CENTRE for ECONOMIC PERFORMANCE

CEP Discussion Paper No 621

March 2004

The Impact of Vocational Qualifications on the Labour Market Outcomes of Low-Achieving School-Leavers

Steven McIntosh

The Queen's Anniversary Prizes for Higher and Further Education 2002

LSE The London School of Economics and Political Science

E·S·R·C Economic & Social Research Council

Abstract
This paper creates a pseudo cohort of individuals who left school in the mid-1990s, using Labour Force Survey. The extent of low achievement at school amongst this group is documented, and then the impact of such low achievement on labour force status is estimated. The main focus of the paper is then to investigate to what extent unqualified school leavers can improve their labour market status through the acquisition of vocational qualifications, and how many follow this option. The results show that vocational qualifications at all levels can improve the employment chances of unqualified school leavers, even once we use panel data to control for unobserved individual heterogeneity and to ensure that the qualification is acquired before employment is attained. There are also small effects on occupational mobility, but little impact on wages. However, few unqualified school leavers seem to be following this vocational route to qualification achievement.

JEL classification: J24 I28.
Keywords: education, vocational qualifications, employment, longitudinal data.

This paper was produced as part of the *Skills for All* programme, which is funded by the Esmée Fairbairn Foundation.

The Centre for Economic Performance is financed by the Economic and Social Research Council.

Acknowledgements
The Labour Force Survey data used in this paper were made available by the ESRC Data Archive at the University of Essex.

Steven McIntosh is a Research Officer in the Centre for Economic Performance, London School of Economics, as part of the Education and Skills group.
Email: s.mcintosh@lse.ac.uk

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

ISBN 0 7530 1723 7

1. Introduction

What becomes of those young people who show little aptitude or enthusiasm at school, and fail to obtain any qualifications there? Given the importance attached to formal qualifications we might expect that their lack of success in school will significantly affect them in later life. If so, what is the size of this effect, and can it be reduced by following a certain route after formal schooling? The route we will focus on here is acquiring vocational qualifications. Finally, if such a route exists, then how many of the disaffected young people take-up such opportunities? This paper sets out the answers to these questions.

The answers are clearly important. They will reveal the costs of under-achievement at school for the individuals involved, as well as the costs to society in terms of lower productivity (as measured by wage levels of those working and the unemployment and inactivity of those who are not). Such information can be presented to teenagers in schools, although it is of some doubt whether the information will be used to make rational decisions about the costs of effort now against the future costs of having possible lower status jobs or no job at all. Perhaps more use of the results might be made by policy-makers, who can see the costs to society of allowing demotivated young people to leave school without qualifications, and can therefore perform a cost-benefit analysis of possible interventions to prevent pupils leaving school with little or nothing to show for their time there.

Similarly, the analysis of possible routes that the unqualified school leavers can take, in an attempt to improve their labour market prospects, will provide valuable information to such people on the value of these routes. This should again help decision-making on the choice of future paths, at a time when such individuals will hopefully be making rational choices, particularly if sobering periods of unemployment and inactivity have been experienced. Of course, any higher wages or employment probabilities for those who have followed these routes will again provide information on the value of these routes to society, and so indicate the level of funding that can justifiably be directed towards them.

The paper proceeds in the next section with a description of the data set used and of the analysis itself. The results are presented in Section 3, followed by some further tests of the reliability of these results in Section 4. A final section offers a summary and conclusions.

2. Data and Methodology

The ideal data set for the analysis here would be a panel, following individuals over the early part of their working lives. Unfortunately, however, the ideal data set does not exist. Amongst the longitudinal data sets available in the UK, the British Household Panel Survey is not large enough to provide young people in sufficient numbers to obtain robust estimates of outcomes for detailed breakdowns by qualifications, the Youth Cohort Study only surveys young people usually until they are 18 years old, and so mostly misses labour market outcomes of interest, while the birth cohort surveys such as the National Child Development Study and the British Cohort Study are now too old for analysing choices made at age 16. We therefore turn to the Labour Force Survey (LFS), which is large enough to perform the detailed analysis required, has detailed information on qualifications and labour market outcomes, and describes the most recent period in time. The only problem is, it is not a longitudinal data set, and so we create a 'pseudo cohort'.

The LFS is a quarterly survey, questioning a sample of about 120,000 individuals, in around 60,000 British households. The sample sizes of the quarterly data sets for the specific age group that we are interested in are not large enough for the detailed analysis that follows, however, and so the quarterly data sets were merged to form annual data sets. We then use these annual data sets to track changes amongst our pseudo cohort over time.

In the same way that a real cohort of individuals followed in a panel data set would age by one year each year, the pseudo cohort is created by examining all 17 year olds in our data in one year, all 18 year olds in the data set the next year, all 19 year olds the following year, and so on. Although the actual individuals making up the annual samples so created would be different, since the LFS is a nationally representative survey the individuals in our pseudo cohort will be representative of the real cohort of this age in the national population.

In fact, the above methodology led to insufficient sample sizes, and so the pseudo cohort was constructed to cover an age band three years wide, rather than simply a single year. To be precise, the paper considers all of those individuals who were born between September 1st 1976 and August 31st 1979. Given that young people can leave school at the end of the school year that follows them being aged 15 on September the 1st, this means that our cohort were entitled to leave school in the summers of 1993, 1994 or 1995. This age group was deliberately chosen because the youngest of them were enjoying their first year beyond compulsory schooling in 1996, which is the first year in which suitable LFS data for

the analysis conducted here were available[1]. The paper examines outcomes for this cohort at points in time three years apart, to prevent the age bands overlapping in the chosen years. Thus, we use data from 1996, when the chosen cohort were mostly aged 17-19, data from 1999, when they were aged 20-22, and data from 2002, when they were aged 23-25.

One characteristic of the LFS that has not been mentioned so far is that it does in fact have a panel element, with respondents being surveyed for 5 consecutive quarters before dropping out of the survey. Such a longitudinal element is clearly of no use if we want to follow individuals for a number of years from school leaving age until mid-twenties (hence the pseudo cohort methodology developed above), although this panel information will be used at the end of the paper in an attempt to examine causality between employment and qualification acquisition. More immediately, however, if individuals are surveyed in the LFS for five successive quarters, then the annual data sets described above for the pseudo cohort analysis will contain multiple observations on the same individuals. This problem is solved by only using observations when individuals are asked to report their wages, a variable to be used in the analysis in any case. Since wage data is only asked of LFS respondents in their first and final questionnaire (waves 1 and 5, and wave 5 only in 1996) this ensures that no individual can be in our annual data sets of four consecutive quarters twice. The end result is that the following number of respondents with usable data in the specified age cohort are observed in each survey: 3799 in 1996, 6322 in 1999 and 6172 in 2002.

The principal unit of analysis in the paper is the highest level of qualification achieved at school. Six levels of achievement are identified, namely no school qualifications at all, GCSEs at grades D-F, 1-4 GCSEs at grade C or above, 5 or more GCSEs at grade C or above[2], 1 A level and 2 or more A levels[3]. The focus of the analysis is on the first group, who have obtained no qualifications at school. The results for the groups with school qualifications are provided for comparison purposes.

The analysis begins with a description of the levels of achievement in terms of school qualifications. This provides an indication of the scale of any problems caused by low achievement at school. The impact of such low achievement on labour force status is then examined. We next consider whether this impact can be attenuated through the obtaining of

[1] Specifically, 1996 was the first year that the LFS asked about all qualifications held by individuals, rather than just their highest three, which is crucial for the analysis presented here.

[2] GCSEs are public examinations taken at the end of compulsory, lower secondary level, schooling at the age of 16, usually in 9 or 10 different subjects. A pass at grade C or above is taken as a successful outcome, and 5 or more such passes are often needed to progress to further academic study.

[3] A levels are public examinations taken at the end of upper secondary schooling at the age of 18, usually in 3 different subjects. Passes in 2 subjects are usually required for entrance to a university.

post-school qualifications, thus revealing whether low achievement at school leaves a permanent mark, or whether those who obtain qualifications after leaving school catch up with their more successful school contempories, in terms of labour market outcomes such as likelihood of employment and wages received. Finally, we run some robustness checks on the results obtained, in particular using the panel element of the LFS described above to investigate the causality between employment and vocational qualification acquisition.

3. Results

3.1 School qualification attainment

The analysis begins in Table 1 by detailing the school qualifications obtained by our cohort by the year 1996, by which time they have all completed compulsory schooling. The results show that only a minority of the individuals in our cohort have failed to acquire any qualifications at school at all. Nevertheless, it is a significant minority, namely 20% of the males and 15% of the females. In addition, a further 9% of males and 8% of females have only achieved at best GCSE qualifications at grade D or below. Therefore just over a quarter of all boys and just under a quarter of all girls were leaving school in the mid-1990s with no qualifications of any note.

Looking further up the school qualifications hierarchy, large numbers, representing just over half of the cohort, hold GCSE qualifications at grade C or above as their highest attainment, two-thirds of whom have at least 5 such qualifications. The remainder of the cohort are the highest achievers, who have acquired A levels. Of those who reach this standard, the vast majority gain at least 2 A levels.

Of course, our cohort are aged 17-19 in 1996, and so some will not have had the chance to sit A level examinations at this stage. We would therefore expect an increase in the proportion of the cohort holding A levels, once the group have reached the age of 20-22 in 1999. This is indeed what we observe in Table 2. Once all of the group have past the normal completing age of upper secondary education (namely 18), one-third of both men and women have obtained at least 2 A levels, with a further 5% holding just 1. As expected, the new recruits to the A level group have emerged from the set of 5 or more good GCSE holders, whose numbers have fallen significantly since 1996 because of this progression to A level

standard. Few of the individuals holding less than 5 good GCSEs seem to have made this progression though, the numbers in these groups remaining largely unchanged since 1996.

Table 3 displays the proportion of the cohort to have reached each school qualification level by the age of 23-25, in 2002. Although, individuals can of course obtain GCSEs and A levels later in life, only small numbers do so, and so we would expect the school qualification distribution to be very similar for the cohort aged 23-25 in 2002 as it was for them aged 20-22 in 1999. Unfortunately there seems to be a slight slippage into the lower categories, so that 31% of men and 29% of women now report having no or only very low level school qualifications. Of course this is illogical, since people cannot have qualifications taken away from them, and so the proportion with no qualifications should not grow. One answer to this conundrum is to remember that we do not have a true cohort of individuals, and so we are not observing the same individuals at the different points in time. Although the surveyed respondents are representative of the nation's population in this age group, sampling error could explain the apparent rise in the proportion holding no school qualifications, with the unqualified being randomly over-represented in 2002. However, the growth in the numbers with no qualifications is large, and suggests something more than sampling error. In addition, if our group is examined in 2001 rather than 2002, a similar proportion of apparently unqualified school leavers emerges, again suggesting that this is not a random error phenomenon. The most likely explanation is that as people get older, they cease reporting their school level qualifications to surveys such as the LFS, despite being explicitly told by the survey to list *all* of their qualifications. This is perhaps an important finding in itself, given the important uses made of these data and the reliability assumed of them. What it means for the current analysis is that when labour market outcomes for the cohort in 2002 are examined, the apparent low-achievers may have better school qualifications than are attributed to them, thus biasing upwards the estimated labour market outcomes for the truly unqualified school leavers. The picture for this group may therefore actually be worse than that drawn below.

3.2 Labour market status by school qualification attainment

Tables 4 to 6 begin the analysis of the effects of under-achievement at school, for each of the studied points in time respectively. Table 4 begins when the cohort are aged 17-19 in 1996[4]. Firstly, considering males, we can see that fewer than half of those who left school with no qualifications are in employment[5]. It is true that a further 15% are studying, many of whom will probably be re-sitting their failed school examinations. In addition, 9% are also involved in government training schemes. This leaves a third of all young unqualified men not doing anything useful in 1996, although at least most of these are classified as unemployed and so are actively looking for a job[6], rather than dropping out of the labour force altogether and being classified as inactive.

The second row of Table 4 reveals the advantage of even low level qualifications, since there is a large jump in the employment rate of those with at best grade D-F GCSEs, compared to the unqualified group (61% relative to 43%). Of course, we could ask whether it is actually a good thing that young people at the age of 17-19 are working at all, rather than continuing their education, and it is true that this group have a lower proportion still studying or involved in training than the unqualified group. However, they do also have significantly lower proportions doing nothing in the unemployed and inactive groups than the unqualified group, so overall it seems safe to say that even low level qualifications benefit labour force status. We also see a slight increase in economic activity moving from the 'poor GCSE' to the 'fewer than 5 good GCSEs' group. The big change comes, as we might expect, however, amongst those who have really succeeded in their GCSE examinations at age 16. Because of this earlier success, 30% of them are still studying at age 17-19.

We observe similar patterns for women, with the main difference from their male counterparts being a lower employment rate amongst the low-achievers in school, though *not* amongst the successful former pupils. Thus, only one-third of those women who left school with no qualifications are in employment at age 17-19, while almost two-thirds of those who achieve 5 or more good GCSEs are. This higher employment rate for female GCSE high achievers compared to males seems to come at the expense of further study, only 23% of this group of women being still in education in 1996, compared to 30% of men.

[4] The A level group are not included in Table 4, since the majority of the cohort had not yet had a chance to sit them in 1996.
[5] 'Employment' here includes self-employment.
[6] The definition of unemployment used here is the ILO definition, i.e. wants to work, has looked for work in the previous four weeks and is available to begin work within two weeks.

The other key difference between men and women is that women who do not work or study are much more likely to be inactive rather than unemployed, while the reverse is true for men. Thus, 28% of female unqualified school leavers are inactive at age 17-19 in 1996, and so have no attachment to the labour force or education at all. This number drops quickly though amongst women who have acquired school qualifications, falling to just 5% amongst the group with 5 or more good GCSEs.

Table 5 shows how things have changed by 1999 when our cohort have aged 3 years. Again considering men initially, the first thing to note is the increase in employment rates at the lower end of the school achievement spectrum. This is because very few of the group who achieved at best GCSEs at some level, as so in all probability left school at age 16, are still studying between the ages of 20-22. In addition, very few are involved in government training. By this age, therefore, if the low-achievers are not working, they are either unemployed or inactive. Around one-quarter of the group with no or very low qualifications are in this state in 1999, although the composition of the state differs according to whether no qualifications were obtained at all, or whether some GCSEs at grade D or below were obtained. In the former group, the non-working non-students are split evenly between unemployment and inactivity, while in the latter case, unemployment is the much more likely circumstance. Thus 12.6%, or 1 in 8, or all men who leave school with no qualifications have no contact with the labour market at all.

Amongst the group who achieved GCSEs at grade C or above, the employment rate is high at over 80%, with little difference according to whether fewer or greater than 5 such qualifications were acquired. At the top end of the school qualifications hierarchy, the employment rate naturally plummets again for the group with 2 or more A Levels, since many in this group will be studying for a degree when they are aged 20-22. Thus, the table shows that 35% of this group are studying in 1999.

For women, the polarisation between those successful and unsuccessful at school if anything seems to have increased for this cohort between 1996 and 1999. Thus, almost half (48%) of those women who left school with no qualifications are not working or studying when they are aged 20-22, the vast majority of whom are inactive rather than unemployed, and so have no contact with the labour force. Only 43% of this group are working, with small numbers studying or registered unemployed. Moving up the hierarchy, we again observe the value of even low level GCSEs (grades D-F) for women, the employment rate rising to 62% for females with such qualifications, while the inactivity rate drops to 24%. The inactivity rate continues to fall as we move up the school qualifications scale, while the

employment rate rises until the 2+ A levels group is reached, many of whom are studying for degrees, as reflected in the 34% studying rate for this group.

By 2002, our cohort are aged 23-25, and for the vast majority formal education will be completed and they will be settling into their adult lives. Table 6 shows their labour force status at this age, again by level of school qualification. For men, we can again see the value of even low level school qualifications, since the employment rate jumps from 71% for the unqualified school leavers to 88% for those who at least acquired some GCSEs at grades D-F while in school. Amongst the former, unqualified group, then, almost a quarter are still without work as they reach their mid-twenties, over half of whom are classified as inactive and so do not even have any attachment to the labour force. For all the other groups, who acquired some qualifications at school, the inactivity rate is insignificantly small, while employment rates range from 83% to 91%. Amongst the A level groups, close to 10% still remain in education, even at this age.

For women, the unqualified school leavers seem to be drifting further out of the labour market as they progress into their mid-twenties. There are now over 40% of this group classified as inactive, with a further 5% officially unemployed. For half of all women who fail to achieve at school, therefore, their lives will not involve work even in their early to mid-twenties. Inactivity rates fall as we move up the school qualifications hierarchy, although still remain substantial: 30% for those with at best GCSEs at grades D-F, 22% for those with no more than 4 good GCSEs, and 14% for those with 5 or more good GCSEs but who did not progress beyond this level. It is not until we reach the women who obtained A levels at school that we witness single-figure inactivity rates.

3.3 The acquisition of post-school qualifications

The previous section revealed that significant amounts of studying take place after the end of compulsory schooling for our cohort. This section describes the post-school qualifications that are actually obtained. From this point onwards in the paper, the school achievement categories are grouped, because of falling cell sizes. The above analysis made clear that the group with no school qualifications at all are very different even from those with low level school qualifications. They therefore remain as a category on their own. The next category, termed ‘low grade lower secondary qualifications,’ contains those who obtain GCSE qualifications, but fail to reach the target level of 5+ GCSEs at grade C or above. Those who do achieve this level form the next category, termed ‘high grade lower secondary

qualifications.' Finally, a composite group comprising all those who acquire any A level qualifications at the end of upper secondary schooling is formed.

Table 7 shows the proportions of each school qualification achievement group who have reached various post-compulsory qualification levels by the age of 23-25 in 2002. We differentiate between post-school qualifications at levels 1, 2, 3 and above 3. These levels compare broadly to the International Standard Classification of Education (ISCED) categories. The post-school qualifications at levels 1 to 3 are all vocational qualifications, since academic qualifications obtained after school are necessarily above the school qualification of A levels, which is a level 3 qualification. The final category of above level 3 post-school qualifications therefore contains both academic and vocational qualifications[7]. The results show that very few of those who leave school with no qualifications manage to acquire meaningful post-compulsory qualifications. Of the men who fall into this category of lowest school achievers, for example, 44% fail to acquire any qualifications at all after leaving school, 31% acquire at best a level 1 qualification, and 11% acquire at best a level 2 qualification. Only 14% of male unqualified school-leavers manage to reach level 3 in post-school qualifications[8] [9]. For women, the proportion of the unqualified school-leavers adding nothing post-school is even higher, slightly, than for men, at 46%. Only 13% of such women reach level 3 in terms of post-school qualifications. Given that level 3 has been described by some commentators as the minimum attainment needed to succeed in today's labour market[10], it does not appear that post-school vocational qualifications have been at all successful in raising those who failed at school up to this desirable level, or even, for that matter, to level 2.

[7] Specifically, above level 3 qualifications are higher degrees, degrees, Higher Education diplomas and other Higher Education qualifications on the academic side, and professional, teaching and nursing qualifications plus HNC/HNDs on the vocational side. Vocational level 3 qualifications comprise higher level RSA qualifications, ONC/ONDs, City and Guilds Advanced Craft qualifications and NVQ 3 / advanced GNVQ qualifications. The vocational level 2 category comprises apprenticeships, City and Guilds Craft qualifications, BTEC diplomas and certificates and NVQ 2 / intermediate GNVQ qualifications. Finally, vocational level 1 qualifications is made up of City and Guilds 'other' qualifications, NVQ 1 / foundation GNVQ qualifications, lower level RSA qualifications and 'other qualifications.'

[8] Given the suspicion, aired above, that some respondents with high level qualifications simply stop reporting their school qualifications by 2002, some of these respondents who have achieved above level 3 may be wrongly assigned to the 'no school qualifications' group, and so the true proportion of unqualified school-leavers reaching level 3 after school is almost certainly even lower than the figure given here.

[9] The most common means of reaching level 2 amongst this group is via apprenticeship, completed by 9% of the male unqualified school-leavers in the cohort. Those who reach level 3 are most likely to do so via NVQ/GNVQ level 3 qualifications, obtained by 4% of the group.

[10] See for example West and Steedman (2003).

The situation is better for those who achieved something at school, even at a low grade. Only around a quarter of this group do not acquire further qualifications after leaving school, and over half improve on their school performance by reaching at least level 2. Of these, 32% of men and 28% of women manage to reach at least level 3[11]. Those who achieved high grades at the end of lower secondary schooling are even more successful after leaving school. Only 20% do not add to their qualifications, and around one half reach level 3 or above[12]. Finally, Table 7 shows that amongst the top achievers at school who acquired A levels, the majority (two-thirds) go on to acquire high level qualifications, most commonly degrees. A significant minority, 18% of men and 13% of women, do not obtain any further qualifications after their A levels. The remainder acquire vocational qualifications at the various levels, this group being the least likely of the 3 school qualification groups to do so, unsurprisingly since their A levels already represent a level 3 qualification.

3.4 The impact of post-school qualifications on labour market success

This section examines the extent to which the acquisition of the various post-school qualifications, as described above, can help the low school achievers in terms of labour market success, by the age of 23-25 in 2002. Labour market success is measured by employment rates and hourly wage rates, with the results displayed separately for men and women in Tables 8 and 9. Table 6 above showed that some members of the group were still studying at this age, and they are therefore excluded from this analysis of labour market success.

The first thing to note, considering men first in Table 8, is that there is a clear hierarchy of labour market success across the three levels of school attainment if they do not add any further qualifications, as we might expect. Thus, those who leave school with nothing, and do not go on to acquire post-school qualifications either, have an employment rate of just 68%. Those who add nothing to their GCSEs have an 81% and an 88% likelihood of employment respectively for low and high grades, while those who have only A levels have a 94% employment probability.

[11] Men in this group are most likely to reach level 2 via apprenticeship (20%) or NVQ/GNVQ level 2 qualifications (23%). Women strongly prefer the NVQ/GNVQ route (31%). To reach level 3, both sexes typically acquire NVQ/GNVQ qualifications at this level.

[12] Again, this group are most likely to reach level 3 via NVQ/GNVQ qualifications at level 3, although proportionally larger numbers than in the previous groups acquire ONC/OND qualifications (16% of this group of men, and 13% of this group of women).

If these various groups acquire post-school qualifications, however, then the most dramatic effect is observed on the labour market success of the unqualified school-leavers. Vocational qualifications at level 1 have a small effect on the employment rate of this lowest group, which rises to 75%. It is at vocational level 2, however, that we really start to observe the positive impact of these qualifications, raising the employment rate of those men who left school with nothing to 89%. Note that this is actually a higher employment rate than those who reached level 2 via the academic route with high grade GCSEs and nothing after school (88%).

Moving up another level, if the unqualified school leavers manage to reach level 3 via the vocational route, then they have a 94% employment rate, thus equalling the 94% employment rate of those men who reach level 3 via the academic route (i.e. A levels but not post-school qualifications). If we compare employment rates of all those with level 3 post-school vocational qualifications, across the 4 levels of school attainment, then they are very similar. It therefore appears that those men who left school with nothing to show for their time there manage to eliminate their disadvantage in terms of finding employment, if they obtain level 3 vocational qualifications after leaving school.

The men do not completely wipe out any disadvantage of their failure at school, however, as the final column of wages reveals. Men who leave school with no qualifications, and add nothing after school, earn on average £6.05 an hour in 2002. This is of course less than men who leave school with good GCSEs or A levels, who earn on average £7.84 an hour and £8.14 an hour respectively if they do not acquire any post-school qualifications. The unqualified school leavers can get closer to these wage rates, but do not completely close the gap, by acquiring vocational qualifications after school, raising their average wages to £7.14 at level 2 and £6.22 at level 3[13]. The acquisition of vocational qualifications after school by the more successful school-leavers does not seem to add significantly to their wages[14], a conclusion consistent with previous research[15].

[13] This apparently lower impact of level 3 than level 2 qualifications may be due to an unreliable estimate based on low numbers. Table 7 shows that very few unqualified school-leavers acquire a level 3 vocational qualification after school.

[14] In fact some inconsistencies appear in the results, whereby wages actually appear lower on average at higher levels of vocational qualification acquisition. This may be due to inaccurate estimates due to small cell sizes, or to the omission of controlling variables, such that those who acquire vocational qualifications have lower earnings potential for some unobserved reason. The safest conclusion seems to be the one offered here, that there is little evidence for vocational qualifications increasing wages.

[15] See for example McIntosh (2002).

For women, we observe vocational qualifications having a substantial impact on employment rates, particularly for the unqualified school leavers, but a very small effect on wages. With respect to employment, Table 9 shows that women who leave school with no qualifications, and remain unqualified after school, only have a 31% likelihood of employment. If they obtain vocational qualifications, however, then their employment rate rises rapidly, to 58% (with level 1 vocational qualifications), 70% (with level 2 vocational qualifications) and 77% (with level 3 vocational qualifications). These employment rates following the acquisition of vocational qualifications narrow, to a certain extent, the gap relative to those who reached level 2 and 3 via the academic route only, with the employment rates of those with no post-school qualifications but either good GCSEs or A levels at school being 77% and 84% respectively.

The acquisition of vocational qualifications after formal schooling does not seem to have a large effect on the wages of women in our cohort, even for the low school achievers. It is not immediately obvious why this should be the case, but may be related to selection issues, which of course are not controlled for in the simple analysis used here. For example we know that those women with few qualifications are much less likely to participate in the labour force, which means that those who do choose to do so may have made this decision because of particular unobserved characteristics of themselves or their jobs that give them higher than expected wages. These higher wages for the low qualified who have chosen to work then close the wage differentials on more highly qualified women.

Tables 10 and 11 report the results from full multivariate analyses of the factors associated with being in work and hourly wages respectively, for the cohort in 2002. The estimated equations control for age, ethnicity and region of residence, and additionally workplace size and sector for the wage analysis. In each case, the impact of various qualification combinations on these labour market outcomes is measured relative to individuals with no qualifications at all, from either school or post-school.

Considering first the likelihood of being in work, in Table 10, we can see that almost all qualification combinations are associated with statistically significantly higher employment rates than no qualifications. The effects are much larger for women than for men, as we would expect given that unqualified women are less likely to be in work than unqualified men. The key finding for this paper, however, is how the acquisition of vocational qualifications boost the employment likelihood of those who left school with no qualifications. Amongst this group of unqualified school-leavers, compared to those who also do not acquire any qualifications after school, those men with vocational qualifications at

level 1 are 4 percentage points more likely to be employed in 2002, with equivalent figures of 10 percentage points and 12 percentage points respectively for vocational qualifications at levels 2 and 3, holding other factors constant. For women, these marginal effects are 16, 19 and 19 percentage points respectively for vocational qualifications at levels 1, 2 and 3, again holding other factors constant. It is therefore very clear that, amongst the group who left school with no qualifications, those who acquire vocational qualifications after school are much more likely to be in employment.

There is no employment benefit of vocational qualifications for those who do well at school, however. Those men with either higher grade lower secondary school qualifications or upper secondary school qualifications are around 11 percentage points more likely to be in employment, regardless of any subsequent acquisition of vocational qualifications, compared to men with no qualifications (around 20 percentage points for women). The acquisition of *some* qualifications therefore seems to be a gateway to employment, beyond which further acquisition is not associated with continued increases in the probability of employment, except for high level (level 4+) qualifications for women.

Turning to wages, the multivariate evidence in Table 11 again suggests that the acquisition of vocational qualifications has little impact on the earnings of the individuals in our cohort. This is the case even for those who left school with no qualifications, the top panel of Table 11 showing no statistically significant difference in wages between those who obtained vocational qualifications at any level after leaving school with nothing and those who did not, for both men and women. Only a high level qualification such as a degree boosts the earnings of this group, and we know very few of them achieve this. Similarly for the other 3 groups who did leave school with some qualifications, their mark-up compared to the unqualified is essentially the same regardless of any subsequent acquisition of vocational qualifications. The one exception to this statement is amongst men who left school with low grade lower secondary qualifications. If they do not add to these qualifications after school, then their wages are statistically insignificantly different from those of the unqualified. However, if they acquire vocational qualifications at levels 2 or 3, a wage differential of 18%[16] and 25% respectively emerges relative to the unqualified.

[16] Calculated as $e^{\beta} - 1$, where β is the estimated coefficient in Table 11.

4. Robustness Checks of Results

The key finding of the previous section is that those who left school with no qualifications are more likely to be in employment if they subsequently acquire vocational qualifications. However, before we can advocate the widespread acquisition of such qualifications by this group, we need to further investigate the causality of this relationship. Is it the case that the likelihood of employment rises *because of* the acquisition of the qualifications? An alternative explanation of the positive association could be that it is easier to acquire vocational qualifications once in employment, through workplace training, so that the causality would run in the opposite direction. Another alternative is the well-known unobserved individual heterogeneity problem, whereby it may be the case that qualification acquisition does not *cause* higher employment rates, but that both are outcomes of other, unobserved, characteristics of individuals, for example their motivation or innate ability. Such factors could be particularly relevant for women, who have a lower participation rate in the labour force than men. For example, those women who have bothered to obtain work-related vocational qualifications are probably more likely to be women who choose to work rather than stay at home with families, thus readily explaining a higher employment rate. We therefore use the panel data element of the LFS to try to evaluate these alternatives.

As described in the data section, individuals are surveyed in the LFS for five successive quarters, before being replaced by new respondents. We therefore use a survey quarter as the unit of time, given us 28 data points in the time dimension, from 1996Q1 to 2002Q4, although of course there are only a maximum of 5 observations per individual respondent, and so it is an unbalanced panel. Since we are no longer concerned with progression over time of our cohort, these points in time are simply merged into a single data set. In fact, small cell sizes for some of the first differenced variables used below means that we have to stop using the cohort established above altogether. Instead, this section considers all individuals between the age of 16 and 29 inclusive at the time that they were surveyed.

A key fact necessary for establishing causality between qualification acquisition and employment is the labour force status of individuals when they acquire the qualification. The LFS does not reveal this exactly, but does tell us the labour force status last period (i.e. 3 months ago) of individuals who have acquired a vocational qualification between last period and this period. This is shown in the first column of Table 12, for males and the acquisition of level 3 vocational qualifications. The results make clear that a large majority (81%) of

those who acquire such qualifications in a 3 month 'window' were in employment at the opening of this 'window' in time. Of these, the main body of the table shows that almost all (95%) are still in employment at the closing of the 'window' 3 months later. Of more interest, for our purposes, are the various groups who were not in employment 3 months ago. Table 12 shows, for example, that amongst those who were unemployed 3 months ago, 37% of those who have acquired a level 3 vocational qualification since then are now in employment. This compares to just 28% of those in the same group who did not acquire a level 3 vocational qualification, as shown by the figure in square brackets. Similarly, amongst those classified as inactive 3 months ago, 28% of those who have acquired a level 3 vocational qualification since then are now in employment, compared to just 13% of those have not. Crucially, the final cell in this row shows that 69% are those men classified as inactive 3 months ago and who have not acquired a level 3 vocational qualification since then are still classified as inactive now, compared to only 35% of those who have acquired such a qualification[17].

Table 13 performs a similar analysis for women, with very similar results. Again, the table makes clear that most level 3 vocational qualifications are acquired by those in employment (76%). Nevertheless, amongst those women not in work last period, the acquisition of a level 3 vocational qualification since then raises the likelihood of employment, from 31% to 40% amongst those classified as unemployed last period, and from 7% to 13% amongst those classified as inactive last period.

Tables 14 and 16 perform similar calculations for vocational qualification acquisition at levels 2 and 1 respectively for men, while the equivalent figures for women are found in Tables 15 and 17. One point to note in these tables is that the likelihood of individuals being in employment before they acquire vocational qualifications falls as the level of the qualifications falls. Thus 74% of men and 68% of women were in employment the period before they acquired a level 2 vocational qualification, while 72% of men and 62% of women were in employment the period before they acquired a level 1 vocational qualification. Amongst those not in employment 3 months ago, in each case there is a higher proportion of individuals who have acquired a vocational qualification since then in employment now, compared to those who have not acquired such a qualification.

[17] Amongst those who were studying or in government training 3 months ago, we also see higher rates of employment amongst those who have acquired a level 3 vocational qualification since then than amongst those who have not, though this is very much to be expected, since those who have not acquired such a qualifications are very likely to still be in education or training, as is shown in the table.

Table 18 summarises all of these results in a multivariate context, pooling the data for men and women because of small cell sizes. The figures shown are the results of probit equations, estimating the impact of the acquisition, between time *t-1* and time *t*, of post-school qualifications at the various levels, on the probability of being in employment at time *t*, **only for those who were not in work at time *t-1***. As before, those classified as studying at time *t* are excluded from the analysis. The probit equations additionally control for gender, age, ethnicity, region of residence and year of observation. Separate equations are estimated for individuals with different levels of school qualification achievement.

The results reveal the usefulness of vocational qualifications for helping the transition from 'out of work' to 'in work'. Considering, for example, the group who left school with no qualifications, if they were out of work last period, then they are 6 percentage points more likely to be in employment this period if they have acquired a level 1 vocational qualification between the two dates, holding other factors constant. The acquisition of vocational qualifications at levels 2 and 3 have equivalent effects on the likelihood of employment of 18 percentage points and 11 percentage points respectively for this group. Even amongst the individuals in the next two education categories, who left school at age 16 with some qualifications at the end of lower secondary education, vocational qualification aids the transition into employment if we focus only on those initially out of work, as Table 18 does. Only for the group with upper secondary school qualifications is there no statistically significant impact on the probability of employment of vocational qualification acquisition by the initially out of work.

Table 18, and indeed the transition matrices in the preceding tables, implicitly assume that labour force status last period is the same as labour force status at the time of qualification acquisition, when showing that those out of work 3 months ago are more likely to be employed now if they have acquired a vocational qualification. While this does suggest that causation can run from qualification acquisition to employment, there nevertheless is a possibility that we are observing individuals who were observed as out of work last period, who find a job and *then* acquire a qualification, all before they are observed in employment 3 months later. In defence against such a possibility, it seems very unlikely that the qualification could be obtained *after* employment was secured, since this would require the qualification to be studied for, assessed and obtained in less than 3 months. As a further check, however, probit equations were estimated to explain current employment status, for those who were out of work both last period and the period before that. The results revealed that vocational qualification acquisition between 6 months ago and 3 months ago (i.e. during

a period in which individuals were out of work at both the beginning and the end, and therefore presumably not in employment when they acquired the qualification) is statistically significantly related to higher employment rates in the current period, at least for the lower achievers at school[18].

The results so far in this section have suggested a positive relationship from vocational qualification acquisition to employment. However, the issue of unobserved heterogeneity driving both variables has not as yet been addressed. This is done in the lower half of Table 18, where random effects probit models are estimated, for exactly the same groups as the standard probit equations in the upper half of the table. The resulting coefficients are, however, very similar[19]. The conclusion therefore remains that, even when we include random effects to control for unobserved individual heterogeneity, the acquisition of vocational qualifications still significantly raises the employment rates of those out of work before the acquisition, for all groups except those with upper secondary school qualifications.

Finally in this section, we consider the impact of vocational qualification acquisition on those already in work with the longitudinal data set. Unfortunately we cannot estimate the impact on wages, since the earnings questions are not asked of respondents in successive waves of the LFS[20]. Therefore Table 19 reports the results from probit equations investigating whether or not individuals have moved up the occupational hierarchy between period *t-1* and period *t*, where the hierarchy is the 9 point 1-digit Standard Occupational Classification. Despite only 4% of the observations in the data set reporting such a movement up the occcupational hierarchy compared to the previous period, the results are still revealing. They show that, for example amongst the group of unqualified school leavers, those who have acquired a vocational qualification at level 1 since the previous period are 1.6 percentage points more likely to have moved up the occupational hierarchy since last period. Given the sample average movement rate of 4%, this is a substantial marginal effect. The acquisition of vocational qualification at level 2 similarly raises the probability of moving up the occupational hierarchy by 1.4 percentage points. No statistically significant impact of

[18] Marginal effects on current employment rates were 9 percentage points, 2 percentage points and 2 percentage points for the group of unqualified school leavers and 8 percentage points 6 percentage points and 0 percentage points for the group with low grade lower secondary school qualifications, for the acquisition of vocational qualifications at levels 3, 2 and 1 respectively.

[19] Indeed, many of the coefficients are slightly larger when random effects are included. This is consistent with the argument of Snijders and Bosker (1999) that population-averaged effects (i.e. those without random effects) are closed to zero than cluster-specific effects (i.e. those with random effects).

[20] Respondents report their earnings only in their first and fifth appearances in the LFS.

level 3 qualification acquisition is observed, although recall that few unqualified school leavers reach this level. There are similar statistically significant effects of vocational qualification acquisition on the probability of occupational movement for the groups who left school with lower secondary qualifications, with marginal effects for acquisition at levels 1, 2 and 3 being respectively 1.6 percentage points, 1.4 percentage points and 2.0 percentage points for those with low grade lower secondary school qualifications, and 1.1 percentage points, 3.6 percentage points and 2.8 percentage points for those with high grade lower secondary school qualifications[21]. Only for the group with upper secondary school qualifications are there no statistically significant effects of vocational qualification acquisition on occupational mobility. Thus, not only does the acquisition of vocational qualifications improve the employment chances of those out of work, but also the chances of job improvement for those already in work.

5. Conclusion

This paper has taken data on the cohort of individuals who were entitled to leave school in the summers of 1993, 1994 or 1995, and examined their further education decisions and early labour market outcomes.

The results revealed that still sizeable minorities of this recent cohort have not obtained any qualifications by the time that they complete compulsory schooling. The analysis then went on to show that such a situation can significantly impact on labour market success, with this group of unqualified school leavers being much less likely to be employed than their contempories at school who obtained qualifications. For men, those without work are split approximately equally between unemployment and inactivity. Women who do not work after leaving school with no qualifications are much more likely to be inactive than to be unemployed, however.

What can this group do to solve their lack of employment opportunities? The obvious answer is to try to obtain some qualifications post-school, which could involve re-sits of school qualifications, but more likely vocational qualifications. The results however reveal that although there is some take up of NVQ level 2 qualifications by both male and female unqualified school leavers, and of apprenticeships and low level City and Guilds

[21] Random effects probit models proved to be unsuccessful, presumably because of the low rate of occupational mobility in the sample.

qualifications by such men, very few individuals who obtained no school level qualifications manage to reach level 3 through the vocational route, and only around a quarter of this group manage even to reach level 2. This is a pity, because the final part of the paper shows that those unqualified school-leavers who do obtain vocational level 2 or 3 qualifications are much more likely to be in employment than those who do not, their employment likelihood closing significantly on that of those individuals who reach these levels via the academic route at school. To a lesser extent the wage gap also closes with vocational qualification acquisition, at least for initially unqualified males.

The vocational route as it stands therefore seems to be for the group who do obtain good GCSEs at school, since a level 3 vocational qualification for this group also closes the employment gap on those with A levels from school, and crucially there is significant take-up of these qualifications by the GSCE group. Around one half of both men and women in our cohort who leave school with at best GCSEs manage to obtain a level 3 qualification or better post-school.

The implication is therefore that, if there is always going to be a significant minority that emerge from school at age 16 having failed along the academic route, then more needs to done to help them reach level 2 or level 3 along the vocational route, otherwise this group is going to remain, and probably become increasingly, marginalised on the labour market.

Table 1: 17-19 Year Olds in 1996 by Highest School Qualification Achieved (%)

School qualifications	Males	Females
none	19.9	14.7
GCSE D-F	8.9	7.6
1-4 GCSE A*-C	19.8	19.5
5+ GCSE A*-C	31.7	34.9
1 A level	2.6	2.9
2+ A levels	17.2	20.5

Source: Labour Force Survey

Table 2: 20-22 Year Olds in 1999 by Highest School Qualification Achieved (%)

School qualifications	Males	Females
none	20.4	18.7
GCSE D-F	7.6	5.3
1-4 GCSE A*-C	17.4	18.3
5+ GCSE A*-C	17.5	19.3
1 A level	4.5	4.9
2+ A levels	32.6	33.6

Source: Labour Force Survey

Table 3: 23-25 Year Olds in 2002 by Highest School Qualification Achieved (%)

School qualifications	Males	Females
none	25.4	23.6
GCSE D-F	6.1	5.7
1-4 GCSE A*-C	17.5	14.8
5+ GCSE A*-C	16.6	18.3
1 A level	3.8	5.0
2+ A levels	30.6	32.7

Source: Labour Force Survey

Table 4: Labour Force Status of 17-19 Year Olds in 1996 (%)

	Males					Females				
School qualifications	employed	training	unemployed	studying	inactive	employed	training	unemployed	studying	inactive
none	42.5	8.6	25.6	15.3	8.0	33.4	3.7	13.6	21.6	27.7
GCSE D-F	61.3	6.0	18.9	10.4	3.4	52.7	8.2	10.2	15.8	13.1
1-4 GCSE A*-C	61.9	7.7	16.8	12.3	1.3	59.3	7.6	12.2	9.9	11.0
5+ GCSE A*-C	55.8	3.7	7.8	29.9	2.7	62.0	2.7	7.6	22.9	4.7

Source: Labour Force Survey

Table 5: Labour Force Status of 20-22 Year Olds in 1999 (%)

	Males					Females				
School qualifications	employed	training	unemployed	studying	inactive	employed	training	unemployed	studying	inactive
none	63.5	2.2	13.5	8.3	12.6	43.3	0.5	9.4	8.7	38.2
GCSE D-F	72.6	1.9	19.2	3.0	3.3	62.3	0.0	11.3	2.3	24.1
1-4 GCSE A*-C	81.5	0.5	10.4	4.2	3.4	67.8	0.0	8.3	3.0	20.9
5+ GCSE A*-C	81.5	0.5	7.8	7.4	2.7	76.2	0.6	5.5	6.1	11.5
1 A level	75.7	1.0	8.9	12.4	2.0	78.5	0.7	2.2	11.3	7.3
2+ A levels	53.3	0.6	8.5	35.0	2.6	56.3	0.2	5.1	34.1	4.3

Source: Labour Force Survey

Table 6: Labour Force Status of 23-25 Year Olds in 2002 (%)

	Males					Females				
School qualifications	employed	training	unemployed	studying	inactive	employed	training	unemployed	studying	inactive
none	70.0	0.1	10.6	6.5	12.7	47.7	0.3	4.6	4.9	42.4
GCSE D-F	88.7	1.1	7.3	0.0	2.8	63.3	0.0	5.8	1.1	29.7
1-4 GCSE A*-C	82.4	0.7	9.0	2.7	5.3	70.1	0.0	5.9	2.4	21.6
5+ GCSE A*-C	89.7	0.0	5.1	1.8	3.4	79.8	0.0	2.7	3.5	14.0
1 A level	88.9	0.9	0.7	7.8	1.7	89.2	0.0	2.7	2.9	5.3
2+ A levels	84.4	0.0	5.0	8.1	2.5	83.7	0.1	3.5	7.1	5.6

Source: Labour Force Survey

Table 7: Summary of Post School Qualifications, by Highest Level of School Qualifications (23-25 Year Olds in 2002) (%)

	Males	Females
No school qualifications		
+ none	44.1	46.1
+ vocational level 1	30.7	29.9
+ vocational level 2	11.1	10.8
+ vocational level 3	5.4	4.1
+ above level 3	8.7	9.1
Low grade lower secondary qualifications		
+ none	25.0	23.9
+ vocational level 1	16.9	20.3
+ vocational level 2	26.1	28.0
+ vocational level 3	25.3	20.6
+ above level 3	6.5	7.2
High grade lower secondary qualifications		
+ none	20.5	19.6
+ vocational level 1	15.0	15.4
+ vocational level 2	14.1	17.4
+ vocational level 3	26.1	28.9
+ above level 3	24.3	18.8
Upper secondary qualifications		
+ none	16.9	13.2
+ vocational level 1	8.3	8.8
+ vocational level 2	3.4	3.2
+ vocational level 3	4.8	5.5
+ above level 3	66.6	69.3

Table 8: Employment Probabilities and Average Wage Levels for 23-25 Year Old Men in 2002, by Qualification Combinations

	Employment rate (%)	Average Hourly Wage (£)
No school qualifications		
+ none	68.2	6.05
+ vocational level 1	75.3	7.25
+ vocational level 2	88.7	7.14
+ vocational level 3	94.3	6.22
+ above level 3	77.9	9.45
Low grade lower secondary qualifications		
+ none	80.8	6.17
+ vocational level 1	80.6	6.32
+ vocational level 2	91.4	7.33
+ vocational level 3	88.9	7.84
+ above level 3	82.2	7.06
High grade lower secondary qualifications		
+ none	88.3	7.84
+ vocational level 1	92.9	8.45
+ vocational level 2	93.5	7.14
+ vocational level 3	92.4	7.68
+ above level 3	90.5	9.15
Upper secondary qualifications		
+ none	94.4	8.14
+ vocational level 1	91.5	7.38
+ vocational level 2	94.8	7.98
+ vocational level 3	95.8	8.18
+ above level 3	91.6	10.03

Source: Labour Force Survey

Table 9: Employment Probabilities and Average Wage Levels for 23-25 Year Old Women in 2002, by Qualification Combinations

	Employment rate (%)	Average Hourly Wage (£)
No school qualifications		
+ none	30.6	5.53
+ vocational level 1	58.3	7.35
+ vocational level 2	70.3	5.44
+ vocational level 3	77.4	5.79
+ above level 3	93.5	8.23
Low grade lower secondary qualifications		
+ none	56.4	5.98
+ vocational level 1	66.3	6.17
+ vocational level 2	66.0	5.95
+ vocational level 3	86.8	6.18
+ above level 3	91.1	7.05
High grade lower secondary qualifications		
+ none	76.8	6.26
+ vocational level 1	73.6	7.47
+ vocational level 2	81.2	6.47
+ vocational level 3	86.8	7.04
+ above level 3	92.1	7.10
Upper secondary qualifications		
+ none	83.9	6.87
+ vocational level 1	90.6	7.81
+ vocational level 2	78.0	6.69
+ vocational level 3	90.5	8.19
+ above level 3	92.0	8.85

Source: Labour Force Survey

Table 10: Determinants of Being in Work for 23-25 Year Olds in 2002, Probit Estimates

	Males	Females
No school qualifications		
+ vocational level 1	0.226 (0.126) [0.040]	0.779 (0.120)** [0.163]
+ vocational level 2	0.728 (0.189)** [0.095]	1.063 (0.164)** [0.187]
+ vocational level 3	1.229 (0.337)** [0.115]	1.234 (0.253)** [0.194]
+ above level 3	0.426 (0.228) [0.066]	2.083 (0.269)** [0.221]
Low grade lower secondary qualifications		
+ none	0.403 (0.135)** [0.065]	0.645 (0.122)** [0.143]
+ vocational level 1	0.354 (0.151)* [0.058]	0.887 (0.133)** [0.174]
+ vocational level 2	0.889 (0.152)** [0.110]	0.870 (0.119)** [0.174]
+ vocational level 3	0.728 (0.145)** [0.098]	1.657 (0.154)** [0.225]
+ above level 3	0.457 (0.235) [0.069]	1.885 (0.280)** [0.216]
High grade lower secondary qualifications		
+ none	0.689 (0.185)** [0.092]	1.202 (0.146)** [0.200]
+ vocational level 1	1.030 (0.240)** [0.111]	1.076 (0.160)** [0.188]
+ vocational level 2	1.002 (0.241)** [0.110]	1.397 (0.159)** [0.210]
+ vocational level 3	0.929 (0.179)** [0.109]	1.617 (0.141)** [0.228]
+ above level 3	0.803 (0.180)** [0.101]	1.909 (0.197)** [0.226]
Upper secondary qualifications		
+ none	1.131 (0.193)** [0.120]	1.496 (0.146)** [0.219]
+ vocational level 1	0.952 (0.221)** [0.107]	1.742 (0.189)** [0.222]
+ vocational level 2	1.138 (0.342)** [0.112]	1.269 (0.245)** [0.196]
+ vocational level 3	1.200 (0.340)** [0.115]	1.906 (0.241)** [0.220]
+ above level 3	0.864 (0.105)** [0.130]	1.901 (0.097)** [0.362]
Observations	2772	3109

Robust standard errors in parentheses. Marginal effects in square brackets. * coefficient significant at 5%; ** coefficient significant at 1%. Equations also control for region of residence, age and ethnicity. The omitted category is no school qualifications and no post-school qualifications. Data: Labour Force Survey.

Table 11: Determinants of Log Hourly Wages for 23-25 Year Olds in 2002

	Males	Females
No school qualifications		
+ vocational level 1	0.027	0.104
	(0.054)	(0.071)
+ vocational level 2	0.107	0.026
	(0.059)	(0.069)
+ vocational level 3	0.040	0.126
	(0.078)	(0.074)
+ above level 3	0.389	0.319
	(0.100)**	(0.075)**
Low grade lower secondary qualifications		
+ none	0.004	0.121
	(0.049)	(0.057)*
+ vocational level 1	0.031	0.137
	(0.051)	(0.055)*
+ vocational level 2	0.165	0.123
	(0.050)**	(0.054)*
+ vocational level 3	0.225	0.132
	(0.047)**	(0.056)*
+ above level 3	0.115	0.210
	(0.076)	(0.078)**
High grade lower secondary qualifications		
+ none	0.226	0.165
	(0.062)**	(0.062)**
+ vocational level 1	0.230	0.257
	(0.073)**	(0.082)**
+ vocational level 2	0.172	0.184
	(0.057)**	(0.059)**
+ vocational level 3	0.238	0.232
	(0.048)**	(0.054)**
+ above level 3	0.310	0.231
	(0.061)**	(0.056)**
Upper secondary qualifications		
+ none	0.211	0.185
	(0.061)**	(0.056)**
+ vocational level 1	0.115	0.343
	(0.064)	(0.058)**
+ vocational level 2	0.219	0.173
	(0.083)**	(0.089)
+ vocational level 3	0.269	0.396
	(0.070)**	(0.069)**
+ above level 3	0.377	0.416
	(0.040)**	(0.048)**
Observations	1514	1713
R-squared	0.27	0.29

Robust standard errors in parentheses. * coefficient significant at 5%; ** coefficient significant at 1%. Equations also control for region of residence, age, ethnicity, workplace size and sector of work. The omitted category is no school qualifications and no post-school qualifications. Data: Labour Force Survey.

Table 12: Transition Matrix for those who Acquire a Vocational Qualification at Level 3, Males, 1996-2002.

This period / Last period	employed	training	unemployed	studying	inactive
Employed (80.9%)	94.6 [95.4]	1.2 [0.3]	2.8 [2.2]	0.9 [1.4]	0.6 [0.7]
Training (2.8%)	44.2 [20.0]	36.8 [66.7]	14.9 [10.1]	1.2 [1.1]	2.8 [2.1]
Unemployed (5.1%)	36.6 [27.7]	2.0 [2.1]	52.8 [57.9]	2.3 [6.9]	6.3 [5.4]
Studying (9.0%)	25.8 [14.5]	0.4 [0.6]	22.0 [9.4]	43.8 [72.1]	8.0 [3.4]
Inactive (2.3%)	28.2 [12.7]	2.0 [0.8]	20.4 [11.2]	14.1 [6.6]	35.3 [68.8]

Source: Labour Force Survey. Numbers in parentheses in first column show the distribution by labour force status last period of those men gaining a vocational level 3 qualification between the two dates. The numbers in the main body of the table are row percentages, showing the percentage this period in each labour force state, by labour force status last period, for all those men who have acquired a vocational level 3 qualification between the two dates. The numbers in square brackets show the equivalent transitions for those men who have *not* acquired a vocational level 3 qualification between the two dates.

Table 13: Transition Matrix for those who Acquire a Vocational Qualification at Level 3, Females, 1996-2002.

This period / Last period	employed	training	unemployed	studying	inactive
Employed (76.1%)	95.6 [94.6]	0.2 [0.2]	1.9 [1.7]	1.2 [1.8]	1.2 [1.7]
Training (1.7%)	44.5 [22.9]	46.9 [65.0]	5.8 [7.6]	0.0 [2.1]	2.8 [2.4]
Unemployed (4.7%)	40.4 [30.8]	2.5 [1.2]	42.2 [47.5]	8.2 [8.3]	6.6 [12.1]
Studying (11.0%)	28.0 [16.7]	1.0 [0.4]	15.6 [7.6]	48.0 [71.7]	7.3 [3.6]
Inactive (6.5%)	13.2 [6.7]	0.0 [0.2]	13.9 [5.3]	4.5 [1.9]	68.4 [86.0]

Source: Labour Force Survey. Numbers in parentheses in first column show the distribution by labour force status last period of those women gaining a vocational level 3 qualification between the two dates. The numbers in the main body of the table are row percentages, showing the percentage this period in each labour force state, by labour force status last period, for all those women who have acquired a vocational level 3 qualification between the two dates. The numbers in square brackets show the equivalent transitions for those women who have *not* acquired a vocational level 3 qualification between the two dates.

Table 14: Transition Matrix for those who Acquire a Vocational Qualification at Level 2, Males, 1996-2002.

This period / Last period	employed	training	unemployed	studying	inactive
Employed (73.7%)	93.2 [95.4]	1.8 [0.3]	3.1 [2.2]	0.9 [1.4]	1.0 [0.7]
Training (5.6%)	28.1 [20.1]	56.9 [66.6]	12.2 [10.1]	0.9 [1.1]	1.9 [2.1]
Unemployed (8.0%)	36.1 [27.6]	3.2 [2.1]	46.7 [58.1]	6.2 [6.9]	7.9 [5.4]
Studying (10.2%)	25.8 [14.5]	2.0 [0.6]	17.9 [9.4]	48.4 [72.2]	5.8 [3.4]
Inactive (2.6%)	19.3 [12.7]	4.5 [0.8]	23.0 [11.2]	2.1 [6.7]	51.1 [68.7]

Source: Labour Force Survey. Numbers in parentheses in first column show the distribution by labour force status last period of those men gaining a vocational level 2 qualification between the two dates. The numbers in the main body of the table are row percentages, showing the percentage this period in each labour force state, by labour force status last period, for all those men who have acquired a vocational level 2 qualification between the two dates. The numbers in square brackets show the equivalent transitions for those men who have *not* acquired a vocational level 2 qualification between the two dates.

Table 15: Transition Matrix for those who Acquire a Vocational Qualification at Level 2, Females, 1996-2002.

This period / Last period	employed	training	unemployed	studying	inactive
Employed (68.3%)	93.8 [94.6]	1.1 [0.2]	2.8 [1.7]	0.5 [1.8]	1.8 [1.7]
Training (4.4%)	39.2 [22.1]	41.7 [66.5]	15.7 [7.0]	2.6 [2.0]	0.8 [2.6]
Unemployed (6.0%)	40.7 [30.8]	1.6 [1.2]	37.0 [47.6]	9.3 [8.3]	11.4 [12.1]
Studying (10.9%)	25.7 [16.7]	2.0 [0.4]	19.9 [7.5]	48.8 [71.7]	3.7 [3.7]
Inactive (10.4%)	9.4 [6.7]	1.4 [0.2]	9.8 [5.3]	1.3 [1.9]	78.2 [86.0]

Source: Labour Force Survey. Numbers in parentheses in first column show the distribution by labour force status last period of those women gaining a vocational level 2 qualification between the two dates. The numbers in the main body of the table are row percentages, showing the percentage this period in each labour force state, by labour force status last period, for all those women who have acquired a vocational level 2 qualification between the two dates. The numbers in square brackets show the equivalent transitions for those women who have *not* acquired a vocational level 2 qualification between the two dates.

Table 16: Transition Matrix for those who Acquire a Vocational Qualification at Level 1, Males, 1996-2002.

This period / Last period	employed	training	unemployed	studying	inactive
Employed (71.8%)	94.2 [95.4]	0.6 [0.3]	3.4 [2.2]	1.0 [1.4]	0.9 [0.7]
Training (3.2%)	26.3 [20.3]	53.1 [66.6]	13.8 [10.1]	3.1 [1.0]	3.7 [2.1]
Unemployed (9.2%)	33.2 [27.6]	4.4 [2.1]	49.8 [58.1]	6.4 [6.9]	6.3 [5.4]
Studying (11.7%)	27.9 [14.4]	2.8 [0.6]	15.3 [9.4]	49.6 [72.3]	4.4 [3.4]
Inactive (4.2%)	22.1 [12.6]	0.0 [0.8]	15.0 [11.2]	7.4 [6.6]	55.6 [68.8]

Source: Labour Force Survey. Numbers in parentheses in first column show the distribution by labour force status last period of those men gaining a vocational level 1 qualification between the two dates. The numbers in the main body of the table are row percentages, showing the percentage this period in each labour force state, by labour force status last period, for all those men who have acquired a vocational level 1 qualification between the two dates. The numbers in square brackets show the equivalent transitions for those men who have *not* acquired a vocational level 1 qualification between the two dates.

Table 17: Transition Matrix for those who Acquire a Vocational Qualification at Level 1, Females, 1996-2002.

This period / Last period	employed	training	unemployed	studying	inactive
Employed (62.3%)	92.8 [94.7]	0.7 [0.2]	2.6 [1.7]	1.8 [1.8]	2.3 [1.7]
Training (2.0%)	28.3 [23.1]	41.0 [65.8]	24.4 [6.8]	0.0 [2.1]	6.4 [2.3]
Unemployed (7.1%)	40.6 [30.7]	1.2 [1.2]	38.7 [47.7]	7.6 [8.4]	12.0 [12.1]
Studying (13.7%)	29.3 [16.5]	1.3 [0.4]	12.8 [7.6]	50.6 [71.9]	6.0 [3.6]
Inactive (14.9%)	9.6 [6.7]	1.0 [0.2]	8.1 [5.3]	3.0 [1.9]	78.4 [86.1]

Source: Labour Force Survey. Numbers in parentheses in first column show the distribution by labour force status last period of those women gaining a vocational level 1 qualification between the two dates. The numbers in the main body of the table are row percentages, showing the percentage this period in each labour force state, by labour force status last period, for all those women who have acquired a vocational level 1 qualification between the two dates. The numbers in square brackets show the equivalent transitions for those women who have *not* acquired a vocational level 1 qualification between the two dates.

Table 18: Determinants of Being in Work This Period, if Not in Work Last Period, by Highest School Qualification, 1996-2002, Probit Estimates

	No qualifications	Low grade lower secondary qualifications	High grade lower secondary qualifications	Upper secondary qualifications
No Random Effects				
Gained vocational level 1	0.288 (0.064)**	0.227 (0.053)**	0.266 (0.067)**	0.054 (0.080)
	[0.062]	[0.065]	[0.101]	[0.021]
Gained vocational level 2	0.673 (0.084)**	0.248 (0.053)**	-0.041 (0.077)	0.037 (0.131)
	[0.176]	[0.072]	[-0.015]	[0.015]
Gained vocational level 3	0.473 (0.155)**	0.459 (0.081)**	0.348 (0.085)**	-0.054 (0.130)
	[0.114]	[0.143]	[0.134]	[-0.021]
Gained above level 3	0.892 (0.174)**	0.581 (0.160)**	0.830 (0.132)**	0.101 (0.054)
	[0.255]	[0.188]	[0.322]	[0.040]
Random Effects				
Gained vocational level 1	0.336 (0.089)**	0.255 (0.065)**	0.271 (0.089)**	0.064 (0.102)
Gained vocational level 2	0.852 (0.118)**	0.239 (0.064)**	-0.021 (0.101)	0.038 (0.165)
Gained vocational level 3	0.565 (0.214)**	0.504 (0.098)**	0.367 (0.113)**	-0.059 (0.164)
Gained above level 3	0.997 (0.242)**	0.584 (0.194)**	0.855 (0.173)**	0.008 (0.069)
Number of observations	25830	24699	14178	13444

Robust standard errors in parentheses. Marginal effects in square brackets. * coefficient significant at 5%; ** coefficient significant at 1%. Equations also control for region of residence, gender, age ethnicity and year. Data: Labour Force Survey.

Table 19: Determinants of an Increase in Occupational Level, if in Work Last Period, by Highest School Qualification, 1996-2002, Probit Estimates

	No qualifications	Low grade lower secondary qualifications	High grade lower secondary qualifications	Upper secondary qualifications
No Random Effects				
Gained vocational level 1	0.220 (0.077)**	0.189 (0.053)**	0.131 (0.063)*	0.041 (0.069)
	[0.016]	[0.016]	[0.011]	[0.004]
Gained vocational level 2	0.197 (0.094)*	0.167 (0.051)**	0.342 (0.059)**	0.060 (0.104)
	[0.014]	[0.014]	[0.036]	[0.005]
Gained vocational level 3	-0.073 (0.162)	0.233 (0.059)**	0.284 (0.058)**	0.118 (0.099)
	[-0.004]	[0.020]	[0.028]	[0.011]
Gained above level 3	0.461 (0.177)**	0.494 (0.120)**	0.561 (0.092)**	0.510 (0.065)**
	[0.044]	[0.055]	[0.071]	[0.067]
Number of observations	32850	69762	58121	73258

Robust standard errors in parentheses. Marginal effects in square brackets. * coefficient significant at 5%; ** coefficient significant at 1%. Equations also control for region of residence, gender, age, ethnicity and year. Data: Labour Force Survey.

References

McIntosh, S. (2002) 'Further Analysis of the Returns to Academic and Vocational Qualifications', DfES Research Report 370.

Snijders, T. and Bosker, R. (1999) *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*, SAGE Publications:London.

West, J. and Steedman, H. (2003) 'Finding Our Way: Vocational Education in England', Centre for Economic Performance, London School of Economics, Occasional Paper 18.

CENTRE FOR ECONOMIC PERFORMANCE
Recent Discussion Papers

620	David Marsden	The 'Network Economy' and Models of the Employment Contract: Psychological, Economic and Legal
619	Alan Manning	Instrumental Variables for Binary Treatments with Heterogeneous Treatment Effects: A Simple Exposition
618	Mari Kangasniemi L. Alan Winters Simon Commander	Is the Medical Brain Drain Beneficial? Evidence from Overseas Doctors in the UK
617	Vicente Cuñat Maria Guadalupe	Executive Compensation and Product Market Competition
616	James Harrigan Anthony J. Venables	Timelines, Trade and Agglomeration
615	Howard Gospel Paul Willman	Comparatively Open: Statutory Information Disclosure for Consultation and Bargaining in Germany, France and the UK
614	Andrew B. Bernard Stephen Redding Peter K. Schott Helen Simpson	Relative Wage Variation and Industry Location
613	David Marsden	Unions and Procedural Justice: An Alternative to the Common Rule
612	David G. Blanchflower Alex Bryson	The Union Wage Premium in the US and the UK
611	Stephen Gibbons Stephen Machin	Valuing Rail Access Using Transport Innovation
610	Johannes Hörner L.Rachel Ngai Claudia Olivetti	Public Enterprises and Labor Market Performance

609	Nikolaus Wolf	Endowments, Market Potential, and Industrial Location: Evidence from Interwar Poland (1918-1939)
608	Ellen E. Meade David Stasavage	Publicity of Debate and the Incentive to Dissent: Evidence from the US Federal Reserve
607	Ghazala Azmat Maia Güell Alan Manning	Gender Gaps in Unemployment Rates in OECD Countries
606	Henry G. Overman L. Alan Winters	The Geography of UK International Trade
605	Stephen Machin Stephen Wood	Looking for HRM/Union Substitution: Evidence from British Workplaces
604	Maarten Goos Alan Manning	Lousy and Lovely Jobs: the Rising Polarization of Work in Britain
603	Nan-Kuang Chen Hsiao-Lei Chu	Collateral Value and Forbearance Lending
602	Ricardo Peccei Helen Bewley Howard Gospel Paul Willman	Is it Good To Talk? Information Disclosure and Organisational Performance in the UK Incorporating evidence submitted on the DTI discussion paper 'High Performance Workplaces – Informing and Consulting Employees'
601	Andy Charlwood	The Anatomy of Union Decline in Britain 1990-1998
600	Christopher A. Pissarides	Unemployment in Britain: A European Success Story
599	Stephen Bond Dietmar Harhoff John Van Reenen	Corporate R&D and Productivity in Germany and the United Kingdom

The Centre for Economic Performance Publications Unit
Tel 020 7955 7673 Fax 020 7955 7595 Email info@cep.lse.ac.uk
Web site http://cep.lse.ac.uk