NEET status during sixth form years vs. part-time paid work in years 9, 10 and 11 – an initial statistical analysis using the LSYPE

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Abstract

This paper identifies a compelling and beneficial correlation between part-time paid employment in years 9, 10 and 11 and being NEET during the sixth form years. The raw relationship shows, across 10,017 young people in England, that the average time spent NEET in a 21 month period is around two weeks for those who worked part-time in each of those three school years, but nearer five weeks for those who did not work at all. This relationship remains statistically significant, if roughly half the effect size, after controlling for KS4 attainment. However, the data reveal significant variations in this relationship across many characteristics of interest, including ethnicity, social background and local area deprivation. The driver of this change in NEET-status is individuals entering employment rather than remaining in education. The data do not allow comment on causality in these relationships, and it seems likely that the attitudes and behaviours are mutually reinforcing, rather than easily reduced to directional conclusions.

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Introduction

This paper focuses on youth activity in England during the two years following compulsory education. It explores the extent to which their positive engagement is correlated with a young person's previous participation in the labour market.

The NEET category, those young people not in education, employment or training, has been the subject of both central and local government targets, as well as considerable political, media and academic analysis (e.g. Maguire and Thompson, 2007; Maguire, 2010; Leitch, 2006; CBI, 2008; DCSF, various). Since NEET outcomes are correlated with a number of individually damaging and fiscally expensive long-term effects, such as long-term unemployment, depression and poor health, the policy relevance of better understanding this cohort is clear (Prince's Trust, 2007; Hammond and Fernstein, 2006).

The Longitudinal Study of Young People in England (LSYPE) affords an opportunity to analyse this category in detail.[1] It has followed a large single cohort of young people, via an annual tracking survey since 2004, when the respondents were in year 9.[2] One area of possible interest has not yet been explored in detail on this dataset and is relevant to the topic of this conference: when young people work part-time in paid employment during term-time, is there any evidence that they are less likely to be unemployed after compulsory education? One reason to anticipate such a finding is that through paid employment young people gain social and human capital, in the form of skills, understanding and networks that make it easier for them to find future work (Feinstein et al, 2008).

Relatively little work has been done on the effect of part-time employment before the age of 16, while the extensive US literature on 16+ learners engaging in part-time employment is divisive. Some have found that working part-time can support cognitive and affective development. Others identify negative effects from part-time work.[3] In general, these quantitative studies focus on the impact on academic attainment, rather than the effect on future participation outcomes.

A mainstream interpretation of these different US findings is the "inverted U", discussed by Stern and Briggs (2001:356). A synthesis over different studies suggests that working over 15-20 hours per week has a negative impact on grades, but that some amount, perhaps 5-10 hours per week, can be beneficial. Stern and Briggs (2001) also find that students themselves see a good fit between school and part-time work – both help prepare for the future.

[1] The data, along with relevant background information, are available at https://ilsype.gide.net/workspaces/public/wiki/LSYPE

[2] Respondents were born between 1st September 1989 and 31st August 1990. Boarders, those solely educated at home and those only in England for the purpose of education are excluded from the study. Young people are interviewed in the Spring/Summer about the most recent academic year.

[3] Those finding positive effects include Schill, McCartin and Meyer (1985); Hamilton and Crouter, (1980); Meyer and Wise, (1980); Steinberg et al, (1981). Those finding negative effects include Marsh, (1991); D'Amico, (1984); Steinberg et al (1982); Wirtz et al (1987); Eckstein and Wolpin, (1999); Singh (2001).

An alternative or complementary interpretation could argue that this disagreement reflects diversity across different students and schools rather than differences of working intensity or commentator ideology. Billet and Ovens (2007) use a series of focus groups with teachers and high-school students in Australia and identify that part-time paid work can contribute to a range of educational purposes, but only where teachers facilitate it proactively and value the opportunities their students take to work outside of school.

A similar trajectory can be charted In the UK. Dustmann et al (1996) used the British Cohort Study and found that young people who worked part-time aged 16 (in 1974) gained fewer qualifications than those who did not work, after controlling for individual ability and other key factors. Dustmann and van Soest (2007), using the National Child Development Study, also found that those who engaged in more part-time work were less likely to participate in further education. A survey by Jethwa (2001) explored those working part-time during compulsory education. He found reports of students being too tired to concentrate on their education - 6% admitted playing truant to go to work.

A more positive analysis can be found in Payne (2003), using the ninth cohort of the Youth Cohort Study. She found that while working excessive hours damages academic prospects, a certain amount of work builds links to the adult world and fosters self-reliance. Similar conclusions are drawn in US and Australian longitudinal studies (Lucas and Lammont, 1998; Robinson, 1999). McKechnie et al (2010) move the debate forward in the UK by arguing, through a series of case studies and observations, that while some jobs may not be academically beneficial, others can be demanding and result in skill attainment with educational value.

This paper takes the literature forward in two directions – first, by exploring the effect on NEET rather than academic outcomes, and second, by exploiting a large UK data-set that allows us to control for prior attainment and explore the effects within different sub-groups. The mixed and controversial effect on academic attainment notwithstanding, the effect of part-time employment on future employability is more intuitive and has been highlighted by, among others, Patten (2001), Billet (2005), Stasz (1999) and Smith and Comyn (2003).

This conference focuses on work-related learning. Since one goal of work-related learning is to mimic the working environment in developing human capital, it is valuable to ask whether an actual working environment, when experienced at the same age, has the desired positive outcomes. Nonetheless, any comparisons with work-related learning are suggestive rather than conclusive – for instance, we expect part-time employment to vary more by level of skill-development than work-related learning.

This paper does not seek to distinguish the different forms of capital the young person might develop through part-time employment. Instead, it looks for the overarching statistical correlations between part-time employment and future NEET outcomes. For technical reasons, the conclusions reported here should be considered a reflection of the 10,017 survey respondents analysed, rather than the English population (see footnote 6 for more information).

1. The NEET category

The NEET category is chosen as the target of this paper due to policy relevance rather than academic tractability. The concept focuses on positive participation in general, and does not distinguish between the very different activities of employment, education and training. It also disguises significant variation – those who might be taking a break from education and employment, for instance to travel or holiday, might be captured as NEET in the same way as those at risk of joining the long-term unemployed. Conflating the two groups risks misdirecting resources, misaligning local government incentives and drawing inappropriate conclusions.

The survey asks people their activity over a number of different months, allowing us to construct their NEET-status with confidence. Specifically, I employ a value for the number of months spent NEET between September 2006 and May 2008 for each respondent. I include the young people whose answers to the survey are present over each of the first five annual surveys, but exclude the small number of individuals (246) who were looking after their own child at the time of the survey, as they merit singular study. This results in data covering 10,017 young people.[4] The 21 months covered by the period are those when most young people are in sixth-form, which represents a natural break-point in analyzing participation.

Number of months NEET	Number of young people	Proportion of total
0	8,726	87.1%
1-4	451	4.5%
5-8	280	2.8%
9-12	326	3.3%
13-16	111	1.1%
17-21	123	1.2%
Total	**10,017**	**100%**

Table 1

[4] The LSYPE data can be weighted to better represent the population in England (NatCen, 2010). Logistic regression models were used to construct weights, with typical factors including family background, ethnicity, region and gender. To enable effective comparison across the analytical techniques used here, I do not weight the data. Although this means analyses are representative of the sample only and not the full population, it is sufficient for the overall conclusions in this paper. In mitigation, many of the key weighting criteria are analysed individually in this paper, and often in ways that drill below the criteria (such as rurality). This approach (and the caveat that comes with it) also helps us avoid the assumption of weighted analysis that the relationships of interest for non-respondents can be correctly interpolated from the relationships for respondents. The headline conclusions of this paper are robust to the weighting methodology, although exact numerical results would vary.

2. The data on part-time employment

The survey asks young people whether they worked in paid employment during term-time in each of years 9, 10 and 11. If so, they are asked their average weekly earnings and their average number of hours worked per week. We do not have any information about the sector they worked in, the total proportion of the year spent working or whether they found the work engaging or stretching.

Years worked	**Respondent count**	**Male respondents**	**Female respondents**
0	5,949	2,973	2,976
1	1,854	923	931
2	1,264	631	633
3	950	408	542
Total	**10,017**	**4,935**	**5,082**

Table 2

	% working part-time during term time in that year (over full sample)	**% working part-time in that year for the first time** (over full sample)	**Average wage** (over those working) [sample standard deviation]	**Average hours p.w.** (over those working) [sample standard deviation]
Year 9	20.0%	Unknown	£13.40 [11.09]	4.00 [3.51]
Year 10	25.3%	12.4%	£18.99 [14.52]	5.02 [3.77]
Year 11	26.9%	8.1%	£26.60 [20.32]	6.33 [4.52]

Table 3

3. Raw relationship between prior labour market participation and NEET outcomes

The raw correlation between average months spent NEET and prior labour market participation is convincing and beneficial, as predicted in the literature:

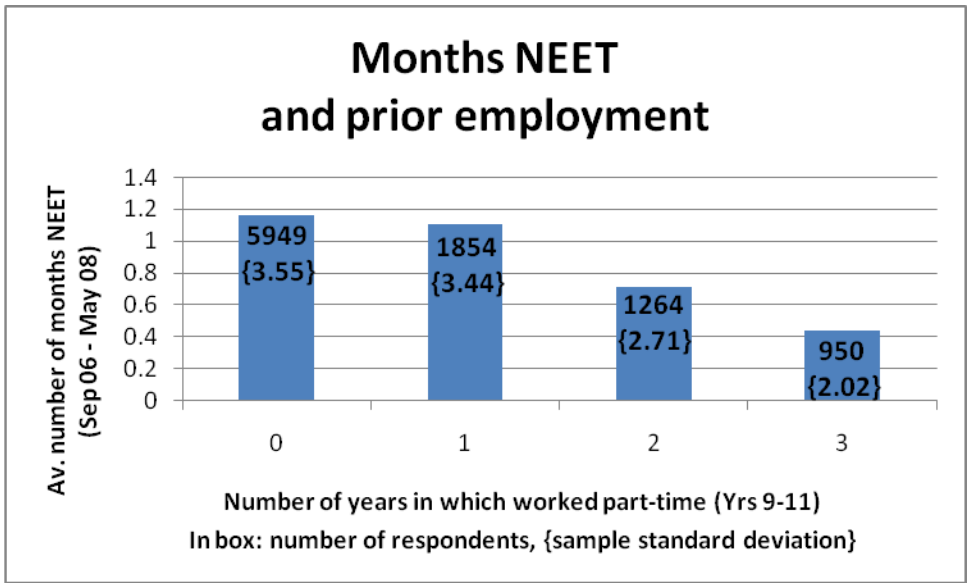

Fig. 1.

The raw relationship shows, across 10,017 young people in England, that the average time spent NEET in a 21 month period is around two weeks for those who worked part-time in each of those three school years, but nearer five weeks for those who did not work at all.

By examining other measures of employment, such as the wages and hours worked in years 9 and 10, this broad beneficial correlation, contrasting those who work against those who do not, remains valid. However, it is in year 11 that the intensity of part-time employment has its own correlation with overall months spent NEET, particularly from 3 hours per week up to around 11 hours a week. After 11 hours per week, there are too few individual respondents to draw reliable conclusions and the activity begins to feel less like 'part-time' employment and more like a full-time activity.

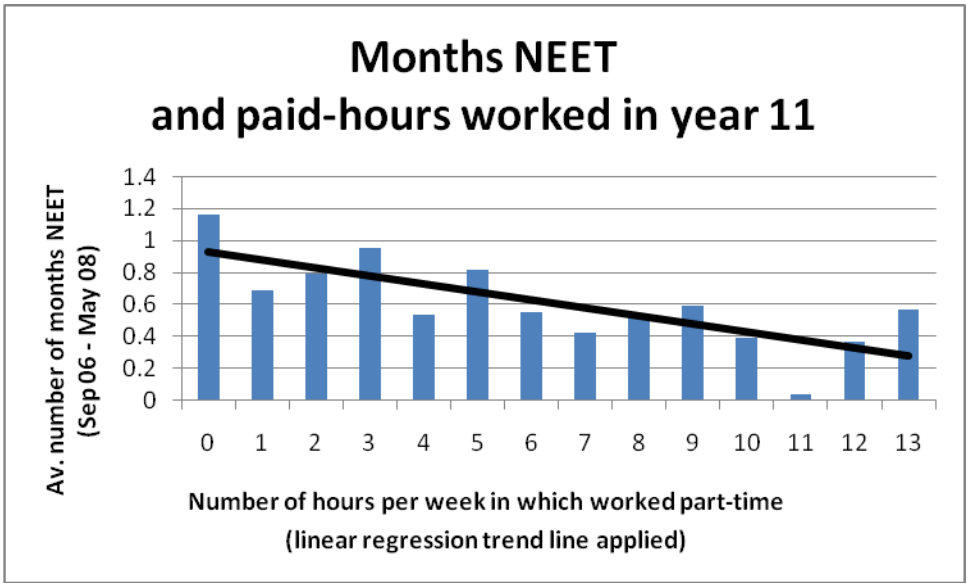

Fig. 2.

Paid-hours p.w. in Y11	Av. Months NEET	Sample st.dev.	Respondents
0	1.16	3.56	7333
1	0.69	2.98	199
2	0.79	3.04	310
3	0.95	3.10	259
4	0.54	2.34	351
5	0.82	2.73	233
6	0.55	2.37	255
7	0.42	1.82	194
8	0.54	2.14	271
9	0.59	2.50	88
10	0.39	2.33	169
11	0.03	0.19	29
12	0.36	1.58	88
13*	0.57	1.62	23

** 198 respondents worked over 13 hours per week.*

Table 4

We should be clear that the statistics do not lend themselves to detailed interpretation about how behaviours and attitudes interact. Different interpretations are discussed in the conclusion.

This graphical analysis highlights the overall correlation but has a number of limitations.

- The high standard deviations point to significant variety within each category, questioning the statistical significance of the results.

- We might also expect other variables to drive NEET outcomes more powerfully than prior labour market participation, such as academic attainment. Where these are related to part-time employment, the raw relationship identified above could lead to misleading inferences, even though it is statistically accurate for the method chosen.
- Although aggregate statistics over a large sample give an indication of overall correlation, they disguise a number of sub-groups which might have different relationships.

The above analysis and trend lines are easy to interpret, but do not do proper justice to the underlying data and the points above – which are addressed in the following sections.

4. Unpacking the relationship – the statistical methodology

To explore the NEET category in detail, it is helpful to move beyond descriptive statistics and graphs into regression analysis. In doing this, we recognize that the NEET variable is censored at zero, in that those who are extremely unlikely to be NEET are recorded the same as those just below the NEET boundary, e.g. at zero months spent NEET.

To model this more accurately, I employ ML Tobit regression.[5] In essence, this assumes that the observed variable, number of months NEET, reflects an underlying latent variable which allows some individuals to be NEET for a negative period of time. We can interpret individuals assessed to be NEET for a 'negative period of time' as those very unlikely to be NEET. Even if their circumstances were different in ways that increase the chance of being NEET in general, they would still be observed as NEET for zero months in the period analysed.

The advantage of this approach is it accounts for being NEET in a probabilistic rather than absolute sense and allows for easy controlling of other variables and statistical analysis. The disadvantage is that we assume an approximately linear relationship. Across the variables available, total number of years in part-time employment provides the best fit to this assumption. The paper also explores "hours per week in year 11" as a separate measure, which emphasizes the intensity of part-time employment and might have different correlations to the number of years worked overall. Acknowledging that this is imperfect process, it is best to use this measure to compare across groups using a consistent methodology, rather than to extrapolate precise outcomes.

An initial question is whether to include a squared term for the hours worked part-time per week in year 11. This is one way to capture a hypothesised effect that working a large number of hours per week will have a detrimental effect on exam results and academic participation, with diminishing marginal employment benefits from increased experience (Payne, 2003).

An analysis of this effect on the overall cohort shows that the squared term is not significant at the 15% level or better, after controlling for KS4 attainment. Prior to controlling for prior attainment, however,

[5] The underlying algebra for the model is given in Appendix 2. Specifically, I use a QHC-grid search for ML and assume extreme-value errors – since this provided a better fit by MLL and AIC than normally-distributed errors. The quantitative conclusions are sensitive to this specification, but the broad qualitative conclusions are not. A constant term is included but not reported.

the squared term is significant at the 0.1% level and improves the estimation fit. This supports the intuition behind the hypothesized effect.

5. Is the raw relationship statistically significant?

The first concern is whether the apparent relationship, described in section 3, is statistically significant.

The above methodology produces a clear conclusion – that the raw relationship is as described in section 3 and statistically significant. Specifically, the coefficient driving the relationship between number of years worked part-time and the number of months NEET is -1.78 {S.E. 0.26}, and for number of hours worked part-time in year 11 in particular it is -1.009 {S.E. 0.14), with a squared term coefficient of 0.0406 {S.E. 0.01}. In both cases the probability of these effects being zero is indistinguishable from zero at four decimal places.

Interpreting the size of the coefficients in the latent relationship is not straightforward.[6] This is because the model allows many young people to have, in effect, a large and negative number of months NEET. Nonetheless, the coefficients can be thought of as the effect of working part-time on the average number of months someone would spend NEET, if they were in the category of individuals who are highly likely to become NEET to some extent during the period.

For instance, for such individuals at high risk of being NEET, each extra year of part-time employment is correlated with a reduction in average time spent NEET of around seven weeks. Meanwhile, those who work very intensively do begin to see diminishing returns, at least based on their year 11 working hours. The first hour or two extra they work is correlated with almost an extra month less NEET per hour, but by the time they are working 12 or more hours per week, each extra hour has a detrimental overall effect. Plotting the combined effect of the two coefficients results in the graph in fig. 3.

[6] The marginal effect on the conditional mean, conditional on being observed, is not reported here. Instead, this paper chooses to motivate and interpret the latent variable model directly, since this reflects the underlying methodology.

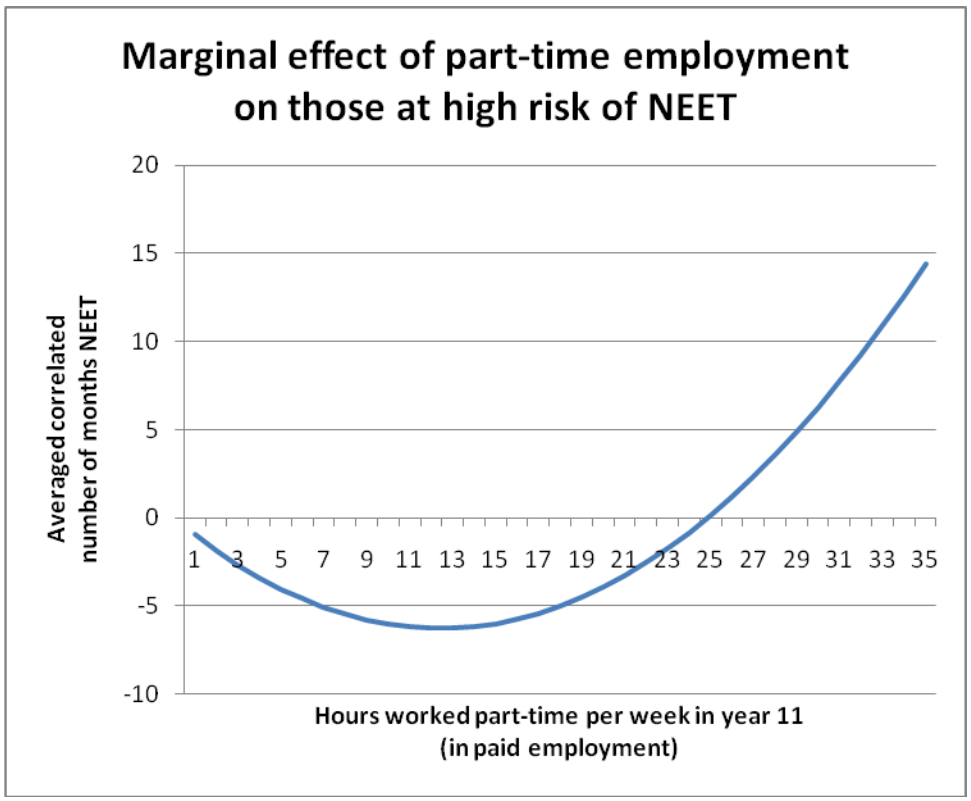

Fig. 3.

We can see that the first few hours spent working per week reduce the number of months spent NEET on average, but that this positive effect gradually reduces as the number of paid hours increases.

These effects should not be interpreted as the average effects on the observed number of months NEET for the whole population. Specifically, fig. 3. cannot be compared directly with fig. 2. Fig. 2. is a simple average of months over the full sample whereas fig. 3. reflects the inferred marginal effect on those which are at high risk of NEET only (e.g. around 15% of the sample) when we apply the statistical model described above.

6. How does academic attainment affect the relationship?

Since the NEET category includes education participation and education is linked to labour market success, we wish to control for academic attainment. I will use the individual's fine-graded GCSE and equivalent points score (capped, to avoid bias from the few individuals taking a very large number of subjects). [7]

[7] This variable has a mean of 317 and a standard deviation of 96 over the full sample.

Including this variable in the above regressions reduces the size of the coefficients by around a half, but they remain highly statistically significant (at the 0.1% level).[8] Academic attainment is, nonetheless, a very strong driver of NEET outcomes and the model fit is significantly improved.[9]

Repeating the above graph shows that the majority of the negative effect from working too hard is no longer present.

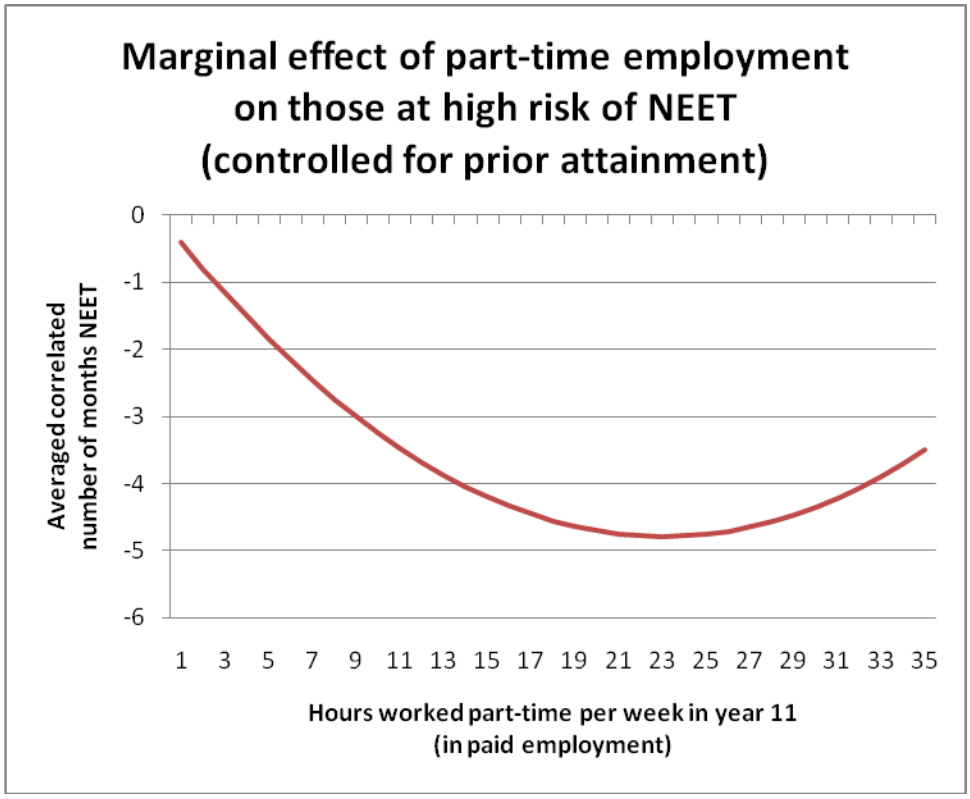

Fig. 4.

This suggests that there is a correlation between those who work part-time and those who succeed in their exams. This may be due to a shared trait – such as an enthusiasm for proactive participation in society and taking advantage of opportunities – exactly those traits that are likely to reduce NEET outcomes. Nonetheless, even when we compare individuals with the same exam grades at KS4, those who work part-time in paid employment are less likely to be NEET during their sixth form years.

[8] Specifically, the coefficient on number of years worked is now -0.84 {S.E. 0.21) and hours per week in year 11 is now -0.42 {S.E. 0.11), with the (no longer significant) quadratic term included. For reference the constant terms and grade coefficients are 11.3 {0.65} and -0.07 {0.00}, respectively (robust across the two estimations).

[9] A further caveat is that there is a correlation between attainment at GCSE and part-time working – for instance a linear regression of capped fine-grade point score against numbers of years working part-time and a constant, gives a coefficient of 7.76 and a t-statistic of 8.16, against hours per week in year 11, 0.68 and a t-statistic of 2.56. In general this will serve to inflate the standard errors and to underestimate the effect of working part-time, since academic attainment is such a strong predictor of the dependent variable. My results here remain a robust lower-bound estimate.

7. Variety across different groups

We wish to test the relationship between paid-employment and NEET outcomes across different genders, family backgrounds, prior opinion on the usefulness of education and ethnicity, as well as different types of local area.

Apart from academic attainment, which is included in all subsequent analyses, the other variables are broadly categorical and there is no reason to believe that the relationship between NEET outcomes and paid-employment is the same across the sub-groups, or indeed that the relationship between NEET outcomes and their academic attainment is the same across them. For this reason, this paper does not include all the variables in a single estimation (e.g. via categorical dummies), which would impose such equivalence. Instead, it repeats the basic estimation under the different groups of interest.[10]

The main purpose of this section is to sift a large number of possible control variables to identify some emerging trends. It is beyond the scope of this paper to explore each in detail, but this nonetheless presents a useful sifting exercise to identify variables to explore more thoroughly in the future. Due to the nature of the analysis, comparisons are most robustly made on directionality and statistical significance, which allow the indicative findings described in this section. Selected numerical output is contained in Appendix 1.

The quadratic term in Y11 hours worked is excluded from the sub-sample estimations – both because it is insignificant at the 15% level when prior attainment is included and also because it suggests a level of quantitative analysis not appropriate for the sifting purpose of this section – each comparison would require a separate analysis of how the quadratic and linear terms combine to create a net effect on the population in question.

We can further validate this decision by observing that the linear term alone accurately summarises, at least for the full cohort, the nature of the combined effect from the extended estimation for those individuals we are most interested in – the vast majority working 13 hours per week or fewer. The trends and indicative findings identified from this analysis are robust to the inclusion of a quadratic term, but quantitative conclusions would not be.

[10] This approach is validated by the wide range of constant terms and KS4 results variable coefficients across the estimations. Within the ethnicity/gender table, for instance, the constant term varies from -18 to +15, reflecting the fact that some ethnicities are far more likely to become NEET than others. The effect of increasing academic success always decreases the time spent NEET, on average, but again varies from -0.02 to -0.10. The standard errors are often high across these estimations, due to low sample size, but not sufficiently high that we can accurately impose the same coefficient values across all cohorts.

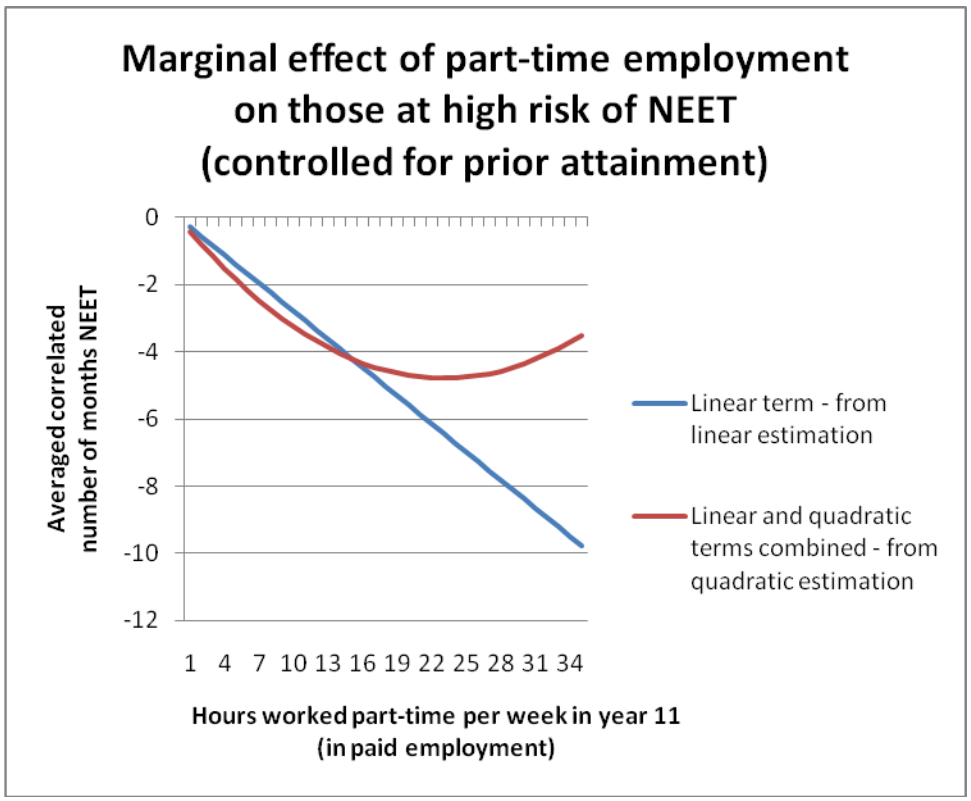

Fig. 5.

7.1 Gender

Overall, young men and women are similar in the relationships being considered. The beneficial correlation from working part-time is slightly stronger for women than men on average.

7.2 Ethnicity

Although the low sample sizes make it hard to draw strong conclusions, there appear to be significant gender differences across ethnicities. While part-time employment has a similar correlation with NEET outcomes on white males and females, the different genders have opposite relationships among certain other ethnicities.

In Bangladeshi and Indian cohorts, men are less likely to spend time NEET when they have previously had part-time employment, but women are much more likely to be NEET. For Black African and Black Caribbean women, if they have been working over a number of years a similar effect is particularly pronounced.

7.3 Family employment background

Although the beneficial correlation is present across all gender sub-groups here, it differs in terms of consistency. The strongest and most consistent correlations are present for young men whose family

employment background is described as routine employment. In general as the family backgrounds become more privileged, the effects have higher variance and are less consistent.

7.4 Views on the future value of education

Respondents were asked if they agreed with the statement ""Even if I do well at school, I will struggle to get the right job" in year 10. [11] For men, the relationship between paid-employment and future NEET outcomes was little affected by their response to that question.

For women, however, if they were more negative about school in year 10, the more years they worked part-time had an increased positive correlation to their NEET outcomes, but the intensity of work in year 11 had a decreased positive correlation. It is hard to interpret this without qualitative interview data, but it identifies an interesting question for future work.

7.5 Deprivation in the local area

We use the 2004 Index of Multiple Deprivation (IMD), with scores from 1-100, where 100 is the most deprived.[12] When included along with KS4 attainment, the effects of part-time employment remain similar to before – slightly reduced but still statistically significant. Where areas are more deprived, individuals are more likely to be NEET for longer, even controlling for their academic success and experience of part-time employment. This 'deprivation' effect is more pronounced on women than men. Unsurprisingly, individuals in more deprived areas are less likely to be involved in part-time work.

The previously discussed relationship between part-time employment and NEET outcomes is broadly similar across most bands of deprivation, except in the most deprived areas. The top 20% most deprived areas see no real link (beneficial or detrimental) between working part-time time and being NEET later.

7.6 Urban vs rural

In general, the more rural the area is, the stronger the beneficial correlation between part-time working and future NEET outcomes, across both genders.

[11] Note that, due to the phrasing of the question, individuals are considering the usefulness of education to themselves – in other words, their views may reflect a combination of the value of education *and* their ability to take advantage of it.

[12] Another less general measure of area deprivation, proportion of FSM students in the respondent's school (using 2004 cohort), did not generate significant differences in the relationship of interest and is not reported here. It was, in general, far less significant than the IMD and other variables included in the estimation (particularly for the male cohort). This is perhaps because we include individual level attainment data, which drives individual outcomes more strongly than the demography of their school-mates. The FSM results are therefore not reported. A similar effect applies to school performance, as measured by value added from KS3 to KS4, which is not reported for the same reasons.

8. Into school or into work?

The NEET category makes sense from the policy perspective of future economic outcomes. However, as noted earlier, it disguises an important distinction – are the NEET-related benefits we observe correlated with prior labour market participation due to young people staying in on school or moving more successfully into the labour market? To answer this question, we repeat the analysis from fig. 1. but consider the average number of months spent specifically in employment and full-time education, rather than the summary NEET statistic.

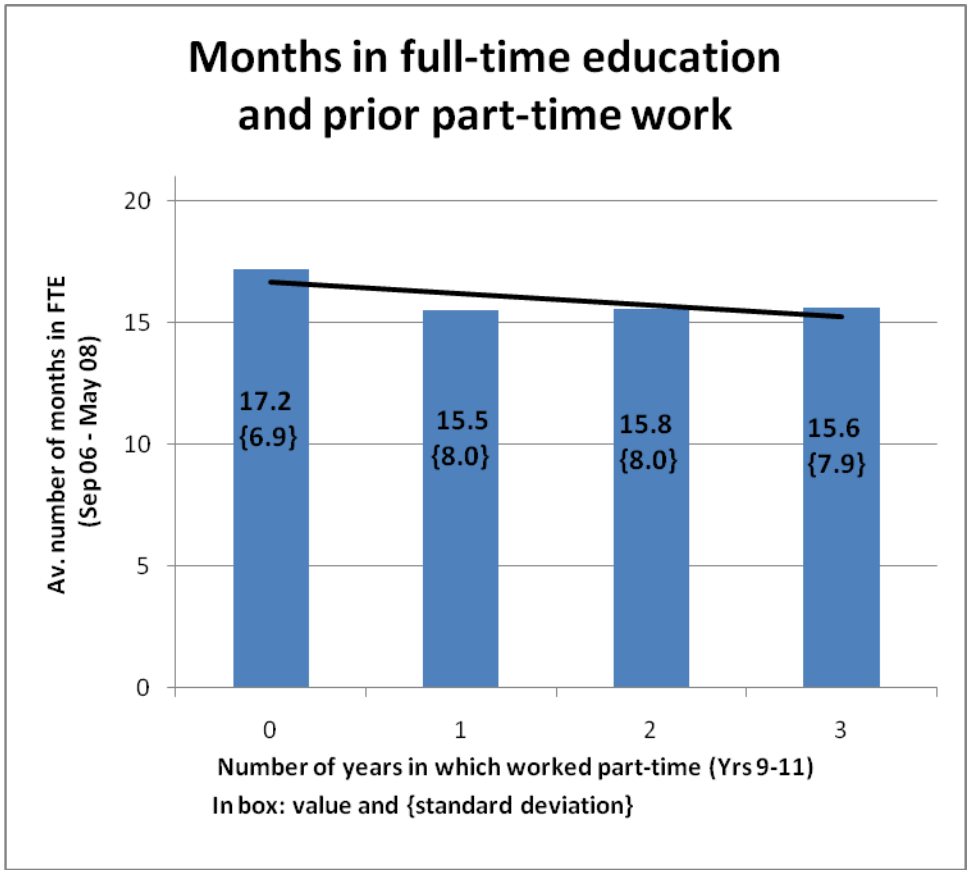

Fig. 6.

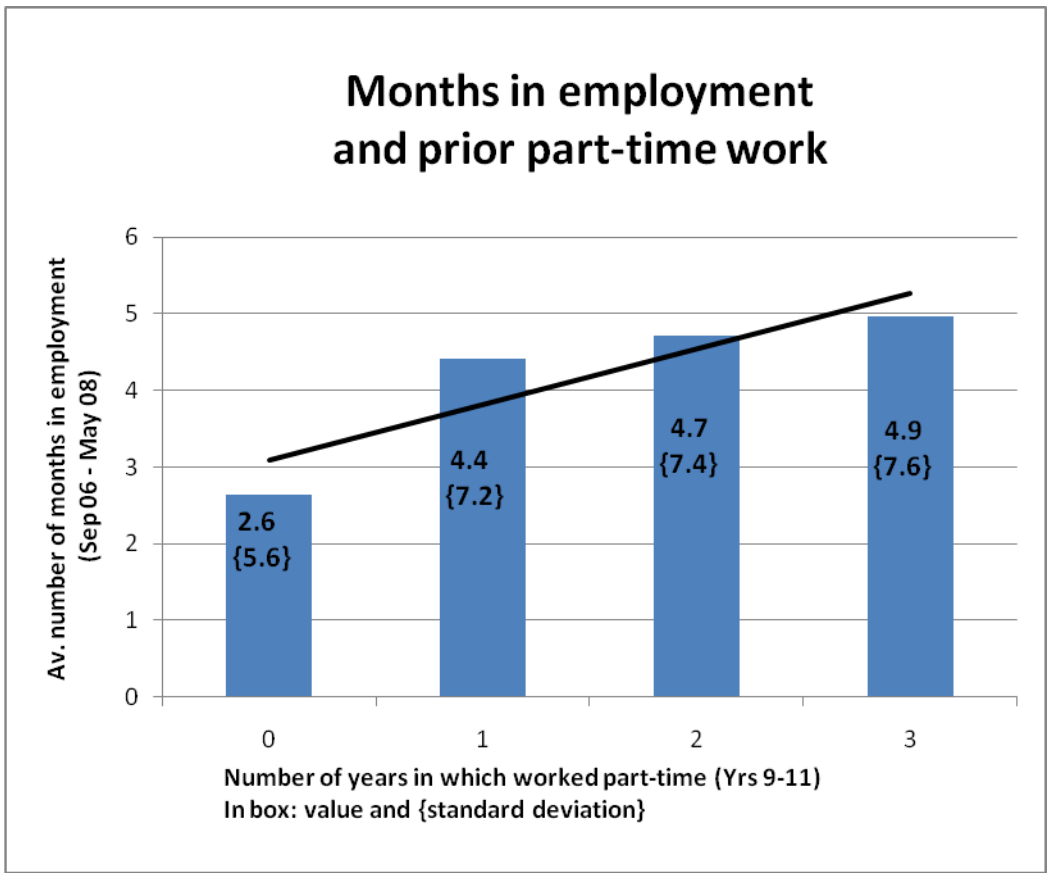

Fig. 7.

When young people have been working part-time in paid employment, they are more likely to end up in a job than those who haven't. In contrast, they are slightly less likely to be in education.

Conclusion

This paper identifies a beneficial correlation between part-time paid employment in years 9, 10 and 11 and being NEET during the sixth form years. Specifically we consider the number of years in which someone worked part-time, from years 9 to 11, and the number of paid-hours worked in an average week in year 11. Graphical analysis of the raw relationship demonstrates, across 10,017 young people, that the average time spent NEET in a 21 month period is around two weeks for those who worked part-time in each of those three school years, but nearer five weeks for those who did not work at all. The beneficial correlation is driven by individuals being more likely to be in work rather than in education.

We then analyse the relationship more rigorously using a latent variable method, whereby young people are allowed to be NEET, in effect, for a negative number of months – representing those individuals who are highly unlikely to be NEET relative to their peers. Using this method, young people who are high risk of being NEET manifest an even stronger raw correlation between part-time employment and NEET outcomes. For instance, each extra year in which someone worked part time is correlated with a seven week reduction in time spent NEET, for those who are likely to be NEET at some point after school.

Viewed another way, each hour per week worked during year 11 is initially related to a reduction in their average time spent NEET by a few weeks, although the positive effect of each extra hour only persists up to around twelve hours per week.

These effect remain statistically robust after adjusting for differences across individuals in their academic attainment at the end of KS4, but is reduced to nearer three weeks on average rather than seven for number of years worked. The effect of working more intensely is also reduced, but so too is the negative effect of over-working. Controlling for prior attainment, we see positive marginal correlations from each additional hour up to around 24 hours per week. The "inverted U" effect observed previously in academic grades (Stern and Briggs, 2001; Payne, 2003) is also observed in this paper for NEET outcomes, albeit less dramatically.

Retaining the control on academic attainment, the paper proceeds to sift a number of different variables which might influence the relationship of interest – gender, ethnicity, personal views on the usefulness of education, social background, and type of local area. It is beyond the scope of this paper to unpack these sub-groups in detail, and in many cases the sample size makes strong conclusions inappropriate. Nonetheless, a few trends emerge, justifying the conclusion that significant differences do exist across sub-groups of policy relevance:

- The beneficial correlation between paid-employment and NEET outcomes is most consistent across individuals whose families are involved in routine or lower-skilled work, and particularly for the young men from such families.
- In the 20% most deprived areas, whether or not someone has worked part-time appears to have very little correlation with their future NEET outcomes, suggesting that part-time youth employment can only go so far in compensating for disadvantage.
- In general, the more rural the area is, the stronger the beneficial correlation between part-time working and future NEET outcomes, across both genders.
- Unlike young men and the average effect overall, young women in some ethnicities, particularly Indian and Bangladeshi, appear to be more likely to be NEET the more they work part-time, although the low sample size makes this a cautious observation. It is possible that this reflects different attitudes towards sons and daughters across different cultures, but a detailed examination of this would require focus group studies and field work.

Aside from the statistical correlations, interpretation of these findings is not straightforward, neither in terms of individual motivation and access nor policy desirability.

For instance, in terms of individual motivation, it might be that the young people who appear to be more successful in the job market as a result of their previous part-time employment had always intended to take employment as soon as was practical – and they also took opportunities to do paid-work part-time back when school was compulsory. Alternatively, the experience of earning money may have opened their eyes to new possibilities and encouraged them to leave education and consolidate their immediate earning power.

In terms of access, we might infer that the improved skills from previous experience made it easier to obtain employment (and business surveys support this claim[13]), but alternatively the benefit might come from contacts and networks rather than skills. Indeed, the effect may be unrelated to their part-time employment. For instance, we cannot distinguish those individuals whose networks generated both their part-time employment and their subsequent employment – with no meaningful skills or networking gains during the part-time work itself.

It is also hard to make statements about the desirability of these findings. For instance, we cannot tell from this data-set whether the jobs are progressive or whether the young people involved felt ownership over their original decisions or are satisfied with them. We cannot observe directly if young people with more experience of the labour market made career/education decisions that they were subsequently more satisfied with.

Nonetheless, being NEET aged 16-18 is a policy concern, and on this basis alone we might be interested in the beneficial correlation between NEET outcomes and part-time employment. Whether or not this correlation can be exploited for policy ends is a different matter. What would matter in this case is whether it is reasonable to infer a degree of causality from the statistical correlation. For instance, the correlations identified do not help us to conclude whether individuals who participate in part-time employment are more likely to be proactive, hard-working individuals, who are thus less likely to be NEET in any case, as opposed to individuals who benefit from the act of paid employment, benefiting from social and human capital gains that improve later outcomes. Indeed, either interpretation seems reductionist and too simplistic.

In practice, individual attitudes shape our choices, behaviours and actions – and those actions and our experiences while doing them shape our attitudes. It seems probable therefore that a reasonable amount of pro-active engagement with the local economic community, during compulsory school years, has benefits for someone's future prospects, although a sensible upper limit in weekly hours is likely to be between 10 and 15 for many young people.

The quantitative conclusions reported here should be considered a reflection of the 10,017 survey respondents analysed, rather than the English population. Given the size of the survey and the sub-groups analysed, the headline correlations and reported conclusions can be considered reasonably accurate for the full population. There are several ways that this work might be extended. The month-by-month NEET data can be extended past May 2008, to examine effects after the further education phase. Other control variables available from the LSYPE and linked datasets might be considered, such as family stability, Ofsted results and whether or not the school has a sixth form. Finally, we might explore interviews and other studies that allow us to unpack the means by which this correlation takes effect, as well as the possible differences within sub-groups.

[13] See The Education and Employers Taskforce (2010) literature survey, *What is to be Gained from Partnership.* For instance, CBI (2007): 50% of 101 member companies "definitely agreed" that "work experience plays a role in developing employability skills."

Appendix 1: Sub-group estimation output summary

Relationships by ethnicity, controlling for KS4 attainment

Variable	Cohort	Male		Female		All	
Hours p.w. worked in Y11		Co-efficient	St. Error [N]	Co-efficient	St. Error [N]	Co-efficient	St. Error [N]
	All	**-0.24**	**0.07 [5075]**	**-0.34**	**0.10 [4925]**	**-0.28**	**0.06 [10000]**
	Indian	-0.23	0.80 [334]	2.31	1.44 [327]	0.97	0.70 [661]
	Bangladeshi	-0.89	0.83 [212]	0.84	1.04 [257]	-0.08	0.56 [469]
	Black African	-0.08	0.0255 [120]	-0.93	2.15 [136]	-1.55	3.10 [256]
	Black Caribbean	0.06	0.37 [138]	-0.34	1.00 [158]	-0.00	0.35 [296]
	Mixed	-0.19	0.45 [227]	-0.36	0.52 [228]	-0.28	0.36 [455]
	Pakistani	0.19	0.72 [309]	-0.45	3.12 [298]	-0.01	0.71 [607]
	White	**-0.30**	**0.07 [3554]**	**-0.39**	**0.10 [3364]**	**-0.34**	**0.060 [6918]**
Number of years in which worked part-time	All	**-0.80**	**0.26 [5082]**	**-0.95**	**0.35 [4935]**	**-0.84**	**0.21 [10017]**
	Indian	0.07	1.64 [334]	4.92	5.64 [327]	1.13	2.10 [661]
	Bangladeshi	-3.25	2.93 [213]	3.61	7.31 [257]	-2.42	2.95 [470]
	Black African	N/A	N/A	1.82	4.29 [136]	-0.00	4.38 [257]
	Black Caribbean	1.38	2.07 [138]	2.14	2.90 [158]	1.43	1.68 [296]
	Mixed	-1.32	1.75 [228]	**-3.86**	**2.13 [229]**	**-2.43**	**1.38 [457]**
	Pakistani	0.40	2.26 [310]	-3.19	8.16 [298]	-0.31	2.12 [608]
	White	**-1.20**	**0.27 [3556]**	**-1.06**	**0.37 [3373]**	**-1.13**	**0.22 [6929]**

*A negative coefficient means that an increase by one unit in either the number of years or number of hours per week, as appropriate, decreases the number of months spent NEET between September 2006 and May 2008 by that amount, as measured by the latent variable.

** Bold text means the value is significant at the 10% level or better and the observation can be better relied upon than others in the table. Values not in bold may indicate either a highly volatile effect within that category or a negligible one.

Relationships by social background, controlling for KS4 attainment

Variable	Cohort	Male		Female		All	
Hours p.w. worked in Y11		Co-efficient	St. Error [N]	Co-efficient	St. Error [N]	Co-efficient	St. Error [N]
	Higher professional	-0.25	0.35 [346]	-0.55	0.47 [283]	-0.38	0.28 [629]
	Lower professional	-0.13	0.12 [1841]	**-0.31**	**0.18 [1843]**	**-0.20**	**0.10 [3684]**
	Intermediate	**-0.58**	**0.21 [827]**	**-0.38**	**0.23 [841]**	**-0.48**	**0.15 [1668]**
	Lower supervisory	-0.12	0.21 [383]	**-0.46**	**0.27 [359]**	-0.25	0.16 [742]
	Routine	**-0.40**	**0.18 [836]**	-0.30	0.23 [775]	**-0.36**	**0.14 [1611]**
Number of years in which worked part-time	Higher professional	-1.93	1.27 [346]	-0.86	1.37 [283]	-1.42	0.93 [629]
	Lower professional	-0.50	0.44 [1843]	-0.88	0.64 [1844]	-0.61	0.36 [3687]
	Intermediate	-0.94	0.69 [828]	-1.00	0.88 [841]	**-0.95**	**0.54 [1669]**
	Lower supervisory	-0.39	0.77 [383]	-0.76	1.04 [359]	-0.41	0.62 [742]
	Routine	**-1.26**	**0.59 [837]**	-0.29	0.77 [779]	**-0.87**	**0.47 [1616]**

Relationships by school view, controlling for KS4 attainment

Variable	Cohort	Male		Female		All	
Hours p.w. worked in Y11		Co-efficient	St. Error [N]	Co-efficient	St. Error [N]	Co-efficient	St. Error [N]
	Negative view of school*	**-0.28**	**0.11 [1922]**	**-0.23**	**0.14 [1687]**	**-0.26**	**0.09 [3609]**
	Positive view of school	**-0.21**	**0.09 [3153]**	**-0.42**	**0.13 [3238]**	**-0.29**	**0.07 [6391]**
Number of years in which worked part-time	Negative view of school	**-0.80**	**0.41 [1926]**	**-1.55**	**0.56 [1690]**	**-1.03**	**0.33 [3616]**
	Positive view of school	**-0.80**	**0.32 [3156]**	-0.62	0.46 [3245]	**-0.71**	**0.27 [6401]**

*The dummy variable for a negative view of school usefulness for future outcomes is taken from agreement or strong agreement with the statement "Even if I do well at school, I will struggle to get the right job" in year 10.

Latent variable deprivation estimation output

Method: QHC; Tobit with Extreme Value error, carried out on EViews 7.0. {..} presents S.E.

NM	Latent variable for number of months NEET September 2006-May 2008
KS4	Key Stage 4 – fine graded GCSE and equivalents points score (capped)
Y11	Number of hours worked per week in year 11
YW	Number of years in which worked part-time from years 9 to 11
IMD	Index of multiple deprivation (1-100; 100 being most deprived)

Full cohort

NM = 9.79 - 0.07KS4 - 0.25Y11 + 0.04 IMD
{0.79} {0.00} {0.06} {0.01}

NM = 9.85 - 0.07KS4 - 0.68YW + 0.04 IMD
{0.81} {0.00} {0.21} {0.01}

YW = 1.30 – 0.04 IMD
{0.04} {0.00}

Y11 = 0.25 – 0.16 IMD
{0.25} {0.01}

Female sub-cohort

NM = 8.60 - 0.08KS4 - 0.30Y11 + 0.05 IMD
{1.32} {0.00} {0.10} {0.02}

NM = 8.55 - 0.08KS4 - 0.72YW + 0.5 IMD
{1.35} {0.00} {0.36} {0.02}

Male sub-cohort

NM = 10.4 - 0.07KS4 - 0.22Y11 + 0.03 IMD
{1.00} {0.00} {0.07} {0.02}

NM = 10.5 - 0.07KS4 - 0.66YW + 0.03 IMD
{1.02} {0.00} {0.26} {0.02}

Variable	Cohort	All	
Hours p.w. worked in Y11		Co-efficient	St. Error [N]
	IMD > 60; <= 80	-0.12	0.38 [402]
	IMD > 40; <= 60	0.04	0.16 [1510]
	IMD > 20; <= 40	**-0.23**	**0.11 [2761]**
	IMD <=20	**-0.35**	**0.08 [5341]**
Number of years in which worked part-time	IMD > 60; <= 80	0.70	1.35 [402]
	IMD > 40; <= 60	0.51	0.72 [1510]
	IMD > 20; <= 40	**-0.77**	**0.42 [2761]**
	IMD <=20	**-0.83**	**0.28 [5341]**

*Too few observations with an IMD score between 80 and 100 to run this analysis.

Urban vs Rural

Variable	Cohort	Male		Female		All	
Hours p.w. worked in Y11		Co-efficient	St. Error [N]	Co-efficient	St. Error [N]	Co-efficient	St. Error [N]
	Urban areas	**-0.18**	**0.08 [4211]**	**-0.30**	**0.12 [4071]**	**-0.22**	**0.07 [8282]**
	Fringe areas	**-0.38**	**0.16 [697]**	**-0.52**	**0.19 [690]**	**-0.44**	**0.12 [1387]**
	Rural areas	**-0.64**	**0.35 [166]**	-0.09	0.44 [164]	**-0.42**	**0.25 [330]**
Number of years in which worked part-time	Urban areas	**-0.62**	**0.30 [4211]**	**-0.88**	**0.42 [4071]**	**-0.68**	**0.24 [8282]**
	Fringe areas	**-1.29**	**0.63 [697]**	**-1.81**	**0.78 [690]**	**-1.50**	**0.49 [1387]**
	Rural areas	-1.68	1.14 [166]	0.29	1.50 [164]	-0.91	0.86 [330]

Appendix 2: Technical details of the model

The Tobit model as applied in this paper assumes the following latent variable equation holds as a reasonable essentialisation:

$$(1) \quad Latent\ future\ Months\ NEET\ (i) = C + \beta\ KS4\ grades\ (i) + \gamma\ youth\ employment(i) + \varepsilon\ (i)$$

Where (i) indexes the different individuals in the survey.

We observe a value of zero months NEET for all individuals, i', where:

$$(2) \quad Latent\ future\ Months\ NEET\ (i') \leq 0$$

Otherwise we observe the true value of months spent NEET, which is estimated as equivalent to the variable "Latent future months NEET" as given above.

The error term is modeled as Extreme Value Type I and has a standardized pdf of:

$$(3) \quad f(x) = e^{-x}e^{-e^{-x}}$$

The values γ and β are estimated by applying maximum likelihood analysis to an equation derived from (1), (2) and (3) which reflects how the latent variable equation translates into the probability of different observations. For details of the optimised equation as used in this paper, see EViews v7.

Many other factors affect someone's NEET outcomes. Where these are uncorrelated with the relationships between academic attainment at KS4, youth employment and months spend NEET, the impact will be absorbed in the error term (ε) and will not generate bias in this analysis. For many variables which the literature suggests might be correlated with the relationships of interest, this paper repeats the analysis on the appropriate sub-samples, enabling a more thorough examination of the relationships in question.

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