

Graduate Employment and Training in Northern Ireland SME's: An Overview using the 2000 Labour Force Survey

By

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Abstract

Using the UK Labour Force Survey, this paper considers whether graduate employment is relatively more important in the Small and Medium Size Enterprise sector in Northern Ireland, when compared to other regions of the UK. We disaggregate our analysis by gender, occupation and industry to provide a more detailed breakdown. The issue of whether graduates are more or less likely to receive on-the-job training is also considered, both by comparison with non-graduates (matched by industry and occupation groups) and graduates in other UK regions. Lastly, given that company size, firm location, industry and occupation groups are all related to the proportion of graduates employed in the labour market, we use a multivariate approach to try to disentangle the extent to which there are differences associated with graduate employment in the Northern Ireland SME sector (having controlled for other factors). The policy implications for graduate employment are considered based on our findings.

Keywords

Graduate employment, Training, SMEs, Northern Ireland

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1. Introduction

Small-to-medium sized enterprises (SME's) have become the focus of attention in recent years for their potential contributions to employment, innovations (i.e., the role of SMEs as 'initiators and catalysts' – see Roper (1997) and Hoffman *et al* ,1998), and new firm formations. For example, Keeble (1997) estimated that between 1987 and 1991 SMEs accounted for 94 per cent of the net employment growth in the UK. Keeble (op.cit.) argues that SMEs are also of interest because of their prominence with regard to government industrial policy that attempts to focus on companies that are more likely to grow. In a recent study of West German firms Almus and Nerlinger (2000) concluded that 'small firms seem to possess higher growth potentials than large ones regardless of whether firms from technology intensive or non-technology intensive branches are analysed' (p.10).

The importance of 'human capital' and the labour market in general to the small firm has received less attention. In particular, it might be expected that graduates have a potentially important impact on small firm productivity and growth, especially (as noted by Belfield, 1999) since "higher education is in part a "training of the mind"... and so graduates might be most productive in organisations where autonomy, independence, and flexibility are prized" (p. 249). However, it is well known that graduates are more likely to be recruited by the largest companies (Williams and Owen, 1997), which suggests that SME's are inefficiently under-utilising an importance resource that may enhance their competitive position and performance.

The reason why SME's may under-recruit graduates has been considered in some detail by Belfield (1999) and Westhead, Storey and Martin (2000). Belfield (op. cit.) presents evidence that shows that SME's pay less than larger companies (even

after controlling for other relevant factors such as sector and occupation mix), and graduates perceive this to be the case, and therefore are less likely to seek employment. Also, graduates often are particularly keen to obtain on-the-job training and thus enhance their career prospects, and Belfield finds that not only do smaller firms offer less training opportunities but graduates (correctly) also perceive this to be the case. This is likely to be an important factor explaining why relatively fewer graduates search for jobs in SME's. Moreover, employers have preconceived ideas about graduates (cf. Johnson and Pere-Verge, 1993), such as whether graduates are suitable, too expensive, lacking in transferable skills and knowledge, and inflexible. Thus, perceptions on both sides of the employment relation are marked by ignorance and inflexibility (Westhead, Storey and Martin provide a more detailed discussion of such issues).

Northern Ireland tends to have relatively fewer SME's than other UK regions, and a lower level of new firm formation (and innovation). Thus, it is of interest to consider if graduate employment is relatively truncated as well, and thus whether government policy should seek to redress any imbalances pertaining to the province.

Hence, the purpose of this paper is to provide an overview (using the UK Labour Force Survey) of graduate employment in the SME sector in Northern Ireland, comparing the situation with other regions of the UK. We disaggregate our analysis by gender, occupation and industry to provide a more detailed breakdown. Given its importance (see above), the issue of whether graduates are more or less likely to receive on-the-job training is also considered, both by comparison with non-graduates (matched by industry and occupation groups) and graduates in other UK regions. Lastly, given that company size, firm location, industry and occupation groups are all related to the proportion of graduates employed in the labour market, we use a

multivariate approach to try to disentangle the extent to which there are differences associated with graduate employment in the Northern Ireland SME sector (having controlled for other factors). The policy implications for graduate employment are considered based on our findings.

2. Graduate Employment in Northern Ireland

We make use of the December 2000 - February 2001 Labour Force Survey for the UK collected by the ONS. Data are weighted to ensure they are nationally representative. Information is available on a range of variables, *inter alia* including whether an individual has a degree, whether they received any training in the 3 month period preceding the date they were interviewed for the LFS,¹ the size of company they worked for (or their employment status if not working), region of residence, occupation and industry.

Table 1 summarises the percentage of the labour force that held university (or equivalent) degrees in the year 2000. Overall, some 9½ per cent of the labour force had degrees or equivalent, with nearly 12 per cent of males being graduates (7.3 per cent of females). Relatively more *employed* males have degrees (16.3 per cent compared to 11.8 per cent for females), but self-employed women are relatively more likely to be graduates (16.7 per cent as opposed to 14.5 per cent of self-employed men).

In terms of location, London and the South East of England labour markets have the largest proportions of graduates, but this in part reflects the differing occupational and industry mix in this part of the UK. Compared to the UK average, a lower proportion of males in Northern Ireland have degrees across all categories of

the labour force (e.g., 10½ per cent of self-employed in the province are graduates compared to 14.5 per cent of UK self-employed males). In contrast, females in Northern Ireland are more (or just as) likely to have degrees compared to the UK averages for women (the exception being self-employed women). However, Northern Ireland does generally better than Wales, the conurbations and (for females) the rest of England, in terms of the relative use of graduates in the labour force.

Table 1: Percentage of Labour Force who have a Degree, UK 2000

Gender & region	Employed	Self-employed	Unemployed	Inactive	Other	All
<i>Males</i>						
London & SE	21.7	19.0	10.7	3.8	10.2	16.1
Northern Ireland	13.6	10.5	6.4	2.8	7.2	9.3
Conurbations ^a	12.9	13.0	6.4	2.8	2.1	9.1
Rest of England	14.2	11.6	7.5	2.9	4.2	10.4
Wales	13.4	8.8	8.3	2.3	6.0	8.9
Rest of Scotland	16.3	15.9	10.4	3.1	0.0	12.5
Total	16.3	14.5	8.3	3.1	5.3	11.9
<i>Females</i>						
London & SE	15.1	24.6	10.2	2.6	5.6	9.8
Northern Ireland	12.5	4.1	8.8	2.2	7.4	6.9
Conurbations	10.4	14.4	5.9	1.5	5.7	6.0
Rest of England	10.0	10.7	9.0	1.9	6.0	6.3
Wales	8.4	10.6	6.6	1.2	0.0	4.7
Rest of Scotland	10.9	22.1	8.5	3.3	3.7	7.8
Total	11.8	16.7	8.5	2.1	5.5	7.3
<i>All</i>						
London & SE	18.6	20.4	10.5	3.0	8.1	12.9
Northern Ireland	13.1	9.5	7.2	2.4	7.3	8.1
Conurbations	11.7	13.3	6.2	2.0	3.5	7.5
Rest of England	12.2	11.4	8.0	2.3	5.1	8.3
Wales	11.0	9.3	7.7	1.6	3.5	6.7
Rest of Scotland	13.8	17.7	9.7	3.2	2.1	10.1
Total	14.1	15.0	8.4	2.4	5.3	9.5

^a Tyne & Wear; South & West Yorkshire; West Midlands; Greater Manchester; Merseyside and Strathclyde. Source: UK Labour Force Survey

¹ The exact wording is: “in the 3 months since beginning [date] have you taken part in any education or any training connected with your job, or a job that you might be able to do in the future?”

Turning to graduate employment by firm size, Table 2 concentrates on just that proportion of the labour force that is employed (data column 1 in Table 1) and for which there is information on company size. Firstly, Table 2 confirms that the relative importance of graduate employment increases with company size (e.g. 9.6 per cent of UK males working in firms employing 1 – 10 workers are graduates; this rises to 19.9 per cent for firms employing 50 or more).

Table 2: Percentage of Employees with a degree by Firm-size, UK 2000

	Employment Size-band					Total
	1 to 10	11 to 19	20 to 24	25 to 49	50 or more	
<i>Males</i>						
London & SE	11.7	14.7	14.3	19.6	26.6	21.8
Northern Ireland	5.2	6.7	14.1	15.2	17.2	13.9
Conurbations ^a	8.2	9.3	7.8	9.3	15.6	12.9
Rest of England	9.1	9.2	9.3	12.4	17.1	14.2
Wales	6.8	4.2	6.4	11.0	17.7	13.4
Rest of Scotland	9.7	9.6	15.5	11.6	20.8	16.3
Total	9.6	10.6	10.9	14.0	19.9	16.4
<i>Females</i>						
London & SE	8.7	11.1	11.5	17.6	18.3	15.2
Northern Ireland	5.0	18.8	12.6	16.1	13.8	12.6
Conurbations	5.7	9.3	10.0	12.2	12.1	10.5
Rest of England	4.9	9.6	9.0	10.1	12.6	10.0
Wales	1.9	7.4	7.7	10.1	11.8	8.3
Rest of Scotland	4.8	7.0	11.7	13.0	14.4	10.9
Total	6.1	9.9	10.1	13.3	14.4	11.8
<i>All</i>						
London & SE	10.1	12.7	13.0	18.6	22.9	18.6
Northern Ireland	5.0	13.3	13.4	15.6	15.7	13.2
Conurbations	6.8	9.3	8.9	10.7	14.1	11.7
Rest of England	6.8	9.4	9.1	11.3	15.2	12.2
Wales	3.9	5.9	7.0	10.5	15.3	11.0
Rest of Scotland	7.1	8.3	13.8	12.2	18.0	13.8
Total	7.6	10.3	10.5	13.7	17.5	14.2

Source: UK Labour Force Survey

Concentrating on differences between Northern Ireland and other regions, male employees in the smallest firms (employing less than 20) in the province are

relatively less likely to be graduates compared to similar-sized companies in other regions of the UK. In contrast, firms in the 20 – 49 size-bands have relatively higher proportions of graduates, while in the 50+ size-band the proportion of graduates is fairly comparable for males *vis a vis* other areas of the UK.

The percentage of females in Northern Ireland who are graduates, employed in firms of various sizes, is relatively high when compared to other regions, especially for the 11 – 49 size-bands. Thus overall, there is some evidence that male graduates are under-utilised (when compared to other areas of the UK) in the smallest firms in the province but in general graduate employment levels are fairly comparable to other areas (excluding the SE of England).

Turning to whether graduates also receive on-the-job training, the LFS shows that overall some 25.9 per cent of the UK employed work-force were involved in training in the 3 months prior to the survey date. Thus graduates (who overall account for some 14 per cent of employees) are relatively more likely to receive training (i.e., about 40 per cent of graduates in the UK received training², significantly higher than the overall UK average of 25.9 per cent of all graduate and non-graduate employees). When data are considered by company size-band then a comparison of Table 2 and Table 3 reveals that male and female graduate employees in the smallest companies are less likely to receive training compared to those working in the largest companies (e.g., 28 per cent of graduate males in the 1 – 10 size-band received training compared to around 40 per cent in the 50+ size-band).

Table 3 also shows that graduates in Northern Ireland are relatively less likely to receive on-the-job training in almost all size-bands, irrespective of gender. The

² That is, 5.7 per cent of employees were both graduates and received training; and this is 40 per cent of the 14.2 per cent of UK employees who are graduates.

percentages in the smallest firm sub-groups are particularly low (mostly less than 2 per cent of employees are both graduates and in receipt of training).

Table 3: Percentage of Employees with a degree and who receive on-the-job training by Firm-size, UK 2000

	Employment Size-band					Total
	1 to 10	11 to 19	20 to 24	25 to 49	50 or more	
<i>Males</i>						
London & SE	3.1	5.0	4.9	7.0	11.1	8.5
Northern Ireland	1.3	0.0	6.5	4.5	4.7	3.8
Conurbations ^a	2.7	2.8	2.9	3.4	6.2	4.9
Rest of England	2.5	4.0	2.7	4.6	6.8	5.4
Wales	1.1	2.5	4.1	6.4	5.5	4.5
Rest of Scotland	3.4	3.7	7.2	4.4	7.0	5.8
Total	2.7	3.9	3.9	5.2	7.9	6.2
<i>Females</i>						
London & SE	3.9	5.1	5.0	8.5	7.8	6.7
Northern Ireland	0.5	2.0	2.7	7.9	4.8	3.8
Conurbations	1.9	4.7	4.9	5.9	6.2	5.1
Rest of England	1.9	3.8	4.9	4.1	5.7	4.4
Wales	0.7	3.4	6.5	6.3	5.4	4.2
Rest of Scotland	0.8	2.7	3.3	2.6	5.8	3.7
Total	2.3	4.3	4.9	6.1	6.5	5.2
<i>All</i>						
London & SE	3.5	5.1	5.0	7.8	9.6	7.6
Northern Ireland	0.8	1.1	4.5	6.1	4.7	3.8
Conurbations	2.2	3.9	3.9	4.7	6.2	5.0
Rest of England	2.2	3.9	3.8	4.4	6.4	4.9
Wales	0.8	3.0	5.3	6.3	5.4	4.4
Rest of Scotland	2.0	3.2	5.4	3.6	6.5	4.8
Total	2.5	4.1	4.4	5.6	7.3	5.7

Source: UK Labour Force Survey

Tables 4 and 5 breakdown the information on graduates and on-the-job-training by occupation and industry sub-groups, and by whether an employee worked in a small company (employing up to 50 workers) or a larger company (employing 50+ workers). Only employees in Northern Ireland are considered. Table 4 shows that for both males and females, graduates are concentrated in a small number of socio-economic occupation groups, namely employers and managers, professional

Table 4: Percentage of Employees in Northern Ireland with a degree and who receive on-the-job training by Firm-size and occupation, UK 2000

Gender & occupation	50+ employees		<50 employees		Total	
	% graduate	% graduate and training	% graduate	% graduate and training	% graduate	% graduate and training
<i>Males</i>						
Employers & managers	33.8	5.9	11.0	2.1	19.1	3.4
Prof. Workers	69.8	26.4	63.4	20.0	66.6	23.0
Other non-manual	24.1	6.9	10.8	2.5	18.1	4.9
Skilled/semi-skilled manual	1.6	0.5	0.6	0.0	1.2	0.3
Unskilled manual	0.0	0.0	0.0	0.0	0.0	0.0
All	17.5	4.7	10.6	2.5	14.1	3.6
<i>Females</i>						
Employers & managers	40.6	11.9	18.2	4.6	36.1	7.9
Prof. Workers	71.8	11.6	71.5	23.3	70.4	21.2
Other non-manual	11.8	5.3	10.1	2.3	16.4	5.9
Skilled/semi-skilled manual	0.0	0.0	1.9	1.9	1.2	0.4
Unskilled manual	0.0	0.0	0.0	0.0	0.0	0.0
All	13.8	4.8	10.7	2.8	15.8	4.8
<i>Total</i>						
Employers & managers	36.1	7.9	13.2	2.8	21.6	4.7
Prof. Workers	70.4	21.2	65.3	20.8	68.0	21.0
Other non-manual	16.4	5.9	10.3	2.4	13.1	4.0
Skilled/semi-skilled manual	1.2	0.4	1.0	0.5	1.1	0.4
Unskilled manual	0.0	0.0	0.0	0.0	0.0	0.0
All	15.8	4.8	10.7	2.7	13.1	3.7

Source: UK Labour Force Survey

Table 5: Percentage of Employees in Northern Ireland with a degree and who receive on-the-job training by Firm-size and industry, UK 2000

Gender & occupation	50+ employees		<50 employees		Total	
	% graduate	% graduate and training	% graduate	% graduate and training	% graduate	% graduate and training
<i>Males</i>						
Agriculture & Utilities	5.7	0.0	3.7	0.0	4.3	0.0
Manufacturing	7.5	2.6	1.8	0.0	6.3	2.1
Distribution, Hotels & Catering, Repairs	4.1	0.0	7.8	0.8	6.9	0.6
Transport, Communication & Financial services	15.1	0.0	10.9	6.3	12.8	3.4
Other Services	34.6	10.7	25.9	6.2	31.1	8.9
All	16.8	4.6	10.7	2.4	13.8	3.5
<i>Females</i>						
Agriculture & Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	2.4	1.2	4.7	0.0	2.9	1.0
Distribution, Hotels & Catering, Repairs	2.1	0.0	2.0	0.8	2.0	0.6
Transport, Communication & Financial services	3.7	0.0	16.4	1.8	12.3	1.2
Other Services	20.7	7.3	17.0	4.6	18.9	6.0
All	13.8	4.8	10.9	2.7	12.2	3.7
<i>Total</i>						
Agriculture & Utilities	5.1	0.0	3.2	0.0	3.7	0.0
Manufacturing	6.0	2.2	2.6	0.0	5.3	1.8
Distribution, Hotels & Catering, Repairs	3.1	0.0	4.8	0.8	4.4	0.6
Transport, Communication & Financial services	11.0	0.0	13.6	4.1	12.6	2.5
Other Services	26.2	8.7	19.8	5.1	23.3	7.0
All	15.5	4.7	10.8	2.6	13.1	3.6

Source: UK Labour Force Survey

workers and other non-manual grades. Overall, there are relatively fewer numbers of graduate men in smaller companies (10.6 per cent *vis a vis* 17.5 per cent), and only some 23.6 per cent of male graduates working in companies employing less than 50 received training (nearly 27 per cent of male graduates working in firms employing 50+ received training). Comparing these overall results with those for professional male workers, there are relatively fewer graduate professional males employed in smaller companies (63.4 as opposed to 69.8 per cent in larger firms), and 31.5 per cent of these graduates received training (compared to 37.8 per cent of male professional workers employed in companies with 50+ employees). Male graduate presence in the employers and managers occupation group is particularly low for smaller companies (11 per cent compared to 33.8 per cent for larger companies), and training for male graduates in this occupation category is relatively low (less than 18 per cent of male graduate employers and managers received training).

For female graduates in Northern Ireland, there is less of a difference between small and larger companies in terms of the percentage of employees that held degrees (the difference is around 3 per cent). The difference in the proportion of female graduates that received on-the-job-training when considering firm size is important: some 26 and 35 per cent, respectively, received training in small and large companies. Moreover, while female workers in the professional workers sub-group are much more likely to be graduates, only 16 per cent of those that work in companies employing 50+ workers received training (compared to nearly 33 per cent of female graduate professional workers employed in smaller firms). In contrast, relative training provision was much lower in small companies for female graduates belonging to the 'other non-manual' sub-group. Clearly larger firms in Northern Ireland employ fewer female graduates than male graduates but aside from

professional workers they tend to train them more (in relative terms). There is much less difference exhibited for small companies employing less than 50 workers.

Table 5 looks at the Northern Ireland data by industry group, using the same breakdown as in Table 4. Clearly graduates are concentrated in the ‘other services’ industry group dominated by public services like health, education and public administration. Relatively few numbers of graduates are employed in other industry groups (such as manufacturing, distribution, agriculture and utilities), and even fewer receive training. Graduate employment in larger companies is relatively higher for males (and to a much lesser extent females) in the other services sector, and the proportion of graduates that receive training is also higher in larger companies (some 30.9 per cent of males in this industry receive training if they work in companies employing 50+ workers, compared to 23.9 per cent for smaller companies – a similar difference is apparent for female graduates also).

3. The Determinants of Graduate Employment

Since industry, occupation, company size, location, and gender are all important factors in determining the extent to which graduates are recruited into the workforce, it is necessary to control for other influences when considering if being located in a Northern Ireland SME makes a difference to the demand for graduates. Thus, we estimated a logistic regression (given that the dependent variable, graduate, takes on a value of 1 if true and 0 if not) using data on individuals which included dummy variables for each 2-digit industry group, each socio-economic occupation group, gender, ethnicity, region of residence, and whether the firm in which an individual worked employed 50+ workers or less (we created a variable called SME to represent this dichotomy). In addition to adding these variables, we also allowed SME to enter

Table 6 Weighted Logit Model of the Demand for Graduate Employees in UK, 2000

Dependent variable: graduate	$\hat{\beta}$	z-statistic	$(\partial y / \partial x)$	z-statistic
<i>Independent variables</i>				
Female	-0.518	-16.07	-0.028	-15.57
Black ethnic	-0.292	-2.30	-0.014	-2.61
<u>Industry</u>				
Oil/gas extraction	0.821	3.02	0.064	2.21
Printing & publishing	0.816	7.52	0.063	5.56
Fuel manufacture	1.273	5.69	0.121	3.70
Chemicals	1.042	9.64	0.089	6.66
Rubber/plastics	-0.401	-1.75	-0.018	-2.11
Basic metals	-0.460	-1.79	-0.021	-2.21
Office machinery	0.966	6.10	0.080	4.29
Electrical machinery	0.551	3.53	0.038	2.84
Precision instruments	0.882	5.46	0.071	3.93
Telecommunications	0.477	4.01	0.032	3.32
Financial intermediaries	0.667	8.15	0.048	6.34
Insurance, pensions	0.672	3.90	0.049	3.00
Other financial	0.637	6.31	0.046	4.93
Real estate	0.934	8.33	0.076	5.93
Computer related	1.354	13.21	0.132	8.46
R&D	1.344	6.96	0.132	4.45
Other business	1.157	14.28	0.100	9.75
Public admin/defence	0.775	12.35	0.057	9.43
Education	2.455	41.89	0.320	24.29
Health, social work	0.589	9.11	0.039	7.52
Sanitation	1.300	4.81	0.125	3.11
Membership organisations	1.248	9.58	0.117	6.29
Recreation/culture/sport	1.152	13.13	0.102	8.90
Extra-territorial	-2.120	-2.02	-0.050	-6.53
SME*Radio equip.	1.063	2.45	0.058	2.45
SME*Motor manufacture	-0.574	-0.92	-0.031	-0.92
SME*Other transport	0.913	2.54	0.050	2.54
SME*R&D	0.827	2.05	0.045	2.05
SME*Other business	0.186	1.75	0.010	1.75
SME*Public admin/defence	0.349	2.79	0.019	2.79
SME* Health/social work	0.545	5.87	0.030	5.86
SME * Sanitation	-2.132	-2.68	-0.116	-2.68
<u>Socio-Economic Group</u>				
Employers (small est.)	-0.426	-6.83	-0.020	-7.90
Self-employed professionals	2.661	17.01	0.406	10.37
Employed professionals	1.463	29.65	0.143	17.92
Intermediate non-manual	-0.412	-8.90	-0.020	-9.93
Junior non-manual	-1.505	-29.76	-0.058	-32.35
Personal service workers	-2.948	-23.98	-0.064	-40.52
				Cont.
Foreman/supervisors	-3.135	-18.24	-0.062	-40.4
Skilled manual	-3.312	-19.61	-0.075	-37.68
Semi-skilled manual	-3.286	-21.32	-0.076	-38.79

Unskilled manual	-4.059	-13.24	-0.068	-36.91
Farmers	-0.857	-2.80	-0.032	-4.24
Agricultural workers	-2.407	-6.21	-0.053	-21.05
Armed forces	-1.263	-6.51	-0.041	-11.99
SME * Intermediate non-manual	0.126	1.75	0.007	1.75
SME * Skilled manual	0.545	2.16	0.030	2.16
SME * Semi-skilled manual	0.501	2.22	0.027	2.23
SME * Unskilled manual	0.773	1.98	0.042	1.98
<u>Region</u>				
Rest Northern	-0.294	-2.49	-0.014	-2.81
Inner London	1.028	12.37	0.086	8.58
Outer London	0.423	6.60	0.027	5.63
SME * Rest of Northern	-0.270	-1.49	-0.015	-1.49
SME * South Yorkshire	-0.532	-2.91	-0.029	-2.91
SME * West Yorkshire	-0.546	-4.07	-0.030	-4.07
SME * Rest Yorks/Humberside	-0.506	-3.51	-0.027	-3.51
SME * East Midlands	-0.542	-5.38	-0.029	-5.38
SME * East Anglia	-0.586	-4.52	-0.032	-4.52
SME * Inner London	-0.473	-3.66	-0.026	-3.65
SME * Outer London	-0.608	-5.71	-0.033	-5.69
SME * Rest of SE	-0.409	-6.16	-0.022	-6.16
SME * South West	-0.440	-4.89	-0.024	-4.89
SME * West Midlands met. County	-0.459	-3.66	-0.025	-3.66
SME * Rest of West Midlands	-0.583	-4.74	-0.032	-4.74
SME * Greater Manchester	-0.535	-4.35	-0.029	-4.35
SME * Merseyside	-0.413	-2.41	-0.022	-2.41
SME * Rest of North West	-0.388	-3.19	-0.021	-3.19
SME * Wales	-0.813	-6.35	-0.044	-6.34
SME * Strathclyde	-0.462	-3.45	-0.025	-3.45
SME * Rest of Scotland	-0.281	-2.70	-0.015	-2.70
SME * Northern Ireland	-0.362	-2.92	-0.020	-2.92
Constant	-0.989	-17.95		

N=61,203

Log likelihood=-16608.392

Pseudo R² = 0.32

% correct predictions=89.1%

$\hat{p} = 0.057$

multiplied by all the other variables since we expect that smaller companies operate differently with respect to hiring graduates, and including these slope dummies will allow us to test for the separate impact of SME's. Finally, we allowed all the variables to enter once again multiplied by SME *and* a dummy for Northern Ireland, in order to test if SME's in the province act differently to SME's located in other regions. In

total, some 242 right-hand-side independent variables were allowed to enter the model estimated, and a stepwise procedure was used to reduce the model to just those variables that were statistically significant. Table 6 presents the final model obtained (estimation was undertaken using STATA 7.0 and over 61,000 observations weighted to ensure the results are nationally representative), with the diagnostic tests reported at the end showing that 89 per cent of individuals are correctly classified by the model (the pseudo R^2 value is 0.32, which is high for this type of data).

The first column of results are the parameter estimates of the logit model, with the test of the null that these are statistically equal to zero reported in column 2 (standard normal test statistics). All coefficients reported are highly significant. The results from the logit model are more easily interpreted by calculating the marginal effects ($\partial y / \partial x$) which indicate the increase in the demand for a graduate (i.e. the variable graduate moving from a 0 to a 1) as each independent variable changes (e.g. move from a male to a female worker). Thus, females (*ceteris paribus*) have a 2.8 per cent less likelihood of being graduates (*vis a vis* males) when all other factors (such as occupation, industry, location) are controlled for.

The results presented show that in addition to females being less likely to be graduates, the ethnic sub-group 'black' also has a 1.4 per cent lower probability of being a graduate (compared to other ethnic groups). Certain industries have a very important influence; for example, working in the fuel manufacturing sector increases (*cet. par.*) the probability of employing a graduate by over 12 per cent (compared to those industrial sectors not listed in Table 6, which act as the benchmark). Industrial sectors such as precision instruments, computer-related services, R&D, and other business services also are more likely (by 7.1, 13.2, 13.2, and 10 per cent, respectively) to employ graduates. Working in the education sector (*vis a vis* the

benchmark industries) raises the probability of being a graduate by some 32 per cent. Sanitation workers, those who work for ‘membership organisations’, and recreation, culture and sport industries are all significantly more likely to employ graduates.

As to the separate impact of industry mix *and* working in a small company, the terms “SME × industry group” indicate whether there is an additional effect. Thus, we find that not only does working in the R&D and other business services sectors increase the demand for graduates, but working in a smaller company in these industries has an additional effect of increasing the probability of being a graduate by 4.5 and 1 per cent, respectively. Generally, for those industries listed where there is an additional industry effect associated with working in a small company, the SME impact is positive (SME’s in motor manufacturing and sanitation are the exceptions³).

The socio-economic occupation group of an individual has a major impact on the probability of whether they are likely to be a graduate. Employers and managers in small companies are 2 per cent less likely to be graduates (*vis a vis* the benchmark group: managers and employers in larger establishments), having controlled for other influences. Self-employed (and employed) professionals are 40.6 per cent (14.3 per cent) more likely to be graduates. All other occupation groups (particularly manual) are less likely to be graduates. However it is interesting to note that in small companies there is a positive association with manual occupations (e.g., being a unskilled manual worker, *cet. par.*, lowers the probability of being a graduate by 6.8 per cent, but being skilled *and* working in a small company results in a lower likelihood of being a graduate of 2.6 per cent).

³ Thus, being employed in the sanitation sector increases the probability of being a graduate by 12.5 per cent, although if the worker was also in a small company (employing less than 50 workers) the impact of working in the industry on the demand for graduates is much lower ($12.5 - 11.6 = 0.9$ per cent additional demand).

In terms of location, working in the rest of the Northern region (outside the Tyneside conurbation) results in a lower probability of being a graduate by 1.4 per cent, while working in London significantly increases the chances of being a graduate. The other location effects are all linked to SME's in the regions. In general, belonging to a small company employing less than 50 has a negative impact on the probability of being a graduate.

Thus, these results show that working in a small company lowers the demand for graduates, but we also find that there are two instances that mitigate against this overall conclusion: (i) manual workers in smaller companies tend to have a smaller negative probability of being a graduate; and (ii) there is a relatively higher demand for graduates in certain industries if the company is small, especially in industries which already have a relatively high demand for graduates (e.g. the R&D and other business services sectors).

Lastly, we find no significant evidence that the demand for graduates in SME's in Northern Ireland is any lower than for other parts of the UK, having controlled for occupation, gender, and industry mix.

3. Summary and Conclusions

This paper provides evidence (from the UK Labour Force Survey for 2000) on the use of graduates in the Northern Ireland labour force, concentrating on whether there is a difference by company size, and comparing the results with other UK regions. Given the potential importance of graduates in terms of the 'human capital' they can bring to businesses, and thus their potential impact on growth, productivity and entrepreneurship in general, this is an important topic.

The major conclusions reached are that (in terms of the raw data, unadjusted for occupation and industry mix): Northern Ireland males do seem less likely to be graduates (*vis a vis* other regions) across various sub-groups in the labour force (such as employed, self-employed and unemployed). However, the differential is significantly smaller if London and the South East are excluded from any comparisons. Females in the Northern Ireland labour market seem equally as likely to be graduates when compared to other UK regions. We found that graduate employment in smaller companies is lower, especially in Northern Ireland (particularly when we consider males in the smallest companies), and we also found the expected concentration of graduates in certain industries and occupations (non-manual occupations, especially professionals, and those employed in the education and health industries). However, using multivariate regression techniques, we find no significant evidence that the demand for graduates in SME's in Northern Ireland is any lower than for other parts of the UK, having controlled for occupation, gender, and industry mix. Thus there is little justification for a specific (or rather separate) policy for Northern Ireland to mitigate against the impact of SME's on graduate demand. This is a national (and indeed international) 'problem' that would benefit from a national approach to redress the imbalances that exist.

This study also presented data from the LFS on the proportion of graduates that received on-the-job training. Based only on the raw data (sub-divided by gender and company-size, as well as location), there is evidence that employees in the smallest companies are less likely to receive training, and that this may indeed be more of a problem in Northern Ireland (compared to other parts of the UK), especially for male workers. This is clearly an area for further research which, if this research finds that workers in Northern Ireland do receive less training, could result in a need

to consider a separate Northern Ireland government response based on the need to change local labour market aspirations and conditions.

References

- Almus, M. and E. A. Nerlinger, 2000, 'Testing 'Gibrat's Law' for Young Firms – Empirical Results for West Germany', *Small Business Economics*, **15**, pp.1-12.
- Belfield, C.R., 1999, 'The behaviour of graduates in the SME labour market: evidence and perceptions', *Small Business Economics*, **12**, pp. 249-259.
- Hoffman, K, M. Parejo, J. Bessant and L. Perren, 1998, 'Small firms, R&D, technology and innovation in the UK: a literature review', *Technovation*, **18** (1), pp. 39-55.
- Johnson, D. and L. Pere-Verge, 1993, Attitudes towards graduate employment in the SME sector, *International Small Business Journal*, **11**, pp. 65-70.
- Keeble, D., 1997, 'Small firms, innovation and regional development in Britain in the 1990s', *Regional Studies*, **31** (3), pp. 281-293.
- Roper, S., 1997, 'Product innovation and Small Business Growth: A Comparison of the Strategies of German, UK and Irish Companies', *Small Business Economics*, **9**, pp.523-537.
- Westhead, P., D.J. Storey and F. Martin, 2000, 'The Shell technology enterprise programme: student outcomes', *Education and Training*, **42** (4/5), pp. 272-281.
- Williams, H., and G. Owen, 1997, 'Recruitment and utilisation of graduates by small and medium-sized enterprises', Department for Education and Employment Research Report RR29, HMSO, Norwich.