# VALUE ADDED IN FURTHER EDUCATION AND VOCATIONAL TRAINING IN NORTHERN IRELAND

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Keywords: Value Added, Qualifications, Further Education, Vocational Training.

JEL Code: I21, I28.

(Word Count: 6790)

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ABSTRACT

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At the age of 16, many young people in the UK decide to leave school and enter vocational education or training, either at a Further Education (FE) college, or on a Government training scheme. In spite of the size and importance of this group, the current debate about education and training standards has tended to focus more on how to improve schools, largely neglecting the potential contribution to be made by the FE and vocational training sectors. In this paper, we seek to begin to redress this imbalance by examining the extent to which those young people leaving school and entering vocational education or training at 16 obtained further qualifications up to the age of 18. In particular, we examine whether the choice between FE and Government training schemes at age 16 influences the subsequent success of young people in terms of gaining additional qualifications. Adopting an ordered probit approach to modelling qualifications levels, our results contradict the (somewhat pessimistic) common perception of Government training schemes. In particular, no significant differences *per se* are found between the value added performance of FE colleges and Government training schemes.

I: INTRODUCTION

It is widely believed that the UK must improve the skills level of its workforce if it is to compete successfully in today's international economy. A major component of the Government's drive to achieve this is an attempt to improve the skills and qualifications levels of young people entering the labour market. The diversity of education and training routes post-16 necessitates a clear understanding of the contribution of each route towards this objective if we are to best develop the potential of our young people.

Widespread dissatisfaction with headline education statistics, such as those found in school league tables, has recently led to a vigorous debate on the concept of *value added* in education and training. It is now generally agreed that it is not enough to just measure outcomes at the end of education and training. It is also necessary to account for initial conditions (ie: qualifications and skills on entry along with socio-economic background characteristics) if we are to correctly monitor the contribution of the various routes and institutions to improving the skills levels of young people. Indeed, the DfEE is now proposing to introduce value added measures into the school performance tables from 1999 (DfEE, 1998).

At the age of 16, many young people decide to leave school and enter vocational education or training, either at a college of Further Education (FE) or on a Government training scheme. This sector, both regionally and nationally, has received considerably less attention in the literature than the school sector. This is likely to be related, at least in part, to the fact that information on school performance (ie: in terms of qualifications obtained and subsequent labour market outcomes) is much better developed than the corresponding information for FE colleges and training schemes[1]. A strong argument for conducting such a study specifically for Northern Ireland is the importance of vocational education and training, in terms of the proportion of young people who choose these routes, relative to the UK average. For example, the proportion of 1993 5th form leavers who entered vocational education and training in NI was 44%, as compared to 40% for Great Britain[2]. This is largely due to higher numbers on training schemes, which may be a symptom of higher regional unemployment or selective secondary schooling, for example. Equally, it may be that participation in youth training in NI is higher than in GB as a result of the differences between Northern Ireland's Youth Training Programme (YTP) and that of England and Wales (YT, formerly YTS).

In this paper, we seek to begin to redress the imbalance in the literature through a detailed examination of the performance of the Northern Ireland vocational education and training sector in terms of qualifications value added. Controlling for background characteristics of young people in vocational education and training allows us to analyse the relative intrinsic merits of the two alternative routes themselves. The remainder of the paper is set out as follows. The following section briefly discusses the structure of Government training schemes in Northern Ireland and reviews the existing literature on value added in education and training. Section 3 discusses our empirical model and econometric methodology. Section 4 presents details of the data set used for the analysis and highlights some important regularities. Section 5 presents and discusses the results and section 6 concludes.

## II: BACKGROUND

The nature of vocational training programmes for young people in Northern Ireland has tended to reflect the corresponding programmes in England and Wales. Generally speaking, such programmes have been aimed at providing relevant vocational training through a combination of class-based instruction, on-the-job training and work experience. The key difference is that in Northern Ireland, a significantly lower proportion of such schemes are based with employers (around one quarter of all schemes in NI are employer-based compared to more than one half in GB). This reflects the relatively small private sector in Northern Ireland compared to other parts of the UK.

The key comparison to be made in the present analysis is between young people who enter FE colleges after leaving school and those who enter vocational training schemes. The academic literature has largely failed to conduct such comparisons, focussing instead on the factors which influence educational participation (see, for example, Rice, 1987; Micklewright et al, 1990; Whitfield & Wilson, 1991; Rice & McVicar, 1996) and the labour market outcomes of those young people that have been on youth training schemes (see, for example, Main & Shelly, 1990; Whitfield & Bourlakis, 1991; Dolton, Makepeace & Treble,

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[1] Government are aware of this. For example, in an analysis of the 'Strengths and Weaknesses' of the FE sector the Department of Education for Northern Ireland (DENI) has argued that there is a 'Need for better information on outcomes, particularly qualifications achieved by students, to enable evaluation of effectiveness of the service (DENI, 1994, p37).
[2] Source: Training Statistics 1994, p126, HMSO, London.

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1994). Most of these studies have either dealt with young people in FE implicitly or not at all[3].

The two studies which are perhaps closest to the present research in terms of aims and methodology are Payne (1995a, 1995b). These have used data from the Youth Cohort Study for England and Wales to investigate the relative effectiveness of the different routes for young people post-16 in terms of (a) gaining qualifications and (b) subsequent labour market outcomes. The results suggest that the choice of route post-16 does indeed have an important influence on the chances of getting qualifications, all other things being equal. For example, in Payne (1995a) young people in FE and vocational training schemes were compared to those who chose the traditional academic route. It was found that those who chose FE were less likely than their counterparts in the academic route to get qualifications, but the differences were not statistically significant after controlling for a range of other factors. Young people who chose the youth training (YT) route were, however, significantly less likely to gain additional qualifications.

However, questions can be raised about some of the econometric techniques used in these studies, particularly those used when investigating the factors which influence the attainment of NVQ levels. In this kind of analysis, the dependent variable for each individual takes values of 0, 1, 2 or 3, corresponding to the NVQ level which the individual had managed to attain. In both Payne (1995a) and (1995b) results are presented for an OLS model with sample selection, based on Heckman's (1979) original model. However, the use of OLS in this case, although a useful starting point, is inappropriate because the dependent variable is discrete rather than continuous. Instead, we argue below that a variation of the Ordered Probit model is the natural specification for such a study.

Payne's findings support the widely held belief that Government youth training schemes are little more than a residual category for those young people unable to find a job and should not be regarded as an alternative to full time further education (for discussion see, for example, Raffe, 1988; Jones, 1988; White, 1988). On the other hand, Rice and McVicar (1996) argue that with the introduction of two year training schemes in the late 1980s and the greater emphasis placed on participants gaining vocational qualifications, these training schemes should be regarded as a closer substitute for full-time further education.

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[3] The exception being Green et al (1996), which investigates the impact of different types of FE provision on subsequent earnings in employment.

The lack of literature on qualifications gained in vocational education and training can be supplemented by turning to analyses of school and individual factors that may affect qualifications gained in secondary education (see, for example, Bradley & Taylor, 1998). These studies approach the examination of attainment levels in secondary education from an implicit value added perspective, where educational attainment is determined by individual and family background factors as well as institutional (school) effects. As such, they provide some additional guidance for our choice of explanatory variables for the qualifications gained equation outlined in the following section. More specifically, Bradley and Taylor (1998) provide support for the ordered probit approach to modelling qualifications performance, adopting an ordered logit approach to modelling qualifications outcomes, with their dependent variable (school performance) categorised as one of four outcomes ('poor' to [4].

## III: EMPIRICAL MODEL AND ECONOMETRIC METHODOLOGY

### *Empirical Model*

We are interested in analysing the extent to which young people get additional qualifications in FE and vocational training. A significant aspect of this analysis involves a comparison of the value added outcomes of FE and vocational training. Behind this analysis lies a host of observed and unobserved characteristics, which affect an individual's chances of obtaining additional qualifications and do not depend on the choice of educational route followed.

Our dependent variable is the qualification level reached by individuals after two years in vocational education and training. An individual's highest attainment is characterised as being separated into four *ordered* levels, namely none, NVQ1, NVQ2 or NVQ3. Our choice of categories for attainment level follows those on which the National Targets for Young People are based (see NACETT, 1998). Due to the small number of individuals gaining NVQ3 in our sample, we group NVQ2 and NVQ3 together as one outcome (NVQ2 or above). Thus, the (dependent) attainment variable is defined as follows: $Y_i = 0, 1, 2$, representing no attainment, attainment of NVQ1 and attainment of NVQ2 or above.

The explanatory variable of primary interest is whether the individual attended a FE college or a Government training scheme. This is modelled as a binary variable (ie: $P_i=1$ if

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[4] In practice, the differences between ordered probit and ordered logit models are small (see Greene, 1993, for a discussion of these models).

individual i enters YTP and 0 if enters FE). As discussed in the previous section, youth training schemes are often viewed as a residual destination for young people (ie: enter YTP if nothing else is available) rather than a first choice destination for the attainment of qualifications[5]. The raw data suggest that YTP tends to attract less academically able young people (see Section 4). Simple correlations also suggest that young people in YTP tend to perform badly compared to those in FE in terms of additional qualifications gained.

Of course, a simple glance at sample characteristics is unlikely to tell the whole story. A number of other observed and unobserved characteristics will affect an individual's chances of obtaining further qualifications in FE or vocational training. The most obvious is ability. Although this is essentially unobservable, we can use existing qualifications levels to represent innate ability. Entrants to YTP tend to come from the less academically able end of the spectrum and we would expect this to be a significant factor in the chances of further qualifications being obtained. This, along with a large number of other background and individual characteristics, both general, and specific to Northern Ireland, must be accounted for in our analysis if we are to correctly specify a model of qualifications attainment.

Our choice of other explanatory variables follows those conventionally included in such studies (see for example, Andrews & Bradley, 1997; Bradley & Taylor, 1998). Family background variables, such as parental employment status, have been proposed as affecting attainment both from inherited characteristics and through what can loosely be described as home culture. For example, parents that are employed full-time are more likely to be educated to a higher level themselves than parents that are unemployed, and their career expectations for their children may therefore involve higher qualification levels. Some studies have found a significant effect from the number of siblings in the home (see, for example, Loeb and Bound, 1996). Significant differences between male and female patterns of attainment suggest the need for the inclusion of a gender variable. In addition to these conventional background variables, studies in Northern Ireland traditionally include variables to allow for religious and community differences, the selective nature of secondary schooling and significant sub-regional geographical effects (see, for example, Armstrong, 1997).

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[5] See, for example, Rice & McVicar (1996).

So, our empirical model with which to examine qualifications value added in FE and YTP is given in equation 1 below:

(1) $Y_i = \alpha + \beta_0 P_i + \mathbf{b'X_i} + \varepsilon_i,$

where $Y_i$ denotes an individual's attainment, $P_i$ whether an individual is in FE or YTP and $\mathbf{X_i}$ is the vector of an individual's background characteristics variables.

*Econometric Methodology*

Equation (1) above forms the basis of our empirical model. The natural specification for estimating equation (1) is a single equation ordered probit model. An unobserved latent variable (z) is related to the explanatory variables as follows:

(2) $Z_i = \alpha + \beta_0 P_i + \mathbf{b'X_i} + \varepsilon_i,$

where the error term is assumed to be distributed normally with zero mean and unit variance.

The observed outcome is $Y_i$, where:

(3)  $Y_i = 0$ if $Z_i \leq 0,$
   $Y_i = 1$ if $0 < Z_i \leq q,$
   $Y_i = 2$ if $Z_i > q.$

The parameter q is to be estimated along with the coefficients in (1). Given our assumptions on the error, the following probabilities apply:

(4) $P(Y_i=0) = \Phi(-\alpha - \beta_0 P_i - \mathbf{b'X_i})$
   $P(Y_i=1) = \Phi(q - \alpha - \beta_0 P_i - \mathbf{b'X_i}) - \Phi(-\alpha - \beta_0 P_i - \mathbf{b'X_i})$
   $P(Y_i=2) = 1 - \Phi(q - \alpha - \beta_0 P_i - \mathbf{b'X_i})$

where $\Phi$ is the standard normal distribution function. We estimate the above probabilities by maximum likelihood.

However, some of the explanatory variables in the attainment equation are also likely to affect the choice of whether to enter YTP or FE. For example, Payne (1995a) finds that the choice to enter FE/YTP is affected by, among other things, qualification levels at 16. The likely endogeneity of the FE/YTP variable is accounted for by explicitly modeling the FE/YTP participation decision as being jointly determined with the qualifications outcome.

The participation equation is given by equation (5) below. For the model to be identified we include, in equation (5), a dummy variable for whether the individual sat psychometric tests in the 5th form. We argue in Section 5 that this dummy is capturing the vocational aspirations of young people, and is therefore a factor in the participation equation but not in the attainment equation[6].

(5) $P_i = a + b_0 T_i + \mathbf{b_1'W_i} + u_i,$

where $T_i$ is a binary dummy for whether or not the individual sat psychometric tests and the vector $\mathbf{W_i}$ is a vector of individual and background characteristics.

The most commonly used method of modeling such a jointly determined process is the bivariate probit, where the errors $\varepsilon_i$ and $u_i$ are assumed to have a standard bivariate normal distribution with correlation $\rho$, ie:

(6)  $E(\varepsilon_i) = E(u_i) = 0,$

   $Var(\varepsilon_i) = Var(u_i) = 1,$

   $Cov(\varepsilon_i, u_i) = \rho.$

However, standard bivariate probit models restrict the dependent variables to binary outcomes. This is correct for our YTP/FE participation variable, but is unnecessarily restrictive for our qualifications variable.[7] Weiss (1993) outlines an ordered probit extension to the standard bivariate probit model, where ordered multiple outcomes are allowed for the dependent variables. The natural specification for our model, given the possibility of endogeneity, is a special case of Weiss's model with just one ordered dependent variable, and the other binary. We call this model the bivariate semi-ordered probit model.

The bivariate semi-ordered probit model follows from both the single equation ordered probit and the bivariate probit outlined above. Our two equations are (1) and (5) above, with the errors distributed bivariate standard normal as above. In order to write down the full likelihood for the model, we define an additional set of variables, $m^j$ (j=0, 1, 2, 3, 4, 5), where:

(7) $m^0 = 1$ if ($Y_i = 0$ and $P_i = 1$), $=0$ otherwise

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[6] For an analysis of this variable and support for its use as the identifying variable in this model see Armstrong (1998b).
[7] As a test of the robustness of our results, we estimate such a bivariate probit model, restricting the qualifications variable to a binary outcome, with 1 denoting the attainment of additional qualifications at NVQ2 or above, and 0 otherwise.

$m^1 = 1$ if ($Y_i = 1$ and $P_i = 1$), $=0$ otherwise

$m^2 = 1$ if ($Y_i = 2$ and $P_i = 1$), $=0$ otherwise

$m^3 = 1$ if ($Y_i = 0$ and $P_i = 0$), $=0$ otherwise

$m^4 = 1$ if ($Y_i = 1$ and $P_i = 0$), $=0$ otherwise

$m^5 = 1$ if ($Y_i = 2$ and $P_i = 0$), $=0$ otherwise.

The log likelihood can then be given by:

(8) $\log L = L^0 + L^1 + L^2 + L^3 + L^4 + L^5$

defined in equations (9) to (14) below.

(9) $L^0 = m^0 * \log \{\Phi_2[ (-\alpha - \beta_0 P_i - \mathbf{b'X_i}), (a + b_0 T_i + \mathbf{b_1'W_i}), (\rho) ]\}$

(10) $L^1 = m^1 *\{ \log \{\Phi_2[ (j - \alpha - \beta_0 P_i - \mathbf{b'X_i}), (a + b_0 T_i + \mathbf{b_1'W_i}), (\rho)] - \Phi_2 [ (-\alpha - \beta_0 P_i - \mathbf{b'X_i}), (a + b_0 T_i + \mathbf{b_1'W_i}), (\rho) ]\} \}$

(11) $L^2 = m^2 * \{ \log \{\Phi_2[ (1000), (a + b_0 T_i + \mathbf{b_1'W_i}), (\rho)] - \Phi_2[ (j - \alpha - \beta_0 P_i - \mathbf{b'X_i}), (a + b_0 T_i + \mathbf{b_1'W_i}), (\rho) ] \} \}$

(12) $L^3 = m^3 * \log \{\Phi_2[(-\alpha - \beta_0 P_i - \mathbf{b'X_i}), (-a - b_0 T_i - \mathbf{b_1'W_i}), (-\rho) ]\}$

(13) $L^4 = m^4 *\{ \log \{\Phi_2[ (j - \alpha - \beta_0 P_i - \mathbf{b'X_i}), (-a - b_0 T_i - \mathbf{b_1'W_i}), (-\rho)] - \Phi_2 [(-\alpha - \beta_0 P_i - \mathbf{b'X_i}), (-a - b_0 T_i - \mathbf{b_1'W_i}), (-\rho) ]\} \}$

(14) $L^5 = m^5 * \{ \log \{\Phi_2[ (1000), (-a - b_0 T_i - \mathbf{b_1'W_i}), (-\rho)] - \Phi_2 [ (j - \alpha - \beta_0 P_i - \mathbf{b'X_i}), (-a - b_0 T_i - \mathbf{b_1'W_i}), (-\rho) ] \} \}.$

The single equation ordered probit model outlined above is a special case of the bivariate semi-ordered probit with $\rho = 0$. Starting with the latter model, we then test the restriction that $\rho = 0$. LIMDEP was used for the estimation of the above models. Key features of the program for estimation of the bivariate semi-ordered probit model is given in the Appendix.

# IV: DATA

The data used are taken from the Status 0 Survey into young people's labour market experiences in Northern Ireland[8]. The survey was collected from a sample of young people in the 1993 5th form leavers cohort in June 1995. Information was compiled on individual's backgrounds, schooling, qualification levels at the end of compulsory schooling, main monthly labour market or educational activity from the end of compulsory schooling and qualifications gained at each stage. Restricting to those who entered FE and vocational training gives us a final sample of 578 individuals.

An examination of the raw data provides us with a great deal of insight into the characteristics of young people in FE and YTP (see Table 2 below for sample means of explanatory variables) and sample characteristics in terms of qualifications gained (see Table 1 below). It is informative to draw out a couple of 'stylized facts' from the data to set our analysis in context.

First, the data shows that YTP is the main destination for low achievers at school in Northern Ireland. More than three quarters of young people in NI who gained no GCSE passes entered YTP after leaving school, for example. This gives us our first stylized fact. Secondly, the raw figures in Table 1 suggest that young people in FE are more likely to gain additional qualifications than their counterparts in YTP (68% as opposed to 60% for 1993 school leavers). The qualifications gained in FE also tend to be higher than those gained in YTP. This supports the result of Payne (1995b) where value added in FE is shown to be higher than that in YTP. However, as discussed in the following section, the interaction of the two 'facts' above, in a suitable econometric model, leads us to question the picture painted by the raw data and found in Payne (1995b).

*Table 1: Gaining Qualifications in Further Education and Vocational Training*

|  | Further Education Students | YTP Students |
|---|---|---|
|  | per cent of cohort | |
| Got Any Additional Qualifications | 68 | 60 |
| Attained NVQ 2 or above | 47 | 40 |
| Attained NVQ 3 | 30 | 2 |

Source:    Status 0 Survey
Notes:    The cohorts are defined as those who entered FE and YTP in October 1993.

*Table 2: Means of Explanatory Variables Used in the Analysis*

| Variable | Mean |
|---|---|
| Catholic | 0.50 |
| Non-Catholic* | 0.50 |
| Female | 0.40 |
| Male* | 0.60 |
| Father Employed Full Time | 0.59 |
| Father Unemployed/Other* | 0.41 |
| Mother Employed Full Time | 0.24 |
| Mother Unemployed/Other* | 0.76 |
| Living with Father and Mother | 0.80 |
| Not Living with Father and Mother* | 0.20 |
| Number of Older Siblings | 1.43 (1.53) |
| Number of Younger Siblings | 1.30 (1.34) |
| % of school leavers with 5+ GCSEs (A-C) | 32.8 (24.8) |
| School Attendance Rate | 91.6 (2.9) |
| Grammar school | 0.14 |
| Secondary/Other school* | 0.86 |
| Belfast DC | 0.11 |
| Derry DC | 0.11 |
| East | 0.28 |
| South | 0.17 |
| North | 0.10 |
| West* | 0.24 |
| No GCSEs (A-C)* | 0.37 |
| 1-4 GCSEs (A-C) | 0.41 |
| 5+ GCSEs (A-C) | 0.22 |
| Sat Psychometric tests | 0.61 |
| Did not sit Psychometric tests* | 0.39 |
| Proportion in school who sat Psychometric tests | 52.8 (38.9) |

Source: Status 0 Survey.
Notes: Figures in brackets are standard deviations for continuous variables. The sample size is 578.

The raw data can be used to derive a summary of what might be called the 'qualifications value added' for young people at FE and YTP (Figure 1). Around one half of both FE and YTP students added value to their entry level of qualifications. This corresponds to around 2,700 FE students in the total cohort and 2,700 YTP students. The majority of FE students who added value to their level of qualifications attained the equivalent of NVQ level 3, and most of the rest attained the equivalent of NVQ level 2 (see Figure 1). In contrast, the majority of young people at YTP who added value to their level of qualifications achieved the equivalent of an NVQ level 2. Only a tiny minority managed to achieve the equivalent of NVQ level 3, and a relatively small proportion achieved the equivalent of NVQ level 1.

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[8] This data set has been used in a number of recent studies (see, for example, Armstrong 1998a, 1998b).

*Figure 1: A Summary of 'Qualifications Value Added' in FE and YTP*

| *FE Students* | *YTP Students* |
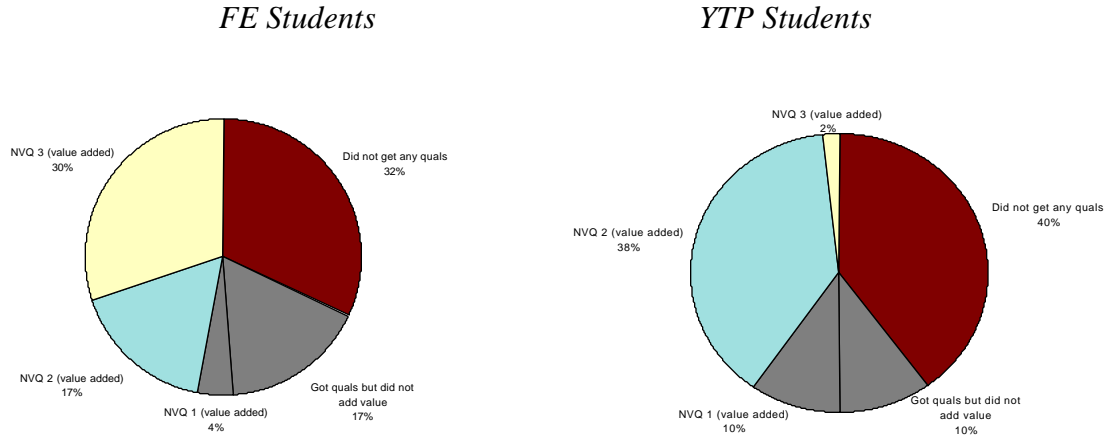


Source:    Status 0 Survey

## V: RESULTS

For estimation of the empirical model outlined in Section 3.1, we begin with the most general specification of those described in Section 3.2 (the bivariate semi-ordered probit model). In this model the choice to participate in either FE or YTP is assumed to be determined jointly with the qualifications attainment variable. We therefore jointly estimate the qualifications equation (1) and the participation equation (5). The results are given in Table 3 below.[9]

The variable 'sat tests' is included as an identifying variable in the participation equation. As such, we believe it is capturing unobserved vocational aspirations that may affect the decision to enter YTP but not the qualifications attainment in YTP or FE. The tests referred to are psychometric tests sat during 5th form, which are targeted towards young people with vocational aspirations, and are intended to help guide these students into appropriate forms of vocational training or employment. Armstrong (1998b) studies the effect of these tests on the subsequent labour market experiences of young people in Northern Ireland. He argues that these tests, which form a significant part of the careers guidance given to 5th formers in NI, are important in helping young people choose the most suitable post-school destination.

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[9] We do not report the results from the estimation of the participation equation in Table 3, as we are interested primarily in the qualifications equation. These results are, however, available from the authors on request.

It is shown, however, that those young people who sat the tests were no less likely to experience unemployment subsequently than those who did not sit the tests. This is taken as showing that these tests have little impact on labour market outcomes once the choice of route post-16 is made. These arguments support our use of the sat tests variable as the identifying variable in the participation equation. The variable is insignificant in the participation equation, as well as in single equation ordered probits for qualifications.

Although our *a priori* arguments suggest the possibility that the participation decision and the attainment level may be jointly determined, this is not reflected by the estimation. The parameter $\rho$, which gives the correlation between the error terms from the two equations ($\varepsilon$ and u), is not significantly different from zero (see Table 3). This suggests the standard ordered probit may be the most suitable specification for our model and the results from this model are also presented in Table 3. Both sets of results are broadly similar, with no significant sign variations between the two models, and the following analysis draws on both specifications. We present the results from both models for completeness.[10]

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[10] A standard bivariate probit model was also estimated to check the robustness of our results. The results of this exercise closely reflect those of the bivariate semi-ordered probit and therefore add little extra to the analysis.

*Table 3: Ordered Probit Results for the Equivalent NVQ Level of Qualifications Attained*

| | 3 Ordered Outcomes (y=0, 1, 2) | | | |
| --- | --- | --- | --- | --- |
| | Model 1 Single Equation | | Model 2 Sample Selection model | |
| | Coef | t | Coef | t |
| Constant | -0.38 | -0.17 | -1.12 | -0.41 |
| YTP | -0.05 | -0.42 | 0.33 | 0.47 |
| Catholic | -0.08 | -0.66 | -0.06 | -0.43 |
| Female | 0.04 | 0.41 | 0.06 | 0.57 |
| Father Employed Full Time | 0.09 | 0.84 | 0.09 | 0.85 |
| Mother Employed Full Time | 0.03 | 0.21 | 0.05 | 0.34 |
| Living with Father and Mother | 0.27 | 2.02 | 0.25 | 1.66 |
| No. of Older Siblings | -0.01 | -0.23 | -0.01 | -0.32 |
| No. of Younger Siblings | -0.10 | -2.54 | -0.10 | -2.56 |
| % of Leavers with 5+ GCSEs | 0.00 | -0.17 | -0.0007 | -0.14 |
| Attendance rate | 0.01 | 0.38 | 0.02 | 0.56 |
| Grammar School | 0.18 | 0.60 | 0.15 | 0.48 |
| Belfast DC | -0.63 | -3.12 | -0.72 | -2.83 |
| Derry DC | -0.18 | -0.90 | -0.28 | -1.1 |
| East | -0.37 | -2.42 | -0.40 | -2.52 |
| South | -0.42 | -2.35 | -0.44 | -2.36 |
| North | -0.70 | -3.79 | 0.79 | -3.43 |
| 1-4 GCSEs | 0.28 | 2.26 | 0.35 | 2.03 |
| 5+GCSEs | 0.55 | 3.61 | 0.72 | 2.15 |
| MU (1) | 0.55 | 11.66 | 0.55 | 9.90 |
| MU (2) | - | - | - | - |
| Rho (p) | - | - | 0.23 | 0.54 |
| Log Likelihood | -565 | | -874 | |
| Log Likelihood (constant slopes) | -599 | | -984 | |
| Pseudo R$^2$ | 0.06 | | 0.11 | |

*The effects of YTP on getting qualifications*

The raw data discussed in the previous section suggest that young people in YTP are less likely to gain additional qualifications than their counterparts in FE. The fundamental question remains, however, as to whether such differences reflect something intrinsic to YTP, such as course content or administration, or differences in the observed and unobserved characteristics of young people who chose to enter the different forms of activity. Our analysis provides a somewhat surprising answer to this question.

The coefficient on the YTP dummy variable is highly insignificant in all of the models estimated. This suggests, in contrast to previous findings (eg: Payne 1995a, 1995b), that the difference between FE and YTP in terms of young people getting additional qualifications is

negligible when other factors are controlled for. This implies there is nothing inherent in YTP itself that reduces the chances of young people gaining qualifications value added.

The significance of this (negative) result is clear. There is no evidence here to agree with the argument that YTP is an inferior substitute, or residual category, compared to full time further education, at least for the 1993 Northern Ireland 5th form leavers cohort. The raw figures, which suggest such a comparison, are clearly misleading in this case. As discussed below, it is the fact that it is low achievers that enter YTP that drives the *apparent* negative relationship between YTP and value added, rather than anything about YTP *per se*.

*Other Influences on Educational Attainment*

As expected, young people who had gained a reasonable number of 'good' GCSE passes at school (i.e. passes at grades A-C), were more likely to get additional qualifications on FE or YTP. These results are consistent with other research from Great Britain (Payne, 1995a, 1995b). They are important because they illustrate the importance of ensuring that young people leave school with an adequate level of qualifications; if they do not, then it is difficult for them to make up the lost ground, either in FE colleges or on YTP. This result, coupled with the fact that YTP entrants are generally from the lower end of the achievement scale in terms of qualifications at age 16, drives the apparent negative YTP/value added relationship in the raw data.

There is some evidence of young people living with both their father and mother being more likely to get qualifications, but this is only significant in the single equation model (Table 3). The number of younger siblings seems to exert a negative influence on the chances of getting additional qualifications. None of the school performance variables was significant in any of the models. It has been shown above that school performance seems to have a significant influence on the choices made by young people post-16. The above results suggest that once these choices have been made the effects of school performance on the subsequent performance of young people in further education or vocational training is negligible. Young people from the Western regions were more likely to get qualifications.

Of course, it would have been, perhaps, more interesting to have measures of performance of the further education or training organization attended by the young person. The expectation would be that young people who attended organizations which performed relatively well

according to standard indicators, would perform relatively well themselves. This, then, could be interpreted in terms of cultural influences on the young person. Unfortunately, data limitations prevented this kind of exercise. However, it may be worth considering this kind of exercise as part of future research.

The longer young people spent in FE or YTP, the more likely they were to get additional qualifications, all other things being equal. For example, less than one half of young people who stayed in FE or YTP for less than 6 months got any qualifications, compared to more than seven out of ten of those who stayed for more than 18 months. It was decided not to include a 'time spent in activity' variable in the main econometric models because it would be highly endogenous; although the time spent in the activity is likely to have a strong causal influence on the chances of getting qualifications, the direction of causation may also be the other way around. For example, one of the reasons why young people may decide to leave FE or YTP before completion of their course is that they believe their chances of getting additional qualifications are likely to be small. Notwithstanding these difficulties some alternative models were estimated which included the time spent in activity as an explanatory variable and, as expected, it was found to have a highly significant positive impact on the chances of getting additional qualifications[11].

VI: CONCLUSION

This paper has investigated whether or not the choice between FE and YTP at the age of 16 has a significant influence on the subsequent chances of gaining additional qualifications. The results suggest that there is no significant difference between young people at FE and YTP; in other words, there is nothing associated specifically with FE or YTP *per se*, which results in young people being more or less likely to get additional qualifications. This result is robust to model specification changes (bivariate probit, bivariate semi-ordered probit and single equation ordered probit models).

Our results are surprising because the raw data suggest that there are some very large differences between the two groups of young people, particularly with respect to qualifications at NVQ level 3. As such, the paper provides a strong argument for the need to

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[11] An alternative way of including the information on time spent in activity is to include 'leaving early' as a category in the ordered probit models. Thus the dependent variable could be specified as =0 if young person left early and got no qualifications, =1 if did not leave early and got no qualifications, =2 if got NVQ level 1 etc. The results are quantitatively very similar to the standard models, and this approach seems not to add much to the analysis.

conduct careful econometric analysis as part of any detailed research into value added issues. Without such analysis, there is a danger that policy makers may be misled by apparent patterns suggested by the raw data.

The results showed that there is a strong relationship between initial standards of general education and subsequent success in vocational training. In particular, the evidence suggested that standards of vocational training can be more easily improved if educational standards at the schooling stage are sufficiently high. This is important from a policy point of view because it reinforces the need to ensure that all young people leave school with a minimum threshold level of education. This will ensure that they are enabled to proceed successfully through further education or vocational training and into employment.

This paper has addressed a key part of the education and training standards debate much under-represented in the literature. Given this position, the main contribution of this paper is in terms of the use of improved quantitative techniques to build on previous studies and the contrasting results found as a result of this innovation. Our results are intended to help inform policy makers in Northern Ireland about the relative merits of FE and YTP. In addition, as a case study of value added in education and training, the paper provides an example of the importance of fully considering initial conditions when assessing the performance of various post-16 education and training routes.

However, the paper should be seen as a first step towards full analysis of these issues and not the end product. Ideally, we would like a larger sample on which to estimate our models. This could allow greater disaggregation of YTP into its component schemes, for example. Also, an extended time period, covering young people up to the age of 19 or 21, for example, would allow us a fuller analysis of post-compulsory education value added[12]. Finally, it would be interesting to see if our results hold across the rest of the UK and are not just unique to Northern Ireland.

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[12] A proposal exists at NIERC to follow-up the original survey on which this analysis is based, which would allow such a study.

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APPENDIX: LIMDEP COMMANDS FOR ESTIMATION OF THE BIVARIATE SEMI-ORDERED PROBIT MODEL

The key LIMDEP commands which were used to estimate the bivariate semi-ordered probit model are shown below.

```
probit; lhs=P; rhs=z$
matrix; pcoef = B$
ordered; lhs = y; rhs=x$
matrix; ycoef = B$

create; if (y = 0 & P = 1) m0 = 1; (else) m0 = 0$
create; if (y = 1 & P = 1) m1 = 1; (else) m1 = 0$
create; if (y = 2 & P = 1) m2 = 1; (else) m2 = 0$
create; if (y = 0 & P = 0) m3 = 1; (else) m3 = 0$
create; if (y = 1 & P = 0) m4 = 1; (else) m4 = 0$
create; if (y = 2 & P = 0) m5 = 1; (else) m5 = 0$

minimize;
start = ycoef, pcoef, 0.5, -0.5;
 labels = b1, .., bn, a1,..,  an, j, ρ ;
 fcn=
 f0=m0 * log (bvn( (-b1'x), (a1'z), (ρ )))                              |

 f1=m1 *(log  (bvn( (j1-b1'x), (a1'z), (ρ)) -  bvn( (-b1'x), (a1'z), (ρ))) )       |

 f2=m2*(log  (bvn( (1000), (a1'z), (ρ)) -     bvn( (j1-b1'x), (a1'z), (ρ))))     |

 f3=m3 * log (bvn( (-b1'x), (-a1'z), (-ρ)))                            |

 f4=m4 *(log  (bvn( ( j1-b1'x), (-a1'z), (-ρ)) -  bvn( (-b1'x), (-a1'z), (-ρ))  )) |

 f5=m5*(log  (bvn( (1000), (-a1'z), (-ρ)) -     bvn( (j1-b1'x), (-a1'z), (-ρ))))   |

(f0+f1+f2+f3+f4+f5) $
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