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Distance Effects, Social Class and the Decision to Participate in Higher Education in Ireland*

JOHN CULLINAN
National University of Ireland, Galway

DARRAGH FLANNERY
University of Limerick

SHARON WALSH
Economic and Social Research Institute, Dublin

SELINA McCOY
Economic and Social Research Institute, Dublin
Trinity College Dublin

Abstract: While a number of international studies have attempted to assess the influence of geographic accessibility on the decision to participate in higher education, this issue has not been addressed in detail in an Irish context. The aim of this paper is to fill this gap and to present a higher education choice model that estimates the impact of travel distance on the decision of school leavers to proceed to higher education in Ireland, while also controlling for a range of individual level characteristics and school related variables. To do so we use data from the 2007 wave of the *School Leavers' Survey* and find that, on average, travel distance is not an important factor in the higher education participation decision, when factors such as student ability are accounted for. However, further analysis shows that travel distance has a significantly negative impact on participation for those from lower social classes and that this impact grows stronger as distance increases. We also find that the distance effects are most pronounced for lower ability students from these social backgrounds. This has important implications for higher education policy in Ireland, especially in relation to equity of access and the design of the maintenance grant system.

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Corresponding author: John Cullinan, email: john.cullinan@nuigalway.ie

I INTRODUCTION

Given the important role that higher (tertiary) education can play in economic development, increased participation in higher education has become an important policy objective in Ireland and in other countries. Indeed, a large amount of theoretical and empirical work has attempted to understand the range of factors that impact on a young person making the transition from second-level to higher education,[1] with a view to informing public policy. In general, this research has tended to focus on the influence of individual-level characteristics, such as the social class of students, their parents' education level and household income, as well as on human capital related variables such as opportunity costs and potential life cycle earnings. Some studies have also attempted to account for regional differences in participation rates, typically by including simple regional-level dummy variables within choice estimation procedures – see Flannery and O'Donoghue (2009) for an Irish example. Other international studies have, however, adopted more sophisticated approaches in this regard. For example, Frenette (2006) estimated the influence of distance from a young person's home to their nearest higher education institution (HEI) on higher level participation in Canada, while Sa *et al.* (2006) constructed a system-wide higher education accessibility measure in order to gauge its influence on the decision process in the Netherlands. To date, no study has comprehensively investigated the impact of geographic accessibility on the decision to participate in higher education. The aim of this paper is to fill this gap and to present a higher education choice model that estimates the impact of network distance to HEIs on the decision of school leavers to participate in higher education in Ireland, with a particular focus on the differential impact of distance across social classes.

There are a number of potential reasons why travel distance or accessibility to HEIs might impact on participation decisions and these are reviewed by Spiess and Wrohlich (2010). For example, from an economic point of view, the "transaction cost argument" implies that the greater the distance to a HEI, the higher the transaction costs of higher education and the lower the associated probability of participation. These transaction costs include direct financial costs (e.g. commuting), search costs (e.g. finding a place to live), indirect financial costs (e.g. forgone economies of scale associated with living at home), information costs, as well as possible emotional costs associated with leaving home. They also argue that there are potentially

[1] See Wilson *et al.* (2005); Lauer (2002); Dubois (2002); Albert (2000); Hung *et al.* (2000); Hilmer (1998) and Brannstrom (2007) for some of the most recent work in this area.

important "neighbourhood effects" whereby the presence of a local university can generate "spillover effects" that influence the behaviour of young people living in the vicinity of a HEI, or that there may be "information network effects" whereby a HEI's faculty or student body provide information about higher education that could influence decisions. There can also be access programmes which explicitly target socio-economically disadvantaged schools in the local area – the Higher Education Access Route (HEAR) programme is a good example from Ireland. Overall, the basic argument is that students who live closer to a HEI will be more likely to participate in higher education. Indeed, geographical distance to university has been used as an instrument in the returns to education literature (Card, 1995; 2001).

Within this context, this paper employs a binary choice model to estimate the impact of travel distance on the decision of "college-ready"[2] school leavers to participate in higher education in Ireland, with a particular focus on the differential effects of distance across social class. It finds that while travel distance does not emerge as significant in influencing higher education participation on average, the results clearly show that such accessibility is significant in the higher education entry rates of school leavers from lower social classes, particularly those who perform less well in the Leaving Certificate examination. The paper proceeds as follows: in the next section we outline a theoretical framework for the decision to attend higher education and also discuss the relevant literature to support our model. Section III presents an overview of higher education in Ireland, followed by a description of the materials and methods used to address our objectives in Section IV. To conclude we present a summary of our key results and findings, as well as a discussion of their implications.

II THEORY AND LITERATURE

The early theoretical work on human capital by Becker (1964) and Ben Porath (1967) presented a life cycle dimension to educational choice, with lifecycle earnings playing a key role in the decision to invest in education or not. In this paper we first develop a human capital model which is based on these early studies, and is similar to those in Keane and Woplin (1997) and Giannelli and Monfardini (2003), in order to consider the education/labour market choice of young people. In our model, individuals are assumed to maximise lifetime utility U derived from the consumption of goods and leisure

[2] The analysis is confined to those who left school on completion of the Leaving Certificate examination, because this represents the dominant entry route to higher education.

at time t, C_t and L_t, respectively, subject to a number of constraints which vary according to the alternatives of work or study. This can be represented as:

$$Max \, \mathrm{E}\left[\sum_{t=1}^{\infty}(1+\delta)^{t-1}[U(C_t, L_t)]\right] \tag{1}$$

where δ is the rate of time preference.

The first constraint in the optimisation is a budget constraint given by:

$$\sum_{t=1}^{\infty}(1+r)^{t-1}[W_t + R_t + F_t - C_t - E_t - D_t] = 0 \tag{2}$$

where r is the rate of interest, W_t is labour income, R_t are transfers made to a student by his/her family, and F_t is financial aid received while in education. In terms of costs, E_t represents direct education (or tuition) costs at time t, while D_t are costs relating to distance from HEIs. The model also includes a labour earnings constraint given by:

$$W_t = wK_tH_t \tag{3}$$

where w is the wage rate per unit of human capital, K_t is the stock of human capital and H_t is hours of work. In addition, there is a time constraint which is represented by:

$$T = \beta_t H_t + L_t + (1-\beta_t)S_t \tag{4}$$

where T is the total time endowment and S_t is hours of study. The term β_t denotes the distribution of time the individual donates to either work or study, which are seen as mutually exclusive i.e. $\beta_t = 1$ if the individual ignores all study and chooses to enter the labour market, while $\beta_t = 0$ if the individual chooses to engage in higher education.

Following Giannelli and Monfardini (2003), human capital in our model can be accumulated through hours of work or hours of study and leads to a human capital accumulation specification of:

$$K_t = K_{t-1} + F[(1-\beta_t)S_t + \beta_t H_t] \quad if \; t = 1,...,t^* \tag{5}$$

or

$$K_t = K_{t-1} + G[H_t] \quad if \; t = t^*+1,...,t^{End} \tag{6}$$

At $t = 1$ (the time at which we observe the individual's choice), it is assumed that human capital accumulation continues until t^* through either study or work. At t^*, future human capital is solely accumulated through labour market experience until the end of active life, denoted by t^{End}, while F and G represent functions describing the amount of human capital accrued from the various time allocations between work and study. The individual is assumed to choose the human capital accumulation process that maximises his/her utility, with indirect utilities for study and work represented by v^s and v^w respectively, where the indirect utility function (v) can be formally presented as:

$$v_{ij} = \phi(W_{ij}, F_{ij}, E_{ij}, I_{ij}, D_{ij}, X_i) \tag{7}$$

In this representation, W_{ij} is expected lifecycle work income for individual i associated with choice j, while F_{ij}, E_{ij}, I_{ij}, and D_{ij} are, respectively, education-related financial aid, the direct costs of education, the indirect or opportunity costs of education, and the distance related costs of education for individual i associated with choice j. Finally, X_i denotes a vector of characteristics specific to individual i, such as their ability, as well as variables relating to their parents, such as transfers, socio-economic status, etc.

This framework is supported by a number of previous theoretical and empirical studies which have focused on the factors impacting on higher education choices. In relation to future income, for example, Willis and Rosen (1979), Lauer (2002) and Wilson *et al.* (2005) all demonstrate the positive influence of expected gains in lifetime earnings on a young person's decision to attend college. The opportunity costs that arise from participating in education may also influence the decision to attend or not, especially the opportunity costs related to the labour market. Gustman and Steinmeier (1981); Light (1995); Rice (1999); Flannery and O'Donoghue (2009) and Giannelli and Monfardini (2003) all show evidence that individuals have a greater likelihood of participating in education when the labour market is depressed.

Tuition fees provide a more direct cost to the individual wishing to participate in education and so higher levels of fees would be expected to have a negative impact on participation. Leslie and Brinkman (1987), Heller (1997) and Neill (2009) all support this hypothesis, however, it should be acknowledged that increases in tuition fees affect individuals' participation decisions in different ways, with those from lower social classes potentially worst affected (Reay *et al.*, 2005). In an Irish context, both McCoy and Smyth (2011) and Denny (2010) suggest that the removal of higher education tuition fees in Ireland in 1996 was not sufficient to increase lower social class

participation in a context where other direct costs remained high and employment represented an attractive option. Higher education financial aids such as grants or scholarships may offset some of the cost burden imposed by tuition fees and thereby have a positive influence on participation. Studies by Heller (1997) and, more recently, Deming and Dynarski (2009) find that higher education grant levels impact positively on the education decisions of young people. For Ireland, McCoy *et al.* (2010b) find that grants are extremely important for higher education participation for those from lower social classes. Furthermore, McCoy *et al.* (2010a) provide evidence that individuals at the margins of grant eligibility thresholds have among the lowest higher education participation rates in Ireland.

Intergenerational effects may influence educational outcomes as an individual with higher parental educational attainment may show stronger preferences for education, perhaps because they may have first-hand experience of the gains of higher education through their parents and so order their educational preferences accordingly. The empirical evidence is mixed with Flannery and O'Donoghue (2009) and Albert (2000) suggesting a positive relationship between parental education and third level participation, in contrast to Black *et al.* (2005) who find a non-causal relationship for intergenerational transmission of human capital, with the exception of mother's education and their son's educational outcomes. Neighbourhood and cohort effects may also impact on the relative preference for education for an individual. For example, the level of (dis)advantage experienced in neighbourhood peer groups may impact upon a person's preference ordering involving education/labour choices. An individual's beliefs or expectations of the gains of higher education may also be influenced by their social environment (Brannstrom, 2007).

With respect to parental income, the empirical evidence is again mixed as Acemoglu and Pischke (2001) find that an increase in family income is associated with a higher probability of a child participating in higher education. However, Cameron and Heckman (1999) dispute the impact of credit constraints faced by lower income families on educational outcomes. While they acknowledge the negative impact of lower household incomes on education participation, they maintain that it is not as a result of short-term credit constraints, but rather due to more long-term factors. It is also important to note that the proportion of young people going on to higher education differs across schools, even taking account of individual background characteristics, suggesting that educational processes may have a significant role in determining higher education participation (Smyth and Hannan, 2007; McCoy *et al.*, 2010a; McCoy and Byrne, 2011). A combination of factors such as the social class mix, teacher expectations, student expectations and level of

student guidance may all be behind such variation. Furthermore, James (2002) and Smyth (2007) highlight the link between student-teacher relations in promoting student achievement.

Of particular importance within the context of this paper is the literature relating to the impact of distance related costs on higher education participation.[3] For example, costs relating to the distance from which a potential student resides relative to educational facilities may well play a role in the decision to participate in education. These costs include travel and transportation costs, as well as the possible extra costs of living away/further from home. This is often most relevant when considered in an urban-rural context. For example, those living in a rural setting may well face these higher costs, since most higher education institutions tend to be located in urban areas. Indeed, the magnitude of these costs may play a role in the education participation decision. For example, Frenette (2006) found that larger travel distances impact negatively on university participation in Canada, with students in upper secondary education that live further away from third level institutions having a lower probability of enrolling in these universities. However, the paper used straight line (Euclidean) measures of distance, when network-based travel distances are generally more appropriate for comparing urban and rural travel distances (see Section 4.2 for more on this). James (2001) also points to social factors within rural communities that negatively impact the educational participation decision. He acknowledges the role of extra financial burdens associated with rural living and higher education participation, but fails to find any link between the two. Instead he points to social preferences in rural areas that may have a negative impact on people's educational decisions in these areas.

In a more comprehensive assessment of the impact of geographic accessibility and higher education participation decisions, Sa *et al*. (2006) construct a higher education accessibility measure for young Dutch students and apply a multinomial logit framework to individual data in order to identify the pivotal factors behind individual decision making in the transition from high school to post-secondary education in the Netherlands. Their results confirm the strong influence that students' track record and talent has on higher education participation, but also show that geographical proximity significantly increases the probability of high school leavers continuing their education at a university or professional college. Other international studies, including Spiess and Wrohlich (2010) and Gibbons and Vignoles (2012), have also found

[3] It is important to acknowledge that there are other factors that may play a role in the participation decision that are not considered at length here, including an individual's consumption motives (Osterbeek and Van Ophem, 2000).

evidence of important distance effects. The former uses German data to find that distance to the nearest university at the time of completing secondary school significantly affects the decision to enrol in a university, controlling for socio-economic and other regional characteristics. It also suggests that the distance effect is driven mainly by transaction costs rather than by neighbourhood effects. Finally, Gibbons and Vignoles (2012) use UK data to conclude that geographic distance has little or no impact on the decision to participate in higher education in England, but does have a strong influence on institutional choice.

III HIGHER EDUCATION IN IRELAND

Higher education institutions in Ireland include universities, institutes of technology (IoTs), colleges of education, as well as a number of other public and private colleges, with a competitive entry system based mainly on grades achieved in the Leaving Certificate examinations at the end of secondary school.[4] Students can attain degrees in both universities and IoTs, but the entry level in the latter is primarily at the sub-degree level. While some private colleges also offer degree level programmes, the norm is to pursue sub-degree programmes at these institutions. Of the 150,000 full-time undergraduate students in higher education in Ireland in 2010, 53 per cent were in the university sector, 40 per cent in IoTs, with the remaining 7 per cent in other colleges (Higher Education Authority, 2012).[5] O'Connell *et al.* (2006) identify wide variations in both county and regional admission rates to higher education institutions in Ireland and indeed across higher education sectors.

From a policy perspective, and in particular in terms of achieving greater equity of access to higher education, the Irish State provides financial aid and assistance to higher education students who meet certain criteria based on parental income levels and geographic distance from their chosen HEI. Those attending private higher education colleges in Ireland do not qualify for this student grant scheme. The spatial component of the assistance is that students who satisfy the income related means test either receive a full or partial grant,[6] depending on whether they live more than or less than 45 kilometres from the HEI (24 kilometres in 2005/06). The proportion of students in receipt of a grant fell from 63 per cent in 1992 to 32 per cent in

[4] A full list of HEIs in Ireland is available at http://www.educationireland.ie/
[5] For a more detailed discussion of the higher education sector in Ireland, see Newman (2011).
[6] These are also known as non-adjacent and adjacent grants respectively.

2007, although there is some evidence of progressivity within the system with those from lower social classes representing a higher proportion of those in receipt (McCoy *et al*., 2010b). Higher education fees were abolished in Ireland in 1996, though so-called "registration fees" have been rising steadily since their inception. For example, the registration fee for the academic year 2005/06 (the year in which the students in our dataset were making their decision on whether to participate in higher education) was €775, compared to a registration fee of €2,000 for the academic year 2011/2012 (Higher Education Authority, 2010; 2011).

To date, a number of studies have considered the determinants of higher education participation in Ireland using a range of datasets, with a distinct focus on the impact of social class. For example, Clancy (1997; 2001) and O'Connell *et al*. (2006) used aggregate-level data, while Smyth (1999) and McCoy *et al*. (2010a) analysed annual school leavers' data from the period 1979-1994. The latter concluded that over the sample timeframe, social inequality in relation to participation in higher education remained virtually constant. O'Connell *et al*. (2006) and McCoy and Smyth (2011) also present evidence of the persistence of social inequality in the Irish higher education system, with McCoy and Smyth (2011) highlighting significant increases in higher education participation by young females within Ireland over the past 30 years. In another relevant study, Flannery and O'Donoghue (2009) used micro-level data from all eight waves of the *Living in Ireland Survey* to estimate the impact of a broad range of factors on higher education participation decisions in Ireland, including parental education level, household income, regional youth employment rates, human capital variables such as predicted life cycle earnings and potential forgone earnings, as well as direct costs such as tuition fees. The study found that parental education level and regional youth employment rates were the most significant factors in the decision to proceed to higher education.

Given the strong evidence of social inequalities within Irish higher education, McCoy *et al*. (2010a) and McCoy and Byrne (2011) explore this issue in greater depth. Both studies highlight the important role that financial constraints play in the decision to participate in higher education for those from lower social classes. They also highlight that those from lower social classes feel that current financial aid is insufficient for overcoming credit constraints relating to higher education participation. Indeed, there is a body of literature that emphasises socio-cultural factors in explaining the gap in higher education participation between social classes, with a suggestion of both "primary" and "secondary" effects (Boudon, 1974; Jackson *et al*., 2007). Primary effects relate to the influence of social class on differences in achievement, while secondary effects relate to differences in behaviour/choice

at a given level of achievement. In fact, both are evident in an Irish context. Children and young people from working-class backgrounds achieve lower standardised test scores or examination grades than those from middle-class backgrounds (Smyth and McCoy, 2009), while young people from higher professional backgrounds are more likely than similarly performing working-class young people to go on to higher education (McCoy and Smyth, 2011).

To summarise, previous studies from Ireland suggest a strong degree of social inequality in the Irish higher education system, and while they do acknowledge the role of higher education costs, policy tools and other factors in fostering these patterns, they do not consider the extent to which geographic inequalities in access to higher education might also have influenced participation at an overall level. Furthermore, they do not consider how travel distance might have different effects for school leavers from different social classes. Indeed, this may be a significant "secondary" effect in explaining variations across social classes in higher education participation. In this context, we now provide a description of the data to be used to analyse the role of distance on higher education participation in Ireland in this paper, as well as details of the geographic information systems (GIS) and statistical methods employed.

IV MATERIALS AND METHODS

4.1 *Data and Sample*

This paper is based on the 2007 wave of the ESRI's *School Leavers' Survey* (*SLS*). School leavers who exited the second-level system in the 2004/05 academic year provide the reference cohort for the survey. The survey is based on a stratified random sample of those leaving the official second-level system, with stratification based on the last programme the school leaver took at school, the year they were in within that programme and gender. Respondents were interviewed between 20 and 26 months after leaving school, with an achieved sample of 2,025 respondents representing a response rate of 54 per cent. The survey adopted a multi-mode response method, allowing respondents the option to complete the survey online, by telephone, by post or through face-to-face interviews. A significant share (44 per cent) completed the survey online, with the remainder split across the other response modes (see Byrne *et al.* (2008) for further details). The survey collects a wide range of individual, school, income, social, demographic, education and labour market related information. For example, it includes details of the current education and/or labour market activities of respondents and thus allows us to identify those school leavers in the sample who make the transition to higher

education (or not). It is also possible to identify which HEI an individual chooses to study at (if they did), as well as the specific type of higher education pursued e.g., degree, diploma, field of study, etc.

In our analysis we wish to consider only those individuals who are eligible to apply to all third level education institutions in a full-time capacity, which we define as those in our data that have completed the traditional or vocational Leaving Certificate exam and did not proceed to undertake a "post leaving certificate" (PLC) course. PLC courses are designed to develop vocational and technological skills in order to help find employment or proceed to further education and training. They take place in schools, colleges and community education centres, are full time and last for one to two years and offer a mixture of practical work, academic work and work experience. Since these courses may be considered a continuation of second level education, though are not classified as higher education, as well as the fact that individuals who complete a PLC will then subsequently face the choice in relation to progressing to higher education, the decision was taken to exclude these individuals from the main estimations (280 individuals in total).[7] We also excluded respondents in the *SLS* who left school either before or during their Leaving Certificate year or did not take the traditional or vocational Leaving Certificate examinations (802 individuals), or who did not report their Leaving Certificate results in the survey (45 individuals). Some observations were also excluded due to missing data for the covariates in the model (40 individuals), though every effort was made to balance the need for a large sample size with a robust model of higher education participation within the data constraints. This left us with a sample of 858 "college-ready" individuals who faced the choice of whether or not to participate in higher education in Ireland.

As noted, the *SLS* dataset contains the Leaving Certificate examination grades for most of the students surveyed, which is used to calculate the Central Applications Office (CAO) points achieved by each individual in our sample. This provides us with an excellent proxy for the scholarly ability of the student and also helps us to account for some supply-side effects in higher education participation. The dataset also provides information on whether or not an individual has undertaken any extra private tuition (grinds) outside of regular school hours while in upper secondary education. Such extra tuition may help foster the observed inequalities within higher education participation in Ireland, as those with higher incomes may be more likely to

[7] Given the uncertainty in relation to whether to include these individuals or not, additional estimations were also undertaken with these individuals included in the sample. While there were some small changes to some of the estimates, none of the key findings or conclusions differed in any meaningful way. Results are available from the authors on request.

avail of such a service. There is also a range of school level variables available in the dataset, including the gender enrolment mix and the religious sponsorship type of the school a student attended. In relation to the former, there is evidence that students in single-sex girls' schools benefit from more interactive teaching methodologies and are also typically more engaged in the learning process (McCoy *et al.*, 2012). These school-level variables may also help to control for other cultural/social variations across school types that might influence higher education participation.

In addition to these variables, we also include in our analysis a variable to control for variation in teaching quality that students may experience while in upper secondary education. McCoy and Byrne (2011) highlight this as a potentially important factor in the decision to progress from upper secondary to third level education in Ireland. Using the *SLS* dataset, we constructed a set of dummy variables based on answers to questions that were likely to indicate whether a student's teachers were of high or low quality. These survey questions asked respondents to rate the competencies of their teachers in their last year of upper secondary education across issues such as the ability of the teacher to keep order in class, the encouragement the student received from their teachers, as well as the availability of teachers to talk to the student. We then undertook a principal component analysis on these indicators of teacher quality, which enabled us to use the predicted score from one of these components to develop a variable that captures the variation in teacher quality.[8] A higher index of teacher quality would indicate a better teacher experience from the student's perspective and may impact on the higher education participation decision. Finally, the survey also provides useful information from an intergenerational perspective, as it provides information on the social class, occupation, and education level of school leavers' parents.

Despite the comprehensive set of variables contained within the *SLS*, there are, however, some potential determinants of the decision to participate in higher education that are not captured within the dataset. This includes data on the possible opportunity costs related to the decision to participate in third level education. In order to incorporate this factor into our analysis, we derived variables using other data sources, including the 2005 (Q2) wave of the *Quarterly National Household Survey* (*QNHS*).[9] The *QNHS* is a nationally representative dataset and provides information on the employment status,

[8] While it may be the case that a more motivated student might have a greater likelihood of providing more positive assessments of their teacher, an in-depth analysis of this possibility is beyond the scope of this paper. However, it is noted that CAO points and our index of teacher quality are not highly correlated.

[9] This wave was chosen as it is the closest corresponding time period to that within which the *SLS* sample was framing their decision on whether or not to participate in higher education.

age group and education level of individuals in Ireland. It also has a spatial element to it, as individuals can be grouped by NUTSII level regions. From this, we constructed a regional youth employment rate, given by the proportion of individuals aged between 15 and 24 years that are in employment, excluding those in education. This is taken as a potential proxy for the opportunity costs involved in undertaking higher education in Ireland. Finally, while we do have information on the secondary school attended by the student and subsequent higher education participation choices made by respondents within the *SLS*, it does not provide us with a measure of the distance a respondent must travel to their nearest HEI. As this is a key focus in this paper, we now discuss the steps taken to address this in detail.

4.2 *Distance Measurements*

In order to model the impact of distance on participation, the postal addresses of every secondary school contained within the *SLS* dataset were "geocoded" to provide precise spatial (x,y) coordinates for each student's school.[10] Geocoding is the process of assigning geographic coordinates to a property address, so that the features can be entered into a GIS for spatial analysis. An example is presented in Figure 1 which shows the spatial coordinates of each of the 729 secondary schools in Ireland (as of 2011), as well as the location of all 46 higher education institutions (also geocoded from postal addresses) that are considered in this paper. All of the GIS analysis was undertaken using ArcGIS 10.

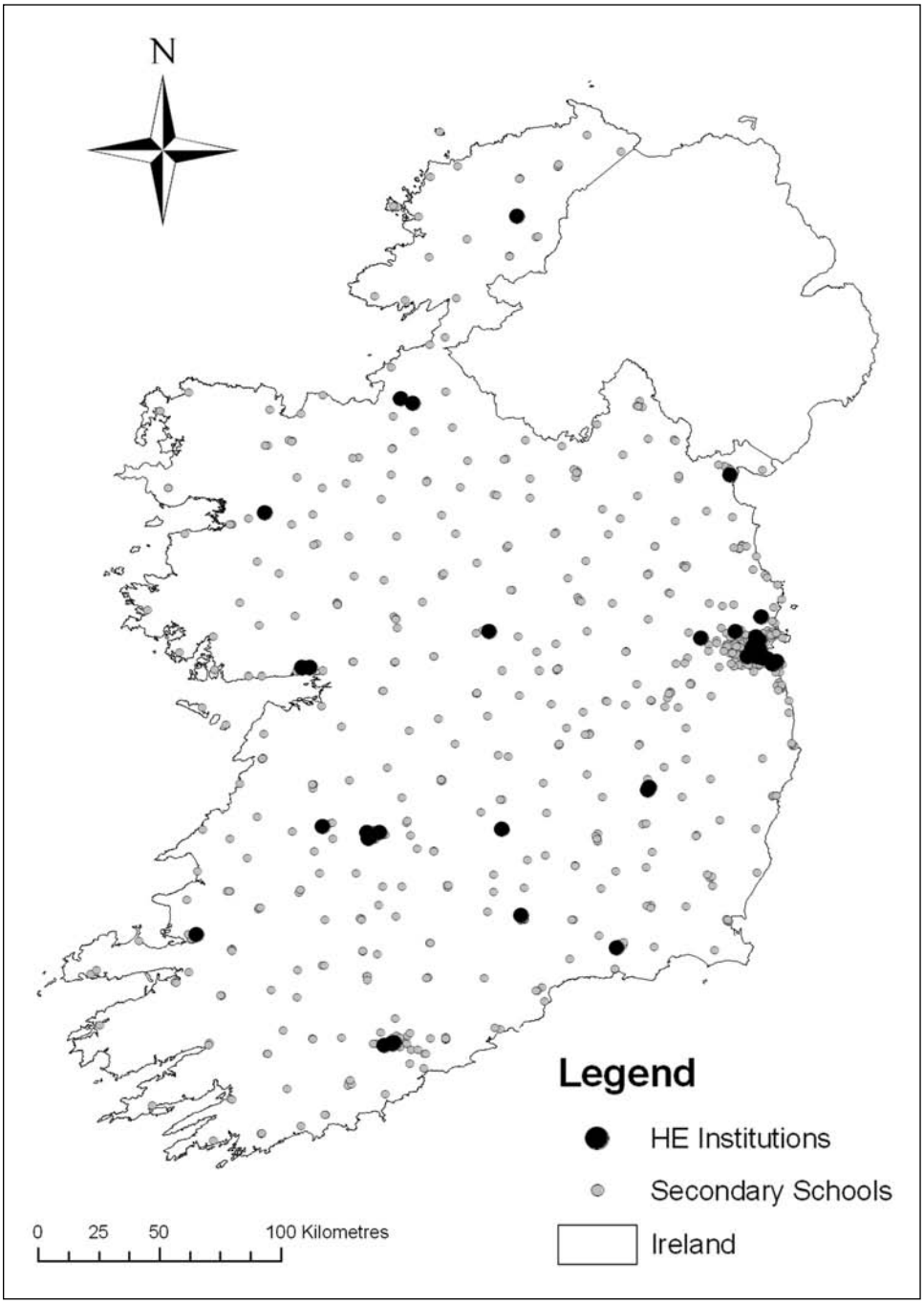
Geocoding the addresses of each school in the dataset allows us to calculate a range of geographic accessibility measures, using the network analyst extension in ArcGIS. Network analysis is a GIS function used to calculate the distance covered and time taken in making a journey on a network.[11] It facilitates, for example, a "route analysis" to derive the optimal travel route from a specified start point (e.g. an individual's residential location or school) to a specified end point (e.g. a HEI), reporting outputs such as journey distance and travel time.[12] Given the fact that road network density tends to differ significantly across Ireland, and in particular between urban and rural areas, road network travel distances were calculated and

[10] Unfortunately, the postal addresses of each respondent's residential location were not available and thus school locations are used in the subsequent modelling. This is a similar approach to that undertaken in Sa *et al.* (2006).

[11] A network is defined as an interconnected set of lines and points in a GIS representing geographic features through which resources can move.

[12] According to Bateman *et al.* (2002), "GIS routines for measuring distance and travel time from multiple precise outset origins to the plethora of potential visit locations have greatly enhanced the ability for researchers to introduce much needed real-world complexities into their analyses".

Figure 1: *Spatial Distribution of Secondary Schools and HEIs in Ireland*



used in the analysis. This provides a more accurate estimate of travel distance than standard Euclidean measures of distance (Cullinan *et al*., 2008; Cullinan, 2010) and improves on previous studies in this area which have used straight line distances (Spiess and Wrohlich, 2010; Frenette, 2006).

In order to measure the accessibility of HEIs for *SLS* respondents, we estimate network-based travel distance measures for each student from his/her school to their nearest HEI. To illustrate, Figure 2 shows the road network distance from the centroid of each electoral division in Ireland to the nearest HEI. The map clearly shows regional differences in accessibility and raises the question as to whether differences in these travel distances for students from different schools impact on higher education participation choices.

4.3 *Model and Estimation*

We consider the impact of travel distance on the likelihood of participating in higher education using a binary logit model. In the model, the decision by student i to participate in higher education (HE_i) is modelled as a function of a vector of HEI accessibility variables ($\mathbf{X}^A$) and a vector of student-specific explanatory variables ($\mathbf{X}^S$) relating to individual, household, socioe-conomic, school performance, human capital and local labour market indicators. The model is represented as:

$$HE_i = f(\mathbf{X}^A, \mathbf{X}^S, \eta_i) \tag{8}$$

where HE_i is an indicator variable taking a value of one if the individual participates in higher education and a value of zero otherwise, while η_i is a stochastic error term. The variables included in $\mathbf{X}^A$ include network travel distance to the nearest HEI (and a squared distance term), as well as a set of region-specific NUTSIII dummy variables (county level dummy variables were also considered but are not included in the final model). The variables included initially in $\mathbf{X}^S$ include the gender of the student (*Gender*), their total CAO points (*CAO Points*), whether they received additional paid tuition (*Grinds*), the social class of the student's father (*Social Class*), their father's education status (*Father's Education*), and a youth employment measure for the area of residence of the student (*Youth Employment*). In addition, we also include variables relating to teacher quality, school enrolment (gender) mix and sponsorship. The choice of these variables was influenced by the theoretical model outlined in Section II and a detailed review of the empirical literature in the area to date. Table 1 presents a more detailed description of the variables used to estimate Equation (8), while Table 2 presents sample descriptive statistics.

Figure 2: *Distance to Nearest Higher Education Institution*

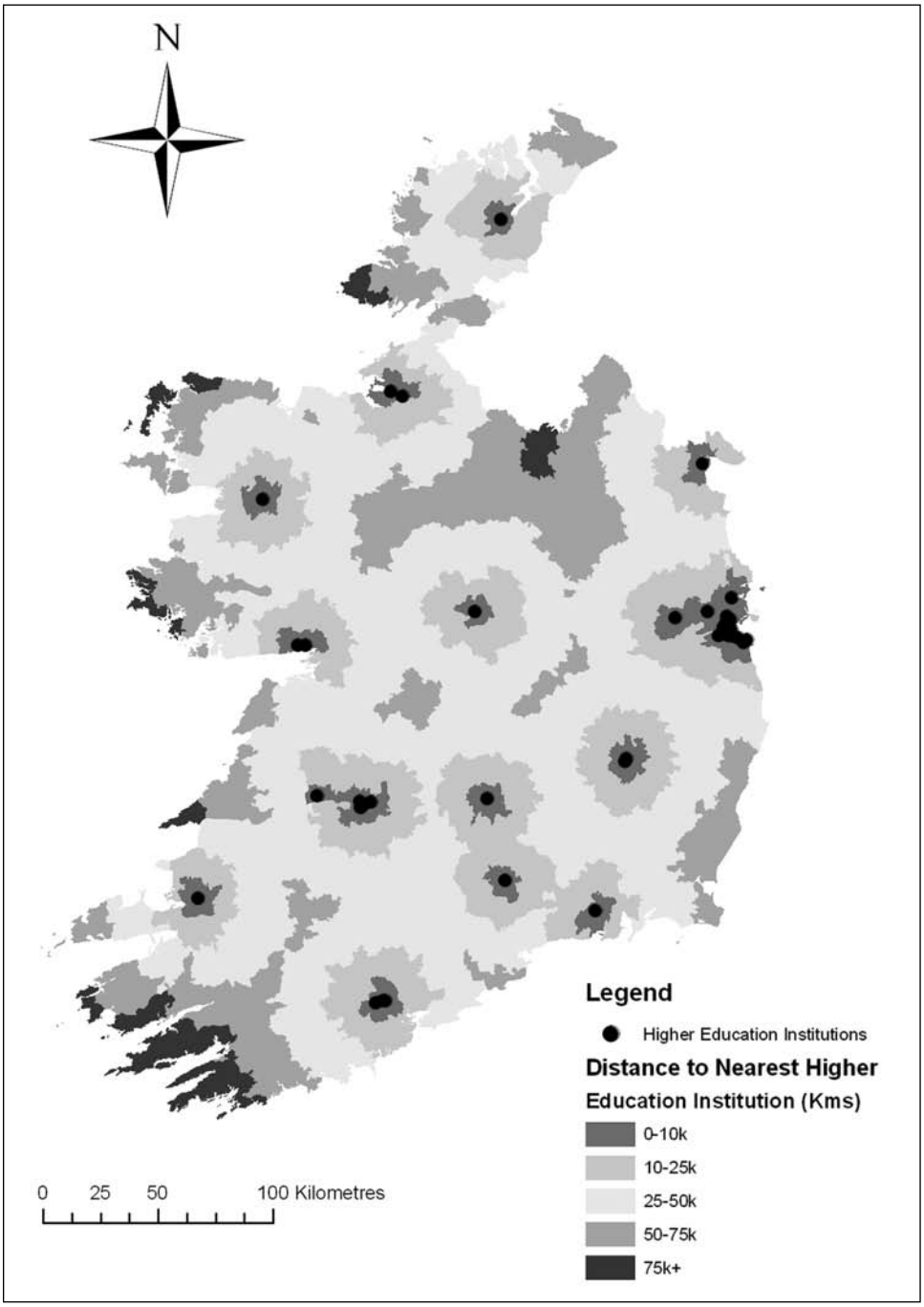


Table 1: *Variable Descriptions*

Variable	*Type*	*Description*
Spatial Variables		
Minimum Distance	Continuous	Distance to nearest HEI (kms)
Minimum Distance Squared	Continuous	Square of distance to nearest HEI (kms)
Border	Indicator	1= Border region; 0 = Not Border region
Midlands	Indicator	1= Midlands region; 0 = Not Midlands region
West	Indicator	1= West region; 0 = Not West region
Dublin	Indicator	1= Dublin region; 0 = Not Dublin region
Mid-East	Indicator	1= Mid-East region; 0 = Not Mid-East region
Mid-West	Indicator	1= Mid-West region; 0 = Not Mid-West region
South-East	Indicator	1= South-East region; 0 = Not South-East region
South-West Region	Indicator	1= South-West region; 0 = Not South-West
Youth Employment	Proportional	Proportion of individuals aged between 15-24 in employment by region
Student Variables		
Gender	Indicator	Gender of respondent (Female = 1; Male = 0)
CAO Points	Continuous	Total CAO points achieved by student
Grinds	Indicator	1= individual attended paid tuition grinds during last year of upper secondary study; 0 = individual did not attend paid tuition grinds during last year of upper secondary study
Socio-economic Variables		
Social Class I	Indicator	Fathers' social class is higher or lower professional = 1; Else = 0
Social Class II	Indicator	Fathers' social class is non-manual or skilled manual = 1; Else = 0
Social Class III	Indicator	Fathers' social class is semi-skilled or unskilled manual = 1; Else = 0
Father Education	Indicator	Father went to higher education (Yes = 1; No = 0)
School Variables		
Teacher Quality	Continuous	Principal components analysis generated proxy for teacher ability, based on student responses to a variety of related questions e.g. ability to control class and extent to which teachers engaged with students
Enrolment Mix I	Indicator	Individual attended a mixed gender secondary school = 1; Else = 0
Enrolment Mix II	Indicator	Individual attended a female only secondary school = 1; Else = 0
Enrolment Mix III	Indicator	Individual attended a male only secondary school = 1; Else = 0
Sponsorship I	Indicator	Catholic sponsored school = 1; Else = 0

Table 1: *Variable Descriptions (contd.)*

Variable	*Type*	*Description*
Sponsorship II	Indicator	Church of Ireland sponsored school = 1; Else = 0
Sponsorship III	Indicator	Interdenominational sponsored school = 1; Else = 0
Sponsorship IV	Indicator	Other sponsored school = 1; Else = 0

Table 2: *Sample Descriptive Statistics*

Variable	*Those Not in Higher Education*				*Those In Higher Education*			
	Mean	*SD*	*Min*	*Max*	*Mean*	*SD*	*Min*	*Max*
Minimum Distance	16.88	17.44	0	65	17.5	19.09	0	77
Border	0.13	0.34	0	1	0.125	0.33	0	1
Midlands	0.051	0.22	0	1	0.06	0.23	0	1
West	0.10	0.30	0	1	0.07	0.26	0	1
Dublin	0.23	0.42	0	1	0.26	0.44	0	1
Mid-East	0.07	0.26	0	1	0.13	0.34	0	1
Mid-West	0.13	0.33	0	1	0.11	0.32	0	1
South-East	0.09	0.29	0	1	0.12	0.33	0	1
South-West	0.18	0.38	0	1	0.10	0.30	0	1
Youth Employment	0.82	0.03	0.75	0.86	0.81	.034	0.75	0.86
Gender	0.40	0.50	0	1	0.55	0.50	0	1
CAO Points	223	110	30	555	387	117	40	600
Grinds	0.35	0.48	0	1	0.56	0.49	0	1
Social Class	1.96	0.77	1	3	1.66	0.73	1	3
Father Education	3.12	1.80	1	7	3.9	1.96	1	7
Teacher Quality	–0.386	1.69	–4.46	1.17	0.132	1.35	–4.46	1.17
Enrolment Mix I	0.73	0.44	0	1	0.59	0.49	0	1
Enrolment Mix II	0.12	0.32	0	1	0.23	0.42	0	1
Enrolment Mix III	0.15	0.35	0	1	0.18	0.38	0	1
Sponsorship I	0.35	0.48	0	1	0.54	0.50	0	1
Sponsorship II	0.03	0.18	0	1	0.02	0.15	0	1
Sponsorship III	0.57	0.49	0	1	0.41	0.49	0	1
Sponsorship IV	0.05	0.20	0	1	0.03	0.17	0	1
Observations	183				675			

Source: Author's Calculations – *School Leaver's Survey*, (2007), *Quarterly National Household Survey* (2005, Q2).

Given the binary nature of the dependent variable, a logit model is estimated, defining $P_i = P(HE_i = 1)$ as the probability that individual i proceeds to higher education after finishing secondary level schooling. Under the assumptions of the logit model $P_i = \Lambda(\mathbf{X}'\beta)$, where $\Lambda(.)$ represents the logistic cumulative distribution function (i.e. $\Lambda(\mathbf{X}'\beta) = \frac{e^{\mathbf{X}'\beta}}{1+e^{\mathbf{X}'\beta}}$), β is a vector of parameters and the vector $\mathbf{X}$ includes both $\mathbf{X}^A$ and $\mathbf{X}^S$. Estimation provides $\hat{\beta}$, unbiased estimates of the model coefficients β and it can easily be shown that:

$$\ln\left(\frac{P}{1-P}\right) = \text{logit}(P) = \mathbf{X}'\beta \tag{9}$$

This implies that the estimated probability of higher education participation, $\hat{P}_i$, can be estimated for each individual using $\hat{\beta}$ and appropriate values for $\mathbf{X}$. Given the multilevel nature of the dataset (i.e. there is a natural classification to the observations at a school level), the model is estimated using clustered standard errors. We also estimated a range of population-averaged multilevel models using the generalised estimating equations method introduced by Liang and Zeger (1986), though the results and conclusions were not found to differ in any meaningful way across the alternative estimation approaches.

V RESULTS

5.1 *Model Results*

Table 3 presents results from the binary choice model of higher education participation estimated with clustered standard errors and sample weights. The dependent variable (*Higher Education*) is an indicator variable taking a value of 1 if the individual participates in higher education after leaving school and a value of 0 otherwise. The results are presented as estimated average marginal effects on the decision to participate in higher education and thus represent an estimate of the mean marginal effect for the population of school leavers.

At an overall level, the results in Table 3 suggest that minimum distance to a HEI does not have a statistically significant association with the decision to proceed to higher education after leaving school. While the estimated average marginal effect is negative, implying that participation decreases as distance increases, statistically it is not significantly different from zero at the usual levels of significance. This model also included a non-linear (squared)

Table 3: *Estimated Marginal Effects: Binary Logit Model with Clustered Standard Errors and Sample Weights*

Variable	*dy/dx*	*z*
Minimum Distance	–0.0013	(1.45)
Midlands	–0.0990*	(1.75)
West	0.0070	(0.12)
Dublin	–0.0089	(0.19)
Mid-East	–0.0840*	(1.96)
Mid-West	–0.0120	(0.23)
South-East	–0.0300	(0.76)
South-West	0.0018	(0.04)
Youth Employment	–0.9040	(1.2)
Gender	–0.0014	(0.03)
CAO Points	0.0013***	(17.23)
Grinds	0.0492**	(2.24)
Social Class II	–0.0354	(1.46)
Social Class III	–0.0716**	(2.46)
Teacher Quality	0.0173**	(2.53)
Enrolment II	–0.0078	(0.17)
Enrolment III	–0.0103	(0.28)
Sponsorship II	–0.0809	(0.89)
Sponsorship III	–0.0420	(1.38)
Sponsorship IV	0.1190**	(1.98)
Statistics		
Wald χ^2	179.23	
Prob > χ^2	0.0000	
Pseudo R^2	0.3864	
Number of Observations	858	

Notes: The dependent variable (*Higher Education*) is an indicator variable taking a value of 0 if the individual does not participate in higher education and a value of 1 if (s)he does. The model is a logit model with clustered standard errors and sample weights and the table reports the average marginal effects. Absolute values of z statistics are presented in parentheses. *** denotes significant at 1 per cent, ** denotes significant at 5 per cent, and * denotes significant at 10 per cent.

term for distance. However, this is not reported in the estimated marginal effects in Table 3 with only the total marginal effect of distance included as is best practice.[13] (The model was also estimated including a linear distance term only and again was not found to be statistically different from zero.) Overall the results suggests that distance does not impact on participation on average though, as discussed below, the impact of distance may vary across different groups. In terms of the other spatial variables, there is evidence of

[13] See Ai and Norton (2003) for a detailed discussion.

some differences in participation across regions, while the youth employment rate is not found to be statistically significantly different from zero.

For the individual-level variables considered, a student's exam performance in secondary school is found to have a strong and statistically significant association with participation, with a 13 per cent increase in the likelihood of participation for an extra 100 CAO points.[14] Gender is not found to be statistically significantly associated with progression to higher education, though we do find that students who attended paid tuition grinds during their last year of upper secondary school are more likely to proceed to higher education. However, it is worth noting that students who seek extra paid tuition may be more academically motivated and more likely to proceed to higher education, even in the absence of these extra classes.

The results in Table 3 also suggest a strong social gradient in higher education participation rates and support findings from previous Irish studies. Students whose fathers' social class is classified as non-manual or skilled manual are 3.5 per cent less likely to participate on average when compared to students whose father is classified as higher or lower professional, though this result is not statistically significant. The estimated differential is 7.2 per cent on average for school leavers from semi-skilled or unskilled manual households when compared to the highest social group and is statistically different from zero. Although not included in the model presented in Table 3 due to multicollinearity issues, similar differences were also found when students are compared on the basis of whether or not their father had participated in third level education.[15]

In terms of school-related variables, the results in Table 3 suggest that teacher quality has a positive and statistically significant association with higher education participation. This suggests that even when controlling for variables such as ability and social class, factors such as the capacity of the secondary level teacher to keep order in class and the encouragement the student received from their upper secondary teachers, can help positively influence the probability of an individual progressing to higher education. They also suggest that the gender mix of a student's school is not an important determining factor, while there are no statistically significant differences in progression between Catholic, Church of Ireland and interdenominational schools, once spatial, individual and socio-economic factors are accounted for.

[14] We found no evidence of a non-linear effect of CAO points on participation.

[15] Studies such as Black *et al.* (2005) have found that maternal education level may be more important than paternal education in educational outcomes and so we also estimated our models with mother's education as a covariate in place of father's education. However, this variable was not found to be statistically significant and was therefore not included in the final model.

5.2 *Distance Effects and Social Class*

While the results in the previous section suggest that travel distance to HEIs does not influence the participation decision on average, they do not address the fact that there may be heterogeneity in the impact of distance across different groups. Since greater travel distances are likely to lead to higher costs of education, the impact of distance on participation may be more pronounced for those on lower incomes and/or those facing more significant credit constraints. As the *SLS* dataset does not include data on household income, we estimated additional models which included interaction terms between travel distance and social class, in order to consider the differential impact of distance across these groups. The estimated average marginal effects of travel distance for the three social classes from the preferred version of this model are presented in Table 4. They suggest that the average marginal effect of distance is very similar for social classes I and II, but increases in magnitude (absolute value) for the lowest social class. While the estimated effect is not statistically significantly different from zero for social classes I and II, for those school leavers in social class III, the estimated average marginal effect of distance is negative and statistically significantly different from zero. This is in contrast to the estimated average marginal effect for the full sample presented in Table 3 and implies that travel distance to a HEI has a differential impact on the probability of participating in higher education for those in different social classes in Ireland. It also supports the contention that travel distance is a greater deterrent in entering third level education for those in lower social classes.

Table 4: *Estimated Marginal Effect of Distance by Social Class*

Social Class	*dy/dx*	*z*
1	–0.0009	(0.85)
2	–0.0009	(0.75)
3	–0.0027**	(2.18)

Notes: The dependent variable (*Higher Education*) is an indicator variable taking a value of 0 if the individual does not participate in higher education and a value of 1 if (s)he does. The model is a logit model with clustered standard errors and sample weights and the table reports the marginal effect of distance by social class. Absolute values of z statistics are presented in parentheses. *** denotes significant at 1 per cent, ** denotes significant at 5 per cent, and * denotes significant at 10 per cent.

While this finding is useful from an analytical perspective, the results in Table 4 should again be considered as the average marginal effect across each of the three groups. A more informative analysis can be provided by

considering the impact on participation rates as both social class and travel distance are allowed to vary. For example, Table 5 presents the estimated difference in higher education participation probabilities for students from social class I and social class III at a range of different travel distances to nearest HEI. It is notable that each of the coefficients are positive, indicating that those from social class I have a higher probability of participating in higher education than those from social class III, across all travel distances. For two school leavers living 10 kilometres from the nearest HEI, the probability of progression to higher education is 5.8 per cent higher for an individual from social class I than for an otherwise similar individual from social class III. This differential increases with distance, such that the estimated difference is 10.1 per cent at 30 kilometres and 12.5 per cent at 50 kilometres. These results are illustrated in Figure 3 which clearly captures this increasing differential. It presents the difference in higher education participation probability as distance to HEI increases, alongside upper and lower confidence interval curves. It also includes a dotted vertical line at a distance of 24 kilometres, representing the cut-off distance for the state-funded non-adjacent maintenance grant at the time our sample was making the decision to enter higher education. The purpose of this line is to investigate whether there is a structural break in the probability difference when this form of financial aid is applied. As can be seen in Figure 3, this does not seem to be the case.

Figure 3: *Estimated Difference in Higher Education Participation Probability by Social Class and Distance*

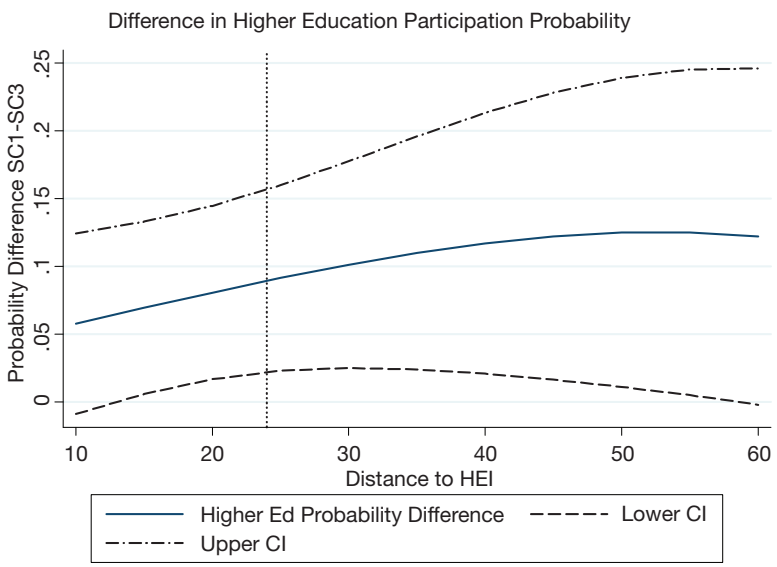


Table 5: *Estimated Difference in Higher Education Participation Probabilities for Social Classes I and III by Distance*

Distance (Kilometres)	*Coefficient*	*z*
10	0.0577*	(1.7)
15	0.0690**	(2.14)
20	0.0807**	(2.47)
25	0.0914***	(2.62)
30	0.1010***	(2.60)
35	0.1010***	(2.51)
40	0.1170*	(2.39)
45	0.1220**	(2.26)
50	0.1250**	(2.15)
55	0.1250**	(2.04)
60	0.1220*	(1.93)

Notes: The table reports the difference in higher education participation probabilities between social class I and social class III by distance. Absolute values of z statistics are presented in parentheses. *** denotes significant at 1 per cent, ** denotes significant at 5 per cent, and * denotes significant at 10 per cent.

Table 6 provides additional analysis of the difference in participation probabilities across social class and distance, this time with a view to exploring the reasons behind the divergence. It shows the difference in higher education participation probabilities between social class I and social class III while travel distances increase, for different levels of CAO points. While the previous results presented assumed that CAO points was held constant at its mean, it may be the case that the spatial differences in participation probabilities between school leavers of different social classes can also be explained in part by different levels of student ability. For instance, it may be the case that two otherwise similar school leavers, one from a higher social class with high ability and the other from a lower social class with high ability, may not have significantly different participation probabilities, regardless of distance to HEI. However, for the same students both living far away from a HEI and of low ability, distance to HEI may have a more influential role in the participation decision.

To investigate this, Table 6 presents the probability difference between school leavers from social class I and III for CAO points levels of 300, 400 and 500 points at increasing distances to HEI. The results show that those from social class I do have a higher probability of participating in higher education across all levels of CAO points and this difference increases with distance as before. Interestingly, however, they also indicate that this gap varies considerably at different levels of CAO points. For instance, a school leaver

Table 6: *Estimated Difference in Higher Education Participation Probabilities for Social Classes I and III by Distance and CAO Points*

Distance	*300 CAO Points*		*400 CAO Points*		*500 CAO Points*	
(Kilometres)	*Coefficient*	*z*	*Coefficient*	*z*	*Coefficient*	*z*
10	0.089*	(1.68)	0.038	(1.58)	0.012	(1.47)
15	0.110**	(2.11)	0.050**	(1.96)	0.016	(1.76)
20	0.130**	(2.44)	0.061**	(2.20)	0.020*	(1.94)
25	0.150*	(2.59)	0.071**	(2.31)	0.024**	(2.02)
30	0.165*	(2.59)	0.079**	(2.31)	0.027**	(2.01)
35	0.177**	(2.50)	0.084**	(2.24)	0.028**	(1.96)
40	0.185**	(2.37)	0.086**	(2.14)	0.029*	(1.88)
45	0.188**	(2.24)	0.83**	(2.00)	0.027*	(1.78)
50	0.184**	(2.09)	0.078*	(1.84)	0.025*	(1.64)
55	0.173*	(1.91)	0.069*	(1.66)	0.022	(1.49)
60	0.156*	(1.69)	0.058	(1.45)	0.018	(1.31)

Notes: The table reports the difference in higher education participation probabilities between social class I and social class III by distance for different levels of CAO points achieved. Absolute values of z statistics are presented in parentheses. *** denotes significant at 1 per cent, ** denotes significant at 5 per cent, and * denotes significant at 10 per cent.

from social class I who attained 300 CAO points and lives 40 kilometres from a HEI is 19 per cent more likely to participate in higher education compared to an individual with the same points and travel distance but from social class III. However, a school leaver from the higher social class at the same distance has only a 3 per cent higher probability of participation when compared to a school leaver from the lower social class if they both have 500 CAO points. This pattern is consistent across all distances with the participation probability difference smaller for those with higher CAO points.

5.3 *Caveats*

In considering the results and findings of this paper, a number of caveats should be borne in mind. First, the analysis presented is based on a cross-sectional survey of school leavers, two years after they left school. As with all cross-sectional data, caution is, therefore, required in attributing causality when factors are measured at the same time-point. However, care is taken to consider variables which are least logically, if not temporally, prior to the outcome in focus. For example, father's social class is likely to be relatively stable over time, so we can regard this background factor as influencing higher education decision making. On the other hand, variables relating to teacher quality and grinds may be subject to endogeneity biases.

A second issue of note concerns the fact that this paper is based solely on entry to higher education institutions in the Republic of Ireland. Second-level students, particularly those residing in border counties, are likely to also consider Northern Ireland institutions in their post-school decision making. In common with the body of research on higher education entry over time (stemming from Clancy's work in the 1980s and more recently O'Connell *et al.* (2006)), this paper is unable to fully address the potential influence of accessibility of Northern Ireland institutions in shaping school leaver's decisions.[16] However, in order to test the robustness of our results to this issue, we also estimated our models using sub-samples of our data which excluded students from the Border region. While this reduced the sample sizes in our estimations, it did not materially impact on the overall findings and our key conclusions. These results are available from the authors on request.

Although this paper considers the impact of accessibility on the decision to proceed to higher education, it does not take account of the fact that there is considerable heterogeneity in relation to the type and quality of HEIs in Ireland. While our results show that travel distance undoubtedly has an influence on the "quantity" of higher education demanded by certain groups, it may also influence the "quality" of higher education pursued. For example, differential travel distances to universities and IoTs may lead to school leavers substituting between different types of institutions. While these effects are important, they are beyond the scope of this paper and are under consideration in parallel research. It is also the case that while this research is concerned with whether travel distance influences the decision to participate in higher education, the results do not explicitly control for school leavers who made a decision to participate in higher education (taking account of distance), but did not achieve sufficient grades to attend. The number of such individuals within the *SLS* sample was, however, relatively small (5 in total), and re-estimations of our models excluding these individuals from the sample did not lead to any significant changes to our results or conclusions.

A final point to bear in mind when considering our results concerns the choice of accessibility measure used. While accessibility measures based on travel time, as opposed to travel distance, may well be preferable in this context, accurate and reliable data in relation to average travel speeds across different road types in Ireland for students is unfortunately currently not available, implying that significant errors in estimating travel times for students are likely. For this reason, we follow previous studies in Ireland (Cullinan, 2011; Cullinan *et al.*, 2011; 2012) and use travel distance in our

[16] Information on entry to Northern Ireland higher education institutions is not collected in the *SLS*.

analysis. Furthermore, we do not have appropriate data on the availability of public transport for students, which might well be an important contributing factor in any participation decision based on travel distance and time, but do include county and region dummy variables in our models to partially account for this. Finally, while distance to nearest HEI has been used in a number of previous studies to model geographic accessibility, other measures, including system-wide accessibility measures and number of HEIs within a set of given distances, could be also used. These alternative measures were considered and used to confirm the robustness of our results and details are available from the authors on request.

VI CONCLUSION

Ireland, like other countries, has seen persistent social inequality in higher education participation, despite a context of large-scale expansion in higher education places. What is perhaps distinct in the Irish context is a rapid increase since the 1980s in the higher education participation levels of the sons and daughters of farmers. These trends have been argued to reflect a decline in inheritance opportunities, along with eligibility for state subsidies through higher education grants. The trends also reflect the growth in places in IoTs over time, with these institutions providing more geographically spread higher education opportunities than the universities (McCoy and Smyth, 2011). Despite the potentially important role of accessibility and regional availability of higher education in understanding entry patterns among different social groups, the issue has received scant attention in the Irish context. Research attention to date has instead focused on the role of broader socio-cultural, economic and educational processes in shaping the higher education decisions of different social groups.

Using nationally representative data from the *School Leavers' Survey*, 2007, this paper assesses the role of geographic accessibility in the higher education decisions of college-ready school leavers of differing social backgrounds. While travel distance does not emerge as significant in influencing higher education participation on average, the results clearly show that such accessibility is significant in the higher education entry rates of school leavers from lower social classes, particularly those performing less well in the Leaving Certificate examination. While this finding has some parallels in international research (Frenette, 2006), we suggest there are some distinct processes underlying it in the Irish context. Earlier research has shown there are significant costs attached to higher education participation, particularly where such participation necessitates living away from the parental home. For

example, McCoy *et al.* (2010b) estimate that the costs of attending higher education are twice as high for those living away from home than for those living with their parents. Furthermore, longer travel times have important implications for students, not merely in terms of financial cost, but also in terms of their available time to engage in paid employment and hence support their studies. Financial supports are available to students from low income backgrounds, but it is unclear to what extent such supports sufficiently offset the substantial additional cost of living away from home or, at the very least, considerable travel costs. The provision of differential grant payment rates according to travel distance (with the non-adjacent rate threshold now set at 45 kilometres), is an explicit acknowledgement of the variation in college costs according to distance. The findings of this paper support the continuation of such differential payment rates. However, the results also suggest that given the particular challenges faced by lower performing students from disadvantaged backgrounds, there may be an argument for particular targeting of such students, both in terms of financial support, but also in terms of social and academic supports and broader academic preparedness for higher education.[17]

Given the strong policy focus on addressing social inequality in higher education access, along with its crucial implications for individuals, society and the economy at large, the potential role of higher education accessibility for less advantaged social groups should not be understated. Substantial investment has been, and continues to be made, by the State and individual higher education institutions in measures designed to promote entry to higher education among socio-economically disadvantaged young people. However, much of this focus is on providing financial support to students, with relatively less attention focused on the importance of social supports, particularly for students living away from home for the first time and perhaps with little family experience of higher education. In this context, it is worth noting that at present many access programmes engage in a range of social activities such as a pre-term orientation week where the students live on campus with other access students to encourage early social integration, in addition to a range of group and social events. Moreover, some higher education access programmes place particular emphasis on promoting entry among young people from disadvantaged schools in both urban and rural areas. Nonetheless, we believe that such social supports could be a more central component of programmes promoting access for under-represented groups (such as the HEAR

[17] Recent research has shown that academic preparedness, measured in terms of attainment in the Leaving Certificate examination, is the strongest predictor of progression and success in higher education (McCoy and Byrne, 2011).

programme), both in terms of promoting entry for young people from disadvantaged backgrounds from a wider geographic spread, as well as ensuring their academic success on entry to higher education.

Finally in terms of our findings, in a situation where higher education expansion over recent decades has stemmed from a greater geographic spread of higher education institutions, the results also suggest that recent discussions around institutional consolidation (Higher Education Strategy Group, 2011) should be considered carefully. The results presented here suggest that such moves could have consequences for access to higher education for young people from lower socio-economic backgrounds and hence run counter to important policy objectives in this regard.

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