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What distinguishes creative industry exporters? And does engaging in innovation, R&D and design matter?

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Abstract

The paper aims to identify the characteristics that distinguish exporters from non-exporters among the Creative Industries Organisations (CIOs); it also identifies the characteristics of high-intensity exporters, defined as those CIOs that earned at least a quarter - and typically half - of their sales income from exports. It does so by examining the responses from 625 CIOs, 89% of which were 'for-profit businesses', to the DCMS's 2020 survey on new product and service development activities.

The analysis finds that structural, strategic and performance characteristics can predict whether or not a CIO is an exporter. Structural characteristics include whether or not the organisation is a for profit business, its workforce size, its sector of activity, and the region in which it is located. Strategic characteristics include the choice of markets targeted, whether or not it has engaged in innovation activities, and performance characteristics include productivity. Furthermore, being a high-intensity exporter is associated with a number of factors, including being a for profit business, being larger than a one-person organisation, the sector of activity, productivity, and being oriented to business-to-business rather than only consumer markets; high-intensity exporting is also related to introducing innovations and engaging in innovation related behaviours such as R&D and design.

Overall, we find that even very small CIOs export, including at high intensity. The tradability of their outputs matters, as does their productivity and innovation activities. Importantly, exporting need not involve the development of new to the market innovations, and while creative Industry exporters tend to invest in R&D and/or design, the amounts invested are typically modest. Furthermore, engaging in both R&D and design is more strongly associated with exporting than engaging in R&D alone. In the conclusions, we discuss how policymakers might support further creative industry exporting, as well as the pressing needs for large scale and systematic data collection and further research in this area.

Key Words: Creative Industries, Exporting, Innovation, R&D, Design, Productivity

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1. Introduction¹

The UK's Creative Industries (CIs) exported almost £38bn by value of services in 2021, which equates to almost 12% of all UK services exports by value - and £13.8bn by value of goods - almost 4% of the UK's total (DCMS, 2022). Moreover, the value of CI exports - and especially services - has been increasing rapidly, doubling between 2010 and 2017, while all UK services exports grew by 59%. The value of CI goods exports also grew, but more modestly, at +24%, a rate similar to that of UK goods exports (+26%) as a whole (DCMS, 2019).

Post-Brexit, the UK government is keen to accelerate UK exporting, including of creative services and goods. The 2018 UK Creative Industries Sector Deal (HM Government, 2018), for instance, explicitly proposed to increase creative industries exports by 50% within five years. To support and expand exporting it is vital to understand the characteristics that distinguish exporters from non-exporters - and of those businesses with greater potential for exporting. Such knowledge could be used to directly assist those most likely to benefit from policy support, thereby benefiting the economy.

To learn about the characteristics distinguishing exporters and non-exporters in the Creative Industries, the Creative Industries Policy and Evidence Centre (PEC) has been undertaking a series of studies (see Di Novo et al., 2020; Di Novo et al., 2021; Fazio, 2021; Maioli et al., 2021). The present study analyses a survey of over 600 UK based CI Organisations - 89% of which were for profit businesses - that was undertaken shortly before the UK went into its first Covid-19 lockdown in March 2020. This study is similar to Di Novo et al., (2021) who examined exporting among the respondents to a survey of 575 UK Creative Industries firms undertaken in 2017 for the Creative Industries Council. This study aims to contribute to the limited knowledge base on CI exporting and focuses, in particular, on the links between innovation outputs and activities and CI exporting.

The paper is structured as follows: we first discuss our data source, after which we undertake a simple descriptive analysis of the data, relating the propensity to export to various characteristics of the organisations, including their size, age, industry, productivity and innovation activities. The analytical core of the paper follows, and is based on regressions which examine the statistical associations between exporting, and the intensity of exporting, and these organisational characteristics. This analysis thereby identifies which characteristics are, and are not, associated with exporting.

¹ This paper includes an analysis of data that is used with permission. Source: Department for Digital, Culture, Media and Sport <https://www.gov.uk/government/publications/rd-in-the-creative-industries-survey>

The paper concludes with a discussion of its main findings, including the policy issues and matters requiring further research.

2. Data Source

Data was gathered by a telephone survey of Creative Industry businesses and organisations commissioned by the Department for Digital, Culture, Media and Sport (DCMS) in early 2020.² Potential respondents were told that the “DCMS is carrying out a study on new product or service development activities undertaken by creative businesses in the UK”.³ As well as asking about engaging in new product and service development (NPSD), the survey also asked if the organisation had any sales outside of the UK in the last 12 months and, if so, the percentage of these sales within its total sales.⁴

The sampling strategy, which sourced background information on organisations from Dun & Bradstreet, covered all nine of the UK’s officially recognised creative industry sub-sectors. The survey also covered organisations of all sizes, including one-person organisations. Larger organisations, which are relatively uncommon in the Creative Industries, were over-sampled to ensure these were adequately represented.⁵ The analysis in this paper treats every response equally, and no weighting has been applied.⁶

Telephone interviewers asked to speak to ‘a member of the senior management team or someone else with significant responsibility for making decisions about running the business or organisation’. The survey was undertaken between 13th February and 31st March 2020, with data collection almost completed before the 23rd of March when the UK entered into lock-down. As almost all of the questions used in this analysis related to past behaviours – such as the introduction of innovations and investments in R&D and design, or to characteristics, such as industry, that are unlikely to have changed, we assume these organisations’ responses were unaffected by the Covid-19 pandemic.⁷ A total number of 625 interviews were conducted, in the vast majority of cases wholly successfully.

² We thank the DCMS for sharing this data with us.

³ “... [where this] could include development of physical products, services, content and experiences”.

⁴ Information was not gathered on the destination countries of these international sales.

⁵ See Tether, 2021 for a fuller discussion of the sampling approach. See also Bird et al., (2020).

⁶ Note that in the regression analyses we control for size and sector, so applying weights is unnecessary.

⁷ This paper complements a report by OMB Research which has also provided an analysis of the data from this survey (Bird et al., 2020). That report is wide-ranging and covers all of the findings of the survey, reporting and discussing the findings only on the basis of descriptive statistics

The survey followed the standard approach developed in the OECD's Oslo Manual (OECD, 2018) when it asked about innovation activities – including but not confined to new product and service development. This approach is also implemented in the UK's biannual Innovation Surveys (UKIS) (Gkypali and Roper, 2018). Utilising the data from this survey, Tether (2021) provides an analysis of the links between R&D, design and innovation among Creative Industry Organisations (CIOs).

In relation to exports, respondents were asked if, in the last 12 months, their business or organisation had sold any goods or services to individuals or organisations based outside of the UK.⁸ If they had, respondents were then asked to state what percentage of their business/organisation's total sales in the last 12 months were to individuals based outside of the UK. Information was not gathered on the destination countries of these exports.

This was a voluntary survey. As with any voluntary survey it is not possible to know whether those who participated constitute an unbiased sample of the target population. Because potential respondents were told that the survey concerned “new product and service development activities” there may be a bias towards firms that had engaged in these activities. However, none of “exporting”, “R&D”, “design” or “innovation” were mentioned by the interviewer when recruiting respondents, which makes it less likely that there was a bias in the response in favour of organisations active in some or all of these activities.

3. Descriptive Analysis

In total, 266 (42%) of the respondents stated that their business/organisation had sold goods or services to individuals or organisations based outside of the UK and had therefore exported in the previous 12 months; 355 (57%) said they had not. Four (1%) were unable to say, and these were removed from all subsequent analysis in this paper.⁹

For the purpose of this analysis, we divide exporters pragmatically into two groups: **High intensity exporters** are those for which exports accounted for at least a quarter of their total sales. Among this group (of 98 CIOs) the median share of sales due to exports was 50%. Eleven high-intensity exporters (HIE) claimed all of their sales were due to exports. Meanwhile, we denote as **low intensity exporters** those for which exports accounted for less than a quarter of

⁸ If asked to clarify, interviewers would inform respondents that this could include commissions, royalties and licences.

⁹ Note that especially with digital products it is possible to export without knowing that you have, or receiving payment for the export. Only exports involving payments and contributing to sales are considered here.

their total sales. Among this group (of 168 CIOs)¹⁰ the median share of sales due to exports was 5% (See Aronica et al., 2021 for a fuller discussion on the classification of exporters in the academic literature).

Figure 1

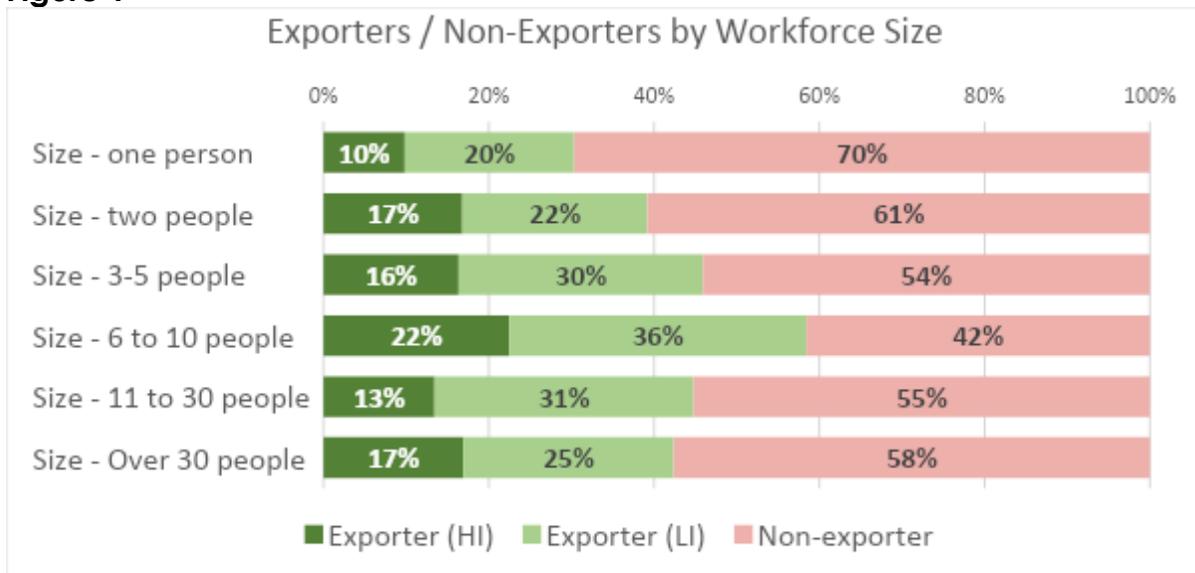


Figure 1 shows exporting by organisational size, measured by workforce. The smallest one-person organisations were the least likely to export (c.f. Di Novo et al., 2021), but even among these 30% were exporters, with 10% were high-intensity exporters. Beyond the smallest organisations, the propensity to export does not appear to increase progressively with size, as the CIOs with the highest propensity to export were those employing 6-10 people; this was the only size-band among which a majority of organisations reported exporting, and more than a fifth were high-intensity exporters. Overall, this distribution shows that even very small CIOs can export, including at high intensity.

Figure 2 shows that exporting behaviour does not vary much with organisational age; perhaps surprisingly, the youngest organisations have a very similar distribution in terms of exporting as older, and indeed the oldest, organisations.

Figure 2 also shows that the propensity to export, and especially the likelihood of being a high-intensity exporter, does differ between businesses and non-businesses, which includes charities, not-for-profits and voluntary organisations. Businesses were more likely to export, especially at high intensity. This said, it is perhaps remarkable that almost three in ten charities, not-for-profits and voluntary organisations reported exporting, including 6% being high intensity exporters.

¹⁰ Included here are 12 CIOs which were unable to state the share of their total sales due to exports. We assume that this share was likely to have been relatively small.

Figures 2

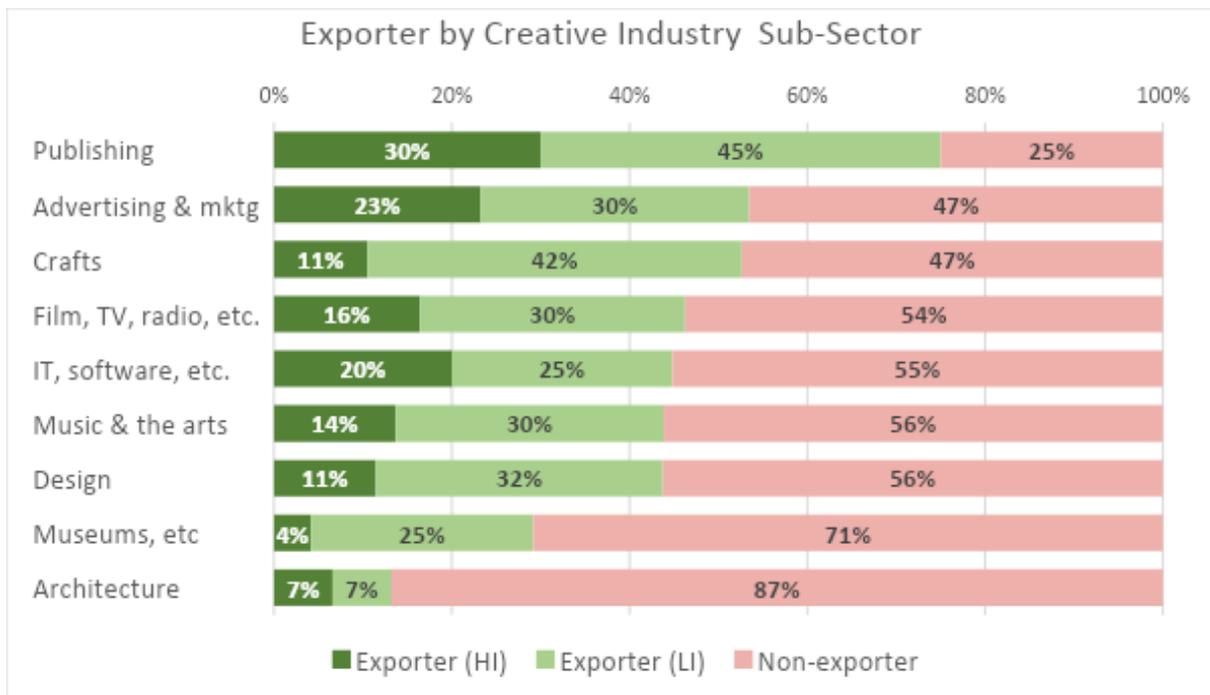
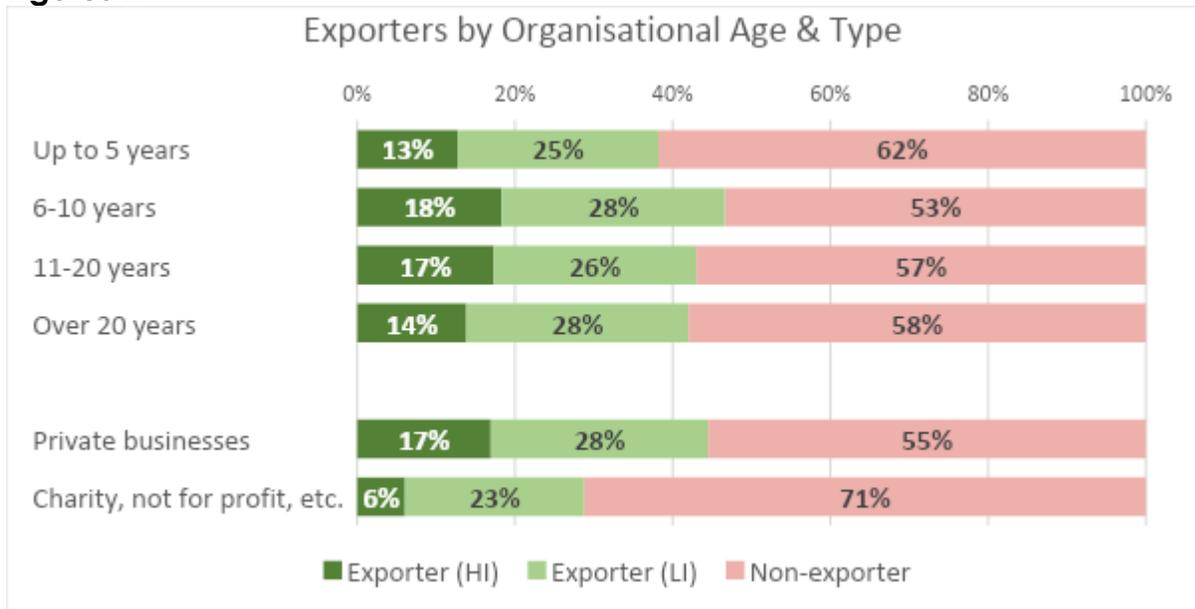
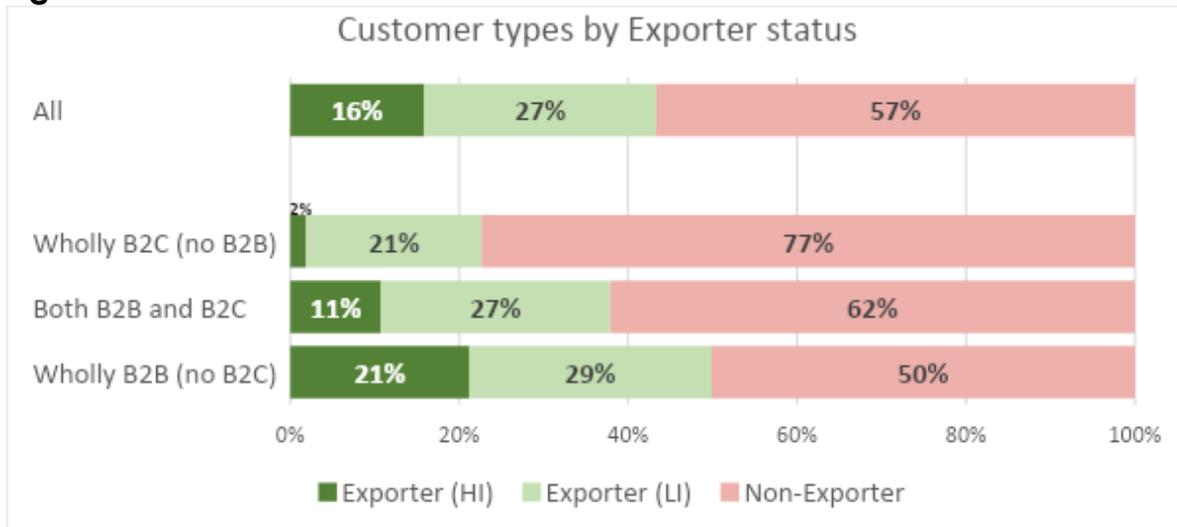


Figure 3 shows participation in exporting varies widely by the Creative Industry sub-sector. Three-quarters of Publishers reported exporting, including 30% as high-intensity exporters. Slightly more than half of both Crafts and ‘Advertising and marketing’ organisations also reported export sales, while at the other

extreme only 13% of Architecture firms had export sales. High-intensity exporting was lowest among 'Museums, galleries and libraries' (4%).¹¹

Note that the data cannot be disaggregated further – we cannot for example identify computer games producers within the wider set of IT, software and computer service businesses.

Figures 4



This variation in exporting between the sub-sectors likely reflects differences in the tradability over distance of the outputs and activities of Creative Industries. Publishing outputs are primarily tangible and intangible goods (Hill, 1977; Hill, 1999), both of which are easily traded over distance.¹² Crafts also produce highly tradable physical products. 'Advertising and marketing' organisations meanwhile provide services, including services that help businesses based abroad market into the UK (as well as to third countries). Architecture, by contrast, typically involves both design activities which can be undertaken remotely, but also activities such as site visits and liaison with local planning authorities, other professional service providers (such as surveyors and engineers) and contractors. Doing these activities at distance from the construction site is challenging, and most (but not all) architecture services are fairly local to building sites. Furthermore, the international provision of architectural services is further hindered by the lack of mutual recognition of professional qualifications

¹¹ Di Novo et al (2021) also found that Architecture firms were the least likely to export (20%). In all other sectors at least half the firms were exporting, with Museums, Galleries and Libraries being the most likely to export (83%), followed by IT, Software and Computer Services (73.5%). In their sample 59% of Publishing firms were exporters.

¹² Publishing outputs (and exports) could also include services, such as translation services. Where these services are provided to foreign clients they would be exports.

in architecture.¹³ Indeed, in light of these constraints, it is perhaps surprising that as many as 14% of the Architecture firms participating in the survey were exporters, with half of these being high-intensity exporters. Also notable is that nearly 30% of Museums, galleries and libraries had export sales, although only 4% were high-intensity exporters.

The survey also asked whether sales were made to 'to individuals and households' (B2C), 'to other businesses' (B2B), and 'to public sector organisations', including health services, schools and universities. From this, we coded whether the CIO was wholly focused on B2C sales, wholly focused on B2B (including public services), or to both B2B and B2C markets.

CIOs selling only to consumers (B2C) were the least likely to export (c.f., Di Novo et al., 2021), and were much less likely to be high-intensity exporters, whereas half the CIOs that only sold to other businesses and organisations were exporters, including a fifth that were high-intensity exporters. Those that sold to both consumers and other businesses were in-between in terms of propensity to export, including at high intensity. These patterns serve to remind that much of the activities of Creative Industries are B2B in orientation, rather than the more visible B2C.

The Creative Industries are unevenly distributed across the UK (see Chapain et al., 2010, Mateos-Garcia, and Bakhshi, 2016; Tether, 2019; Gardiner and Sunley, 2020; Siepel et al., 2020), being especially concentrated in London and the South East region. This uneven distribution is also reflected in the response to this survey, with just over a quarter of the respondents being based in London, and almost 22% being in the South East, such that almost half the responses were from London and the South East. By contrast, only six respondents were in Northern Ireland, and 13 in Wales. To undertake the analysis we grouped the responses by region outside of London and the South East, into: 1 – the South West and (East and West) Midlands; 2 – the North of England (North East, North West and Yorkshire and the Humber); and 3 – Scotland, Wales and Northern Ireland.

¹³ The Royal Institute of British Architects (RIBA) has urged the UK government to push for mutual recognition agreements with other countries: see

Figure 5

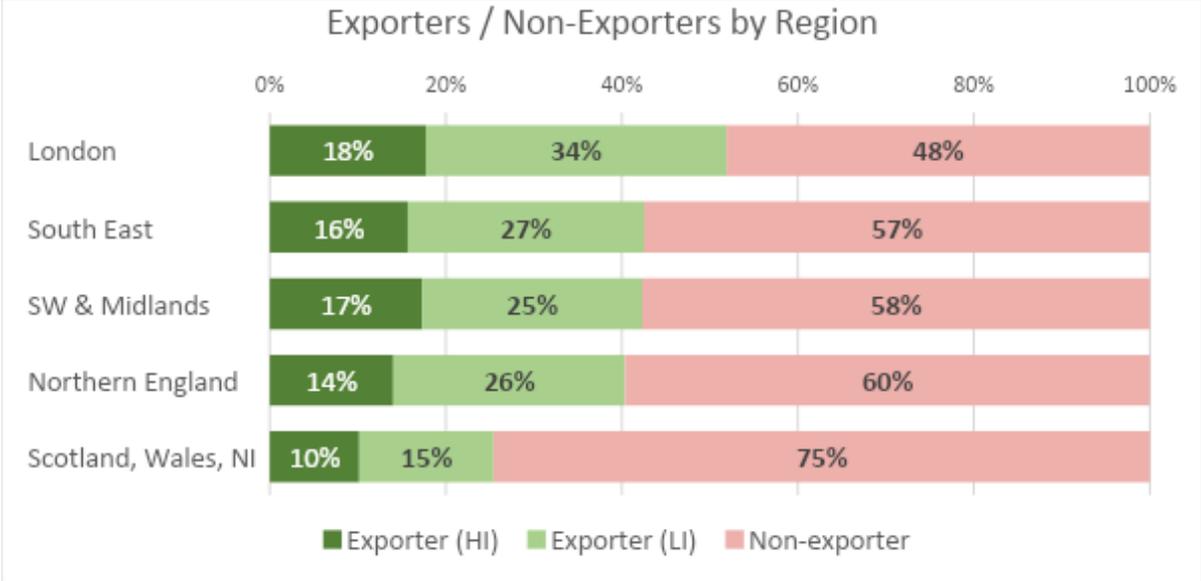
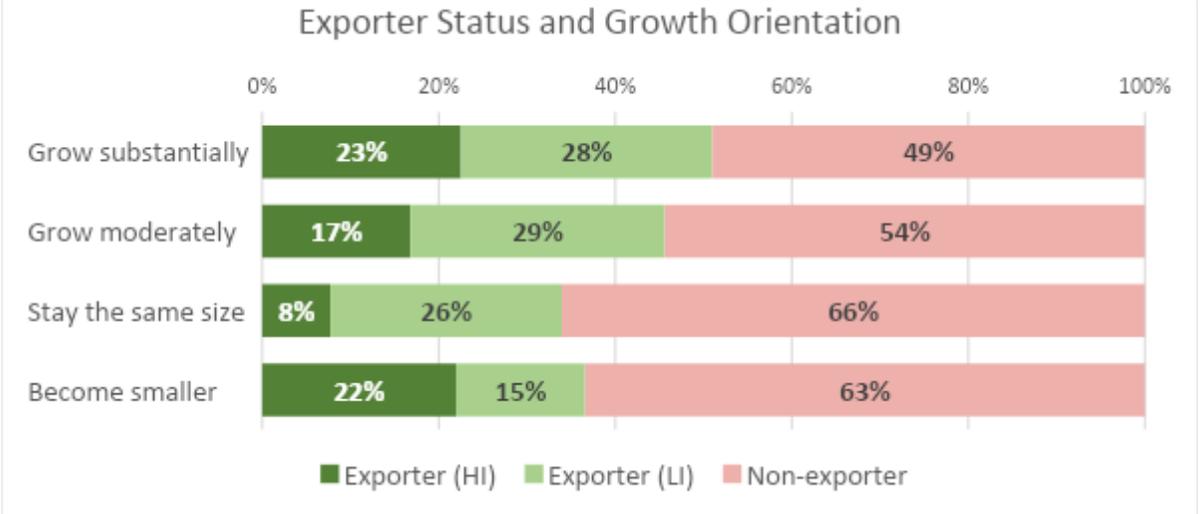


Figure 5 shows that among the survey respondents, those based in London were the most likely to export and were marginally the most likely to be high intensity exporters. Indeed, London-based CIOs were twice as likely to export as those in Scotland, Wales and Northern Ireland (c.f., Di Novo et al, 2021). Reasons for this could include easier access to export opportunities from London, but it could also reflect differences in the sample composition by size, sector, growth orientation and ambition. It is notable however that at least one in ten of the CIOs in all of the regions/regional groups were high intensity exporters, demonstrating that high-intensity exporting is possible from across the UK.

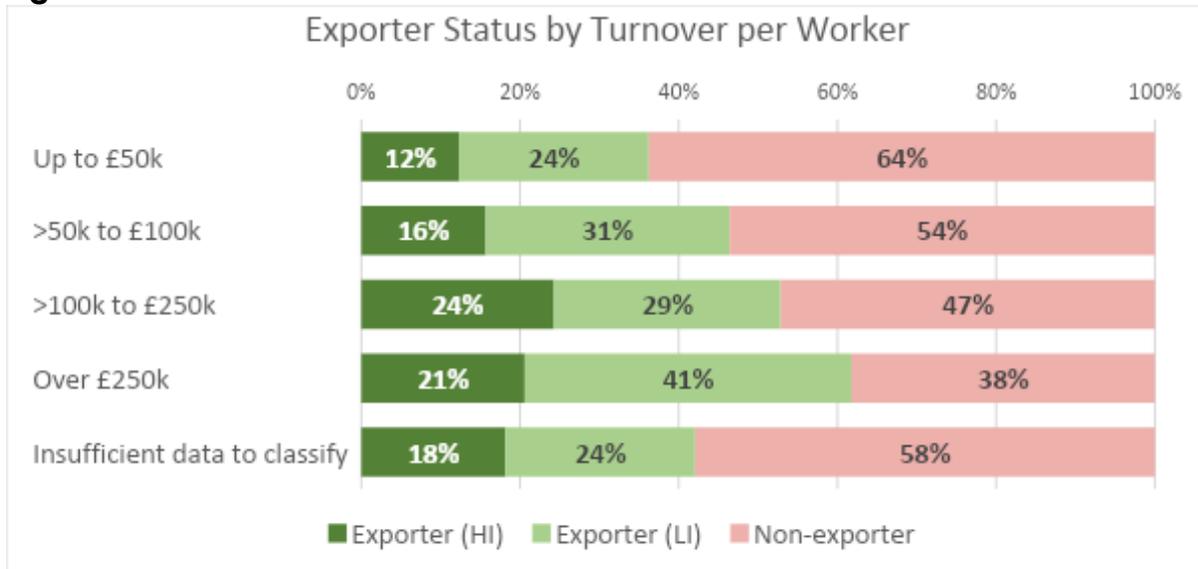
Figures 6



The survey asked the CIOs about their growth objectives for the next three years in terms of total sales, asking respondents to select between: grow substantially (more than 20% growth); grow moderately (up to 20% growth); stay the same size; or become smaller. The most common response was to grow moderately (40%), while almost a quarter aimed to grow substantially (defined as achieving over 20% growth in sales annually). Meanwhile, 27% of the firms aimed to remain the same size and a small proportion (6.6%) aimed to reduce their turnover; i.e., become smaller. Related to exports status, there is an association between being growth-oriented and exporting, especially high-intensity exporting (Figure 6), with nearly a quarter of those aiming to grow substantially exporting intensively compared with under 10% of those aiming to remain the same size. This suggests a connection between business ambition and exporting (c.f., Di Novo et al, 2021). However, rather surprisingly, the share of high-intensity exporters was almost as high among the small group of CIOs that aimed to become smaller. A possible explanation for this surprising result is that this group included export-oriented businesses facing greater barriers to trade due to Brexit. Di Novo et al (2021) report that the EU is the largest export market for the UK's Creative Industries and therefore greater difficulties in trading with EU customers post-Brexit might induce some exporters, and particularly high-intensity exporters, to scale back their businesses, reducing its size.

Next, in relation to productivity, previous studies have shown that exporting and productivity are linked (Wagner, 2007; Love and Mansury, 2009; Cassiman et al., 2010), with more productive (and more efficient) firms being more likely to identify and embrace export opportunities. Exporting also exposes the firm to foreign competition from which it can learn and improve the quality of its products, services and/or production processes, leading to higher productivity (Gkypali et al., 2021). In this study we can only measure productivity crudely –by sales divided by the number of workers –and for much of the sample this information is only available in bands. Figure 7 shows that the proportion of exporters does tend to increase with increasing sales per worker. The pattern for high-intensity exporting is not so clear, although high-intensity exporting does appear to increase until turnover per employee exceeds £100,000, which is at least twice the sales per employee of the least productive band.

Figure 7



Innovation activities have also been related to exporting in previous research (Cassiman and Golovko, 2011; Golovko and Valentini, 2011; Love and Roper, 2015), including Di Novo et al's (2021) study. This paper also finds such an association. We can identify innovators on the basis of their innovations introduced (i.e. outputs) and by the innovation activities that the CIO had engaged in (i.e., inputs).

In relation to outputs we can distinguish between: 1. CIOs that said they had not introduced any 'new or significantly improved products or services in the last three years' ("product/service innovations") or any 'new or significantly improved forms of organisation, business structures or processes over the last three years' ("process/organisational innovations"); 2. those that had introduced only "product/service innovations"; 3. those that had introduced only "process/organisational innovations", and; 4. those that had introduced both types of innovation. Figure 8 shows that the non-innovators were the least likely to be exporters, and were about half as likely to be exporters as those that had introduced both types of innovation; they were also less likely to be high-intensity exporters. Interestingly though, the proportion of high-intensity exporters does not vary substantially among the different categories of innovators, suggesting that more innovation does not necessarily enhance exporting.

Among those businesses that claimed to have introduced at least one product/service innovation, respondents were also asked whether any of these were 'new to the market', that is a novel product or service innovation introduced before competitors had introduced a similar offering. By contrast 'new to the organisation' product/service innovations are similar to those already available from competitors. Figure 8 shows 'new to the market' innovators were the most likely to export, but the share of high-intensity exporters

in this group was almost the same as that for 'new to the organisation' innovators.

Figure 8

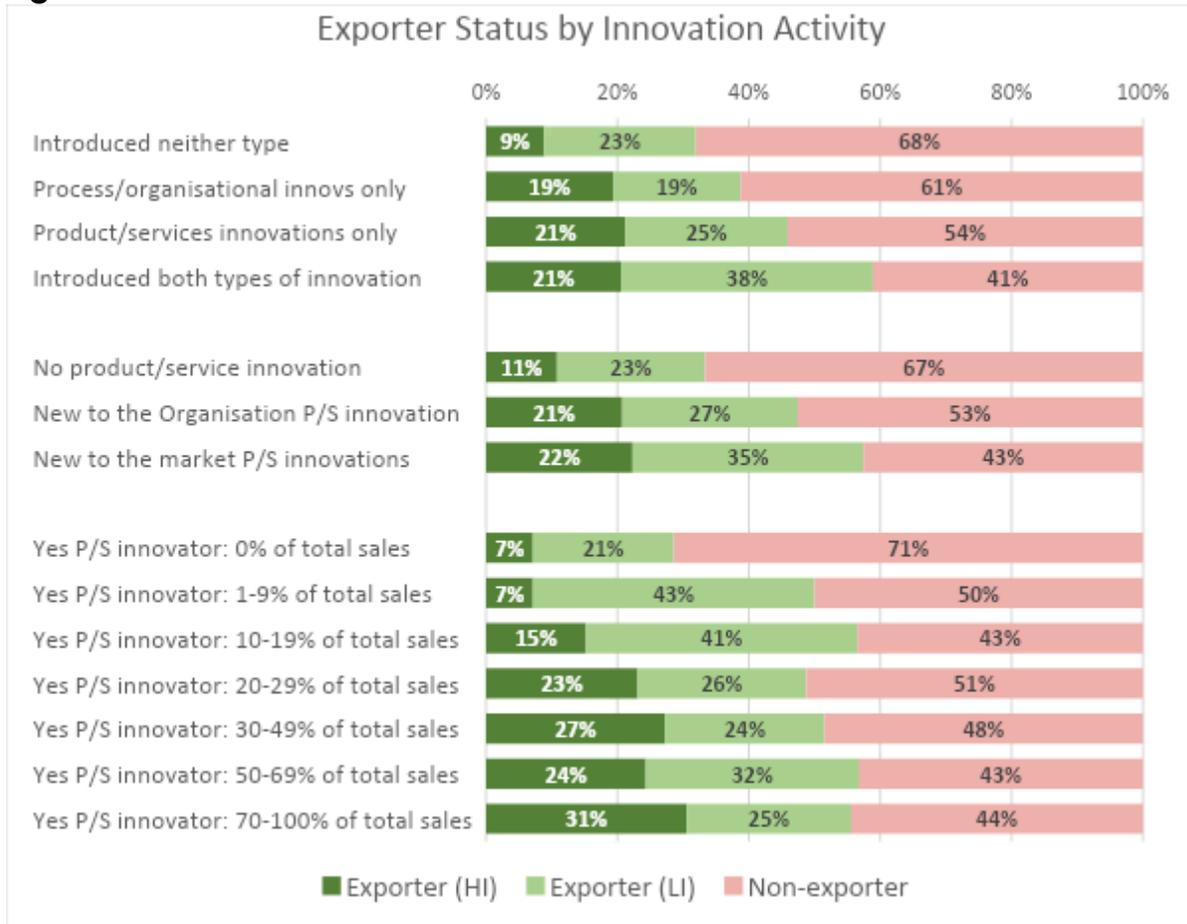
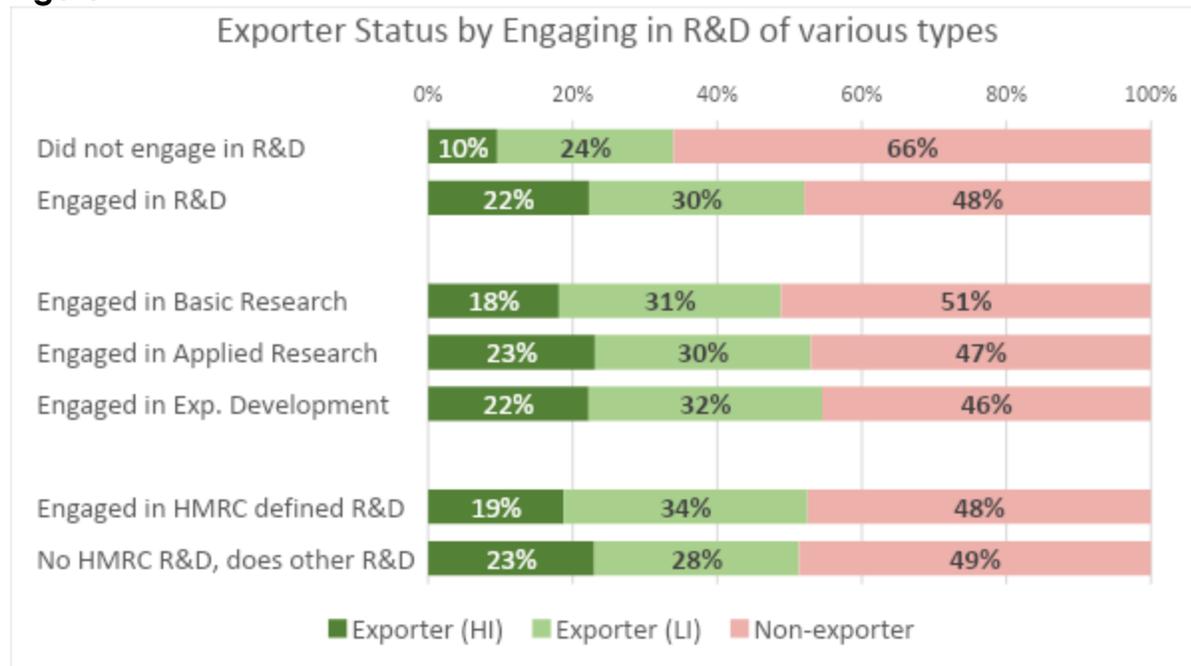


Figure 8 also shows the proportion of exporters, and high-intensity exporters, by the share of sales that could be attributed to innovations introduced in the last three years. Organisations for which product/services innovations contributed no sales were the least likely to export and, along with those for which innovations accounted for less than 10% of total sales, were the least likely to be high-intensity exporters. Explanations for this include that: (1) the innovation(s) may have only very recently been introduced and hence had yet to achieve significant sales; and/or (2) they may have been commercially unsuccessful.

Beyond this first group, the proportion of exporters as a whole does not vary widely with the share of sales due to innovations. However, the proportion of high-intensity exporters does increase, at least until innovation-related sales account for at least 30% of total sales. This suggests that intensive innovators – those innovating continuously or repeatedly, rather than occasionally – are the most likely to also be high-intensity exporters. Repeated innovation appears to

be more strongly related to exporting than 'breakthrough' or 'cutting edge' innovation.

Figure 9



In relation to inputs to innovation, the survey asked the CIOs whether they had engaged in various innovation-related activities including R&D, design, training and market research. Overall just under half (47%) of the respondents claimed that their CIO had engaged in R&D in the past year (Tether 2021). Figure 9 shows that there is an association between engaging in R&D and exporting; especially notable is that those that had engaged in R&D were twice as likely to be high-intensity exporters as those that had not engaged in R&D.

The survey also asked the businesses that had engaged in R&D whether they had engaged in each of the three constituent elements of R&D: basic research; applied research and experimental development. Overall, 21%, 36% and 31% had engaged in these activities in the past year respectively (Tether, 2021). The proportions of exporters, and high-intensity exporters, do not vary very much by engagement in these specific R&D sub-activities (see Figure 9).

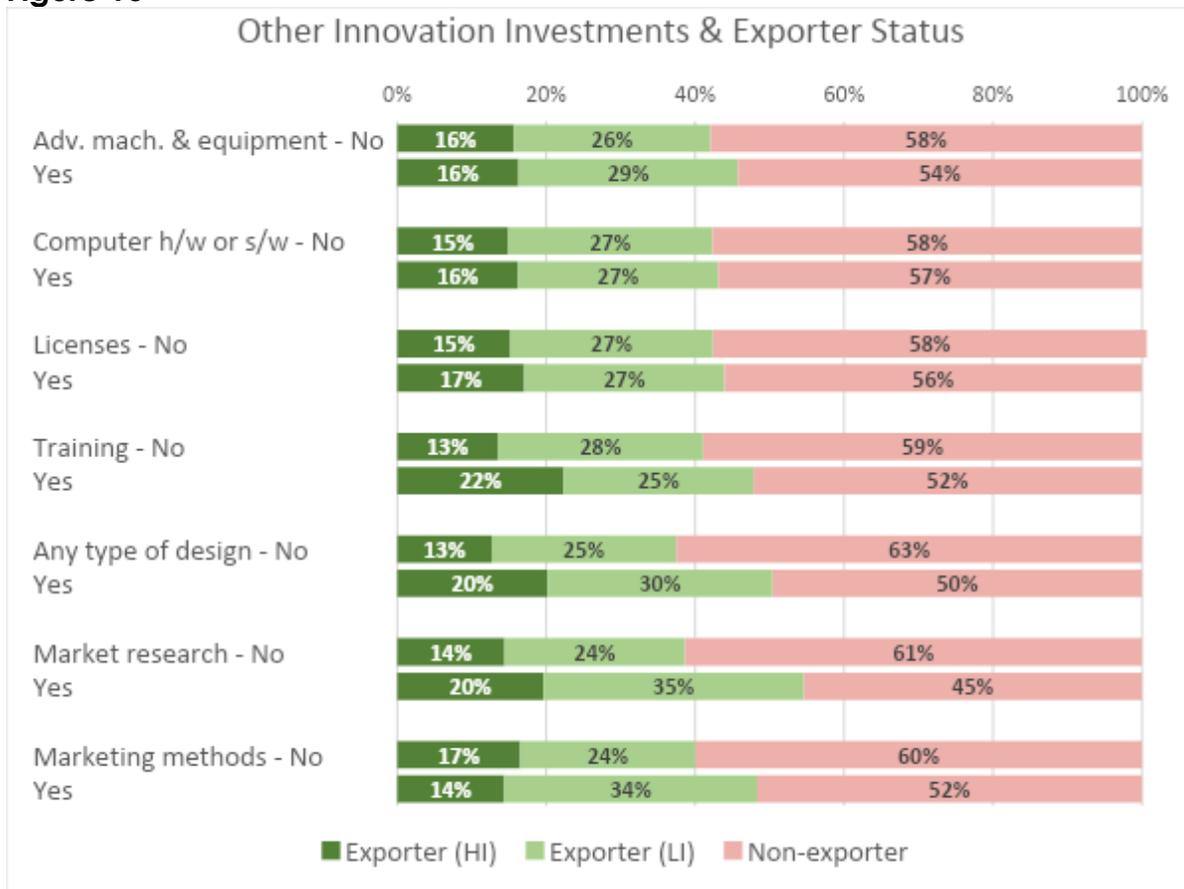
The survey further asked if the CIOs had “undertaken any activities which aim to advance science or technology by resolving scientific or technological uncertainties?”; this, in essence, is the definition of R&D used by HMRC for the granting of R&D tax credits. About one in eight of the respondents said they had, but among those engaged in R&D the majority (74%) said they had not. Related to exporting, the proportion of exporters among those undertaking HMRC-defined R&D was very similar to the proportion engaged in non-HMRC defined R&D, while the proportion of high-intensity exporters was slightly higher

among the latter. This indicates that R&D is associated with Creative Industries exporting, but that R&D need not be oriented to 'cutting edge' knowledge or to seeking scientific or technological 'breakthroughs'.

As well as asking about whether or not the CIOs had engaged in R&D, the survey also asked if they had invested in seven other activities or technologies "for the purposes of current or future new product or service development activities".¹⁴

Figure 10 shows there are negligible differences in the proportions of exporters and high-intensity exporters among businesses investing – or not investing – in three of these: 1. advanced machinery and equipment; 2. computer hardware and/or software; and 3. licences.

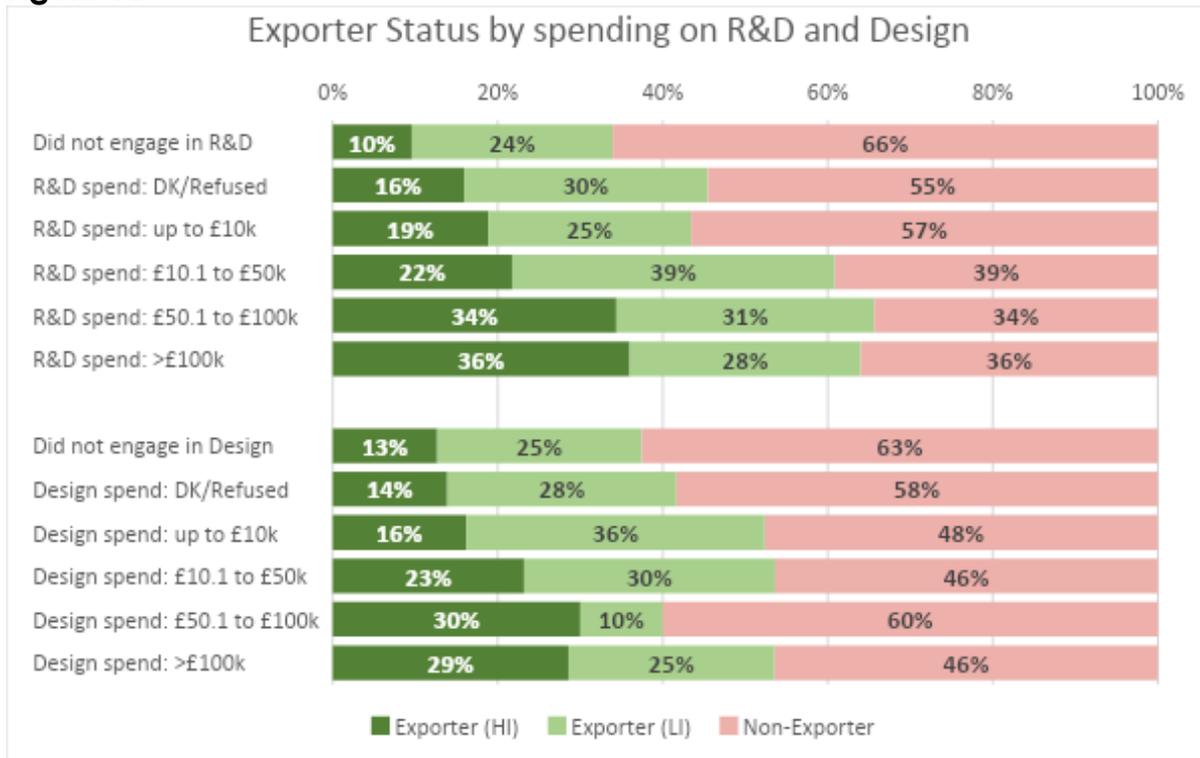
Figure 10



¹⁴ Overall, in the last year, 66% of the CIOs had acquired computer hardware or software, 49% licences for technology or products/services, 41% in any type of design, 34% in changes to marketing methods or product launch advertising, 26% in market research, 26% in training to develop products, and 21% in advanced machinery and equipment (other than computer hardware or software).

By contrast, exporting appears to be more widespread among CIOs investing in: 1. training; 2. any type of design; 3. market research; and 4. in 'changed marketing methods and launch advertising'. High-intensity exporting is also more common among CIOs investing in the first three of these, while it is slightly less common among firms investing in 'changed marketing methods and launch advertising.' Overall, these findings suggest that capital investments do not distinguish exporters from non-exporters, whereas investments in human capital and in intangibles (such as design and market research) may be linked to exporting, including at high-intensity.

Figure 11



Lastly in this section, for both R&D and design, among CIOs engaged in these activities, the survey gathered information on the level of the CIOs investment in R&D and/or design. For both R&D and design, a minority of businesses were unable or refused to reveal their investments. For the remainder we banded these investments as follows: 1. Up to £10,000; 2. Between £10,001 and £50,000; 3. Between £50,001 and £100,000; and 4. Over £100,000. Figure 11 relates these levels of expenditure to the propensity to export (and to be a high-intensity exporter). For R&D there appears to be a clear association between the propensity to export and spending until investment in R&D reaches £50,000. For design, the propensity to export is less clearly associated with levels of spending, although the propensity to be a high-intensity exporter does increase until

spending reaches over £50,000. These findings suggest that a greater commitment to R&D and/or design may be associated with exporting, and especially high-intensity exporting. Reasons for this include that engaging in exporting might help the CIOs spread the cost of R&D and/or design, thereby reducing the cost of R&D and/or design per unit of output (Cohen and Klepper, 1996).

4. Multivariate Analyses

Until now we have explored exporting in the creative industries on a bivariate basis; that is, seeing how the propensity to export varies with one characteristic, such as size, sector, or productivity. We now draw the characteristics together into multivariate analyses. Multivariate analyses have the advantage that the influence of each characteristic on the other is controlled for, such that we can, for example, see if higher productivity is related to exporting after controlling for size (as more productive firms are typically also larger firms). In the following, we undertake two sets of analyses. The first seeks to distinguish exporters from non-exporters; for this we estimate a set of binary logistic regressions which 'predict' group membership (i.e., exporter vs. non-exporter). Our analytical approach begins with a first regression which includes all of the measured characteristics discussed above – except for its innovation outputs and activities. These variables are then added into subsequent regressions.

The second set of analyses repeats the first but estimates multinomial logistic regressions with three outcomes: non-exporters; low-intensity exporters, and high-intensity exporters. Our interest is in the latter, and the aim of this is to identify the characteristics associated with high-intensity exporting (HIE).

Table 1: Binary Logistic Regressions results for Exporters compared with Non-Exporters

	Model 1.1 Exp(B)	Model 1.2 Exp(B)	Model 1.3 Exp(B)	Model 1.4 Exp(B)
Charity etc. (Not a firm)	0.28***	0.21***	0.26***	0.26***
Age: Young CIO	0.88	0.81	0.90	0.92
Size: One person	0.38**	0.43**	0.44**	0.43**
Size: Two person	0.71	0.78	0.77	0.76
Size: 3-5 person	0.84	0.85	0.89	0.89
Size: 6 - 10 person	1.30	1.16	1.32	1.29
Size: 11 to 30	1.07	0.93	0.96	0.96
Advertising & mktg	1.19	1.18	1.32	1.32
Architecture	0.18***	0.19***	0.13***	0.13***
Crafts	2.24	1.90	1.69	1.62
Film, TV, radio	1.21	1.23	1.10	1.09
IT, Software, etc.	0.71	0.68	0.56*	0.56*
Publishing	4.38***	4.24***	4.25***	4.40***
Museums etc.	1.77	2.24	1.94	1.79
Music & the arts	1.89	2.09*	1.79	1.78
Sell to B2B & B2C	0.85	0.88	0.86	0.86
Sell to B2C only	0.34***	0.38**	0.40**	0.40**
South East	0.68	0.70	0.76	0.75
South West & Midlands	0.79	0.82	0.79	0.79
Northern England	0.59*	0.64	0.63^(12%)	0.62^(11%)
Scotland, Wales, NI	0.37***	0.34***	0.40**	0.39**
TO/worker: £50-100k	1.44	1.34	1.32	1.35
TO/worker: £100-250k	1.70*	1.74*	1.70*	1.63^(13%)
TO/worker: >£250k	2.15*	2.02^(11%)	2.30**	2.17*
TO/worker: n.a.	1.00	1.07	0.98	0.81
Become smaller	1.04	1.15	1.30	1.34
Stay same size	0.69^(11%)	0.79	0.80	0.78
Grow substantially	1.20	1.05	1.00	0.98
Innovation: Product only		1.27		
Innovation: Process only		0.96		
Innovation: Both types		1.88**		
New to market prod. inr		1.47		
Engaged in R&D			1.71***	1.25
R&D incl. advance S&T			1.51 ^(18%)	1.52 ^(18%)
Design ^s			1.48*	0.96
Both R&D and design				2.19*
Constant	1.57	1.09	0.95	1.12
Observations (N.)	612	600	602	602
Model Chi-squared	125.4***	134.9***	139.7***	143.4***
-2 Log Likelihood	712.0	683.9	682.5	678.8
Nagelkerke R-squared	0.248	0.270	0.278	0.285
Hosmer & Lemeshow	0.203	0.823	0.979	0.562
Correctly classified %	70%	70%	71%	72%

*** significant at 1%, ** at 5%, * at 10%. Reference groups are: size – 31+; industry – design, markets – B2B only; region – London; TO/worker <£50k; growth – grow moderately; innovation – neither type; R&D – none. \$ other innovation investments are included in the regressions but are not reported as not significant

Table 1 (cont.): Binary Logistic Regressions results for Exporters c.f. Non-Exporters

	Model 1.5 Exp(B)	Model 1.6 Exp(B)	Model 1.7 Exp(B)
Charity etc. (Not a firm)	0.26***	0.27***	0.27***
Size: One person	0.42**	0.42**	0.42**
Size: Two person	0.75	0.75	0.73
Size: 3-5 person	0.89	0.88	0.87
Size: 6 - 10 person	1.32	1.32	1.28
Size: 11 to 30	1.05	1.04	1.04
Architecture	0.11***	0.11***	0.11***
IT, Software, etc.	0.44***	0.44***	0.44***
Publishing	3.30***	3.32***	3.41***
Music & the arts	1.30	1.31	1.32
Sell to B2C only	0.47**	0.47**	0.46**
South East	0.71	0.71	0.70
South West & Midlands	0.77	0.77	0.76
Northern England	0.65	0.65	0.64
Scotland, Wales, NI	0.40**	0.40**	0.39**
TO/worker: £50-100k	1.28	1.29	1.29
TO/worker: £100-250k	1.57	1.56	1.54
TO/worker: >£250k	2.02 ^(12%)	2.01 ^(12%)	1.96
TO/worker: n.a.	1.15	1.14	1.10
R&D spend: to £10k	1.45	1.45	1.20
R&D spend: >£10-50k	2.95***	2.96***	2.25**
R&D spend: >£50k	3.09***	3.06***	2.23*
R&D spend: n.a.	1.45	1.37	1.09
Design spend: to £10k	1.42		
Design spend: £10.1-50k	1.46		
Design spend: >£50k	1.30		
Design spend: n.a.	1.16		
Invests in Design		1.38 ^(12%)	1.02
Invests in Design & R&D			1.78 ^(16%)
Constant	1.11	1.11	1.25
Observations (N.)	607	607	607
Model Chi-squared	141.4***	134.9***	143.1***
-2 Log Likelihood	688.1	683.9	686.4
Nagelkerke R-squared	0.279	0.279	0.282
Hosmer & Lemeshow	0.241	0.161	0.908
Correctly classified %	67.9%	68.7%	68.5%

*** significant at 1%, ** at 5%, * at 10%. Reference groups are: size – 31+; industry – design, markets – B2B only; region – London; TO/worker <£50k; growth – grow moderately; innovation – neither type; R&D - none. Note, other innovation investments such as training were included but are not reported were not found to be statistically significant

We must stress that the analyses that follow are associative rather than causal. We do not and cannot know from this analysis what causes exporting. What we can do is identify the characteristics that distinguish exporters from non-exporters, and the distinguishing characteristics of the subset of high-intensity exporters. We can also see what characteristics do not distinguish (high-intensity) exporters from non-exporters.

We begin with Model 1.1 in Table 1 which seeks to distinguish exporters from non-exporters and includes all of the previously discussed measured characteristics of the CIOs except for their innovation behaviours. The reported figures are the exponents of the coefficients which are also the odds ratios. Where these are greater than 1, CIOs with this characteristic are generally more likely to export; where these are smaller than 1, CIOs with this characteristic are generally less likely to export. So for example, if $\text{Exp}(B)$ is 2 then a CIO with this characteristic is (approximately) twice as likely to be an exporter (all else being equal), while if $\text{Exp}(B)$ is 0.5 then a CIO with this characteristic is (about) half as likely to be an exporter (all else being equal).¹⁵ In this and the subsequent models, we highlight in bold those characteristics that are statistically significant in distinguishing exporters from non-exporters. Conventionally, significance is accepted at the 10% or higher (toward 1%), but we also identify characteristics that are not quite statistically significant at this level (i.e. their significance is at 11% or 12%).

All models in this set find that non-businesses i.e. 'Charities, not for profits, or voluntary organisations' – are much less likely to export than businesses. All models also find that the smallest one-person CIOs are significantly less likely to export; that one-person organisations are less likely to export is unsurprising; more surprising is that two-person and three-to five person organisations are not significantly less likely to export than CIOs with at least 30 people.

The first and all subsequent models also find that young organisations, defined as those that are not more than five years old, are not significantly different from older organisations in their propensities to export.

All models also find that there are sectoral differences in the propensity to export. While taking account of other characteristics, Architecture businesses are much less likely to export than are those in the other creative industries; by contrast, Publishing businesses are much more likely to export. We expect that these differences relate primarily to differences in the tradability of the activities and outputs of the Creative Industries. Interestingly there is also evidence that IT, Software and Computer Services businesses are less likely to export especially once innovation activities are included in the models. This might indicate that these businesses are primarily active in the provision of computer services (which

¹⁵ This is only approximately correct, as the effects are not fully independent of one another.

are less tradeable), rather than in the production of software, including computer games (which is very highly tradable).

There is also strong evidence in all of the models that businesses which sell only to consumers are very much less likely to export than those that sell to other businesses and organisations, either exclusively, or to both businesses and consumers.

The models in this first set also consistently find that CIOs based in Scotland, Wales and Northern Ireland were less likely to export than those in London, the reference region. There was also weaker evidence that those in Northern England were less likely to export, although this regional effect generally became insignificant once innovation behaviours were included in the models.

The models in this first set also consistently find that the propensity to export is significantly higher among the more productive CIOs, and especially those achieving sales of at least £100,000 per worker (when compared with the reference group with sales per worker not exceeding £50,000). Notably these productivity effects tend to weaken as innovation behaviours are included in the models, suggesting that innovation activities are more widespread among the most productive CIOs.

The first model also finds that CIOs that aim to remain the same size are less likely to export than those that seek to grow moderately (the reference group) although this effect becomes insignificant once innovation behaviours are included in the models. Also notable is that the organisations that were seeking to grow substantially were not significantly more likely to export than those that were seeking to grow moderately.

In the subsequent models, we add in innovation related variables. In the first of these (Model 1.2), we incorporate two additional variables: a multi-category variable identifying whether the CIO had introduced both product and process innovations, one or other of these, or neither (the last being the reference group); and a binary (or dummy) variable that identifies those product innovators that introduced at least one 'new to the market' innovation. This model shows that introducing both types of innovation is significantly associated with a higher propensity to export, but the introduction of 'new to the market' product innovations does not significantly enhance the probability of being an exporter.

Model 1.3 removes these innovation output variables and instead introduces variables on innovation related activities, including: (1) whether the CIO engaged in R&D (2) whether this R&D included activities to advance science and technology (the HMRC definition), and (3) a set of seven dummy variables for each of the other innovation related investments including training, market research and 'all forms of design' (i.e. the investments reported on in Figure 10). Among the seven investments, only 'any type of design' is statistically significant

and associated with exporting.¹⁶ This model also finds that engaging in R&D is statistically associated with exporting and, while positive, the additional effect for engaging in R&D activities to advance science and technology is not statistically significant.

The next model (Model 1.4) includes an additional dummy variable identifying those CIOs that said they had engaged in both R&D and design. With the inclusion of this variable, which is positive and statistically significant, the significance of the both the initial dummies for 'engaged in R&D' and 'engaged in design' become insignificant, which indicates that simultaneously engaging in both R&D and design is significantly associated to exporting whereas engaging in only one of these is not.

In Model 1.5 we remove the dummy variables on R&D and design investment, and instead incorporate multi-category variables on the levels of investment in these activities, including categories for where the level of investment in R&D and design is not known. To reduce complexity, for this and the subsequent models (1.6, 1.7 and 1.8) we also exclude from the models some variables never previously found to be significant (i.e. in Models 1.1 to 1.4). This model finds that the propensity to export increases with R&D spending, and finds especially firms that spent at least £10,000 on R&D were more likely to export. Meanwhile, those that spent over £50,000 on R&D were only very slightly (and not-significantly) more likely to export than those that spent £10,000-50,000 indicating that additional spending on R&D does not further increase the propensity to export. Meanwhile there is no statistically significant association between the level of design investment and exporting.

Model 1.6 replaces the multi-category variable for levels of spending on design with a simple dummy variable. This has a significance level of 12%, outside the conventional threshold of 10%. Model 1.7 then adds in a dummy variable for investing in both design and R&D; this is positive but not significant (significance level of 16%), while the effect for investing in design is close to unity, indicating that design is only associated with exporting among R&D active organisations.

In summary, whether a Creative Industry Organisation is an exporter or not can be predicted based on a set of structural, strategic and performance characteristics. Structural characteristics include whether or not the organisation is a firm (as opposed to a charity, voluntary organisation, or not for profit), its workforce size, its sector of activity, and the region in which it is located. Strategic characteristics include the choice of markets targeted, whether or not it has engaged in innovation activities, while performance characteristics include productivity and the introduction of innovation.

¹⁶ To save space the (insignificant) results for the other investments are not reported in the table.

To illustrate this we developed a scale based on a simplified reading of the regression results reported above. This scoring assigns positive (or negative) values for factors found to be positively (or negatively) associated with exporting. Factors strongly associated with exporting (or not exporting) are given 2 points, while factors weakly associated with exporting (or not exporting) are given 1 point. Specifically, -2 points are assigned for each of the following: (1) the CIO is not a business (i.e., charity, not for profit, etc.); (2) the CIO is a one person organisation; (3) the CIO is focused exclusively on serving consumer markets; (4) the CIO is based in Scotland, Wales or Northern Ireland. -1 is assigned if the CIO is based in the northern regions of England. Meanwhile, +2 points are assigned (1) if the CIO spent at least £10,000 on R&D, (2) introduced both 'product' and 'process' innovations; and (3) if the CIO had a turnover per worker exceeding £250,000. Meanwhile +1 point is assigned if (1) the CIO has a turnover per worker between £100,000 and £250,000, and if (2) the CIO engaged in both R&D and design. This provides a scale which ranges from -6 to +5; the median value of which is 0.

Figure 12

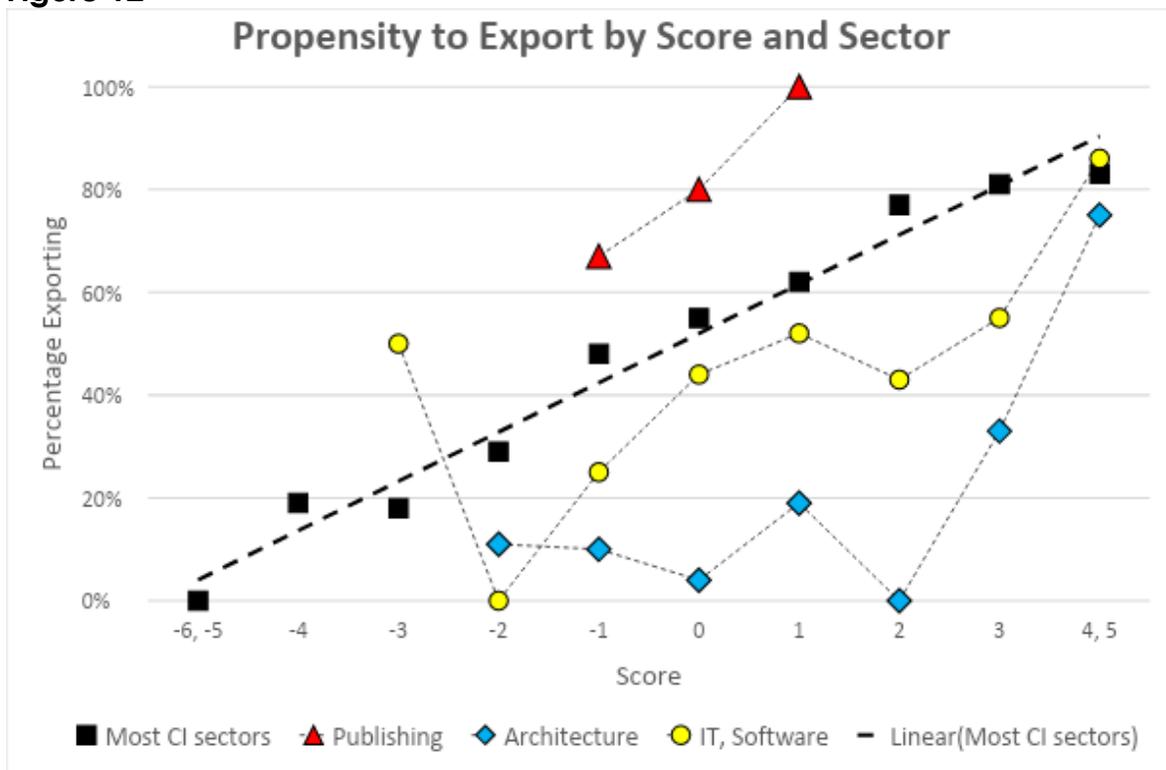


Table 2: Proportions of Exporters by Score and Creative Industry Sub-Sectors

Score	Most CI Sectors		Publishing		Architecture		IT, Software, etc	
	N. Exporters		N. Exporters		N. Exporters		N. Exporters	
All	359	47%	39	77%	90	13%	124	45%
-6, -5	6	0%	0	n.a.	1	n.a.	0	n.a.
-4	26	19%	0	n.a.	3	n.a.	1	n.a.
-3	22	18%	2	n.a.	2	n.a.	4	50%
-2	77	29%	1	n.a.	18	11%	7	0%
-1	42	48%	9	67%	10	10%	12	25%
0	99	55%	15	80%	25	4%	36	44%
1	47	62%	5	100%	16	19%	21	52%
2	13	77%	2	n.a.	5	0%	14	43%
3	21	81%	3	n.a.	6	33%	22	55%
4, 5	6	83%	2	n.a.	4	75%	7	86%

Figure 12 and Table 2 shows the proportions of exporters against these scores. CIOs in Publishing, Architecture and IT, Software and Computer services are separated out because the regressions indicated these sub-sectors behave differently. The percentage of exporters is not reported when the available cell count is below 4.

Table 3: Multinomial Logistic Regressions – Identifying High intensity exporters

	Model 2.1 Exp(B)	Model 2.2 Exp(B)	Model 2.3 Exp(B)	Model 2.4 Exp(B)	Model 2.5 Exp(B)
Charity etc. (Not a firm)	0.19**	0.16***	0.16**	0.17**	0.20**
Age: Young CIO	0.78	0.76	0.86	1.05	0.85
Size: One person	0.31**	0.39^(12%)	0.32*	0.33*	0.38^(11%)
Other size bands	<i>Included but not reported as none is statistically significant</i>				
Advertising & mktg	1.98 ^(14%)	1.84	2.70**	2.87**	2.33**
Architecture	0.42 ^(14%)	0.35*	0.24**	0.22**	0.15***
Publishing	8.29***	7.10***	8.53***	9.24***	7.91***
Music & arts	3.54**	3.63**	2.83*	2.85*	2.42*
Other Sectors	<i>Included but not reported as none is statistically significant</i>				
Sell to B2B & B2C	0.56*	0.53*	0.61 ^(13%)	0.58 ^(11%)	0.66
Sell to B2C only	0.08**	0.08**	0.10**	0.10**	0.11**
Regions	<i>Included but not reported as none is statistically significant</i>				
TO/worker: £50-100k	1.48	1.28	1.46	1.51	1.47
TO/worker: £100-250k	2.27**	1.98*	2.48**	2.26*	2.34**
TO/worker: >£250k	2.09	1.89	2.33 ^(18%)	1.92	1.86
TO/worker: n.a.	1.33	1.35	1.23	1.33	1.95 ^(13%)
Become smaller	1.66	2.06 ^(15%)	2.62*	2.67*	2.58*
Stay same size	0.43**	0.56^(12%)	0.46*	0.44**	0.43**
Grow substantially	1.52	1.40	1.32	1.27	1.23
Innovation: Product only		2.21**			
Innovation: Process only		1.74			
Innovation: Both types		2.36**			
New to market prod. inn.		1.25			
Engaged in R&D			4.03**	1.92*	
R&D incl. advance S&T			1.20		
R&D spend: to £10k					2.78***
R&D spend: >£10-50k					3.25**
R&D spend: >£50k					4.17***
R&D spend: n.a.					1.75
All forms of design ^s			1.94**	0.77	
Design spend: to £10k					1.63
Design spend: £10.1-50k					2.07^(11%)
Design spend: >£50k					3.44**
Design spend: n.a.					1.36
Chgs to mktg methods ^s			0.53*	0.49**	0.46**
Both R&D and design				4.15**	
Intercept	0.36	0.20	0.18	0.22	0.17
Observations (N.)	612	600	602	602	605
Model Chi-squared	159.4***	173.5***	197.1***	199.3***	205.5***
-2 Log Likelihood	987.4	683.9	962.4	972.5	966.3
Nagelkerke R-squared	0.268	0.294	0.327	0.327	0.336
Deviance G.o.F.	0.993	0.999	1.000	1.000	1.000
Correctly classified %	61.6%	62.5%	63.1%	63.9%	65.9%

*** significant at 1%, ** 5%, * 10%. Reference groups are: size – 31+; industry – design, markets – B2B only; region – London; TO/worker <£50k; growth – grow moderately; innovation – neither type; R&D – none; R&D and Design spend - none. ^s other innovation investments included but not reported as not significant

The figure and table show how the propensity to export increases with the scoring. Among 'most CI sectors', there are no exporters among the few CIOs scoring -5 or -6, while around a fifth of those scoring -3 or -4 are exporters; by contrast, over four-fifths of those scoring 3 or more are exporters. Given the CIOs have to be highly productive and/or engaged in innovation activities to score 3 or above this highlights the association between these and exporting.

The figure and table also show that for a given score Publishing firms are more likely to export, while Architecture firms, and to a lesser extent IT, Software and Computer Service firms are also less likely to export. Also evident is that among the small number of Architecture and IT, Software and Computer Service firms that have high scores three quarters or more were exporters.

We now turn to the second set of models which seek to identify the characteristics of high-intensity exporters (HIE), i.e., those for which exports accounted for at least a quarter of their total sales, and for which exports typically accounted for half their sales (i.e., median = 50%). To identify the factors associated with being a high-intensity exporter (HIE) we estimated multinomial logistic regressions with three outcomes: non-exporter (the reference group); low-intensity exporters; high-intensity exporters. Table 3 shows the results for the high-intensity exporters and the factors which distinguish these from non-exporters. While not reported directly, comparison of these results with those in Table 1 for all exporters can be used to distinguish high-intensity from low-intensity exporters.

As with the first set of models, we begin by including all of the measured characteristics other than the innovation related behaviours.

The first model (Model 2.1) finds that, as with all exporters:

1. Non-businesses ('Charities, not for profits, voluntary organisations) are much less likely than businesses to be high-intensity exporters;
2. One person organisations are also much less likely to be HIE, but beyond single person entities workforce size is not associated with HIE status;
3. Young CIOs are not less likely to be HIE (than older CIOs);
4. Those that sell only to consumers (B2C) are much less likely to be HIE;
5. There is also weaker evidence that CIOs that sell to both other organisations and consumers are less likely to be HIE than those that sell exclusively to organisations;
6. Sector differences arise - Publishing CIOs are much more likely to be HIE than those in most other Creative Industry sub-sectors, as are, perhaps more surprisingly, 'Music and the arts' organisation. Advertising and marketing organisations are also more likely to be HIE once innovation activities are included in the models. Meanwhile the opposite is the case

with Architecture organisations, which become significantly less likely to be HIE once innovation related behaviours are included.

7. There is evidence that the more productive CIOs are more likely to be HIE. Also notable is that (while not significant) the effect size for those with turnovers per worker above £250,000 is very similar to those with turnovers per worker of £100k-250k, indicating that if these categories were combined the whole category would be significant.
8. There is stronger evidence that those CIOs that aim to remain the same size (rather than grow or become smaller) are less likely to be HIE. As before, those that seek to grow substantially are not significantly more likely than those seeking moderate growth to be HIE. Once innovation behaviours are included in the models, CIOs seeking to become smaller in terms of turnover are (perhaps surprisingly) more likely to be HIE (indicating that innovation activities are less common in these CIOs).
9. Lastly, and in contrast to the models for exporting as a whole, the models in this set do not find any statistically significant associations between regional location and high-intensity exporting.

In subsequent models we introduce different innovation-related performance and activity variables. In Model 2.2 we introduce a multi-category variable for the type(s) of innovation introduced, as well as a dummy variable for the introduction of 'new to the market' product innovations. This model finds that high-intensity exporting is more common among those that introduced product or service innovations, either alone or together with process / organisational innovations, but the introduction of 'new to the market' product innovations does not have a significant additional positive effect. As with exporting as a whole, this suggests that achieving 'breakthrough innovations' is not more strongly associated with high-intensity exporting than those introducing 'normal' innovations.

Model 2.3 replaces the innovation output variables introduced in Model 2.2 with innovation activity variables, including a dummy variable for engaging in R&D, an additional dummy variable for those that engaged in activities to advance science and technology, and a set of dummy variables identifying investing in each of the seven other innovation related activities. As with exporting as a whole, engaging in R&D is strongly associated with HIE, but there is no additional effect associated with R&D to advance science and technology. Beyond this, investing in design is also strongly associated with HIE, while investing in 'Changes to marketing methods or product launch advertising' is, by contrast, negatively associated with HIE status. This indicates that high-intensity exporters are less likely to invest in these. We speculate that this may be for two reasons. First, as these CIOs are intensive exporters, they are likely to have already established their marketing methods and may have less need to build or change them. Second, as high-intensity exporters are more likely to be engaged in business-to-business markets than business-to-consumer markets, they may

have a low need for advertising. Beyond 'all form of design' and 'changes to marketing methods or product launch advertising', there are no associations between HIE and the five other innovation related investments, including training, market research, or investments in advanced equipment and software.

Model 2.4 then removes the insignificant dummy variable identifying CIOs whose R&D included activities oriented to advancing science and technology and includes a dummy variable identifying CIOs that engaged in both R&D and design. This is positive and highly significant, while engaging in design alone becomes insignificant. Meanwhile, the effect of engaging in R&D becomes smaller (as expected) but remains significant. These results indicate that engaging in both R&D and design are strongly associated with high-intensity exporting, whereas undertaking R&D alone is less strongly associated with it, and only engaging in design is not associated with it.

Lastly, Model 2.5 removes the dummy variables for engaging in R&D, in design, and in both, and includes multi-category variables for the levels of expenditures on R&D and design. This finds that being a high-intensity exporter is positively associated with increasing spending on R&D, as well as with increasing spending on design, although the effects for the latter are smaller and weaker than those for R&D.

In summary, the regression models indicate high-intensity exporting is unevenly distributed among CIOs and is associated with a number of factors, including firm/non-firm status, one-person vs larger organisations, sector of activity, business-to-business versus consumer markets, and the productivity of the organisation; it is also related to innovation outputs and behaviours.

To illustrate the findings in a simplified way, we first exclude CIOs active in Publishing and Architecture, as well as non-firms and all CIOs that only sell to consumers rather than businesses and other organisations. We do this because, with the exception of Publishing which are the most likely to be high-intensity exporters, these organisations are unlikely to be high-intensity exporters. Just under 400 firms remain; for these (398) we created a score based on their attributes: -1 if the organisation was (1) a single person entity, and (2) if the organisation aimed to remain the same size; a score of +1 was assigned (1) if the business had high productivity (a turnover per worker > £100k) and (2) if the business was active in 'Advertising or marketing', or in 'Music and the arts' (both sectors in which HIE status is more likely). This provides a scale ranging from -2 to +2. However, because there are few firms with scores of -2 and +2 (13 and 14 respectively) we reduced this to a three point scale – negative, zero and positive. Positive (negative) scores are associated with internal and external characteristic sets more (less) favourable to high-intensity exporting. Overall, just 8% of the retained sample with negative scores were high-intensity exporters,

compared with 19% of those with scores of zero, and 30% of those with positive scores (Table 4).

Table 4: Proportions of High-Intensity Exporters by Score and Innovation Behaviours

	Negative Score (less favourable)		Score of Zero (neutral context)		Positive Score (favourable)	
	N.	HIE % [Exp%]	N.	HIE % [Exp%]	N.	HIE % [Exp%]
All in the selected sample	98	8% [38%]	193	19% [48%]	106	30% [65%]
Introduced product or service innovations?						
No	63	13% [38%]	87	14% [40%]	42	17% [48%]
Yes – new to the CIO	22	0% [27%]	48	21% [46%]	28	39% [86%]
Yes – incl. new to market	12	0% [50%]	54	24% [61%]	33	42% [70%]
Engaged in R&D and/or design?						
Engaging in neither	45	11% [38%]	59	17% [41%]	44	16% [54%]
Engaged in design only	9	0% [22%]	27	7% [44%]	10	20% [60%]
Engaged in R&D only	20	0% [20%]	54	17% [50%]	15	33% [67%]
Engaged in both	23	9% [56%]	51	29% [57%]	36	50% [78%]
Annual investment in R&D and design?						
None	45	11% [38%]	59	17% [41%]	44	16% [54%]
Spent up to £10k	39	3% [36%]	77	17% [46%]	29	31% [59%]
Spent £10.1k to £50k	9	11% [22%]	30	17% [67%]	14	36% [79%]
Spent over £50k	5	20% [80%]	27	30% [52%]	19	58% [90%]

Analysis excludes: Publishing and Architecture firms, non-firms, firms only selling to consumers.
HIE% is high-intensity exporters as a percentage of all firms in the cell.
Exp% is the proportion of exporters as a percentage of all exporters.

We then use cross-tabulations to explore the links between these scores, the CIOs innovation related behaviours, and whether or not they are a high-intensity exporter (Table 4). First we cross-tabulate by score and the types of product/service innovations the CIOs had introduced in the last three years. This shows that among those with less favourable for exporting characteristics sets (i.e., those with negative scores), introducing innovations is not associated with a higher propensity to be a HIE, but innovation is associated with being a HIE among those with neutral and especially favourable characteristics sets. Also

notable is that, among those with neutral and favourable characteristics sets, introducing 'new to the market innovations' were only very marginally more likely to be HIE relative to those introducing 'new to the organisation' innovations, again suggesting that the 'level' of innovation by novelty is not related to high-intensity exporting.

Next, we cross-tabulate by whether or not the CIO had engaged in R&D and/or design. Again, among those with less favourable characteristics sets, engaging in either or both of these activities is not associated with a higher propensity to be an HIE, whereas engaging in both almost doubles the chances of being an HIE for those with neutral sets, and among those with favourable sets increases this by three times. Half of the CIOs that engaged in both R&D and design and that had favourable sets were high-intensity exporters.

Lastly, we cross-tabulate by spending on both R&D and design combined. This indicates that spending over £50,000 per annum on R&D and/or design is generally associated with a higher propensity to be an HIE, but it is especially powerful among those with favourable characteristics sets. Meanwhile, among this group spending modest amounts (up to £10k and £10k-£50k) doubles the chances of being an HIE.

Overall, these cross-tabulations suggest that introducing (product/service) innovations, engaging in R&D and design, and/or investing more in these activities are especially associated with HIE status for those with characteristics sets favourable to high-intensity exporting.

5. Concluding Discussion

This paper has aimed to contribute to the limited knowledge base and literature exporting by Creative Industry businesses and organisations. Specifically, it has aimed to: 1 – shed light on the factors or characteristics that distinguish exporters from non-exporters among UK CIOs; 2 – to shed light on the factors or characteristics that distinguish high-intensity exporters among UK CIOs; and 3 – explore the relationships between innovation and exporting in the UK's Creative Industries.

Although certain caution is warranted whenever analysis is based on a voluntary survey, it is notable that some of our findings are similar to those reported by Di Novo et al. (2021) on the basis of a survey of similar size. Consistent findings include that (1) the very smallest single-person Creative Industry firms are less likely to export (but beyond these substantial proportions of very small Creative Industry firms can and do export), (2) Architecture firms are less likely to export,

and (3) there are positive associations between innovation activities and exporting.

A second caveat is that the analysis is cross-sectional, and therefore the normal 'health warnings' apply. Specifically, cross-sectional analyses find connections or associations between variables or characteristics, or indeed the absence of such associations. Some factors are found to be positively associated with the variable of interest – which here is exporting or high intensity exporting – such that CIOs with these characteristics are more likely to export, or to be high-intensity exporters. Other factors are found to be negatively associated with the variable of interest – such that CIOs with these characteristics are less likely to export, or to be high-intensity exporters. And still other factors are (statistically) unrelated, meaning that the presence or absence of these characteristics does not relate to the propensity to export (or to be a high-intensity exporter). Interpreting or explaining these results is fraught with dangers, including endogeneity (or simultaneity – which arises when two variables such as innovation and exporting have the same underlying cause), and reverse-causation (e.g., exporting may induce firms to innovate and invest in R&D and/or design, rather than innovation, R&D and/or design stimulating exporting). Furthermore, in cross-sectional analyses, there are no time effects, everything is simultaneous and characteristics are implicitly taken to be fixed or permanent, even though this is not the case. Furthermore, we can only use the information available to us (and assume that it is accurate) – for example, we do not have information on locations other than by region, and we do not have data on productivity measured by the value of output per hour worked. Ultimately, explaining or interpreting the relationships found in the analysis is a mixture of theory, reason and speculation.

Policy Issues and Insights

While policy-makers with sector knowledge are likely to be aware of the aggregate extent of exporting by the UK's Creative Industries, we assume they do not have detailed knowledge of the organisational level characteristics that distinguish exporters from non-exporters in the Creative Industries. Our analysis, combined with that of Di Novo et al. (2021), indicates the following:

1. The very smallest one-person CIOs are less likely to export, but what is perhaps more remarkable is that many small CIOs employing fewer than 10 people are exporters, including at high-intensity. Certainly, it should not be assumed that only large CIOs export.
2. Similarly, very young CIOs can and do export, and it should not be assumed that exporting is only for well-established CIOs.

3. The core activity of the CIOs matters. Both Di Novo et al and our study find Architecture firms to be much less likely to export, which we consider to be partly related to the tradability of architectural activities and to the barriers to internationalisation in architecture due to the lack of mutual recognition of qualifications. However, even in architecture there are some high intensity exporters. More generally though, the nature of the outputs of the Creative Industries relates to their tradability, and tradability can vary within sub-sectors. For example, within IT, Software and Computer Services sub-sector, software, including computer games, is extremely tradable, while computer services are less tradable. Similarly within the Music and performing arts, recorded audio-visual files are extremely tradable while artistic performances are less so.
4. As Di Novo et al. (2021) also found, innovation activities and exporting are linked. There are various explanations for this. One is that 'better quality firms' both export and innovate; that is both of these behaviours have the same underlying cause. There is likely to be some validity to this view, however they are also likely to be linked. Exporting can induce innovation, as exporting exposes the firm to foreign competitors, new ideas, and different tastes or preferences among buyers. A well-managed business can respond to these challenges by developing innovations. An interesting finding from our analysis is that innovations associated with exporting need not be 'new to the market' but can be new to the organisation, and therefore essentially similar to innovations already available from rivals. This suggests a responsiveness among the exporting businesses to the offerings of others. Innovation is also likely to spur exporting. One of the reasons for this is cost-spreading (Cohen and Klepper, 1996). If a business develops an innovation then a large part of the costs of this are fixed; the larger the volume of output over which it can spread the cost of developing the innovation the greater the chance that it can not only earn its money back but also make a profit. Exporting is one way of expanding the market for the innovation.
5. Further in relation to innovation, the findings suggest several things that policy makers could reflect on. One is that while exporting is linked to the undertaking of R&D, it is not especially linked to R&D defined narrowly (as by the HMRC for tax credit purposes) as seeking to make advances in science and technology. If the aim is to encourage innovation as an indirect means to expand exporting, then policies should support a broader rather than a narrower concept of R&D. A second concern is the importance of design, particularly when linked to R&D among exporters and an independent input to high-intensity exporting. The UK is currently seeking to increase its total investment in R&D from around 1.7% of GDP to 2.4% by 2024, a very substantial increase. Our analysis suggests that in the context of the Creative Industries, if the aim is to increase innovation

outputs and exports then it is important not to neglect design. Firms that invest in both R&D and design are much more likely to be exporters, and to be high-intensity exporters, than firms that only invest in R&D. A third observation is that the level of investments in R&D and design need not be high to develop innovations and engage in exporting. It appears that modest investments in R&D, and very modest investments in design, may help a firm to export. We contend that design can enable firms to (among other things) learn about and respond to differences in tastes between domestic overseas buyers, tweak products or services to accommodate these differences, and/or enable firms to introduce products and services that are inherently more attractive and/or usable in overseas markets. See Yu and Tether (2022) for a fuller discussion on how engaging in design helps firms gain and retain geographically distant customers.

Table 5: High-Intensity / All Exporters and proportions of Low-Intensity Exporters

	Negative Score (less favourable)		Score of Zero (neutral context)		Positive Score (favourable)	
	N.	H/E% [LIE%]	N.	H/E% [LIE%]	N.	H/E% [LIE%]
All in the selected sample	98	21% [30%]	193	39% [30%]	106	46% [35%]
Introduced product or service innovations?						
No	63	33% [25%]	87	34% [26%]	42	35% [31%]
Yes – new to the CIO	22	0% [27%]	48	45% [25%]	28	46% [46%]
Yes – incl. new to market	12	0% [50%]	54	39% [37%]	33	61% [27%]
Engaged in R&D and/or design?						
Engaging in neither	45	29% [27%]	59	42% [24%]	44	29% [39%]
Engaged in design only	9	0% [22%]	27	17% [37%]	10	67% [40%]
Engaged in R&D only	20	0% [20%]	54	33% [33%]	15	50% [33%]
Engaged in both	23	15% [48%]	51	52% [28%]	36	64% [28%]
Annual investment in R&D and design?						
None	45	29% [27%]	59	42% [24%]	44	29% [39%]
Spent up to £10k	39	7% [33%]	77	37% [29%]	29	53% [28%]
Spent £10.1k to £50k	9	50% [11%]	30	25% [50%]	14	45% [43%]
Spent over £50k	5	25% [60%]	27	57% [22%]	19	65% [32%]

Analysis excludes: Publishing and Architecture firms, non-firms, firms only selling to consumers.

H/E% is high-intensity exporters as a percentage of all exporters.

LIE% is low-intensity exporters as a percentage of all firms in the cell.

Beyond these findings there are questions about prioritisation. One policy orientation would be to encourage more exporting ‘across the board’ and to seek to remove barriers to exporting where these exist. An alternative would be to focus effort on where policies are most likely to have an impact soonest. We have seen earlier that we can predict which CIOs are the most and least likely to export. We can also predict which are the most likely to be high-intensity exporters. An intriguing finding concerns the low intensity exporters. As exporters, these firms have two important properties in common. One is that

they presumably want to export, and would presumably be open to exporting more. The second is that there is at least some overseas demand for their products or services. As Table 5 shows, even among those with characteristics sets that are favourable (and neutral) to exporting at high-intensity, low-intensity exporters constituted about a third of the total sample of firms. If these firms could be identified they would appear to constitute the 'low hanging fruit' for policy interventions intended to encourage greater exporting.

Future Research and Evidence Issues

As mentioned at the beginning of this paper, little is known specifically about the exporting – and more generally trade - in the Creative Industries. Based on the analysis in this paper, we consider that there are at least two areas of pressing research need.

The first is understanding more fully the tradability of Creative Industry activities. It is obvious that intangible and digital products are extremely tradable – and can be traded at almost no cost, globally, provided the digital infrastructure exists. But less clear is how tradable other creative activities are, including the inputs they are combined together to produce Creative Industry outputs and services. Creative Industry policy has placed emphasis on geographically constrained clusters, which implies that these inputs are not very tradable over distance. But is this the case, and to what extent? Furthermore, has the tradability of creative industry activities changed dramatically following the Covid pandemic and the shift to online working?

The second is the interplay between innovation, exporting and performance in the Creative Industries. As discussed earlier, each may drive or at least influence the other (Bernard & Jensen, 1999; Cassiman et al., 2010; Golovko & Valentini, 2011; Filipescu et al., 2013; Gkypali et al., 2021). We are surprised quite how conventional the Creative Industries appear to be in terms of their engagement in R&D (Tether, 2021) and the links between this and innovation outputs. But the role of design is important too, and it would be very valuable to not only understand better how design is being used in the Creative Industries (including what types of design), but also how this links to innovation and exporting. Certainly it is vital not to neglect design while seeking to drive up participation in R&D.

A future priority should also be the gathering of high quality, longitudinal data on creative industry exporting and the geography of creative industry markets more generally. Ideally, this would involve a dedicated data gathering effort.

Managerial Message

Finally and very briefly on managerial implications. While the intended audience for this paper is not managers, the analysis should be encouraging to managers of small and young Creative Industry Organisations interested in exporting, because it suggests that exporting, including high-intensity exporting, is accessible to small and young CIOs. Furthermore, it also indicates (1) that modest investments in R&D and design can aid exporting, but (2) there is no need to develop 'cutting edge' innovations to engage in exporting.

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