

NBER WORKING PAPERS SERIES

TRAINING AT WORK: A COMPARISON OF U.S. AND BRITISH YOUTHS

David G. Blanchflower

Lisa M. Lynch

Working Paper No. 4037

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
March 1992

Preliminary draft - do not quote without permission of the authors. Comments welcomed. Valuable research assistance was provided by Matthew Downer and Ken Chay. This paper has been prepared for the NBER/CEP conference on **International Comparisons of Private Sector Training**, in London, England, December 16-17, 1991. Helpful comments have been provided by Peter Elias and participants of seminars at Carnegie Mellon, MIT, and Williams College. This paper is part of NBER's research program in Labor Studies. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

TRAINING AT WORK: A COMPARISON OF U.S. AND BRITISH YOUTHS

ABSTRACT

This paper compares and contrasts the structure of post school training for young non-university graduates in Britain and the United States. We utilize two unique longitudinal surveys in these countries on young people to examine four issues: the extent of post school training in Britain and the U.S. and the wage gains associated with it; the link between formal training and further qualifications in Britain and the return to this on wages; differentials in the training experience by gender in the two countries; and the possible implications for skill development in Britain of dismantling significant elements of the traditional apprenticeship system. Our principal findings are that non-college graduates in Britain receive much more post school training than similar youths in the United States. This training is also linked with higher national recognized qualifications. The rates of return to post school training in both countries is high, especially in the United States. The higher rates of return to training in the U.S. is consistent with underinvestment in training in the U.S.. When the sample is divided by gender, however, women in the U.S. receive more training than their British counterparts and their wages increase by a greater amount. As Britain has replaced the traditional apprenticeship system with a government-led program called Youth Training more women seem to be receiving training after school. However, far fewer young people are obtaining qualifications after their training.

David Blanchflower
Department of Economics
Dartmouth College
Hanover, NH 03755
and NBER

Lisa M. Lynch
M.I.T.
E52-563
50 Memorial Drive
Cambridge, MA 02139
and NBER

1. Introduction

Recent initiatives such as *Apprenticeship 2000* and Department of Labor reports such as Work-Based Learning (1987) have urged a reexamination of apprenticeship training in the United States in order to bridge the skill needs of non-college bound youths. Much of this renewed focus has been inspired by the successful experience of apprenticeships in Germany. While there is much to learn from the German experience, many of the supporting structures of the apprenticeship programs in Germany will be difficult to replicate in the United States (see Soskice (this volume) for a review of these structures). These structures include the long term relationships between banks and firms, the greater link between schools and post-school training, and the influence of local chambers of commerce on the number of apprenticeships offered. Therefore, an examination of an apprenticeship program in a country which has an institutional structure closer to that in the United States would be informative.

Such a comparison can be made with apprenticeship schemes in Great Britain in the 1970s. In 1964, Industrial Training Boards, ITBs, were created in Britain to promote the skill development of the workforce. In particular, these ITBs could impose levies on employers to raise training funds to support an extensive apprenticeship program and there were additional funds provided by the government. The ITBs also developed standards and structures for these apprenticeships. Most programs involved training on-the-job plus either a day release program, block release program, or both. In addition, over 90% of these release programs were undertaken at local colleges. This link between on-the-job training and the schools extended in other directions as well. In particular, many apprentices would take nationally recognized exams, during or at the completion of their training to obtain qualifications beyond the formal apprenticeship.

There were problems associated with the apprenticeships schemes in Britain, especially when compared to the German experience. Studies by Prais and Wagner (1983) and Steedman and Wagner (1987, 1989) documented in detail the differences in content

and duration of training across apprenticeships in Germany and Britain. For example, training was more firm specific in Britain than in Germany, and apprenticeships were not created in new growth industries such as computers. In addition, with the exception of hairdressing, women had much more difficulty in getting an apprenticeship than males. Nevertheless, we will argue that the program was relatively successful in training school leavers in Britain, especially for males.

In the 1980s the ITBs were dismantled by the Thatcher government and the government ceased to subsidize apprenticeships. Apprenticeships in Britain have been rapidly replaced by a government-led Youth Training Scheme ⁽¹⁾ which is administered at the local level by Training and Enterprise Councils (TECs) (see U.K. Department of Employment, 1988). The structure of these TECs is based in part on the U.S. experience with Private Industry Councils, PICs. In particular, they are voluntary organizations and they are local-based rather than industry-based. The TECs are not able to levy fees on local employers as the ITBs were and therefore depend upon voluntary contributions by employers and government funds for training. This has resulted in problems with the TECs being under-funded.

All young people who are not in school and are not employed between the ages of 16-18 must participate in Youth Training, YT, in order to receive any benefit while not working. One consequence of YT has been the virtual abolition of youth 'unemployment' in Britain for those aged 16-18. Work by Lynch (1985) on British school leaver unemployment in the early 1980's indicated that there seemed to be a long run cost (as measured by negative duration dependence in re-employment probabilities) of early spells of unemployment on subsequent labor market experience. Therefore, YT appears to be a substantial improvement over having 16 year old school leavers unemployed for their first years in the labor market. However, YT seems to have been introduced with limited empirical analysis of the impact on youths in Britain of the traditional apprenticeship and employer provided training programs that they replaced.

Over the last decade the number of employer supported apprenticeships in Britain has declined substantially. Estimates of the total number of apprentices derived using self-assessment from a sample of individuals in the Labour Force Surveys suggest a decline from 367,000 apprentices in 1979 to 318,000 in 1986: in manufacturing the numbers were 154,000 in 1979 and 106,000 in 1986. There is some discrepancy in the estimates of the number of apprenticeships in this period depending on whether individual or firm level data is used. For example, in 1979, employers in manufacturing reported that there were 155,000 apprentices while surveys of individuals led to an estimate of 154,000 apprenticeships. However, in 1986 employers reported only 61,800 apprentices while the estimate obtained using individual responses was 106,000. This discrepancy has arisen because participants on YTS report that they are undertaking an apprenticeship even though the companies where they are placed do not classify them in the same way. Nevertheless, given the concentration of apprenticeships in manufacturing we would have expected some decline in their number (as reported by either individuals or firms), independent of the actions by the British government in the 1980s. Manufacturing employment collapsed from 7,113,000 in 1979 (31.5% of all employees) to 5,138,000 in 1986 (24.6% of all employees) and to 4,872,000 in March 1991 (22.3% of employees) ⁽²⁾. The decline in the number of apprentices, however, was accelerated by the government's decision to shift expenditures and support from apprenticeships to Youth Training.

This paper compares and contrasts the structure of post school training for young non-university graduates in Britain and the United States. We are able to utilize two unique and broadly comparable longitudinal data series on young people -- the U.S. National Longitudinal Survey Youth Cohort (NLSY), and the British National Child Development Survey (NCDS). In addition, we make use of two large individual data files -- the 1981 and 1989 Labour Force Surveys -- to determine how the labor market in the UK changed during the 1980s. We use these data to examine the early labor market experiences of young people as they make the transition from school to work.

There are two main reasons why we have used cross country comparisons to examine the issue of youth training. First, given that there is a debate in the U.S. about the possible expansion of apprenticeships, we hope to inform that debate by comparing and contrasting the US system with a very different apprenticeship system that operated in the UK in the 1970s. In particular, apprenticeships in the UK tended to be of longer duration, and were usually accompanied by classroom training and some kind of nationally recognized qualification. Second, the apprenticeship system in the UK is in a process of evolution and in its place are emerging a series of government funded training schemes. Unfortunately, these schemes do not appear to be as closely linked to nationally recognised qualifications as the traditional apprenticeships were. In addition, in evaluating the success of these new programs in Britain, it is important to have empirical evidence on the impact of the traditional apprenticeship schemes they have replaced.

In the remainder of the paper we focus on four issues: the extent of post-school training in Great Britain and the US and the wage gains associated with it; the link between formal training and further qualifications in Britain and the return to this on wages; differentials in the training experience by gender in the two countries; and the possible implications for skill development in Britain of dismantling significant elements of the traditional apprenticeship system.

In Section 2 of the paper we provide details of the two longitudinal data files used in our empirical analysis and report on previous empirical work in the area. In Section 3 we report on the extent of coverage of training in the two countries. We also provide information for the UK on how training has changed in the 1980s using data from the 1981 and 1989 Labour Force Surveys. Section 4 provides a series of estimates of the wage gains associated with training derived from earnings equations and earnings growth equations for both Britain and the U.S.. Section 5 reports our conclusions.

2. The Empirical Framework

There have been relatively few empirical studies in the United States which have examined the extent of private sector training in general, or more specifically, the skill formation process of young workers once they leave school. This is especially true for young workers who are not college graduates. This limited analysis has been due primarily to the lack of detailed information on post school training and the lack of matching detailed employment histories of workers. Recent exceptions to this include Brown (1989), Gritz (1988), Lynch (1991, 1992), Lillard and Tan (1986), Mincer (1983, 1988), and Pergamit and Shack-Marquez (1986). Only the papers by Gritz and Lynch use recent data from the NLSY on young people in the 1980s. The primary findings of these studies on U.S. youths is that most private sector training is obtained from one of three sources -- company provided on-the-job training, company or individual funded off-the-job training from 'for-profit' proprietary vocational and technical institutions, and apprenticeships. College graduates, especially those in technical, managerial and professional occupations are the most likely to receive company provided training. Formal training for non-college graduates takes the form primarily of off-the-job training from 'for profit' proprietary institutions. There appear to be significant wage gains associated with private sector training, however, company provided training does not appear to be easily portable from employer to employer for non-college graduates (see Lynch (1992)). Finally, company provided training increases the total amount of time a young worker remains with an employer, and this is especially true for females.

There have also been relatively few studies in Britain of the extent of post school training. Again, this is chiefly a function of the lack of appropriate data sources to examine this issue. Exceptions include Baker (1991), Dolton, Makepeace, and Treble (this volume), Greenhalgh and Stewart (1987), Rigg (1989), Booth (1990a, 1990b), Green (1991), Payne (1991), and Greenhalgh and Mavrotas (1991a,b). Most of these studies refer to either one-time employer surveys of training, or summary findings from the Labour Force Survey or General Household Survey in the 1980s of the patterns of training. With

the exception of the papers by Baker, and Dolton et. al. there have been no studies using longitudinal data of the extent and rates of return to various forms of post school training in Britain. The paper by Baker uses an empirical framework proposed by Lynch (1991b) and data from the NCDS. Unfortunately, she only examines the returns to training for males in Britain and, as we will discuss later, ignores an important dimension of training in Britain - the link with formal qualifications. Dolton et. al. (this volume) present preliminary findings of the returns to YT schemes for youths in Britain in the 1980s. While few youths in their sample have completed their training programs since they are only able to examine the labor market experience of youths in the first two to three years after leaving school, their findings suggest there have been large changes in the delivery and impact of training in Britain in the 1980s.

In order to examine the differences across Britain and the United States in the skills development of young workers we utilize two unique micro longitudinal data sets -- the National Longitudinal Survey Youth Cohort, NLSY for the United States and the National Child Development Survey, NCDS, for Great Britain. The NLSY is an annual survey of 12,686 males and females in the United States who were 14 to 21 years of age at the end of 1978. These respondents have been interviewed every year since then on all aspects of their labor market experience. The response rate has been high throughout the survey with over 90 percent of the original sample still responding in 1988. The data on types of training received (other than governmental or schooling) are some of the most comprehensive data available in the U.S. on private sector training. Respondents are asked about what types of training they had received over the survey year (up to 3 spells) and the dates of training periods by source. Potential sources of training include business college, nurses programs, apprenticeships, vocational and technical institutes, barber or beauty schools, correspondence courses, and company-provided training. These training spells can be matched with detailed employment histories and schooling histories.

The training data are divided into the variables: company training (ON-JT); apprenticeships (APT); and training obtained from for-profit proprietary institutions outside the firm (OFF-JT). The variable OFF-JT includes courses obtained from business courses, barber or beauty school, nurses programs, vocational and technical institutes, and correspondence courses. Our measure of off-the-job training may include both individual financed and firm financed training. However, only about one quarter of those receiving off-the-job training had the training costs paid for by their employer. All of these types of training programs are independent from training received in a formal regular schooling program. Unfortunately, except in the 1988 survey, the training questions refer to only those spells of training that lasted at least 4 weeks (they do not have to be full-time programs). This suggests that the NLSY measure of training is more likely to capture formal training spells than informal on-the-job training.

For the wage analysis presented in this paper a subsample of the 12,686 respondents has been selected. We have excluded all of the 1280 respondents in the military subsample from the analysis. For comparison with the British data we have created a sample from the NLSY that pools all those youths who were 18 in 1979, 18 in 1980, or 18 in 1981. We then follow these youths until they reach the age of 25. Since we are primarily interested in the training process of non college bound youths we exclude anyone who has completed a four year college or university degree from our sample. We also exclude anyone who does not have a wage observation at some time during the year they are 25 years of age, or who is self-employed. These sample restrictions yield a final sample of 2,275 for the NLSY.

For our analysis of British youths we use the National Child Development Study, NCDS. This longitudinal survey takes as its subjects all those living in Great Britain who were born between the 3rd and the 9th of March, 1958. The survey has been sponsored by five Government Departments - the Departments of Health and Social Security (DHSS), Education and Science (DES), Employment (DE), Environment (DOE), and the Manpower

Services Commission (MSC) (which has now been abolished). Major surveys of the subjects were carried out in 1965 (NCDS1), 1969 (NCDS2), 1974 (NCDS3), and 1981 (NCDS4). In addition to those born during the first week of March 1958, all immigrants who arrived in Britain after 1958 and before 1974 and had been born during that week were added to the sample. Finally, information was also solicited from the respondents' parents, teachers, and doctors. The size of the original cohort was 18,559.

Contact has been maintained with a relatively high number of the original cohort. High response rates to the first three sweeps of the survey were achieved primarily because of the cooperation of the public school system. However, it proved more difficult to obtain responses when the cohort reached the age of twenty three, when many had left their original family home and started families of their own. The 1981 survey, which took place between August 1981 and March 1982 when the respondents were 23, contained a total of 12,537 interviewees or approximately 76 percent of the original target sample. Elias and Blanchflower (1988) provide evidence of response bias: individuals with the lowest levels of attainment on the early ability tests were most likely not to respond to subsequent sweeps of the survey. The extent to which our estimates are affected by this sample attrition is the subject of current research. The sample used in the wage analysis excludes all those who were self-employed, all graduates of universities or polytechnics, and anyone not employed at the age of 23 in 1981. These restrictions, plus missing information on some of the ability tests taken by these youths, yield a final sample of 5,950, or just over two thirds of those in employment in 1981 ⁽³⁾.

There were a variety of training sources available for British youths during the 1970s. These included primarily apprenticeships, and company sponsored training. The company training programs were typically split between colleges and employer training centres and were usually done on a full time basis. In contrast, most apprenticeships provided a mix of training at the work site plus day release programs run at local colleges.

During this time period in Britain the use of non-employer sponsored off-the-job training programs, of the US type discussed above, was quite limited.

3. The Extent of Training in the U.S. and Britain

Before comparing the extent of training in these two countries, and the wage gains associated with these types of training, it is important to establish the similarities or dissimilarities between the two samples of youths. Tables 1 and 2 present a summary of the labour market status of a comparable group of youths in the NCDS and the NLSY. The British NCDS numbers in Table 1 show the percentage of the sample employed, unemployed, and out of the labour force (OLF) each year from the age of 16-19 and then again at age 23. The remaining individuals are in full-time education, e.g. 37% at age 16. For those in employment we also show the percentage engaged in training or apprenticeships. In 1974, when the NCDS cohort was sixteen years old, approximately 59 percent of the British youths were employed, two percent were unemployed, and two percent were out of the labour force. At that time more than 40% of male employees were on an apprenticeship compared with only 8% of employed females. A further 6% of male employees and 4% of female employees were receiving some type of company training from their employers. By the age of 23 virtually all individuals had left their apprenticeships.

Table 2 presents comparable figures to those in Table 1 using data from the U.S. NLSY. In this table we follow a subsample of the NLSY who were 18 years of age in 1981 until they are 25 years old in 1988. Given the differences in school leaving patterns across the countries we believe that the appropriate comparison group to 16 year old school leavers in Britain is 18 year olds in the U.S.. The overall employment rate at age twenty five is very similar in the NLSY in 1988 to the NCDS in 1981 - approximately three quarters of individuals in the cohort. One major difference between the two countries is the much higher proportion of males who were out of the labor force in the US and the higher proportion of females in Britain who were out of the labor force. However, even though

these two samples examine quite different periods of time, it does appear that using crude measures of labour market status there are many similarities across these two samples. The most obvious differences between the two countries is in the extent of coverage of apprenticeships, which are relatively rare in the US, but were widespread in Great Britain, primarily among young men.

Table 3 shows the percentage in both the British NCDS sample and U.S. NLSY sample who had ever received training by gender and type of training⁽⁴⁾. Here we see evidence of the sharp differences in the extent and nature of training across the two countries. For example, 52% of individuals in Great Britain had received some training by age 23 compared with 35% for the US when respondents were 25. When the sample is divided by gender the differences across the two countries are even more striking. Approximately 65 percent of British males had received some form of training by the age of 23 compared to 45 percent in the U.S. at age 25. However, young females in the U.S. are more likely to have received additional training after school than females in Britain.

An examination of durations of training spells again provides some interesting contrasts between the two countries. In Table 4 we see that apprenticeships in Britain on average took 43 months for males to complete and 34 months for females. A few apprenticeships lasted as long as five years. Training courses obtained while employed, on the other hand, were typically much shorter in duration with well over half of these courses completed in under six months. While the numbers using the NLSY on youths in the United States are not strictly comparable to the British data (they include both completed and uncompleted spells), it does appear that on average the duration of training from apprenticeships is much shorter in the United States. However, the duration of off-the-job training in the U.S. seems similar to or even longer than the duration of other training courses in Britain.

The dimension of training in Britain that differs the most from that in the United States is the link between training and further qualifications. When youths complete

apprenticeships or firm provided training in Britain they have the option to take examinations that give them formal qualifications. This is rarely true for on-the-job training or off-the-job training in the United States. Approximately nine out of ten individuals who completed apprenticeships in the NCDS sample also obtained some kind of qualification during or at the end of their program. Table 5 shows that two major types of qualifications account for nearly 60% of all those obtained by apprentices -- Cities & Guilds - Craft, and Cities and Guilds - Advanced. These are qualifications that are typically taken by craft workers. The remaining qualifications are dispersed across a wide range of different types. A higher proportion of British females did not receive a qualification after their apprenticeships than was the case for men. Qualifications obtained from training courses are also reported in part A2 of the table. Individuals often progressed in a sequence from one training course to another (e.g. from an OND to an HND) and then on to some further professional qualification. Approximately fifty percent of those who participated in a training course other than an apprenticeship received no further qualification while the other fifty percent received a wide range of qualifications. Females were generally more likely to have obtained a qualification than men. Typing/secretarial qualifications (e.g. Royal Society of Arts Stages 1, 2 and 3) and nursing qualifications are especially important for females.

Table 5 also indicates that there is a relationship between formal schooling and training in the United States. In particular, those who go on to some additional schooling after high school are more likely to participate in some training (especially off-the-job training). In addition, those who complete high school are much more likely to receive company provided training than those who drop out. It could be argued that while a lower percentage in the United States have post school training, a much higher percentage go on to post high school education than in Britain. Therefore, if you included the 20 percent of our U.S. sample that has post high school education in training, the training differential in Table 3 between the U.S. and Britain would go away. However, approximately 15 percent

of our British sample of non-university graduates stay on in school after 16, so they should be included in training as well. Nevertheless, in all of the following empirical work we will report estimates on dummy variables for completing high school and completing some post high school education in the equations for the United States.

It is possible to compare the distribution of youth employment across industries in the two countries and more specifically to see which sectors have higher concentrations of training. We find that apprenticeships in Britain in 1981 appear to be concentrated in the manufacturing sector, however, forty three percent of all male apprentices are not in the manufacturing or construction sector, and over eighty percent of all female apprentices in Britain are not in these two sectors. Therefore, apprenticeships in Britain in the 1970s did not occur just in the manufacturing sector. This suggests that their decline in the 1980s was not simply a function of sectoral decline. In the United States, it is interesting to note that over fifty percent of females who received company provided on-the-job training were in wholesale and retail trade, and finance, insurance, and real estate. In contrast, fifty three percent of males who received company provided on-the-job training were in construction, manufacturing, and transportation, communication and utilities.

In order to illustrate the extent to which the UK labour market changed since 1981 we have examined the early labour market experiences of a group of young people over the period 1981-1989. To do this we have used two large scale nationally representative surveys -- the 1981 and 1989 UK Labour Force Surveys ⁽⁵⁾ -- to construct three artificial age cohorts (16-19, 20-23, 24-27) ⁽⁶⁾. Our main purpose in doing this is to compare the labour market experiences of the 16-19 cohort over the eight year period 1981-1989 with the experiences of our NCDS respondents over the preceding seven year period, 1974-1981. Table 6 is thus directly comparable to Table 2 where we followed NCDS respondents between the ages of 16 and 23. In Table 6 we observe the 16-19 cohort first in 1981 and then again in 1989 when they become the 24-27 year old category. In 1981 and 1989 we are able to report on the proportion of the employed who are doing an

apprenticeship. In 1989 we also report the percentage of the employed who were receiving company provided training: unfortunately such information is not available in 1981. The remaining individuals in each age cohort are out of the labour force (percentages not reported). The overall unemployment rate in 1989 was lower than it was in 1981 (7.6% and 9.4% respectively). The proportion of all 16-19 year olds who were unemployed in 1989 was approximately half the 1981 level (7.7% and 14.9% respectively), however, over ten percent of all 16-19 year olds in 1989 were on a government scheme such as YT (7). Over the period in question there was also a decline in the percentage of young people in full-time education (30.6% in 1981 compared with 24.4% in 1989).

Table 6 shows the extent of the decline in apprenticeships over the 1980s. In 1981, 34.3% of employed males (16-19) were in an apprenticeship at the date of interview. By 1989 this had fallen to 21.3% of the employed aged 16-19. In the case of females the decline was much smaller, but started from a significantly lower base. An additional group of individuals reported that they were doing an 'apprenticeship' while on a government scheme (32.3% of males and 15% of females on such schemes). These individuals are not on employer sponsored apprenticeships and do not have a contract of employment with the company where they have a YT placement. Consequently it does not seem to be appropriate to include them in our count of apprentices. Moreover, the companies that use the trainees do not appear to classify them as apprentices - hence the discrepancy between individual and employer based estimates of the numbers of apprentices in the UK in the 1980s referred to above. Further, these YT schemes normally last for a maximum of only two years compared with an average duration of a completed apprenticeship in NCDS of around 43 months for men and 34 months for women (Table 4).

It does appear that the *decline* in apprenticeships has created a gap in the training needs of companies that has been filled by an *increase* in other types of post-school training (8). This increase is especially noticeable in the case of females. For example, in 1976 when the NCDS cohort was 18, 9.5% of females had received some training with

their current employer (see Table 1). In contrast, in the 1989 LFS, we find that 22.4% of 16-19 year old females had had some form of company training. Since one of the criticisms of the traditional apprenticeship schemes in the 1970s was the exclusion of women this is an encouraging sign.

Table 7 illustrates the coverage of apprenticeships across three cohorts of individuals -- 16-19 years, 20-23 years and 24-27 years of age. It provides information on those individuals who had completed or were doing an apprenticeship at the date of interview. In 1989 we also report the proportion of individuals on apprenticeship programs who were YT participants. The decline in apprenticeships is most marked for the cohort of males who were 20-23 in 1989. In 1981 28.5% of men in this cohort had either completed or were doing an apprenticeship: by 1989 this number had fallen to 18.8%. In contrast, there was a slight increase in the proportion of women who had completed an apprenticeship -- presumably pursued while on a government scheme.

Table 8 reports on the changes over the 1980s in the extent to which qualifications accompanied apprenticeships. The base is any individual who had completed an apprenticeship. For all workers, and for males and females separately, we report the proportion of individuals in 1981 and 1989 who received no qualifications alongside their apprenticeship (columns 1, 3 and 5)). In addition, we report on the proportion of individuals who did receive a qualification who obtained any type of City and Guild qualification (columns 2, 4 and 6). Even when we condition on the smaller number of completed apprenticeships in 1989, nearly twice as many individuals in 1981 obtained a qualification along with their apprenticeship than was the case in 1989. This was true both for men and women. For example, in 1981 22.5% of 16-19 year olds did not obtain any other qualification apart from the apprenticeship itself, compared with 47.9% in 1989. Of those individuals who did obtain a qualification, a higher proportion received City & Guilds in 1989 than was the case in 1981. The change in the mixture of qualifications is most pronounced in the case of females.

4. Comparative Wage Gains to Training

We have seen that there are distinct differences in the extent of post school training for young workers in Britain and the United States. In this section, we discuss whether the wage gains associated with the various types of training differ across the two countries. In order to provide econometric evidence on this issue we estimated log hourly earnings for the two countries. Our aim here has been to try and estimate common specifications across both countries, subject to data limitations and differences in both institutional structures and industry and occupational classification systems. Information is available in both the NCDS and the NLSY on gender, marital status, disabled status, the presence of children, experience, part-time work, firm/establishment size, months of tenure in the current job, race, union status, local unemployment conditions, training and qualifications, ability test scores, number of jobs since leaving school as well as industry and region. In addition, a number of country specific controls were also included such as the month of interview in the case of Britain and the year the individual reached 18 for the U.S.

Subject to these cross country differences, Tables 9 and 10 present results from a standard log earnings specification for Great Britain and the United States, respectively. In Table 9 we find that in Britain in 1981, ever having received training with the individual's current employer (outside of an apprenticeship) raised hourly earnings on average by 2 percent, *ceteris paribus*⁽⁹⁾. This figure is roughly similar across males and females. For those who completed an apprenticeship, earnings were found to be approximately 5% higher in an equation which also included a set of highest qualification dummies⁽¹⁰⁾. However, the wage gain to apprenticeships is even higher than this when you include the gain associated with additional qualifications received alongside apprenticeship⁽¹¹⁾. For example, for both men and women simply obtaining an apprenticeship raised hourly earnings by approximately 2%. In the case of males, however, a City and Guild Craft Certificate conveyed a gain of a further 2% while a City and Guild Advanced Certificate conveyed a further 5 percent. We could find no evidence

for any significant positive certification effects in the case of females. We do find evidence of youths sharing the costs of their training with their employer. If a British male youth was in an apprenticeship at the date of interview in 1981, their pay was approximately 10% lower, *ceteris paribus*, and nearly 20% lower in the case of females. It should be noted, however, that these effects are poorly defined (t-statistics = 1.19 and 1.44 respectively).

In Table 10 we see that in the United States in 1988, spells of training provided by previous employers had no impact on current wages, while having had some company training with the current employer (both completed and uncompleted) increased wages by 8 percent (although the significance of this is marginal). Having received some form of off-the-job training in the past seemed to raise wages by around 4 percent, with no difference across males and females. Having been an apprentice raised earnings by around 20 percent for males but had no effect for females in the U.S.. If post high school education is an important source of training for young workers we would expect to see significant effects in the wage equation. However, post high school education seems to have no effect on the wages of males but it does seem to have a large effect for females.

There are a number of remarkable similarities in the coefficients on many of the variables we have estimated in the two countries. For some variables such as marital status, branch, and firm size the coefficients were almost identical. However, there are some differences. In both countries there is evidence of a downward sloping wage curve (12), although the unemployment elasticity of pay is greater in absolute terms in the US than it is in the UK (-.06 and -.2 respectively). The union effect is stronger in the United States than in Britain (14% vs. 7%) even though the percentage unionized is much lower in the U.S.. Apart from these last two coefficients the equations are remarkably similar. This suggests to us that the underlying labor markets are not that dissimilar so that examining the differences in training across the two countries can be informative.

Before we reach any final conclusions on training in Britain and the U.S. it is important to note that a common problem in all studies of the returns to training is the issue

of bias in the training estimates due to self-selection. Employers are more likely to place in training programs those individuals who have some unobservable characteristics, such as 'trainability'. In addition, individuals who are more motivated may be more likely pursue off-the-job training or apprenticeship programs. In both cases the estimated coefficients on the various training measures will be biased upwards. A variety of ways to try to address this issue are described in Heckman (1979) and Heckman and Robb (1986). We follow a simple strategy where we assume an individual's wage at time t can be expressed as:

$$\log(w_{it}) = Z'_{it}b + f_i + e_{it} \quad (1)$$

where Z' is a vector of variables affecting wages that vary for each individual over time, and f_i are all the characteristics that are individual specific but time invariant. By differencing individuals' wages over time all time invariant effects (both observed and unobserved) drop out, and the training coefficients may be estimated without bias.

In Tables 11 and 12 we present estimates from a fixed effect model which assumes that self-selection varies only across individuals and not over time for the individual. In the NCDS it is difficult to obtain a continuous wage history of individuals and a corresponding history of factors such as marital status, local unemployment rates, qualifications, training etc.. Therefore, we have used information on the weekly wages associated with the first job after leaving school: we then differenced that from wages in the 1981 interview when the individuals were 23. Hours of work were not reported for the first wage so we were forced to use the difference in real weekly wages between the first and the current job as the dependent variable in our wage change equation⁽¹³⁾. Because the first job could have occurred at any time over the seven year period between 1974 and 1981⁽¹⁴⁾ we have also included 7 year dummies to indicate the year in which the first job occurred.

As can be seen from Table 11, apprenticeships have a positive and significant effect on real wage growth in the case of men but no effect at all for women. In the case of men an apprenticeship alone increases wage growth between the first and the current job by nearly 15%. If that apprenticeship was accompanied by a City and Guild qualification, an ONC/OND or an HNC/HND, the coefficient is considerably higher. In the case of an apprenticeship with a City and Guild Operative qualification the wage gain rises to approximately 30%. Rates of return to apprenticeships, especially when accompanied by a qualification, are substantial. For example, in the case of men with an apprenticeship plus a City and Guild Operative qualification the coefficient of .2948 translates into a rate of return of 9.12% ⁽¹⁵⁾. If a depreciation rate is imposed at .05 the rate of return falls to 4.8% .

Other employer provided training which is not accompanied by a qualification appears to significantly *lower* female earnings by around 14%. There is also some evidence that the wage gains to training are greater if accompanied by qualifications. City and Guild Advanced qualifications for men and 'other qualifications' for women (mostly in nursing) have wage enhancing effects.

Since the time period covered between the first and current job in columns 1-3 varies between 1 and 7 years, we have also repeated this analysis on a group of respondents (64% of the sample) all of whom left school at the compulsory school leaving age of 16 in 1974 and whose first job was in that year ⁽¹⁶⁾. The results are qualitatively similar to those in column 1 with the exception that training accompanied by a City and Guild Craft qualification provides a substantial gain in earnings for this group. Also apprenticeships accompanied by either an ONC/OND or and HNC/HND provide an even higher gain in earnings than was found in column 1.

One potential criticism of the results reported in Table 11 is that the returns to apprenticeships and/or training simply reflect a selection process into union jobs. In Appendix Table A1 we re-estimate equation 1 in Table 11 separately for union and non-

union workers. We only have information on union status of the respondents at age 23, however, if apprenticeships provide entry to union jobs one would expect to observe a high correlation between union status at ages 16 and 23. It is quite clear that the wage gains associated with an apprenticeship exists for both the union and non-union sectors. Indeed, the earnings gains from having qualifications alongside an apprenticeship appear to be even higher in the non-union sector than in the union sector. In contrast there are little or no differences between the sectors in the gains associated with training courses, with or without qualifications. One possible explanation for the difference in the returns relating to apprenticeships could be that non-union employers use the qualifications to screen for the best applicants.

In Table 12 we report wage difference equations for the United States. The dependent variable here is the log of real weekly earnings at age 25 minus the log of real weekly earnings at age 20. Apprenticeships appear to convey substantial earnings gains for men: although the coefficient on this variable is also large for women (0.29), the estimate is not well determined. Young women seem to benefit from company training while young men have increased earnings growth from off-the-job training.

Calculations of rates of return to training suggest substantial returns to training for U.S. youths that are even higher than their British counterparts. This result is consistent with a finding of underinvestment in training in the United States. Apprentices in the U.S. seem to have a higher wage premium than their British counterparts, but when one includes the return associated with qualifications received alongside the apprenticeship in Great Britain, the gains look more similar. Finally, in both countries women appear to have lower returns to apprenticeships than men. Therefore, the primary difference across the two countries in post-school training seems to be that the incidence and duration of training in Britain is greater, especially for males, while the wage gains associated with training are similar or even higher in the United States. This implies that a larger number of young

workers and firms in Britain were benefiting from productivity enhancing training in the 1970s to the early 1980s than was the case in the United States.

5. Conclusions

This paper has attempted to show the extent of and returns to the training structures in place for youths in Great Britain in the 1970s relative to the training opportunities available to youths in the United States. We examined youth training in Britain in the 1970s and early 1980s in order to observe how a more formal apprenticeship and employer-led training program functioned in a country with institutional structures similar to those operating in the United States. This analysis will hopefully be useful to current discussions in the U.S. directed at revitalizing apprenticeship training.

Our principal findings are that non-college graduates in Britain received much more post school training than similar youths in the United States. This training was also linked with obtaining higher qualifications. The primary source of training in Britain in the 1970s, especially for males, was apprenticeships. This apprenticeship training may have been more limited than that provided to young apprentices in Germany, but it still offered substantial benefits in terms of the associated higher wages to those who undertook such a program. This return is even higher when one includes the returns associated with formal qualifications obtained during or at the completion of an apprenticeship. However, we could find no evidence of a positive rate of return to an apprenticeship for young women in Great Britain.

While it appears that there was much more formal post school training provided to youths in Britain than in the U.S., when the sample is divided by gender there are some interesting differences. In particular, women in the U.S. seem to receive more training than their counterparts in Britain and their wages seem to increase as much if not higher with this training.

There seems to be both good news and bad news associated with the Youth Training programs of the 1980s in Britain. The good news is that female school leavers

seem to be receiving much more training than was the case under the traditional training and apprenticeship system in the 1970s. The bad news is that fewer young people are obtaining qualifications from their training programs. The Youth Training Scheme has been recently renamed 'Youth Training' so that it would be viewed as part of the permanent training and education structure in Britain (rather than a temporary unemployment scheme). If YT is to deliver high quality training of a type that will service adequately the skill needs of firms, then certifying the skills acquired in YT may be useful for both firms and individuals. Nationally recognized qualifications appear to offer significant positive returns to those that possess them, particularly if they accompany an apprenticeship program. This is a lesson for the current policy discussion on expanding apprenticeships in the United States.

REFERENCES

- Baker, Meredith. (1991), "Returns to Training for British Males", mimeo, Flinders University, Australia, August.
- Blanchflower, David (1991), "Fear, Unemployment and Pay Flexibility', Economic Journal, 101, pp. 483-496.
- Blanchflower, David and Oswald, Andrew (1990), "The Wage Curve", Scandinavian Journal of Economics, 92, pp. 215-236.
- Blanchflower, David and Oswald, Andrew (1991), "International Wage Curves", paper presented to the NBER Conference on Differences and Changes in Wage Structures, September 20-21, London.
- Blanchflower, David, Oswald, Andrew and Garrett, Mario (1990), "Insider Power in Wage Determination", Economica, 57, pp. 143-170.
- Booth, Alison (1990a), "Earning and Learning: What Price Firm Specific Training?", mimeo, Birkbeck College, London.
- Booth, Alison (1990b), "Job-related Formal Training: Who Receives it and What is it Worth?", mimeo, Birkbeck College, London.
- Brown, James. (1989), "Why Do Wages Increase with Tenure?", American Economic Review, December, pp. 971-991.

- Dolton, Peter, Makepeace, Gerald and Treble, John. (1992), "Measuring the Effects of Training in the Youth Cohort Study", Chapter this volume.
- Elias, Peter and Blanchflower, David (1988), The Occupations, Earnings and Work Histories of Young Adults - Who Gets the Good Jobs?, Research Paper no. 68. London: Department of Employment.
- Green, Francis. (1991), "Sex Discrimination in Job-Related Training", British Journal of Industrial Relations, June.
- Greenhalgh, Christine and Stewart, Mark (1987), "The Effects and Determinants of Training" Oxford Bulletin of Economics and Statistics, pp. 171-190.
- Greenhalgh, Christine and Mavrotas, George (1991), "Workforce Training in the Thatcher Era - Market Forces and Market Failures", mimeo, University of Oxford.
- Greenhalgh, Christine and Mavrotas, George (1991), "Job Training, New Technology and Labour Turnover", mimeo, University of Oxford.
- Gritz, Mark (1988), "The Impact of Training on the Frequency and Duration of Employment", University of Washington.
- Heckman, James. (1979), "Sample Selection Bias as Specification Error", Econometrica, pp. 153-161.

- Heckman, James and Robb, Richard. (1986), "Alternative Identifying Assumptions in Econometric Models of Selection Bias", in Advances in Econometrics, JAI Press, pp. 243-287.
- Lillard, Lee and Tan, Hong. (1986), "Private Sector Training: Who Gets it and What Are its Effects?", Rand monograph R-3331-DOL/RC.
- Lynch, Lisa M. (1985). "State Dependency in Youth Unemployment: A Lost Generation?", Journal of Econometrics, pp. 71-84.
- Lynch, Lisa M. (1991), "The Role of Off-the-Job vs. On-the-Job Training for the Mobility of Women Workers", American Economic Review, May, pp.151-156.
- Lynch, Lisa M. (1992) "Private Sector Training and the Earnings of Young Workers", American Economic Review, March.
- Micklewright, John (1989), "Choice at Sixteen", Economica, 56, pp. 25-40.
- Mincer, Jacob. (1983), "Union Effects: Wages, Turnover, and Job Training", in Research in Labor Economics, pp. 217-252.
- Mincer, Jacob. (1988), "Job Training, Wage Growth and Labor Turnover", NBER working paper no 2090, August.
- Payne, Joan. (1991) "Women's Training Needs: The British Policy Gap", mimeo, University of Oxford, September.

- Pergamit, M. and Shack-Marquez, J. (1986), "Earnings and Different Types of Training", mimeo, BLS and Board of Governors, Federal Reserve.
- Prais, S. J. and Wagner, K. (1983). "Some Practical Aspects of Human Capital Investment: Training Standards in Five Occupations in Britain and Germany", National Institute Economic Review, no. 105, August.
- Rigg, Malcolm (1989), Training in Britain: Individuals' Perspectives, HMSO, London
- Steedman, H. and Wagner, K. (1987) "A Second Look at Productivity, Machinery, and Skills in Britain and Germany", National Institute Economic Review, no. 122, November.
- Steedman, H. and Wagner, K. (1989) "Productivity, Machinery and Skills: Clothing Manufacturing in Britain and Germany", National Institute Economic Review, no. 128, May.
- Soskice, David. (1992) "The German Training System: Reconciling Markets and Institutions", Chapter this volume.
- U.K. Department of Employment (1988), Employment for the 1990s. London: HMSO Books.
- U.S. Department of Labor. (1989), Work-Based Training: Training America's Workers. Washington: U.S. GPO.

Table 1. Labour Market Status, Great Britain, 1974-1981, NCDS.

1) <u>All workers</u>	Age				
	16	17	18	19	23
Employed	59.0	65.8	74.2	74.4	73.4
No training	67.5	69.5	72.7	78.2	94.0
On the job training	6.8	7.1	8.0	7.1	6.1
Apprenticeship	25.8	23.4	19.3	14.7	0.8
Government schemes	*	*	0.1	0.1	0.1
Unemployment	2.4	3.7	4.4	4.1	9.3
OLF	1.6	3.4	5.4	6.9	13.8
N	12458	12470	12440	12468	12422
2) <u>Males</u>					
Employed	62.7	70.2	78.1	79.9	82.8
No training	50.2	53.4	59.4	67.6	93.4
On the job training	6.2	6.7	7.2	6.4	6.4
Apprenticeship	43.5	39.9	33.4	26.0	1.1
Government schemes	-	*	*	0.1	0.1
Unemployment	2.8	3.7	4.6	4.3	12.2
OLF	0.7	0.8	1.4	1.1	1.8
N	6244	6241	6217	6245	6212
3) <u>Females</u>					
Employed	54.6	61.6	70.7	69.1	65.8
No training	88.3	87.5	87.0	90.3	95.3
On the job training	3.7	8.0	9.5	8.4	5.5
Apprenticeship	8.1	4.5	3.5	1.3	0.5
Government schemes	*	*	*	0.1	*
Unemployment	2.8	3.7	4.2	3.9	6.6
OLF	2.4	5.8	9.4	12.7	26.0
N	6214	6229	6223	6223	6210

Notes: employment status determined in the February prior to the group's birthdays. In the case of the final column, when the respondents were 23, this was evaluated in May 1981, close to the end of the interview period. * less than 0.05%

Source: NCDS tapes.

Table 2. Labour Market Status, United States, NLSY*

Year	1981	1982	1983	1984	1988
Age	18	19	20	21	25
All workers					
(N=1559)					
Employed	54.6	56.6	58.7	63.7	77.8
On The Job	1.7	1.4	2.0	2.1	3.8 (10.2)**
Off The Job	8.8	11.3	7.1	4.8	5.5 (5.9)
Apprenticeship	0.2	0.7	0.4	0.1	0.5 (0.9)
Unemployed	15.3	14.3	13.3	9.7	4.6
OLF	8.8	14.3	15.0	15.0	15.6
Males					
(N=785)					
Employed	56.5	58.0	60.0	64.2	84.1
On The Job	2.4	1.3	0.9	3.2	5.9 (12.9)
Off The Job	10.7	10.4	6.0	3.1	3.6 (4.3)
Apprenticeship	0.4	1.2	0.7	0.2	1.0 (1.5)
Unemployed	15.0	15.1	12.8	9.2	2.8
OLF	7.4	12.1	12.6	14.2	11.9
Females					
(N=774)					
Employed	52.7	55.1	57.3	63.3	71.5
On The Job	1.0	1.6	3.1	1.0	1.4 (7.1)
Off The Job	7.9	12.3	8.3	6.5	7.3 (7.7)
Apprenticeship	0.0	0.2	0.0	0.0	0.0 (0.3)
Unemployed	14.8	13.5	13.8	10.3	6.5
OLF	10.1	16.5	17.5	15.8	19.3

Note:

*These numbers reflect the primary activity of the respondents so that some of those employed or unemployed may also be in school in addition to those who report that they are in full time schooling.

**Training including spells less than four weeks in parentheses

Table 3. Training Coverage (%)

<u>Great Britain, NCDS</u>	All	Males	Females
Ever had any training	52	65	35
Ever started an apprenticeship	24	39	5
Ever started other training	33	34	30
N	9209	5179	4030

Note: Sample includes only those individuals employed at the survey date in 1981.

<u>United States, NLSY</u>	All	Males	Females
Ever had any training	35	33	36
Ever started an apprenticeship	3	4	1
Ever started on-the-job training	8	8	7
Ever started off-the-job training	28	25	31
N	2300	1221	1079

Note: the sample is composed of those individuals in employment aged 25 in 1988.

Table 4. Duration of Training

Great Britain, NCDSa) *Apprenticeships*

	Completed	Uncompleted
Males		
12 months or less	3 %	57 %
> 1 year but ≤ 2 years	5	23
> 2 years but ≤ 3 years	19	15
> 3 years but ≤ 4 years	52	5
> 4 years	21	-
Mean duration (months)	43.19	14.91
N	1340	411

Females

12 months or less	7 %	72 %
> 1 year but ≤ 2 years	16	18
> 2 years but ≤ 3 years	53	10
> 3 years but ≤ 4 years	16	-
> 4 years	8	-
Mean duration (months)	33.7	10.93
N	100	58

Base: individuals who had ever started an apprenticeship

b) *Training Courses*

	1st course	2nd course	3rd course
Up to 1 month	24%	34%	46%
1 - 6 months	28	27	30
> 6 but under 12 months	18	17	15
> 12 months	31	22	14
N	2852	1060	420

Note: apprenticeships are not counted here as a training course.

Base: Individuals who received at least one training course.

United States, NLSY (Average duration of training in months - completed and uncompleted spells of non-college graduates)

	All	Males	Females
Apprenticeship	16 months	19 months	10 months
Company provided training	7	8	6
Off-the-job training	10	11	10

Table 5. Percent with Qualifications (%)

A) Great Britain, NCDSA1) Apprentices

	All	Males	Females
Other technical qualifications	5.9	5.1	14.0
City & Guilds Operative	2.4	1.8	8.4
City & Guilds Craft	27.4	28.1	19.6
City & Guilds Advanced	31.5	33.9	5.6
City & Guilds FTC	6.2	6.7	0.7
ONC,OND,SNC,SND	2.8	2.8	2.8
Professional level 1	2.1	1.4	9.1
Other qualifications	9.0	9.6	5.5
None	12.7	10.6	34.5
N	1658	1515	143

Base: Individuals with an apprenticeship

A2) Training from other sources (first training course) (%)

	Males	Females
Other tech. qualifications	3.5	1.0
RSA Stage 1/2/3	0.3	9.6
City & Guilds Craft	4.3	1.9
City & Guilds Advanced	2.2	0.5
ONC,OND,SNC,SND	6.2	3.7
HNC,HND,SCOTS	2.1	0.4
TEC,BEC CERT,DIP	1.2	1.6
Professional level 1	2.9	2.6
Nursing	0.8	18.9
Other qualifications	22.5	16.3
None	54.0	43.5
N	1506	1131

Base: individuals who did at least one training courses.

B) United States, NLSY

	Males				Females			
	No training	OJT	OFFJT	APT	No training	OJT	OFFJT	APT
Less than High School	41	21	20	20	24	16	14	33
High School	40	55	55	40	49	56	58	33
Post High School	19	24	25	40	27	28	28	34
N	815	95	310	47	691	75	332	6

Table 6. Labour Market Status of Individuals in the UK: 1981 and 1989 (%)

	AGE			
	16-19	20-23	24-27	All ages
<u>1) Males - 1981</u>				
Employed	51.6	74.6	83.3	69.7
Apprenticeship	34.3	7.7	2.1	4.3
Unemployed	16.8	14.8	12.5	7.9
FT Education	29.6	8.9	2.6	3.7
N	7641	6851	6287	85877
<u>2) Males - 1989</u>				
Employed	51.3	75.8	83.5	73.6
On the job training	16.5	15.8	15.2	11.3
Apprenticeship	21.3	4.6	0.5	1.8
Govt. scheme	12.4	1.7	1.2	1.6
Apprenticeship	32.3	7.8	n/a	24.1
Unemployed	8.5	10.0	8.4	6.4
FT Education	24.4	7.2	2.1	3.1
N	4892	4679	4841	62275
<u>3) Females - 1981</u>				
Employed	48.3	61.3	52.9	43.3
Apprenticeship	3.6	1.1	0.2	0.6
Unemployed	13.7	9.2	6.6	4.3
FT Education	31.8	6.6	1.1	3.2
N	7480	6652	6454	93150
<u>4) Females - 1989</u>				
Employed	53.6	66.7	63.3	47.6
On the job training	22.4	17.6	15.7	13.6
Apprenticeship	3.2	1.1	0.4	0.4
Govt. scheme	8.3	0.8	0.6	0.8
Apprenticeship	15.0	14.3	n/a	12.6
Unemployed	6.8	7.2	6.8	3.8
FT Education	24.4	6.6	1.2	2.4
N	4734	4763	5184	67998

Source: Labour Force Surveys of 1981 and 1989 (own calculations)

Table 7. Coverage of Apprenticeships in the UK (%)

Age	1981		1989		
	Completed	Still Doing	Completed	Still Doing	
a) All					
16-19	1.1	9.4	2.5	11.1	(26.9)
20-23	12.9	3.8	9.8	2.3	
24-27	14.7	1.3	13.9	0.4	
b) Male					
16-19	1.4	16.7	2.6	18.3	(27.7)
20-23	22.1	6.4	15.0	3.8	
24-27	26.0	2.2	23.8	0.5	
b) Female					
16-19	0.8	2.0	2.4	3.8	(42.5)
20-23	3.5	1.0	4.8	0.9	
24-27	3.7	0.4	4.7	0.3	

Notes: in parentheses are the proportion of individuals still doing an apprenticeship who reported that they were on YT.

Base: population of individuals in that category

Source: Labour Force Survey tapes, 1981 and 1989 -- own calculations

Table 8. Apprenticeships and qualifications in the UK

	(1)		(2)		(3)		(4)		(5)		(6)	
a)1981	All		Males		Females							
	None	City & Guilds	None	City & Guilds	None	City & Guilds	None	City & Guilds	None	City & Guilds	None	City & Guilds
16-19	22.5	28.7	21.7	32.2	23.8	22.2						
20-23	18.1	44.6	18.0	47.9	19.4	23.3						
24-27	25.2	47.0	23.2	50.4	38.3	24.3						
b)1989	All		Males		Females							
	None	City & Guilds	None	City & Guilds	None	City & Guilds	None	City & Guilds	None	City & Guilds	None	City & Guilds
16-19	47.9	43.8	47.2	40.4	48.8	47.5						
20-23	35.0	47.8	34.4	47.5	36.9	48.9						
24-27	33.8	45.1	31.6	47.1	44.0	36.1						

Source: Labour Force Survey tapes, 1981 and 1989 -- own calculations

**Table 9. Great Britain, NCDS Regression Results - hourly earnings
(for non-college graduates)**

	<u>All workers</u>	<u>Male</u>	<u>Female</u>
Male	.1651 (17.26)	-	-
Union member	.0691 (7.85)	.0622 (4.91)	.0632 (5.24)
Log unemployment rate	-.0601 (2.55)	-.0415 (1.24)	-0.659 (2.04)
Tenure in current job*1000	.6288 (3.17)	.2405 (0.88)	.6460 (2.26)
<u>Training Variables</u>			
Trained with current firm	.0244 (2.97)	.0178 (1.51)	.0255 (2.26)
Completed apprenticeship - no quals	.0234 (3.79)	.0178 (2.26)	.0175 (1.70)
Apprenticeship + C & G Craft	.0418 (2.12)	.0436 (1.95)	-.1093 (1.57)
Apprenticeship + C & G Advanced	.0717 (3.75)	.0718 (3.30)	.0274 (0.27)
Doing an apprenticeship now	-.1279 (1.94)	-.0928 (1.19)	-.1917 (1.44)
Constant	5.3651 (75.06)	5.2554 (53.98)	5.2581 (52.29)
Adjusted R ²	.3510	.2978	.3717
F	27.08	12.45	14.58
DF	5950	3197	2635

Note: T-statistics in (). All equations include the following additional controls -- dummies for marital status, number of children, disability status, part-time, shiftwork, temporary job, sheltered job, two jobs, employed in a branch, establishment size, highest qualification, ever been a picket, problems with numbers, problems with literacy, ability tests, months since first job, number of jobs since leaving school, ever unemployed, ever OLF, experience in the labour market, 63 industry dummies, 11 region dummies and 4 month of interview dummies.

Table 10. United States, NLSY, Regression Results - hourly earnings
(real wage at age 25 for non-college graduates)

	<u>All workers</u>	<u>Male</u>	<u>Female</u>
Male	.16 (6.32)	-	-
Black	-.01 (0.33)	-.003 (0.08)	-.02 (0.44)
Union coverage	.14 (6.04)	.17 (5.19)	.10 (2.86)
Log unemployment rate	-.20 (7.18)	-.21 (4.96)	-.21 (5.47)
Tenure in current job	.001 (2.37)	.001 (1.68)	.001 (1.59)
Previous company training	-.03 (0.65)	-.02 (0.36)	-.03 (0.56)
Previous off-the-job training	.04 (2.07)	.04 (1.27)	.04 (1.45)
Ever had apprenticeship	.19 (3.16)	.22 (3.27)	-.14 (0.80)
Company training with current employer	.08 (1.48)	.08 (1.00)	.09 (1.10)
Off-the-job training during current employment	-.02 (0.53)	-.03 (0.47)	-.03 (0.55)
Still apprentice	.06 (0.23)	-.10 (0.32)	.66 (1.50)
High school graduate	.03 (1.31)	.004 (0.12)	.08 (2.28)
Post high school	.07 (2.51)	.01 (0.34)	.14 (3.20)
Constant	1.24 (12.44)	1.51 (9.99)	1.39 (9.66)
Adjusted R ²	.33	.29	.34
F	16.67	7.71	8.83
N	2275	1204	1070

Note: Absolute value T-statistics in (). * training includes both completed and uncompleted spells. All equations include the following additional controls -- Hispanic, marital dummies, disability, number of children, part-time, branch employee, firm size, ASVAB scores, experience, experience squared, number of jobs, region, smsa, dummies for year turned 18, and 34 industry dummies.

**Table 11. Great Britain, NCDS Regression Results - Wage Difference
(for non-college graduates)**

	All workers	Male	Female
Tenure in current job	.0016 (5.10)	.0007 (1.63)	.0023 (5.02)
Training only	-.0534 (2.43)	-.0341 (1.15)	-.1370 (4.31)
Training + C&G Operative	.0288 (0.26)	-.0048 (0.04)	.1263 (0.28)
Training + C&G Craft	.0539 (1.01)	-.0236 (0.39)	-.0329 (0.29)
Training + C&G Advanced	.2355 (3.62)	.2293 (3.17)	.0948 (0.88)
Training + ONC/OND	.0440 (0.92)	-.0038 (0.07)	.0484 (0.67)
Training + HNC/HND	.0841 (1.48)	.0375 (0.58)	.1394 (1.17)
Training + other quals	.1291 (7.97)	.1074 (4.75)	.1370 (6.21)
Apprenticeship only*	.0931 (2.15)	.1448 (2.98)	-.0634 (0.66)
Apprenticeship + C & G Operative	.2813 (3.01)	.2948 (2.74)	.0693 (0.38)
Apprenticeship + C & G Craft	.1950 (6.45)	.1720 (5.38)	-.0159 (0.14)
Apprenticeship + C & G Advanced	.2309 (8.08)	.1997 (6.67)	.0628 (0.38)
Apprenticeship + ONC/OND	.2443 (2.94)	.2508 (2.83)	-.1128 (0.48)
Apprenticeship + HNC/HND	.2656 (2.77)	.2406 (2.40)	.4317 (1.30)
Constant	1.4128 (50.62)	1.5787 (40.63)	1.3086 (33.82)
Adjusted R ²	.6018	.5743	.6070
F	96.31	48.15	49.34
DF	6826	3735	2987

Note: The dependent variable for this equation is the log real weekly earnings in 1981 minus the log real weekly earnings of the first job after leaving school. Other variables included in this equation -- switches to part time status, 4 change in plant size variables, 7 years since first job variables, number of jobs since leaving school, ever unemployed and ever OLF since leaving school dummies, and 94 industry and 12 occupation switches. The sample size is now larger than in the wage levels equation because we do not have to drop observations with missing ability tests.

* This variable includes not only apprenticeships with no other qualifications as well as apprenticeships accompanied by all other qualifications except the ones identified above

Table 12. United States, NLSY, Regression Results - Wage Difference for Non-college graduates
(Log real wage at age 25 - log real wage at age 20)

	All workers	Male	Female
Δ Experience	.005 (4.57)	.006 (3.27)	.004 (2.30)
Δ Tenure on current job	.0002 (0.42)	.0004 (0.47)	.0003 (0.42)
Δ School	.03 (1.92)	.02 (0.85)	.06 (2.10)
Δ company training	.12 (1.94)	.07 (0.79)	.16 (1.93)
Δ off-the-job training	.05 (1.02)	.13 (1.85)	-.07 (0.96)
Δ apprenticeship	.38 (3.38)	.37 (2.81)	.29 (1.13)
Constant	-.08 (1.35)	-.13 (0.85)	.02 (0.26)
Adjusted R ²	.11	.14	.07
F	4.57	3.67	2.02
N	1570	831	738

Note: Regressions include the following additional variables -- change in disability status, change in marital status, change in # children, change in part-time status, change in union status, change in local unemployment rate, change in number of jobs, change in region, change in 34 industry dummies, change in smsa, and age dummies for year turned 18.

Appendix

A1. Great Britain, Wage Differences (Non-college Graduates)

	<u>Union</u>	<u>Non-union</u>
Tenure in current job	.0011 (2.59)	.0017 (3.93)
Training only	-.0311 (1.11)	-.0640 (1.87)
Training + C & G Operative	.0291 (0.16)	.0467 (0.32)
Training + C & G Craft	-.0009 (0.01)	.0864 (1.17)
Training + C & G Advanced	.2711 (2.80)	.2431 (2.73)
Training + ONC/OND	.0376 (0.66)	.0150 (0.23)
Training + HNC/HND	.0729 (0.96)	.0652 (0.77)
Training + other quals	.0806 (3.83)	.1506 (6.12)
Apprenticeship only*	.0889 (1.38)	.1238 (2.07)
Apprenticeship + C & G Operative	.2009 (1.53)	.3301 (2.46)
Apprenticeship + C & G Craft	.1352 (3.67)	.2534 (4.94)
Apprenticeship + C & G Advanced	.1930 (5.31)	.2583 (5.73)
Apprenticeship + ONC/OND	.1221 (1.06)	.3912 (3.26)
Apprenticeship + HNC/HND	.1916 (1.50)	.2736 (1.92)
Constant	1.5293 (37.58)	1.3831 (36.36)
Adjusted R ²	.6249	.5525
F	156.20	123.79
D F	3318	3545

Note: The dependent variable for this equation is the log real weekly earnings in 1981 minus the log real weekly earnings of the first job after leaving school. Other variables included in this equation -- switches to part-time status, 4 change in plant size variables, 7 years since first job variables, number of jobs since leaving school, ever unemployed and ever OLF since leaving school dummies, and 94 industry and 12 occupation switches. The sample size is now larger than in the wage levels equation because we do not have to drop observations with missing ability tests.

* This variable includes apprenticeships without any other qualifications plus apprenticeships with all other qualifications except the ones identified above

ENDNOTES

1. Subsequently renamed Youth Training (YT) in an attempt to emphasize its permanency.
2. Source: Employment Gazette, September 1991, Table 1.2
3. We include 10 individuals who received a degree in conjunction with their apprenticeship.
4. In the NCDS respondents were asked: "have you ever been on any training courses which involved at least 14 days or 100 hours attendance at a college, training centre or skill centre?" Further details on up to three of these training courses was then also collected. In the NLSY training information was obtained from the following question: "in addition to your schooling, military and government-sponsored training programs, did you receive any other types of training for more than one month?" They were also asked, "which category best describes where you received this training". Both of these questions were asked for up to three training questions per year.
5. The Labour Force Surveys are carried out in more than 75,000 households in the UK i.e. approximately one in every 350 private households. They were conducted every other year from 1973 to 1983 and from 1984 they have been conducted annually. The results reported here give representative estimates relating to the whole population resident in private households in the year of interest.
6. We group individuals together in this ad hoc way to ensure large cell sizes.
7. There are some discrepancies between the labour market status of the NCDS cohort reported in Table 2 and that reported here. In particular it appears that a higher proportion

of the LFS1981 sample are unemployed: this is principally attributable to a) sample attrition and b) the fact that recent immigrants, who tended to have relatively high unemployment rates, are under-represented in the NCDS cohort.

8. It should be noted that the training questions in the 1989 LFS and NCDS4 are somewhat different. NCDS respondents reported on whether they had *ever* had any training with their current employer while in the 1989 LFS respondents reported whether *over the preceding four weeks* they had received any education or training connected with their job or a job that they might be able to do in the future. Clearly, the definition used in the LFS would tend to produce lower estimates on the existence of training.

9. This variable is coded as 1 if the respondent had received training of any kind (no matter what the duration or type of training) while working for their current employer, zero otherwise.

10. This estimate is obtained (results not reported) by including a dummy variable which is set to 1 if the individual had completed an apprenticeship, zero otherwise.

11 After some experimentation we set all of the highest qualification variables to indicate the qualification obtained alongside the apprenticeship. On the basis of a series of t-tests we combined variables for those individuals with only an apprenticeship and those with all other qualifications apart from either a city and Guild Craft Certificate or a City and Guild Advanced Certificate.

12. For further discussion of the relationship between local unemployment and pay see Blanchflower (1991), Blanchflower, Oswald and Garrett (1990) and Blanchflower and Oswald (1990, 1991).

13. Unfortunately a suitable regional price index is also unavailable and so we are forced to deflate both the (log of the) first and current weekly wage by the aggregate Retail Price Index for the relevant month.

14. However, the vast majority of individuals had their first job when they were 16. The age at which individuals started their first job are as follows: age 15 - 0.3%; age 16 - 64.0%; age 17 - 12.9%; age 18 - 13.5%; age 19 - 4.4%; age 20 - 1.9%; age 21 - 1.9%; age 22 - 0.9% and age 23 - 0.3%.

15. To calculate these rates of return it is necessary to include both the costs and benefits of participating in an apprenticeship. To estimate the size of the costs we ran a regression of log weekly earnings in the first job using the full set of controls from Table 9, plus a variable to indicate whether the individual was doing an apprenticeship. This suggested that earnings were reduced by approximately 18%, *ceteris paribus*, in the case of men and 27% in the case of women (results not reported). In our calculations we assume that the average duration of an apprenticeship is 4 years (see Table 4) and we assume that there are 50 years of lifetime work (from age 16 to 66).

16. Compulsory schooling ends at age 16 in the UK. For an interesting discussion of the factors influencing the school leaving decision using the NCDS data see Micklewright (1989).