Entering Further Education in England: The Effect of Year 11 Work Habits

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Research Supervisor: Dr Amira Elasra

Department of Economics
University of Warwick

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Abstract

This paper examines the effect of part-time work during the final year of compulsory schooling on the probability of entering full-time education the following year. Data for students eligible to leave school in 2006 in England is used. Using a binary probit model, it is found that extensive involvement in work during term-time is detrimental to post-compulsory educational attainment. Working for a few hours, on the other hand, is associated with a higher probability of staying-on in further education after Year 11.

Acknowledgement

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I. Introduction

An individual's transition to the labour market has always been a closely followed activity, both because of its leverage in shaping a country's future as well as its position as a possible political flashpoint. It therefore, should come as no surprise that the minimum school-leaving age and the possible determinants of staying-on in education beyond that age have been the subject of intense scrutiny and review over time.

The proportion of individuals opting for full-time education after compulsory schooling has consistently risen over the years. Britain, which has historically lagged behind many other industrial economies, has also experienced a similar trend (see Figures 1 and 2).

Figure 1: Changes in Staying-On Rates in Education for 16-year olds
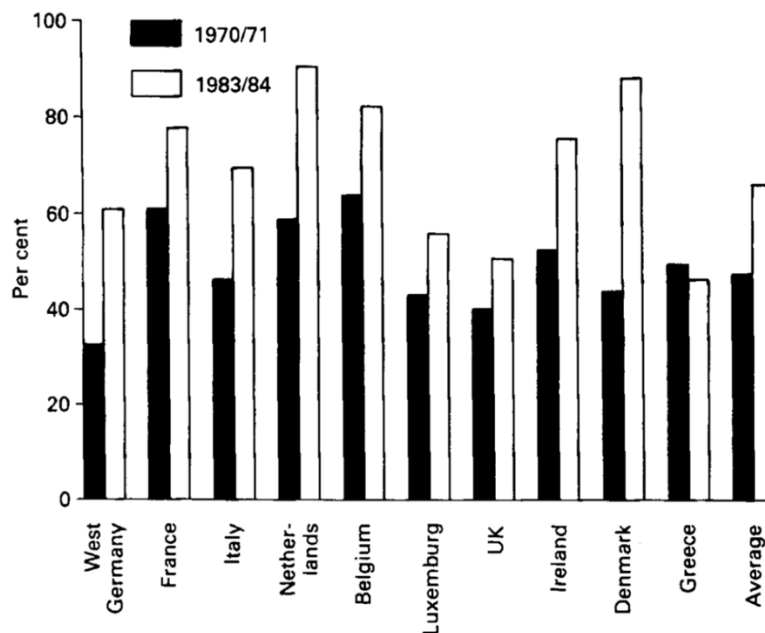
Source: Micklewright, Pearson and Smith, 1989, p.2

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Figure 2: Proportion of the cohort aged 16 years in full-time post compulsory education in England and Wales
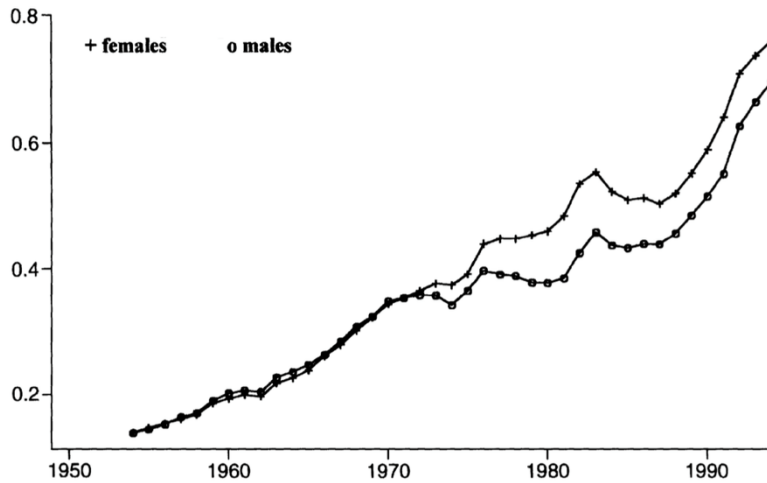
Source: McVicar and Rice, 2001, p.48

McVicar and Rice (2001) attribute this trend to an increase in the level of attainment at GCSE and the expansion of higher education. The advent and adoption of technology at an exponential speed has also led to a biased growth in the demand for skilled workers[1] (Van Reenen, 2011). Therefore, better educated and trained workers, who are better paid as well, have seen their incomes rise faster than low-skilled workers. This is, in turn, reflected in a growth in the earnings differential over time (Gregory and Hunter, 1995). Figure 3 illustrates this trend, the result of which is a higher opportunity cost of leaving school at the first available opportunity.

Figure 3: Differences in wages between the richest and poorest tenth in the UK by gender
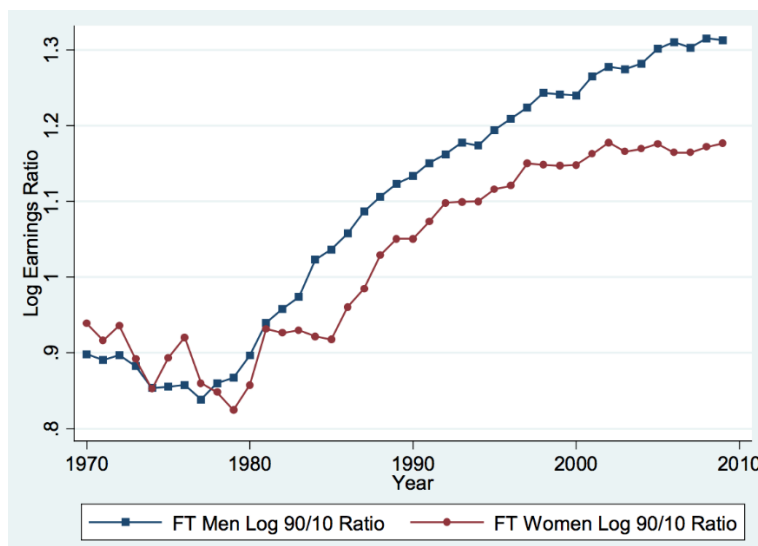
Source: Machin and Van Reenen, 2010, p.2

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[1] This is called skill-biased technological change (Meschi et al, 2016)

The biased growth in the demand for skilled workers has also been used to justify occasional raises in the school-leaving age in Britain at different points in time[2] (Condron, 2007). The current age at which pupils can leave full-time education in England is 16 years, with Participation Age set at 18 years[3].

An important implication of the above discussion is that the determinants of staying-on in education post the minimum leaving age are as important as ever. This paper attempts to analyse one such determinant, the effect of part-time work during the final year of compulsory education (Year 11) on the probability of entering full-time, non-compulsory education the following year.

The persistent importance of part-time work in the life of students can be gauged by the fact that the proportion of British 16-year olds working during school was 23.8% in 1992 and 28.2% in 2004 (Dustmann and Van Soest, 2007). Past researchers, as the following section shows, are not in consensus on the relationship between work and educational attainment, with differences ranging from the sign of the main effect to the existence of non-linearity in the relationship. Moreover, existing literature overwhelmingly studies the work and staying-on decision of pupils well before the turn of the century. This paper examines this relationship in a more recent context, taking into account the changes in and evolution of both work habits and educational attainment. This was a major motivation in the decision to examine the effect of part-time work, which is both relevant and intriguing.

Hypotheses:

Hypothesis 1: More extensive work involvement during school is detrimental to the probability of entering further education.

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[2] See Appendix 1 for history of the school-leaving age
[3] Participation Age, introduced in 2013, requires students to remain in some form of education or training until they turn 18 (DCSF, 2009)

Hypothesis 2: Less extensive work involvement has a negative effect on entering further education, albeit this effect is less pronounced than the one from more extensive work involvement.

II. Literature Review

There have been a range of studies examining the determinants of the decision to stay-on[4] in post-compulsory education. These have typically used individual characteristics and family background to explain this decision. Mocetti (2012) found evidence that previous school failures, followed by parents' socioeconomic status were the largest determinants of leaving school after compulsory education. Jackson (2009), meanwhile concluded that poorer health in adolescents is strongly negatively related to educational attainment. He said this is due to lesser participation and poorer academic performance.

Dustmann and Van Soest (2007) examined a cohort of students in the UK who were eligible to leave school in 1974 to analyse work habits during school, performance and the school-leaving decision. Using an ordered probit model, they differentiated between those 16-year olds who continued in full-time education, those who left school for work and those who left school for training. They concluded that working while in full-time education affected the staying-on decision negatively, but the effect is only marginally significant for males. They also found that parental aspirations for the child's academic career were a major determinant of the decision to continue in full-time education.

Ruhm (1997) studied high school employment in the US and concluded that engaging in work during senior year reduced further attainment of education; this effect was particularly pronounced for students working more than 20 hours per week. Ehrenberg and Sherman

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[4] 'Staying-on' and 'entering further education' in the context of this paper refer to entering full-time post-compulsory education

(1985) used panel data collected from the High School Class of 1972 in the US to construct a structural persistence (probit) model, and estimated their regression separately for each year of college. They found that part-time work did have an adverse effect on the probability that the student will be enrolled in college the next year. An increase in the number of hours worked was also observed to have reduced the rate of graduating on time for non-dropouts. Moreover, off-campus (but not on-campus) work was associated with a lower probability of being enrolled for post graduate education.

  Eckstein and Wolpin (1999) came up with a rather unconventional argument to explain the school-leaving decision. They found that students who dropped out of high school demonstrated different traits as compared to those who stayed-on – the dropouts had lower school ability, a lower expected value of the gains from staying-on and a comparative advantage in jobs usually done by non-graduates. They argued that even if part-time work during school was prohibited, it would only lead to a minimal increase in the probability of graduating for the dropouts. This implies that part-time work on its own does not affect the dropout decision, but is instead reflective of certain individual characteristics and traits that shape it.

  Neumark and Joyce (2001) investigated the effect that school-to-work programs had on future outcomes for high school students in the US. These were programs offered by schools that aimed to effectively prepare students for the world of work. Examples include internships, apprenticeships, job shadowing, working in a school-sponsored enterprise etc. The results indicated that these programs led to an increase in the subjective probability of obtaining a high school diploma by the age of 20, though there was no evidence of any effect on future college attendance.

  Griliches (1980) investigated the effect of term-time work on educational and occupational expectations. He found a marginal positive effect on educational expectations, as those students who had earlier claimed that work interfered with their schooling reported higher expectations during a subsequent questionnaire as compared to their counterparts. Robinson (1999) found no negative effect of part-time work during Year 11 on school completion.

To see whether employment during school had any detrimental effect on academic goals and aspirations, Marsh (1991) examined a cohort of students in the US who were eligible to leave high school in 1982. The results obtained were overwhelmingly supportive of the zero-sum model advocated by Coleman (1961), which states that time spent outside academic pursuits negatively affects academic outcomes through either the time constraint or via lesser involvement at school. The number of hours worked during the sophomore year were significantly and positively related to dropping out; this relation held over the final two years of high school, albeit it was weaker. Work during the academic year was also negatively related to a range of final year and postsecondary outcomes, such as educational aspirations. An exception to this were those who were working to save money for college; for these students, part-time work had a positive effect on actual attendance at college, educational aspirations and time spent on homework. Marsh also concluded that working during the summer had some positive effects on educational outcomes. This is again in line with the zero-sum theory, as the opportunity costs of working during the summer are low as compared to those incurred by working during term time.

D'Amico (1984) found that those students who worked for less than twenty hours per week during term time were more likely to complete high school. Working for more than twenty hours was meanwhile associated with an increased probability of dropping out, which could be due to excess work distracting students from their academic goals.

III. Data

The data source for this paper is *Next Steps* (formerly the *Longitudinal Study of Young People in England*) which is obtainable from the UK Data Service. It is a longitudinal study that started out by following the lives of over 16,000 people in England who were born in 1990-1991, and were thus eligible to leave school in 2006. For the purpose of this paper, data collected during

Waves 3 and 4 is being used[5]. Data for Wave 3 was collected when the individual was in their final year of compulsory schooling (Year 11), and that for Wave 4 was collected one year after that. Wave 3 data contains information on family background and individual characteristics of the young person being surveyed, including data on work habits during Year 11. Data from Wave 4 is mainly used to obtain information about the main occupation of the individual one year after the scheduled completion of compulsory schooling. Data from these two waves has been combined to enable a cross-sectional analysis. All regressions in this paper only include those students who were in Year 11 at the time of Wave 3.

The school-leaving age when the data was collected was 16 years, with no concept of Participation Age.

Description of Data:

Nearly 27% of the respondents claimed to work during term time, and over 77% entered full-time education after Year 11. Controls that have been added include categorical variables reflecting the health condition of respondents over the 12 months preceding the survey, performance at school during Year 11, and annual family income. Other controls include whether parents wanted their child to enter full-time education after school, whether the student had any caring responsibilities at home, the number of siblings as well as measures for gender and ethnicity[6].

A preliminary analysis of the data reveals a negative relationship between hours worked and entering further education; this is shown in Figure 4 below. As can be inferred, nearly 78% of those working up to five hours per week continue in education, whereas about 73% of those working between five and ten hours do so. This proportion sees a further decline in higher hour categories, with only 48% of those working more than twenty hours opting for further education.

[5] See Appendix 2 for a description of data collection exercises for this study
[6] See Appendix 3 for a description of all variables, and Appendix 4 for summary statistics of key variables

Figure 4: Effect of Hours Worked on the Staying-On Decision
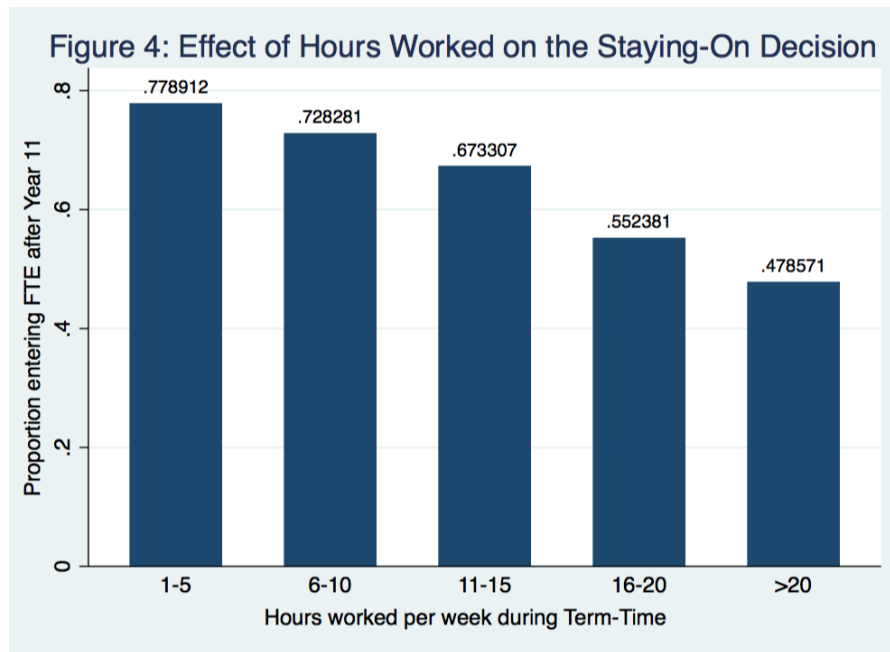
Survey Weights:

Survey weights provided in the dataset have been incorporated to ensure that the survey design for the relevant waves has been accounted for. This also means that all standard errors in the results are robust; therefore, heteroscedasticity is not a potential problem.

IV. Methodology

The main dependant variable, entering full-time education, is binary. Hence using a linear probability model appeared to be an adequate choice. To enable comparison with existing literature, the binary probit model is being used. This also allows the use of marginal effects to analyse the results. Part-time work during Year 11 is the main independent variable. The regression including these variables is set out below (as Model I):

Model I (Part-time work is the main independent variable):

$Pr(Full\text{-}Time\ Education = 1) = \mathsf{F}(a + b_1 Part\text{-}time\ work + b_2 Parental\ support + b_3 Caring\ responsibilities + b_4 Bad\ health + b_5 Bad\ marks + b_6 Income + b_7 Ethnicity + b_8 Sex + b_9 Siblings + e)$

To investigate the hypotheses and facilitate a more comprehensive analysis of the relationship between part-time work and entering further education, two new independent variables, 'high work hours' and 'low work hours' were introduced. These two dummy variables account for whether the extent of work involvement was high (more than six hours per week), or whether the student was involved in less extensive part-time work (up to six hours per week). Six hours was chosen as the cut-off for low work hours as the average number of hours worked per week by those in the sample is 6.47. While Steinberg et al (1982) make a case for 15-20 work hours per week as the cut-off, due to a limited number of students working for such a high number of hours per week in the sample, it was decided to use a lower cut-off so as not to compromise on the validity of the results.

The above mentioned variables could not be included in Model I as they have been derived from the part-time work variable. This leads to multicollinearity and incorrect standard error estimates. Hence, two separate equations were estimated:

Model II (High work hours is the main independent variable):
$Pr(Full\text{-}Time\ Education = 1) = \mathsf{F}(a + b_1 High\ work\ hours + b_2 Parental\ support + b_3 Caring\ responsibilities + b_4 Bad\ health + b_5 Bad\ marks + b_6 Income + b_7 Ethnicity + b_8 Sex + b_9 Siblings + e)$

Model III (Low work hours is the main independent variable):
$Pr(Full\text{-}Time\ Education = 1) = \mathsf{F}(a + b_1 Low\ work\ hours + b_2 Parental\ support + b_3 Caring\ responsibilities + b_4 Bad\ health + b_5 Bad\ marks + b_6 Income + b_7 Ethnicity + b_8 Sex + b_9 Siblings + e)$

Endogeneity

One issue that has not been mentioned in previous literature is endogeneity in the form of reverse causality. While the above regressions aim to examine the effect of part-time work (during Year 11) on the post-Year 11 decision, it could also be the case that the aspiration of

entering education after compulsory schooling is driving work habits during Year 11. This notion is consistent with the findings of Marsh (1991), who found that there was a positive relationship between work and entering further education for those students who were working to save money for the latter. This means that future expectations were influencing the labour supply decision for these students. However, due to the unavailability of a suitable instrument, it is not possible to account for this type of endogeneity. The effect, however, is not expected to be significantly large as it is unlikely that the amount of money earned from part-time work is large enough to influence the staying-on decision in a major way (Robinson, 1999).

Another form of endogeneity, but that which has been discussed by past researchers is unobserved individual heterogeneity. Such heterogeneity has the potential of affecting both the part-time work and staying-on decisions, and thus contaminating the coefficient estimates. For instance, lower motivation for schooling can lead to an increased probability of an individual working part-time during school, or for a higher number of hours. It can also separately be linked to an increased chance of leaving education after school. This has the potential of magnifying any effect of part-time work on school-leaving. Unfortunately, there is a lack of suitable instruments for part-time work that could be used to deal with this bias. Stinebrickner and Stinebrickner (2003) caution that an instrument exogenous only to part-time work is very difficult to find, whereas Rothstein (2007) also hinges on the availability of an instrument. Buscha et al (2012) sum this debate by acknowledging that even the best attempts to date to provide an exogenous variation are questionable.

V. Results and Analysis

Part-time work:

  The regression coefficients are given in Table 1 and the marginal effects at the mean in Table 2 below. The coefficient of part-time work in Model I is negative, but insignificant. This limits its interpretative relevance and by extension, its ability to define a definite association with the dependant variable. The negative sign, however, implies that those who work during term time are somewhat (0.19 percentage points) less likely to stay-on in education, as compared to those who do not. This might be the result of part-time work causing a loss of enthusiasm in schooling. A possible cause of this could be paid work fuelling the prospect of financial independence, making the students lose the willingness to invest in education further (D'Amico, 1984). It could also be the case that these students enjoy the personal autonomy that they gain from working, which is in contrast to the constrained life at home and school (Robinson, 1999). Thus it is difficult for them to resist the urge of giving up full-time education.

  The results for high work hours in Model II imply that those who work for more than the average number of hours per week during term-time are significantly less likely to continue in full-time education after the completion of compulsory schooling as compared to their counterparts at school. The results are therefore supportive of Hypothesis 1, which stated that more extensive work involvement during school is detrimental to the probability of entering further education.

  The results for Model III contradict Hypothesis 2, which stated that the effect of working less extensively during term-time is negative (and less severe than working extensively). The coefficient for low work hours is positive, and its marginal effect implies that those who work for six or less hours each week are in fact 3.8 percentage points more likely to continue in education after Year 11 as compared to their fellow students. A possible reason for this could be that employment in (the usually) low-paying jobs informs students about the unattractive nature and compensation of jobs that non-graduates do, and makes them aware of the importance of educational qualifications (D'Amico, 1984). This trend would be particularly

prevalent in the case of those who are working to assess their employability or the condition of the labour market. Disillusioned at the unavailability of a position or job that they had expected or desired, these people thereafter enter further education. Another explanation may be that employment during school promotes perseverance by equipping students with skills such as discipline and focus. It may also instil a sense of competence and responsibility as well as self-confidence, which is gained through interacting with other people (Robinson, 1999). These can promote a more optimistic and proactive outlook to life that can, in turn, lead to students wanting to pursue more qualifications.

Table 1: Probit Regression Results[7]

(Dependent Variable: Entered full-time education after Year 11)

Independent Variable	Model I	Model II	Model III
Part-time work	**-0.006**		
	(0.042)		
High work hours		**-0.187***	
		(0.056)	
Low work hours			**0.136***
			(0.050)
Ethnicity (Reference Category: White)			
Mixed	0.290**	0.291**	0.301**
	(0.120)	(0.120)	(0.121)
Indian	0.771***	0.755***	0.786***
	(0.111)	(0.111)	(0.112)
Pakistani	0.566***	0.547***	0.585***
	(0.143)	(0.142)	(0.142)
Bangladeshi	0.607***	0.587***	0.628***
	(0.217)	(0.218)	(0.218)
Black Caribbean	0.484***	0.468***	0.500***
	(0.150)	(0.150)	(0.150)
Black African	1.013***	1.008***	1.034***
	(0.208)	(0.207)	(0.208)
Other	0.260	0.250	0.274
	(0.171)	(0.172)	(0.171)
Cons	-0.139	-0.131	-0.162
	(0.376)	(0.375)	(0.377)
No. of Observations	7173	7173	7173

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%

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[7] Tables show limited controls (or categories) for clarity. See Appendices for full results.

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Table 2: Marginal Effects

Independent Variable	Model I	Model II	Model III
Part-time work	-0.0019		
	(0.012)		
High work hours		-0.058***	
		(0.018)	
Low work hours			0.038***
			(0.013)
Ethnicity (Reference Category: White)			
Mixed	0.079***	0.079***	0.082***
	(0.029)	(0.029)	(0.029)
Indian	0.167***	0.165***	0.169***
	(0.016)	(0.016)	(0.016)
Pakistani	0.136***	0.133***	0.140***
	(0.026)	(0.026)	(0.025)
Bangladeshi	0.143***	0.140***	0.147***
	(0.036)	(0.037)	(0.036)
Black Caribbean	0.121***	0.118***	0.124***
	(0.029)	(0.030)	(0.029)
Black African	0.194***	0.193***	0.196***
	(0.020)	(0.020)	(0.019)
Other	0.072*	0.069	0.075*
	(0.042)	(0.043)	(0.042)

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%

Those working for more than six hours meanwhile are significantly (5.8 percentage points) less likely to continue studying full-time beyond the age of 16. These students may be working for many hours to signal that they wish to join the labour market soon. They would want to gain a certain level of exposure and experience so as to improve their chances of getting a good job once they leave school. It could also be the case that these students want to finance part of their post-compulsory education themselves (perhaps as a result of the self-sufficiency instilled in them from working and earning during school). It is not possible to see who they are and whether they are successful in their endeavour as they may resume studying after many years, data for which may not be available. Another possible explanation is that since these students have focused comparatively more on work, they tend to fall short of understanding the benefits of education.

Ethnicity and part-time work:

  As compared to whites, who account for roughly 70% of the sample, students from ethnic minorities are more likely to enter full-time education, as seen by the signs of the coefficients for all ethnicities where whites are the base category. A possible reason for ethnic minorities staying-on could be to avoid unemployment, or in expectation of a greater future benefit of staying-on. It could also be due to an anticipation of racism if work is found, whereby further education acts as a delaying mechanism (Leslie and Drinkwater, 1999). However, part-time work may play an important role in explaining the differences in staying-on rates across ethnicities. Analysis of the data shows that ethnic minorities are less likely to engage in part-time work as compared to whites. This is shown in Table 3.

Table 3: Proportion of Young People from each Ethnicity Engaging in Part-Time Work

Ethnicity	% of given Ethnicity working during Term-Time
White	33.6%
Mixed	22.7%
Indian	7.71%
Pakistani	4.79%
Bangladeshi	4.78%
Black Caribbean	11.8%
Black African	6.69%
Other	13.5%

  To see whether ethnic minorities' distinctive labour supply decision has a bearing on the difference in their and whites' school-leaving decision, an interaction term between ethnicity and part-time work was added to Model I, the results of which are shown in Table 4 (Model IV).

  The rationale behind not including the interaction term in the main regressions was to ensure uniformity in the results above and enable a comparison of results across the models, as including it would have led to different interaction terms for the main independent variables in Models II and III (high work hours and low work hours respectively). The interpretation of the latter two models' interaction terms is unclear and lacks the intuitive validity for inclusion. The fact that there are no specific trends across ethnic lines with respect

to differences in hours worked, and no evidence of it in the literature either means that the results would not have carried weight. Moreover, further dividing the minority ethnicities by number of hours worked made some results questionable, due to the small number of observations.

The results in Table 4 show that the coefficients for the interaction terms for all ethnicities are negative, except for Pakistanis and Other. While the coefficient of the former is insignificant, the latter can comprise multiple ethnicities with different characteristics, and so the intuition behind the coefficient sign cannot be commented on. The negative coefficients of the interaction terms for all other ethnic minorities meanwhile imply that as compared to a white who does not engage in part-time work, a student from one of these ethnic minorities who works is less likely to enter full-time education. This serves to show the importance of part-time work in explaining the staying-on decision. Combined with the fact that these ethnic minorities work notably less than whites, if the part-time work differential did not exist, or was the other way around, it is likely that the differential in full-time education entrance rates would be offset to some extent. Hence disparity in the labour supply decision across ethnicities can be labelled as one of the determinants of the divergence in their staying-on rates.

Table 4: Probit Regression Results

(Dependent Variable: Entered full-time education after Year 11)

Independent Variable	Model IV
Part-time work[8]	**0.0071**
	(0.044)
Ethnicity	
(Reference Category: White)	
Mixed	0.395***
	(0.138)
Indian	0.893***
	(0.120)
Pakistani	0.562***
	(0.144)
Bangladeshi	0.644***
	(0.214)
Black Caribbean	0.528***
	(0.163)
Black African	1.189***
	(0.238)
Other	0.170
	(0.182)
Ethnicity * Part-time work	
(Reference Category: Non-working White)	
Mixed	**-0.418**
	(0.266)
Indian*Part-time work	**-0.929***
	(0.282)
Pakistani*Part-time work	**0.122**
	(0.500)
Bangladeshi*Part-time work	**-0.888****
	(0.450)
Black Caribbean*Part-time work	**-0.399**
	(0.368)
Black African*Part-time work	**-1.091****
	(0.528)
Other*Part-time work	**1.115****
	(0.495)
Cons	-0.137
	(0.369)
No. of Observations	7173

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%

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[8] The coefficient estimate of part-time work here is positive, whereas the marginal effect (shown in Appendix 6) is negative.

Number of hours worked:

While the above analysis provides useful – and arguably conclusive – insights into the prevalence of non-linearity in the examinable relationship, it was decided to incorporate a continuous hours worked variable in the analysis. This would give the effect of each additional hour of work on the dependent variable for the working population. Due to multicollinearity making the estimates unreliable, it has been included in a separate regression, the results of which are reported in Appendix 7.

The marginal effect of work hours implies that each additional hour of work leads to a 0.6 percentage point decrease in the probability of entering full-time education after Year 11. This is consistent with the results stated above, with higher work hours leading to a significant drop in the probability of acquiring further education.

Model Robustness:

The effects of main explanatory variables are fairly consistent across models. Including a continuous independent variable complements the main relationship that was derived. Additionally, the opposing effects of high and low work hours justify the insignificance in the effect of part-time work in Models I and IV. This implies that the model is sufficiently robust.

VI. Conclusion and Limitations

The results in this paper indicate that part-time work may not necessarily have an adverse effect on the probability of entering post-compulsory education. While long work hours do seem to be detrimental for educational attainment, working for a few hours per week is shown to increase the likeliness of entering further education. These results are fairly consistent with those formulated by D'Amico (1984).

A limitation of this study is that the role of the link between work and academic performance in shaping the staying-on decision could not be studied. Part-time work may be detrimental to performance and those with worse grades are significantly less likely to continue studying (Dustmann and Van Soest, 2007). However, it was not possible to study this relationship here due to the lack of a reliable measure of performance such as GCSE grades, which have a direct effect on enrolment in further education (e.g. through minimum entry requirements). The current measure of performance, which was the closest alternative variable available, is subjective and based on students' perception of their results. This is an unreliable measure, as argued by Robinson (1999), who showed how students did not perceive their work to negatively affect their school performance but that measured effects on performance were contrary to these perceptions. Future research can deal with this by including a standardized measure of academic performance to make the analysis more extensive.

The extent of part-time work's effect on different ethnicities and their staying-on rates can also be studied in greater detail in the future by including measures for each ethnic minority's likeliness of entering further education, both when they work and when they do not. This can then be linked to that ethnicity's work and staying-on rates, to give a more accurate picture of the effect that work has on students from that ethnicity.

Policy Implications:

While the introduction of Participation Age is meant to tackle the problem of full-time employment immediately after Year 11, it does not explicitly aim to encourage students to continue full-time education after the age of 16, or to enter higher education when they turn 18. Thus, the effect of long work hours on staying-on in full-time education today is likely to be similar to that found in this paper, and needs to be addressed promptly through a combination of both short and long term solutions.

A direct monetary allowance to students staying-on in education (similar to the now-discontinued Educational Maintenance Allowance) can have the effect of incentivising the take-up of further education to some extent, especially given the strong effect of income on educational attainment.

As far as a long term solution is concerned, Cameron and Heckman (2001) suggested that it is the long term effect of family income (and not short-term credit constraints), captured in the early years, that has the greatest influence on staying-on in the form of a child's learning ability and college readiness. These long term factors need to be investigated in further detail. Mandatory programs providing limited work experience to students can also be considered to take advantage of the non-linear relationship derived above.

These policies should be considered earnestly, given that both part-time work and the dilemma of leaving school after compulsory education are here to stay.

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Data Source:

Next Steps: https://www.ukdataservice.ac.uk/

Appendices

Appendix 1: History of the School-Leaving Age in England

Year	School-leaving age	Legislation
1893	Set at 11	Elementary Education Act 1893
1899	Raised to 12	
1918	Raised to 14	Education Act 1918
1944	Raised to 15	Education Act 1944
1972	Raised to 16	
2008	Participation Age set at 17	Education and Skills Act 2008 (Enforceable from 2013 onwards)
2008	Participation Age to be raised to 18	(Enforceable from 2015 onwards)

Appendix 2: Data collection waves of *Next Steps*

Wave	Year	Age of respondent
1	2004	13-14 (Year 9)
2	2005	14-15 (Year 10)
3	2006	15-16 (Year 11)
4	2007	16-17
5	2008	17-18
6	2009	18-19
7	2010	19-20
8	2015-16	25

Appendix 3: Description of variables

Variable Name	Variable	Variable Type	Variable Description
fte	Full-time Education	Dummy variable	Equal to 1 if young person (YP) entered full-time education after Year 11
ptwork	Part-time work	Dummy variable	Equal to 1 if YP did part-time work during term time in Year 11
highwh	High work hours	Dummy variable	Equal to 1 if YP engaged in more than six hours of work per week during term time in Year 11
lowwh	Low work hours	Dummy variable	Equal to 1 if YP engaged in up to six hours of work per week during term time in Year 11
workhrs	Number of Hours Worked	Continuous variable	Number of hours worked per week during term time
parsupp	Parental Support	Dummy variable	Equal to 1 if main parent wanted YP to continue in full-time education after Year 11
care	Caring responsibilities	Dummy variable	Equal to 1 if YP has any caring responsibilities within household
bhealth	Condition of Health	Categorical variable	Equal to 1 if condition of health very good in last 12 months; 2 if fairly good; 3 if not very good; 4 if not good at all
bmarks	School Performance	Categorical variable	Equal to 1 if YP strongly agrees that they get good marks for their work; 2 if agrees; 3 if disagrees; 4 if strongly disagrees
income	Family income	Categorical variable	Total yearly income for both parents (grouped)
Ethnic	Ethnicity	Categorical variable	YP's ethnic group
sex	Sex	Dummy variable	Equal to 1 if YP is male; 0 if female
sibs	Siblings	Continuous variable	Number of siblings to YP in household

Appendix 4: Summary statistics of key variables

Variable	Mean	Standard Deviation	Min	Max
Full-time education	0.771	0.420	0	1
Part-time work	0.267	0.442	0	1
High work hours	0.107	0.309	0	1
Low work hours	0.157	0.364	0	1
Work hours[9] (Continuous)	6.47	4.65	1	37

Breakdown of sample by ethnicity

Ethnicity	Representation in sample
White	69.73%
Mixed	4.86%
Indian	6.70%
Pakistani	5.85%
Bangladeshi	4.58%
Black Caribbean	2.97%
Black African	2.88%
Other	2.41%

Breakdown of sample by gender

Gender	Representation in Sample
Male	50.46%
Female	49.54%

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[9] To preserve the sample size in Model V (Appendix 7), the people who did not engage in part-time work were coded as '0' in the hours worked variable. This does not affect the interpretation of the marginal effect.

Appendix 5a: Full Regression Results
(Dependent Variable: Entered full-time education)

Independent Variable	Model I	Model II	Model III
Parental Support	1.263***	1.259***	1.265***
	(0.054)	(0.054)	(0.054)
Caring responsibilities	-0.149	-0.152*	-0.154*
	(0.090)	(0.090)	(0.091)
Bad Health: (Reference Category: Very good health)			
Good health	-0.136***	-0.135***	-0.134***
	(0.045)	(0.045)	(0.045)
Bad health	-0.218*	-0.212*	-0.211*
	(0.120)	(0.119)	(0.119)
Very bad health	-0.627**	-0.625**	-0.607**
	(0.272)	(0.276)	(0.272)
Bad Marks: (Reference Category: Very good marks)			
Good Marks	-0.440***	-0.438***	-0.441***
	(0.060)	(0.061)	(0.060)
Bad marks	-0.921***	-0.919***	-0.920***
	(0.078)	(0.078)	(0.078)
Very bad marks	-1.421***	-1.405***	-1.399***
	(0.225)	(0.224)	(0.225)
Income: (Reference Category:<£2600 per year)			
£2600 up to £5199	0.075	0.076	0.076
	(0.395)	(0.394)	(0.397)
£5200 up to £10,399	0.050	0.058	0.052
	(0.380)	(0.379)	(0.382)
£10,400 up to £15,599	0.206	0.222	0.204
	(0.379)	(0.378)	(0.380)
£15,600 up to £20,799	0.346	0.364	0.343
	(0.374)	(0.373)	(0.375)
£20,800 up to £25,999	0.329	0.348	0.322
	(0.377)	(0.376)	(0.378)
£26,000 up to £31,199	0.330	0.352	0.321
	(0.375)	(0.374)	(0.376)
£31,200 up to £36,399	0.385	0.407	0.378
	(0.375)	(0.374)	(0.376)
£36,400 up to £41,599	0.455	0.472	0.445
	(0.379)	(0.378)	(0.381)
£41,600 up to £46,799	0.609	0.631*	0.600
	(0.380)	(0.379)	(0.381)
£46,800 up to £51,999	0.650*	0.670*	0.642*
	(0.370)	(0.379)	(0.381)
>£52,000	0.876**	0.893**	0.869**
	(0.376)	(0.374)	(0.377)
Sex (1 if male)	-0.134***	-0.140***	-0.135***
	(0.042)	(0.042)	(0.042)
Number of siblings	-0.024	-0.023	-0.025
	(0.020)	(0.020)	(0.020)

No. of Observations	7173	7173	7173

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%

Appendix 5b: Full Marginal Effects

Independent Variable	Model I	Model II	Model III
Parental Support	0.443***	0.442***	0.444***
	(0.020)	(0.020)	(0.020)
Caring responsibilities	-0.046	-0.047	-0.047
	(0.029)	(0.029)	(0.029)
Bad Health: (Reference Category: Very good health)			
Good health	-0.040***	-0.040***	-0.039***
	(0.013)	(0.013)	(0.013)
Bad health	-0.066*	-0.064*	-0.064*
	(0.039)	(0.039)	(0.039)
Very bad health	-0.214**	-0.213**	-0.207*
	(0.106)	(0.107)	(0.105)
Bad Marks: (Reference Category: Very good marks)			
Good Marks	-0.106***	-0.106***	-0.106***
	(0.013)	(0.013)	(0.013)
Bad marks	-0.271***	-0.270***	-0.270***
	(0.024)	(0.024)	(0.023)
Very bad marks	-0.468***	-0.462***	-0.459***
	(0.086)	(0.086)	(0.086)
Income: (Reference Category:<£2600 per year)			
£2600 up to £5199	0.028	0.028	0.028
	(0.147)	(0.147)	(0.147)
£5200 up to £10,399	0.019	0.022	0.019
	(0.142)	(0.142)	(0.142)
£10,400 up to £15,599	0.073	0.080	0.073
	(0.141)	(0.142)	(0.141)
£15,600 up to £20,799	0.119	0.126	0.118
	(0.139)	(0.140)	(0.139)
£20,800 up to £25,999	0.114	0.121	0.111
	(0.140)	(0.141)	(0.140)
£26,000 up to £31,199	0.114	0.122	0.111
	(0.140)	(0.140)	(0.140)
£31,200 up to £36,399	0.131	0.139	0.128
	(0.139)	(0.140)	(0.140)
£36,400 up to £41,599	0.151	0.158	0.148

	(0.140)	(0.141)	(0.141)
£41,600 up to £46,799	0.193	0.200	0.190
	(0.140)	(0.140)	(0.140)
£46,800 up to £51,999	0.203	0.210	0.200
	(0.140)	(0.140)	(0.140)
>£52,000	0.251*	0.257*	0.248*
	(0.139)	(0.139)	(0.139)
Sex (1 if male)	-0.039***	-0.041***	-0.039***
	(0.012)	(0.012)	(0.012)
Number of siblings	-0.007	-0.007	-0.007
	(0.006)	(0.006)	(0.006)

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%

Appendix 6: Model IV with interaction term
(Dependent Variable: Entered full-time education)

Independent Variable	Regression Coefficient	Marginal Effect
Part-time work	0.0071	-0.0090
	(0.044)	(0.013)
Parental Support	1.263***	0.444***
	(0.054)	(0.020)
Caring responsibilities	-0.146	-0.045
	(0.090)	(0.029)
Bad Health:		
(Reference Category: Very good health)		
Good health	-0.137***	-0.040***
	(0.045)	(0.013)
Bad health	-0.215*	-0.065*
	(0.120)	(0.039)
Very bad health	-0.627**	-0.215**
	(0.272)	(0.106)
Bad Marks:		
(Reference Category: Very good marks)		
Good Marks	-0.444***	-0.108***
	(0.060)	(0.013)
Bad marks	-0.922***	-0.271***
	(0.078)	(0.024)
Very bad marks	-1.428***	-0.471***
	(0.225)	(0.086)
Income:		
(Reference Category:<£2600 per year)		
£2600 up to £5199	0.068	0.025
	(0.388)	(0.145)
£5200 up to £10,399	0.046	0.017
	(0.373)	(0.139)
£10,400 up to £15,599	0.206	0.074
	(0.372)	(0.138)
£15,600 up to £20,799	0.337	0.116
	(0.366)	(0.136)
£20,800 up to £25,999	0.325	0.113
	(0.369)	(0.137)
£26,000 up to £31,199	0.326	0.113
	(0.367)	(0.137)
£31,200 up to £36,399	0.380	0.130
	(0.367)	(0.137)
£36,400 up to £41,599	0.449	0.150
	(0.372)	(0.138)
£41,600 up to £46,799	0.607	0.192
	(0.373)	(0.137)
£46,800 up to £51,999	0.645*	0.201
	(0.372)	(0.137)
>£52,000	0.872**	0.250*
	(0.368)	(0.136)
Ethnicity		

(Reference Category: White)

Mixed	0.395***	0.074**
	(0.138)	(0.030)
Indian	0.893***	0.143***
	(0.120)	(0.020)
Pakistani	0.562***	0.142***
	(0.144)	(0.033)
Bangladeshi	0.644***	0.098*
	(0.214)	(0.054)
Black Caribbean	0.528***	0.105***
	(0.163)	(0.033)
Black African	1.189***	0.177***
	(0.238)	(0.026)
Other	0.170	0.127***
	(0.182)	(0.035)
Sex (1 if male)	-0.133***	-0.039***
	(0.042)	(0.012)
Number of siblings	-0.024	-0.007
	(0.020)	(0.006)

Ethnicity * Part-time work[10]
(Reference Category: Non-working White)

Mixed	-0.418
	(0.266)
Indian*Part-time work	-0.929***
	(0.282)
Pakistani*Part-time work	0.122
	(0.500)
Bangladeshi*Part-time work	-0.888**
	(0.450)
Black Caribbean*Part-time work	-0.399
	(0.368)
Black African*Part-time work	-1.091**
	(0.528)
Other*Part-time work	1.116**
	(0.495)
Cons	-0.137
	(0.369)
No. of Observations	7173

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%

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[10] The marginal effects for the interaction term have not been included. Stata does not produce them, as the value of the interaction term cannot change independently of the values of the component terms, and so their interpretation is void (Williams, 2012)

Appendix 7: Model V with continuous hours worked variable
(Dependent Variable: Entered full-time education)

Independent Variable	Regression Coefficient	Marginal Effect
Work Hours	-0.019***	-0.006***
	(0.005)	(0.001)
Parental Support	1.257***	0.441***
	(0.054)	(0.020)
Caring responsibilities	-0.149*	-0.046
	(0.090)	(0.029)
Bad Health: (Reference Category: Very good health)		
Good health	-0.136***	-0.040***
	(0.045)	(0.013)
Bad health	-0.217*	-0.066*
	(0.119)	(0.039)
Very bad health	-0.624**	-0.213**
	(0.275)	(0.107)
Bad Marks: (Reference Category: Very good marks)		
Good Marks	-0.436***	-0.105***
	(0.060)	(0.013)
Bad marks	-0.918***	-0.270***
	(0.078)	(0.024)
Very bad marks	-1.408***	-0.463***
	(0.224)	(0.086)
Income: (Reference Category:<£2600 per year)		
£2600 up to £5199	0.067	0.025
	(0.394)	(0.147)
£5200 up to £10,399	0.050	0.019
	(0.379)	(0.142)
£10,400 up to £15,599	0.219	0.079
	(0.378)	(0.141)
£15,600 up to £20,799	0.364	0.126
	(0.373)	(0.139)
£20,800 up to £25,999	0.350	0.121
	(0.376)	(0.140)
£26,000 up to £31,199	0.355	0.123
	(0.373)	(0.140)
£31,200 up to £36,399	0.405	0.138
	(0.374)	(0.140)
£36,400 up to £41,599	0.471	0.157
	(0.378)	(0.141)
£41,600 up to £46,799	0.632*	0.200
	(0.379)	(0.140)
£46,800 up to £51,999	0.667*	0.209
	(0.379)	(0.140)
>£52,000	0.896**	0.257*
	(0.374)	(0.139)
Ethnicity		

(Reference Category: White)

Mixed	0.287**	0.078***
	(0.120)	(0.029)
Indian	0.745***	0.163***
	(0.111)	(0.016)
Pakistani	0.538***	0.131***
	(0.142)	(0.026)
Bangladeshi	0.575***	0.137***
	(0.217)	(0.038)
Black Caribbean	0.458***	0.116***
	(0.150)	(0.030)
Black African	0.999***	0.192***
	(0.206)	(0.020)
Other	0.243	0.068
	(0.172)	(0.043)
Sex (1 if male)	-0.139***	-0.041***
	(0.042)	(0.012)
Number of siblings	-0.022	-0.007
	(0.020)	(0.006)
Cons	-0.114	
	(0.375)	
No. of Observations	7173	

Robust standard errors in parentheses   *Sig. at 10%, **Sig. at 5%, ***Sig. at 1%