

The Impact of Working While Studying on Educational and Labour Market Outcomes

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Abstract

As a result of the expansion of higher education and changes to student funding in the UK, students are increasingly taking up opportunities to work while studying. Employment during term-time may provide needed funds but takes time away from studying. It may also constitute an investment in 'informal' human capital, making graduates more attractive to potential employers. Given the ambiguous effect of working while studying, we investigate whether term-time employment has a detrimental impact on educational attainment and examine whether this is compensated by wage gains arising from transferable skills and work experience. Using survey data from a UK university, we find that students work more for financial than investment reasons and identify a negative effect of term-time employment for students working out of financial necessity or those working with a greater intensity. We find some evidence that individuals who have undertaken term-time employment have higher salaries upon graduation.

Keywords: Human capital; Term time employment; Higher education

Introduction

Working while studying is becoming an increasingly common phenomenon among students in the British higher education system. A recent report by the Trade Union Congress (TUC) shows that the number of students undertaking term-time employment grew more than 50% between 1996 and 2006 [1]. The increase is partly the result of the changes in student funding over the past two decades, due to the rapid expansion in student numbers. While in the 1960s only about 6% of young people aged 18-30 attended university [2], 43% were enrolled by 2006¹ [3], resulting in an increased financial pressure on both the Government and the higher education institutions (HEIs). By 1998 it was decided that some of the costs of higher education had to be borne by the students themselves (and their families). Means tested tuition fees of up to a maximum of £1,000 per annum (plus inflation adjustment) were introduced along with the replacement of maintenance grants with new low interest income contingent loans². At the same time, the New Labour government made widening participation, among previously underrepresented groups - such as ethnic minorities, students from lower socio-economic backgrounds and low participation neighborhoods, one of their key priorities [4].

The combination of the introduction of tuition fees and widening participation has changed the composition of the student population and made students more aware of the financial implications of entering higher education. A higher percentage of students is now likely to work to fund their studies, particularly those coming from lower socio-

economic backgrounds [5-7]. Income obtained from paid employment and student loans are now the norm rather than the exception. In 2007 the average student debt was estimated to be around £12,256 [8] and student loans were often perceived to be too low to cover all living expenses [9,10].

On this basis, it might be assumed that employment while the university is in session (hereafter referred to as term-time employment) is necessary to take care of students' basic 'consumption' needs. However, there is another motivation for working while studying. Given the 'massification' of higher education, term-time employment is also a way for students to gain additional transferable skills and distinguish themselves from the 'mass'. Frean [11] estimates that in 2007 there were roughly 265,000 graduates in the UK (170,000 of which looking for employment) but only about 95,000 graduate jobs available. This shortfall is far greater than 10 years ago. With an increasingly competitive market for graduate jobs (and an apparent over-supply of graduates) any additional investment in human capital by individuals might make the difference between landing a good job versus a mediocre one.

As Ruhm [12] suggests, referring to high school students, employment during education is potentially an additional way of acquiring human capital in the form of "on the job training". It provides skills and experience that could enhance future earning power in the labour market, partly compensating for any negative effects of term-time employment on formal education.

The aim of this paper is to tease out the ambiguous effects of working while studying. We investigate whether term-time employment has a detrimental impact on educational attainment and

¹ The end of the so-called 'binary divide' in 1992 when polytechnics were granted university status partially accounts for the higher figures after the 1990s.

² The maximum loan available was also dependent on living arrangements, with students residing with their parents entitled to a lower amount.

examine whether this is partly compensated by wage gains arising from transferable skills and work experience. We also look at nature of work undertaken, since employment that is related to the degree or to one's career objectives may be more valuable than working simply in order to have enough money to live. In the paper we explicitly model term-time employment as an additional form of (more informal) human capital. No UK study has specifically modelled term-time employment in this way. In order to do that, we use data collected via a student survey to assess the effects of term-time employment on both education and labour market outcomes. To date no study has been able to match term-time employment in the UK to both educational and labour market performance.

Some studies in the UK have shown that term-time employment has a negative impact on academic performance [13-15]. Similarly, several US studies have identified negative effects of working whilst in college on grade point average [16-18], although the effects and magnitude vary across studies³. On the other hand, several UK studies have highlighted benefits of term-time employment, including work experience, improving time management skills and gaining transferable skills, such as communication, oral presentation skills and teamwork [13,19,20].

There has been a wealth of research in the US on the effect of employment whilst in high school on future wages [12,21,22], but less so on employment whilst in higher education (Ehrenberg and Sherman [23] is an exception). Ruhm [12] finds that employment during the senior year had long lasting positive effects on wages, whilst Light [21,24] illustrates how not controlling for high school employment overstated returns to schooling even though the positive effect of employment is only short lived. Purcell et al. [14] find that having undertaken term-time or vacation employment has no wage effects for female students in the UK, but career related experience leads to significantly higher earnings for male students. Hakkinen [25], studying Finnish university students, shows that work experience increases wages one year after graduation but has no effect later on. Hakkinen's finding indicates that having work experience may make it easier to find an initial suitable job, and fits in with the idea that employers use both qualifications and work experience as 'signals' (Spence, 1973) to assess the quality of potential employees [26,27].

The paper is organized as follows.

Theoretical background

This section presents a theoretical model which incorporates the ideas by Ruhm [12] in a human capital investment model à la Becker [28] and a production model à la Ben-Porath [29]. Models of term-time employment, focusing on the US case, have hitherto concentrated either on the effect of credit constraints [30] or on parental transfers [18]. Our focus is on the role of term-time employment as an alternative way to acquire human capital. A key element of our model is that it distinguishes between formal human capital derived from

educational attainment (measured with proxies such as the final degree classification), and informal human capital obtained through other means, such as work experience.

We illustrate our model in a simple two-period framework. (For a more detailed exposition see Pemberton et al., 2010). The first period ($n=1$) covers the period spent at university while the second period ($n=2$) is the initial period after graduation (i.e. the entrance into the labour market). It is assumed that the students have chosen to attend university, and made a choice of institution and degree subject prior to the first period, so that these choices can be treated as exogenous to the model. A rational student will have as an objective the maximisation of his/her utility (U) across the two periods. The utility function in turn depends on consumption over the two periods:

$$U_i = U_{i1}[C_{i1}(x_{i1}^c, t_{i1}^c)] + (1-\rho_i)U_{i2}[C_{i2}(x_{i2}^c, t_{i2}^c)] \quad (1)$$

Consumption is produced in each of the two periods by combining market goods (x_{in}^c) and time (t_{in}^c). The discount factor ρ_i measures how willing students are to forego current consumption for future consumption and varies across students.

In the first period a student allocates the time between formal human capital acquisition (t_{i1}^h), term-time employment (t_{i1}^w)⁴ and consumption (t_{i1}^c).⁵ Time devoted to formal human capital encompasses both formal classes and independent study. In the second period the graduate is no longer required to spend time in acquiring formal human capital, so the choices reduce to either employment (t_{i2}^w) or consumption (t_{i2}^c). The second period wage (w_{i2}) is expected to be higher than the first period wage (w_{i1}), because of the higher human capital embodied in the graduate.

The time constraints in both periods are:

$$t_{in} = t_{in}^c + t_{in}^w + t_{in}^h \quad n=1,2 \quad (2)$$

with no formal human capital acquisition ($t_{i2}^h=0$) in the second period.

The budget constraint in period 1 is:

$$p_{i1}^c x_{i1}^c + p_{i1}^h x_{i1}^h = (aE_{i1})t_{i1}^w + a_{i1} + d_{i1} \quad (3)$$

The cost of consumption and higher education are at fixed prices (p_{i1}^c, p_{i1}^h) per unit of consumption and higher education. The direct cost of higher education ($p_{i1}^h x_{i1}^h$) includes fees and educational resources, with students paying fees at the point of entry so incurring all the direct costs in period 1.⁶ Consumption ($p_{i1}^c x_{i1}^c$) and the costs of higher education are paid for by income obtained from exogenous sources (a_{i1}), debt (d_{i1}) or employment (t_{i1}^w). In period 1 the wage rate ($w_{i1} = aE_{i1}$) is based on prior human capital stock (E_{i1}), where a is a fixed rate paid for each unit of human capital. Exogenous income (a_{i1}) e.g. parental support, scholarships/grants, or previous savings will differ across students and may therefore have a big influence on the time devoted to employment and the level of debt taken on. Students are assumed to be debt constrained, with debt paid back in the second

³ In United States there has been a wealth of research on the effect of working whilst in high school on grade point average (e.g. Oettinger, 1999; Tyler, 2003; Rothstein, 2007; Lee and Orazemb, 2010), with mixed results.

⁴ For simplicity we ignore the vacation period, since we assume that students do not undertake any investment in formal human capital during this period and their only decision is between employment and consumption time. Any money earned from vacation employment will be subsumed into exogenous sources of income, see equation 3.

⁵ Many models (e.g. Heckman, 1976; Dolton et al., 2003; Stevens and Weale, 2004) refer to consumption time as "leisure".

⁶ Since 2007 the British system has allowed students to defer payment of fees until after graduation, so fees could be paid in period 1 or 2 under this new system. The data used in this study were collected during the pre-2007 system of paying fees up-front.

period at a fixed rate of r^7 , although the level of debt available will vary across individuals (some students may have more access to capital markets or be more debt averse⁸). In the second period wage rate ($w_{i2}=aE_{i2}$) is assumed to depend on human capital at the beginning of period 2 (which will include the additions to human capital in period 1, including that gained through both formal and informal means). Hence, the budget constraint in the second period is:

$$P_{i2}^c x_{i2}^c + d_{i1}(1+r) = (aE_{i2})t_{i2}^w + a_{i2} \quad (4)$$

The individual's human capital production function in period 1 is modelled using a Cobb Douglas functional form:

$$H_{i1} = (t_{i1}^h E_{i1})^{B1} (x_{i1}^h)^{B2} (t_{i1}^w E_{i1})^{B3} \quad (5)$$

where E_{i1} is the stock of human capital of individual i at the beginning of period 1; t_{i1}^h is the proportion of time devoted to human capital acquisition and x_{i1}^h are goods and services used for human capital production. Contrary to the traditional human capital models which assume that human capital is only increased during higher education through formal education and employment diverts time away from human capital investment and consumption, we allow term-time employment (t_{i1}^w) to directly enter the human capital production function. We define human capital produced in the first period (H_{i1}) as the sum of human capital obtained through formal ($H_{i1}^F = (t_{i1}^h E_{i1})^{B1} (x_{i1}^h)^{B2}$) and informal ($H_{i1}^I = (t_{i1}^w E_{i1})^{B3}$) means. Employment during higher education will, therefore, have ambiguous effects. On one hand, it potentially reduces the time devoted to formal human capital (t_{i1}^h) acquisition. On the other hand, it potentially increases human capital through accumulation of 'soft' skills (which we refer to as informal human capital).

The B 's coefficients in equation 5 represent how efficient an individual is at converting their inputs into human capital. Both $B1$ and $B2$ are greater than zero, which implies that both time and goods inputs are needed to increase production. $B3$ represents the scale of production of employment on human capital during higher education and if term-time employment has no effect on human capital than $B3$ would be equal to zero. The assumption is that the production function has decreasing returns to scale, so that $B1 + B2 + B3 \leq 1$, as a result of limited intellectual capacity. Becker [31] suggested that differences in efficiency could reflect differences in ability.⁹ Therefore, the production on human capital not only depends on the time and resources diverted to it but also an individual's ability and efficiency at combining these (Thurow [32] for a more thorough demonstration of this). It should be noted that equation 5 does not mean that time spent in employment and formal education both increase human capital by the same amount and are then direct substitutes.¹⁰

Students pick the levels of $x_{i1}^c, x_{i2}^c, x_{i1}^h, t_{i1}^c, t_{i2}^c$ and t_{i1}^h that maximize their utility in equation 1 t_{i1}^c subject to their budget and time constraints (in equations 2-4) and their consumption and human capital production functions. Term-time employment is a potential supplementary means to increase future wages, as well as a means of increasing current disposable income. In the second period, the wage may be dependent on both formal and informal human capital, although the return of the two different types of human capital may be different, i.e. the return of formal education (α_E) is not necessarily equal to the return of informal human capital acquired via employment (α_W). So the wage in the second period (w_{i2}) is equal to $\alpha_E + \alpha_W$. We assume that increasing formal human capital has positive

returns in the labour market i.e. $\frac{\partial w_{i2}}{\partial H_{i1}^F} > 0$ ($\alpha_E > 0$). Term-time employment will directly increase wage if viewed as informal human capital or as a signal of employability, i.e. $\frac{\partial w_{i2}}{\partial H_{i1}^I} \geq 0$ ($\alpha_W \geq 0$).

However, because term-time employment is likely to divert time away from studying, it may also have a negative effect on future wages via

the reduction of formal human capital $\frac{\partial H_{i1}^F}{\partial t_{i1}^w} < 0$. It is difficult,

therefore, to predict a priori the total effect of term-time employment on future wages, because that depends on whether the reduction in wage from lower formal human capital is compensated by gains in wage through greater informal human capital.

Data

The data used in this study comes from a survey on student employment undertaken at a medium-sized research intensive university based in the South East of England. A number of prior studies [5,19,20,33-39] use surveys to depict student employment. However, the majority of these studies have not empirically tested the effects of term-time employment on degree outcomes (with the notable exceptions of Universities UK [4] and Jones and Sloane [13]) or labour market outcomes (with the exception of Purcell et al., [14]). In our dataset, the primary survey data were matched with both secondary student record data and labour market outcomes, something past studies have not been able to do.

The survey collected information on family background (including parental income and socio-economic background), students' financial circumstances, work experience (as part of the degree and/or unpaid), and term-time employment. An attitudinal variable measured the importance of having a career relative to other life roles [40]. The survey, available to all undergraduates at the university, was issued in the 2006 spring term and resulted in a sample of 1,182 students (A response rate of 15%). In the spring term of 2007 a follow-up survey

⁷ Under the United Kingdom system students do not have to pay their debt back until they research a certain earnings threshold, but they would require a very low utility from consumption.

⁸ Oosterbeek and van der Broek (2009) modeled the borrowing behavior of students in the and found borrowing was affected by potential future earnings, the students' discount rate and their level of debt aversion.

⁹ However empirically it is difficult to find an accurate measure of natural ability.

¹⁰ This could be formally expressed by the relationship between $B1, B2$ and $B3$, for example if employment had a smaller effect than formal education than $B3 < B1 + B2$

was undertaken to collect further information on student employment (with a response rate of 40%) to those who had answered the first questionnaire but not yet graduated. 355 respondents graduated in 2006 and 323 graduated in 2007. The students in our sample were fairly representative of the students at the university¹¹, with a slight female bias, which is common among similar surveys [5,6,14,36,39].

The survey data were then matched with data from the students' university records and responses to the Destinations of Leavers in Higher Education (DLHE) survey. The students' records contained information on personal characteristics, qualifications on entry (i.e. A-levels scores or equivalent), course details and final degree classification (i.e. first, upper second, lower second, third, pass and fail), which is the common measure used by employers for academic achievement in the UK. The DLHE survey is undertaken by all UK universities, on behalf of the Higher Education Statistical Agency (HESA), to gather information on student destinations six months after graduation. It is primarily aimed at British domicile students and collects information on job location (at postcode level) and type (part-time, full-time, freelance etc.), Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes at 4-digit level, and salary. We were able to match 533 British domicile survey respondents (a match rate of 86%) to their DLHE survey responses¹². A list of relevant variables from the survey, student record and DLHE survey can be found in Appendix 1.

We do not have information on employment in their final year for all students, because not all 2007 graduates responded to our follow up survey. Therefore our measure of term-time employment is based on information up to the penultimate year.¹³ Previous empirical studies have generally taken average hours worked per week, for example asking how many hours the respondent worked last week but ignoring how often they work and in which years of their degree. Patterns of work across the degree are, however, important in terms of implications on academic performance. For example a student who works for 16 hours every four weeks may not be affected as much as a student who works 4 hours every week. So, an "intensity of work" variable (low, medium and high) was created for each of respondent, based on the average number of hours and weeks worked per year (Table 1).

Weeks per term/ hours per week	1-4 hours	5-10 hours	11-16 hours	over 16 hours
1-3 weeks	Low	Low	Medium	Medium
4-7 weeks	Low	Medium	Medium	Medium
Over 7 weeks	Low	Medium	High	High

Table 1: Intensity of term-time employment in a given academic year.

The intensity of work in the first and second year¹⁴ of studies was then used to create an aggregated variable called "overall intensity"

(with 4 categories: low, medium, high and very high) as shown in Table 2. The indicator in Table 2 is our primary measure of the amount of term-time employment undertaken by students.

Year 1	Year 2	Not worked	Low	Medium	High
Not worked	-	Low	Low	Medium	
Low	Low	Low	Medium	High	
Medium	Low	Medium	High	Very high	
High	Medium	Medium	High	Very high	

Table 2: Overall intensity of term-time employment.

Methodology

In the empirical part of our paper we model both formal human capital acquisition and the determinants of labour market outcomes. Since we do not observe directly the inputs of human capital acquisition (except term-time employment), the empirical model of degree performance (our measure of formal human capital) is based on factors that influence time use, preferences and the budget constraint.

We assume that human capital is determined by existing human capital stocks (as measured by qualifications on entry), which also partly reflects ability, and the time and resources invested. Similar to earlier studies examining degree performance [41,42] we then use an ordered probit model to assess the impact of a series of factors on human capital acquisition with a particular emphasis on the role of term-time employment. Final degree classification is a discrete variable which can take the values: m=1 (lower second or below¹⁵), 2 (upper second) or 3 (first). The dependent variable is the probability of getting a certain "final degree classification" (d) with the following predicted probabilities calculated:

$$\Pr(d = 1) = \Phi(-\beta_{m/1}^x X + \beta_{m/1}^{TTE} TTE)$$

$$\Pr(d = 2) = \Phi(c_1 - \beta_{m/1}^x X + \beta_{m/1}^{TTE} TTE) - \Phi(-\beta_{m/1}^x X + \beta_{m/1}^{TTE} TTE)$$

$$\Pr(d = 3) = \Phi(c_2 - \beta_{m/1}^x X + \beta_{m/1}^{TTE} TTE) - \Phi(c_1 - \beta_{m/1}^x X + \beta_{m/1}^{TTE} TTE)$$

Φ is the cumulative normal distribution and c1 and c2 are the known cut-off points dividing the different degree classifications. TTE includes term-time employment variables (described in more detail below), while X is a vector of control variables that are likely to influence degree performance, including personal characteristics such as gender, nationality, ethnicity, socio-economic background and age, parents' income and education, subject of study, qualifications on

¹¹ Based on comparisons with the University's full graduating cohorts of 2006 and 2007 (see Jewell, 2008 for the actual figures).

¹² The DLHE survey is targeted at British domiciled students, with HESA asking for a response rate of 80% of all graduating undergraduates, hence relatively fewer non-British domiciled students respond to the DLHE survey.

¹³ Very few students (12) in the 2006 cohort who had not worked by their final year worked in their final year.

¹⁴ Generally the overall intensity of employment variable was a good indicator of employment undertaken in the final year for the students we have full data for.

¹⁵ Given that only 12 students achieved a third or a pass, these categories were combined with the lower second category. Anyone without a result or "other" result (11 cases) was excluded.

entry, school background, term-time accommodation, financial circumstances, course attributes (length of course, whether single honors) and year of graduation. A description of all the control variables is provided in Appendix 1.

We then move on to investigate the possible labour market effects of term-time employment both in terms of the likelihood of gaining a graduate job and in terms of the actual entry salary. We model the likelihood of getting a graduate job (GRAD) using a logistic regression (equation 11) and the salary, w , using a Mincer-type [43] regression equation (equation 12), estimated by OLS with robust standard errors:

$$\ln\left(\frac{GRAD}{N-GRAD}\right) = \beta^X X + \beta^{FAC} FAC + \beta^{DC} DC + \beta^{EMP} EMP(11)$$

$$\ln w = \beta^X X + \beta^{FAC} FAC + \beta^{DC} DC + \beta^{EMP} EMP(12)$$

Our focus is this time not only on employment, EMP (term-time, degree related and unpaid work), but also on the effect of degree performance (DC) as a measure of human capital, and subject studied at faculty level (FAC). X is again a vector of additional control variables similar to those used in the degree classification model. However, in the salary regressions we exclude financial circumstances, term-time

accommodation and course attributes since these do not significantly affect salary level, and we add controls for region and industry of employment as location and sector might have a significant effect on initial salaries.

Results

Descriptive statistics: reasons for term-time employment

Before moving on to the empirical models, we start by describing some basic patterns about term-time employment. 53% of our sample had undertaken employment at some point, with students most likely to do so in their second year (47%) and less likely in their first year (34%). Although a significant proportion of students also work in their final year, the percentage (42%) is lower than in the second year. This is also true of intensity (as defined in Table 1). As Figure 1 shows, the majority of students have 'high work intensity' in their first (51%) and second year (56%), while they tend to undertake a 'medium intensity' level of employment in their final year (43% compared with 40% undertaking a high level).

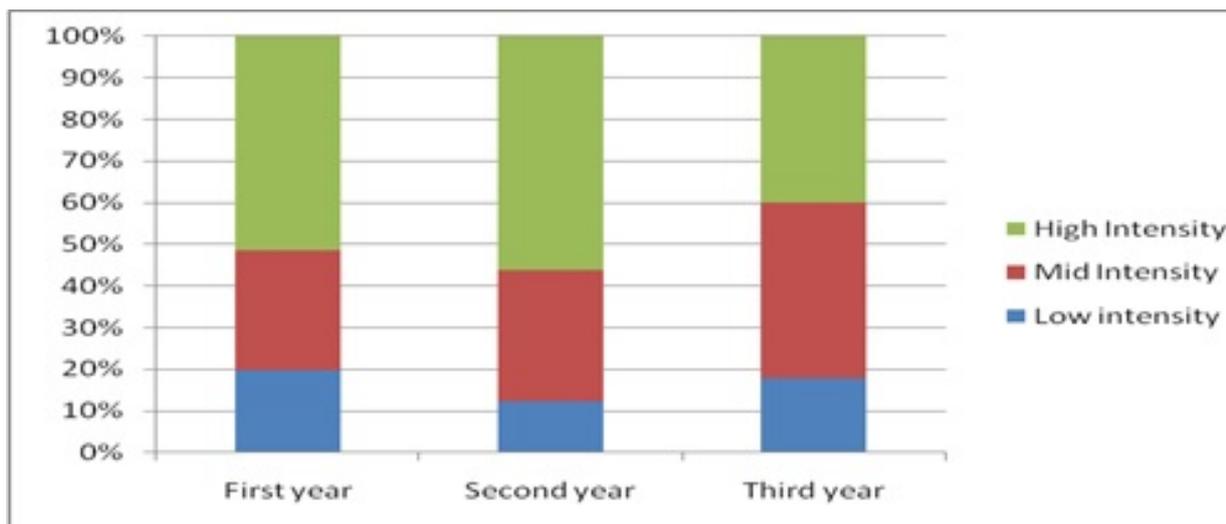


Figure 1: Intensity of term-time employment by year of study. Notes: n=231 for first year, n=317 for second year and n=203 for final year. The final year includes only students with information on their final year employment.

These findings, which are similar to Barke et al. [35] and Universities UK [6], suggest that students tend to work in their second year, either due to a shortfall in funds or for experience reasons, but cut back on term-time employment in the final year presumably to concentrate on their studies. Students may also work more in their second year so they can work less in their final year. Therefore students appear to be making conscious decisions about how much and when to work, following rational optimizing behaviour.

Students were also asked their main reasons (with multiple responses permitted) for undergoing term-time employment. Table 3 reports the main reasons quoted by students.

Reason for working	%
Pay for social/leisure/luxuries	68.1

To stay at university/pay for necessities	47.5
Debt reduction	42.8
General work experience	27.5
Career related experience	15.6
Degree related experience	8.9

Table 3: Reasons for working during term-time.

The majority of students work during term-time to pay for social and leisure activities or luxuries, with just under half of the students working out of financial necessity. Students who work for financial necessity are more likely to work in each year of their study and with a greater intensity. Students forced to work to fund their studies, are also

more likely to come from non-professional backgrounds (37% compared with 29% of all survey respondents), less likely to benefit from family support (46% compared to 71% overall) and have higher expected debt (with an average of £12,256 compared with an overall average of £10,901). Debt reduction is also a common reason for working, suggesting that students are indeed concerned about the level of debt they are incurring. Self-reported expected debt is significantly higher for students from lower socio-economic backgrounds (£12,052 versus £10,429), those not living with their parents (£11,163 versus £7,473) and those without family support (£12,626 versus £10,184). Although not shown, individuals with less family support, who live with their parents and who have non-graduate parents are also more likely to be employed during term-time. Term-time employment decisions seem to be mainly connected to financial circumstances and socio-economic background. Work experience is a less frequent reason, particularly career related experience. From the findings above, it seems that term-time employment is regarded as an additional form of human capital investment by very few students.

However, although the majority of students did not cite work experience as the main reason for working, many students realized the value of term-time employment ex-post. 62% of term-time workers report having gained valuable general work experience. Relatively few students (17%), however, considered this experience relevant to the specific career they want to pursue. Other common positive aspects of term-time employment that the students reported include increased

confidence, transferable skills, (such as communication and teamwork), and improved time management skills, all equally important when entering the labour market.

A considerable proportion of students report a negative impact of term-time employment on study time (67%). 54% say that term-time employment reduces their leisure time, and 45% say it affects their sleeping time. As suggested by the theoretical model, students are forced into making time allocation decisions, which could potentially affect their academic performance. However, relatively few students (about 14%) actually report a harmful effect on coursework or exam performance. We will specifically test the effect on degree performance in the next section. It is clear that students who have no choice but to work during term-time are more likely to report negative effects, particularly with regards to study time (with 79% reporting a negative impact on this). It may be this group of students who are more likely to suffer detrimental effects on degree performance as a result of term-time employment. If so, this might have serious policy implications, especially in the current 'widening participation' climate in the UK.

The effect of term-time employment on degree performance

In this section, we specifically test the effect of term-time employment on academic performance. Table 4 reports the results of the ordered probit model (equation 10) for the employment variables (with the reporting of marginal effects for each degree classification).

	Coefficient		Marginal Effect					
			Lower second and below		Upper second		First	
Regression 1								
Employed during term time	-0.223**	[-2.18]	0.055**	[2.16]	-0.001	[-0.17]	-0.054**	[-2.19]
Regression 2								
Employed during term time	-0.069	[-0.56]	0.017	[0.56]	-0.0001	[-0.08]	-0.016	[-0.57]
Work out of financial necessity	-0.345**	[-2.36]	0.09**	[2.2]	-0.015	[-1.03]	-0.075**	[-2.6]
Regression 3								
Intensity of employment (base category not employed during term time)								
Low	-0.007	[0.04]	0.002	[0.04]	-0.00001	[-0.03]	-0.002	[-0.05]
Medium	0.034	[-0.2]	-0.008	[-0.2]	-0.0002	[-0.09]	0.008	[0.2]
High	-0.490***	[-3.06]	0.14***	[2.67]	-0.045	[-1.5]	-0.095***	[-3.78]
Very high	0.464**	[-2.64]	0.129**	[2.32]	-0.037	[-1.25]	-0.092***	[-3.24]
No of obs.	600							

Table 4: Marginal effects of term-time employment from an ordered probit of degree classification. Notes: All regressions include controls for gender, age, nationality, ethnicity, qualification on entry, faculty of study, socio-economic background, parents' income and education, school background, financial support, term-time accommodation, course attributes and year of graduation. z statistics in brackets, *** p<0.01, ** p<0.05, * p<0.1.

Most of the results of the control variables (not shown) are consistent with previous studies [41,42], although these earlier studies did not include measures of term-time employment and had fewer family and financial background variables than our study.

Taking into account a series of control variables (described in section 4) we find that term-time employment increases the likelihood

of getting a lower second or below and reduces the likelihood of a first. When we include an indicator for students who are working out of financial necessity (second regression in Table 4) the term-time employment indicator becomes insignificant. However, students working for financial reasons are considerably less likely to get a first (by 8 percentage points) and more likely to get a lower second (by 9 percentage points). The third regression in Table 4 also includes a set of

dummy variables for the intensity of employment. 'Low' or 'medium' intensities have no impact on degree performance, while a 'high' or 'very high' intensity reduced considerably the chances of getting a first (by 9-10 percentage points) and increased the probability of getting a lower second and below (by 13-14 percentage points).

Among the control variables, some results are worth mentioning. Females on average outperform men, although there are no significant differences in the likelihood of getting a first. A stronger predictor of success is prior formal human capital (qualifications on entry), which may partly reflect innate ability. There are no direct effects of socio-economic background; partly because this is itself is connected to term-time employment. Individuals with a higher 'career importance'

score, as expected, have a greater probability of getting a first. A higher weight placed on having a career is likely to be associated with greater motivation (something prior studies have not been able to control for) and is an indicator of students' preferences (e.g. they are willing to give more time and effort to their studies).

We also repeated the estimations in Table 4 using an OLS model of final percentage marks instead of degree classification. This allowed us to evaluate more precisely the effect of term-time employment on academic performance (i.e. in percentage point rather than class category) and for each year of the degree separately. The results are presented in Table 5.

	Total weighted average	First year	Second year	Final year
Regression 1				
Employed during term-time	-1.19** [-2.01]	-1.75*** [-2.74]	-1.84*** [-2.98]	-1.40** [-2.00]
Regression 2				
Employed during term-time	-0.41 [-0.62]	-1.69** [-2.05]	-1.07 [-1.48]	-0.38 [-0.46]
Work out of financial necessity	-1.71** [-2.24]	-0.11 [-0.10]	-1.63* [-1.82]	-2.35** [-2.21]
Regression 3				
Intensity of employment (base category not employed during term-time)				
Low	0.14 [0.16]	-1.09 [-0.87]	-0.22 [-0.16]	-2.13 [-1.29]
Medium	0.32 [0.33]	-1.55* [-1.74]	-1.85** [-2.31]	-0.16 [-0.19]
High	-2.50*** [-2.86]	-2.25** [-2.53]	-2.24*** [-2.80]	-2.65*** [-2.83]
Very high	-2.82*** [-3.15]	-	-	-
No of obs.	592	585	591	424

Table 5: OLS coefficients of the effect of term-time employment on percentage grades. Notes: All regressions include controls for gender, age, nationality, ethnicity, qualification on entry, faculty of study, socio-economic background, parents' income and education, school background, financial support, term-time accommodation, course attributes and year of graduation. z statistics in brackets, *** p<0.01, ** p<0.05, * p<0.1.

As observed in the previous model, undertaking term-time employment has a negative impact on studying, reducing grades in each year. The biggest impact is during the second year when working during term leads to an average reduction in marks of 1.8%. For students who work out of financial necessity the impact is much stronger in the final year with a reduction of 2.3% (regression 2 in Table 5). These findings indicate that, on average, students choose the optimal amount of term-time employment, in particular by cutting back in the final year when the marks have a greater weight for the overall mark (and degree classification), but this is not the case for financially constrained students. Regression 3 in Table 5 also

demonstrates that 'high intensity' work affects performance the most, especially in the final year (reducing marks by 2.7%). 'Medium intensity' has a negative impact in the second year. This has serious policy implications because - as mentioned earlier - high intensity employment is more likely to be undertaken by those from lower socio-economic backgrounds and those forced to work out of financial necessity.

Generally our results seem to support the idea that term-time employment has a negative impact (especially on the likelihood of getting a first) for students working out of necessity or those working a (very) high intensity of employment. We do not find any positive

impact of low levels of employment on degree performance that other studies have identified [13].

A caveat to these results is that there may be other unobservable factors related to motivations or preferences, that themselves directly influence degree performance [44,45]. However, we are able to control for quite a number of factors such as the importance of having a career (a proxy for motivation), family and socio-economic background, which may potentially affect both the decision to work and academic performance. We also performed a Chow test (test statistic = 79.6 and $\chi^2(60) = 88.38$) which suggested there are no systematic differences between students working and not working.

The effect of term-time employment on labour market outcomes

Having established that term-time employment has mainly a negative effect on academic performance (i.e. acquisition of formal human capital), it is now interesting to see whether it does have some positive effects on labour market outcomes. To assess this, we combined our survey data with the DLHE records of our respondents. 71% of the graduates in our sample entered employment after graduating, 19% continued with their study, 5% were unemployed and 5% were undertaking other activities, such as travelling. For the graduates who did enter employment, we focused on two main indicators of success in the labour market: whether the job required a degree (labelled as 'graduate job') and the entry salary level.

Graduate jobs

We based our definition of 'graduate job' on Elias and Purcell [46]. In their contribution they define four type of graduate jobs i.e. traditional, modern, new and niche, based on the National Statistics 2000 Occupational Code classification from which they create their own classification (SOC (HE)). We do not differentiate among sub-categories and simply define a job as 'graduate' if it falls in one of the four categories above.

We then model the likelihood of obtaining a graduate job for those in the labour market¹⁶ using a binary logit (equation 11). Table 6 reports the results of the model (expressed as marginal effects) for the main variables of interest: subject studied, degree classification and employment (including both term-time and degree and unpaid work experience). Nonetheless, a few results on the control variables (as described in section 4) are worth mentioning. Females are less likely to obtain graduate level employment, despite performing better in their degree. This might be due to discrimination in the labour market [47]. Students who have higher career importance scores are more likely to get a graduate job, indicating high motivation aids assimilation into the labour market.

Degree classification (base category - upper second)	Term time employment indicator		Employed for work experience indicator		Intensity of employment	
First	0.179***	[2.50]	0.180**	[2.52]	0.171**	[2.34]

Lower second and below	-0.027	[-0.36]	-0.023	[-0.32]	-0.066	[-0.85]
Faculty (base category - arts and humanities)						
Economic and social sciences	0.271***	[4.42]	0.273**	[4.46]	0.260**	[4.15]
Life sciences	0.120*	[1.72]	0.124*	[1.79]	0.104*	[1.44]
Sciences	0.208***	[2.98]	0.212**	[3.05]	0.194**	[2.64]
Employment						
Degree work experience	0.261***	[3.12]	0.265**	[3.23]	0.251**	[2.87]
Unpaid work experience	0.084	[1.31]	0.088	[1.40]	0.078	[1.20]
Term time employment	0.03	[0.53]	-	-	-	-
Work for non-experience reasons (term-time)			0.049	[0.79]	-	-
Work for experience reasons (term-time)	-	-	-0.012	[-0.15]	-	-
Intensity of Employment						
Low	-	-	-	-	0.048	[0.61]
Medium	-	-	-	-	-0.093	[-0.91]
High	-	-	-	-	-0.053	[-0.54]
Very High	-	-	-	-	0.167**	[2.39]
No of obs.	376		376		376	
Log likelihood	-215.1		-214.9		-211.5	
LR Chi2	58.18		59.57		64.04	
Pseudo r-squared	0.15		0.15		0.16	
Count r-squared	0.7		0.71		0.7	

Table 6: Marginal Effects from a logit of the likelihood of obtaining a graduate level job. Notes: Regressions include controls for gender, age, ethnicity, qualifications on entry, socio-economic background, parents' income and education, attitudes to careers and year of graduation. z statistics in brackets, *** p<0.01, ** p<0.05, * p<0.1.

Both subject and degree classification are important determinants of getting a graduate job. Students with a first class degree increase their chances of a graduate job by 18 percentage points compared to an identical student with an upper second. Graduates of economics and social sciences are more likely to get a graduate job than graduates of arts and humanities. This is consistent with other recent findings [48]. Both degree classification and subject are potential 'selectivity devices' to help employers select the type of graduates they want. But, given the larger number of graduates in recent years, employers might need

¹⁶ The results are not changed if we include those who are unemployed with the non-graduate job category, since these students have essentially chosen to enter the labour market.

other 'signals' to select the best graduates and work experience while studying might provide employers with such an additional 'signal'.

Table 6 shows that placements (degree work experience) but not unpaid work experience while in higher education increase a graduate's chances of obtaining a graduate job (by 26 percentage points). Surprisingly, however, term-time employment is insignificant even when we divide term-time employment into that undertaken for work experience reasons and for non-experience reasons. This suggests that potential graduate employers are more attracted by factors such as a first class degree, the specific subject studied and degree work experience, than other forms of work experience gained during term-time or unpaid work experience. However, individuals that undertake a 'high intensity' term-time employment are more likely to get a graduate job. This could be either because they increase their skills (human capital theory) or because being able to balance studying with high intensity of employment sends an impressive and positive signal to potential employers.

Entry salaries

An alternative – and more commonly used - measure of success in the labour market is salary. We have information for 223 of our survey respondents. The sample size is reduced since not all the students entered the labour market (376 did) and not all provided their salary (or were doing unpaid and voluntary work), however there are no major differences in the characteristics of those who did and did not report their salary [49], with a slight overrepresentation of those with a good degree and those from science subjects. An OLS model (with robust standard errors to control for heteroscedasticity) was used in order to gain a better understanding of salary determinants (equation 12). A number of control variables commonly believed to influence graduate salaries [50-60] were included (as described in section 4)¹⁷. The factors of interest are again subject degree classification and student employment. Table 7 reports the results on these variables.

	Term time employment indicator		Employed for work experience indicator		Intensity of employment	
Degree classification (base category - upper second)						
First	0.093**	[2.26]	0.083**	[2.04]	0.093**	[2.29]
Lower second and below	0.006	[0.14]	0.004	[0.11]	-0.005	[-0.012]
Faculty (base category - arts and humanities)						
Economic and social sciences	0.197***	[3.63]	0.196***	[3.68]	0.186***	[3.40]
Life sciences	0.153***	[2.86]	0.150***	[2.89]	0.145***	[2.63]
Sciences	0.141**	[2.47]	0.140**	[2.49]	0.128**	[2.20]
Employment						
Degree work experience	0.088*	[1.91]	0.079*	[1.77]	0.081*	[1.76]

Unpaid work experience	-0.017	[-0.44]	-0.026	[-0.69]	-0.02	[-0.54]
Term time employment	0.024	[0.70]	-	-	-	-
Work for non-experience reasons (term time)			-0.002	[-0.06]		
Work for experience reasons (term time)	-	-	0.091**	[2.00]	-	-
Intensity of Employment						
Low					0.025	[0.41]
Medium					-0.047	[-0.92]
High					0.032	[0.52]
Very High					0.070*	[1.69]
No of obs.	223		223		223	
R-squared	0.44		0.45		0.45	
Adjusted r-squared	0.38		0.39		0.38	

Table 7: Ordinary least squares regressions of the log of actual salaries. Notes: Regressions include controls for gender, age, ethnicity, qualifications on entry, industry, region, socio-economic background, parents' income and education, attitudes to careers and year of graduation t statistics in brackets, *** p<0.01, ** p<0.05, * p<0.1.

Before commenting on the results in Table 7, it is worth mentioning some of the effects of the control variables. Firstly, females on average earn less than males, ceteris paribus. Students with a graduate father or whose parents earn £35,000 or more have, on average, higher wages. Possible reasons for this include better social connections, greater parental support or guidance or more ambitious goals as a result of their background. Such students may also be able to stay unemployed longer until they find a more suitable job.

Graduates with a first class degree earn on average 8-9% more than graduates with an upper second. Graduates of economic and social sciences (who on average earn the most), life sciences and sciences earn more than graduate of art and humanities subjects. Having work experience as part of the degree course has a significant (but only at the 10% level) positive effect on earnings, suggesting that employers are attracted to graduates of such programmes (as also observed for the likelihood of getting a graduate job in Table 8) and reward them for having this kind of experience. The first regression in Table 7 included a dummy for term-time employment, which was insignificant. However, there is some evidence that term-time employment undertaken for experience reasons increases salary, as seen in the second regression in Table 7. Term-time employment undertaken for experience reasons may reflect attributes such as good time management skills or motivation, and provide a signal for employers of desirable graduate traits. However, there is potential endogeneity that students who undertake term time employment for experience may be more ambitious, better at interviews and therefore are students who

¹⁷ Our results could suffer from potential selection bias of student destination such as choosing to enter further study (if these students or from particular subjects or of higher ability), however a multinomial selection model showed there was no selection bias (see Jewell, 2008), which is also true of other studies (e.g., Naylor, 2007), so we concentrate on the OLS results.

are more likely to acquire a higher salary in the first place. This problem is potentially reduced with the inclusion of the importance of having a career variable. As in the final regression in Table 7 those undertaking high levels of employment have higher salaries (although this is only significant at the 10% level), which could reflect as seen in table 6 that these students are more likely to get a graduate level job. Moreover, the impact of term-time employment on labour market outcomes may depend on the type of occupation the graduate enters. Due to the sample size, it was not possible to break down term-time employment further into subjects, industries and degree classification.

Conclusions

Given the increase in term-time employment in the UK over the past few decades we were interested in its role in human capital acquisition. We have theorised that term-time employment potentially has more than one role in higher education. On the one hand, it may be an important input into a student's budget constraint, providing much needed funding, but potentially diverting time from study and hence hindering academic performance. On the other hand, term-time employment may help develop additional skills (or 'informal' human capital) that are valuable in the labour market. We examined the role of term-time employment by using a unique dataset that contained information on term-time work activities, academic performance and labour market outcomes of graduates, along with their individual characteristics.

Our evidence suggests that term-time employment is more likely to be undertaken for consumption and financial reasons rather than as additional human capital investment, even though many students recognised the value of working ex-post. 25% of all respondents (48% of students employed during term-time) worked during term-time for financial reasons. This group was disproportionately from lower socio-economic backgrounds, had less financial support from their families and had therefore a higher expected debt on graduation. It seems that some students have the advantage of not having to work, while it is those who are obliged to work, or who work with a greater intensity who experience the larger negative effects on their academic performance.

Maybe unsurprisingly, however, it has to be noted that, while students report negative effects of term-time employment on studying, they also say that they are more willing to give up study time than social/leisure time to accommodate term-time employment. Hence, as predicted by the theoretical model, term-time employment hinders academic performance by reducing the time spent on study.

We do find some evidence that students make rational decisions about the amount of term-time employment they undertake, for example by reducing the level of term-time employment in their final and most important year. However, it appears that students who are forced to work out of financial necessity have very little flexibility in the re-allocation of the hours worked across the years and have to continue working even in their final year (and with greater intensity). This in turn is detrimental to their degree outcomes as final year marks carry the highest weighting in the final degree classification.

The positive effects of term-time employment reported by working students include gaining work-related experience, developing transferable skills, increasing their confidence and improving time management skills. Working low levels of employment seems to be

beneficial in terms of the skills developed, although we find no definite significant positive impact on degree performance that other studies have identified [13].

Our second area of interest was the impact of term-time employment on labour market outcomes. Our results show that both degree classification and degree subject are important determinants of success in the labour market. Degree-related work experience and unpaid work experience increase the likelihood of getting a graduate job, but term-time employment itself has no impact, except for students working at a 'very high intensity'. However, there is some evidence that term-time employment undertaken for employment reasons or with a very high intensity does lead, on average, to greater entry salaries. This may be because of a potential 'signalling effect', i.e. work experience while studying becomes a signal that students have certain desirable qualities such as stronger motivation, ambition and better time management skills.

The findings on term-time employment have several policy implications. Firstly, financially constrained students have less control over the level of employment they undertake which may have detrimental effects on their academic performance and, ultimately, their labour market outcomes (both in terms of obtaining a graduate job and salary level). It is important, therefore, to offer the appropriate amount of support to 'financially constrained' students to ensure that they are not penalised not only in the short-term, but most crucially in the long-run. The UK system of student grants for poorer students introduced in the 2006/2007 academic year seems to be a step in this direction.

Secondly, the increase in term-time employment over the past decade means that students are forced to make an additional decision about their allocation of time. There is now potentially a trade-off between human capital acquisition and debt, with many students (43%) reporting working for debt reduction reasons and having higher expected debt upon graduation. Students that are debt averse may be willing to accept lower performance for lower debt which may have implications for the cost of higher education and future labour market outcomes, particularly if they graduate in a subject with a lower than average graduate premium.

Thirdly, graduate employers need to be aware that the fact that some students are forced to work might impact negatively on their degree performance, but might also mean that they have developed more 'informal' human capital which can be equally valuable in the work environment. Universities could help students to find employment that provides them with more specific human capital or alternatively with more general skills useful in the labour market. In the UK, some HEIs are already moving towards the direction of building work-experience and placements into the formal curriculum and in the USA 'collaborative' learning has become a very topical issue¹⁸.

Finally, it should be noted that this study was undertaken at a single institution based in the South East, where term-time jobs may be more readily available. Similar studies across different institutions, particularly new universities and those in different regions of the UK, would provide further insights into the role of employment, especially term-time, in higher education in the UK. In future work it may be useful to know more about the type (and occupation) of term time jobs

¹⁸ For example see <http://www.usajobs.gov/ei/studentcareerexperience.asp>.

to provide further insight into how term time jobs may contribute to informal human capital acquisition.

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