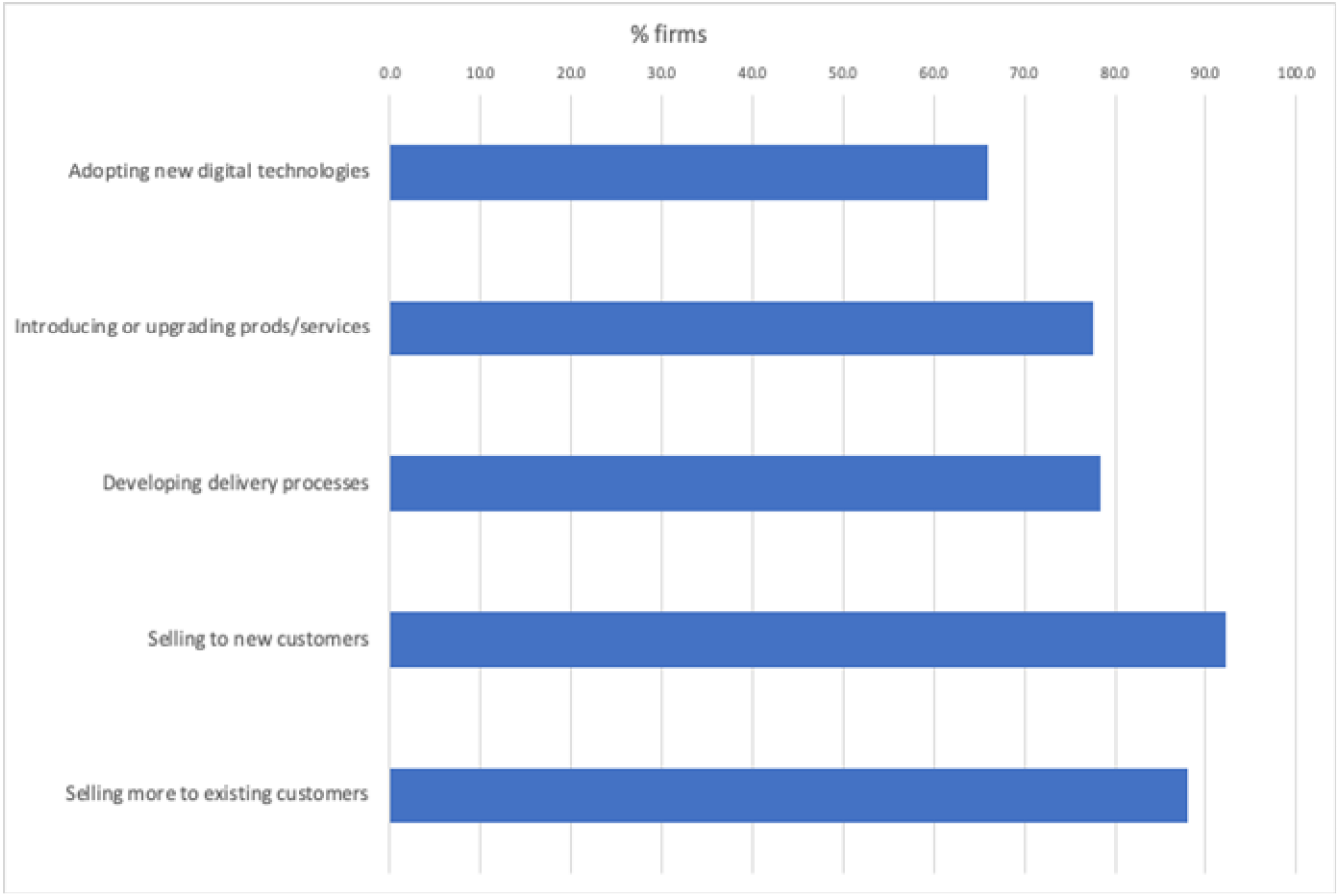


Figure 2.5: Important means of achieving business objectives over the year prior to the survey (% firms) (N=2015)



2.2 Understanding innovation

As part of the survey respondents were asked an open-ended question: 'What is it you think of as 'innovation'? What does it mean within your firm? We summarise some of more typical responses in Box 2.1, illustrating the diversity of firms' interpretation of the term 'innovation'. For some firms the meaning of 'innovation' is not clear. For others it has a clear link to new technologies and their application to reduce costs and improve efficiency. Other companies stress the creation of added value for customers, enhancements to profitability, or the strategic value of innovation in terms of their position relative to competitors. A common sentiment here is that innovation is about changing the business and its products/services for the better while the nature of that change is interpreted in a variety of different ways.

Box 2.1: What do you think of as 'innovation'?

- 'Ideas and growing on new technologies and to achieve our goals and improve products or services really.' (Agriculture/Mining/Energy, micro)
- 'We do intelligence, achieving things using less fuel, so the environmental impact, using precision technology for efficiency.' (Agriculture/Mining/Energy, micro)
- 'Creating new products or services or new way of doing things.' (Manufacturing, micro)
- 'I am not sure really.' (Manufacturing, micro)
- 'I don't know really. I don't know, we just plod on.' (Manufacturing, micro)
- 'It helps production, and it lowers costs.' (Manufacturing, micro)
- 'New technologies.' (Manufacturing, micro)
- 'Being more efficient on what we are doing really, really innovation is a good idea that has been implemented, well I think not just about new equipment or technology.' (Manufacturing, small)
- 'Design, style and make.' (Manufacturing, small)
- 'Constantly trying to deliver higher energy and efficiency.' (Manufacturing, medium)
- 'Doing something no one else is doing in the sector.' (Manufacturing, medium)
- 'Further development of an existing strength. Investigation in new processes and procedures.' (Construction, medium)
- 'Innovation is important to attract new customers. It's important to come up with something new to increase sales.' (Hotel/Catering, medium)
- 'I would say technology.' (Finance, medium)
- 'It means providing a product or a service that is not available. That solves a specific problem, something which is niche.' (Property/Management/Business Services, medium)
- 'Innovation within our firm involves adopting new technology and using in creative ways to help our customers.' (Property/Management/Business Services, small)
- 'Our focus is creating new products, so for us innovation is using new technologies to do this really.' (Property/Management/Business Services, medium)
- 'Better services provided to our clients.' (Property/Management/Business Services, medium)
- 'A lot of things, quality control, supply chain management and security.' (Public administration/Other, micro)
- 'Improvement in service with little impact on cost or a reduction in cost. It covers sustainability, environmental improvements and improving efficiency.' (Public administration/Other, large)

One implication is that using the term 'innovation' creates ambiguity in terms of mutual understanding – my interpretation of the term may be different from yours – and the potential for miscommunication (see Box 2.2, 2.3 and 2.4). In the survey questionnaire we therefore ask not about innovation but adopt more descriptive language about product or service changes (new or improved), process changes or changes to the way the firm does business. These metrics are the focus of the next section.

Box 2.2: Innovation? What innovation? (Transport, small but part of wider group)

The respondent doesn't really get involved in innovation, that happens within the IT Department mainly, but they are listened to if suggestions are made.

The firm has a continuous training cycle to ensure staff are up to speed on the latest and on-going development in Electric Vehicles and in electronics which allows quicker and more accurate servicing and diagnosis. Training includes:

- Manufacturer's training
- Internal training on ethical procedures, safety, processes and so on.

Recruitment of skilled people has been a challenge with it taking 11 months to recently recruit two new staff members. The respondent noted this is down to 'supply and demand' and ability of Dealers and others to pay more to keep, or recruit, people. Largely the firm wants to recruit people who are productive from day one, but have started recruiting apprentices recently.

Innovation is a driver for training in this firm:

'the technology is changing every day, you need to keep up every day, it is a constant, constant battle.'

Box 2.3: Minor changes can be critical (Care home, small)

Their innovation is a significant movement from pen and paper records. They are investing in:

- An electronic care planning system
- Electronic HR system
- Medication management system (due later in the year).

They are investing the required resource for the software (monthly subscription or annual licence) but appreciate that the cost is worth the time saved and data received. For example, it now takes 5-10 minutes a day to review staff time as opposed to 2.5 days a week, saving 1.5 days every week in time on payroll. The electronic care system is vital for regulatory compliance. At a recent inspection, they were able to provide necessary evidence more easily than searching for paper documents. It also allows them to highlight in advance what needs to be done in a care package.

The shift from pen and paper is saving the business time, reducing bureaucracy and ensuring a better quality of care to residents.

Box 2.4: Change driven from the supply chain (Manufacturer, micro)

The firm described their innovation activity as responding to new materials and methods developed for the market and constantly monitoring new materials to see which would work best. The respondent was responsible for both finance and customer feedback. Customer feedback is drawn upon to consider what needs to change and when. There is no specific budget for innovation activities, but if a resulting product was at a higher cost, the cost will be charged to the consumer for the more expensive product.

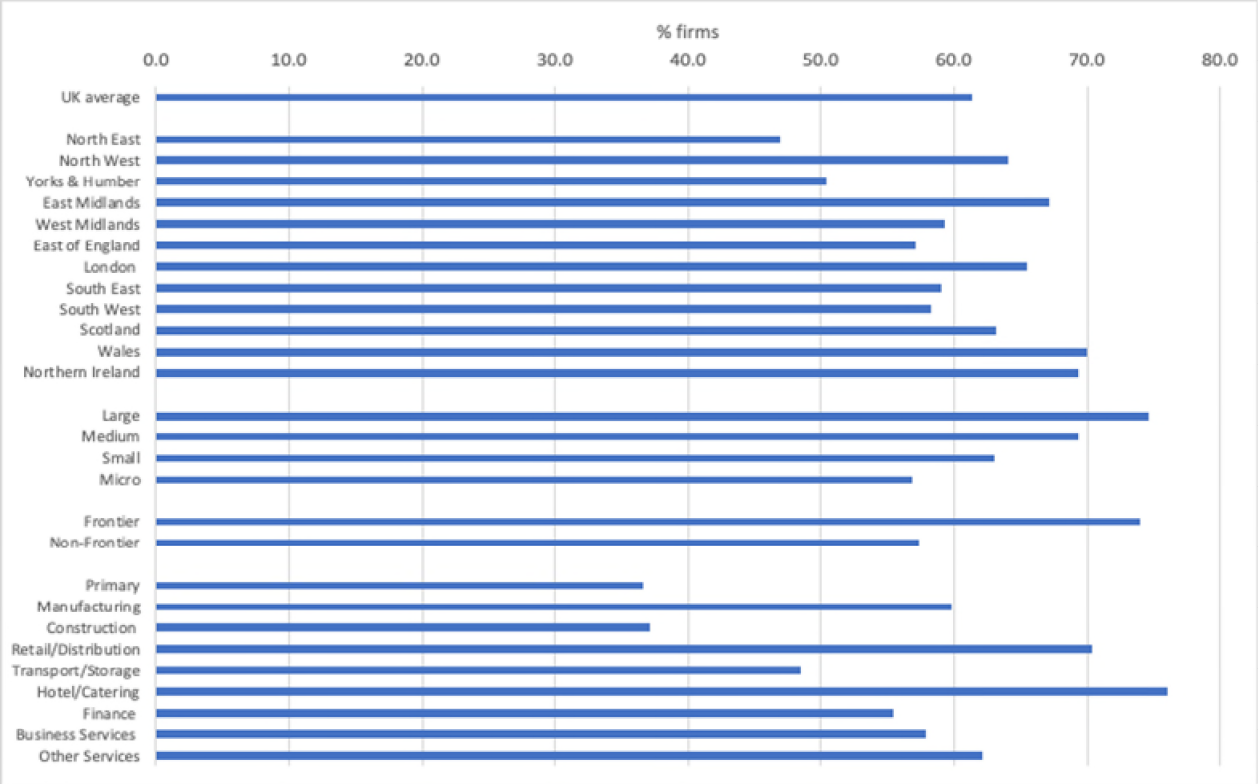
In a recent example, they expanded their product range by moving to a more expensive composite door blank. The new blank was better quality, more weatherproof and more solid, with a wider choice of colours and better delivery timescales. The firm decided to offer this as part of their range. It did not cost the business anything extra as they would only be bought if customers were paying for them. They are the only local suppliers offering this. It has the effect of increasing the choice available to customers and generate more money because they are more expensive doors.

The firm is not experiencing any particular challenges at the moment. They had considered changing a supplier, but to one in Belarus and decided against this as it was too risky.

2.3 Innovation outcomes

We focus first on firms' changes to the products and/or services which they offer and focus on any changes in the last year. Overall, 61.4 per cent of firms reported changes to their products or services, a proportion which rises to 74.0 per cent among frontier firms (57.4 per cent among non-frontier firms). The probability of innovating increases consistently with firm size and is notably higher in the service sectors than in construction, transport and primary sectors. Levels of innovative activity vary markedly by region with the highest regional shares in Northern Ireland and Wales. An element of caution is necessary here, however, due to relatively small response numbers in both regions (Figure 2.6).

Figure 2.6: Proportion of firms making product or service changes in the last year



It is then possible to breakdown the group of innovating firms into those doing product or service innovation only and those reporting both product and service innovation (Figure 2.7). Overall, 17.2 per cent of firms reported product innovation only, 13.7 service innovation only and 30.4 per cent both. This pattern is relatively similar for frontier and non-frontier firms, although larger firms were more likely to be undertaking both types of innovation. By sector we see a largely expected pattern with retail and manufacturing both having a focus on product innovation and services sectors having a sectoral focus. There is little obvious pattern across regions (Figure 2.7).

Another breakdown of interest is whether firms' product and service changes were new to the firm or whether they were new to the market, i.e., whether they were 'introduced before firms' competitors'. Overall, 32.5 per cent of firms reported that product and service changes were wholly new to the firm, with 28.3 per cent suggesting that at least some of their innovation was new to the market (Figure 2.8). Unsurprisingly perhaps the proportion of firms suggesting they were undertaking some new to the market innovation was higher among larger and frontier firms and notably lower in some sectors such as primary and transport and storage. Notably a significant proportion of micro firms did report some new to the market innovation.

Figure 2.7: Product or service innovation? Or both?

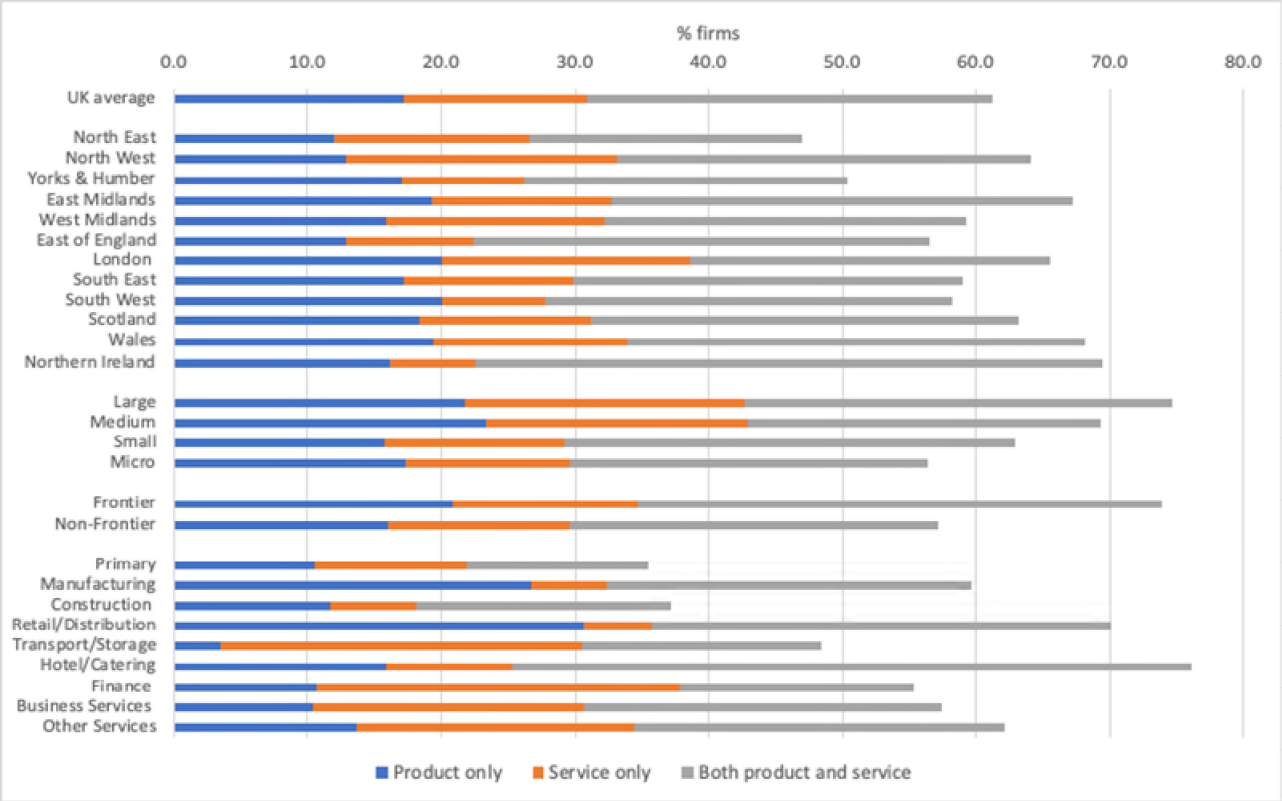
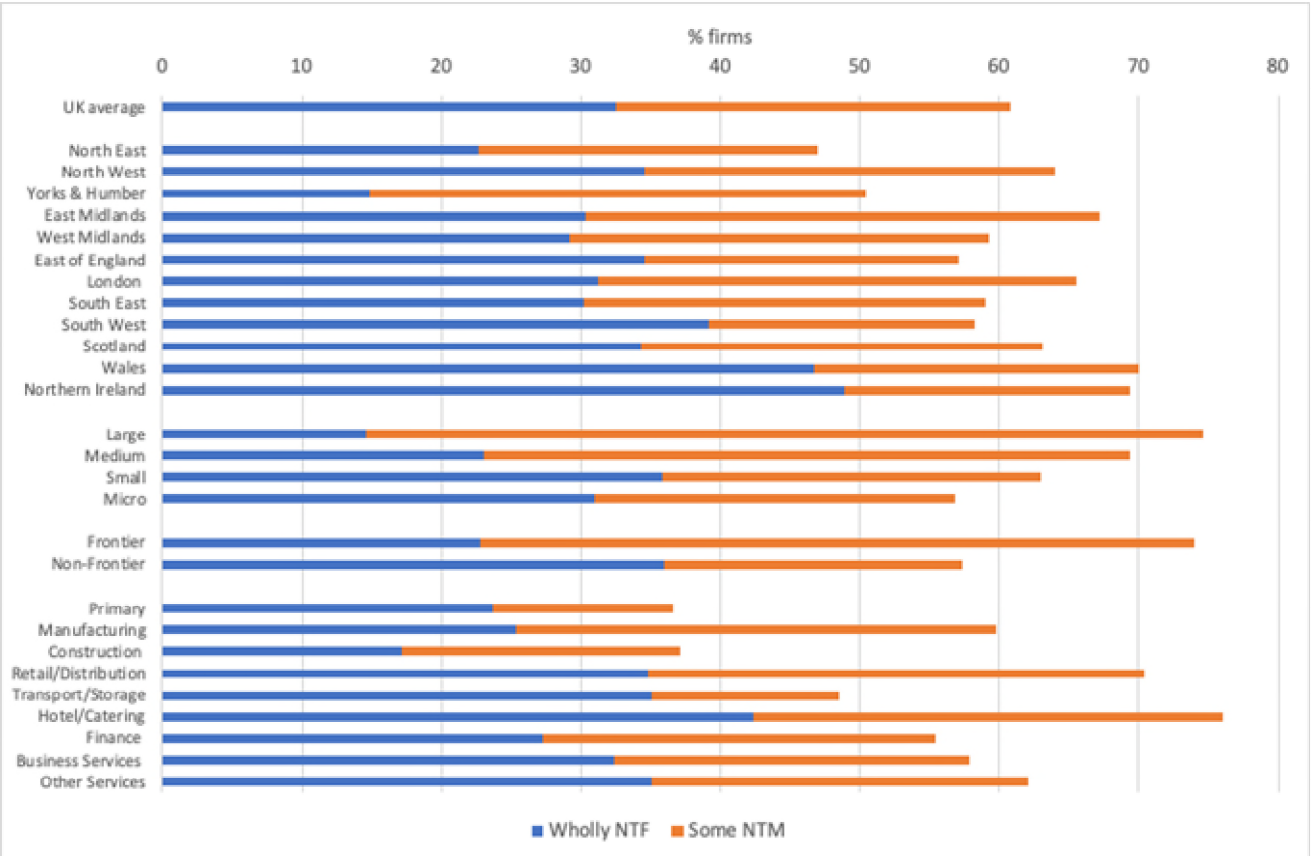


Figure 2.8: New to the firm or new to the market innovation? (% firms)



Another dimension of innovation, reflected in the definitions provided by firms in Box 2.1, relates to process innovation. Here, firms were asked: Have you made any changes to the processes which you use to produce goods or deliver services over the last 12 months? Here again the reference period is the 12 months prior to the survey. Overall, 45.8 per cent of firms responded positively to this question (Figure 2.9). Rates of process innovation were again higher among frontier firms and larger companies and higher in a range of service sectors. Note however that the regional pattern here is rather different to that suggested in terms of product/service innovation.

Among those firms which had made process innovations 55.7 per cent reported cost savings, 22.7 per cent said costs had actually increased and a further 20.6 per cent reported no changes in costs. Figure 2.10 profiles the distribution of cost reductions achieved by those firms who did report cost reductions.

Figure 2.9: Proportion of firms introducing process innovations in the previous year

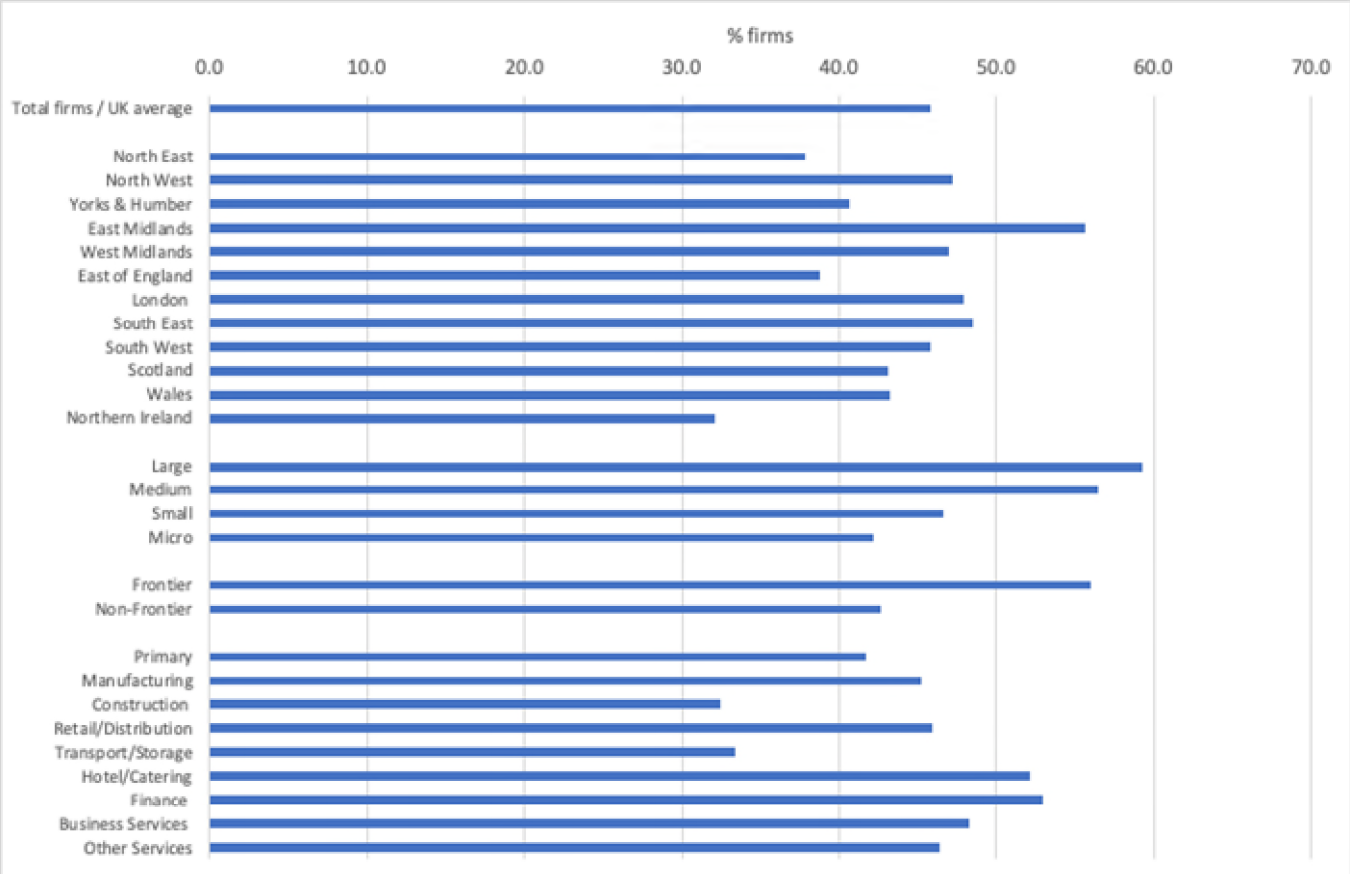
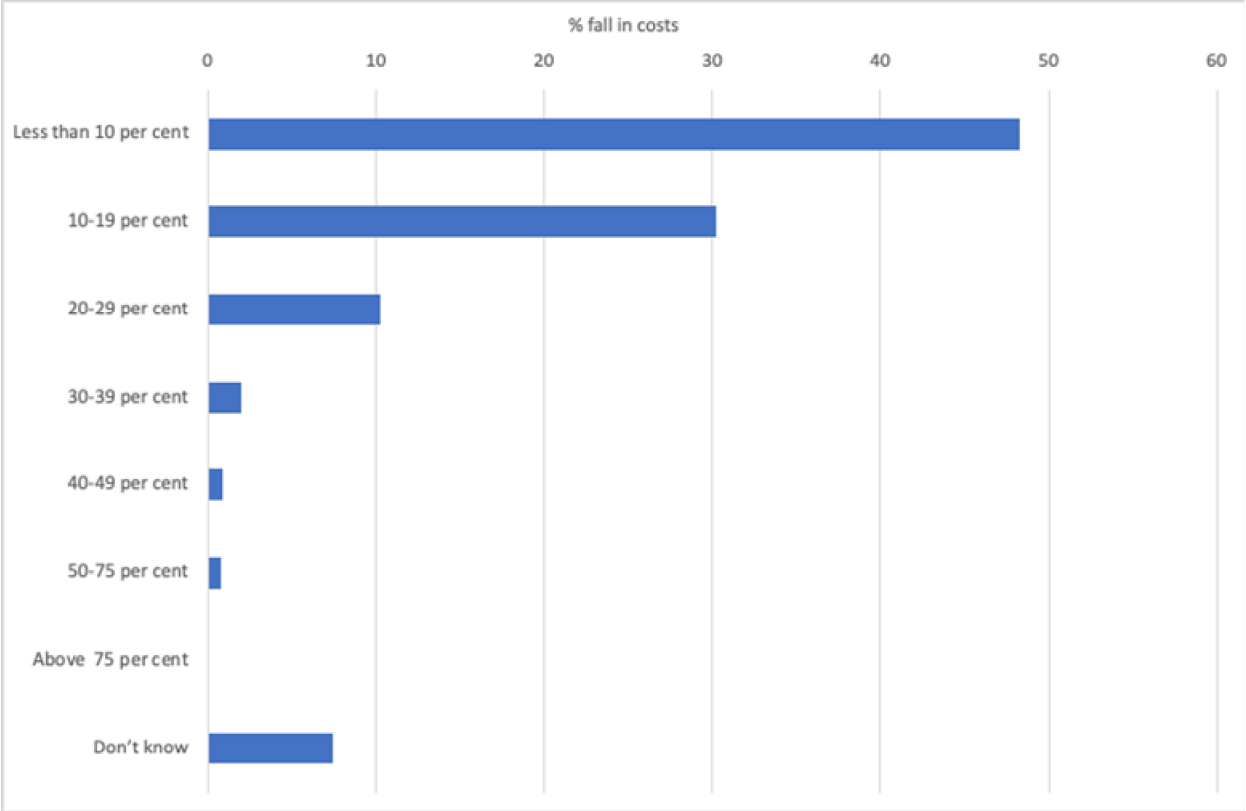


Figure 2.10: Cost reductions due to process innovation (% firms achieving cost reductions)



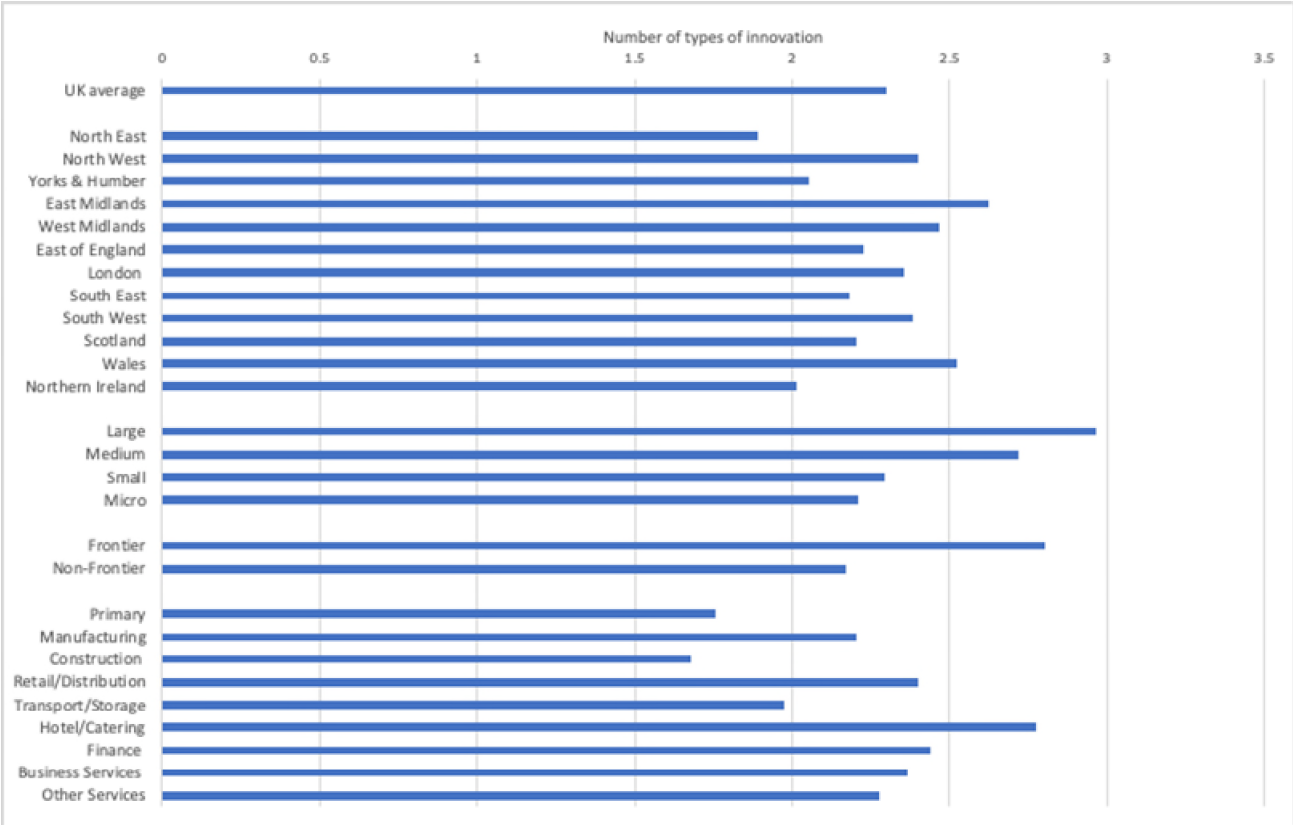
We also asked about a broader range of business model changes to business practices, work organisation and organising external relationships. Overall, 30.6 per cent of firms reported undertaking changes in their business practices, 38.9 per cent changes in work organisation, 21.3 per cent changes in their external relationships and 35.1 per cent changes in their marketing strategies. As previously, these business model innovations were more common among frontier and larger firms and also more common among service sector firms rather than firms in transport, manufacturing and primary production (Table 2.1).

Table 2.1: Business model innovation in the year prior to the survey (% firms)

	Business practices	Work organisation	Organising external relationships	Marketing strategies
UK average	30.6	38.9	21.3	35.1
North East	17.7	32.0	6.8	47.8
North West	25.8	39.2	23.3	40.3
Yorks & Humber	24.1	43.4	25.2	24.7
East Midlands	30.1	48.1	24.3	37.8
West Midlands	37.7	43.2	20.2	40.4
East of England	35.0	33.5	24.5	35.4
London	32.7	33.4	19.7	35.4
South East	25.2	36.1	18.9	34.4
South West	31.9	46.0	27.4	29.0
Scotland	30.4	36.9	14.6	32.2
Wales	47.5	43.1	18.0	36.0
Northern Ireland	26.4	25.5	7.7	40.0
Large	40.1	46.4	30.3	44.6
Medium	36.4	42.3	26.5	40.8
Small	29.4	36.3	19.8	35.4
Micro	29.8	39.8	21.1	33.7
Frontier	36.5	41.7	30.2	45.0
Non-Frontier	28.8	38.0	18.5	32.1
Primary	27.9	30.7	16.5	24.4
Manufacturing	28.8	35.5	19.1	32.6
Construction	24.8	37.0	17.5	21.1
Retail/Distribution	25.7	38.8	22.4	38.2
Transport/Storage	35.3	33.9	20.1	25.9
Hotel/Catering	34.7	47.8	23.3	42.4
Finance	39.5	42.7	20.6	33.1
Business Services	34.4	41.1	24.0	35.6
Other Services	29.6	33.3	18.8	38.0

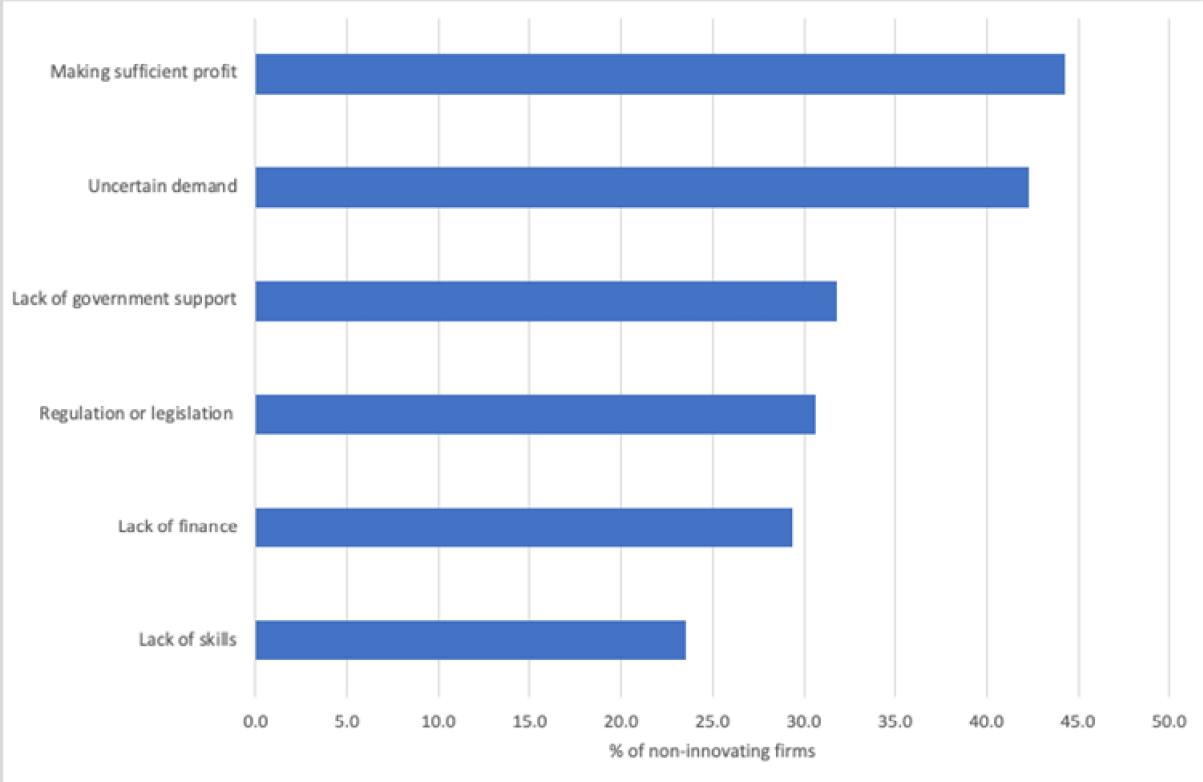
One way of summarising the overall picture of innovation activity is to consider the diversity of innovation being undertaken by firms. Here, we consider the six different forms of innovation measured in the ISNS 23 (i.e., product/service, process, business practices, work organisation, organising external relationships, marketing strategies) and create a 'count' variable reflecting the number of types of innovation undertaken by each firm. Firms undertaking no innovation of any type here take value 0; where firms were undertaking all types of innovation the diversity measure equals 6. The results are included in Figure 2.11. On average, firms were undertaking 2.3 types of innovation, with this number being greater in larger, frontier and services firms.

Figure 2.11: Number of types of innovation being undertaken (max 6.0)



Where firms were not undertaking product or service innovation, they were also asked about the reasons for not undertaking any development activity. Here sample sizes are limited, so Figure 2.12 provides an overall response profile for all non-innovating firms. In each case this relates to where firms said that each reason for not innovating was either 'important' or 'very important'. The most common reasons for not innovating were 'Making sufficient profit' and 'Uncertain demand'. Lack of skills or finance were less commonly cited as reasons for not innovating (Figure 2.12).

Figure 2.12: Reasons for not innovating (% of non-innovating firms) (N=767)

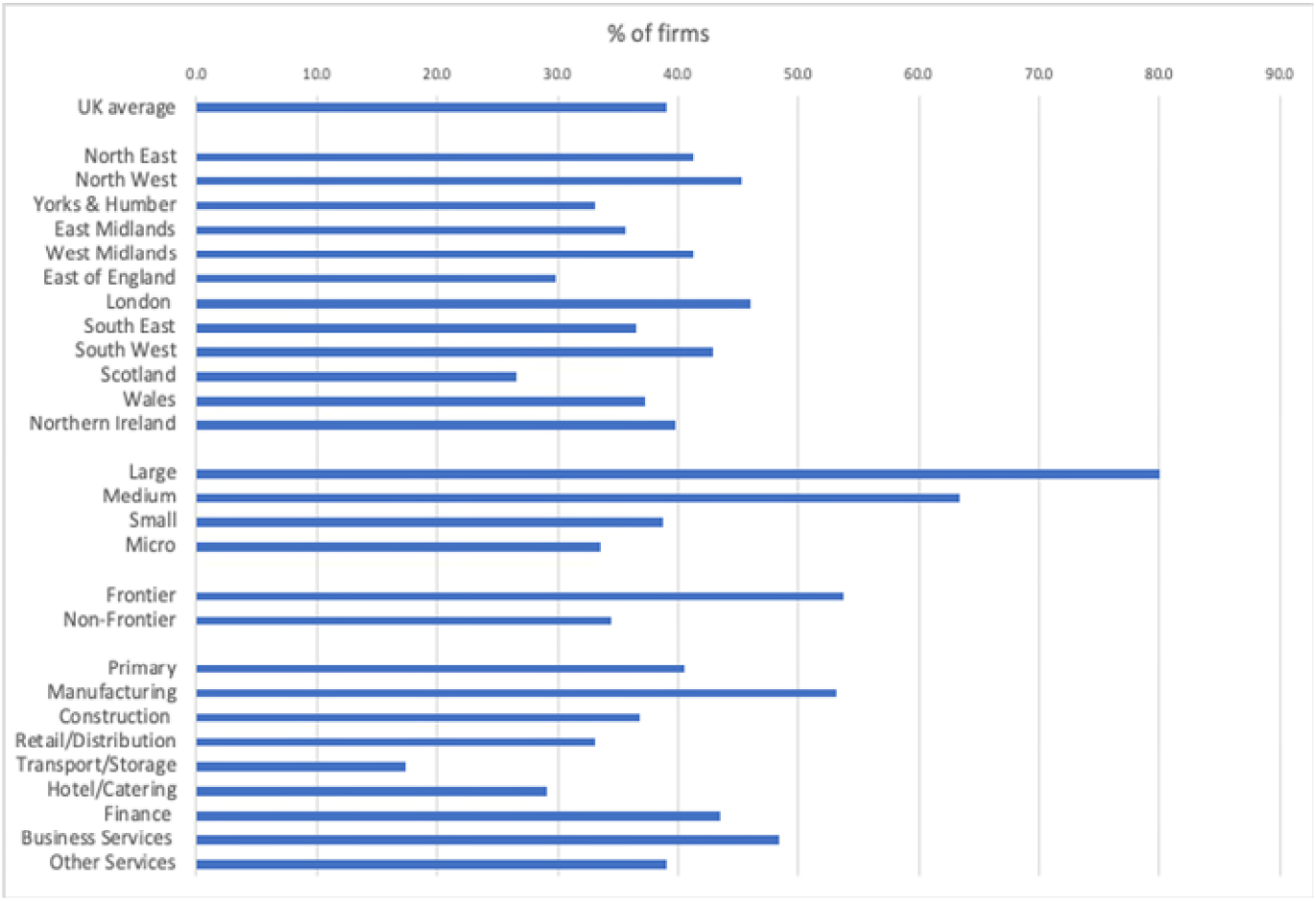


2.4 Investing in Innovation: R&D and beyond

Investment in innovation – through R&D or other innovation inputs – is critical to innovation success. The on-going cost-of-doing-business crisis is putting significant pressure on firms' cash flows so are they continuing to invest in innovation? In this section we focus on these financial commitments to innovation through R&D and other innovation related activities. First, we consider whether firms undertook R&D over the last year. Secondly, we consider firms' willingness to invest in training, design etc. related to their innovation activity. Again, we measure firms' investment activity in the year prior to the survey.

Overall, 39 per cent of UK firms reported engaging in some form of R&D activity in the year prior to the ISNS 2023 survey (Figure 2.13). This proportion was significantly greater among frontier firms (54 per cent) and large firms with more than 250 employees (80 per cent). The proportion of firms conducting R&D falls systematically with sizeband with only around a third of micro-businesses (with 5-9 employees) reporting R&D activity. Sectorally, R&D was most common among manufacturing and business services firms with generally similar levels of R&D activity across most UK regions (Figure 2.13).

Figure 2.13: Proportion of firms investing in R&D in the year prior to the survey (N=1940)



As part of the survey firms were asked whether over the last year they had 'purchased any machinery, equipment or software as part of changes to products, services or processes within your organisation'? Around 55 per cent of firms responded positively, a higher proportion than reported R&D (Table 2.2). Firms were then asked whether 'to help with product or service development, or organisational changes, did your business invest in … over the last year? Overall, around a third of firms reported investment in training (38 per cent), design (31 per cent) and new marketing arrangements (32 per cent) (Table 2.2 and see also Box 2.5). Lower proportions of firms invested in licensing (8 per cent) or market research (20 per cent). Frontier firms were more involved in each area of innovation investment, as were larger firms. Small and micro-businesses were much less likely to be involved in licensing of patents or know-how from other organisations (Table 2.2). Sectoral and regional variations in investment activity are again relatively consistent.

Box 2.5: Innovation from more general training (Manufacturing, small)

The firm pivoted from manufacturing tyres for lorries and vans when new products came in from China at a lower cost. Decided to '*look outside the box'* for a specialism and asked potential customers what they were looking for. Innovation and R&D is a big part of what they do. In part they respond to customer demand but also develop new products which are in keeping with the applications they work with, e.g. using bullet proofing material for tyres which can be used in quarries. They therefore *'create something and then find a market'.*

They do not have a specified R&D budget, mangers will make a decision as to whether invest in a particular R&D product. They calculate what is spent each year and claim relevant tax relief.

The firm reports no especially current financial pressures. Business in the trade is always slower around the end and beginning of the calendar year and this cashflow constraint is the only reported constraint on R&D activity.

They do undertake training but it is not specific to innovation activity. For example, they recently held training on tyre fitting, which include standard tyres and bespoke. Generally, when they have developed a new product, no specific training will be needed as all staff will have been involved in the development in some way.

Table 2.2: Proportion of firms investing in other aspects of innovation in the year prior to the survey (N=1980)

	Machinery equipment or software	Investment in patent/ licensing	Investment in innovation training	Investment in product design	Investment in market research	Investment in new market development
UK average	55	8.1	38.3	31	20.4	31.5
North East	36.3	8.5	33.9	35.6	37	43.2
North West	53.6	8.1	35.3	31.5	20	30.4
Yorks & Humber	43.9	7.5	41.4	33.4	17.8	20.3
East Midlands	65.1	6.8	28	32.4	22.4	36.4
West Midlands	61.2	14.1	44.1	35.9	23.1	34.3
East of England	54.1	8.5	44.2	24.3	19.5	30.7
London	54.5	9.2	39.5	35.3	25.4	34.8
South East	51.5	7.2	32	27.9	15.3	29.8
South West	51.6	7	35.3	26.8	16	31.4
Scotland	58.6	4.7	47.6	30.1	23.2	24.4
Wales	68.5	3.3	43.2	28.8	23.1	27.6
Northern Ireland	58	9.9	35.2	35.3	11.3	31.4
Large	66.3	23.9	50.3	30.9	43.5	43.8
Medium	63.1	21.5	40.2	36.5	32.7	39
Small	55	7.8	40.6	31.3	20.3	31.6
Micro	51.7	5.7	34.1	29	17.4	28.8
Frontier	62.1	14.2	40.7	44.2	31.8	40.5
Non-Frontier	52.5	6.2	37.5	26.9	16.8	28.6
Primary	69.1	7.4	41	17.2	14.5	29.2
Manufacturing	57.9	7.5	34.3	38.7	22.8	35
Construction	50.8	4.8	38	20.2	11.1	20.7
Retail/Distribution	49.2	5.2	33.8	32.3	19.9	28.5
Transport/Storage	50.7	3.9	32.2	22.9	16.7	29.5
Hotel/Catering	56.5	10.9	47.6	26.2	20.5	34.1
Finance	46.5	7.4	38	27.6	19.8	35
Business Services	58.8	9.7	36.6	38.2	20.5	40.8
Other Services	52.5	9.7	38.1	30.3	24.3	26.2

Box 2.6: The benefits of training (IT, micro)

The firm provides IT support to a range of clients from NHS to SMEs. It is vital to them to be aware of technological developments and to see how this may help their clients – *'IT is such a fast-moving sector, we have to keep up with everything'.* Mainly they look at what's developing in the market, but occasionally do some software development themselves.

Training is therefore vital and they have a training budget which is decided at the end of the year. Training might be identified by managers or by staff – who can identify what they need to know to do their job, but also which might have benefits for their career too.

The training referred to in the survey was training of service-desk staff on a Microsoft product. The service-desk staff identified that they needed this training in order to help them respond to more complex customer queries related to the product. The respondent reported no negative feedback from the staff who attended this training.

Given the importance of training, it is also important to the firm to keep hold of trained staff – '*we've invested time, effort and energy in their training, we'd like to keep them'*. One means of doing so is the award of quarterly performance bonuses or, because there is not a desire to motivate staff solely by performance bonuses, bonuses can also be awarded for good feedback on a task.

The firm is experiencing increased costs on most things, but not energy because this is included within the agreement with premises owner. This makes a significant difference because they are high users of energy to run hardware. However, there are issues with lead times and how quickly kit can be delivered. This is affecting customer relations, as sometimes the firm cannot get hold of kit as quickly as competitors, who may have partnerships with suppliers which allow them to cut lead times. These issues are not yet impacting on their training budget or on ability to keep up with sector innovations and with the energy crisis abating, they hope it will not impact in the coming months - *'with a bit of luck'*.

2.5 Funding innovation

By far the most common approach to funding R&D and innovation in the year before the survey was internal funding used by around two-thirds of all innovators (Table 2.3). Grant (7.8 per cent) and government loan (6.9 per cent) finance were also significant for some firms with 12.0 per cent of firms also using R&D tax credits (Table 2.3). Equity funding was notably more common among frontier (7.4 per cent) than non-frontier firms (3.1 per cent) (Table 2.3). In terms of firm size band, larger firms are clearly using a greater variety of innovation funding sources than smaller firms, although surprisingly perhaps the proportion of firms in each sizeband using tax reliefs is broadly similar.

A potentially important question is whether a lack of finance constrained firms' R&D and innovation activity? This was the case for 28.3 per cent of innovating firms which sought external finance (Figure 2.14). Larger firms were, perhaps surprisingly, more likely to report financial constraints while there was little difference in the level of financial constraint perceived by frontier and non-frontier firms (Figure 2.14). Sectoral and regional

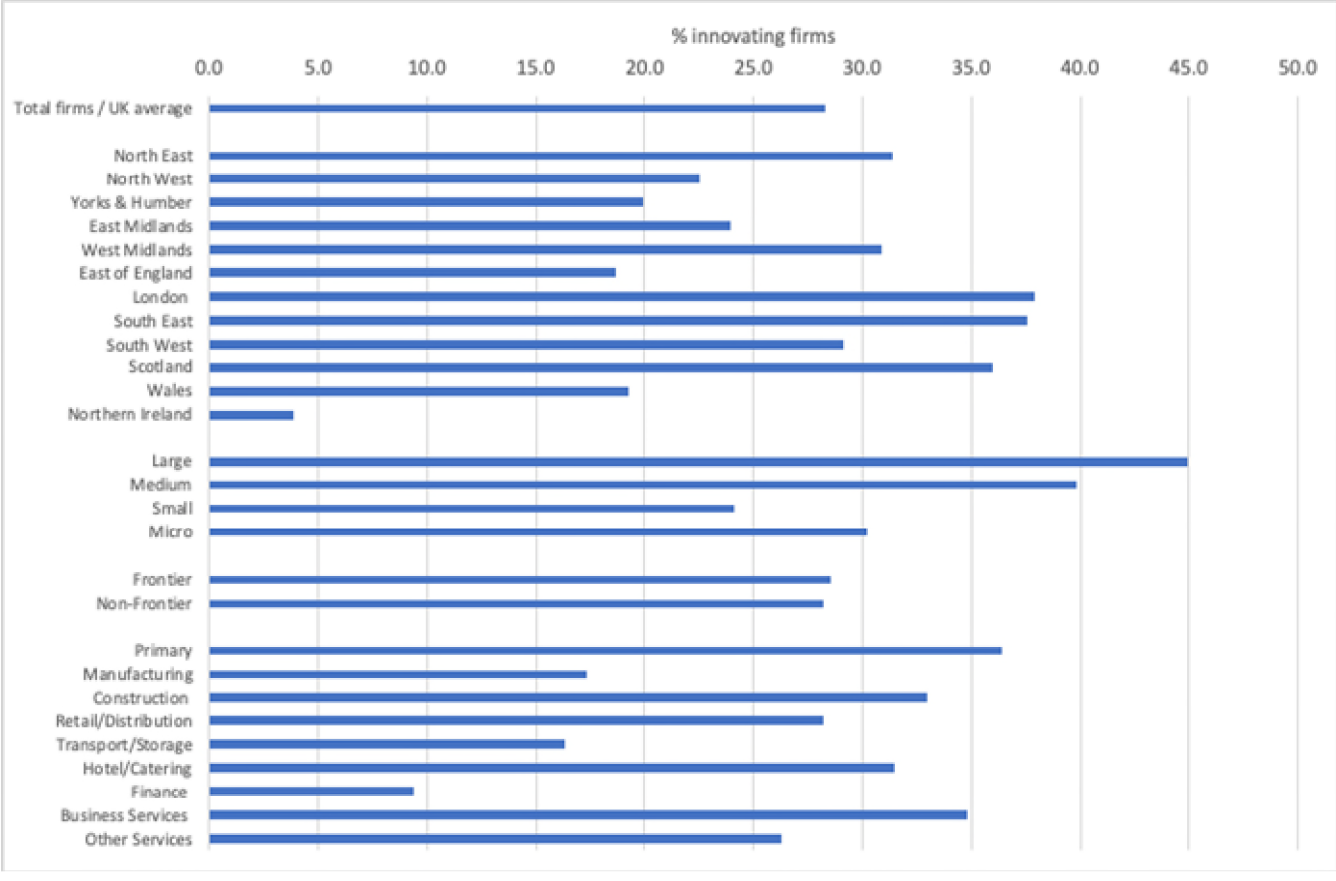
comparisons are included in Figure 2.14 for completeness but should be treated as indicative due to relatively small response numbers.

Table 2.3: Funding of R&D and innovation in year before the survey (N=714)

	Internal (%)	Grant (%)	Gov't loan (%)	Bank loan (%)	Equity finance (%)	R&D tax relief (%)
UK average	66.7	7.8	6.9	8.2	4.2	12.0
Large	60.8	17.9	22.3	19.4	17.3	15.1
Medium	56.1	8.9	5.8	22.7	9.6	15.7
Small	62.8	7.1	7.8	4.6	3.9	10.6
Micro	74.4	7.9	5.2	9.8	2.7	12.7
Frontier	64.9	7.7	6.5	12.1	7.4	14.5
Non-Frontier	67.3	7.9	7.0	6.9	3.1	11.0

Notes: Due to interview restrictions this question was asked of only half of the survey respondents so sectoral and regional sample sizes here are small. Sectoral and regional results are therefore not reported. As firms could use more than one source of finance totals do not add to 100.

Figure 2.14: Percentage of innovating firms (seeking external funding) and perceiving funding constraints (N=578)



2.6 Barriers to Innovation

Just over half of all innovating firms (51.5 per cent) reported factors which had constrained their innovation activities over the last year (Figure 2.15) (although see Box 2.7). This proportion was surprisingly consistent across groups of firms although those experiencing barriers tended to be among the more innovation-active groups – larger firms, frontier firms and those in the service sectors (Figure 2.15). Perhaps unsurprisingly the after-effects of the COVID-19 pandemic (53.8 per cent) and the cost of doing business crisis (51.0 per cent) were the most common barriers experienced by innovating firms. Other factors playing a significant role in constraining innovation were: regulations and legislation (39.5 per cent); uncertain demand (38.2 per cent); lack of skills (35.4 per cent); lack of government support (30.9 per cent); and, lack of finance (30.4 per cent) (Figure 2.16). Table 7.1 provides a detailed breakdown of the barriers experienced by different groups of innovating firms (although see also Boxes 2.8 and 2.9).

Box 2.7: Innovation without constraints (Manufacturing, large)

The nature of R&D varies across the group, e.g., in engineering, the focus is on improving manufacturing processes, to maximise efficiency. In marine manufacturing, they undertake research and offer shipping firms a variety of means to make large ships greener and more efficient. For ships spending millions of pounds in oil each year, a 2-5% improvement in the operation of the propellor can save a huge amount in cost and carbon emissions.

A key driver in the marine industry at the moment is the new EEXI legislation[2]. Ship owners are considering how to maximise the life span of their ships, either through relatively cheap solutions (modifications to propellers) which make some progress toward improving efficiency; more expensive solutions to achieve better progress; or scrapping vessels, where no solution is viable. The group offers a range of solutions and is currently working on another idea, to modify the positioning of the propeller and rudders on ships. The idea is not new, but no viable means of doing so have been found to date. If this could be done, it would involve a significant modification to the ship, but yield high returns in terms of increased efficiency and reduced operating costs. The firm is working with a university and an external designer on the project. They have worked with these partners before and have a track record in doing so. The firm brings practical knowledge and experience and manufacturing capability. If successful, they would have rights to the Intellectual Property and a market advantage.

The firm reports that while they have no specific budget for R&D, a lack of external shareholders and no borrowing means they can make their own decisions regarding R&D and choose what projects to invest in, or not, on a case-by-case basis. On this basis, they have been approached by, and worked with, other universities in the past, recognizing the value universities bring in their 'radical ideas' married to their own 'real-world expertise'.

They are not currently experiencing any particular cost pressures to limit innovation, and again the respondent referred to the lack of shareholders as an advantage in this regard. However, parts of their business are reliant on metals which could only be soured in Ukraine and identify accessing these metals as problematic.

[2] From 1 January 2023 it is mandatory for all ships to calculate their attained Energy Efficiency Existing Ship Index (EEXI) to measure their energy efficiency and to initiate the collection of data for the reporting of their annual operational carbon intensity indicator (CII). Based on a ship's CII, its carbon intensity will be rated A, B, C, D or E (where A is the best), similar to ratings for domestic appliances. A ship rated D for three consecutive years, or E for one year, will have to submit a corrective action plan to show how the required index of C or above will be achieved. Administrations, port authorities and other stakeholders as appropriate, are encouraged to provide incentives to ships rated as A or B. Over time, inefficient ships will not be able to operate in some territories. (Adapted from International Maritime Organisation)

Figure 2.15: Innovating firms experiencing barriers to their innovation

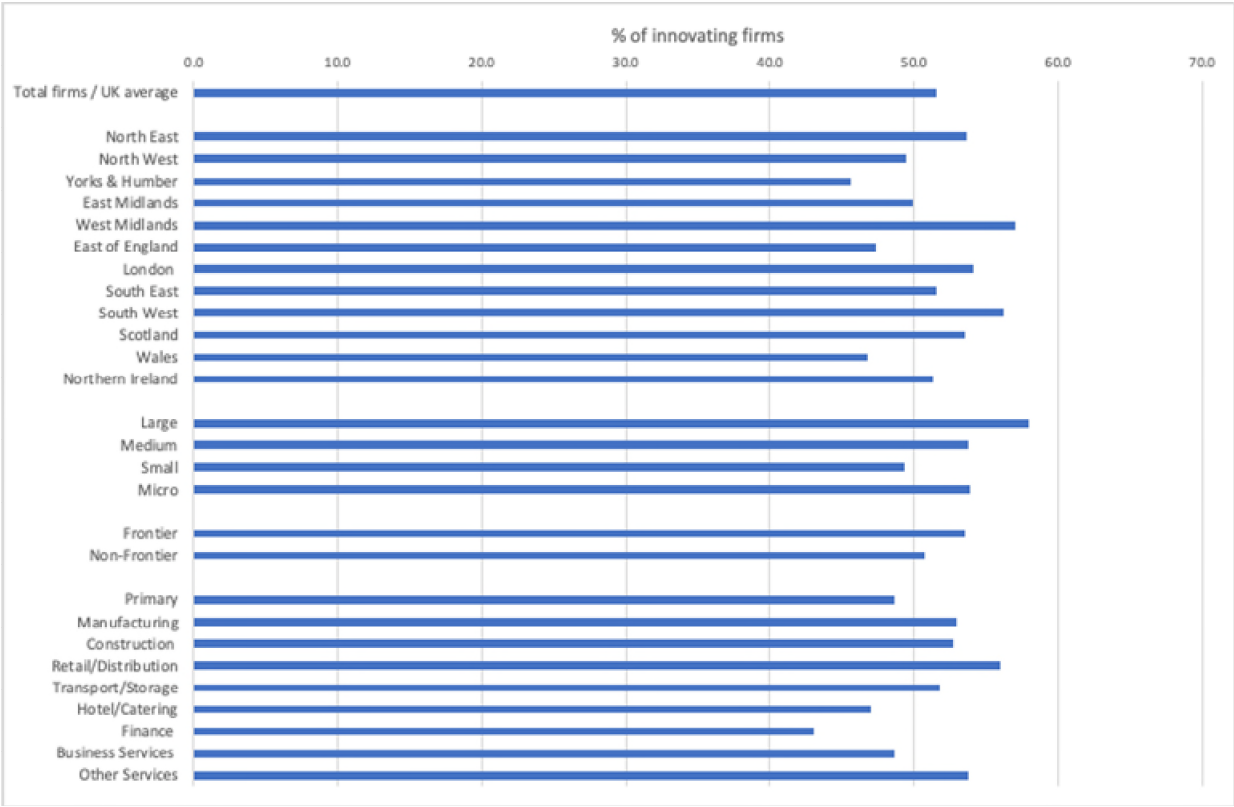


Figure 2.16: Barriers to innovation: all UK innovators

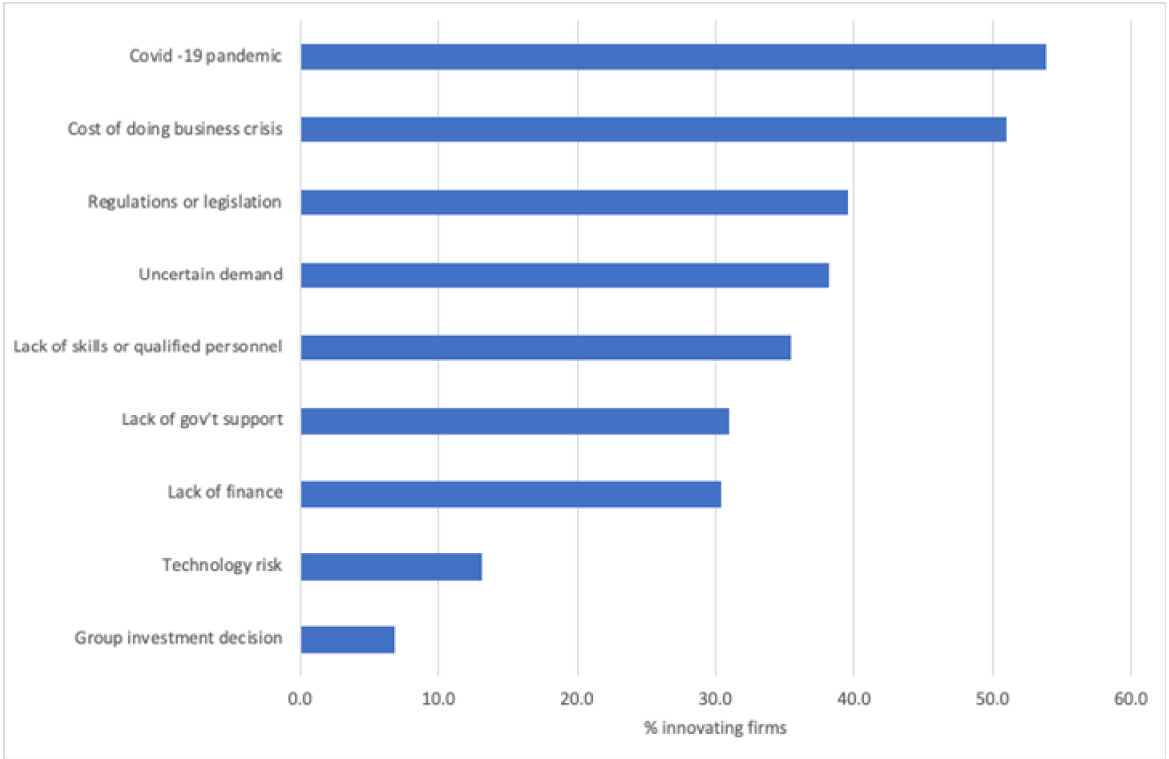


Table 2.4: Percentage of innovating firms experiencing different barriers to innovation

	Uncertain demand	Technology risk	Lack of finance	Lack of skills or qualified personnel	Lack of gov't support	Regulations or legislation	Cost of doing business crisis	Group investment decision or policy	Covid - 19 pandemic
UK average	38.1	13.1	30.3	35.6	30.7	39.4	51.0	6.9	54.2
North East	24.8	11.2	21.3	24.0	14.0	29.8	64.7	0.5	48.9
North West	26.8	10.3	33.2	36.2	21.1	41.9	48.6	4.4	40.3
Yorks & Humber	47.8	16.7	32.8	24.8	39.7	33.9	63.8	1.3	47.7
East Midlands	30.5	5.8	45.2	29.1	26.4	42.0	51.2	3.0	46.2
West Midlands	41.1	7.6	48.8	54.1	28.2	33.1	51.3	8.3	54.8
East of England	27.7	10.7	17.5	40.4	18.2	34.8	42.8	5.4	55.6
London	36.1	17.5	34.7	35.9	32.9	38.3	49.1	10.6	47.4
South East	48.3	17.4	22.9	32.8	24.0	36.3	55.3	10.3	58.8
South West	38.9	11.3	26.4	29.0	39.2	44.2	47.0	1.0	63.7
Scotland	63.0	12.3	36.0	31.9	46.6	42.0	44.7	0.0	65.3
Wales	36.2	23.7	20.5	44.2	38.9	46.3	67.6	0.8	68.4
Northern Ireland	18.3	1.4	22.3	39.3	76.4	65.3	50.3	29.2	47.4
Large	25.8	25.4	21.3	37.7	26.1	39.8	26.1	17.1	49.6
Medium	35.0	21.9	22.4	36.1	24.1	41.3	40.6	15.6	38.5
Small	34.7	14.2	30.2	40.9	27.4	39.4	52.6	7.3	49.7
Micro	43.1	9.9	32.4	29.4	36.2	39.3	52.2	3.9	61.0
Frontier	35.6	17.0	31.8	35.1	39.5	47.0	49.7	4.0	52.7
Non-Frontier	39.2	11.4	29.7	35.9	27.0	36.2	51.6	8.1	54.9
Primary	47.5	9.1	31.5	56.7	47.1	59.9	38.4	2.3	44.2
Manufacturing	47.3	14.8	25.3	42.1	27.9	41.8	51.1	5.1	56.2
Construction	44.1	24.0	21.9	33.3	35.7	31.8	52.3	17.7	54.6
Retail/Distribution	46.8	8.8	24.2	23.3	34.5	45.8	58.2	3.2	64.5
Transport/Storage	41.7	16.2	15.8	32.9	40.3	46.8	44.8	3.3	61.3
Hotel/Catering	55.5	13.1	34.0	35.9	29.1	42.3	59.2	9.9	65.0
Finance	55.9	29.4	9.8	25.1	20.3	59.4	42.7	4.8	38.2
Business Services	26.2	21.8	35.2	39.7	28.1	31.5	35.9	3.3	38.7
Other Services	19.1	6.9	38.4	41.9	28.6	34.3	50.6	10.4	45.5

Box 2.8: Regulation stifling change (Manufacturer, small)

The firm was established in 2010 to manufacture smart meters, but bigger businesses dominated that market and so they had to evolve. They have been manufacturing electric meters, but have also moved into devices for solar panels and are about to launch an EV charger.

They have a dedicated R&D team of 3 engineers and technical support, who develop all the electronics and device firmware. The budget is agreed with shareholders at the AGM, together with priorities for the year. R&D is critical to keep up with product development but also to grow and develop into new markets (such as renewable energy products).

The respondent reported that there is little room for innovation with the products because of the amount of Government regulation associated with electric metering products.

The firm has experienced significant delays in the ability to get hold of electronic components in the last year. They have had to re-develop some devices so that they no longer need or are reliant on electronic components. Competitors reliant on older products have struggled to get hold of components they need. However, this firm has fared well through the supply chain challenges, aided by an upsurge in consumer demand for solar panels.

They do experience recruitment challenges, for qualified production people, but have not needed to recruit to their R&D team. Therefore, neither recruitment, nor the supply chain issues, are having a negative impact on their ability to continue R&D and nor are they likely to over the next few months.

Box 2.9: Innovation in the longer view (manufacturing, micro)

The firm designs, programmes, tests and validates flow measurement systems for hydro-carbon industries. Manufacturing is out-sourced to Contract Electronic Manufacturers. They make a component of bigger systems, and are around 6 or 7 steps from the ultimate industry consumer.

The scope for innovation in the industry is limited by regulations on differential pressure meters, which date back to 1950. Additionally, the kit could be on oil pipelines with £2million of oil passing through the pipework every hour. While some errors may occur, they are within acceptable levels, and not at such a scale as to prompt customers, e.g., oil companies, to change proven, tested and known equipment for unproven, innovative equipment. Therefore, alongside regulatory requirements, there is a reluctance to change systems by the ultimate customers which does not foster innovation.

On the other hand, certain aspects do change, such as a need to enhance security on hardware and software, to prevent sabotage and to ensure electronics are up-to-date.

'Certain things don't change, other things change all the time'.

The firm is currently re-designing their core product because of obsolescence of electronic components, whereby parts are no longer being produced. Additionally, they are now using a new software system and, as this is widely used, they need to add security steps to ensure only approved software can be run. They are also using the opportunity to revisit how data is stored. It is the first major re-design of the product in 15 years.

While they are undertaking the re-design, they are also ensuring the development work will allow for further product development in the future – using the same structure but different

forms to broaden the range of products. This would enable them to explore new industry markets.

Over the coming year, the firm will continue with the re-design. They have already experienced issues with supplies and skills which have influenced how they work and what they are doing. For example, while the firm employs 5 people, they currently have 4 contract staff who are mainly supporting the design work. Two are ex-employees who the firm has kept by moving to a different contractual relationship (e.g. after one moved to Spain). This is vital because they have difficulties recruiting skilled people, being located in a rural location on the south coast ('*we have a 180 degree arc to recruit from*') in an unattractive industry (serving carbon fuels). In fact, the respondent identified getting the right person it the right position as the key problem they face.

Additionally, they have had to design the new product according to the parts that they could access on short lead times. Some parts are unavailable for 2 years, or even unavailable for an unknown amount of time, which was not acceptable for the re-design. Whilst these parts might have resulted in a product with more capacity or with more '*bells and whistles'* the firm took the decision to progress with what was available in the market.

Price have also increased as some sellers have raised prices, stopped selling some products altogether or implemented Non-Cancellable, Non-Returnable clauses. The firm is stuck with such a clause on an order for parts it no longer wants because the part was found to be ineffective, though they hope to be able to sell on in the widely used 'grey market' for similar electronic products.

The firm has faced recruitment, supply and cost issues in progressing the re-design of their product, but they have had to overcome these issues to continue as their product is no longer viable, being reliant on obsolete parts, and will continue to develop the product and set the foundations for further product development in the next 3 years or so.

2.7 Innovation People

Skilled employees are a critical factor in delivering on R&D and innovation and difficulty in obtaining suitable employees often emerges from business surveys as a key barrier to firms' innovation activity. Other concerns have been raised in the past relating to the inclusiveness of innovation activity and/or the diversity of firms' innovation teams. These concerns have motivated initiatives such as the UKRI Community Research Networks and the 'No Limits' initiative by Innovate UK. A lack of information has often hindered the development of this type of initiative, however, or made it difficult to benchmark and monitor progress.

To contribute to these agendas this Section provides for the first time a profile of the gender and ethnic composition of firms' innovation teams, and an overview of any recruitment challenges which firms have faced over the year prior to the ISNS 2023 survey. We also identify those specific occupational groups for which these recruitment challenges were most intense.

2.7.1 Understanding firms' innovation teams

As part of the survey firms were asked about the overall size and composition of their innovation teams. More specifically firms were asked first: 'How many people are involved in delivering or implementing changes to products or services in your organisation? This was intended to provide an indication of those involved in delivering innovation in the organisation regardless of whether this related to product, service or business model. Follow up questions then explored the proportion of the innovation team which were female (Figure 2.17) or from ethnic minority groups (Figure 2.18).

Overall, 37 per cent of the members of innovation teams across the UK were female. This proportion was slightly higher among frontier (40.3 per cent) than non-frontier firms (36.1 per cent) and noticeably lower in micro-firms (33.4 per cent) compared to other firm sizebands (Figure 2.17). Sectoral patterns are largely predictable with higher proportions of female members of innovation teams across service sectors and lower proportions in transport, construction, manufacturing and primary industries (Figure 2.17).

Turning to ethnic minority representation we see that this accounted for 15.4 per cent of firms' innovation teams (Figure 2.18). This proportion varies significantly, however, being slightly higher in frontier (18.0 per cent) than non-frontier firms (14.2 per cent). In sectoral terms the profile reflects that of female team membership – higher in services but lower in transport, construction, manufacturing and primary industries. Here, however, the distinction between the services and other sectors is more marked than that by gender. In regional terms ethnic minority representation in innovation teams reflects to some extent the underlying demography of each area. London stands out, however, with 41.8 per cent of innovation team members being from ethnic minority groups – nearly three times the national average proportion.

Across the two dimensions (gender, ethnicity), frontier firms generally have more diverse innovation teams than non-frontier firms. And, there is a strong (and consistent) sectoral pattern: more diverse innovation teams in services and markedly less diversity in transport, construction, manufacturing and the primary industries. Innovation teams in London are marked by high levels of ethnic diversity, while those in the East Midlands appear have lower levels of both ethnic and gender diversity.

Figure 2.17: Proportion of R&D and innovation team which are female (N=904)

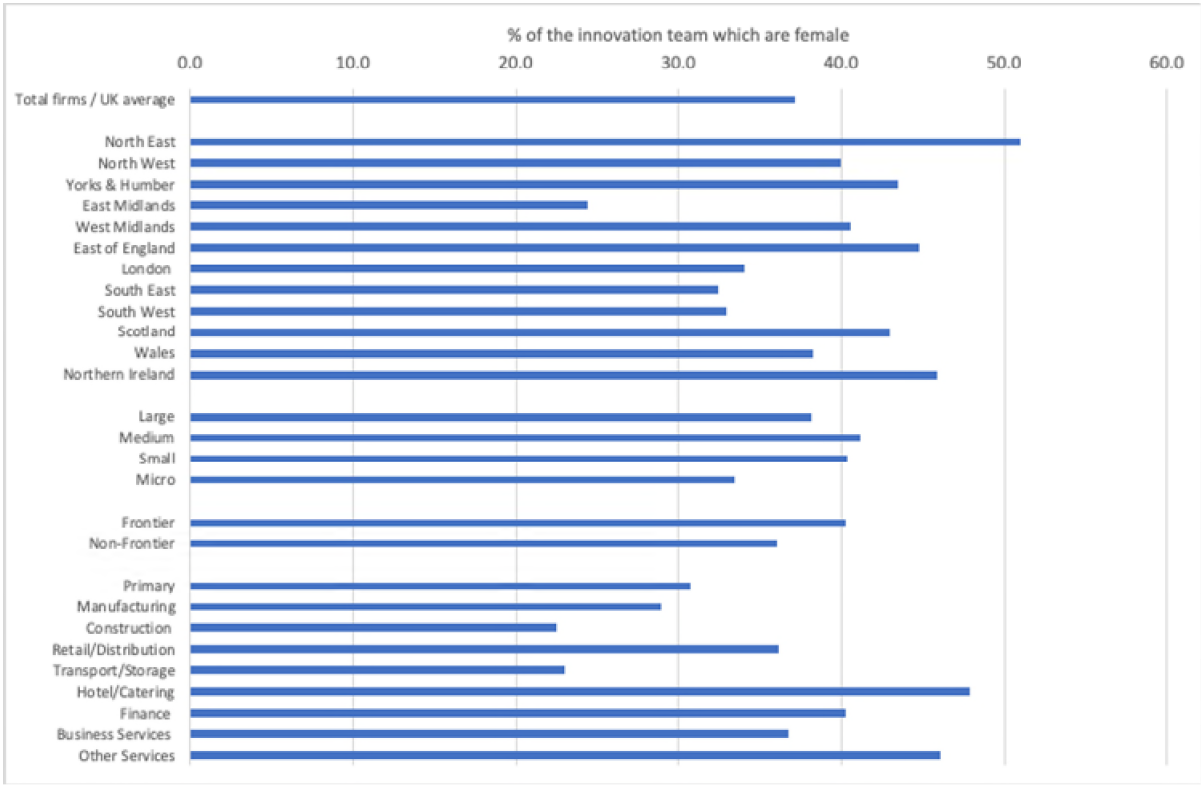
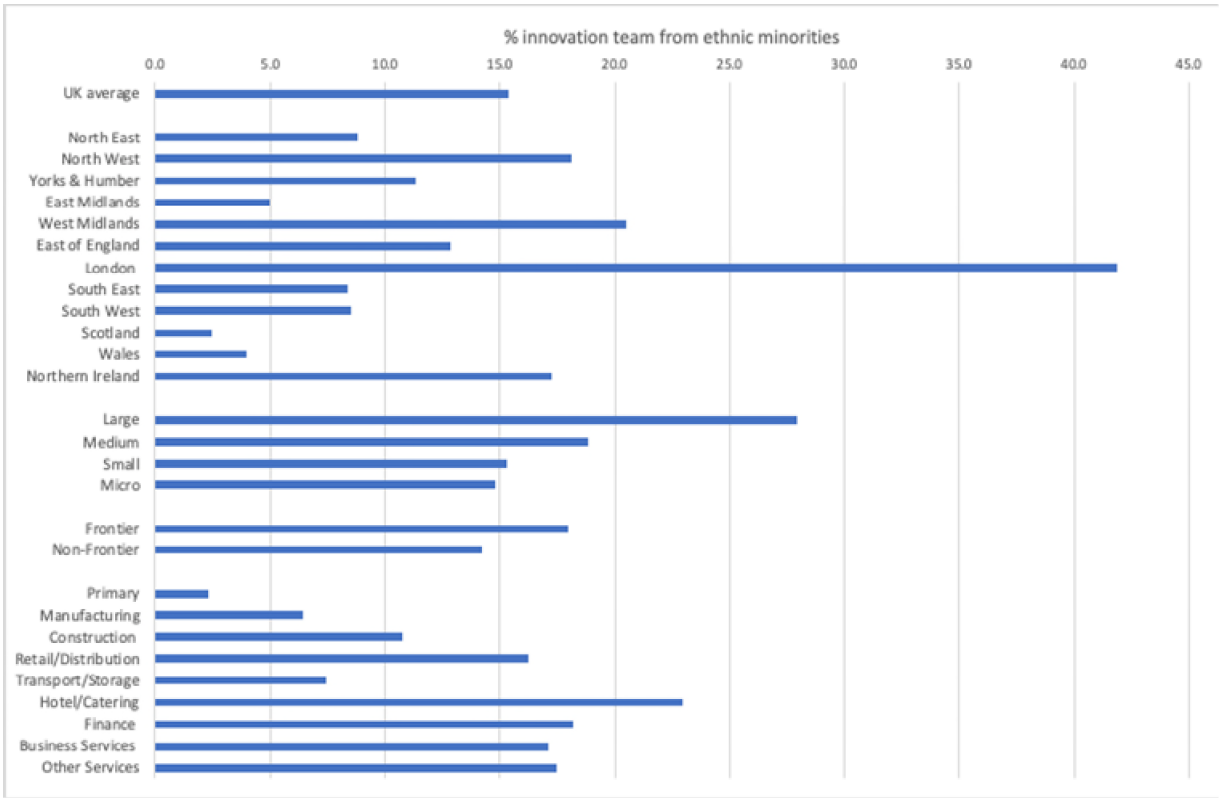


Figure 2.18: Percentage of the innovation team which are from ethnic minorities (N=886)



2.7.2 Recruiting barriers for innovation

In the context of a generally tight labour market over the last year in the UK, have firms experienced recruitment barriers to innovation? In the survey we asked a general question about whether 'over the last year your research and development or product/service development activities been restricted by difficulties recruiting staff? Where firms had experienced recruitment difficulties a follow-up question then asked about the specific occupational groups for which these difficulties had arisen.

Across the UK, 39.3 per cent of firms indicated that recruitment issues had restricted their innovation activities over the previous year (Figure 2.19 and Box 2.10). This proportion was almost equally evident in both frontier and non-frontier firms but was significantly more common in larger (48.9 per cent) than in micro firms (36.7 per cent). Sectoral variations were also evident in some cases reflecting broader recruitment issues (e.g., hotels/catering). Recruitment difficulties were most intense in the East of England and less of a constraint on innovation activity in the South West (Figure 2.19).

Box 2.10: Avoiding recruitment issues (Construction, small)

The firm largely works on local authority contracts, installing kitchens and bathrooms, working on void properties etc. This is a stable part of the business that they will continue with. However, they are looking to diversify and open up new revenue streams. To increase sales and move into other markets, they are considering buying out part of another local business which has developed the installation of air source heat pumps, solar panels and other renewables.

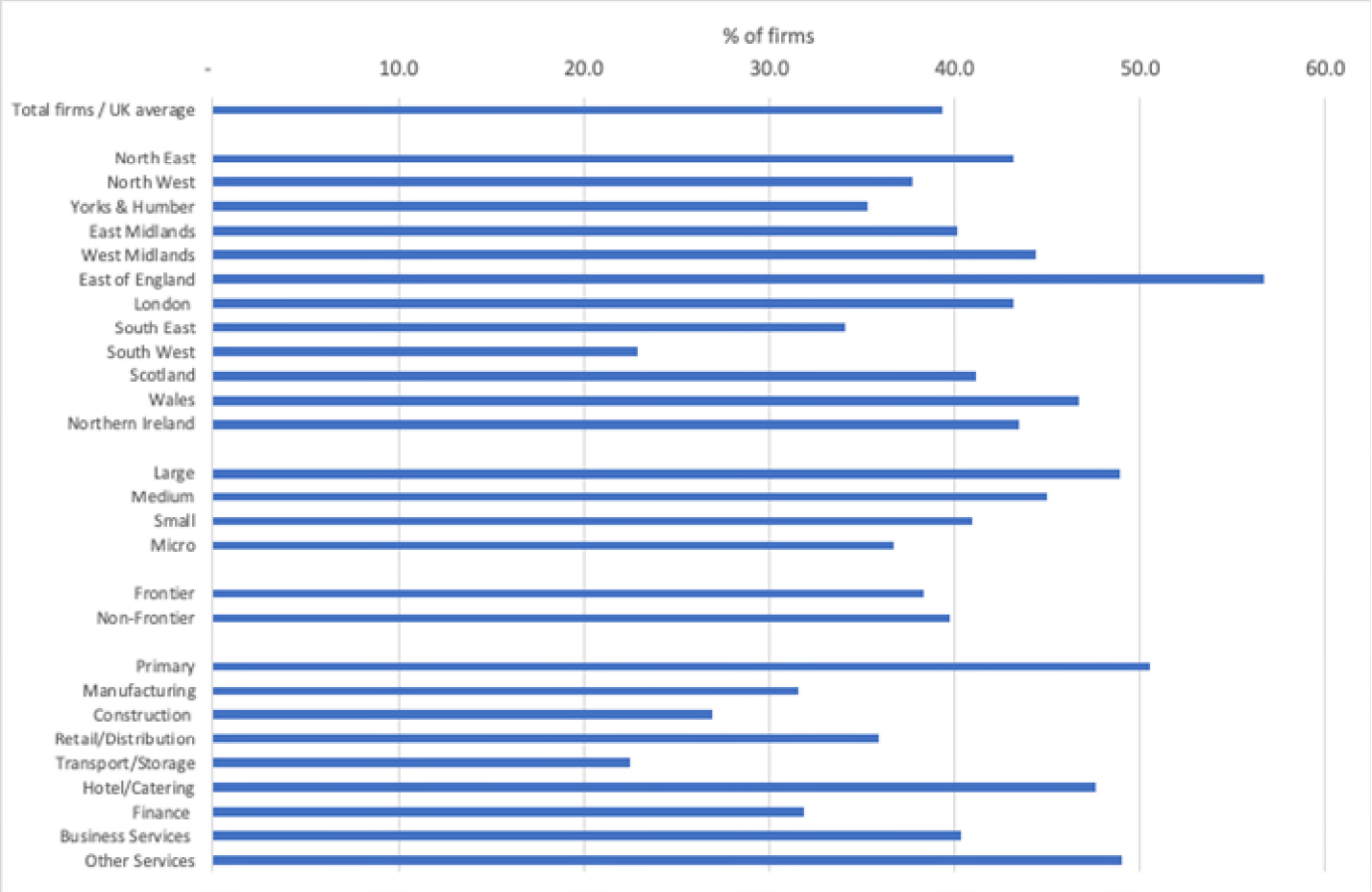
The firm currently has people qualified to install green technology and with the requisite, transferable skills, although additional training would be needed. The Managing Director of the firm is very keen to ensure staff are fully up to date with all training. This is critical for their customers, for the nature of the work they do and to remain ISO 9001 compliant. This has also put them in position to buy in the new business if they choose to.

The firm does not have difficulty accessing training, it is readily available and they anticipate no difficulty in accessing training specific to the new business. There is no dedicated training budget, but resources are made available for training.

As a small, family-run business, it does not have a particular problem with staff retention. The owners care about their staff and this '*filters through the hierarchical chain'.* Regular two-way communications sessions with staff are also cited as important to retaining skilled staff and thus ensuring the firm has the skilled people they need to take on this new (to them), green area of work.

Among those firms experiencing recruitment difficulties (which restricted their innovation activities) it was issues recruiting technicians (31.2 per cent), engineering staff (20.9 per cent), graduate-level technicians (18.6 per cent), and software developers (15.5 per cent) which were most common (Figure 2.20). These groups prove consistently the most problematic across sectors, firm sizebands etc. although proportions vary somewhat (see Box 2.11).

Figure 2.19: Percentage of firms experiencing difficulties recruiting for innovation (N=1021)



Box 2.11: Critical skills (Manufacturer, micro)

The firm is a small batch plastics manufacturer, producing prototypes and small run for medical and military industries and more widely. R&D is very important to their business. Customers will come to them to design new products or test scale up manufacturing of existing ideas, but also the firm is independently developing new products or processes, with specific purposes/markets in mind.

Over the coming year, they intend to look at processes and designs to see what can be done differently, in order to increase production and reduce the amount of time taken to complete jobs – providing a better service and more competitive price for customers.

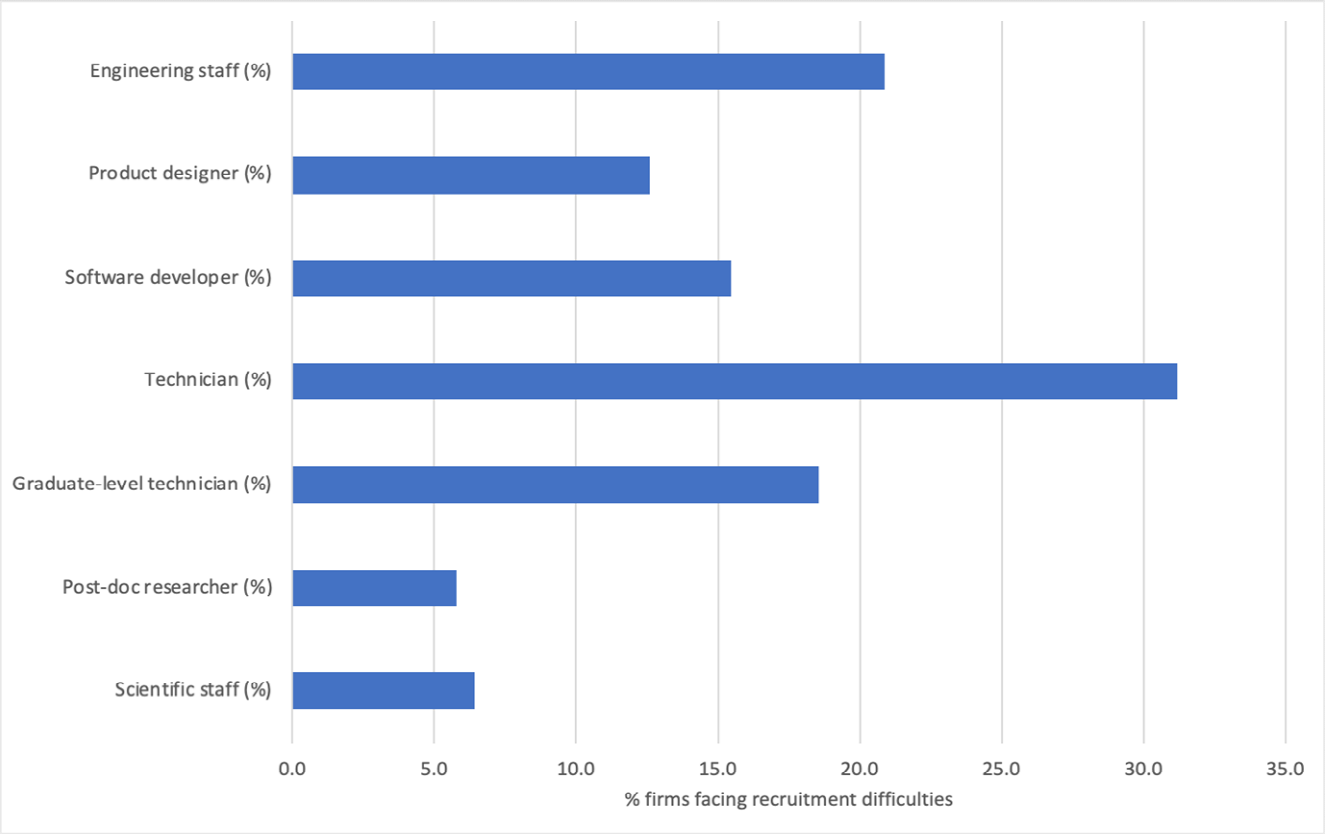
Whilst they have seen a lot of price rises, the biggest problem is having time to do R&D because they cannot get skilled staff. Applicants don't have the skills they need. University graduates do not have hands-on experience but expect to be paid £45,000 to £50,000 – a salary no one at the firm is on. The firm needs people who are multi-skilled and can work in any part of the factory, including vacuum forming, lasering, programming. Few people have these skillsets.

This means the firm is in a Catch-22 situation, without the time to implement product and process improvements that would help speed up processes and free up time.

They have considered taking on and developing a school leaver, moulding them to be the employee the firm needs. However, again, they lack the time to be able to train someone at this level.

Another potential barrier to them being able to implement the R&D they aspire to over the coming year is if one of their two most important machines break down. One did recently and they have invested in a new machine. While they have set aside resource should the other machine break down, this would get in the way of implementing the improvements they plan.

Figure 2.20: Occupational breakdown of recruitment difficulties (N=390)



Note: Firms may report more than one main recruitment difficulty, so figures do not add to 100.

2.8 Collaborating to Innovate

Collaboration in R&D and innovation, whether formal or informal, can help firms share the costs of innovation, reduce the associated risks and provide access to otherwise unavailable skills and technologies. The evidence emphasises the consequent value of collaboration, with different types of partners providing access to very different types of knowledge and expertise. For example, university links might be helpful where firms aim at new to market innovation, while supply chain collaboration with customers or suppliers may be more relevant where firms are aiming at more incremental product or service improvements.

In the State of the Nation Survey we have a particular interest in firms' collaboration with other local actors. This reflects the growing interest in the role of local eco-system interaction as enabling innovation and its downstream benefits of growth, exporting and productivity. Questions in the survey are at two levels. First, firms were asked to identify whether or not they collaborated with a range of different partners 'to help with

product/service development, or organisational changes'. We then distinguish between local and non-local partners, identifying local partners as being within 15 miles of the business.

As part of the survey firms were asked whether 'to help with product/service development, or organisational changes, did your business collaborate with any external partners over the last 12 months? Responses are summarised in Figure 2.21 for all firms. Overall, 41 per cent of firms reported collaborating with other organisations, a proportion which was higher in frontier and larger firms (Figure 2.21). By sector we see higher collaboration rates in business and professional services and manufacturing, and a markedly lower level of collaborative activity in construction. Regional differences are also significant with lower collaboration levels in Wales than in all other regions.

A detailed breakdown of collaboration by firm type is included in Table 2.5. This emphasises the relative importance of supply chain related collaborations – with suppliers and customers – and with other businesses. Comparably levels of collaboration with universities, public labs and/or business support providers are relatively uncommon.

Figure 2.21: Collaboration with external partners for innovation (all firms) (N=1963)

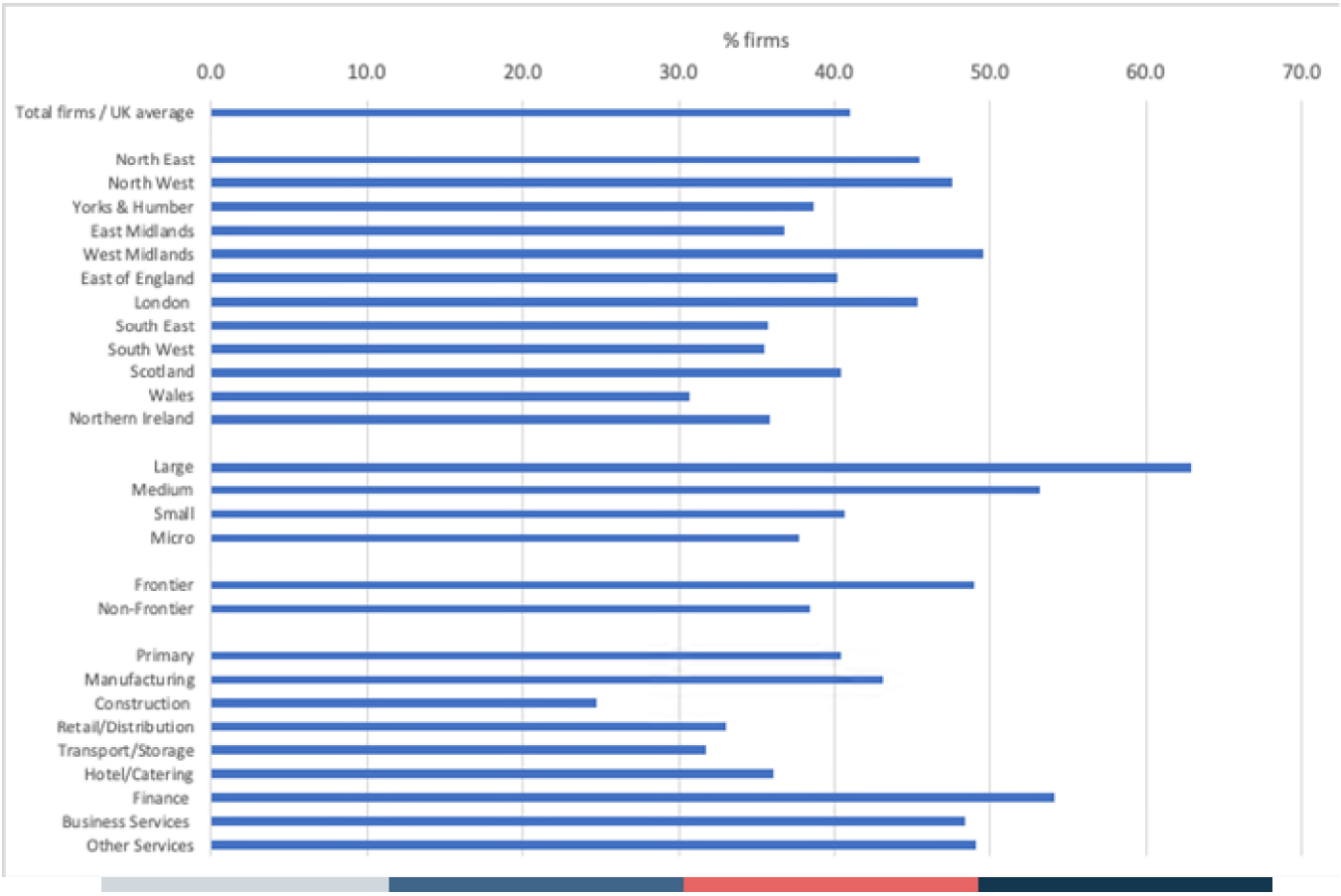
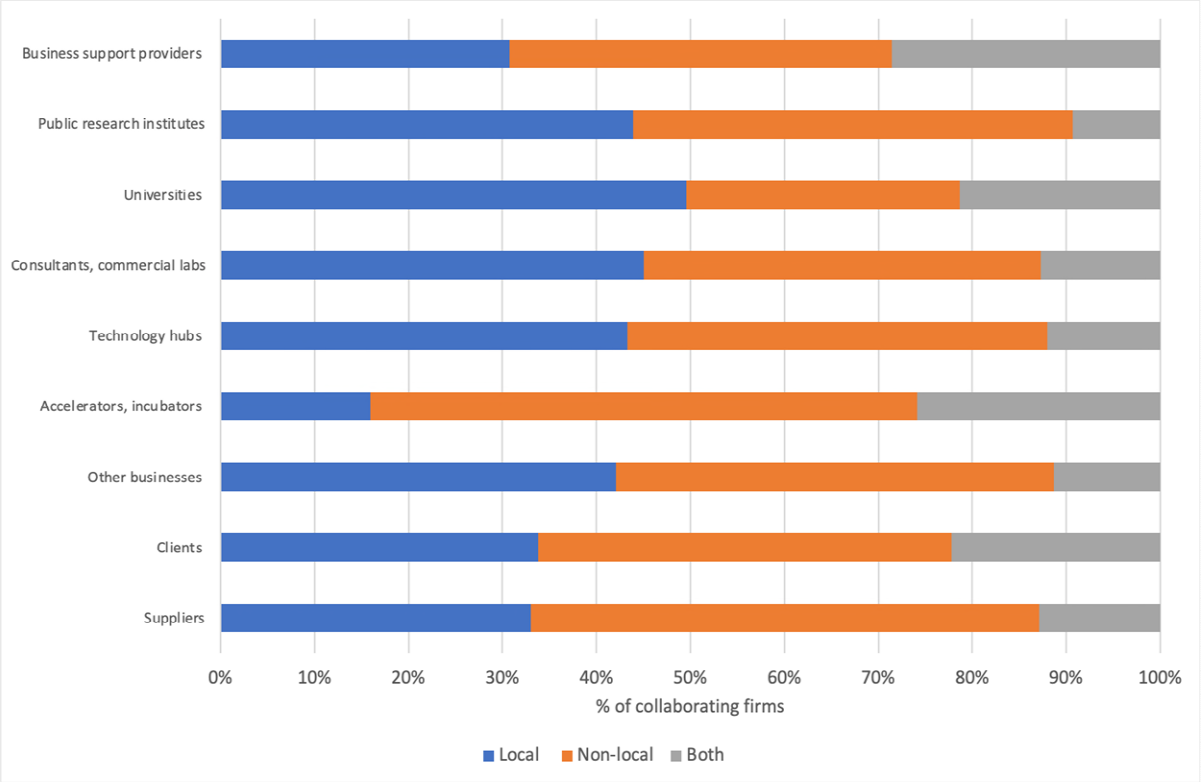


Table 2.5: Collaboration profile by type of firm

	Suppliers	Clients or customers	Other businesses	Accelerator incubators or science parks	Technology hub or innovation centres	Consultants commercial labs or private R&D institute	Universities or other higher institutions	Gov't or public research institutes	Business support providers
UK average	43.9	26	39.5	5.5	12.2	18.1	7	9.4	6.4
North East	32.5	22.7	36.2	1.9	17.8	32.1	6.6	2.8	4.6
North West	46.5	35.3	31.7	7.6	10.2	24.1	4.7	8.1	1.4
Yorks & Humber	41.2	37.2	38.8	3.3	15.1	15.6	5.1	1.7	3.5
East Midlands	42.8	14.7	33.3	2	9.8	23.7	5.5	11.9	2.5
West Midlands	41.8	39.6	39	9.3	22.2	21.7	15.1	17.3	16.1
East of England	42.1	23.2	48	7.9	9.6	12	6	6.9	2.8
London	31.9	20	49.1	9.4	14.3	18.6	3.1	5.5	3.5
South East	54.8	22	36.5	0.6	4.1	12.3	10.5	11.3	8.1
South West	56.4	28.9	24.9	6.1	14	20.5	4.6	10.2	6.9
Scotland	43.7	13.4	50.2	1.2	7.1	18.9	2.1	18.8	12.9
Wales	14.6	14.4	47.9	3.5	24.5	12.3	30.3	2.6	0.7
Northern Ireland	53.1	39.4	46.6	0	16.4	6.6	0.4	16	27.3
Large	52.8	30	22.9	17.8	24.9	37.2	21.5	13.4	21.5
Medium	46.8	42.8	35.6	13.8	24.5	20.1	11.4	12	19.6
Small	41	22.9	43.2	5.4	12.2	18.5	8.4	10.2	7
Micro	45.8	25.7	37.2	3.1	8.9	16.3	3.7	7.7	2.1
Frontier	43	25.9	42	11.6	13.2	22.9	13.3	10.6	6.8
Non-Frontier	44.2	26	38.5	3	11.8	16.2	4.5	8.9	6.2
Primary	40.2	16.7	41.3	5.8	12.8	22.4	10.2	1.8	5
Manufacturing	40.1	22.8	39	1.6	9.9	17	8.8	5.7	4.8
Construction	48.1	26.9	35.3	3	12.5	22.1	9.9	11.4	5.6
Retail/Distribution	50.9	25.7	37.6	5.7	12	20.2	3.1	3.5	4.2
Transport/Storage	41.7	19.7	38.1	4.2	6.7	10.2	6.6	14.8	14.4
Hotel/Catering	52.9	24	44.1	3.2	11.7	9.3	6.2	6.6	8.5
Finance	31.4	22.6	44.6	7.7	19.1	21.2	7.2	3.8	8.6
Business Services	41.9	29.1	34.6	2.2	11.1	22.9	10.9	8.8	4.6
Other Services	39	27.5	43.4	10.7	13.9	16.5	4.7	16.3	8

Is firms' collaboration for innovation local or non-local? Figure 2.22 profiles the overall picture for the population of UK firms in terms of whether firms' collaborations are entirely local, entirely non-local or include both local and non-local partners. In terms of universities, for example, 49.5 per cent of firms collaborate only with local (i.e., within 15 miles) universities, 29.1 per cent collaborate only with non-local universities and 21.4 per cent of firms work with both local and non-local universities (Figure 2.22). Indeed, collaboration with local universities (only) is a more dominant form of collaboration than with any other type of local partner, emphasising their importance to local innovation eco-systems. Other types of collaboration – particularly that with accelerators/incubators is less common (Figure 2.20) and predominantly non-local (Figure 2.22).

Figure 2.22: Local and non-local collaboration (N=799)



2.9 Supporting Innovation

A range of innovation and business support measures are available to firms across the UK. Grants and loans to support R&D and innovation activity are available from Innovate UK as well as agencies in the devolved territories. Advisory support, and management and leadership training are available through schemes such as Innovate UK EDGE and the Help to Grow management programme. In terms of R&D and innovation, support is also

available through the R&D tax credit scheme. In this section we provide a brief profile of firms' appetite for external advice and support in different areas of business activity.

As part of the survey firms were asked whether they had sought external support for any business purpose in the year prior to the survey. For those firms which had accessed some external support, a follow up question then explored the nature of that support, i.e., whether it related to business growth, innovation or some other aspect of business performance.

Across the whole sample of UK firms 34.8 per cent of firms sought some form of external advice in the 12 months prior to the survey (Figure 2.23). Frontier firms, larger firms and those in the services and primary sectors were more likely to seek advice than smaller, non-frontier and transport, construction firms. There is relatively little difference across regions in terms of the proportion of firms seeking external support, although this proportion appears lower in Wales. Note, however, that the number of Welsh respondents to the survey was relatively small compared to that in most other regions.

Figure 2.24 considers why all firms and frontier and non-frontier firms sought advice. Overall, the most common types of support sought related to running and growing the business. This may reflect the particularly challenging operating conditions during 2022 (the year before the survey). Both of these general types of support were almost equally common among frontier and non-frontier firms. Other types of support – around digital technologies, product and service innovation and net zero – were less common but more likely to be sought by frontier rather than non-frontier firms.

Figure 2.23: Percentage of firms seeking external advice for any business purpose (N=1945)

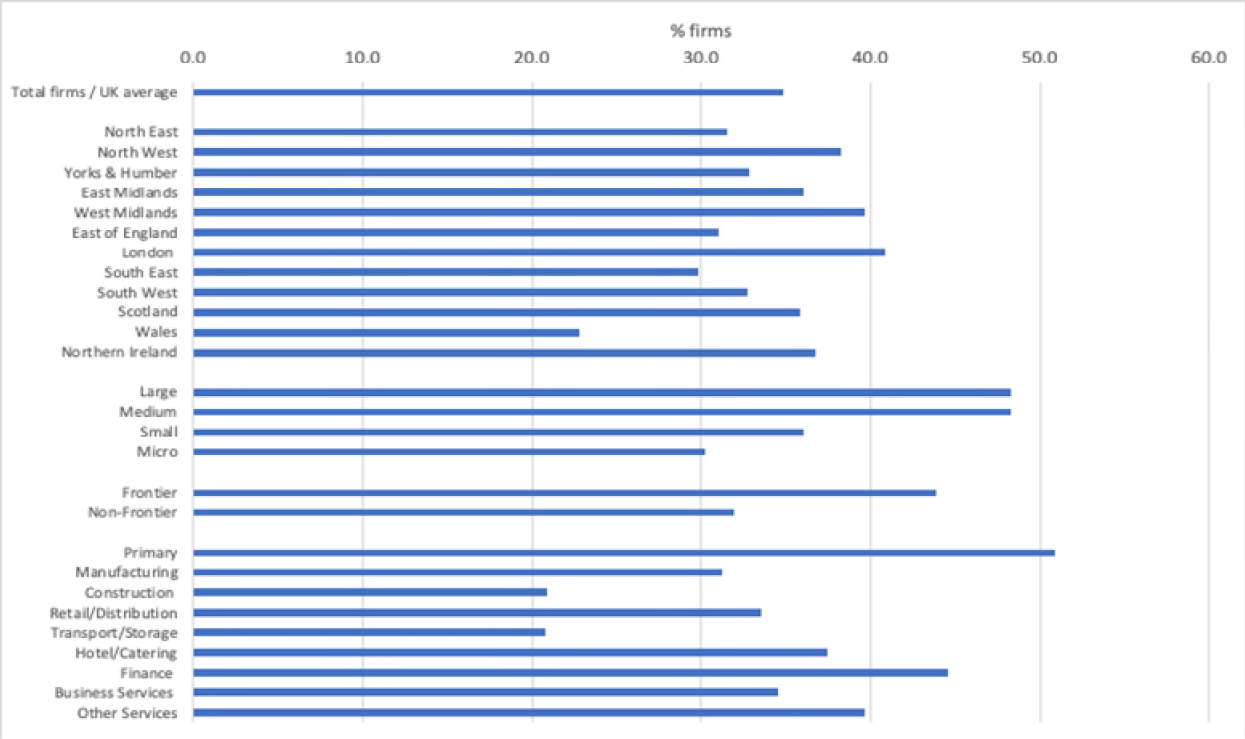
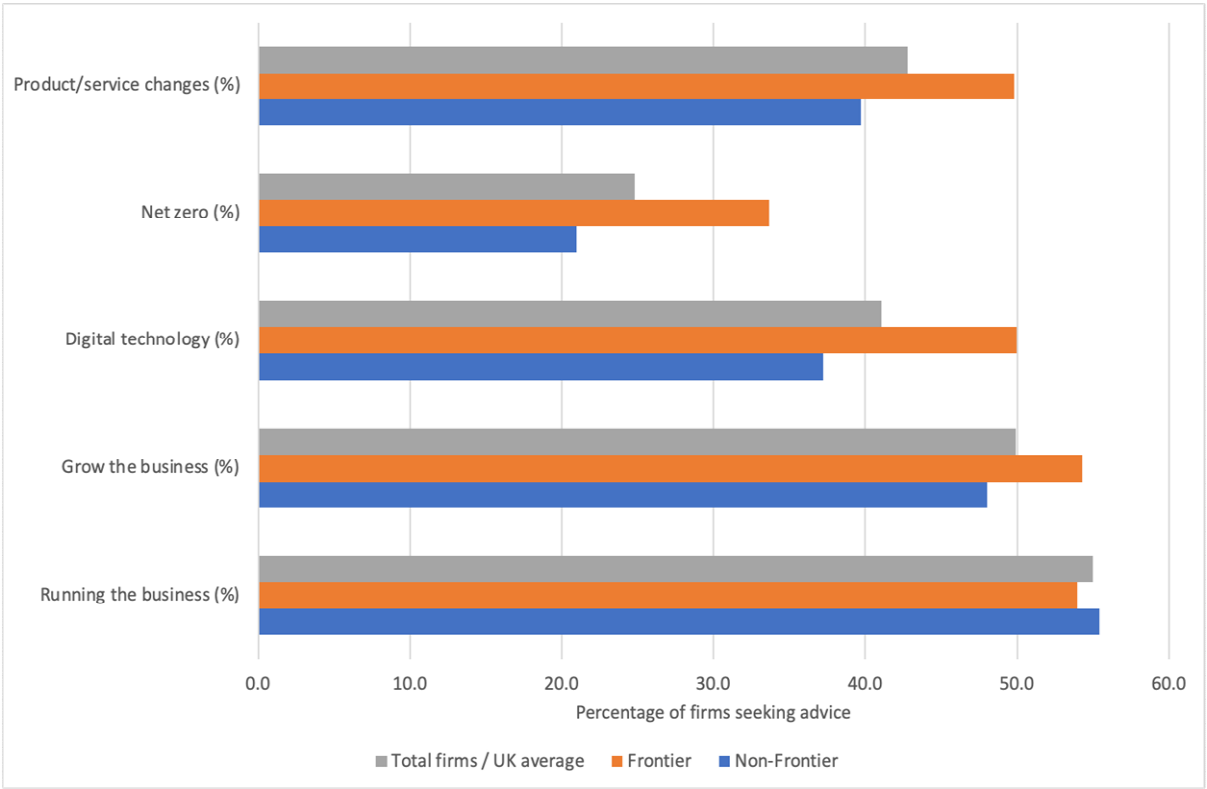


Figure 2.24: Percentage of firms seeking advice of different types (N=725)



Note: As firms could have sought more than one type of support figures do not add to 100.

SECTION 3: INNOVATION INTENTIONS

3.1 Introduction

In this section we look forward to firms R&D investment intentions over the next 12 months and firms anticipated support needs. Reflecting the barriers noted earlier arising from the COVID-19 pandemic and the cost of doing business crisis we might anticipate that firms will plan to increase their R&D investments as economic circumstances improve. But is any improvement or increase in R&D investment likely to be matched by an increase in support needs?

3.2 Prospects for R&D investment

Overall, 53.0 per cent of UK firms are planning to invest in R&D over the next 12 months (Figure 3.1). This proportion is significantly higher among frontier and larger firms and those located in London. As in the past year, a significantly higher proportion of services companies intend to invest in R&D compared to firms in transport and construction, although here we see strong R&D investment intentions from manufacturing businesses (see Box 3.1).

Box 3.1: Looking to the future (construction, small)

The firm builds one-off, high spec houses and manufactures timber-frames. In 2018, they embarked on a Knowledge Transfer Partnership with a local university to develop air-tight, high performance accommodation pods for use, e.g., in hotel grounds. The firm invested £150k in the KTP and reported that it worked well, getting good value from the 3 academics they met with monthly. The firm employed an engineer to work on the product. However, the product was ready for launch when Covid hit. The business had to move into survival mode and needed a loan, which they are still repaying, to get through the pandemic. The engineer they had recruited left the business to become a teacher – looking for more stable employment. The respondent thought this was probably just as well as they would have felt the need to continue investing in the product at a challenging time for the business. The momentum was lost and the business is still rebuilding – ensuring they have '*made a few pounds before looking at innovation again'.*

Although the firm found the KTP valuable, they reported they would not do it again because it was too much investment for a small, family-owned business. They have also invested in a new computerised timber saw. This is reducing waste by optimizing the value of every piece of timber in the factory.

The firm does have further innovation ambitions. The owner has visited many factories with more automation and robotics, but they do not manufacture sufficient quantities of their high-value product (and their market is limited to a 40 mile radius). Additionally, the impact of Covid and Brexit (for this Northern Ireland based firm, some products have come out of the market because of the Protocol) has meant a loss of impetus, but the longer-term ambition is to grow the business for the benefit of the owner's children who will take over in due course.

Among those firms planning R&D investment over the next 12 months, investment intentions are relatively strong. Overall, 52.1 per cent of this group were planning to increase their level of R&D investment, compared to only 5.8 per cent who are planning to reduce investment, and 42.2% who planned to maintain current levels of R&D investment (Figure 3.2). These proportions seem very similar across all sectors regions and groups of companies.

Figure 3.1: Proportion of firms intending to invest in R&D in the next 12 months

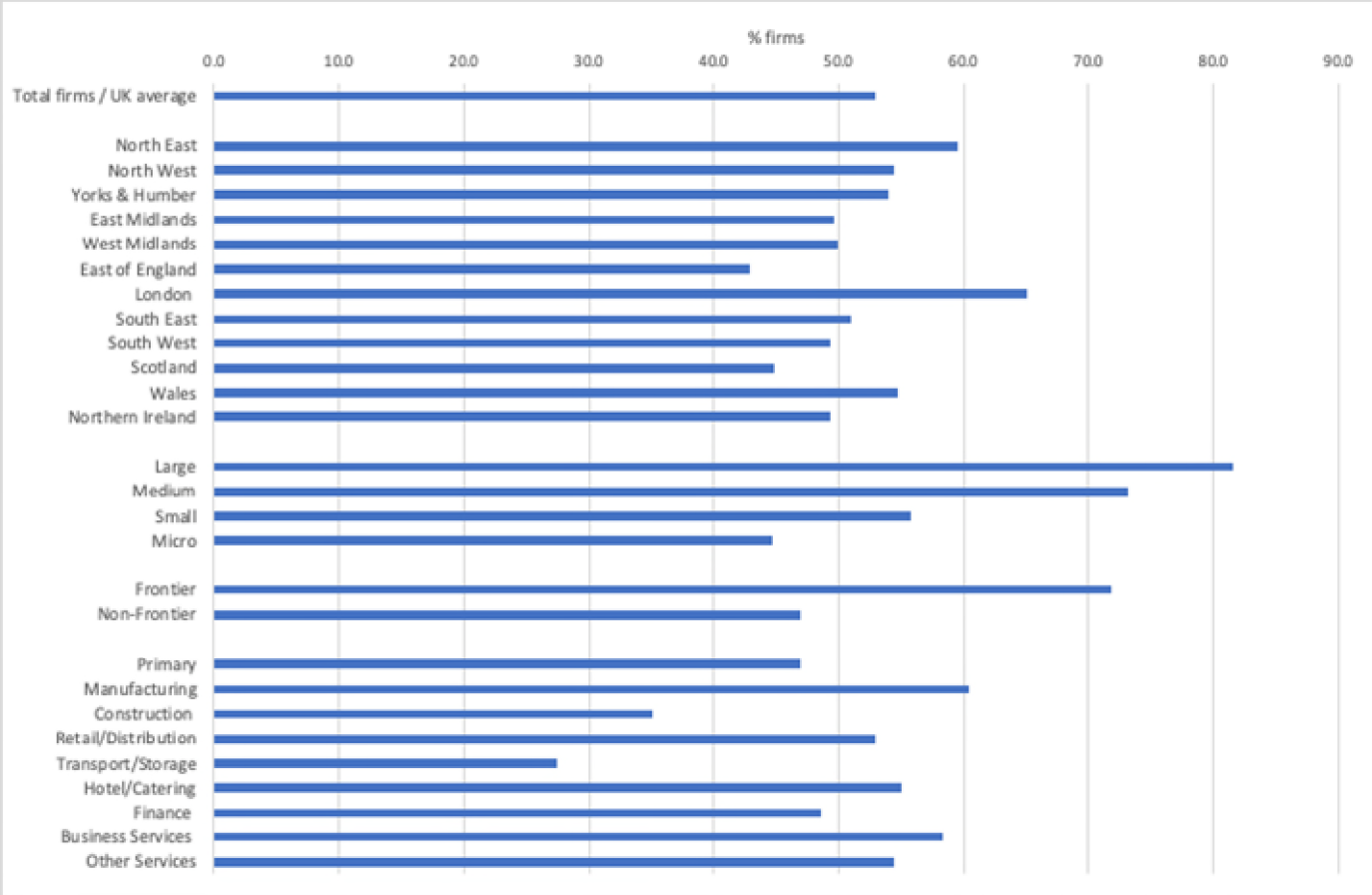
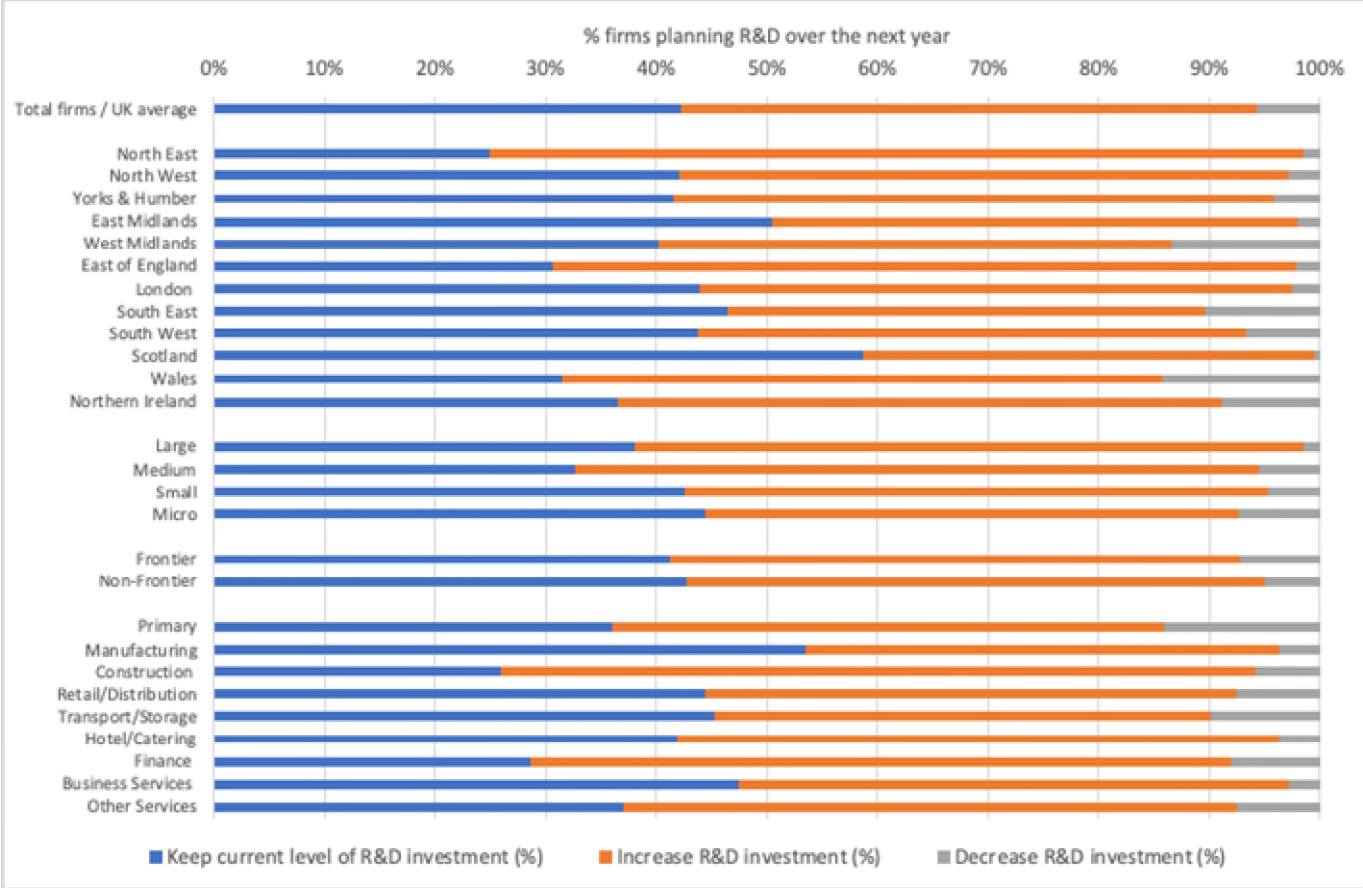
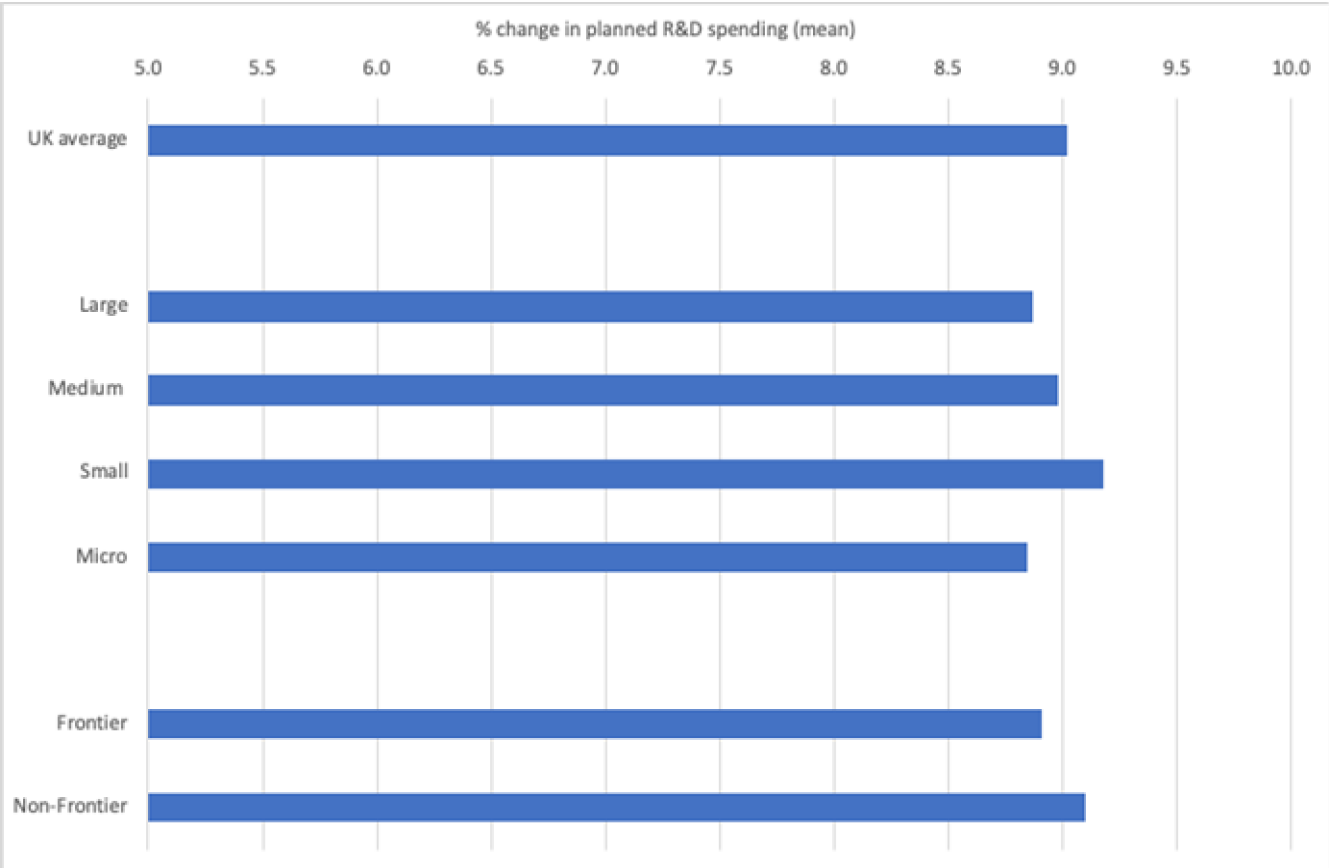


Figure 3.2: Firms planning to increase, maintain or decrease R&D investments?



Firms planning to engage in R&D over the next 12 months were also asked whether they were planning to increase their investment, decrease it or maintain their current level. Responses are summarised in Figure 3.3. On average firms were intending to increase R&D spend by around 9.0 per cent, with this figure varying little between different firm sizebands and also between frontier and non-frontier firms.

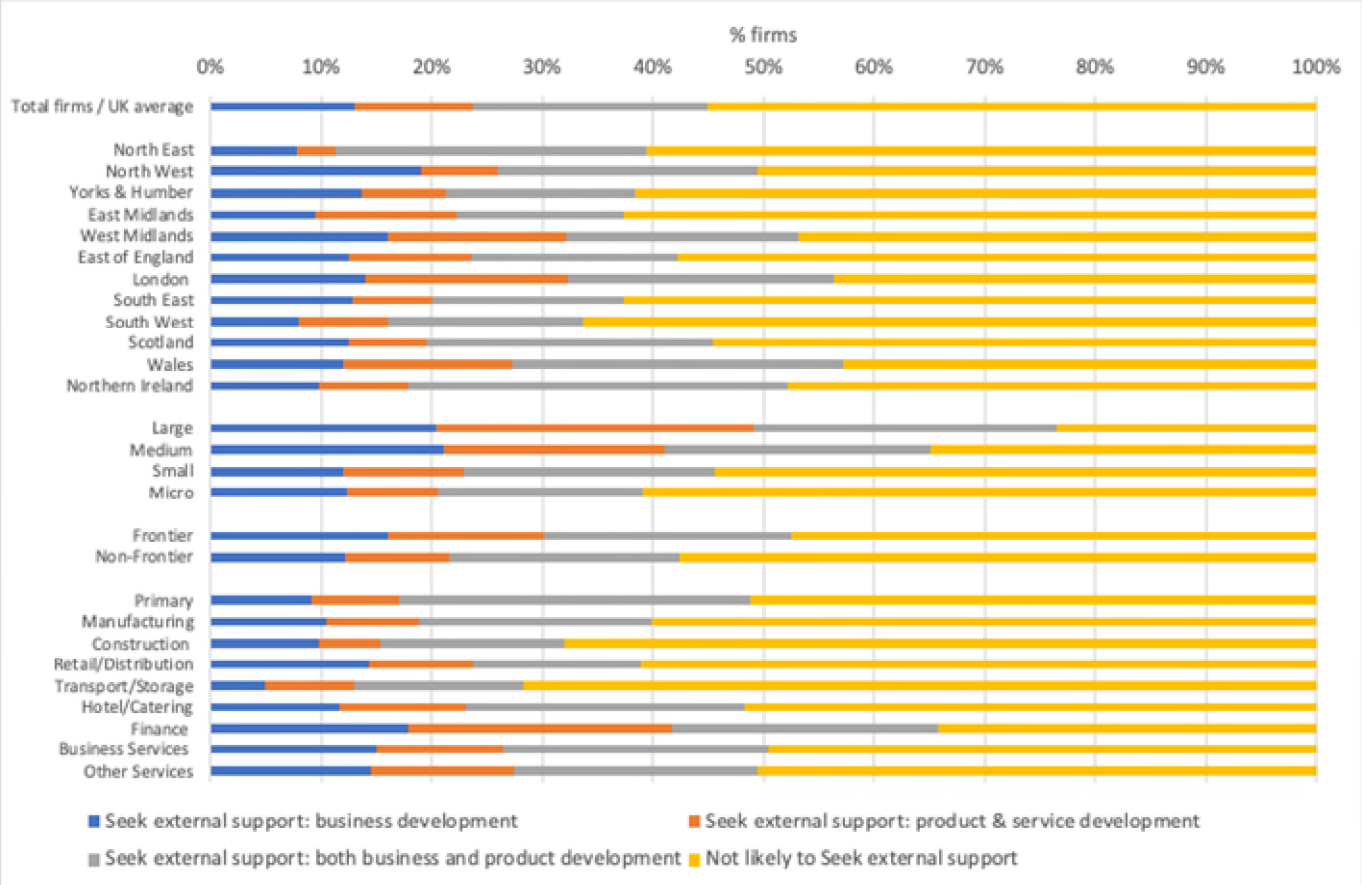
Figure 3.3: Planned increases in R&D by type of firm (% change) (N=901)



3.3 Future innovation advice

As part of the survey we also asked firms how likely they were to seek external support for their innovation and business development activity over the next 12 months (Figure 3.4). Slightly less than half of all firms (44.9 per cent) indicated that they were likely to seek external support either for business development or product and service innovation. Frontier firms, larger businesses, and those in the finance sector were most likely to be in the group of firms seeking support for either business development and product development (Figure 3.4).

Figure 3.4: Likelihood of seeking external support/advice over the next year



SECTION 4: NEXT STEPS

The Innovation State of the Nation Survey was designed to provide a comprehensive picture of current innovation activity, and also provide insight into a number of areas of policy concern.

Future, more in depth, analysis will focus on a range of specific areas exploring the inter-relation between the context in which innovation is taking place, the resources available to firms, and innovation outcomes. Illustrative areas we aim to explore over coming months are:

- The specific barriers and enablers of innovation, by firm type and sector, across regions of the UK as an input into discussions about levelling up and the contribution of place- based innovation to growth and productivity.
- The role of local eco-system collaboration as an enabler of innovation, and the role of specific types of collaborative relationships in shaping innovation outputs.
- More detailed investigation of innovation in micro-businesses, exploiting the new data included in the ISNS survey covering firms with five to nine employees. How does innovation in these companies compare to that in larger firms? Is it, as we might expect, more focused on new to the firm rather than new to the market innovation? And, how does this relate to the objectives of these smaller firms?
- Exploring in more detail the profile of innovation activity in frontier and non-frontier firms and identifying the barriers and enablers of innovation in each group of firms.
- How does diversity in the leadership team and innovation team of companies influence their objectives and innovation activity? Prior literature suggests the value of diversity in both contexts. Is this supported by the evidence from the ISNS survey?

We would welcome suggestions for other specific analysis which we might undertake related to the ISNS data.

Plans are currently being developed for the ISNS 2024. The focus of this survey, building on the ISNS 2023, will be to begin the development of a longitudinal data set which allows us to compare firms' innovation activity from year to year. Again, we would be interested to discuss suggestions for additional questions which might be included in the survey to provide few useful future insights.

ANNEX 1: ISNS 2023 SURVEY OVERVIEW

A1.1 Definitions

In the report tables we focus on comparisons between regions, 9 broad sectors (SIC codes: ABDE, C, F, G, H, I, K, JLM, NPQRS) and 4 firm size bands (5-9,10-49, 50-249, 250+ employees). In addition, we adopt a categorisation of frontier and non-frontier firms which is used throughout the report. Typically, in OECD analysis frontier firms – identified from secondary sources such as accounting data - have higher productivity, are faster growing and have higher levels of innovation than non-frontier firms. Here, we use a rather different approach to identify frontier firms which draws on the OECD Oslo Manual which provides guidance on measuring firms' innovation[3]. In the survey firms were asked 'Thinking about how your firm compares to your main UK competitors. How strongly do you agree that: We are often the first to introduce innovative products or services'. Where a respondent strongly agreed with this statement we classify their firm as a 'frontier' company; all other firms are classified as non-frontier. Overall, around a quarter of firms responding to the survey were classified as 'frontier' firms on this basis.

Defining innovation itself is also critical to this type of survey and our innovation definition and survey methodology are designed differently to those in the UK Innovation Survey. These differences result in a level of measured innovation activity which is significantly higher than that typically recorded in the UK Innovation Survey, but is similar to other telephone surveys of innovation. There are two key differences between the definitions used here and that used in the UK Innovation Survey. First, here we ask 'Have you introduced any new products or services or made any changes to the existing products or services which your firm sells over the last 12 months? So the focus is on 'any' changes to products or services, a lower bar than the 'significant' and 'technical' requirements for innovation in the UK Innovation Survey. This difference is consistent with the higher levels of innovative activity noted here. Second, as ISNS is intended to be an annual survey we ask only about the year prior to the survey (so next year we can ask about the interval between surveys). This we would anticipate reduces the innovation rate relative to the three-year reference period of the UK Innovation Survey although this is clearly more than offset by the less demanding innovation definition.

A1.2 Conducting the survey

A1.2.1 Introduction

The Innovation State of the Nation 2023 (ISNS 23) survey was conducted using a combination of Computer Assisted Telephone Interviewing (CATI) and an online B2B panel. While the original plan was to complete all of the 2,000 required interviews via CATI,

[3] OECD. (2005). *Oslo Manual - Guidelines for collecting and interpreting innovation data*, OECD, Paris.

fieldwork progress was much slower than anticipated and so responses were also sought using an online B2B panel running in parallel to the CATI interviewing.

Within each respondent organisation, a member of the senior management team or a senior decision maker involved in developing new products or services was sought to be interviewed.

Businesses with 5 or more employees were in scope for the survey. This definition excluded owners and partners, agency staff and contractors but included other directors and temporary and casual staff. Organisations were additionally screened to ensure they were not a charity, not for profit or public sector organisation.

In total 2,018 interviews were completed: 1,217 via CATI and 801 online. Interviews were conducted between 14 November 2022 and 28 February 2023 (c. 13 weeks of fieldwork). CATI interviews lasted an average of 19 minutes and online completion took an average of 10 minutes. Two sample sources were used, the first was a randomised sample of relevant organisations purchased from Dun & Bradstreet. The CATI survey was conducted by OMB Research Ltd, with on-line completion by members of Dynata's B2B panel of UK business professionals.

For the CATI survey a sample of relevant UK private sector organisations was purchased from Dun & Bradstreet and a stratified sampling approach was adopted. Targets were adopted in a 45-cell grid comprised of 9 grouped sectors (SIC codes: ABDE, C, F, G, H, I, K, JLM, NPQRS) and 5 size bands (5-9,10-19, 20-49, 50-249, 250+). Soft targets were also set on UK region to ensure a broadly representative spread. Organisations with 50+ employees and within certain sectors (e.g. manufacturing, finance, agriculture/energy) were intentionally over-sampled to ensure they were adequately represented and to allow more robust sub-analysis by these groups.

For the online panel interviews, Dynata's business panel was used. Dynata have a large universe of B2B professional audiences. All panellists are fully verified using thorough vetting solutions prior to being accepted on the panel. Targets were again proposed using the 45-cell grid of grouped sectors and size bands balanced with availability of the target profile within the panel reach. Soft targets were also set on UK region to ensure a broadly representative spread.

A1.2.2 Fieldwork

Following a pilot stage to fully test the questionnaire, fieldwork took place between 14 November 2022 and 28 February 2023. In total, 1,217 CATI and 801 online interviews were completed. For the telephone (CATI) interviews, the outcomes of attempted calls are shown in Table A1.1 in the following broad categories:

- Completed interviews.
- Refusals (direct refusals by target respondent; terminated interviews; and where the 'gatekeeper' – a receptionist, PA or colleague – refuses to put the call through).
- 'Unusable' numbers. These indicate both 'screen outs', e.g., organisations falling outside of the scope of the survey, as well as dead phone lines, wrong numbers, etc.

The profile of achieved responses, broken down by size and sector are detailed in Table A1.2.

Table A1.1: Telephone response rate

	Total
Total number of records	20,887
Unusable	1,798
% Unusable	9%
Total usable records	19,089
Completed Interviews	1,217
Response Rate	6%
Refusals	1,876
Refusal Rate	10%

Table A1.2: Achieved responses by employment sizeband

	Micro	Small	Medium	Large	Total
	5-9	10-49	50-249	250+	
Agriculture/Mining/Energy (A B D E)	48	62	23	10	143
Manufacturing (C)	199	303	97	59	658
Construction (F)	38	74	33	14	159
Retail/Distribution (G)	65	88	35	29	217
Transport/Storage (H)	20	72	24	17	133
Hotel/Catering (I)	34	75	31	15	155
Finance (K)	34	47	35	32	148
Property/Business Services	67	120	50	46	283
Other Services (N P Q..	29	59	17	16	121
Total	534	900	345	238	2,017

Survey respondents were also asked whether their organisation was a single site enterprise or headquarters, a subsidiary with UK headquarters or subsidiary with non-UK headquarters. The corporate structure of businesses is often thought to be important for innovation outcomes due to the potential for knowledge sharing between subsidiaries of larger firms and the larger financial resources of groups of businesses[4]. Around 85 per cent of respondent organisations were single-site enterprises or headquarters, with the bulk of

[4] Ebersberger, B., Loof, H. (2004). *Multinational enterprises, spillovers, innovation and productivity,* CESIS Working Paper 24, The Royal Institute of Technology, Sweden.

the remainder being subsidiaries with UK headquarters (Figure A1.1). Frontier firms were more likely to be subsidiaries with UK or international headquarters as were larger firms and those in the hotels/catering sector. Northern Ireland also has a noticeably larger proportion of subsidiary operations as does Wales (Figure A1.1).

Figure A1.1: Organisation of respondent firms (N=2010)

A1.2.3 Weighting

As indicated earlier stratified sampling was used to ensure broadly balanced response numbers by sizeband and sector. Weighting is therefore necessary to provide representative results. We use simple population weights based on the population of private sector businesses in 2022 (Table A1.3). The applied weights are reported in Table A1.4.

Table A1.3: Target population of private sector businesses, start 2022

	Micro	Small	Medium	Large	Total
	5-9	10-49	50-249	250+	
Agriculture/Mining/Energy (A B D E)	9,455	5,650	910	240	16,255
Manufacturing (C)	18,860	21,145	6,080	1,225	47,310
Construction (F)	30,175	17,830	2,060	300	50,365
Retail/Distribution (G)	56,560	37,265	5,110	1,135	100,070
Transport/Storage (H)	10,265	8,280	1,560	380	20,485
Hotel/Catering (I)	36,695	33,210	2,980	610	73,495
Finance (K)	4,740	3,295	985	385	9,405
Property/Business Services	50,370	39,275	6,490	1,365	97,500
Other Services (N P Q..	53,720	51,290	9,765	2,035	116,810
Total	270,840	217,240	35,940	7,675	531,695

Source: Business Population Estimates for the UK and Regions 2022, October 2022, ONS, Table 5, 'Number of businesses in the private sector'.

Table A1.4: Response weights by sector and employment sizeband

	Micro	Small	Medium	Large	Total
	5-9	10-49	50-249	250+	
Agriculture/Mining/Energy (A B D E)	197.0	91.1	39.6	24.0	113.7
Manufacturing (C)	94.8	69.8	62.7	20.8	71.9
Construction (F)	794.1	240.9	62.4	21.4	316.8
Retail/Distribution (G)	870.2	423.5	146.0	39.1	461.2
Transport/Storage (H)	513.3	115.0	65.0	22.4	154.0
Hotel/Catering (I)	641.3	641.3	96.1	40.7	474.2
Finance (K)	139.4	70.1	28.1	12.0	63.5
Property/Business Services	751.8	327.3	129.8	29.7	344.5
Other Services (N P Q..	1193.3	1193.3	574.4	127.2	965.4
Total	507.2	241.4	104.2	32.2	263.6

ANNEX 2: SURVEY QUESTIONNAIRE

INNOVATION STATE OF THE NATION SURVEY 2023

INTRODUCTION

Please can I speak to the business owner, or a senior decision maker that would be involved in developing new products or services in the business (e.g. Managing Director, Product Development Manager).

Good morning/afternoon. My name is xxxx and I'm calling on behalf of Innovate UK from OMB Research Ltd, an independent market research agency.

We've been commissioned by Innovate UK and the University of Warwick to conduct a survey about business innovation activity, focusing on how your company has fared over the last year and how you see the future. The survey is intended to be used for public good and might help to shape Innovate UK future support for business innovation.

IF NEEDED: **By innovation we mean any changes you may have made to the products or services you produce or the way in which you organise your business.**

IF RESPONDENT SAYS THESE TOPICS ARE NOT RELEVANT TO THE BUSINESS PLEASE SAY WE ARE STILL INTERESTED IN SPEAKING TO THEM AS KEEN TO UNDERSTAND THE REASONS PREVENTING THEM FROM UNDERTAKING ANY INNOVATION AND WHAT TYPE OF SUPPORT THEY MAY NEED

The survey will take around 15-20 minutes, depending on your answers. Is it convenient to speak to you now or would you prefer to make an appointment for another time?

REASSURANCES TO USE IF NECESSARY:

- The research is being conducted under the Code of Practice of the Market Research Society, which means that all of the answers you give are strictly confidential and anonymous.
- OMB Research Ltd will not disclose to University of Warwick who has taken part in the research or divulge specific details about your organisation unless you agree to this at the end of the survey. All responses are reported in aggregate and anonymously.
- Participation in this survey is voluntary, although your cooperation will ensure that the views expressed are representative of all employers in your industry.
- Your organisation was selected at random from a list purchased from a commercial sample provider.

- If you would like, we will also email you a summary report of our findings as a thank you for taking part once the research has been completed
- If you would like to speak to someone at OMB about the survey please contact Hannah Gorry (Associate Director, OMB Research) on 01732 220582. Alternatively, if you would like to speak to someone at Innovate UK about the research please contact Jaime Tinker by email at: Jaime.Tinker@iuk.ukri.org.
- Alternatively, if you wish to talk to someone at University of Warwick about the research please call Professor Steve Roper or vicki.belt@wbs.ac.uk
- If you would like to confirm that OMB Research is a bona fide market research agency, you can contact the Market Research Society on 0800 975 9596.

INTERVIEWER NOTE: If respondent requires more information about the research before agreeing to participate, then you can offer the information email.

S. SCREENER

SX The survey is aimed at businesses with 5 or more employees. Can I just check that this applies to your business?

IF NO, THANK AND CLOSE AND CODE CALL OUTCOME ACCORDINGLY, SAYING: **Thank you for your time, but for this survey we are only speaking to businesses with more than 5 employees;**

IF YES: CONTINUE.

S1. The information you give us will be used for research purposes only and we will not disclose to Innovate UK or the University of Warwick who has taken part in the research or divulge specific details about your organisation unless you agree to this at the end of the survey.

You can find out more information about our surveys and what we do with the information we collect in our Privacy Notice, which is on our website (IF NECESSARY: **www.ombresearch.co.uk/privacy).**

All calls are recorded for training and quality purposes.

ASK ALL

Before I continue, can I just confirm that you are happy to participate in the survey on this basis? SINGLE CODE.

SINGLE CODE.

Yes, agreed to participate in survey	1	CONTINUE
Requested more information	2	SEND INFO EMAIL

No, declined to participate	3	CLOSE AND UPDATE CALL OUTCOME WITH REASON FOR DECLINING

ASK ALL

S2a. Can I just confirm that I am speaking to a member of the senior management team or that you are a senior decision maker involved in developing new products or services at [NAME OF BUSINESS]**?**

Yes	1	*Continue*
No	2	*Ask to speak to someone who is one of the most senior people involved in developing new products or services*

READ TO ALL

First, I would like to ask some questions about your business.

ASK ALL

S3. Would you classify your business as...?

READ OUT. SINGLE CODE

A business mainly seeking to make a profit (i.e. a private sector business)	1	
A charity / Not for profit organisation	3	THANK & CLOSE: Thank you but we are only speaking to businesses in the private sector
Part of the public sector	4	THANK & CLOSE: Thank you but we are only speaking to businesses in the private sector

A. ABOUT THE BUSINESS

A1/A1B SECTOR DELETED – SECTOR TO RUN FROM SAMPLE

ASK ALL

A1A How many people are currently on the payroll as employees?

RECORD NUMBER.

AS NECESSARY: **Please…**

- **Include full and part time staff**
- **Include temporaries/casuals**
- **Include UK staff only**
- **Exclude agency staff**
- **Exclude self-employed, contractors**
- **Exclude owners/partners, but count other directors as employees**

Write in number	1	IF <5 CLOSE
DO NOT READ OUT: Don't know/refused	2	

IF DK/REF NUMBER OF EMPLOYEES (A1A=2)

A1B Do you know the approximate number of employees, is it…?

READ OUT. SINGLE CODE.

Under 5	1	CLOSE
5-9	2	
10-19	3	
20-49	4	
50-99	5	
100-249	6	
250-499	7	
500 – 999	8	
1,000+	9	
DO NOT READ OUT: Don't know	97	
DO NOT READ OUT: Refused	98	

ASK ALL

A2. Which of the following best describes this specific site…?

READ OUT. SINGLE CODE.

INTERVIEWER NOTE: IF WORKING FROM HOME THEN SITE REFERS TO THE SITE WHEN THEY ARE IN THE OFFICE

The only site in the organisation	1	
The Headquarters of a multi-site organisation	2	
A Branch/subsidiary with headquarters elsewhere in the UK	3	
Or A Branch/subsidiary with headquarters outside of the UK	4	
DO NOT READ OUT: Don't know	97	
DO NOT READ OUT: Refused	98	

ASK ALL

A3. For how many years has the business been operating?

READ OUT. SINGLE CODE.

AS NECESSARY: **Please just answer about the business in its current form.**

Less than five years	1	
5 to 10 years	2	
11 to 20 years	3	
More than 20 years	4	
DO NOT READ OUT: Don't know	97	
DO NOT READ OUT: Refused	98	

ASK ALL

A4. Do you have any customers outside of the UK?

SINGLE CODE.

Yes	1	
No	2	
DO NOT READ OUT: Don't know	97	
DO NOT READ OUT: Refused	98	

ASK IF HAVE EXPORT SALES (A4=1)

A4A. Approximately what proportion of your sales were to customers outside of the UK over the last year? READ OUT AS NECESSARY

Less than 20 per cent	1	
21-40 per cent	2	
41-60 per cent	3	
61-80 per cent	4	
More than 80 per cent	5	
DO NOT READ OUT: Don't know	97	
DO NOT READ OUT: Refused	98	

ASK ALL

A5. Including owners or partners, how many people manage this business on a day- -to-day basis?

ENTER NUMBER

ENTER NUMBER (RANGE=0-99)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

A6. How many, if any, of the people that manage this business are women?

ENTER NUMBER

ENTER NUMBER (RANGE=0-NUMBER AT A5)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

A7. How many, if any, of the people who manage the business are from ethnic minority groups?

ENTER NUMBER

ENTER NUMBER (RANGE=0-NUMBER AT A5)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

B. STRATEGIC OBJECTIVES OF THE BUSINESS

READ TO ALL

Now, I would now like to ask some questions about the priorities of your business and its performance.

ASK ALL

B1. Thinking about the objectives of your business over the last 12 months. How important have each of the following been?

READ OUT. CATI TO RANDOMISE ORDER. SINGLE CODE PER ROW.

READ OUT SCALE IN FULL FOR FIRST STATEMENT THEN REMIND AS NECESSARY.

PROMPT AS NECESSARY: **How important has this been for your business over the last 12 months?**

		Not at all important	Not very important	Neither important nor unimportant	Fairly important	Very important	DO NOT READ OUT: Don't know
B	Increasing efficiency	1	2	3	4	5	97
C	Increasing sales	1	2	3	4	5	97
D	Increasing profit margins	1	2	3	4	5	97
E	Sustaining cash flow	1	2	3	4	5	97
F	Reducing environmental impact	1	2	3	4	5	97
G	Generating social or community benefits	1	2	3	4	5	97

ASK ALL

B2. Now, thinking about how you aim to achieve your business objectives. How important have each of the following been over the last 12 months?

RANDOMISE BUT KEEP 7&8 TOGETHER

READ OUT. SINGLE CODE PER ROW.

READ OUT SCALE IN FULL FOR FIRST STATEMENT THEN REMIND AS NECESSARY

		Not at all important	Not very important	Neither important nor unimportant	Fairly important	Very important	DO NOT READ OUT: Don't know
1	Adopting new digital technologies	1	2	3	4	5	97
3	Introducing or upgrading products or services	1	2	3	4	5	97
5	Developing your production or service delivery processes	1	2	3	4	5	97
7	Selling to new customers	1	2	3	4	5	97
8	Selling more to existing customers	1	2	3	4	5	97

ASK ALL

B3. Thinking about how your firm compares to your main UK competitors. To what extent would you agree or disagree that…?

READ OUT. SINGLE CODE PER ROW. CATI TO RANDOMISE

READ OUT SCALE IN FULL FOR FIRST STATEMENT THEN REMIND AS NECESSARY

	Disagree strongly	Disagree slightly	Neither agree nor disagree	Agree slightly	Agree strongly	DO NOT READ OUT: Don't know
We are often the first to introduce innovative products or services	1	2	3	4	5	97
We lead the sector in terms of service or product quality	1	2	3	4	5	97
The design of our products or services is key to our success	1	2	3	4	5	97

ASK ALL

B4. Not counting owners and partners, how many people did your business employ a year ago?

READ OUT AS NECESSARY: **Please include full and part time staff, and temporary/casual staff, but not agency staff.**

ENTER NUMBER.

ENTER NUMBER	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF DON'T KNOW/REFUSED EMPLOYEES A YEAR AGO (B4=97-98)

B4a. Would you say the number of people employed by your business over the last year has …?

READ OUT. SINGLE CODE.

Increased	1
Decreased	2
Or, stayed exactly the same	3
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF NUMBER OF PEOPLE EMPLOYED HAS INCREASED/DECREASED (B4A=1-2)

B4b. By approximately what percentage did the number of people employed by your business [IF B4a = 1:increase][IF B4a = 2:decrease], compared with the previous 12 months?

PROBE FOR AN ESTIMATE AND ENTER PERCENTAGE.

ENTER PERCENTAGE (IF DECREASED, RANGE = 1-100%; IF INCREASED, RANGE = 1-999%)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

B5. Can you please tell me the approximate turnover of your business in the past 12 months?

ENTER NUMBER.

WRITE IN AMOUNT IN £	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98
ADD CHECK QUESTION AS PER BANDS AT B5A	

ASK IF DK OR REFUSED TURNOVER IN PAST 12 MONTHS (B5=97-98)

B5a. Which of these ranges does your turnover fall into?

SINGLE CODE – READ OUT AS NECESSARY

Less than £50,000	1
£50,000 - £99,999	2
£100,000 - £249,999	3
£250,000 - £499,999	4
£500,000 - £749,999	5
£750,000 - £999,999	6
£1m – £1.99m	7
£2m-£4.99m	8
£5m - £9.99m	9
£10m - £14.99m	10
£15m - £24.99m	11
£25m or more	12
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

B6. Compared with the previous 12 months, has your turnover increased, decreased or stayed roughly the same?

SINGLE CODE

Increased	1
Decreased	2
Or, stayed roughly the same	3
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF TURNOVER HAS INCREASED/DECREASED (B6=1-2)

B6a. By approximately what percentage did your turnover [IF B6 = 1:increase][IF B6 = 2:decrease], compared with the previous 12 months?

ENTER PERCENTAGE

ENTER PERCENTAGE (IF DECREASED, RANGE = 1-100%; IF INCREASED, RANGE = 1-999%)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

C. PRODUCT AND SERVICE CHANGE

READ OUT TO ALL

Now moving on to think about the changes you have made to your products or services or how you run or organise your business

ASK AT RANDOM TO 1:10 RESPONDENTS

C1. What is it that you think of as 'innovation'? What does it mean within your firm?

RECORD VERBATIM COMMENT

ASK ALL

C2. Have you introduced any new products or services or made any changes to the existing products or services which your firm sells over the last 12 months?

Yes – introduced new or made changes to existing	1
No	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF NOT MADE CHANGES OVER LAST 12 MONTHS (C2=2)

C2A. Thinking about why you have made no changes to your products and services. To what extent would you agree or disagree with the following reasons?

READ OUT. SINGLE CODE PER ROW. CATI TO ROTATE

READ OUT SCALE IN FULL FOR FIRST STATEMENT THEN REMIND AS NECESSARY

AS NECESSARY: **To what extent do you agree that this is a reason for you not making changes to your products/services?**

		Disagree strongly	Disagree slightly	Neither agree nor disagree	Agree slightly	Agree strongly	Don't know
1	Making sufficient profit already	1	2	3	4	5	97
2	Uncertain demand	1	2	3	4	5	97
3	Lack of finance	1	2	3	4	5	97
4	Lack of skills	1	2	3	4	5	97
5	A lack of government support	1	2	3	4	5	97
6	Regulation or legislation	1	2	3	4	5	97

ASK IF MADE CHANGES OVER LAST 12 MONTHS (C2=1)

C3. Thinking about the products or services that your firm has sold over the last year, do these include…?

SINGLE CODE. READ OUT.

New or improved products	1
New or improved services	2
Both – new or improved products AND services	3
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF NEW OR IMPROVED PRODUCTS (C3=1 OR 3)

C3b Thinking about the new products you have introduced, were any of them new to the market, by which I mean they were introduced before your competitors?

SINGLE CODE. READ OUT

Yes – at least some are new to the market	1
No – all just new to the firm	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF NEW OR IMPROVED SERVICES (C3=2 OR 3)

C3c Thinking about the new services you have introduced, were any of them new to the market, by which I mean they were introduced before your competitors?

SINGLE CODE. READ OUT

Yes – at least some are new to the market	1
No – all just new to the firm	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF MADE CHANGES OVER LAST 12 MONTHS (C2=1)

C6. Have you experienced any significant barriers which have restricted your product or service development activity during the last year?

Yes	1
No	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

IF YES AT C2 AND YES AT C6

C6A Did these barriers relate to…?:

CATI TO ROTATE 1-8. READ OUT. MULTICODE ALLOWED

A	Uncertain demand	1
B	Technology risks	2
C	Lack of finance	3
D	Lack of skills or qualified personnel	4
E	Lack of government support	5
F	Regulation or legislation	6
G	Cost of doing business crisis	7
H	(ONLY IF A2=2,3,OR 4) Group investment decisions or policy	8
I	The COVID-19 pandemic	9

	DO NOT READ OUT: None of these	96
	DO NOT READ OUT: Don't know	97

D. PROCESS AND BUSINESS MODEL CHANGES

READ OUT TO ALL

Moving on now to think about business structures and the processes you use within your business.

ASK ALL

D1. Have you made any changes to the processes which you use to produce goods or deliver services over the last 12 months?

Yes	1
No	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK. IF MADE CHANGES TO PROCESSES (D1=1)

D1a. Did these process changes lead to any cost savings?

SINGLE CODE. PROMPT AS PER PRECODES.

Yes – there were cost savings	1
No - costs actually increased	2
No - costs stayed the same	3
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF COST SAVINGS (D1A=1)

D1B. Approximately how much did costs fall due to these changes to the processes which you use over the last 12 months?

READ OUT AS NECESSARY – SINGLE CODE.

Less than 10 per cent	1
10-19 per cent	2
20-29 per cent	3
30-39 per cent	4

40-49 per cent	5
50-75 per cent	6
More than 75 per cent	7
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

D2. Now thinking more broadly about the way in which your business is organised. Over the last 12 months did you make major changes to:

READ OUT. MULTICODE ALLOWED. CATI TO ROTATE 1-4.

Business practices	1
Methods of organising work and decision making	2
Methods of organising external relationships	3
Marketing concepts or strategies	4
DO NOT READ OUT: None of these	96
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF MADE CHANGES TO PRODUCTS, SERVICES, PROCESSES, PRACTICES, METHODS OR CONCEPTS (C2=1 OR D1=1 OR D2=1-4)

D2A. Thinking about all of the <IF C2=1 **product, service,**> <IF D1=1 **process>** <(IF C2=1 OR D1=1) AND D2=1-4 **and**> <IF D2=1-4 **organisational**> **changes you have made over the last 12 months. How important have they been in helping you to…?**

READ OUT – SINGLE CODE – CATI TO RANDOMISE

READ OUT SCALE IN FULL FOR FIRST STATEMENT THEN REMIND AS NECESSARY

AS NECESSARY: **How important have the changes you have made been in helping you to do this?**

	Not at all important	Not very important	Neither important nor unimportant	Fairly important	Very important	Don't know
Increase efficiency	1	2	3	4	5	97
Increase sales	1	2	3	4	5	97
Increase profit margins	1	2	3	4	5	97

Sustain cash flow	1	2	3	4	5	97
Reduce environmental impact	1	2	3	4	5	97
Generate social or community benefits	1	2	3	4	5	97

ASK ALL

D3. Over the last year has your company undertaken any Research and Development (R&D), either in-house or contracted out?

SINGLE CODE – PROBE AS PER PRECODES

In-house R&D	1
Contracted out R&D	2
Both	3
No – not conducted any R&D in last 12 months	4
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

D4. Over the last year has your company purchased any machinery, equipment or software as part of changes to products, services or processes within your organisation?

SINGLE CODE.

Yes	1
No	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL

D5. To help with product or service development, or organisational changes, did your business invest in any of the following over the last year?

READ OUT. MULTICODE ALLOWED. CATI TO ROTATE

Licensing of patents or know-how from other organisations	1
Training specifically linked to product/service changes	2
Product or service design	3

Market introduction of innovations (e.g. market research, launch advertising)	4
Developing new marketing relationships or channels	5
DO NOT READ OUT: None of these	96
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

E. ECO-SYTEM INTERACTION AND PARTNERING

READ OUT TO ALL

E1 To help with product/service development, or organisational changes, did your business collaborate with any external partners over the last 12 months?

SINGLE CODE.

Yes	1
No	2
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF COLLABORATED WITH EXTERNAL PARTNERS (E1=1)

E1B Which types of partners did you collaborate with over the last 12 months?

DO NOT READ OUT - PROBE AS PER PRECODES. MULTICODE 1-11.

INTERVIEWER NOTE: R&D STANDS FOR 'RESEARCH AND DEVELOPMENT'

Suppliers of equipment, materials, services or software	1
Clients or customers	2
Other businesses	3
Accelerators, incubators or science parks	5
Technology hubs or innovation centres (e.g. Catapults)	6
Consultants, commercial labs or private R&D institutes	8
Universities or other higher education institutions	9
Government or public research institutes	10
Business support providers (e.g. Growth Hubs, IUK Edge)	11
DO NOT READ OUT: None of these	96
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK FOR EACH IDENTIFIED CODES 1-11 AT E1B

E1C And were these collaborators based locally or were they more widely spread?

ADD AS NECESSARY: **By locally I mean within 15 miles of your business**

CATI TO ONLY SHOW CODES 1-11 SELECTED AT E1B – READ OUT

	Locally	Wider	DO NOT READ OUT: Both	DO NOT READ OUT Don't know
Suppliers of equipment, materials, services or software	1	2	3	97
Clients or customers	1	2	3	97
Other businesses	1	2	3	97
Accelerators, incubators or science parks	1	2	3	97
Technology hubs or innovation centres (e.g. Catapults)	1	2	3	97
Consultants, commercial labs or private R&D institutes	1	2	3	97
Universities or other higher education institutions	1	2	3	97
Government or public research institutes	1	2	3	97
Business support providers (e.g. Growth Hubs, IUK Edge)	1	2	3	97

G. R&D AND INNOVATION: PEOPLE

CATI TO RANDOMLY ASSIGN TO GROUP 1 OR 2 – GROUP 1 TO BE ASKED SECTION G AND GROUP 2 SECTION H

READ OUT TO ALL (GROUP 1)

Now I would like to ask you about the people in your business who are involved in delivering and implementing changes to products or services in your organisation.

ASK ALL(GROUP 1)

G1: How many people are involved in <u>delivering or implementing changes</u> to products or services in your organisation?

ENTER NUMBER

ENTER NUMBER (RANGE=0-999)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF AT LEAST 1 PERSON INVOLVED IN DELIVERING/IMPLEMENTING CHANGES (G1>=1)

G1a. How many, if any, of this team are women?

ENTER NUMBER

ENTER NUMBER (RANGE=0-NUMBER AT G1)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF AT LEAST 1 PERSON INVOLVED IN DELIVERING/IMPLEMENTING CHANGES (G1>=1)

G1b. How many, if any, of this team are from ethnic minority groups?

ENTER NUMBER

ENTER NUMBER (RANGE=0-NUMBER AT G1)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK ALL (GROUP 1)

G2. Over the last year have your research and development or product/service development activities been restricted by <u>difficulties recruiting staff</u>?

SINGLE CODE.

Yes	1	
No	2	
DO NOT READ OUT: Don't know	97	
DO NOT READ OUT: Refused	98	

ASK IF R&D ACTIVITIES RESTRICTED (G2=1)

G2a. Which of the following skill groups did you have difficulties recruiting?

READ OUT. MULTICODE CODES 1-11. KEEP ORDER

Scientific staff	1
Post-doctoral research staff	2
Graduate level technical or scientific staff	3
Technicians	4
Software developers	5
Product Designers	6
Engineering staff	7
Other (SPECIFY)	11
DO NOT READ OUT: None of these	96
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

H. FINANCING INNOVATION

CATI TO RANDOMLY ASSIGN TO GROUP 1 OR 2 – GROUP 1 TO BE ASKED SECTION G AND GROUP 2 SECTION H

ASK ALL (GROUP 2)

H1. **Have you tried to obtain any external finance for your firm in the past 12 months?**

Yes	1
No	3
DO NOT READ OUT Don't know	97
DO NOT READ OUT Refused	98

ASK IF TRIED TO GET EXTERNAL FUNDING IN LAST 12 MONTHS (H1=1)

H1A. **Which of the following types of finance has your firm sought in the last 12 months? Please include applications for all types of finance including where you failed to obtain it.**

READ OUT. MULTICODE OK

Equity Finance, e.g. where a share of the business is sold to investors or other people	4
Loan from a bank-or other financial institution	8
Loan from a Peer to peer platform	11
Innovate UK grants or loans	14
Other government or local authority grants	15
Or any other type of finance (SPECIFY)	16
DO NOT READ OUT Don't know	97
DO NOT READ OUT Refused	98

ASK IF CONDUCT R&D OR NPD (C2=1 OR D3=1-3) AND (GROUP 2)

H2. And over the last year how did you fund any R&D and product/service development activity?

READ OUT CODES 1-6, MULTICODE POSSIBLE

Internal funding	1
Grants from Innovate UK or elsewhere	2
Government loans	3
Loans from banks or other finance providers	4
Equity finance (AS NECESSARY: where a share of the business is sold to investors or other people)	5

R&D tax relief	8
Or some other form of finance (SPECIFY)	6
DO NOT READ OUT: Did not undertake any R&D or product/service development	7
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

ASK IF ACCESSED FINANCE (H2=1-6)

H2b. And was your R&D or product/service development activity restricted by a lack of or limited funding from any sources?

SINGLE CODE.

Yes – R&D restricted by funding	1
No	2
Don't know	97
Refused	98

ASK IF R&D OR PRODUCT/SERVICE DEVELOPMENT ACTIVITY RESTRICTED (H2B=1)

H2a. Which sources of funding restricted your R&D activity?

READ OUT, MULTICODE POSSIBLE.

Internal funding	1
Grants or loans from Innovate UK or elsewhere	2
Government loans	3
Loans from banks or other finance providers	4
Equity finance	5
R&D tax relief	7
Or any other form of finance (SPECIFY)	6
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

K. SUPPORTING INNOVATION

READ OUT TO ALL

Now I would like to move on to discuss the sources of advice and information you use when running your business

ASK ALL

K1. **In the last 12 months have you sought external advice or information on matters affecting your business? We are only interested when this has been more than a casual conversation.**
SINGLE CODE.

Yes	1
No	2
DO NOT READ OUT: Don't know	97

ASK ALL RECEIVING ADVICE/INFORMATION (K1=1)

K1A. **Was the assistance or support that you used...?**
CATI TO ROTATE - READ OUT 1-9 – MULTICODE POSSIBLE

Information relating to the day to day running of your business	1
Strategic advice to help grow your business	4
Advice/support around digital technologies	5
Support with net zero or reducing environmental impacts	6
Help with introducing new or upgraded goods or services	8
Other (SPECIFY)	10
DO NOT READ OUT: None of these	96
DO NOT READ OUT: Don't know	97

ASK ALL WHO HAVE RECEIVED INFORMATION/ADVICE (K1=1)

K1B. **And who has provided this advice or information to you over the last 12 months?**

INTERVIEWER RECORD FULLY ALL SUPPORT PROVIDERS USED

CODEFRAME FOR K1B

Accountant	1
Bank	2
Business networks/trade associations	3
(WALES ONLY) Business Wales	4
Catapult network	5
Consultant/general business adviser	6
Chamber of Commerce	7
(Specialist) financial adviser	8
Friend or family member	9
.GOV website	10
Innovate UK Edge	11
Internet search/google/other websites	12
(NORTHERN IRELAND ONLY) Inter-Trade Ireland	13
(NORTHERN IRELAND ONLY) Invest NI	14
Knowledge Transfer Network	15
Local Council/Authority	16
Local Enterprise Partnerships	17
(NORTHERN IRELAND ONLY) NI Business Info website	18
Solicitor/lawyer	19
Tax agent	20
The Pensions Regulator	21
Universities/other education sector	22
Work colleagues	23
Find business support website	24
Other (SPECIFY)	95
None/have not sought information or advice/will not seek it	96
Don't know	97

ASK ALL

K2 Thinking about the next year, are you likely to seek external support with developing your business or your products/services?

SINGLE CODE. PROBE AS PER PRECODES

Yes, business development	1
Yes, product/service development	2
Yes, probably both business and product/service development	3
No – not likely to seek external support	4
DO NOT READ OUT Don't know	97

J. PROSPECTS FOR THE NEXT YEAR

READ OUT TO ALL

Finally I would like to ask you some questions about your future plans for your business and the future business environment

ASK ALL

J4. Is your business planning to engage in R&D or new product/service development over the next 12 months?

SINGLE CODE.

Yes	1
No	2
Don't know	97
Refused	98

IF PLANNING TO ENGAGE IN R&D OR NPD OVER NEXT 12 MONTHS (J4=1)

J1. Thinking about R&D and developing new products/services over the next 12 months. Are you likely to…?

READ OUT. SINGLE CODE.

Keep investment at current levels	1
Increase investment	2
Or decrease investment	3
DO NOT READ OUT: Don't know	97

DO NOT READ OUT: Refused	98

ASK IF J1= 2 OR 3

J1a. By approximately what percentage are you planning to <J1=2 **INCREASE**> <J1=3 **DECREASE**> **investment in R&D or product/service development over the next 12 months?**

PROBE FOR AN ESTIMATE AND ENTER PERCENTAGE

ENTER PERCENTAGE (IF DECREASED, RANGE = 1-100%; IF INCREASED, RANGE = 1-999%)	
DO NOT READ OUT: Don't know	97
DO NOT READ OUT: Refused	98

IF PLANNING TO ENGAGE IN R&D OR NPD OVER NEXT 12 MONTHS (J4=1)

J3 Thinking about your R&D and innovation activity over the next 12 months, can you tell me how useful each of the following would be in helping with your R&D and innovation activity?

CATI TO ROTATE. READ OUT – SINGLE CODE PER ROW.

READ OUT SCALE IN FULL FOR FIRST STATEMENT THEN REMIND AS NECESSARY

		Not useful	Somewhat useful	Very useful	Don't know	N/A
A	Innovation Loans	1	2	3	97	95
B	R&D or innovation grants	1	2	3	97	95
C	R&D tax credits	1	2	3	97	95
E	Intellectual property support	1	2	3	97	95
F	Marketing or export support	1	2	3	97	95
G	Strategy advice or support	1	2	3	97	95
H	Help finding innovation partners	1	2	3	97	95

N. CLOSING QUESTIONS

READ OUT TO ALL

That's the end of the interview, thank you very much for your time. I just need to run through a few questions to ask your permission for how we use your data.

ASK ALL

N1A If you would like, we can email you a summary report of our findings as a thank you for taking part once the research has been completed. Would you like us to email you the report?

SINGLE CODE.

Yes	1	
No	2	

ASK IF N1A =1

N1B And can I take a note of your email address please?

SINGLE CODE.

Yes – WRITE IN EMAIL	1	
No	2	

ASK ALL

N2 The research team at Innovate UK and Warwick University may be conducting some more detailed research on the issues we have covered.

Would you be willing for us to pass on your contact details and relevant survey responses to them so that they could invite you to take part?

You may not be contacted and, if you are, there is no obligation to take part. Your contact details will be stored for a maximum duration of 3 years, before being securely destroyed.

SINGLE CODE

Yes	1	
No	2	

ASK ALL AGREEING TO FURTHER CONTACT (N2=1)

N3 And can I just confirm the best number to contact you on is [SHOW TELEPHONE NUMBER**]?**

SINGLE CODE.

Yes	1	
No - write in number	2	

ASK ALL AGREEING TO FURTHER CONTACT (N2=1) AND N1A=2

N3B And can I take a note of your email address please?

SINGLE CODE.

Yes – WRITE IN EMAIL	1	
No	2	

ASK ALL AGREEING TO FURTHER CONTACT (N2=1)

N3C And can I just confirm your name?

SINGLE CODE.

Yes - Write in name	1	
No – refused	2	

ASK ALL

N4 It is sometimes possible to link the data we have collected with other government surveys or datasets to enable further statistical analysis. Would you be happy for this to be done?

SINGLE CODE.

ADD IF NECESSARY: **Your confidentiality will be maintained, and linked data will be anonymised and only used for statistical purposes.**

Yes	1	
No	2	

READ OUT TO ALL

Finally, I would just like to confirm that this survey has been carried out by OMB Research Ltd and within the rules of the MRS Code of Conduct.

ANNEX 3: DATA TABLES

Data for ISNS 2023 Report

	Figure 2.1	Figure 2.2	Figure 2.6	Figure 2.7			Figure 2.8	
				Innovation (% firms)			New-to-Firm/market innovation (% firms)	
	Exporting (% firms)	% annual growth in sales (nominal)	Product or service change (past year) (% firms)	Product only	Service only	Both product and service	Wholly New-to-Firm	Some New-to-Market
UK average	42.2	6.9	61.4	17.2	13.7	30.4	32.5	28.3
North East	41.9	5.6	47.0	12.0	14.6	20.4	22.7	24.3
North West	46.1	3.2	64.1	12.9	20.3	30.9	34.5	29.6
Yorks & Humber	32.4	5.5	50.4	17.1	9.2	24.2	14.8	35.6
East Midlands	36.2	3.6	67.2	19.3	13.5	34.4	30.3	36.9
West Midlands	43.7	4.9	59.3	15.9	16.3	27.1	29.2	30.1
East of England	34.8	8.6	57.1	12.9	9.6	34.0	34.6	22.6
London	49.8	7.6	65.5	20.1	18.5	26.9	31.3	34.2
South East	40.6	7.4	59.0	17.2	12.6	29.2	30.2	28.8
South West	42.6	10.8	58.2	20.0	7.7	30.5	39.2	19.1
Scotland	43.7	6.2	63.2	18.4	12.8	32.0	34.3	28.9
Wales	27.2	8.0	70.0	19.4	14.5	34.2	46.7	23.3
Northern Ireland	68.6	6.0	69.4	16.2	6.3	46.9	48.9	20.5
Large	69.8	10.8	74.7	21.8	20.9	32.0	14.6	60.1
Medium	69.4	6.4	69.4	23.3	19.6	26.5	23.1	46.3
Small	43.1	7.3	63.0	15.8	13.4	33.7	35.8	27.2
Micro	35.9	6.4	56.8	17.3	12.4	26.8	31.0	25.8
Frontier	54.6	11.0	74.0	20.9	13.9	39.2	22.8	51.3
Non-Frontier	38.3	5.6	57.4	16.0	13.6	27.6	35.9	21.5
Primary	21.7	5.4	36.6	10.5	11.3	13.6	23.7	12.9
Manufacturing	60.7	7.7	59.8	26.8	5.6	27.4	25.3	34.5
Construction	16.8	6.1	37.1	11.7	6.4	19.1	17.1	20.0
Retail/Distribution	41.4	1.9	70.4	30.6	5.2	34.3	34.9	35.5
Transport/Storage	45.7	4.6	48.5	3.5	27.0	17.9	35.1	13.4
Hotel/Catering	41.8	12.7	76.1	15.9	9.4	50.8	42.4	33.6
Finance	55.8	4.9	55.4	10.6	27.3	17.5	27.3	28.1
Business Services	52.5	12.9	57.8	10.4	20.3	26.8	32.4	25.5
Other Services	38.7	3.2	62.1	13.7	20.7	27.7	35.0	27.1

Data for ISNS 2023 Report (Continued)

	Figure 2.9	Figure 2.11	Figure 2.13	Figure 2.14	Figure 2.15	Figure 2.17	Figure 2.18
	Process innovation (past year) % firms	Innovation diversity (Average)	Invested in R&D (Past year) % firms	Restricted external funding for R&D/innovation (% firms)	Experience innovation barriers (% firms)	% of innovation team that are female (Averaged)	% of innovation team that are ethnic minority (Averaged)
UK average	45.8	2.30	39.1	28.3	51.5	37.1	15.4
North East	37.9	1.89	41.3	31.4	53.6	51.0	8.8
North West	47.3	2.40	45.3	22.5	49.4	39.9	18.1
Yorks & Humber	40.7	2.05	33.1	19.9	45.6	43.5	11.3
East Midlands	55.6	2.62	35.6	23.9	49.9	24.4	4.9
West Midlands	47.0	2.47	41.2	30.9	57.0	40.5	20.5
East of England	38.8	2.22	29.8	18.7	47.3	44.8	12.9
London	47.9	2.35	46.1	37.9	54.1	34.0	41.8
South East	48.5	2.18	36.5	37.5	51.6	32.4	8.4
South West	45.8	2.38	42.9	29.1	56.2	32.9	8.5
Scotland	43.1	2.20	26.6	35.9	53.5	42.9	2.4
Wales	43.2	2.52	37.3	19.3	46.8	38.3	3.9
Northern Ireland	32.1	2.01	39.7	3.9	51.3	45.9	17.2
Large	59.3	2.96	80.0	45.0	57.9	38.1	27.9
Medium	56.4	2.72	63.3	39.9	53.7	41.2	18.8
Small	46.6	2.29	38.7	24.1	49.4	40.4	15.3
Micro	42.1	2.21	33.6	30.2	53.9	33.4	14.8
Frontier	56.0	2.80	53.8	28.6	53.5	40.3	18.0
Non-Frontier	42.7	2.17	34.4	28.2	50.7	36.1	14.2
Primary	41.7	1.76	40.6	36.4	48.6	30.7	2.3
Manufacturing	45.2	2.20	53.1	17.3	52.9	28.9	6.4
Construction	32.4	1.68	36.8	33.0	52.7	22.5	10.8
Retail/Distribution	45.9	2.40	33.2	28.2	56.0	36.1	16.2
Transport/Storage	33.4	1.97	17.4	16.3	51.8	23.0	7.5
Hotel/Catering	52.2	2.77	29.1	31.5	47.0	47.9	22.9
Finance	53.0	2.44	43.5	9.4	43.0	40.2	18.2
Business Services	48.2	2.37	48.4	34.8	48.6	36.7	17.1
Other Services	46.4	2.28	39.1	26.3	53.8	46.1	17.5

Data for ISNS 2023 Report (Continued)

	Figure 2.19 Experience difficulty recruiting for innovation (% firms)	Figure 2.21 External partnership for innovation (% firms)	Figure 2.23 Seeking external advice for business purpose (% firms)	Figure 3.1 Intends to invest in R&D in next 12 months (% firms)
UK average	39.3	40.9	34.8	53.0
North East	43.2	45.5	31.6	59.5
North West	37.8	47.5	38.2	54.4
Yorks & Humber	35.3	38.7	32.9	54.0
East Midlands	40.2	36.8	36.1	49.6
West Midlands	44.3	49.5	39.6	49.9
East of England	56.6	40.2	31.0	43.0
London	43.2	45.3	40.9	65.1
South East	34.1	35.7	29.9	51.1
South West	22.9	35.5	32.7	49.3
Scotland	41.1	40.4	35.9	44.8
Wales	46.7	30.7	22.8	54.8
Northern Ireland	43.5	35.8	36.7	49.3
Large	48.9	62.9	48.2	81.6
Medium	45.0	53.2	48.2	73.2
Small	40.9	40.7	36.0	55.8
Micro	36.7	37.7	30.2	44.7
Frontier	38.3	49.0	43.9	71.8
Non-Frontier	39.7	38.5	32.0	46.9
Primary	50.5	40.5	50.9	47.0
Manufacturing	31.6	43.1	31.2	60.4
Construction	27.0	24.8	20.9	35.1
Retail/Distribution	35.9	33.1	33.5	52.9
Transport/Storage	22.5	31.8	20.8	27.4
Hotel/Catering	47.6	36.1	37.4	55.0
Finance	31.9	54.1	44.6	48.6
Business Services	40.4	48.3	34.5	58.3
Other Services	49.0	49.1	39.7	54.4

Data for ISNS 2023 Report (Continued)

	Figure 3.2			Figure 3.4			
	Future R&D investment (% firms)			Likelihood of seeking external support/advice over the next year for: (% firms)			
	Keep current level of R&D investment	Increase R&D investment	Decrease R&D investment	Business development	Product & service development	Both business and product development	Not likely to Seek external support
UK average	42.2	52.1	5.8	13.0	10.7	21.2	55.1
North East	24.9	73.5	1.5	7.7	3.5	28.1	60.7
North West	42.1	55.1	2.8	19.0	6.9	23.6	50.5
Yorks & Humber	41.5	54.3	4.2	13.6	7.6	17.1	61.6
East Midlands	50.5	47.6	2.0	9.5	12.8	15.0	62.7
West Midlands	40.3	46.3	13.5	15.9	16.3	21.0	46.9
East of England	30.6	67.2	2.2	12.4	11.1	18.7	57.8
London	43.8	53.6	2.6	13.9	18.4	24.1	43.7
South East	46.4	43.1	10.5	12.9	7.1	17.3	62.7
South West	43.7	49.7	6.7	7.9	8.1	17.6	66.4
Scotland	58.7	40.8	0.5	12.5	7.0	25.9	54.6
Wales	31.4	54.3	14.3	11.9	15.4	29.8	42.9
Northern Ireland	36.6	54.6	8.8	9.8	8.0	34.4	47.8
Large	38.1	60.5	1.5	20.3	28.7	27.5	23.5
Medium	32.6	61.8	5.6	21.0	20.0	24.2	34.9
Small	42.5	52.7	4.8	12.0	10.9	22.7	54.4
Micro	44.4	48.2	7.4	12.3	8.2	18.5	61.0
Frontier	41.2	51.6	7.2	15.9	14.2	22.3	47.6
Non-Frontier	42.7	52.3	5.1	12.1	9.6	20.8	57.6
Primary	36.0	49.9	14.1	9.2	7.8	31.8	51.3
Manufacturing	53.5	42.8	3.7	10.4	8.4	21.1	60.1
Construction	25.9	68.3	5.8	9.7	5.5	16.8	68.0
Retail/Distribution	44.4	48.1	7.5	14.3	9.4	15.1	61.2
Transport/Storage	45.3	44.8	9.9	4.9	8.2	15.2	71.7
Hotel/Catering	41.8	54.5	3.7	11.6	11.4	25.1	51.8
Finance	28.6	63.3	8.1	17.8	23.9	24.0	34.3
Business Services	47.3	49.8	2.9	14.9	11.5	24.1	49.5
Other Services	37.0	55.5	7.6	14.4	13.1	21.9	50.6

Data for ISNS 2023 Report (Continued)

Figure 2.3: Turnover and employment growth of innovating and non-innovating firms (% firms)

	Non-innovators	Innovators
% Employment growth over the last year (UK average)	11.5	15.0
% Sales growth over the last year (UK average)	2.6	9.7

Figure 2.4: Business objectives over year prior to the survey (% firms)

Increasing efficiency	91.2
Increasing sales	92.9
Increasing profit margins	90.3
Sustaining cash flow	93.7
Reducing environmental impact	72.2
Social or community benefits	52.8

Figure 2.5: Important means of achieving business objectives over the year prior to the survey (% firms)

Adopting new digital technologies	65.9
Introducing or upgrading prods/services	77.6
Developing delivery processes	78.5
Selling to new customers	92.2
Selling more to existing customers	87.9

Figure 2.10: Cost reductions due to process innovation (% firms achieving cost reductions)

Less than 10 per cent	48.3
10-19 per cent	30.2
20-29 per cent	10.2
30-39 per cent	2.0
40-49 per cent	0.9
50-75 per cent	0.8
Above 75 per cent	0.1
Don’t know	7.5

Figure 2.12: Reasons for not innovating (% of non-innovating firms)

Lack of skills	23.5
Lack of finance	29.4
Regulation or legislation	30.6
Lack of government support	31.8
Uncertain demand	42.3
Making sufficient profit	44.3

Figure 2.16: Barriers to innovation: all UK innovators (% of innovators)

Group investment decision	6.8
Technology risk	13.1
Lack of finance	30.4
Lack of gov't support	30.9
Lack of skills or qualified personnel	35.4
Uncertain demand	38.2
Regulations or legislation	39.5
Cost of doing business crisis	51.0
Covid -19 pandemic	53.8

Figure 2.20: Occupational breakdown of recruitment difficulties (% firms)

Scientific staff	6.4
Post-doc researcher	5.8
Graduate-level technician	18.6
Technician	31.2
Software developer	15.5
Product designer	12.6
Engineering staff	20.9

Figure 2.22: Local and non-local collaboration (% firms)

	Local	Non-local	Both
Suppliers	33.0	54.1	12.9
Clients	33.8	44.0	22.3
Other businesses	42.0	46.7	11.3
Accelerators, incubators	15.9	58.2	25.9
Technology hubs	43.2	44.7	12.1
Consultants, commercial labs	45.1	42.3	12.7
Universities	49.5	29.1	21.4
Public research institutes	43.9	46.8	9.4
Business support providers	30.7	40.7	28.6

Figure 2.24: Seeking advice of different types (% firms)

	Non-Frontier	Frontier	All firms: UK average
Product/service changes	39.7	49.8	42.8
Net zero	21.0	33.6	24.8
Digital technology	37.2	49.9	41.1
Grow the business	48.0	54.3	49.9
Running the business	55.4	54.0	55.0

Figure 3.3: Planned increase in R&D by type of firm (mean % change)

UK average	9.0
Large	8.9
Medium	9.0
Small	9.2
Micro	8.8
Frontier	8.9
Non-Frontier	9.1

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