Apprenticeships for Young People in England: Is there a Payoff?

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Apprenticeships for Young People in England: Is there a Payoff?

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Abstract:

In recent times, there has been a policy drive to increase the number of people undertaking apprenticeships in England. In this paper we examine the characteristics of young people who start an apprenticeship and we look at whether there is an earnings premium a few years later. Specifically, we use administrative data in England to track students through their education and into the labour market. We analyse the earnings differential to starting an apprenticeships after a few years of experience (at the age of 28). Starting an apprenticeship is associated with a positive earnings differential on average. This is much larger for men than for women, mainly reflecting the different sectors in which they start their apprenticeship. Our analysis also suggests barriers to opportunity for accessing apprenticeship in the first place – for example, for those from economically disadvantaged backgrounds.

Keywords: apprenticeship; vocational education.

JEL codes: I20; I28; J24

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- As policymakers seek to increase the number of apprenticeships, we ask whether there is an earnings differential from starting an apprenticeship for young people. To address this question, we use administrative data on education and earnings ('longitudinal educational outcomes') for those who completed the compulsory phase of education, at age 16 in 2003. We follow them until they are 28, in 2015, and estimate the earnings differential at this time.

- About 17 percent of 16 year-olds in 2003 started an apprenticeship by the age of 28 – where for this cohort, starts only took place within five years of finishing GCSEs. About 60% of these are classified as an 'intermediate' apprenticeship (or level 2) with the remainder mainly 'advanced' apprenticeships (or level 3). Most people starting an apprenticeship achieve a highest level of qualification at either level 2 (equivalent to GCSE) or level 3 (equivalent to A-level). Higher apprenticeships were only introduced in 2010 and hence are not considered here.

- While 17% of the cohort start an apprenticeship, only 2% of the cohort progress from an intermediate to an advanced apprenticeship. This has increased to about 4% in more recent times – for the cohort finishing GCSEs in 2011. In other words, just 17% of the original cohort of young people we observed who started an intermediate apprenticeship progressed to an advanced one, but has risen to approximately 25% more recently.

- Apprenticeships are made up of a number of different components (or aims). During this period, only half those starting an advanced apprenticeship achieved most or all of their aims, and the figure is even lower for those starting an intermediate apprenticeship. Non-completion is still a big issue which has been documented in recent research. However, we generally focus on the payoff to starting an apprenticeship because the potential benefit is not only in certification but also on-the-job training, achievement of some if not all the aims and the potential connections made possible through the apprenticeship programme.

- There is strong concentration of men and women within different apprenticeship sectors. For intermediate apprenticeships, most men are classified within Engineering and Manufacturing Technologies (21%), Construction Planning and the Built Environment (29%), Retail and Commercial Enterprise (17%) or Business, Administration and Law (13%). For advanced apprenticeships, there is even more concentration, as 53% of men are classified as within Engineering and Manufacturing Technologies and 26% are within Construction, Planning and the Built Environment. For women doing intermediate apprenticeships, the biggest sectors are Health, Public Services and Care (22%), Retail and Commercial Enterprise (37%) and Business, Administration and Law (32%). At the advanced level, these are also the biggest sectors: Health Public Services and Care, 35%; Retail and Commercial Enterprise, 23%; Business, Administration and Law, 28%.

- Those starting an apprenticeship are more likely than average to be white and to speak English as a first language. Although the number of apprenticeships has increased over time, this has not changed. Furthermore, those from disadvantaged backgrounds – especially men - are less likely to start an apprenticeship. The percentage of disadvantaged men who start advanced apprenticeships is the same as those with university degrees. For this cohort, the percentage of men and women with an advanced apprenticeship who were eligible to receive free school meals when at school is 7% and 11% respectively. This compares to 12% and 14% - for men and women respectively – who start an intermediate apprenticeship. The average person in the cohort eligible to receive free school meals when at school is 14%.

- After controlling for factors including prior attainment, secondary school attended, demographics and experience, our results show a positive earnings differential from starting an apprenticeship in many contexts, though we cannot of course control for other factors such as social skills, motivation and other attributes valued by employers, so the earnings differential is not necessarily attributable wholly to apprenticeships. By the age of 28, if we consider those educated up to level 2, the baseline earnings for men and women is £19,709 and £13,621 respectively. This is the average earnings of those whose highest education was GCSEs (with at least one GCSE of A*-C) at age 28 in 2015. After taking account of factors we can observe - men who start an apprenticeship earn 23% more than those who left school with only GCSEs and roughly 16% more than those who left education with a level 2 vocational qualification. For women, those

who start an apprenticeship earn 15% more than those who left school with only GCSEs and about 4% more than those who left education with a level 2 vocational qualification.

- For those educated up to level 3, the baseline earnings for apprentices aged 28 are £22,464 and £18,500 for men and women respectively. This is the average earnings of those whose highest education was A-levels in 2015, when they were aged 28. After taking account of factors we can observe, men who start an apprenticeship earn about 37% more than those who left education with A-levels (and did not progress any further). They earn about 35% more than those who left education with a level 3 vocational qualification. Women who start an apprenticeship earn about 9% more than those who left education with A-levels by the time they are age 28. They earn roughly 15% more that those who left education with a level 3 vocational qualification.

- The gender differences in the earnings differential are particularly striking, especially for those educated to level 3, where they are over three times larger for men than for women. This is mainly driven by the sector of apprenticeship – men are more prominent in higher paying sectors. It is disturbing that women enter sectors with much poorer prospects and that the situation hasn't changed over the last ten years.

- The earnings differential is higher for those who complete the full apprenticeship programme than non-completers and for 'advanced apprenticeships' than 'intermediate apprenticeships'. Although those from disadvantaged backgrounds are less likely to access advanced apprenticeships than the average student, the earnings premium attached to starting an apprenticeship is the same for them as for others.

- Interestingly, men who complete an advanced apprenticeship in engineering earn more on average than men with a degree in engineering at age 28 (although this differential disappears after taking account of all observable characteristics and post-education labour market experience). At the opposite extreme, there are apprenticeship sectors that have a negligible or lower premium than alternatives for people educated to the same level. This includes having an apprenticeship in service enterprises (such as hairdressing) for women educated to level 2 or level 3 and childcare at level 3 (also affecting women). Thus, much like university degrees, potential 'returns' to an apprenticeship vary across subject specialisms.

- Since good apprenticeships for young people are much scarcer than university degrees, it is important to address barriers to creating more such opportunities where it is clear

that there is a positive payoff. Most businesses will not benefit from the focus on training provision for levy-payers as this only applies to the largest employers (accounting for only 2% of employers in the UK). In addition to increasing the incentive for businesses to recruit young people as apprentices, there is also a need to address the under-representation of those from poor backgrounds and those from minority groups.

1. Introduction

In England, there has been a big policy drive to increase the number of apprenticeships. One of the commitments made by the new Conservative government in 2015 was to increase the number of apprenticeships to three million by 2020. While often spoken about as a policy directed at young people, most of the growth has in fact been for workers over the age of 24.[1] The apprenticeship levy, which commenced this year, aims to incentivise large firms to take on apprentices, although it is too early to evaluate its effectiveness.

The policy focus on apprenticeships raises the question as to whether this is a worthwhile investment for young people at the beginning of their careers relative to other options. The main difference between apprenticeships and classroom-based vocational education is that the former involves most time being spent on the firm, with some 'in-house' training and work. In theory, apprenticeships should offer an excellent environment to acquire generic employability skills - such as team-working, communication skills - and specific occupational skills acquired 'on the job' as well as in a more theoretical context.[2] Furthermore, they may ease the school-to-work transition by establishing better matches of workers' skills to firms' needs and by acting as a substitute for job-search. On the other hand, there is a risk, in the absence of appropriate monitoring, that firms might provide training which is too company-specific or lacking in the quantity or quality that will be of use to other firms should the employee move. Thus the quality of apprenticeships may vary depending on the institutional context. Furthermore, even in countries with a good reputation for apprenticeships and vocational training, the initial advantage they confer may not last a lifetime.[3] Whether or not apprenticeships have a payoff, and for how long, is ultimately an empirical question. This is an important question for young people to consider when making post-16 choices and to policymakers when considering whether and how to incentivise firms to take on apprentices.

We use the new administrative linked education-earnings data (the Longitudinal Educational Outcomes dataset) to examine this question for the cohort of students who finished their compulsory education in 2003, at age 16. We choose this year because it is the earliest we can follow students from the school system into further/higher education and into the labour market. We focus on earnings at age 28, which is in the year 2015. Although not the first paper to estimate the earnings differential to having an apprenticeship, it is the first that has used the

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[1] See Hupkau and Ventura, 2017
[2] See Wolter and Ryan (2011) for an excellent review of the international evidence on the effects of apprenticeships for young people and firms.
[3] Hanushek et al. 2015

newly available administrative data specifically for this purpose.[4] It is especially useful because one can control directly for a lot of factors that might impact on the probability of starting an apprenticeship and earnings (such as prior attainment) but has the limitation that only the early career of a young person can be evaluated with this data.

Between 2003 and 2008, about 17% of young people in our cohort had started an apprenticeship. However, most had undertaken some form of further education beforehand - most often classroom-based vocational qualifications, although many do A-levels. Often further vocational qualifications are then pursued as part of the apprenticeship. In fact, an apprenticeship is made up of a number of different aims or components and it is very common to not achieve all of them. The number of apprenticeship starts vastly outweighs the number of apprenticeship completions.[5] This does not mean that there is no benefit from some time having been spent on an apprenticeship programme. However, the fact that young people often pursue a bundle of post-16 options and the fact that many do not complete their apprenticeship, complicates how to evaluate the earnings differential that is attributable to an apprenticeship itself. Another issue is that those who undertake apprenticeships most usually have a highest educational qualification up to level 2 (the educational equivalent of GCSEs) or level 3 (A-levels). They have a very different educational profile to those who pursue university degrees and spend less time in the education system.

We tackle these issues by comparing individuals who start an apprenticeship relative to those of the same educational level (a highest level of education of level 2 or level 3). In the case of men – where earnings differentials are found to be high – we also compare the earnings of those who completed advanced apprenticeship to those of graduates at age 28. As the latter have such a different experience-earnings profile (and enter the labour market much later), we need to be careful with the interpretation as one might expect graduates to have a steeper earnings profile beyond this age. In all cases, we try to 'net out' as many characteristics of individuals as possible that might influence both the probability of starting an apprenticeship and later earnings such as prior attainment, the secondary school attended and demographics. In some specifications, we also control for post-education/apprenticeship experience as this can be very different according to the path chosen, even amongst those who have the same highest level of education.

Our findings show a positive differential for having started an apprenticeship in many contexts. However, the extent of this differential depends on the apprenticeship sector.

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[4] However Conlon et al. (2017) have recently included apprenticeships in a broad study investigating the payoff to different types of further education using the LEO data. McIntosh and Morris (2016) is a very recent example of a study estimating the wage differentials to having an apprenticeship using the Labour Force Survey.
[5] Bursnall et al. 2017

Furthermore, it is not always higher than the average payoff from only doing classroom-based qualifications, whether academic or vocational. The earnings differential from starting an apprenticeship is much higher for men than for women, partly reflecting the different sectors in which they pursue an apprenticeship.[6] It is particularly high for those men who do an 'advanced apprenticeship' in engineering. In fact, those who complete an advanced apprenticeship in engineering earn more than those with a degree in engineering at age 28. After controlling for all observable characteristics, the earnings differential is about the same at this age.

The remainder of this report is structured as follows. In Section 2, we describe the data used for this analysis, how we construct the educational categories of interest, and the methodology. In Section 3, we describe some salient features of apprenticeships in England for young people, including how this has evolved over time. In Section 4, we investigate who gets on to an apprenticeship programme based on demographics, location and prior attainment. In Section 5, we estimate the earnings differential from starting an apprenticeship and also consider how this varies according to whether the apprenticeship has been completed and the level of the apprenticeship (intermediate or advanced). We explore the earnings differential to starting an apprenticeship in different sectors. Finally, for men, we compare the earnings differential of achieving an advanced apprenticeship compared to achieving a university degree. We conclude in Section 6.

2. Data and Methodology

By combining data from the National Pupil Database (NPD), the Individual Learner Record (ILR) and Higher Education Statistics Agency (HESA), we are able to track students' participation into publicly funded education from primary school up to Further and Higher Education in England. We focus on the cohort of students who left compulsory schooling (at age 16) in the academic year 2002/03 for which we have good information on all educational outcomes through school and for whom records can be linked to earnings data from the tax records of HMRC.[7] The cohort is composed of over 565,000 students.

We have information on students' educational participation every year up until they leave publicly-funded education completely. We classify students based on their highest level

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[6] The authors are currently further exploring the gender difference in the earnings differential attributable to apprenticeships. This will be published as a discussion paper within the Centre for Vocational Education Research in the near future.

[7] The last available tax year of HMRC records is 2014/2015, bearing in mind that the tax year terminates on April 5th. Therefore this cohort will be aged 27-28 over the course of the tax year. It is technically possible to link the cohort undertaking GCSEs in 2001/02 to their tax records. However, some of the education data was not available to us and there was not as high participation in apprenticeships in this cohort, which is of primary interest in this paper.

of education achieved throughout the whole period. This is observed up to when they are aged 27/28. Table 1 reports students' highest education achievement for the whole cohort and separately for females and males.

In the English system, 'level 2' is considered equivalent to the educational level that should be achieved by the end of secondary school. However, many people pursuing post-16 vocational education undertake 'level 2' courses. This is especially common if individuals do not get good GCSE grades by the end of compulsory education. We divide those with level 2 as their highest level of education into 3 sub-categories: those with GCSEs only (who achieve at least one GCSE at grade A*-C); those with a level 2 vocational education and those with a level 2 qualification and who started an apprenticeship. As we will see in the next section, this is usually an 'intermediate apprenticeship'.

We separate those with a highest educational qualification of 'level 3' into the following subcategories: those with A-levels only; those with a vocational qualification (of whom about 25% also have A-levels); and those who started an apprenticeship, which is most often an 'advanced apprenticeship'. Amongst those who started an apprenticeship, 27% of men and 41% of women have A-levels, with the remainder having a vocational qualification.

As Table 1 illustrates, about 30% of this cohort had level 2 as their highest level of education - of which close to 30% had started an apprenticeship; just over 20% had level 3 as their highest level of education - of which 32% of men and 17% of women had started an apprenticeship. Tertiary education is mainly at university, with very little sub-degree level education (at level 4 or 5). About 27% of men and 33% of women undertake tertiary education in this cohort before the age of 28. Only a small percentage of men and women with tertiary education also have apprenticeships (as documented below). Finally, a significant minority of the cohort - 21% of men and 14% of women - left the system with very low-level education (below level 2).

Although our analysis is mainly based on the cohort who undertook their GCSE exams in 2003, we can also consider how apprenticeship starts have changed over time. This is discussed below and, in particular, we look at whether the probability of starting an apprenticeship has changed for the cohort that did their GCSEs in 2003 and in 2011 - the latest year we can consider given that most young people start an apprenticeship within five years of completing their compulsory education.

For the 2003 cohort, we would like to assess whether, conditional on the highest level of education achieved, there is a payoff to commencing an apprenticeship programme over and above other forms of education at age 28, which is the latest we can observe them – in 2015. It makes sense to compare young people with apprenticeships to others within the same category

(as defined by highest level of education) rather than to people with much higher levels of education and a very different labour market trajectory. Having said that, we will be comparing the earnings of men who complete an advanced apprenticeship to university graduates as the average earnings for the former group are particularly high. We will consider whether the differential still exists after controlling for all observable characteristics.

Even when comparing individuals within the same broad categories, we need to bear in mind that those starting an apprenticeship might differ in many respects from those who do not. It is important to control for these characteristics in regression analysis as otherwise the association between starting an apprenticeship and earnings might simply reflect these omitted variables, such as prior attainment, that are also likely to have a direct influence on earnings. Although the linked data sets enable us to control for very important characteristics of students that potentially influence both whether they gain access to an apprenticeship and labour market outcomes, there are potentially important omitted characteristics. For example, one would expect employers to screen students on many qualities that are not available in these data, such as motivation and non-cognitive abilities. To the extent that these omitted variables both positively influence the probability of getting on to an apprenticeship and labour market earnings, the association between starting an apprenticeship and earnings will not reflect the true return. In this case, the earnings differential will be larger than the true return to starting an apprenticeship.

With these caveats in mind, we will estimate the following OLS regression:

$$Y_i = \beta_0 + \beta_1 Vocational + \beta_2 Apprenticeship + \beta_3 X_i + \alpha_s + \epsilon_i$$

where Vocational and Apprenticeship are mutually exclusive dummies that indicate whether the individual has a vocational qualification (but not an apprenticeship), or he/she has started an apprenticeship. The omitted category or reference group are individuals who only have an academic qualification. Y represents log earnings for individual i, as observed at age 28 (in 2015), which is the latest point at which they can be observed in our data. We do not have information on hours of work. It is important to note that this earnings measure will capture the differential attributable both to wages and the time spent working.

The main coefficient of interest β_2 represents the differential associated with starting an apprenticeship in terms of the outcome Y. We also include a vector of individual characteristics X_i, namely demographic characteristics, prior attainment at age 11 (Key Stage 2) and age 16 (GCSE). Demographic characteristics are ethnicity, whether the student was eligible to receive free school meals when in secondary school and whether English is the main language spoken at home. Measures of prior attainment are the points scores obtained in English, maths and science at age 11 as well as the points score obtained at age 16 in GCSEs.

Finally we include a secondary school fixed effect α_s. We run this regression separately for students whose highest vocational achievement is level 2 and level 3 and for males and females.

3. Apprenticeships in England

Amongst those who finished their compulsory education in 2003 at age 16, about 17% of the cohort started an apprenticeship at some stage and we only observe new starts between the age of 16 and 22 (no new starts between age 23 and 28). Almost all apprenticeships are either intermediate or advanced for this age group, with higher apprenticeships a new phenomenon.[8] About 60% of apprenticeship starts were classified as intermediate, although many do more than one apprenticeship. Figure 1 plots the share of each cohort starting an apprenticeship up to those who finished their compulsory schooling in 2011. The share has increased over time. For those who completed compulsory schooling in 2011, 23% of the cohort started an apprenticeship within five years. The increase has been greater for intermediate apprenticeships up to about the 2010 cohort. This may be related to recent reforms on the duration of intermediate apprenticeships around this time.[9]

Table 2 shows characteristics of apprenticeships for men and women respectively at these different levels. This is shown for men and women who completed their GCSEs in 2003 and is similar in many respects to those who completed their GCSE in 2011 (shown in Appendix Table A1).[10] Apprenticeships are made up of a number of different components or aims. At this time, only half of those starting an advanced apprenticeship achieved most or all of their aims. This is lower for those starting an intermediate apprenticeship. A recent study compares starts and completers for all apprentices (not only young people) for those starting an apprenticeship in 2011/12.[11] This finds a non-completion rate of at least one-third and possibly up to 45%. Thus, non-completion of apprenticeships continues to be an important issue, especially since the government target is based on starts. However, we primarily consider the earnings differential to starting an apprenticeship (as opposed to completing it) since the benefit of an apprenticeship is not necessarily primarily related to certification. It might also include the benefits of being trained on-the-job, completing some - even if not all - of the aims, and the contacts through which another job might be obtained.

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[8] From the 2003 cohort, we could find only 13 men and 5 females who started an apprenticeship at level 4 by the age of 28. For the 2011 cohort, 1,513 men and 902 women started an apprenticeship at level 4 within 5 years of undertaking their GCSEs. Notice, however, that higher apprenticeships were introduced in 2010.

[9] See Nafilyan and Speckesser, 2017.

[10] Notable differences include a higher share of apprentices with a vocational qualification at level 2 or 3 and a reduction in the average completion and duration of apprenticeships.

[11] See Bursnall et al. (2017)

The next panel of Table 2 shows the highest qualification achieved for those who started an apprenticeship. The vast majority achieved a highest qualification of level 2 or level 3. However, a significant minority of those starting an intermediate apprenticeship do not have a qualification of level 2. Very few obtained a degree or a qualification at level 4 (foundation degree). For intermediate apprentices, most obtained a qualification of level 2 academic (GCSEs) or vocational. For advanced apprentices, most obtained a qualification of level 3 vocational – 59% for men and 49% for women. The second biggest category is level 2 vocational – 17% for men and 24% for women. The educational profile of those with intermediate and advanced apprenticeships motivates how we construct comparison groups. Typically we compare those within the same highest level of education to each other, distinguishing between those with academic qualifications (GCSE or A-levels), vocational, and apprenticeship. The latter category contains those who either have a vocational or academic qualification or some combination of the two.

For both men and women, there is strong concentration within apprenticeship sectors, although the sectors differ according to gender. For intermediate apprenticeships, most men are classified within Engineering and Manufacturing Technologies (21%), Construction Planning and the Built Environment (29%), Retail and Commercial Enterprise (17%) or Business, Administration and Law (13%). For advanced apprenticeships, there is even more concentration, as 53% are classified as within Engineering and Manufacturing Technologies and 26% are within Construction, Planning and the Built Environment. For women doing intermediate apprenticeships, the biggest sectors are Health, Public Services and Care (22%), Retail and Commercial Enterprise (37%) and Business, Administration and Law (32%). At the advanced level, these are also the biggest sectors with the shares as follows: Health Public Services and Care, 35%; Retail and Commercial Enterprise, 23%; Business, Administration and Law, 28%.

In Table 3, we show a more refined definition of apprenticeship sector for the 10 most popular sectors by level. Panel A gives this information for men whereas Panel B gives this information for women. Average earnings at age 28 is also shown. For advanced apprenticeships, the top 3 sectors for men are Engineering, Building and Construction and Transportation Operations and Management. Those men who undertake the most popular (Engineering) earn more than men who undertook other types of apprenticeship. Average earnings at age 28 for a man who started an engineering apprenticeship is £29,265. For women at the advanced level, the top three apprenticeship sectors are Child Development and Wellbeing, Administration and Service Enterprises (hairdressing for example). All three have low average earnings at age 28 relative to the top ten sectors for men. They are £12,038,

£16,514 and £12,045 for Child Development and Wellbeing, Administration and Service Enterprises respectively. Such gender differences suggest that we do need to treat men and women differently when considering payoffs. It is also illustrative of the huge variation to the potential payoff to an apprenticeship. In Appendix Table A2, we show the top ten sectors for the cohort who did their GCSE exam in 2011. Although the most popular sectors have not changed that much, the degree of concentration in particular sectors has decreased a little for men.

4. Who gets an apprenticeship?

In Tables 4 and 5, we show characteristics of individuals who obtained an intermediate and advanced apprenticeship for men and women respectively. We also show summary statistics for the top decile of earners at age 28 amongst those who started an apprenticeship. For comparison, we show the same summary statistics for the entire cohort - those undertaking their GCSE exam in 2003. The variables are measured in the last year of compulsory schooling when individuals were aged 16.

All categories of apprentice are more likely to speak English as a first language and to be white compared to the cohort as a whole.[12] They are also much less likely to come from London. Those who start an intermediate apprenticeship are similar to the average in the cohort in terms of eligibility for free school meals and the probability of coming from a prosperous or deprived area (as measured by the IDACI index), although they are a little less likely to come from a deprived area and (if male) to have been eligible to receive free school meals.[13] They have below average results in terms of GCSE and primary school attainment in English and maths. They are also less likely to have attended a 'very good' secondary school - as measured by whether Ofsted evaluates the school as outstanding or very good.

Advanced apprentices are less likely to have been eligible for free school meals than the cohort as a whole and to have come from the 10% most deprived areas. Differences are more striking for men than for women. Men who pursue advanced apprentices are higher achieving at GCSEs than the average but the opposite is true for women. They are fairly similar to the average in terms of the probability of attending a very good secondary school - although more so for men than for women. If we consider the top 10% of earners who start an apprenticeship at some stage (as measured at age 28), they have a similar profile to those who start advanced apprenticeships, with the most striking differences being that they have higher

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[12] The under-representation of ethnic minorities is not due to their application behaviour (at least for those who apply for apprenticeships using the National Apprenticeship Service). In fact, they apply in greater numbers and are less like to be selected. See the report by the Learning and Work Institute (2017).

[13] The IDACI index is the Income Deprivation Affecting Children Index (IDACI).

achievement at GCSE and are much more likely to come from London than others with an apprenticeship (although similar to the cohort as a whole).

One question is whether those starting an apprenticeship in more recent times have very different characteristics than the cohort we are considering. To investigate this, we estimate Probit models of the probability of starting an apprenticeship conditional on observable characteristics. We do not find much evidence that apprentices are selected differently in more recent times than they were for the cohort we are considering. This is explained in the Appendix (Table A3).

In Tables 6 and 7 - for men and women respectively - we show summary statistics of individual characteristics according to the highest level of education achieved and whether he/she has ever started an apprenticeship. In this case, we combine different levels of apprenticeship, although intermediate apprenticeships will be more common for those qualified to level 2 and advanced apprenticeships for those qualified to level 3.[14] Columns (1) to (3) of each table show summary statistics for those whose highest qualification is level 2, dividing this into academic (GCSE), vocational and those with an apprenticeship. Columns (4)-(6) show summary statistics for those whose highest qualification is level 3, dividing this into academic (A-levels), vocational and those with an apprenticeship. Columns 7 and 8 show summary statistics for those with higher levels of education: level 4/5 (column 7), a degree (column 8). The final column shows summary statistics for the whole cohort.

This shows that those starting an apprenticeship are more likely to be classified as white and to speak English as a first language than any other group defined by educational attainment. They are also less likely to come from London. This is true for both men and women.

Based on eligibility to receive free school meals, those with level 2 as a highest qualification and who commenced an apprenticeship are less likely to be disadvantaged than others with a similar level of education (within the level 2 group). However, there is much more 'selection' according to disadvantage amongst those who are qualified to level 3. Those who started an apprenticeship are much less likely to have been eligible to receive free school meals than the cohort as a whole: 6% and 9% for men and women respectively, compared to 14% in the cohort as a whole. However, they are quite similar in this respect to those whose highest qualification is A-levels, and very different from those with a level 3 vocational qualification (but no apprenticeship) who are more likely to come from a disadvantaged background. Level 3 school leavers with A-levels or an apprenticeship come from the 10% most deprived areas with about the same probability - which is also similar to university

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[14] We show some regressions whether the payoffs to starting an intermediate apprenticeship and advanced apprenticeship are distinguished within educational level.

graduates. It is clear that someone from a disadvantaged background has a relatively small probability of being amongst either university graduates or those whose highest qualification is A-levels or those who start an advanced apprenticeship. However, whereas university graduates are more likely to be drawn from the least deprived areas (16-17% compared to 10-11% in the cohort), those with a level 3 qualification and who started an apprenticeship are much closer to the average for the cohort in this respect. When compared to university graduates, they are much less likely to have attended a 'very good' secondary school. Thus, although not from the poorest backgrounds, those with a level 3 qualification who start an apprenticeship are not from a socio-economic elite either.

Much of what drives the relationship between disadvantage and educational progression is academic achievement when at school. When we look at a measure of academic achievement while at school (5 or more GCSEs at grades A*-C), it is clear that those who ultimately attain higher-level qualifications are those who did better in the GCSE exam. In particular, there is huge difference between those who achieved a degree compared with all other groups - though they are closer to those who stopped their education at A-levels, as these students also performed very well at GCSE. This measure illustrates that those who start apprenticeships look very different in terms of their educational background than those with degrees (and A-levels). They look a lot more like those who undertook vocational qualifications at their respective levels, although apprentices are clearly 'positively selected' within these groups; they have higher prior attainment than those with a vocational qualification at the same level.

Finally, we show average years of post-compulsory education and years of labour market experience (after leaving the education system) for these groups. When considering the payoff to apprenticeships, it is important to bear in mind that such individuals will often have lower years of experience, as measured after they complete their education+apprenticeship. We will estimate the payoff using regressions with and without controlling for years of experience.[15] A further point to note is that those with degree level education spend much longer in the education system than those with a level 3 qualification and thus have less labour market experience. As they have such different labour market trajectories, an analysis at the age of 28 is going to be more limited when comparing apprentices to those with degrees (as opposed to those with qualifications at a similar level).

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[15] The 'on-the-job' experience which is during an apprenticeship is part of the apprenticeship process itself and included within our estimate of the earnings differential to starting an apprenticeship.

5. Is there a payoff to having an apprenticeship?

We then assess whether, conditional on the highest level of education achieved, there is a payoff to commencing an apprenticeship programme over and above other forms of education using the methodology described in Section 2. Before discussing the regression results which include controls, we describe raw patterns in the data over time.

Trends in Earnings

Figures 2 and 3 show trends in earnings over time for men and women at levels 2 and 3 respectively (where their highest level of qualification was either level 2 or level 3). Although in general we are interested in earnings at age 28 in 2015, these figures plot log earnings each year these groups have completed education and are in the labour market. They show trends for the cohort who completed their compulsory education in 2003 (at age 16). Hence, everyone is about the same age, although the sample composition will change year-on-year as not everyone has positive earnings every year. Furthermore, the groups have different years of post-education experience, partly driven by when they finish their education and start working (as well as years in employment). These differences are not reflected in the figures, although they will be taken into account in the regression analysis, which tries to measure the earnings differential attributable to starting an apprenticeship net of the other individuals' observable characteristics.

We begin by considering average (unadjusted) log earnings for those whose highest level of qualification is at level 2.[16] Figure 2 shows that women earn less on average than men and have a flatter earnings profile. This is true for all educational categories. For both men and women, those with a vocational qualification (but no apprenticeship) earn less than those in other groups. For men, those with an apprenticeship earn more on average in each year. For women, the raw differential starts out as slightly higher for apprentices (compared to those with GCSEs only) but this is reversed by age 28. The difference is small, however.

In Figure 3, we show log earnings for those whose highest qualification is level 3.[17] For men, the raw differential to having started an apprenticeship is clearly positive and is higher

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[16] In tables 6 and 7, we report average annual earnings of men and women respectively in 2015 (when this cohort were aged 28). The average earnings for those with only GCSEs was £19,709 and £13,621 for men and women respectively. Those with (at most) a level 2 vocational qualification earned £22,268 and £24,460 for men and women respectively. This is £24,460 (for men) and £12,538 (for women) if they also started an apprenticeship within 5 years of leaving school. Note that these numbers do not control for any other characteristics. Also, whereas the numbers used in our regression results are trimmed (to exclude the top and bottom percentiles), here they are untrimmed.

[17] For those educated up to level 3, men and women with only A-levels earned £22,464 and £18,500 on average at age 28. For those with (at most) a level 3 vocational qualification, the average earnings were £20,755 (for men) and £15,113 (for women). For those who has also started an apprenticeship, the average was £25,558 and £15,586 for men and women respectively.

than earnings for both other categories: individuals with A-levels or an equivalent vocational qualification. The raw difference in log earnings between individuals with A-levels or an equivalent vocational qualification is much smaller. The situation is very different for women. In early years, the raw differential to starting an apprenticeship is positive. But by age 28, those with A-levels have higher average log earnings than those who started an apprenticeship or those with a vocational qualification. Furthermore, there is not much difference between average log earnings at age 28 between those with an apprenticeship and those with a vocational qualification.

These figures suggest that men with a highest qualification of level 3 and who started an apprenticeship fare particularly well relative to other groups, with medium-term benefits of starting an apprenticeship less obvious for women (in the raw data). We now consider what happens when we control for other characteristics in a regression context, thus controlling properly for observable characteristics that might obscure the true relationship between starting an apprenticeship and average earnings.

Payoffs: Level 2 as highest qualification

Table 8 shows regression results with three specifications for men (columns 1-3) and for women (columns 4-6). We first report the average (log) earnings differential with no controls. Then - as explained above - we include controls for demographics, prior attainment and school attended. And finally, we also add years of experience after the end of education or an apprenticeship - noting that the 'on-the-job' experience done as part of an apprenticeship is included within the 'effect' that we would like to measure. Controlling for post-education experience adjusts estimates for the fact that people who follow different education routes necessarily enter the labour market at different times (as shown in Tables 6 and 7). In general, it is not completely unambiguous whether to include years of actual experience in the regression (although the convention would be to include this) as the educational qualification might directly affect years of employment - which is an outcome in itself.

For men and women, the earnings differential to having started an apprenticeship gets stronger as controls are added. Even without controlling for years of experience the earnings differential at age 28 is 11% and 4% for men and women respectively compared to the baseline (which is those who leave education with only GCSEs). As those with GCSEs have more labour market experience, the differential increases substantially when this is taken account of (in specifications 3 and 6). The earnings differential is then about 10% for men and 12% for women. It is also higher than the payoff to a vocational (non-apprenticeship) qualification at this level, which in turn is associated with higher average earnings than leaving school with

only GCSE qualifications. Vocational qualifications at this level is only higher than the payoff to GCSEs (for men) when including years of experience as a control. The relative payoff to having completed an apprenticeship (as opposed to starting one) is even higher and is reported in Appendix Table A4.1. Given that unobserved attributes such as motivation are very likely to affect both completion and earnings, we shouldn't make too much of the difference between completers and non-completers. However, most of the earnings differential is attributable to starting an apprenticeship in the first place (rather than completing one).

As discussed above, although individuals with level 2 as a highest qualification are more likely to commence an intermediate apprenticeship, a significant number also undertake an advanced apprenticeship. Table 9 shows the same regressions where the two types of apprenticeship are distinguished. There is a much higher differential from having started an advanced apprenticeship rather than an intermediate apprenticeship. However, again, one should not make too much of this as there is very likely to be unobserved attributes affecting both the level of apprenticeship and earnings.

Another interesting exercise is to compare the payoffs to starting an apprenticeship with achieving vocational qualifications without an apprenticeship, but including a control for the main vocational sector of learning. For example, it might be that those starting an apprenticeship have a very different sector of learning to others with a vocational qualification (but no apprenticeship). We report the results of these regressions in Table 10.[18] It is interesting to note that including this additional control makes very little difference to the average earnings differential.

Payoffs: Level 3 as highest qualification

Table 11 shows results where we consider only those with level 3 as their highest qualification. The baseline consists of those individuals who achieve A-levels as their highest qualifications. For men, the average payoff to having an apprenticeship is much larger. Even without controlling for experience, the earnings differential at age 28 is 24%. This increases to nearly 37% when controlling for experience. In contrast, there is very little difference in the average earnings differential from leaving education with level 3 vocational qualifications compared to A-levels after controls have been added.

For women, the situation is very different. The raw differential to starting an apprenticeship is negative but goes to zero after including basic controls. However, the differential becomes positive when controlling for experience and is about 9%. The average

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[18] In this regression, we exclude those with only academic qualifications as they do not have a vocational sector of learning. In Table 10, the omitted category is those with a vocational qualification but no apprenticeship.

differential to leaving education with vocational qualifications (as opposed to A-levels) is negative in the raw data but is narrowed substantially when basic controls are included. It remains negative (at about 5%) when experience is also included. Thus, for women, there is a positive payoff to having started an apprenticeship only after controlling for experience. Thus, conditional on observable characteristics and experience, the average earnings differential to starting an apprenticeship is positive relative to leaving education with either A-levels or classroom-based vocational qualifications.

When we distinguish between completers and non-completers, there is a higher payoff for the former. This is shown in the Appendix (Table A4.2). When controls are included, there isn't much difference between the payoffs to completers versus non-completers, suggesting that the latter group are not really losing out much on average.

Table 12 shows results where we distinguish between those who started an advanced apprenticeship and those who started an intermediate apprenticeship. The average payoff is much higher for the former group. However, in Table 13, we compare those with an apprenticeship to those with a vocational qualification and include a control for the sector of learning (again excluding those with academic qualifications, see footnote 18). This shows that much of the differential payoff to having started an intermediate apprenticeship compared to an advanced apprenticeship is driven by the sector of learning. Nonetheless, the payoff to having an advanced apprenticeship is higher by some margin even after taking account of the sector of learning. As those undertaking an advanced apprenticeship are different from those undertaking an intermediate apprenticeship for reasons that are not fully measured in the data, one should not interpret these differences as causal. However, they provide suggestive evidence that an apprenticeship is a good investment for those able to get one.

We have considered whether there is an additional payoff or penalty to having an apprenticeship conditional on demographics such as whether the individual was eligible to receive free school meals when at school, whether from London, and whether a person attended a 'good secondary school'. However, the payoff to these groups is about the same as the average.[19] Thus, although those from disadvantaged backgrounds are less likely to access advanced apprenticeships than the average student, the earnings premium attached to starting an apprenticeship is the same for them as for others.

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[19] The results of this analysis can be provided by the authors on request.

Payoffs to Apprenticeships in Different Sectors

Table 14 shows the earnings differential for men according to the sector of the apprenticeships, where small sectors are aggregated together into one category. Columns (1) to (3) show the average earnings differential for those whose highest level of education is level 2 and columns (4) to (6) show the average earnings differential for those whose highest level of education is level 3. As before, controls are progressively added to the regression. The baseline is those with GCSEs only (with regard to level 2) and A-levels only (with regard to level 3).[20] The results show that the average payoff at age 28 to starting an apprenticeship is higher in all sectors of apprenticeship at both levels 2 and 3 relative to the baseline (omitted category) and also relative to undertaking a vocational qualification without an apprenticeship. This is true whether or not we add a control for experience. However, the average payoff is very different across sectors. Although it is always high, it is highest for those with an apprenticeship in engineering. This is true at both levels 2 and 3. Also, within sector, the average payoff to having an apprenticeship is always higher (relative to the baseline) for those with a level 3 qualification as their highest level (rather than level 2). This most likely reflects the greater prevalence of 'advanced apprenticeships' in this group.

Table 15 shows results from the same set of regressions for women, except in this case the sectors of apprenticeship are different, reflecting their prevalence. Considering those with a highest qualification of level 2, there is a relatively high payoff (compared to the baseline) for those who started an apprenticeship in healthcare, administration or 'another sector' (the miscellaneous group). This payoff is also significantly higher than having a vocational level 2 qualification as the highest qualification. The payoff to starting an apprenticeship in childcare is also positive but only when controlling for experience and it is less than having a vocational level 2 qualification (with no apprenticeship). There is no payoff to having and apprenticeship in service enterprises - the second most popular sector of apprenticeships for women, which includes hairdressing.

When we consider those with level 3 as their highest educational qualification, the outlook is worse, whether we compare average payoffs to the baseline or to those with a level 3 vocational qualification but no apprenticeship. The only sectors with relatively high average payoffs are administration and the miscellaneous 'other' category - and even then, they are much lower than men starting level 3 apprenticeships. Those starting apprentices in childcare or services enterprises have lower payoffs than those whose highest qualification is A-levels or a vocational equivalent (as demonstrated by comparing coefficients to the first row). Those starting an apprenticeship in healthcare have an average payoff which is about the same as

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[20] 'GCSEs only' include individuals who achieved at least one GCSE at Grade C or above.

those whose highest qualification is A-levels (conditional on all observable characteristics) and higher than those whose highest qualification is level 3 vocational (but no apprenticeship).

The overall picture is one where young men have a very high earnings differential to starting an apprenticeship in all sectors, although the magnitude varies depending on the sector. On the other hand, the differential for women is lower and only exists (on average) in some sectors.

Advanced Apprenticeship v Degree for men

Having established that apprenticeships are associated with higher earnings for those qualified up to level 3, another interesting question is how they compare to those who have a university degree. In Section 5, we saw that male apprentices have very different characteristics to those holding a university degree. In particular, they have much lower educational attainment at school (on average) and spend much less time in the education system. The latter issue makes it particularly difficult to make a comparison when the cohort is only aged 28, as university graduates enter the labour market much later and thus have less experience. Here we compare men who have completed an advanced apprenticeship who those who have completed a university degree.[21] Figure 4a shows the earnings profile over time for those men who achieved an advanced apprenticeship compared to those who achieved a university degree. Figure 4b shows the earnings profile over years of experience (where this starts after individuals have completed their education/apprenticeship). Figure 4a illustrates that men with an advanced apprenticeship enter the labour market much earlier than those with a degree. Figure 4b shows that those with a university degree have a steeper age-earnings profile as they begin their career. While those with an advanced apprenticeship earn more on average, the differential converges over time and we do not see what happens beyond the age of 28. Furthermore, these calculations do not take into account student debt repayments.

In Table 16, we report results in a regression context, where we progressively include controls. Specifically, we estimate the average earnings differential for achieving an advanced apprenticeship compared to achieving a degree (which is the baseline). In columns (1) to (3) the baseline is achieving any degree and in columns (4) to (6) the baseline is achieving an engineering degree. In the upper panel, we show the average differential for achieving any type of advanced apprenticeship and in the lower panel, we report regressions where we break this down according to the sector of the apprenticeship. The raw earnings differential attached to achieving an advanced apprenticeship (over a university degree) is 11 percent at age 28.

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[21] We exclude the small number of people who have an advanced apprenticeship as well as a highest qualification at Levels 4 or 5.

Although this increases after conditioning on a lot of observable characteristics (column 2), the magnitude goes back to about 11 percent when also controlling for experience. When we break this down by sector, it is clear that the differential is considerably higher for those with an advanced apprenticeship in engineering. Even conditional on observable characteristics and experience, they earn about 27% more on average than those with a university degree at age 28. The average differential, though positive, is lower in other sectors and is only negligible for those with an advanced apprenticeship in administration.

We then compare men who achieved an advanced apprenticeship to men with a degree in engineering (as opposed to any type of degree). When we make this comparison, those with a degree in engineering always earn more when controlling for experience (and by a considerable margin). The only exception is an engineering apprenticeship. Conditional on observable characteristics, those who achieve an advanced apprenticeship in engineering have the same average earnings differential as those with an engineering degree at age 28.

6. Conclusion

In many contexts, there is an average earnings differential from starting an apprenticeship for a young person. It is higher for completers than non-completers, for 'advanced apprenticeships' than 'intermediate apprenticeships' and for men than women. The average differential is strongly dependent on the sector chosen with the differential being strongest for engineering. Men who complete an advanced apprenticeship in engineering earn more on average than men with a degree in engineering at age 28 - although this differential disappears after taking account of all observable characteristics and post-education labour market experience. At the opposite extreme, there are apprenticeship sectors that have a negligible or lower premium than alternatives for people educated to the same level. This includes having an apprenticeship in service enterprises (such as hairdressing) for women educated to level 2 or level 3 and childcare at level 3 (also affecting women). Thus, much like university degrees, one should think of the potential 'returns' to an apprenticeship as being variable across subject specialism. In the light of strong differences by sector, it is disturbing that there is such strong gender segregation and that women do not enter the sectors with higher earnings prospects. Furthermore, this has not changed over the last ten years. One might also ask whether apprenticeships with no positive earnings differential have any advantage in terms of pedagogy/productivity.

We also show evidence of inequality of opportunity for who can get on to an apprenticeship programme. For example, those from minority backgrounds (as defined by ethnicity or whether English is the first language spoken are under-represented). Economically disadvantaged groups are also under-represented, especially among men. For example, among men, the percentage of those eligible to receive free school meals who start an advanced

apprenticeship is the same as those who complete a university degree; the same is true for those who live in the most disadvantaged areas. On the other hand, those who start an apprenticeship are more representative of the cohort when it comes to the probability of being drawn from the more prosperous areas (unlike graduates, who are strongly over-represented). Furthermore, advanced apprenticeships are clearly accessible to those with GCSE grades that are close to the average for the cohort (and below average in the case of women). This is unlike the average university graduate, who leaves school with a much higher level of educational attainment. Thus, on various indicators, it appears that apprenticeships are drawn from a more representative sample of the population even if they are not at all commonly observed amongst the poorest groups.

Since apprenticeships for young people are relatively scarce compared to say, university degrees, it is important to address barriers to creating more such opportunities where there is clearly a positive payoff. Most businesses will not benefit from the focus on training provision for levy-payers as this only applies to the largest employers (accounting for only 2% of employers in the UK). Furthermore, the incentives to recruit 16-18 year olds have been reduced.[22] In addition to increasing the incentive for businesses to recruit young people as apprentices (as opposed to apprenticeships for older people), there is also a need to address the under-representation of those from poor backgrounds and those from minority groups. Finally, opportunities to get on apprenticeships with good earnings prospects are clearly greater for men than for women. This is a major concern going forward if apprenticeships are to become a more dominant part of the landscape for young people in England.

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[22] https://feweek.co.uk/2017/01/05/funding-reform-will-see-16-18-apprenticeships-drop-by-two-thirds/

References

Bursnall, M., V. Nafilyan, and S. Speckesser. (2017). An analysis of the duration and achievement of apprenticeships in England. CVER Briefing Note 004. Centre for Vocational Education Research. London School of Economics

Conlon, G., S. Hedges and P. Patrignani (2017). The earnings differentials associated with vocational education and training using the Longitudinal Education Outcomes data. CVER Research Paper 007. Centre for Vocational Education Research, London School of Economics

Hanushek, E. A., G. Schwerdt, L. Woessmann, and L. Zhang. (2016). General education, vocational education, and labor-market outcomes over the life-cycle. *Journal of Human Resources*

Hupkau, C., and G. Ventura (2017). Further Education in England: Learners and Institutions. CVER Briefing Note 001. Centre for Vocational Education Research. London School of Economics

Learning and Work Institute. (2017). Three Million Apprenticeships: Building Ladders of Opportunity.

Nafilyan, V., and S. Speckesser, (2017). The longer the better? The impact of the 2012 apprenticeship reform in England on achievement and other outcomes. CVER Research Paper 007. Centre for Vocational Education Research, London School of Economics

McIntosh, S, and D. Morris. (2016). Labour Market Returns to Vocational Qualifications in the Labour Force Survey. CVER Research Paper 006. Centre for Vocational Education Research, London School of Economics

Wolter, S. C., and P. Ryan. 2011. "Apprenticeship." In Eric Hanushek, Stephen Machin and Ludger Woessmann, ed., *Handbook of Economics of Education* 3(3), Elsevier.

Figure 1: Share of intermediate and advanced apprenticeships by cohort and by gender (for the period 2003-2016)
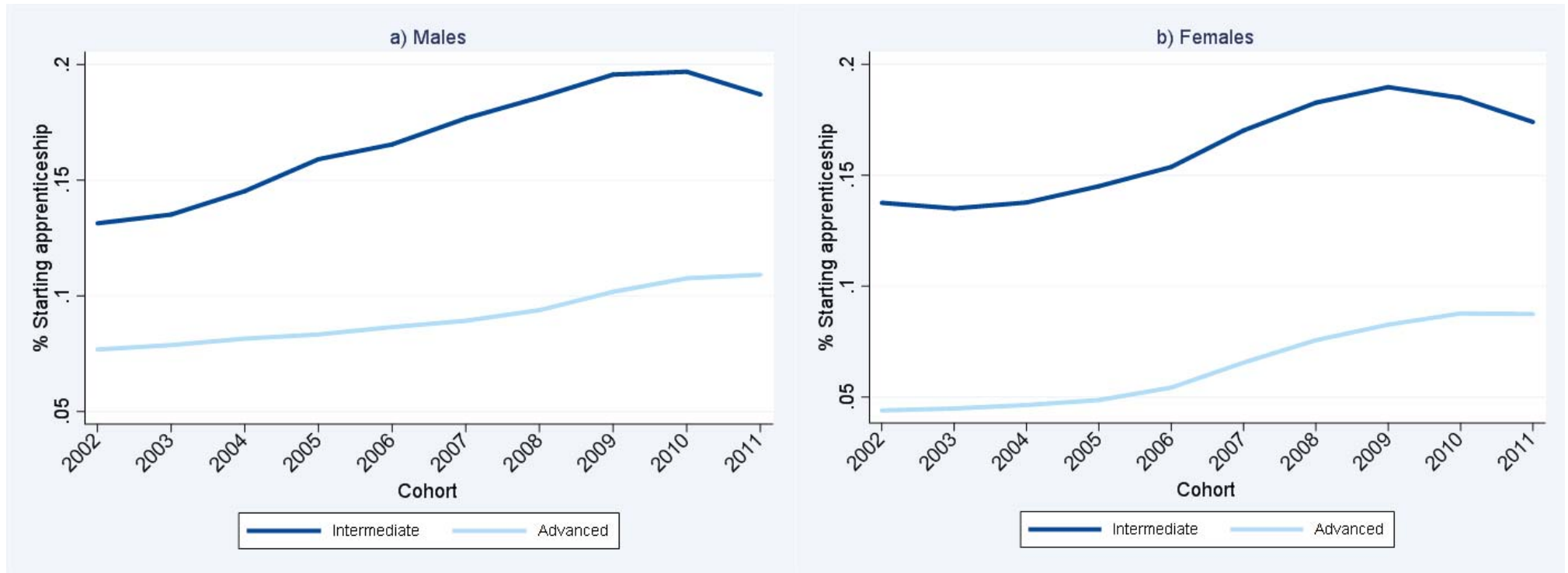
Figure 2: Earnings profiles of people whose highest education attainment is at Level 2
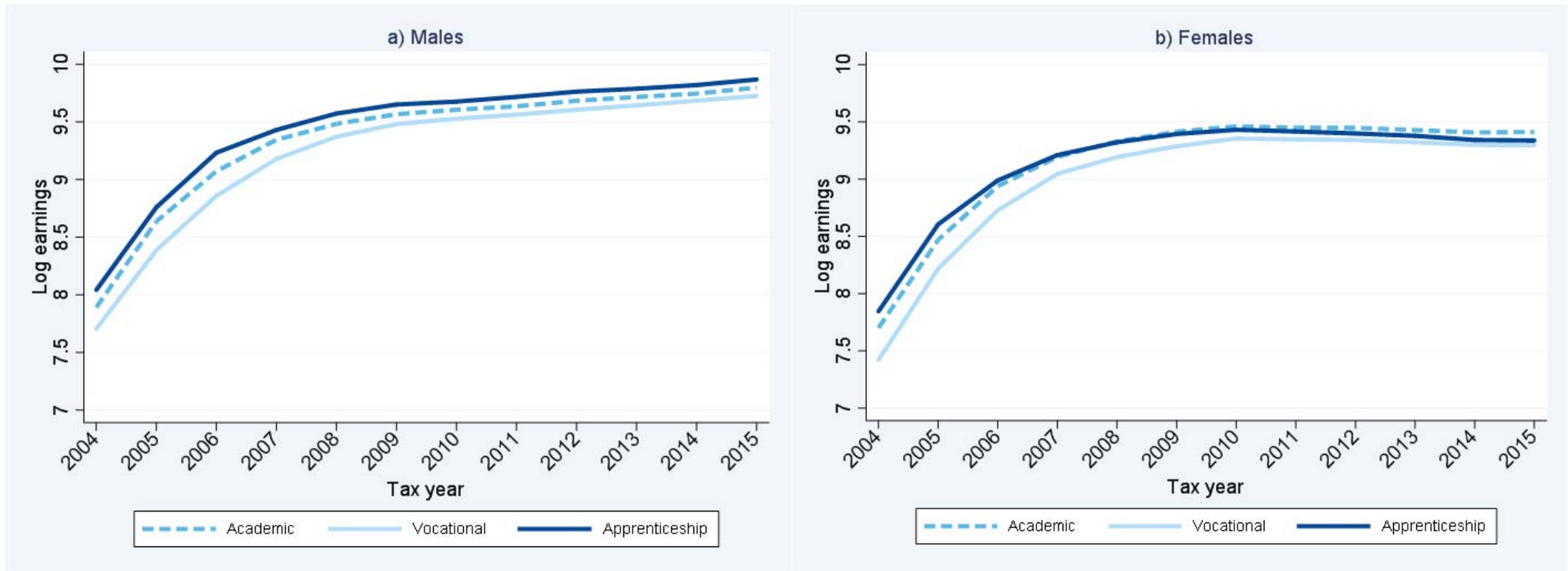
Note: Log Gross Earnings over time for the 2003 cohort. Earnings obtained when the individual is in education are excluded from the graph.

Figure 3: Earnings profiles of people whose highest education attainment is at Level 3
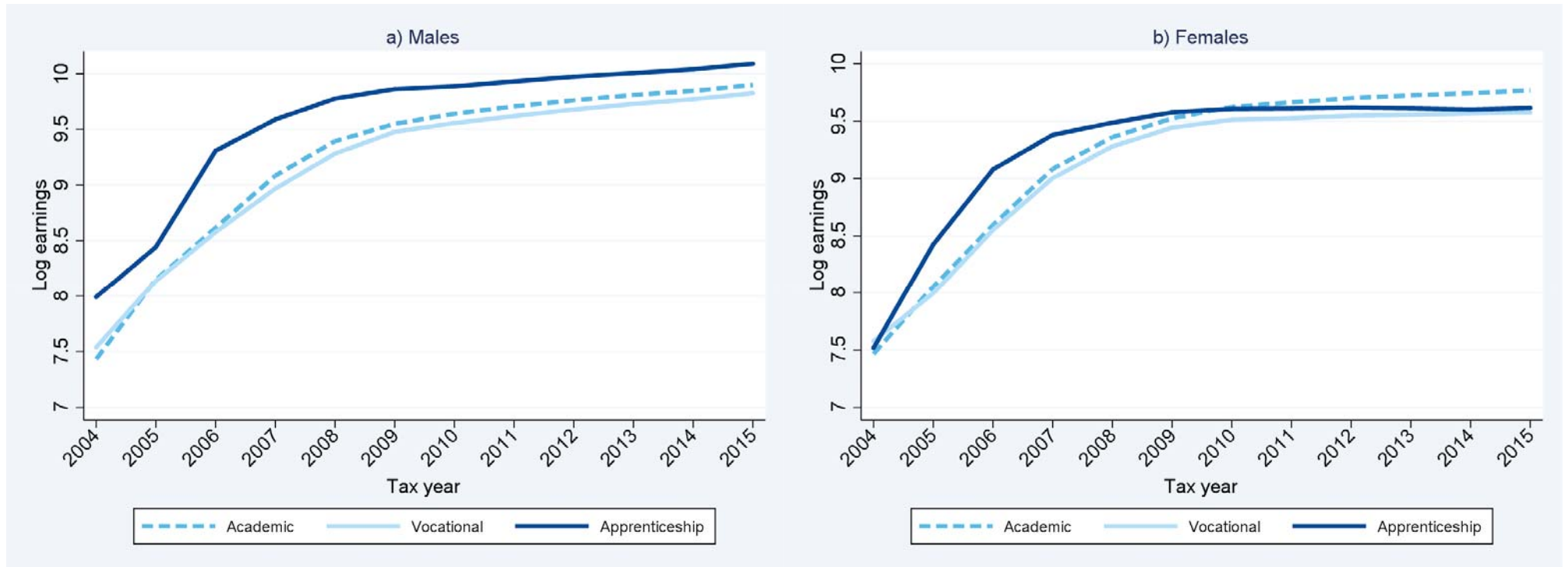
Note: Log Gross Earnings over time for the 2003 cohort. Earnings obtained when the individual is in education are excluded from the graph.

Figure 4: Advanced Apprentices v Degrees for Men
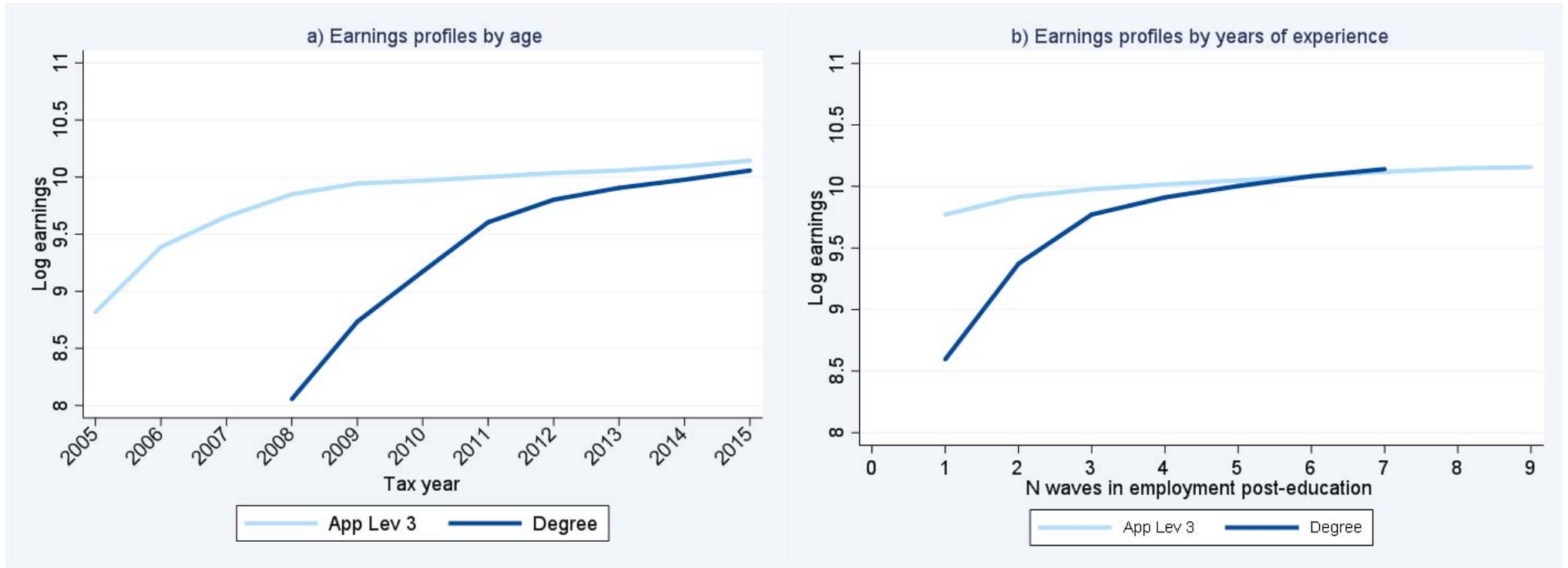
Note: Log Gross Earnings for the 2003 cohort. Earnings obtained when the individual is in education are excluded from the graph.

Table 1: Highest education attainment for the cohort of students taking their GCSEs in 2002/03

Highest level of Education	Men		Women	
	N.	%	N.	%
Below Level 2	61,332	21%	37,977	14%
Level 2				
Academic (GCSEs)	38,011	13%	36,366	13%
Vocational w/o apprenticeship	22,268	8%	19,851	7%
Apprenticeship	24,460	9%	22,969	8%
Level 3				
Academic (A/AS Levels)	24,735	9%	25,460	9%
Vocational w/o apprenticeship	19,866	7%	25,329	9%
Apprenticeship	18,941	7%	12,111	4%
Tertiary				
Level 4 or 5	6,186	2%	8,753	3%
Degree	71,799	25%	89,378	32%
Total	287,598		278,194	

Note: 26% of men and 17% of women with level 4 or 5 as their highest level of education and 2.7% of men and 2.4% of women with a degree also have started an apprenticeship. However, the apprenticeship is usually completed or interrupted before they achieve their highest education.

Table 2: Characteristics of Intermediate and Advanced Apprenticeships (2002/03 cohort)

	Intermediate apprenticeships		Advanced apprenticeships	
	Men	Women	Men	Women
Percentage of the whole cohort	11%	11%	8%	5%
Started Intermediate Apprenticeship	-	-	36%	52%
More than one apprenticeship at the same level (whole cohort)	2%	2%	1%	0%
Progressed to the next Level of apprenticeship (whole cohort)	2%	2%	0%	0%
Of starts:				
Majority aims achieved	42%	43%	51%	47%
All aims achieved	39%	41%	44%	44%
Actual duration (months)	12	11	20	14
Planned duration (months)	17	16	30	20
Highest Qualification achieved				
Less than Level 2	18%	14%	4%	2%
Level 2 Academic	17%	19%	7%	7%
Level 2 Vocational	45%	43%	17%	24%
Level 3 Academic	7%	9%	4%	5%
Level 3 Vocational	8%	9%	59%	49%
Level 4/5	1%	2%	5%	6%
Degree or more	3%	5%	4%	5%
Apprenticeship main sector				
Health, Public Services and Care	5%	22%	1%	35%
Science and Mathematics	0%	0%	0%	0%
Agriculture, Horticulture and Animal Care	3%	2%	1%	2%
Engineering and Manufacturing Technologies	21%	1%	53%	2%
Construction, Planning and the Built Environment	29%	0%	26%	0%
Information and Communication Technology	5%	1%	3%	1%
Retail and Commercial Enterprise	17%	37%	4%	23%
Leisure, Travel and Tourism	3%	2%	1%	6%
Arts, Media and Publishing	0%	0%	1%	0%
Education and Training	0%	0%	0%	0%
Preparation for Life and Work	3%	2%	3%	3%
Business, Administration and Law	13%	32%	6%	28%
Observations	30,807	30,982	22,609	12,477

Table 3: Detailed sector composition of Intermediate and Advanced apprenticeships

Panel A: 10 Most Popular Sectors of Apprenticeships for men

	Intermediate apprenticeships				Advanced apprenticeships		
	N.	%	Average earnings		N.	%	Average earnings
Building and Construction	4806	24%	19,562	Engineering	5767	32%	29,265
Administration	2779	14%	19,095	Building and Construction	4081	23%	24,044
Engineering	1841	9%	23,378	Transportation Operations and Maintenance	3942	22%	23,426
Transportation Operations and Maintenance	1771	9%	19,182	Administration	691	4%	22,072
Hospitality and Catering	1143	6%	17,573	ICT Practitioners	562	3%	27,134
Retailing and Wholesaling	1099	5%	17,580	Foundations for Learning and Life	539	3%	25,627
Warehousing and Distribution	908	4%	20,859	Accounting and Finance	494	3%	26,090
Health and Social care	770	4%	17,862	Hospitality and Catering	472	3%	20,025
Sport, Leisure and Recreation	752	4%	19,262	Manufacturing Technologies	289	2%	28,437
ICT for Users	723	4%	19,679	Sport, Leisure and Recreation	254	1%	21,064

Panel B: 10 Most Popular Sectors of Apprenticeships for women

	Intermediate apprenticeships				Advanced apprenticeships		
	N.	%	Average earnings		N.	%	Average earnings
Administration	6806	32%	14,438	Child Development and Well Being	2432	24%	12,038
Service Enterprises (e.g. Hairdressing)	3563	17%	11,218	Administration	2239	22%	16,514
Health and Social care	2118	10%	12,211	Service Enterprises (e.g. Hairdressing)	1282	13%	12,045
Child Development and Well Being	2079	10%	10,715	Health and Social care	700	7%	15,161
Retail and Wholesaling	2079	10%	12,554	Accounting and Finance	700	7%	21,052
Hospitality and Catering	1249	6%	12,446	Travel and Tourism	493	5%	14,849
Foundations for Learning and Life	495	2%	12,836	Hospitality and Catering	489	5%	14,852
Animal Care and Veterinary Services	418	2%	13,287	Nursing and Vocations Allied to Medicine	385	4%	13,237
Sport, Leisure and Recreation	394	2%	14,585	Foundations for Learning and Life	291	3%	14,602
Business Management	351	2%	15,093	Retail and Wholesaling	237	2%	15,349

Table 4: Summary statistics for men starting an intermediate or advanced apprenticeship

	Cohort average	Intermediate	Advanced	Top 10% apprenticeship earners
English as first language	91%	97%	98%	98%
White	80%	89%	90%	90%
Eligible for FSM	14%	12%	7%	6%
10% least deprived areas[1]	11%	9%	11%	11%
10% most deprived areas[1]	10%	9%	6%	10%
Originally from London	14%	7%	7%	14%
KS2 English grade	54	50	53	55
KS2 Maths grade	59	54	60	63
5 GCSEs graded A*-C	46%	30%	49%	55%
Very good secondary school[2]	28%	25%	27%	27%
Observations	287,598	38,856	22,609	4,356

Notes: 1. This ranking is based on the Income Deprivation Affecting Children Index which measures proportion of children under 16 in a local area who live in low income households. 2. A Very good secondary schools is defined as being graded as excellent, outstanding or really good by OFSTED (2003).

Table 5: Summary statistics for women starting an intermediate or advanced apprenticeship

	Cohort average	Intermediate	Advanced	Top 10% apprenticeship earners
English as first language	91%	96%	97%	97%
White	80%	88%	89%	87%
Eligible for FSM	14%	14%	11%	9%
10% least deprived areas[1]	10%	7%	8%	10%
10% most deprived areas[1]	10%	11%	8%	10%
Originally from London	14%	8%	7%	16%
KS2 English grade	60	56	58	62
KS2 Maths grade	57	51	55	61
5 GCSEs graded A*-C	57%	37%	49%	63%
Very good secondary school[2]	31%	25%	27%	29%
Observations	278,194	37,565	12,477	3,424

Notes: 1. This ranking is based on the Income Deprivation Affecting Children Index which measures proportion of children under 16 in a local area who live in low income households. 2. A Very good secondary schools is defined as being graded as excellent, outstanding or really good by OFSTED (2003).

Table 6: Summary statistic by highest level and type of education for men

	Level 2			Level 3			Tertiary		Whole Cohort
	Academic (GCSEs)	Vocational	With apprenticeship	Academic (A-Levels)	Vocational	With apprenticeship	Level 4/5	Bachelor's degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
English as first language	91%	92%	97%	90%	90%	98%	94%	86%	91%
White English	79%	81%	89%	79%	78%	90%	84%	74%	80%
Eligible for FSM	15%	19%	12%	8%	12%	6%	7%	7%	14%
10% least deprived areas[1]	8%	7%	8%	14%	10%	12%	13%	17%	11%
10% most deprived areas[1]	11%	13%	9%	6%	9%	5%	6%	5%	10%
Originally from London	17%	12%	8%	18%	15%	8%	10%	18%	14%
KS2 English grade	53	47	50	61	54	54	57	63	54
KS2 Maths grade	57	50	54	70	58	61	64	72	59
5 GCSEs graded A*-C	33%	15%	25%	87%	52%	56%	72%	88%	46%
Very good secondary school[2]	26%	21%	25%	33%	27%	28%	29%	37%	28%
Years of post-compulsory education	0	3	3	2	3	4	6	6	3
Labour markets characteristics									
Employed for at least one day (2015)	89%	88%	90%	90%	91%	89%	90%	94%	89%
Self-employed	3%	3%	4%	1%	2%	4%	2%	2%	2%
Number of worked days	289	283	290	303	302	299	308	314	293
Yearly earnings in 2015	19709	17862	20467	22464	20755	25558	25430	26591	21515
Years of experience[3]	8	7	7	8	8	7	6	6	7
Observations	38,011	22,268	24,460	24,735	19,866	18,941	6,186	59,516	287,598

Notes: 1. This ranking is based on the Income Deprivation Affecting Children Index which measures proportion of children under 16 in a local area who live in low income households. 2. A Very good secondary schools is defined as being graded as excellent, outstanding or really good by OFSTED.

Table 7: Summary statistic by highest level and type of education for women

	Level 2			Level 3			Tertiary		Whole Cohort
	Academic (GCSEs)	Vocational	With apprenticeship	Academic (A-Levels)	Vocational	With apprenticeship	Level 4/5	Bachelor's degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
English as first language	91%	93%	96%	90%	93%	97%	93%	86%	91%
White English	80%	83%	88%	79%	83%	89%	84%	74%	80%
Eligible for FSM	18%	20%	15%	9%	12%	9%	9%	7%	14%
10% least deprived areas[1]	7%	6%	6%	13%	9%	9%	11%	16%	10%
10% most deprived areas[1]	13%	14%	11%	7%	8%	7%	7%	6%	10%
Originally from London	16%	11%	9%	17%	13%	7%	10%	18%	14%
KS2 English grade	57	52	55	65	58	60	61	67	60
KS2 Maths grade	53	46	50	64	54	57	59	68	57
5 GCSEs graded A*-C	37%	21%	28%	88%	57%	63%	74%	91%	57%
Very good secondary school[2]	28%	23%	25%	35%	29%	28%	30%	40%	31%
Years of post-compulsory education	0	3	2	2	3	3	7	6	4
Labour markets characteristics									
Employed for at least one day (2015)	88%	87%	90%	90%	90%	90%	89%	93%	89%
Self-employed	1%	1%	1%	1%	1%	1%	1%	1%	1%
Number of worked days	284	282	289	301	300	302	304	314	297
Yearly earnings in 2015	13621	12119	12538	18500	15113	15586	20401	22809	17579
Years of experience[3]	8	7	7	8	8	7	5	6	7
Observations	36,366	19,851	22969	25,460	25,329	12,111	8,753	70,817	278,194

Notes: 1. This ranking is based on the Income Deprivation Affecting Children Index which measures proportion of children under 16 in a local area who live in low income households. 2. A Very good secondary schools is defined as being graded as excellent, outstanding or really good by OFSTED. 3. Counting years with positive earnings after completion of education

Table 8: Apprenticeship payoffs at age 28 for men and women whose highest qualification is Level 2

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Level 2 vocational	-0.098***	-0.006	0.074***	-0.064***	0.042**	0.107***
	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)	(0.013)
Level 2 with apprenticeship	0.081***	0.112***	0.229***	-0.030**	0.038**	0.145***
	(0.009)	(0.010)	(0.010)	(0.011)	(0.012)	(0.011)
N. years of experience			0.099***			0.115***
			(0.002)			(0.002)
P-value (H1: Vocational ≠ Apprenticeship)	0.000	0.000	0.000	0.007	0.749	0.002
N	55106	55106	55106	45632	45632	45632
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is GCSEs and no apprenticeship.

Table 9: Apprenticeship payoffs at age 28 by apprenticeship type (highest education Level 2)

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Level 2 vocational	-0.098***	-0.007	0.074***	-0.064***	0.042**	0.107***
	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)	(0.013)
Level 2 with Intermediate apprenticeship	0.055***	0.097***	0.195***	-0.043***	0.027*	0.119***
	(0.010)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
Level 2 with Advanced apprenticeship	0.171***	0.163***	0.345***	0.029	0.087***	0.268***
	(0.015)	(0.015)	(0.016)	(0.019)	(0.021)	(0.021)
N. years of experience			0.100***			0.116***
			(0.002)			(0.002)
P-value (H1: Intermediate ≠ Advanced)	0.000	0.000	0.000	0.000	0.005	0.000
N	55106	55106	55106	45632	45632	45632
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is GCSEs and no apprenticeship.

Table 10: Apprenticeship payoffs at age 28 based on the apprenticeship level

	Men				Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Level 2 with Intermediate apprenticeship	0.168***	0.123***	0.151***	0.131***	0.041**	0.024	0.055***	0.045**
	(0.012)	(0.014)	(0.013)	(0.014)	(0.014)	(0.016)	(0.015)	(0.016)
Level 2 with Advanced apprenticeship	0.293***	0.198***	0.328***	0.293***	0.093***	0.061*	0.191***	0.196***
	(0.017)	(0.019)	(0.019)	(0.020)	(0.022)	(0.025)	(0.025)	(0.025)
P-value (H1: Intermediate ≠ Advanced)	0.000	0.000	0.000	0.000	0.016	0.138	0.000	0.000
N	26925	26925	26925	26925	22801	22801	22801	22801
Controls:								
Demographic characteristics		✓	✓	✓		✓	✓	✓
Key Stage 4 results		✓	✓	✓		✓	✓	✓
Key Stage 2 results		✓	✓	✓		✓	✓	✓
Secondary Schools fixed effects		✓	✓	✓		✓	✓	✓
Years of experience			✓	✓			✓	✓
Sector of highest vocational education				✓				✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is vocational level 2 and no apprenticeship.

Table 11: Apprenticeship payoffs at age 28 for men and women whose highest qualification is Level 3

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Level 3 vocational	-0.094***	-0.018	0.023*	-0.194***	-0.075***	-0.046***
	(0.010)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)
Level 3 with apprenticeship	0.191***	0.242***	0.368***	-0.140***	-0.023	0.092***
	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.012)
N. years of experience			0.103***			0.096***
			(0.002)			(0.003)
P-value (H1: Vocational ≠ Apprenticeship)	0.000	0.000	0.000	0.000	0.000	0.000
N	47184	47184	47184	43145	43145	43145
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is A-Levels and no apprenticeship.

Table 12: Apprenticeship payoffs at age 28 by apprenticeship type (highest education Level 3)

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Level 3 vocational	-0.094***	-0.014	0.027*	-0.194***	-0.074***	-0.045***
	(0.010)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)
Level 3 with Intermediate apprenticeship	0.038*	0.083***	0.189***	-0.141***	-0.041*	0.064***
	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)
Level 3 with Advanced apprenticeship	0.242***	0.302***	0.437***	-0.139***	-0.007	0.116***
	(0.010)	(0.011)	(0.011)	(0.013)	(0.014)	(0.014)
N. years of experience			0.104***			0.096***
			(0.002)			(0.003)
P-value (H1: Intermediate ≠ Advanced)	0.000	0.000	0.000	0.895	0.056	0.003
N	47184	47184	47184	43145	43145	43145
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001
Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is GCSEs and no apprenticeship.

Table 13: Apprenticeship payoffs at age 28 based on the apprenticeship level

	Men				Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Level 3 with Intermediate apprenticeship	0.144***	0.113***	0.176***	0.119***	0.044**	0.026	0.101***	0.046*
	(0.017)	(0.019)	(0.019)	(0.019)	(0.016)	(0.018)	(0.017)	(0.018)
Level 3 with Advanced apprenticeship	0.339***	0.321***	0.408***	0.245***	0.058***	0.079***	0.168***	0.097***
	(0.010)	(0.011)	(0.012)	(0.015)	(0.014)	(0.015)	(0.016)	(0.018)
P-value (H1: Intermediate ≠ Advanced)	0.000	0.000	0.000	0.000	0.442	0.009	0.001	0.013
N	27159	27159	27159	27159	24702	24702	24702	24702
Controls:								
Demographic characteristics		✓	✓	✓		✓	✓	✓
Key Stage 4 results		✓	✓	✓		✓	✓	✓
Key Stage 2 results		✓	✓	✓		✓	✓	✓
Secondary Schools fixed effects		✓	✓	✓		✓	✓	✓
Years of experience			✓	✓			✓	✓
Sector of highest vocational education				✓				✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001
Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is vocational level 3 and no apprenticeship.

Table 14: Men apprenticeship payoffs by most popular apprenticeship sectors

	Level 2			Level 3		
	(1)	(2)	(3)	(4)	(5)	(6)
Vocational with no apprenticeship	-0.098***	-0.007	0.074***	-0.094***	-0.016	0.024*
	(0.010)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)
Apprenticeship in Engineering	0.241***	0.230***	0.376***	0.358***	0.393***	0.550***
	(0.019)	(0.021)	(0.020)	(0.014)	(0.015)	(0.015)
Apprenticeship in Construction	0.030	0.070***	0.224***	0.118***	0.191***	0.340***
	(0.017)	(0.018)	(0.018)	(0.016)	(0.017)	(0.017)
Apprenticeship in Administration	0.070***	0.083***	0.163***	0.067**	0.113***	0.206***
	(0.020)	(0.022)	(0.021)	(0.023)	(0.024)	(0.024)
Apprenticeship in Transportation	0.099***	0.135***	0.260***	0.205***	0.289***	0.373***
	(0.018)	(0.019)	(0.020)	(0.014)	(0.016)	(0.016)
Apprenticeship in another sector	0.059***	0.099***	0.192***	0.113***	0.150***	0.268***
	(0.012)	(0.013)	(0.013)	(0.015)	(0.015)	(0.015)
N. years of experience			0.099***			0.105***
			(0.002)			(0.002)
N	55106	55106	55106	47184	47184	47184
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001
Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men whose highest education is respectively GCSEs and A-Levels with no apprenticeship.

Table 15: Women apprenticeship payoffs by most popular apprenticeship sectors

	Level 2			Level 3		
	(1)	(2)	(3)	(4)	(5)	(6)
Vocational with no apprenticeship	-0.064***	0.040**	0.106***	-0.194***	-0.082***	-0.052***
	(0.012)	(0.013)	(0.013)	(0.010)	(0.011)	(0.011)
Apprenticeship in Childcare	-0.175***	-0.067**	0.082**	-0.385***	-0.212***	-0.087***
	(0.024)	(0.026)	(0.025)	(0.023)	(0.025)	(0.025)
Apprenticeship in Healthcare	-0.077**	0.066*	0.189***	-0.276***	-0.113*	0.014
	(0.025)	(0.027)	(0.026)	(0.040)	(0.044)	(0.043)
Apprenticeship in Administration	0.095***	0.133***	0.197***	-0.014	0.082***	0.174***
	(0.016)	(0.018)	(0.017)	(0.016)	(0.017)	(0.017)
Apprenticeship in Service enterprises	-0.175***	-0.109***	0.022	-0.351***	-0.216***	-0.068*
	(0.020)	(0.022)	(0.021)	(0.028)	(0.030)	(0.029)
Apprenticeship in another sector	0.030	0.081***	0.189***	-0.059***	0.025	0.142***
	(0.016)	(0.017)	(0.016)	(0.016)	(0.017)	(0.017)
N. years of experience			0.115***			0.096***
			(0.002)			(0.003)
N	45632	45632	45632	43145	43145	43145
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is women whose highest education is respectively GCSEs and A-Levels with no apprenticeship.

Table 16: Payoffs of Advanced apprenticeship v. Degree for men

	Obtained any Degree			Obtained a degree in Engineering		
	(1)	(2)	(3)	(4)	(5)	(6)
Achieved a Level 3 apprenticeship	0.116***	0.331***	0.113***	-0.094***	0.075**	-0.087**
	(0.009)	(0.012)	(0.012)	(0.015)	(0.026)	(0.027)
N. years of experience			0.127***			0.089***
			(0.003)			(0.006)
N	52104	52104	52104	10637	10637	10637
Level 3 apprenticeship in Engineering	0.285***	0.456***	0.266***	0.075***	0.214***	0.061
	(0.018)	(0.020)	(0.020)	(0.021)	(0.034)	(0.034)
Level 3 apprenticeship in Construction	0.041*	0.266***	0.083***	-0.169***	-0.004	-0.150***
	(0.018)	(0.020)	(0.020)	(0.021)	(0.033)	(0.033)
Level 3 apprenticeship in Administration	0.023	0.220***	-0.012	-0.188***	-0.036	-0.208***
	(0.034)	(0.037)	(0.038)	(0.036)	(0.053)	(0.053)
Level 3 apprenticeship in Construction	0.082***	0.348***	0.062***	-0.128***	0.062	-0.150***
	(0.014)	(0.017)	(0.018)	(0.018)	(0.032)	(0.034)
Level 3 apprenticeship in another sector	0.097***	0.273***	0.068**	-0.113***	0.035	-0.129***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.033)	(0.034)
N. years of experience			0.128***			0.091***
			(0.003)			(0.006)
N	52104	52104	52104	10637	10637	10637
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men who have obtained a degree.

Appendix

Table A1: Characteristics of Intermediate and Advanced Apprenticeships (2010/11 cohort)

	Intermediate apprenticeships		Advanced apprenticeships	
	Men	Women	Men	Women
Percentage of the whole cohort	14%	13%	11%	9%
Started Intermediate Apprenticeship	-	-	43%	57%
More than one apprenticeship at the same level (whole cohort)	3%	3%	1%	1%
Progressed to the next Level of apprenticeship (whole cohort)	4%	4%	0%	0%
Of starts:				
Planned duration (months)	15.51	13.8	23.8	16.3
Highest Qualification achieved				
Less than Level 2	3%	2%	0%	0%
Level 2 Academic	14%	13%	3%	3%
Level 2 Vocational	45%	36%	16%	17%
Level 3 Academic	9%	14%	6%	8%
Level 3 Vocational	28%	34%	69%	70%
Level 4/5	1%	1%	5%	2%
Degree or more	1%	1%	1%	1%
Apprenticeship main sector				
Health, Public Services and Care	6%	22%	2%	37%
Science and Mathematics	0%	0%	0%	0%
Agriculture, Horticulture and Animal Care	4%	2%	1%	2%
Engineering and Manufacturing Technologies	19%	1%	36%	2%
Construction, Planning and the Built Environment	19%	0%	18%	0%
Information and Communication Technology	4%	1%	14%	2%
Retail and Commercial Enterprise	20%	30%	5%	19%
Leisure, Travel and Tourism	6%	2%	8%	3%
Arts, Media and Publishing	0%	0%	1%	1%
Education and Training	0%	1%	1%	3%
Preparation for Life and Work	1%	1%	1%	1%
Business, Administration and Law	21%	39%	14%	30%
Observations	40,395	34,534	31,467	24,259

Table A2: Detailed sector composition of Intermediate and Advanced apprenticeships (2011 cohort)

Panel A: 10 Most Popular Sectors of Apprenticeships for Men

Intermediate apprenticeships			*Advanced apprenticeships*		
	N.	%		N.	%
Building and Construction	7538	19%	Engineering	8238	26%
Administration	7326	18%	Building and Construction	5639	18%
Transportation Operations and Maintenance	3769	9%	ICT Practitioners	3924	12%
Hospitality and Catering	3737	9%	Transportation Operations and Maintenance	2854	9%
Engineering	2878	7%	Administration	2450	8%
Sport, Leisure and Recreation	2420	6%	Sport, Leisure and Recreation	2384	8%
Warehousing and Distribution	1677	4%	Accounting and Finance	1201	4%
Retailing and Wholesaling	1494	4%	Hospitality and Catering	826	3%
Public Services	1345	3%	Business Management	396	1%
Service Enterprises	1246	3%	Health and Social Care	351	1%

Panel B: 10 Most Popular Sectors of Apprenticeships for Women

Intermediate apprenticeships			*Advanced apprenticeships*		
	N.	%		N.	%
Administration	12280	36%	Administration	5351	22%
Service Enterprises (e.g. Hairdressing)	4733	14%	Child Development and Well Being	5084	21%
Health and Social care	4624	13%	Service Enterprises (e.g. Hairdressing)	3517	14%
Hospitality and Catering	3572	10%	Health and Social care	2883	12%
Child Development and Well Being	2941	9%	Accounting and Finance	1010	4%
Retail and Wholesaling	1930	6%	Hospitality and Catering	759	3%
Sport, Leisure and Recreation	774	2%	Direct Learning Support	582	2%
Business Management	645	2%	Sport, Leisure and Recreation	577	2%
Animal Care and Veterinary Services	512	1%	Business Management	494	2%
Marketing and Sales	368	1%	Nursing and Subjects and Vocations Allied to Medicine	469	2%

Table A3: Marginal effects on the probability of starting an intermediate or advanced apprenticeship, by gender and by cohort

This table shows marginal effects from a Probit model where the dependent variable is whether an individual starts an apprenticeship (intermediate or advanced) relative to the rest of the cohort. For example, the coefficient on 'English as a first language' is 0.068. This means the men who speak English as a first language are more likely to start an intermediate apprenticeship by 6.8 percentage points than others. This is controlling for other variables in the regression. The main point of this table is to see that the probability of starting an apprenticeship conditional on these characteristics have not changed very much for the cohort that finished their compulsory education in 2003 or 2011. Thus, while the number of apprenticeships did increase (as shown in Figure 1), the profile of those undertaking an apprenticeship did not change very much.

	Men				Women			
	Intermediate		Advanced		Intermediate		Advanced	
	2003	2011	2003	2011	2003	2011	2003	2011
English as first language	0.068***	0.068***	0.054***	0.043***	0.052***	0.055***	0.018***	0.023***
	(0.018)	(0.015)	(0.025)	(0.018)	(0.018)	(0.016)	(0.026)	(0.019)
White	0.037***	0.068***	0.027***	0.041***	0.032***	0.060***	0.015***	0.035***
	(0.011)	(0.011)	(0.012)	(0.013)	(0.011)	(0.012)	(0.015)	(0.014)
Eligible for FSM	-0.023***	-0.021***	-0.036***	-0.038***	-0.011***	-0.008***	-0.011***	-0.015***
	(0.010)	(0.009)	(0.014)	(0.012)	(0.010)	(0.009)	(0.015)	(0.012)
10% least deprived areas	-0.020***	-0.028***	-0.008***	-0.001	-0.033***	-0.032***	-0.011***	-0.009***
	(0.011)	(0.010)	(0.012)	(0.011)	(0.012)	(0.011)	(0.015)	(0.012)
10% most deprived areas	-0.008***	0.014***	-0.020***	-0.013***	0.002	0.007*	-0.004**	0.001
	(0.012)	(0.011)	(0.015)	(0.014)	(0.011)	(0.011)	(0.016)	(0.014)
Originally from London	-0.056***	-0.056***	-0.028***	-0.017***	-0.050***	-0.032***	-0.019***	-0.013***
	(0.011)	(0.010)	(0.013)	(0.011)	(0.011)	(0.010)	(0.016)	(0.012)
KS2 English grade	-0.001***	-0.001***	-0.001***	-0.001***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KS2 Maths grade	-0.000***	-0.000	0.001***	0.001***	-0.001***	-0.000***	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
5 GCSEs graded A*-C	-0.088***	-0.120***	-0.001	0.010***	-0.099***	-0.127***	-0.014***	-0.028***
	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)	(0.011)	(0.010)
Very good secondary school	-0.005**	-0.015***	-0.003*	-0.009***	-0.012***	-0.017***	-0.005***	-0.008***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.010)	(0.008)
Pr(Y=1), mean X	0.13	0.18	0.08	0.11	0.13	0.17	0.04	0.09
N	249603	245076	249603	245076	249202	243453	249202	243453

Notes: * p<0.05, **p<0.01, ***p<0.001; 1. This ranking is based on the Income Deprivation Affecting Children Index which measures proportion of children under 16 in a local area who live in low income households. 2. A Very good secondary schools is defined as being graded as excellent, outstanding or really good by OFSTED (2003).

Table A4.1: Apprenticeship payoffs at age 28 for men and women whose highest qualification is Level 2 by completion status

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Level 2 vocational	-0.098***	-0.005	0.075***	-0.064***	0.043**	0.107***
	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)	(0.013)
Level 2 with non-completed apprenticeship	0.052***	0.077***	0.203***	-0.060***	0.004	0.118***
	(0.011)	(0.012)	(0.012)	(0.013)	(0.014)	(0.014)
Level 2 with completed apprenticeship	0.124***	0.164***	0.266***	0.008	0.081***	0.179***
	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)
N. years of experience			0.099***			0.115***
			(0.002)			(0.002)
P-value (H1: completed ≠ non-completed)	0.000	0.000	0.000	0.000	0.000	0.000
N	55106	55106	55106	45632	45632	45632
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is GCSEs and no apprenticeship.

Table A4.2: Apprenticeship payoffs at age 28 for men and women whose highest qualification is Level 3 by completion status

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Level 3 vocational	-0.094***	-0.017	0.023*	-0.194***	-0.075***	-0.046***
	(0.010)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)
Level 3 with non-completed apprenticeship	0.157***	0.204***	0.350***	-0.159***	-0.045**	0.085***
	(0.012)	(0.013)	(0.014)	(0.016)	(0.017)	(0.017)
Level 3 with completed apprenticeship	0.212***	0.267***	0.380***	-0.129***	-0.009	0.096***
	(0.010)	(0.011)	(0.012)	(0.013)	(0.014)	(0.014)
N. years of experience			0.103***			0.096***
			(0.002)			(0.003)
P-value (H1: completed ≠ non-completed)	0.000	0.000	0.000	0.087	0.056	0.540
N	47184	47184	47184	43145	43145	43145
Controls:						
Demographic characteristics		✓	✓		✓	✓
Key Stage 4 results		✓	✓		✓	✓
Key Stage 2 results		✓	✓		✓	✓
Secondary Schools fixed effects		✓	✓		✓	✓
Years of experience			✓			✓

Standard errors in parentheses: * p<0.05, ** p< 0.01, *** p< 0.001

Notes: Yearly gross earnings in 2015 prices. Excluded top and bottom 1% of yearly earnings distribution. Regressions include the following controls: demographic characteristics (White British, English as first language, FSM eligibility, IDACI score), prior attainment in Key Stage 4, prior attainment in Key stage 2 (English and Maths) and secondary schools' fixed effects. The omitted category is men and women whose highest education is A-Levels and no apprenticeship.

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