

"The labour market participation of Northern Ireland University Students."

by

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Abstract

This paper seeks to examine what factors are associated with student labour force participation in Northern Ireland in both term-time and vacation making use of Quarterly Labour Force Survey data for the period March 1998 to February 1999. The results suggest female students are more likely to work than male students, mature students are less likely to work than non-mature students, Roman Catholic students are less likely to work than non-Roman Catholic students, students living at home are more likely to work than student living away from home and an increase in the actual or predicted wage increases the probability of labour force participation. The author suggests that some of these results are due to the particular nature of the Northern Ireland socio-economic situation while others are likely to be true for the rest of the United Kingdom.

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Introduction

Traditionally, the labour market experience for higher and further education students has been viewed as one where work is purely a part-time and/or vacation experience. However, this view is now out of line with reality as many students are working virtually full-time in order to support themselves through their studies.

Older studies such as that of Ford *et al* (1995) have reported on term time employment undertaken by students whilst Bailey and Mallier (1999) reported an analysis of the hours worked by students in paid employment during their summer vacation. The recent changes in the availability of finance to students, with the shift from grants to loans, have had implications for the already increasing labour market participation of students during term-time which have been examined in the literature with some estimates suggesting that half of students are working on some basis during term-time (Berkley (1997), Watts and Pickering (2000), and Thanki (2000)). For example, Mickelwright *et al* (1994) shows that 59% of those 16 - 18 year olds in full time education had some source of income from employment in 1988 - 1991 which had risen from 40% in 1968 - 1971.

This study seeks to look at a small geographic area, Northern Ireland, using Quarterly Labour Force survey data¹. The value added by this paper is that Northern Ireland has a number of

1. Material from the March 1998 - February 1999 Quarterly Labour Force Surveys is Crown Copyright; has been made available from the Office for National Statistics (ONS) through the

unique features, which make it an interesting case study. The first of these is the large proportion of students who stay within the province to study² and indeed continue to reside at home; so in this way it may be seen as leading the rest of the United Kingdom. This becomes of particular importance when we begin to examine what factors motivate students to participate in the labour force during term-time and the strength of such factors. The second is a relatively large sample size, which is approximately 20% bigger than that of McVicar & McKee (2001). The third is that unlike previous studies of Northern Ireland, this study focuses on a different population which is the post-18 student.

Higher Education in the United Kingdom

Higher Education in the United Kingdom, especially at undergraduate level, is assumed to be a full-time activity with three inter-related teaching terms over a nine-month period followed by a prolonged break from study in the summer. While the flexibility of the semester approach in Germany and North America allows students to withdraw from their studies without penalty during the academic year to take employment, the comparative inflexibility of the three term approach has meant opportunities for British students are more limited. Nevertheless, an integral part of student life has been to work during the summer vacation and with the erosion of both the absolute and relative value of student maintenance grants, the introduction of top-up loans in lieu of grants and the exclusion of students from social security benefits, the significance of the potential earnings from both vacation and term-time employment has increased.

In 1962 maintenance awards and the payment of course fees for under-graduate students became mandatory following the recommendations of the Anderson Committee (1960). However, the mandatory awards have always been subject to a downward adjustment dependent upon the personal circumstances of an individual and from the mid-1980's an increasing percentage of students have been awarded a NIL grant, although course fees continue to be paid. In 1990 the Government adopted an alternative two pronged approach to the financing of student maintenance. The monetary level of mandatory awards was frozen at the 1990-91 level while simultaneously the Government financed low cost loans, to be repaid following the completion of study. Parallel to these changes modifications to the Social Security regulations were introduced which were designed to exclude all students (including those who would otherwise have qualified by right of sufficient National Insurance contributions) from receiving unemployment and/or income support benefits. Subsequently, in 1993, the Government initiated a reduction in the monetary value of the mandatory awards by 10% per annum for each of the following three years while raising the upper limit of Government financed student loans. These policy changes reduced the value of non-repayable grants a student may receive while increasing the probability of their becoming indebted to the Student Loans Company. One consequence was for the earnings received during a summer vacation to no longer be regarded as a top-up to the mandatory grant but

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2. The proportion of Northern Ireland students staying within the province to initially pursue their undergraduate studies has risen from 57% in 1996 to 66% in 2000 as compared to virtually no change for England and Scotland and a 2% rise for Wales in the same period (UCAS 1996 - 2000).

rather as a means to avoid and/or reduce the potential debt a student may acquire while studying. Since this time, all maintenance grants have been converted into loans with the shift to an 'all-loans' system of student support being completed in the academic year 1999/2000. Additionally, tuition fees have been introduced thus further increasing the potential level of student indebtedness. A recent survey of 1st year undergraduates at the University of Ulster found that 55% had taken out a loan from the Student Loans Company (Thanki (2000)).

This raises the issue of why do students participate in higher education; the reason is that being a graduate has considerable benefits in terms of higher pay with DETI (2002) reporting that average gross graduate hourly pay in Northern Ireland was 70% higher than average gross non-graduate hourly pay in Spring 2001 (£11.60 compared to £6.80).

The Northern Irish Higher Education Situation

Northern Ireland is an unusual higher education student situation from the UK perspective as approximately 69% of undergraduate students (according to DHFETE (2000) figures) from the province who undertake a programme of higher education stay within the province. Thus there is likely to be a much higher level of *living at home* than would be the case for the UK as a whole which is borne out by the evidence with, for the United Kingdom as a whole, 63% of students living at home (which is defined as their being either the child, step-child, foster child, grandchild or child-in-law of the head of household) as compared to 75% in Northern Ireland (both sets of figures are derived from the QLFS data). This has the consequence that it is more likely that students may continue with jobs in higher education that they commenced whilst in further education or before. This may have significant impacts on their labour market histories as the traditional belief as expressed in Bailey and Mallier (1999) was that student employment was of a short-term temporary nature. This high rate of domestic undergraduate education has remained stable in the late 1990s with nearly 69% of Northern Ireland domiciled graduates graduating in Northern Ireland in 1998/99.

Model and Methodology

This study makes use of four of the most recently available quarters of the quarterly Labour Force Survey (March 1998 - February 1999) to analyse the labour market behaviour of Northern Ireland undergraduates over a full academic year including the vacation.

Firstly, a tobit wage equation is estimated and used to predict a wage rate for the remaining students who did not work, because we would otherwise be implicitly stating that the expected market wage rate of the non-workers is 0 (zero) which is likely to result in the wage variable being highly significant and the significance of other variables being diminished. The Tobit technique constructs an independent variable (y^*) which usually is bounded by 0 and infinity and we then estimate $y_i^* = \beta'x_i + e_i$ with the resulting model being essentially a half-way house between a Probit and an Ordinary Least Squares regression. Typically, the coefficients that are obtained from such a Tobit estimation are larger in absolute value than those from an OLS regression. This is a standard procedure in the labour force participation literature, i.e. Layard et al (1980).

Secondly, a logit regression will be used to estimate those parameters which determined labour force participation where the value of the dependent variable is limited to being in one

of two states (0 or 1) where either the student was employed (denoted by a '1') or the student was not employed (denoted by a '0').

Our variables can be classified as follows:

Demographic characteristics

These include gender, marital status, age, religion (which is often used in place of ethnicity in Northern Ireland studies as a differentiation variable because the population is overwhelmingly white, e.g. Armstrong and McVicar (2000)), previous completed undergraduate study and where the student is living (i.e. at home with parents or grandparents)

Seasonal Characteristics

These are dummies for the time of year.

Labour market characteristics

This is the actual or predicted hourly wage.

The variables not utilised in prior Northern Ireland studies are marital status and whether or not a student is living at home; these differences reflect the alternative focus of this paper which is on post-18 education.

Hypotheses

The descriptive statistics for the sample of 541 over the 4 quarters (which is an average sample of just over 135 per quarter³ are interesting in themselves and are of use in suggesting more detailed hypotheses for the more econometric part of the analysis.

- 23% did paid work in the week they were interviewed which varied from 18% in the March - May quarter to 27% in the June - August quarter which is as one would expect in that students stop work for the exam period but return to work in the Summer. This statistic does seem on the low side compared to the studies cited earlier but there are reasons for this.

In the terminology of Micklewright et al, this paper focuses on a narrow definition of the participation rate which is those individuals recording a positive wage income. Typically in the period under their analysis (1968 - 1991), this resulted in a 25% under recording of labour force participation compared to that obtained from the use of a broader definition of any form of paid income. Furthermore other recent work looking at Northern Ireland such as McVicar & McKee (2001) has found that labour market participation by students in full-time education in Northern Ireland is lower than that for Great Britain by a margin of 25% (i.e. 35% - 45% participation in Northern Ireland compared to 60% - 70% in Great Britain). They explain this as being due to a variety of reasons relating to a comparatively slack youth labour

3. This is over the 0.4% of the population expected from the QLFS sampling techniques used in Northern Ireland (see ONS (1998) for further details of the QLFS sampling methodology) as there were 51472 Northern Irish students enrolled on Higher Education Courses in Northern Ireland in 1998/99 - DENI (1999).

market in Northern Ireland - these include relatively high youth unemployment, lower wages and a larger proportion of the population being in the 15 - 24 year old age band (14.4% of the total population in Northern Ireland compared to 12.1% in Great Britain)

- 41% of the sample is male which is slightly at odds with the figures in DFHETE (2000) which state that 35% of all graduates in Northern Ireland were male. This may well be due to there being higher non-completion rates amongst males with 81% of females who commenced undergraduate studies in 1996/97 completing them in 1998/99 compared to a completion rate of 71% for males (HESA (2000)).
- 49% of the sample is Roman Catholic with 19% being Presbyterian, 13% being Church of Ireland and 14% being members of another Protestant church.
- 75% were the child, stepchild or grandchild of the head of household (i.e. they are living at home).
- 95% have never been married.
- Of those who worked, the average wage was £4 per hour. In term time, the mean wage was £4.03 with a median of £3.79. In the summer vacation, the mean wage was £3.91 with a median of £3.47 with an increased sample size.
- Of those who worked, descriptive statistics for the number of hours worked per week were as follows:

	Mean	Median	Standard deviation	Number of students
March to May 1998	16.76	12	10.41	29
June to August 1998	19.64	16.5	14.33	36
September to November 1998	18.11	16	13.47	35
December 1998 to February 1999	14.27	12	9.88	41
March 1998 to February 1999	17.11	12	12.19	141 ⁴

Table 1
Descriptive statistics for the number of hours worked per week

Thus, we see that the descriptive statistics have a mean, which varies across the quarters peaking, not unsurprisingly, in the Summer and Autumn. The median behaves very similarly to the mean as does the spread of the data as measured by the standard deviation.

These descriptive statistics and the findings of prior research suggest a number of *a priori* hypotheses:

- A mature student is more likely to participate, on the grounds of being more likely to have prior labour market experience, suggesting a positive effect on the probability of

4. These figures are based on the usual hours worked and not the hours worked in the interview week.

obtaining employment; thus a positive coefficient is suggested for the "Is the student over 21?" variable.

- A graduate student will be less likely to participate, on the grounds that they wish to maximise the value of their additional investment in higher education and will be seeking to obtain as good a result as possible in as short a time as possible; thus a negative coefficient is suggested for the "Is the student a graduate?" variable⁵.
- The probability of participation is likely to be higher in the Summer, *ceteris paribus*; thus a positive coefficient is suggested for the "Is it Summer?" variable.
- The probability of participation rises as the predicted wage rises; thus a positive coefficient is suggested for the "Actual/Predicted wage per hour" variable.
- The probability of participation is likely to be higher for those students who are living at home; thus a positive coefficient is suggested for the "Is the student living at home?" variable. This is argued as being due to these students being more likely to be continuing with existing employment when they enter higher education.
- The inclusion of the "Is the student female and mature?" variable is a proxy variable for the existence of actual or potential progeny. The sign and magnitude of this are unclear as it could be argued that the existence or likelihood of children will reduce the probability of labour force participation as they may need taking care of; conversely, the added costs of children may be seen as attenuating financial pressures which may increase the probability of labour force participation.

Results

The tobit model proved to be an adequate model for modelling wage rates being significant at the 95% level of statistical significance on the basis of a likelihood-ratio test. The only variable statistically significant at the 95% level or above was whether a student lived at home or not with this exerting a downward effect of £1.78 per hour *ceteris paribus*, and this was significant at the 99% level.

Next, I report the marginal effects calculated at the mean values of the independent variables for the logit regression⁶.

5. Those students with an undergraduate qualification at entry amount to only 8% of the sample as compared to 66% with 'A'-level entry, 12% with GNVQ entry and 4% with HND/HNC entry.

6. Note that the marginal effects (i.e. the effect on the dependent variable of a one unit increase in an independent variable) for a Logit regression are not the reported coefficients as they would be for an Ordinary Least Squares Regression and are also not constant for all values of the independent variables. In order to obtain the marginal effects, we must first differentiate the functional form with respect to the independent variables (the x's) and then estimate for suitable values of the independent variables such as the mean values of the independent variables. The functional form

here is $y = \frac{e^{\beta'x}}{1 + e^{\beta'x}}$ which when differentiated with respect to x gives

$$\frac{dy}{dx} = \beta \times \frac{e^{\beta'x}}{1 + e^{\beta'x}} \times \frac{1}{1 + e^{\beta'x}} = \beta \times P[y = 1] \times P[y = 0].$$

This final equation is then estimated at the mean values of the independent variables for each coefficient; for more details see Greene (1993).

Variable		Marginal Effect	Log-likelihood test of significance	Mean
Constant		-1.273		
Is the student female?	*	0.130	3.8368	0.5867
Is the student married?		0.102	0.0230	0.0498
Is the student over 21?	**	-0.184	5.2116	0.1328
Is the student Roman Catholic?	**	-0.059	4.4724	0.4760
Is the student a graduate?	**	-0.187	3.9878	0.0812
Is it Spring?	*	0.142	3.3718	0.2177
Is it Summer?	**	0.119	7.4870	0.2251
Is the student living at home?	**	0.358	7.9812	0.7509
Is the student female and mature?		0.037	0.5338	0.0720
Actual/Predicted wage per hour	**	0.196	5.5390	4.0496

* = Significant at the 90% level of statistical significance

** = Significant at the 95% level of statistical significance⁷

Table 2
Results of the Logit regression on the probability of labour force participation⁸

These results can be best summarised by the following set of statements which compare the variables to their "control" or "base" state.

- A female student is 13% more likely to be willing to work than a male student, ceteris paribus (this is statistically significant at the 90% level).
- A mature student is 18.4% less likely to be willing to participate in the labour force than a non-mature student, ceteris paribus (this is statistically significant at the 95% level).
- A mature female student is 3.7% more likely to be willing to participate in the labour force than a non-mature female student, ceteris paribus (this is not statistically significant at the 90% level)
- A married student is 10.2% more likely to be willing to participate in the labour force than an unmarried student ceteris paribus (this is not statistically significant at the 90% level).
- A Roman Catholic student is 5.9% less likely to be willing to participate in the labour force than a non-Roman Catholic student, ceteris paribus (this is statistically significant at the 95% level).
- A graduate student is 18.7% less likely to be willing to participate in the labour force than an undergraduate, ceteris paribus (this is statistically significant at the 95% level).

7. The critical value for the log-likelihood test of significance is distributed as $\chi^2(1)$. The critical level for at the 90% significance level is 2.7055 while the critical value for $\chi^2(1)$ at the 95% significance level is 3.8415.

8. The Autumn variable is not included as there is a multicollinearity issue which appears to be caused by a combination of variables being closely correlated with gender.

- A student living at home is 35.8% more willing to participate in the labour force than a student not living at home, ceteris paribus (this is statistically significant at the 95% level).
- A £1 increase in the actual or predicted wage per hour increases the probability of desired labour force participation by 19.6% ceteris paribus (this is statistically significant at the 95% level).
- The statistical significance of the constant, as indicated by a t-ratio test, does suggest that certain explanatory factors are being omitted; it would not be unreasonable to conclude that the absence of a variable capturing the effect of previous labour experience, other than the continuation of a previous job, is one of these.

Overall, the model is significant at the 95% level of statistical significance and correctly predicts the labour market behaviour of 93% of the students.

Conclusions

This study sought to examine what factors motivated student labour force participation in Northern Ireland during the course of the period from March 1998 to February 1999; a period which contains both term-time and summer vacation.

The evidence from the Logit regression suggest a number of conclusions based upon those variables which are statistically significant at the 90% level or higher. These are that female students are more likely to work than male students, that mature students are less likely to work than non-mature students, that Roman Catholic students are less likely to work than non-Roman Catholic students, that students living at home are more likely to work than student living away from home, and that an increase in the actual or predicted wage increases the probability of labour force participation.

The policy issues that flow from this study fall into two areas.

Firstly, some students are working very long hours with 17 hours being the average for those who worked even in the examination season. However, these averages hide some outliers of students who are working virtually full-time throughout the year. These figures give rise to concerns about the extent to which both their investment and the investment of the state in their higher education is being best used. Thus, the issue is raised of what are the long-term consequences of labour market participation whilst in full time education. Research in this area indicates that there could be positive benefits such as students being brought to the attention of future employers, students being provided with a labour market history (and thus reducing uncertainty in employment selection) or students being provided with either directly usable job skills or transferable skills. The converse argument is that participation may impact on the academic performance of a student. US research such as Meyer & Wise (1984) has tended to find a positive relationship between employment whilst in High School and post-High School wage rates. UK research such as Dustmann et al (1996) and McVicar & McKee (2001) has tended to find that labour market participation for students in further education is detrimental above a certain level with the critical level for McVicar & McKee, who were looking at Northern Ireland, being 15 hours per week. As the mean for the students who were working in this research is over 17 hours, it does not seem unreasonable to suppose that some of these students are harming their academic performance.

Secondly, given the relatively tight nature of the youth labour market in Northern Ireland, the issue arises of whether the scarcity of part-time work has an effect on whether or not a young person participates in Higher Education. Some progress towards changes in student support in Northern Ireland have been made recently with the decision made by the Higher and Further Education, Training and Employment Committee to "end tuition fees, (introduce) some means-tested grants and some deferred contributions ... to those Northern Ireland students who stay in Northern Ireland." (NIA Hansard (2000)). More recently, the Minister of Higher and Further Education, Training and Employment announced "proposals designed, first, to target resources in higher education to those from lower income groups thereby widening access to higher education from among the under-represented and those with specific needs ...". This was to be done by "introducing means-tested, non-repayable access bursaries on a sliding scale of up to £1,500 per annum for full-time undergraduates whose parental or spouse residual income is £15,000 or less. It is estimated that such bursaries will be taken up by over one third of the full-time student population" and "... raising the residual income threshold at which a student contribution towards tuition fees becomes due from £17,805 per annum to £20,000 per annum. ... Therefore more than 50% of students will not pay anything towards the cost of their tuition." (NIA Hansard (2001)). Only time will tell whether this has any effect on the labour market participation of students in Northern Ireland but this author suspects that the effect may be marginal and merely alter the rate of take-up of hardship funds.

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