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The Returns to Higher Education in Wales: Evidence from the Labour Force Survey

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Interest in the financial rewards of gaining a higher education qualification has risen substantially since the publication earlier this year of the white paper *The Future of Higher Education* (DfES 2003). The paper highlighted that on average graduates earn around 50% more than non-graduates, and tend to have a wider range of career opportunities. The paper further suggested that students currently only contribute about a quarter of the average cost of a higher education course.

The disparity between the cost and benefit of attending university is addressed by the proposed introduction of variable (top-up) fees, thus increasing the contribution made by students towards the cost of higher

education courses. Top-up fees are likely to reflect the resources required in providing courses, the number of applicants for courses and additional earnings gained by graduates.

There have been numerous studies investigating the returns to higher education courses by characteristics such as institution, mode of learning and subject area. Less well explored areas include the financial returns to graduates living or working in Wales and their performance in the labour market. This is of particular interest given the recent agreement to transfer responsibility for the higher and further education student support system and the tuition fee regime for Wales from Westminster to the National Assembly (Welsh Assembly Government, 2003).

Overview

This paper uses data from the quarterly *Labour Force Survey* (LFS). Data for the spring quarters from 1998 to 2003 were pooled to increase the sample size, and to provide a six year average picture of the Welsh labour market. Labour market indicators including economic activity, unemployment, qualifications held and earnings were taken from the survey. Hourly earnings (all in 2003 prices) were used in order to avoid any differences in part-time or other flexible working across jobs, and full-time equivalent (FTE) annual earnings were estimated by assuming a 37.5 hour week. The FTE wages of qualified workers of working age in Wales and the UK are shown in Table 1.

Table 1: FTE Annual Wages by Qualification

Qualified Workers	Wales	Premium	UK	Premium
Degree or Equivalent	£26,320	127%	£29,509	145%
Other HE Qualification	£21,008	82%	£21,914	82%
GCE A Level or Equivalent	£16,018	38%	£17,625	47%
GCSE Grades A-C or Equivalent	£12,855	11%	£14,807	23%
Other Qualifications	£12,583	9%	£14,356	19%
No Qualifications	£11,570	0%	£12,026	0%
All Workers	£16,264	-	£18,395	-

Source: Labour Force Survey 1998-2003 (spring quarters)

Table 2: Employment and Unemployment Rates by Qualification

Qualification Level	Wales		UK	
	Employment Rate	Unemployment Rate (ILO)	Employment Rate	Unemployment Rate (ILO)
Degree or Equivalent	88.0%	2.2%	88.4%	2.6%
Other HE Qualification	83.6%	3.0%	85.5%	2.6%
GCE A Level or Equivalent	73.4%	4.5%	78.3%	4.1%
GCSE grades A-C or Equivalent	71.2%	7.2%	75.9%	6.0%
Other Qualifications	69.2%	6.6%	72.0%	7.3%
No Qualifications	47.0%	11.4%	52.2%	10.3%
All Workers	69.7%	6.0%	74.6%	5.4%

Source: Labour Force Survey 1998-2003 (spring quarters).

By gaining a degree, graduates working in Wales can expect to earn on average a premium of £10,056 more each year than the typical worker, and a premium of £14,750 (127%) more than workers with no formal qualifications. This is lower than the 145% premium earned by graduates throughout the UK. This difference may be at least partly attributed to the lower share of professional, high value-added or graduate jobs in Wales compared to the rest of the UK.

Qualified workers across all levels in Wales earn less than those with equivalent qualifications in the UK as a whole. However, the gap is relatively narrow between unqualified workers in Wales and the UK; this is perhaps unsurprising given the national minimum wage. Recent information published by the Office for National Statistics (ONS) suggests that price levels in Wales are among the lowest of the UK regions (ONS, 2002) and thus real wages, adjusted for purchasing power parity, may be closer to the UK average.

The additional education and training associated with qualifications is likely to improve other aspects of labour market performance aside from earnings. Table 2 shows the employment rate and International Labour Organisation (ILO)

definition of the unemployment rate for qualified residents of working age living in Wales and the UK.

Table 2 demonstrates a clear relationship between labour market performance and the level of qualifications held by those in Wales. Graduates are less likely to be unemployed and more likely to be in employment than the typical worker in Wales. The unemployment rate for unqualified workers is nearly twice that of the average worker in Wales and more than double the overall rate for the UK as a whole.

Graduates in Wales have a lower rate of unemployment and similar employment rate compared with graduates across the UK. The strong performance of graduates in Wales may also partly be attributed to the greater mobility associated with more highly qualified workers. Highly qualified workers are more likely to migrate into or out of Wales to take advantage of job opportunities, thus lowering the incidence of unemployment.

Subject Areas: Earnings

As highlighted in recent studies, the financial returns to higher education and labour market performance can vary substantially by higher education subject. Using LFS data for the UK from

1993 - 1999 Walker and Zhu (2001) found that the earnings premia of degree subjects for women varied from 17.4% for arts to 43.8% for law relative to workers with two or more GCE A-levels. The FTE annual wages for graduates of working age by single subject areas is shown in Table 3.

Figures from Table 3 reflect broad findings from previous studies with subjects such as law, medicine and accountancy appearing in the top half of the earnings table. Accountancy degree holders in Wales tend to have the highest wages, earning on average just over £10,000 more than the typical graduate each year. Arts graduates had the lowest wages of all the subject areas considered, although this is still 12.7% higher than the average worker in Wales. Table 3 shows that earnings for arts graduates across the UK are also low, this is consistent with results from the study undertaken by Walker and Zhu.

Occupational employment may account for some of the variation in wage levels across subject areas. Careers in some subject areas are relatively well mapped out, with a strong link between degree subjects and specific occupations such as accounting and accountants. For other subject areas occupational links are less straightforward, workers may

Table 3: FTE Annual Wages by Higher Education Subject Area

Subject	Wales	Rank	UK	Rank
Accountancy	£36,353	1	£40,225	1
Physical and Environmental Sciences	£34,481	2	£30,235	8
Medicine	£34,068	3	£33,132	5
Engineering	£31,182	4	£33,498	3
Education	£27,846	5	£27,264	12
Law	£27,647	6	£36,236	2
Other Business and Finance	£27,080	7	£32,348	6
Average (Degree or Equivalent)	£26,320	Average	£29,509	Average
Mathematical Sciences and Computing	£26,257	8	£33,402	4
Architecture and Related Studies	£25,807	9	£29,625	9
Technology	£24,936	10	£31,245	7
Other Social Sciences	£24,685	11	£28,155	10
Biological and Agricultural Subjects	£24,600	12	£28,013	11
Other Medical Related Subjects	£24,574	13	£27,176	13
Humanities	£24,334	14	£24,234	15
Languages and Linguistics	£22,503	15	£27,138	14
Nursing	£21,417	16	£19,440	18
Librarianship and Information Studies	£20,681	17	£23,985	16
Arts	£18,332	18	£23,867	17

Source: Labour Force Survey 1998-2003 (spring quarters).

also change career or take up temporary or permanent employment unrelated to their qualification. Therefore lower wage levels, as shown in Table 3, may indicate that graduates qualified in some subject areas are working in 'non-graduate' jobs with lower wages. This scenario is more likely if low wages are matched with poor labour market performance.

A theme emerging from the figures shown in Table 3 is the role of the public sector. Subject areas associated with the public sector appear further up Table 3 for Wales than the UK. Medicine is the third highest paid subject area in Wales but only the fifth highest across the UK. Education stands in twelfth position for the UK but jumps to fifth place in Wales and nursing has the lowest wage level for the UK but is ranked sixteenth for Wales.

The latest data from the LFS suggests that public services jobs account for around 31% of employment in Wales but only 26% in Great Britain. The relative strength of the public sector in Wales may help explain why subject areas such as medicine, education and nursing perform strongly. Relative earnings may also contribute towards understanding why Wales may lose

more graduates from specific subject areas.

In addressing the development of a skilled workforce, the higher education strategy for Wales *Reaching Higher* (Welsh Assembly Government, 2002) suggests that " ... *it is very much in Wales' interest that highly skilled graduates should choose to settle in Wales.*" Table 3 shows that wages across subject areas such as arts, law and mathematical sciences and computing are far lower in Wales compared to the UK. This suggests that the incentive to seek employment outside of Wales may be greater for these subject areas. Conversely, workers in Wales holding medicine, education and nursing degrees earn more on average than their counterparts across the UK.

Subject Areas: Labour Market Performance

As shown in Table 2, the education and training associated with higher education qualifications is likely to impact on measures of labour market performance other than earnings. Table 4 shows the employment rate and ILO unemployment rate for those of working age, qualified in higher education subject areas living in Wales and the UK.

Subject areas are ranked by employment rate in descending order.

Overall, those with a higher education qualification have a lower rate of unemployment and are more likely to be in employment. For some subject areas the sample size was too low to calculate an unemployment rate although corresponding figures for the UK suggest unemployment among these areas is low.

It is difficult to conclude from Tables 3 and 4 whether there is an excess supply or shortage of graduates in specific subject areas. Strong direct links to a profession may help raise wages and employment opportunities, whilst other subjects may involve lengthy postgraduate study, which increases inactivity and thus lowers the rate of employment. Graduates in subject areas such as arts and languages and linguistics may expect lower wages and perform less well in the labour market, but there may be high non-pecuniary benefits in undertaking such courses.

Higher rates of unemployment are shown across engineering and physical and environmental sciences. The employment rates of these subjects are

Table 4: Employment and Unemployment Rates by Higher Education Subject Area

Subject Area	Wales		UK
	Employment Rate	Unemployment Rate (ILO)	Unemployment Rate (ILO)
Medicine	96.1%	-	0.5%
Architecture and Related Studies	94.0%	2.5%	2.0%
Technology	93.8%	2.8%	3.9%
Accountancy	93.2%	-	1.9%
Mathematical Sciences and Computing	92.9%	5.6%	3.3%
Arts	92.7%	5.1%	5.3%
Other Business and Finance	92.5%	2.3%	2.9%
Librarianship and Information Studies	91.5%	-	3.7%
Engineering	91.3%	4.3%	2.2%
Other Medical Related Subjects	90.4%	-	1.3%
Physical and Environmental Sciences	89.7%	3.6%	2.3%
Education	89.4%	0.2%	1.1%
Other Social Sciences	88.5%	2.4%	3.0%
Languages and Linguistics	87.9%	5.1%	3.1%
Law	86.8%	-	2.1%
Biological and Agricultural Subjects	86.6%	2.6%	2.5%
Nursing	85.1%	1.2%	1.2%
Humanities	79.1%	1.2%	3.4%
Average (Degree or Equivalent)	88.0%	2.2%	2.6%

Source: Labour Force Survey 1998-2003 (spring quarters).

Note: - Denotes figures are unavailable due to low sample size

also lower than expected as the majority of qualification holders across these subject areas are male. It would not be unreasonable to suggest that the continuing decline of both traditional and new manufacturing industries, electronics in particular, has influenced these results.

Mathematical sciences and computing graduates working in Wales earn less than the average graduate and have a higher rate of unemployment. The unemployment rate for maths and computing graduates across the UK is also above that of the average degree holder but wage levels remain robust. This may be attributed to a rapid expansion in the number of computing graduates in recent years. UK data from the Higher Education Statistics Agency (HESA) suggests that the overall number of students in higher education grew by 18.8% from 1996/97 to 2001/02 whilst the number of those studying computing subjects expanded by 60.8% over the same period (see www.hesa.ac.uk).

Gender

The employment and unemployment rates from Table 4 reflect the labour market performance of graduates qualified in specific subject areas. However, indicators of labour market performance will also be influenced by characteristics common among certain subject areas. A well-cited example is gender; as highlighted above many subject areas attract a disproportionate number of male or female students.

LFS data over the period 1998-2003 for

the UK suggests that men accounted for 54% of all those qualified in medicine and 83% in architecture or related studies. Women accounted for 91% of those qualified in nursing and 66% in education subject areas. The FTE annual wages and employment rates for nursing graduates living and working in Wales by gender are shown in Table 5.

Table 5 suggests there are significant differences in labour market performance between male and female qualified nurses. Qualified male nurses may stay in the nursing profession longer or take fewer career breaks and thus earn higher wages with a higher rate of employment. However, the majority of those with nursing qualifications are female and this is reflected in the overall labour market characteristics for qualified nurses.

The average male and female worker in Wales with no qualifications earns £12,882 and £10,310 respectively (see Table 6). Therefore the premiums for males and females qualified in nursing compared to unqualified male and female workers are high for both genders standing at 100%. Qualified male nurses may earn more, but wages for unqualified female worker are lower and therefore the relative premium for women is, coincidentally, the same. Indeed, there is a similar pattern across most higher education subject areas with women earning similar or higher premiums than men. Table 6 shows the FTE annual wages for those of working age by gender and qualification.

Male workers in Wales earn more than

their female counterparts across all levels of qualification, although the gender pay gap narrows for those holding higher education qualifications. The relatively high earnings of female graduates partly reflects the benefits of the education and training associated with higher education. However, the gender pay gaps by qualification are also partly the consequence of the length and frequency of breaks away from the labour market.

Conclusions

When considering the student support system and tuition fee regime for Wales the Welsh Assembly will have access to a body of evidence suggesting that graduates gain considerable financial rewards during their careers. However, the financial benefits of higher education for those choosing to live or work in Wales tend to be lower than for the UK average. Furthermore, the pattern of returns across subject areas in Wales differs from the UK reflecting distinct characteristics of the Welsh economy and labour market such as the greater role played by the public sector.

Gaining a degree improves broader measures of labour market performance such as finding employment and is likely to increase mobility. Encouraging highly skilled graduates to settle in Wales may therefore prove challenging in subject areas where both wages and job opportunities are more attractive in the rest of the UK. It would not be unreasonable to expect many graduates to balance the need for a well paid job against the cost of undertaking a higher education course.

Table 5: FTE Annual Wages for Graduate Nurses in Wales

	Employment Rate	Pay	Premium*
Male	88.3%	£25,814	100%
Female	83.6%	£20,593	100%

Source: Labour Force Survey 1998-2003 (spring quarters).

*Premium compared to the average male and female worker in Wales with no qualifications.

Table 6: FTE Annual Wages for Qualified Workers by Gender in Wales

Qualified Workers Wales	Males	Females	Gender Gap
Degree or Equivalent	£28,001	£24,463	14.5%
Other Higher Education Qualification	£22,375	£19,531	14.6%
GCE A Level or Equivalent	£17,614	£12,693	38.8%
GCSE grades A-C or Equivalent	£14,178	£11,908	19.1%
Other Qualifications	£13,779	£10,996	25.3%
No Qualifications	£12,882	£10,310	24.9%
All Workers	£17,813	£14,466	23.1%

Source: Labour Force Survey 1998-2003 (spring quarters).

The number of students engaged in higher education has expanded significantly in recent years with a corresponding increase in the flow of graduates into the labour market. Subject areas are emerging in Wales in which graduate earnings are notably lower, and broader measures of labour market performance are similar or worse than the average graduate worker. Some areas such as arts perform less well in both Wales and the

UK. Developments in the Welsh economy such as the continuing decline of the manufacturing sector may have influenced disparities between Wales and the UK in engineering and the physical and environmental sciences. The ability of graduates across subject areas to secure employment and their potential earnings should therefore be reflected in the student support system and tuition fee regime for Wales.

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