

External sales behaviour of Northern Ireland businesses: A focus on 10X sectors

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This Data Insight explores the external sales behaviour of Northern Ireland businesses over the period 2014–2020. The focus is on 10X classified businesses and the impact of the UK’s exit from the European Union (EU).

What we did

The dataset was cleaned and adjusted to remove the effect of inflation, so that patterns in the volume of trade could be observed.

Firm-level analyses were used to examine whether changes occurred in the external sales behaviour of ten sectors, including four sectors classified according to their use of advanced technologies (10X). Sales to external markets are measured by a four-fold division in percentage terms:

- Great Britain (GB) sales
- Republic of Ireland (ROI) sales
- rest of the European Union (REU) sales
- rest of the world (ROW) sales.

These indicators were analysed by sector over time.

[Regression analysis](#) was used to investigate the determinants of external sales to the four market areas: GB, ROI, REU and ROW. A second layer of investigation interacted these sectors with a ‘EU exit decision’ dummy variable to examine whether trading behaviour altered in the post-EU exit period.

Background

This project responds to an Economic and Social Research Council funding call to expand the use of the “Business Data for Research” (NI) database by researchers.

The vision for Northern Ireland set out in the “[10X Economy](#)” is an innovation-led growth underpinned by trade and investment¹. Growing external sales is critical to the development of a strong Northern Irish economy and this is best achieved by businesses that innovate² – thus underscoring the importance of [research in this area](#).

As part of the testing of the Business Data for Research dataset, our study used the de-identified Northern Ireland Annual Business Inquiry dataset, including the Broad Economy Sales and Exports Statistics dataset which includes data on trade sources and destinations. We provide insights on the trading ecosystem that prevails for Northern Irish businesses, with a particular focus on 10X-priority type trading activity.

What we found

Our results are based on the returns of about 5,000 Northern Irish businesses each year (see Table 1). The sample is skewed towards larger businesses, as reflected in the high overall average employment figure of 60.49 individuals per business. The general trend observed is that the percentage of total sales to these export markets increased steadily over the period. As expected, sales to these external markets declined in 2020 as a result of the Covid-19 pandemic.

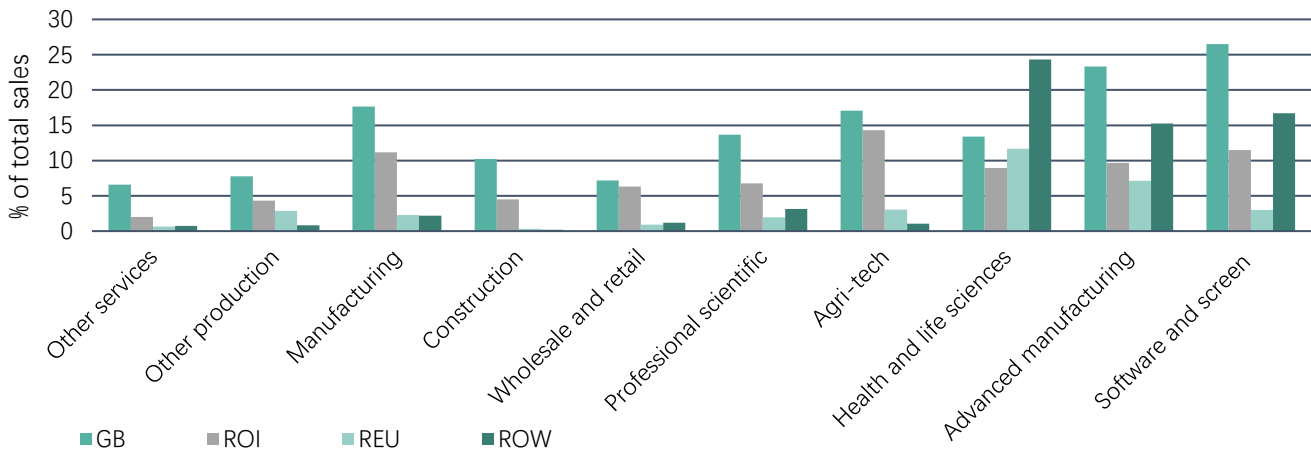
Table 1: Sales to external markets, 2014–2020

	2014	2015	2016	2017	2018	2019	2020	Total
Number of businesses	6,171	5,942	4,874	4,661	5,207	4,755	5,051	36,661
Average employment (size)	50.18	51.80	61.22	63.45	64.58	70.45	65.30	60.49 ¹
GB% of sales	9.64%	10.20%	12.37%	11.88%	13.18%	13.91%	11.72%	11.75% ¹
	<i>Pre-EU exit decision</i>			<i>Post-EU exit decision</i>			<i>COVID</i>	
		10.64%			13.00%		11.72%	
ROI% of sales	5.49%	5.27%	5.60%	6.46%	6.88%	7.54%	6.34%	6.18% ¹
	<i>Pre-EU exit decision</i>			<i>Post-EU exit decision</i>			<i>COVID</i>	
		5.44%			6.96%		6.34%	
REU% of sales	1.44%	1.31%	1.77%	1.73%	2.20%	2.05%	1.80%	1.74% ¹
	<i>Pre-EU exit decision</i>			<i>Post-EU exit decision</i>			<i>COVID</i>	
		1.49%			2.00%		1.80%	
ROW% of sales	2.00%	1.95%	2.49%	2.96%	3.13%	3.78%	2.82%	2.69% ¹
	<i>Pre-EU exit decision</i>			<i>Post-EU exit decision</i>			<i>COVID</i>	
		2.13%			3.29%		2.82%	

Note: Underlying data is indexed to 2019 prices (ONS, 2022)

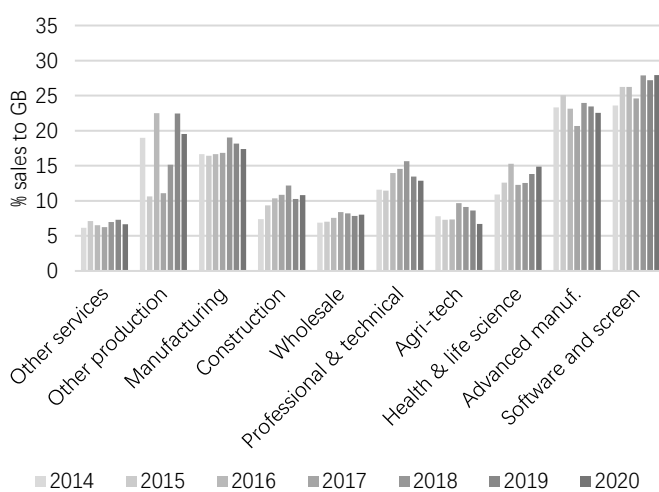
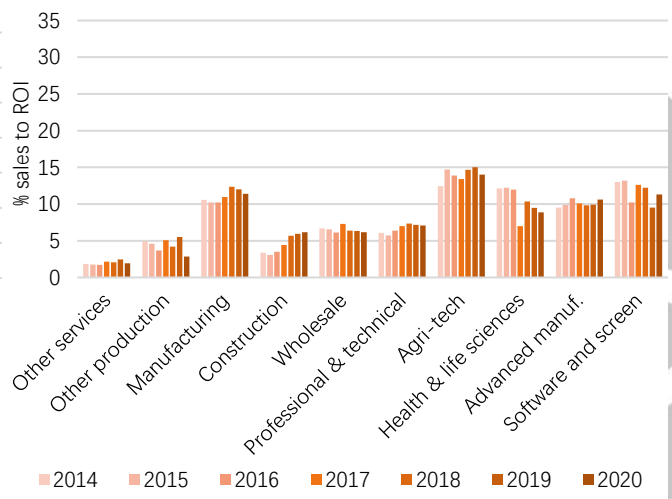
1. Average for the seven years.

As illustrated in Figure 1, sectoral differences are evident in the percentage of sales to the four markets. Generally, it seems non-10X businesses (the six to the left-hand side of each figure) are less engaged with external markets relative to 10X businesses (the four to the right-hand side of each figure).

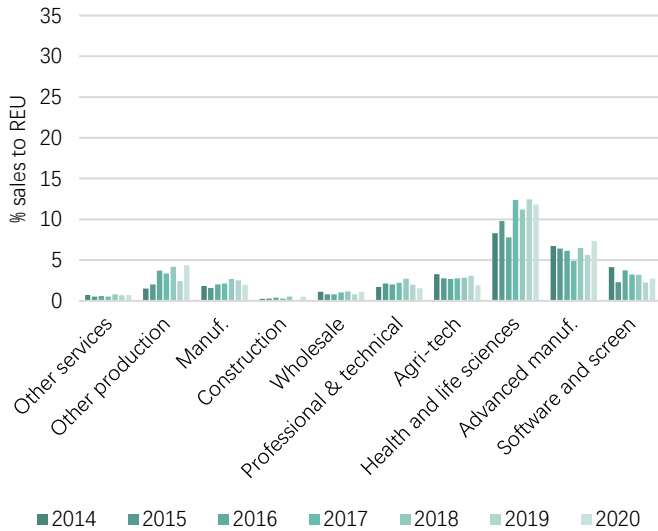
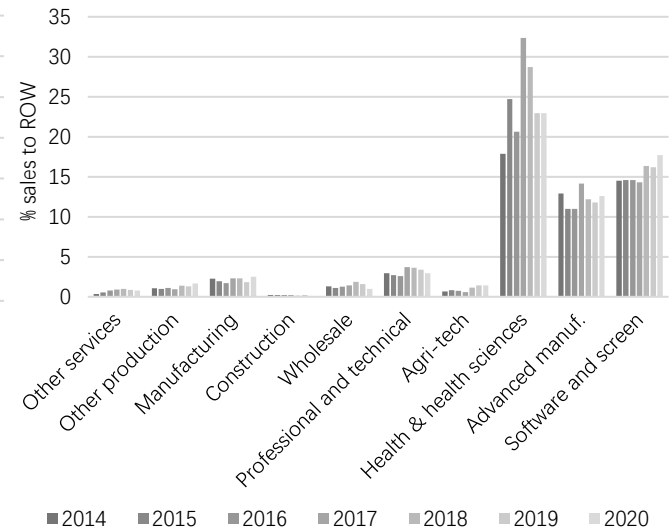
Figure 1: Percentage of total sales to external markets: pooled data – 2014–2020


Note: Underlying data are indexed to 2019 prices (ONS, 2022).

Next the sectoral data is analysed over the period 2014 to 2020 for each external market (Figures 2 to 4). The graphs highlight which sectors are most active in the four external markets. The scale of each graph is kept the same so that the sales to the four markets can be visually compared. Overall, the largest external market is GB (Figure 2), followed by ROI (Figure 3). Differences in the relative importance of markets are observed across the sectors. For example, the ROI market is most important to the agri-tech sector (Figure 3), and the ROW market is most important to the health and life sciences sector which is probably driven by the USA (Figure 5). This sector is also very active in markets in the REU (Figure 4). In general, the 10X sectors have the strongest exporting behaviour and their sales to GB have also been steadily increasing over the period.

Figure 2: Percentage sales to GB by sector, 2014–2020

Figure 3: Percentage sales to ROI by sector, 2014–2020


Note: Underlying data are indexed to 2019 prices (ONS, 2022).

Figure 4: Percentage sales to REU by sector, 2014-2020

Figure 5: Percentage sales to ROW by sector, 2014-2020


Note: Underlying data are indexed to 2019 prices (ONS, 2022).

Other determinants of performance

Random effects regression analysis is used to identify the determinants of external sales behaviour and to test whether the EU Exit decision had a significant impact on sales activity to the four markets. The results are shown in Table 2. After treatment for outliers and controlling for location, legal status, trade characteristics, subsidies, size, and year effects we find (in the main) consistent results with those observed in Figures 2 to 5.

Notably, businesses in the four 10X sectors report significantly higher percentages of sales to external markets (models 1a, 2a, 3a and 4a - except for health and life sciences to the GB and ROI markets). In general, the proportions of sales to external markets in 10X businesses fell in the period 2017-2019 relative to those reported in 2014-2016 as indicated by the lower reported estimates (models 1b, 2b, 3b and 4b). In terms of non-10X sector trade, construction increased its activity with the GB market, other production to the ROI and REU markets and the manufacturing and professional and technical services sectors also reported increased proportions of sales to the REU in the period 2017-2019 (models 1b, 2b and 3b).

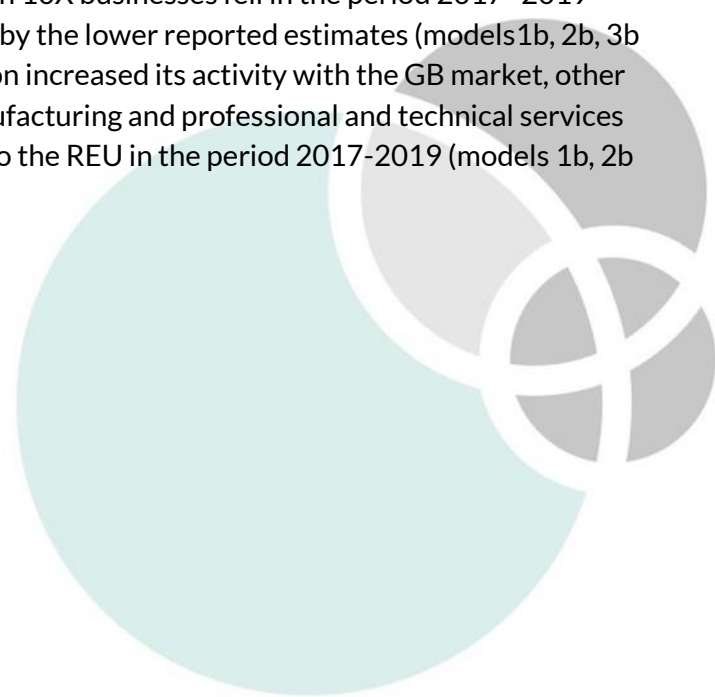


Table 2: Determinants of trading behaviour, 2014-2020

<i>Total sales to:</i>	GB (%)		ROI (%)		REU (%)		ROW (%)	
Model	1a	1b	2a	2b	3a	3b	4a	4b
Observations	41,020	35,288	41,020	35,288	41,020	35,288	41,020	35,288
Number of businesses	14,533	13,561	14,533	13,561	14,533	13,561	14,533	13,561
<i>Sector (Base- Other services) ‡</i>								
Non-10X	<i>Full period</i>	<i>Pre-EU exit</i>	<i>Full period</i>	<i>Pre-EU exit</i>	<i>Full period</i>	<i>Pre-EU exit</i>	<i>Full period</i>	<i>Pre-EU exit</i>
Other production	-1.05	-1.70	-0.19	-0.56	1.25***	0.35	-0.06	-0.07
Manufacturing	6.72***	6.97***	2.42***	2.05***	0.15	0.04	0.25	-0.06
Construction	1.37**	0.68	0.45	0.18	-0.58***	-0.54**	-0.45*	-0.28
Wholesale and retail	-0.72	-1.11*	1.40***	1.17***	-0.24	-0.41*	-0.25	-0.19
Professional and technical	4.82***	4.61***	1.11***	0.81**	0.45**	0.41	0.82***	1.04***
10X								
Agri-tech	6.07***	4.66***	4.74***	5.23***	0.90**	1.23***	-1.24**	-1.62***
Health and life sciences	0.86	3.72	0.56	2.46	6.16***	6.97***	17.27***	19.29***
Advanced manufacturing	9.97***	12.80***	1.09**	0.76	3.25***	4.01***	8.04***	9.74***
Software and screen	12.34***	11.85***	3.74***	4.45***	0.94**	1.12***	9.63***	9.17***
Non-10X	<i>Post-EU exit</i>		<i>Post-EU exit</i>		<i>Post-EU exit</i>		<i>Post-EU exit</i>	
Other services	N/A	-0.01	N/A	0.14	N/A	-0.08	N/A	0.04
Other production	N/A	1.99***	N/A	0.74*	N/A	1.55***	N/A	0.07
Manufacturing	N/A	0.56	N/A	0.72***	N/A	0.49***	N/A	-0.16
Construction	N/A	1.27**	N/A	0.31	N/A	-0.11	N/A	-0.40*
Wholesale and retail	N/A	0.01	N/A	0.15	N/A	0.23	N/A	0.07
Professional and technical	N/A	0.95*	N/A	0.50	N/A	0.60***	N/A	-0.11
10X								
Agri-tech	N/A	2.63***	N/A	0.00	N/A	-0.13	N/A	0.14
Health and life sciences	N/A	-1.60	N/A	-3.14***	N/A	1.72***	N/A	3.33***
Advanced manufacturing	N/A	-2.22***	N/A	-0.67*	N/A	-0.48***	N/A	1.83***
Software and screen	N/A	1.57*	N/A	-1.43***	N/A	-0.22	N/A	2.62***
Control variables								
<i>Location (Base- Belfast) ‡</i>								
Antrim and Newtownabbey	2.90***	2.59***	-0.45	-0.26	-0.01	0.13	-0.91***	-0.80**
North Down and East Antrim	1.73***	2.45***	-0.23	-0.18	-0.13	-0.05	-0.43	-0.44
Lisburn and Castlereagh	1.16	1.60*	0.47	0.57	0.00	0.09	-1.06***	-1.19***
South Down and Armagh	0.22	0.66	2.43***	2.67***	0.42**	0.50**	-1.01***	-1.04***
Causeway Coast and Glens	0.47	0.79	-0.16	-0.06	-0.20	-0.13	-0.66*	-0.70*
Derry and Strabane	-0.18	-0.35	1.77***	1.94***	-0.09	-0.03	-0.22	-0.05
Fermanagh and Mid-Ulster	1.10*	1.63**	1.28***	1.40***	-0.18	-0.17	-1.41***	-1.47***
<i>Legal status (Base- companies)</i>								

Sole proprietor	6.08***	6.68***	1.33***	1.58***	0.61***	0.61***	0.57**	0.64**
Partnership / ltd partnership	-1.88**	-2.28***	0.06	0.24	0.24	0.22	0.08	0.03
<i>Other control variables</i>								
Goods	-0.19	-0.36	-0.35**	-0.25	0.00	-0.14	0.22*	0.26*
Subsidies	0.15***	0.40***	0.06*	0.04	0.01	0.05*	0.09***	0.21***
Size (Sine total employees)	-2.34***	-2.38***	-0.05	-0.03	-0.64***	-0.70***	-0.88***	-1.06***
Size squared	0.32***	0.32***	-0.07**	-0.08**	0.09***	0.10***	0.17***	0.19***
Year	Yes	N/A	Yes	N/A	Yes	N/A	Yes	N/A
Constant	5.18***	5.18***	-0.34	-0.59	0.53*	0.63*	1.22***	1.46***

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Data for 2020 is removed from Models 1b, 2b, 3b and 4b. ‡ This variable has a number of 'unknown' – results not reported in this table.

Why it matters

Our findings suggest that a targeted approach focusing on 10X sectors could benefit the Northern Ireland economy as these sectors are most active in external markets. External sales (including exports) are recognised as important to developing the small regional Northern Ireland economy, and the recent growth trajectory of 10X sectors may point to a resilience and diversification benefit which results from greater emphasis on external sales.

What next?

Studies could examine:

- (1) The impact of the EU Exit on these trading patterns (our data only spans the EU Exit decision (2016): the Northern Ireland Protocol checks came into force in 2021).
- (2) Economics of scale across sectors. The regression results highlight a U-shaped relationship between size and sales to the external markets.
- (3) Whether regional trade patterns change because of the EU Exit. The regressions show that the border regions have significantly more trade with the Republic of Ireland, relative to Belfast.
- (4) As far as data allows, consideration at the level of significant individual country markets: notably the USA.

References

1. Department for the Economy (2021a) 10X economy: Northern Ireland's decade of innovation. Available from: <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/10x-economy-ni-decadeinnovation.pdf>
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3. ONS (2022) Regional GVA (balanced) by industry: ALL ITL Regions DATASET, Office for National Statistics. Available from: <https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry> [accessed 31 March 2023].

Acknowledgements

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