Two Education Systems, One Island: A Comparative Analysis of Education Provision in the Republic of Ireland and Northern Ireland

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1. INTRODUCTION

Since the partition of Ireland in 1921 the education systems of the Republic of Ireland and Northern Ireland have diverged significantly. In recent years, spurred by the fallout of the Brexit referendum, there has been much greater policy discussion on North-South issues on the island in areas including but not limited to health, education, infrastructure, and the environment. The Irish Government's Shared Island initiative has identified education as an important area with potential for more co-operation between Ireland and Northern Ireland. There are considerable differences between the two jurisdictions in terms of education and labour market outcomes. Northern Ireland, for example, continues to use academic selection at age 11 to track students in grammar and secondary schools despite the known social inequalities this perpetuates, and post-secondary non-tertiary education is less developed than in the Republic.

Access to, and participation in, education is a key factor determining employment opportunities, career success, wage growth and broader life chances, such as health and well-being (Belfield and Levin, 2007). The effectiveness of the education and training system in enabling the acquisition of skills and qualifications matters not only for individuals but also for the economy and society. At a macroeconomic level, human capital plays a significant role in determining employment and productivity levels and ultimately macroeconomic growth rates. By contrast, early school leaving has a societal cost and is linked to unemployment, social exclusion and poverty (Smyth and McCoy, 2009). Therefore, it is essential to consider how the education and training system shapes pathways to qualifications.

McGuinness and Bergin (2020) have shown substantial gaps between educational attainment in Northern Ireland and Ireland. Furthermore, Bergin and McGuinness (2021) found that the rate of early school leaving in Northern Ireland was almost twice that of Ireland, with the analysis indicating that early school leaving there is much more heavily concentrated among males and those from working-class backgrounds. However, these broad comparisons do not explain the processes behind these figures or what groups (in terms of gender and social background) have particular types of qualifications. Despite the clear value of such a comparison, there has been very little research comparing the two education and training systems. This study aims to fill this gap by comparing the two systems as a basis for policy learning.

In addressing the following research questions, this study provides new insights into the way the education and training systems in Ireland and Northern Ireland shape outcomes.

1. **What are the trends in educational attainment in the two jurisdictions?** How do overall educational outcomes (in terms of qualifications, exam performance and skills) compare across the two jurisdictions? To what extent are these outcomes differentially influenced by gender and social background?
2. **What are the skill levels among the two populations** from primary education to adult life? Is any mismatch evident between skills and qualifications?
3. **How do earnings and the relative returns to different levels of education compare** in Ireland and Northern Ireland?
4. **What aspects of the respective education and training systems shape differences** in terms of skills and qualifications? What lessons can be learned for the future?

The paper draws on survey and administrative data to document three sets of outcomes in the two jurisdictions: overall educational attainment, that is, the highest educational level obtained; exam performance at lower and upper secondary levels; and the skills developed at different stages of the life course. All three dimensions are important in assessing educational outcomes. Qualification level has been found to be strongly associated with employment chances, job quality and pay levels (Müller and Gangl, 2003). Grades at a particular educational stage can determine access to the next educational level (e.g. from upper secondary to higher education) and play a role in shaping employment chances among school leavers, at least in some countries (Barnardi, 2003; Smyth, 2008). Looking at skill development, as measured by international comparative studies (such as the Programme for International Assessment (PISA), the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS)), provides insights into the kinds of competencies developed within educational systems (Dämmrich and Triventi, 2018).

The remainder of the paper is structured as follows: Section 2 provides a brief overview of the education and training systems on the island. Section 3 examines patterns of educational attainment in both jurisdictions and the relative incidence of early school leaving; Section 4 presents relative exam performance at lower sand upper secondary levels and Section 5 examines skill development over the life course. In examining the patterns of qualifications, grades and skills respectively in Ireland and Northern Ireland, the emphasis is on comparing overall outcomes in the two systems but also on examining the extent to which these outcomes are differentially influenced by socio-economic background and gender. Section 6 examines the relationship between qualifications and skills (such as literacy, numeracy and digital skills) and the relative returns to education and skills. Section 7 concludes.

2. OVERVIEW OF THE EDUCATION AND TRAINING SYSTEMS IN IRELAND AND NORTHEN IRELAND

Education in Ireland is compulsory for children between the ages of six to 16 years, or until they have completed three years of second-level (post-primary) education. In practice, however, most children start primary school before the age of six. In Northern Ireland, education is compulsory for children between the ages of four and 16.

Both jurisdictions provide free pre-school education, but the two systems now differ significantly in terms of the timing of early years provision. In Northern Ireland, this is available to children in the year before they start primary school under the Pre-School Education Programme. In Ireland, children can participate in the Early Childhood Care and Education Scheme when they are as young as two years and eight months of age, for a maximum of two years.

At both primary and secondary levels, Northern Ireland's school system is fragmented on the basis of school type and religious denomination. A range of school categories make up the system in Northern Ireland, including Controlled (many of which were originally Protestant schools), Catholic Maintained, Voluntary Grammar, Integrated, Irish-Medium and Independent schools.[1] Grant-aided schools follow

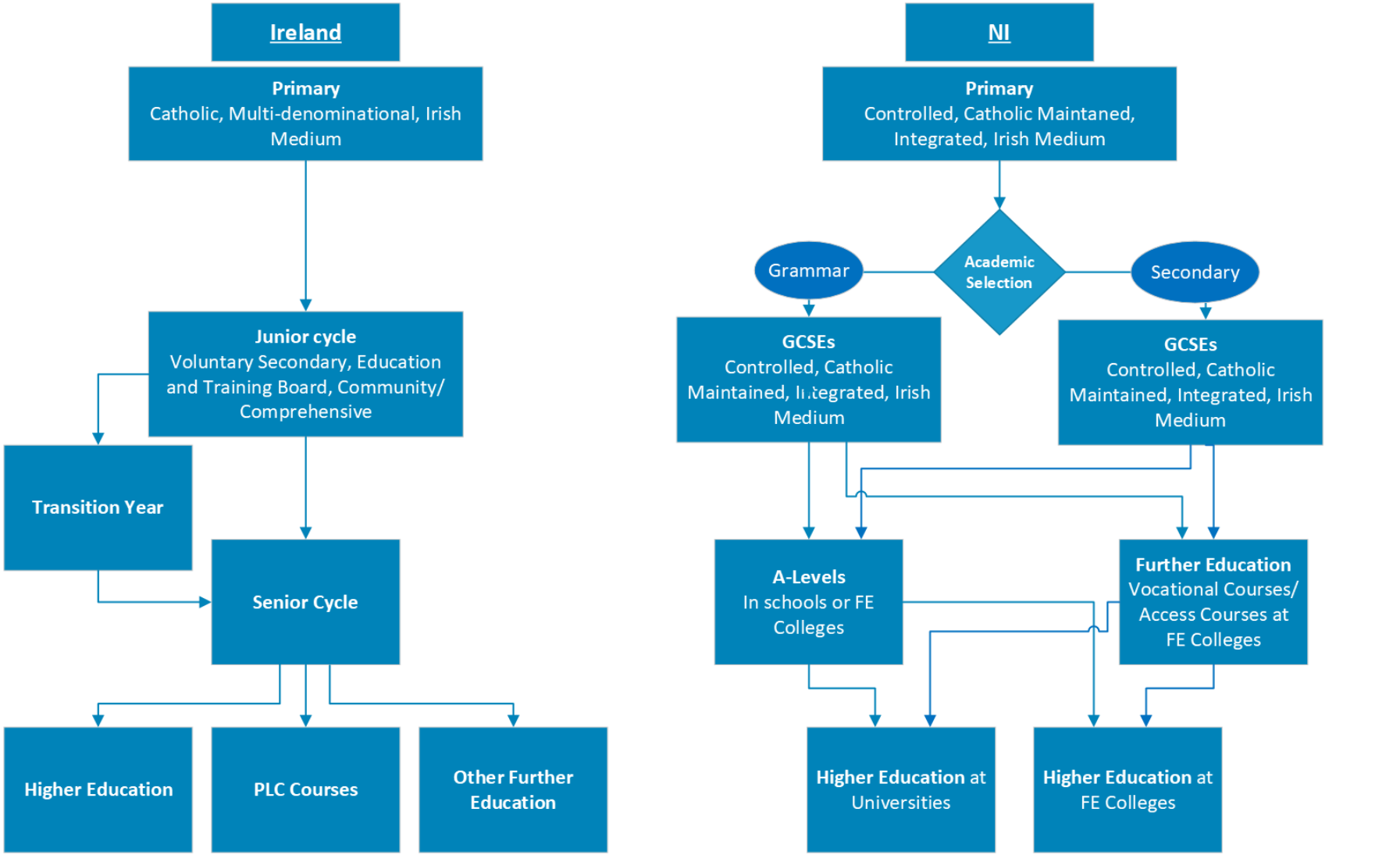
[1] Controlled schools are managed and funded by the Education Authority through school boards of governors (including representatives of the Protestant churches in most cases). Catholic Maintained schools are managed by boards of governors nominated by trustees. For Voluntary Grammar schools, the board of governors is the employing

the Revised Northern Ireland Curriculum, which has a largely prescribed curriculum from four to 14 years, with greater flexibility and choice from 15 years onwards. Children attend primary school for seven years (from four to 11 years). Second-level education is provided in secondary schools or grammar schools. Entry to grammar schools is through academic selection and the results of transfer tests are used to determine places. At the end of compulsory education (16 years), students take their GCSE examination, after which those who stay in education study for a further two years, either for A-levels or vocational courses, in schools or further education colleges. Subsequent education pathways include further education and higher education.

In Ireland, primary and secondary systems are also typically structured around religious denomination. Primary schools are publicly funded but are generally privately organised and usually with Church (mostly Catholic) involvement in governance. Primary education consists of an eight-year cycle and students follow a national curriculum. There are three types of secondary school (voluntary secondary, Education and Training Board (ETB), and community/comprehensive) and all schools follow the same curriculum and qualifications framework. Following recent statutory change, secondary schools are now not permitted to assess students for entry. However, it is very common for students not to attend their nearest or most accessible school, with around half not doing so, most often in urban areas, indicating a strong degree of active school selection by parents and children, with the families that make more active choices tending to be more advantaged (Smyth et al., 2004). Second-level education comprises an initial three-year junior cycle, which has recently been reformed, and is followed by a two- or three-year senior cycle (depending on whether students take the optional one-year Transition Year course). In the final two years of the senior cycle, students can take one of three programmes (established Leaving Certificate, Leaving Certificate Vocational Programme or the Leaving Certificate Applied Programme) and each has a state examination at the end of the programme. Subsequent education pathways in both jurisdictions include further education and higher education. The education systems and the associated pathways are displayed in Figure 2.1.

authority. This is also the case for Integrated schools, which bring together both communities. Irish-medium schools span the controlled and maintained sectors. It should be noted there is a very small number of independent schools in Northern Ireland.

FIGURE 2.1 EDUCATION SYSTEMS AND ASSOCIATED PATHWAYS



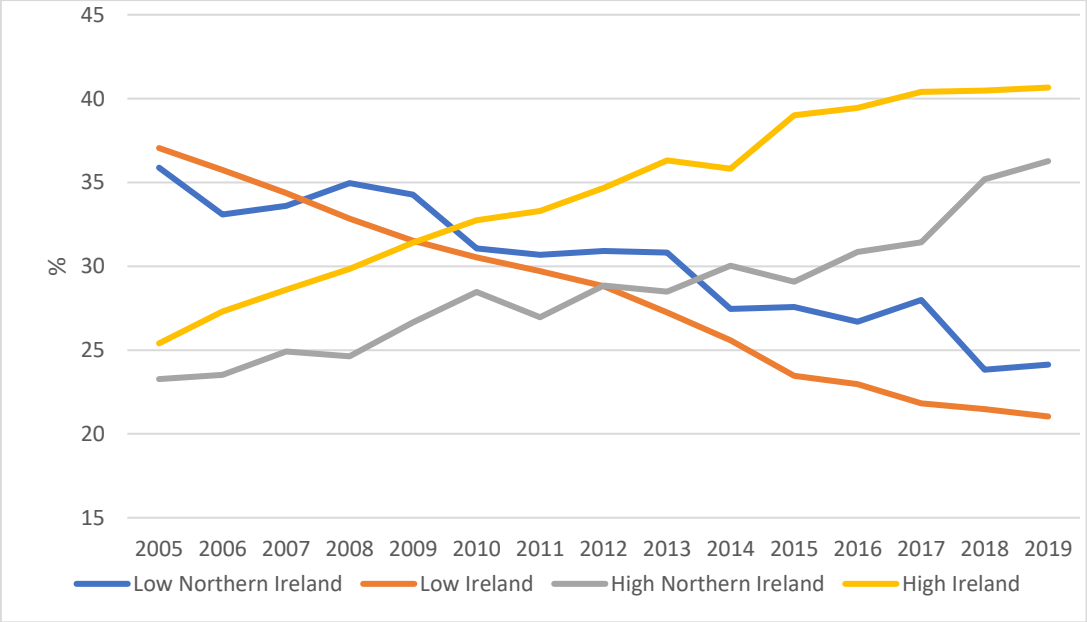
3. EDUCATIONAL ATTAINMENT

We use several data sources to measure comparative rates of educational attainment both over time (based on EU Labour Force Survey (EU-LFS) data) and at a specific point in time (based on Programme for the International Assessment of Adult Competencies (PIAAC) data). We then go on to assess the relative incidence of both early school leaving and of young people who are not in education, employment or training (NEET).

Patterns of educational attainment using the EU-LFS

Figure 3.1 uses data from the EU-LFS for Northern Ireland and Ireland to measure educational attainment in both jurisdictions over time. The EU-LFS provides educational attainment on a three-point scale of low, medium and high education.[2] Figure 3.1 displays the proportions of those aged 15-64 years in each jurisdiction who obtain a low education or a high education. The proportion who attain a medium level education is roughly consistent over time; in 2019, it was 39.6% in Northern Ireland and 38.2% in Ireland.

FIGURE 3.1 HIGH AND LOW EDUCATIONAL ATTAINMENT 2005–2019, 15-64 YEAR OLDS



Source: EU-LFS, 2005–2019.

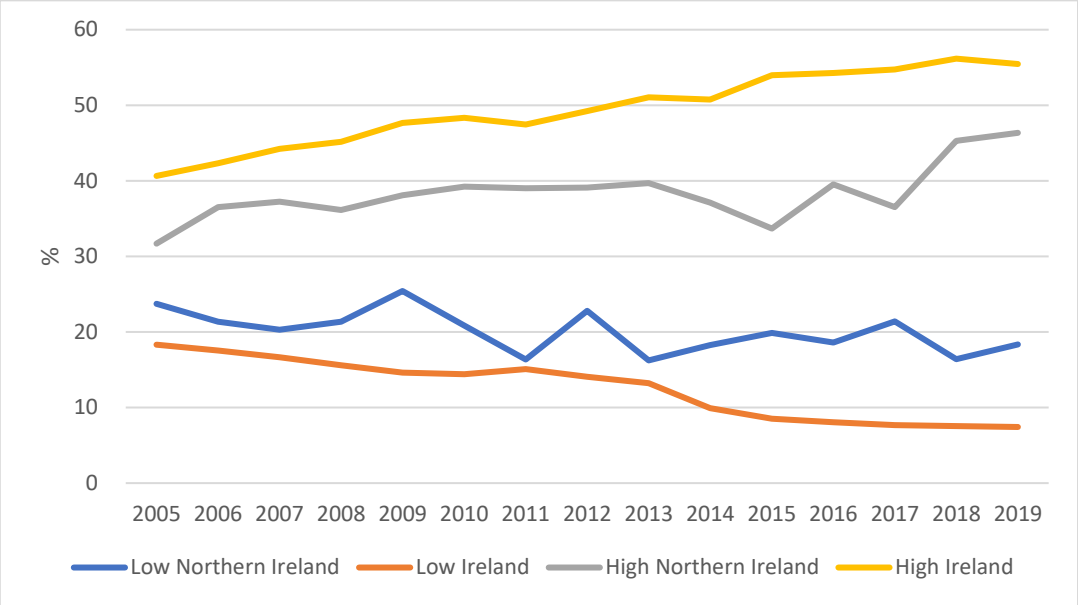
Between 2005 and 2019, across both jurisdictions, the proportion of those attaining a low level of education fell considerably while the proportion attaining a high level of education increased; from 23.3% in 2005 to 36.3% in 2019 in Northern Ireland and from 25.4% to 40.7% in Ireland. By 2019, the proportion of working-aged individuals in Northern Ireland with low educational attainment exceeded the level in Ireland by three percentage points; at the other end of the spectrum, the proportion of individuals with high educational attainment in Ireland in 2019 exceeded that of Northern Ireland by four percentage points.

Figure 3.2 shows the educational attainment (again high and low) in Northern Ireland for those aged 25-34 on the basis that educational patterns among this age group will more accurately reflect the

[2] Low education is up to and including ISCED level 2, medium education is ISCED levels 3 and 4 and high education is ISCED levels 5 and more. This is consistent regardless of which ISCED classification is used, 97 or 11.

current outputs of each respective education system. In 2019, 7.4% of those in this age bracket attained a low education in Ireland, compared to 18% in Northern Ireland. While both levels have fallen from 2005, the improvements in educational attainment have been greater in Ireland. However, while the proportion with a high level of education remains considerably higher in Ireland than in Northern Ireland, the more recent years have seen some convergence. Notwithstanding this, in 2019 the proportion of young people with high educational attainment in Ireland still exceeded that of Northern Ireland, by nine percentage points.

FIGURE 3.2 HIGH AND LOW EDUCATIONAL ATTAINMENT 2005–2019, 25-34 YEAR OLDS



Source: EU-LFS, 2005-2019.

Patterns of educational attainment using PIAAC

In Table 3.1, we use PIAAC data to measure differences in educational attainment between the two jurisdictions. The levels of attainment will not directly align with those based on the EU-LFS data as (a) PIAAC is based on the International Standard Classification of Assessment (ISCED) 1997 classification system while the EU-LFS uses ISCED 2011 for 2014 and (b) there will be some variations due to sampling. Nevertheless, the patterns observed are very similar.[3] Again, we see that the proportions educated to the lowest levels of education are much higher in Northern Ireland, compared to Ireland. A substantially higher proportion of people in Northern Ireland are educated to upper secondary level relative to Ireland. The proportion of persons educated to lower secondary level, which roughly equates to Key Stage 3 in Northern Ireland and Junior Certificate in Ireland, was approximately seven percentage points higher in Ireland.[4,5] At the upper end of the spectrum, the data indicate that the proportions of the population holding third-level qualifications were broadly similar. However, the proportions in Ireland educated to post-secondary level was almost three times that of Northern Ireland. Consequently, the proportion of the population educated to the two highest levels of

3 Primary is no formal education as well as ISCED 1997 level 1, lower secondary is ISCED 1997 levels 2 and 3C (shorter than 2 years), upper secondary is ISCED 1997 3C (2 years or more) as well as 3A and 3B, post-secondary is ISCED 1997 level 4 and level 5B, tertiary education is a combination of levels 5A and 6. For the equivalence of the ISCED levels to actual qualifications in Northern Ireland and Ireland, see ISCED Mappings, UNESCO UIS.

4 Lower secondary level in Northern Ireland equates to Key Stage 3 as well as GCSEs if less than 5 A*-C grades.

5 ISCED 1997 level 2.

attainment (post-secondary and third level) was 49.1% in Ireland compared to 29.8% in Northern Ireland.

TABLE 3.1 EDUCATIONAL ATTAINMENT, 2014, ALL PERSONS (%)

	Northern Ireland	Ireland
Primary or below	19.1	8.1
Lower secondary	13.7	20.4
Upper secondary	37.4	22.4
Post-secondary	10.6	29.9
Degree or above	19.2	19.3
N	*3,721*	*5,965*

Source: PIAAC, own analyses.

Table 3.2 measures educational attainment among 25-29 year olds in 2014, as this will give a more accurate representation of how the respective education and training systems are performing currently. Compared to the results from Table 3.1, which will include older cohorts who completed education many decades ago, the data indicate that both jurisdictions have seen significant falls over time in the proportions of young people leaving education with the lowest levels of schooling. However, as indicated by the EU-LFS data, the falls have been greater in Ireland than in Northern Ireland. Among this age cohort, the incidence of low educational achievement in Northern Ireland, at 12.3%, is over five times that of Ireland. At the other end of the spectrum, while the proportions of young people obtaining third-level qualifications remain similar, it appears the gap in post-secondary achievement is also widening over time. The proportions of 25-29 year olds educated to the two highest levels of qualification was 65.9% in Ireland in 2014 compared to 40.8% in Northern Ireland. The data would suggest that there is either lower access to, or demand for, post-school sub-tertiary pathways in Northern Ireland compared to Ireland.

TABLE 3.2 EDUCATIONAL ATTAINMENT, 2014, 25-29 YEAR OLDS

	Northern Ireland	Ireland
Primary or below	12.4	2.2
Lower secondary	10.6	8.4
Upper secondary	36.2	23.5
Post-secondary	11.4	36.2
Degree or above	29.4	29.7
N	*352*	*579*

Source: PIAAC, own analyses.

Tables 3.3 and 3.4 detail educational attainment levels among young people by gender. Some marked differences occur relative to the pooled data; in particular, the proportion of females with third-level qualifications was four percentage points lower in Ireland in 2014 than in Northern Ireland. In contrast, there was a significant gap in favour of Ireland in the proportion of females educated to post-

secondary level. For males, the stark difference in low educational attainment was again apparent between the two jurisdictions, with 13% in Northern Ireland having a primary or below education compared to 3% in Ireland. At the same time, males in Ireland were four percentage points more likely to have a third-level education compared to those in Northern Ireland and 18 percentage points more likely to have completed a post-secondary education.

Consistent with international patterns (see, for example, OECD, 2020b), males in both jurisdictions were more likely to be qualified to the lowest level of educational achievement compared to females; females in both Northern Ireland and Ireland were more likely to hold third-level qualifications compared to males.

TABLE 3.3 EDUCATIONAL ATTAINMENT 2014, 25-29 YEAR OLDS, FEMALES

	Northern Ireland (%)	Ireland (%)
Primary or below	11.5	1.2
Lower secondary	9.1	7.9
Upper secondary	36.1	20.4
Post-secondary	8.1	38.9
Degree or above	35.1	31.6
N	*235*	*322*

Source: PIAAC, own analyses.

TABLE 3.4 EDUCATIONAL ATTAINMENT 2014, 25-29 YEAR OLDS, MALES

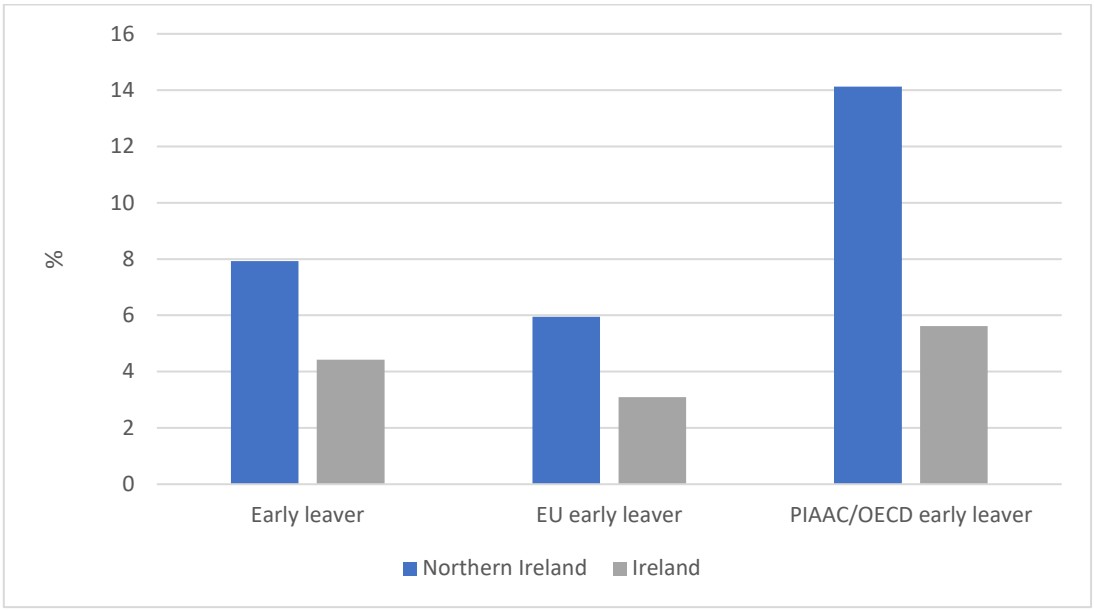
	Northern Ireland (%)	Ireland (%)
Primary or below	13.2	3.2
Lower secondary	12.1	9.0
Upper secondary	36.3	26.8
Post-secondary	14.8	33.4
Degree or above	23.6	27.6
N	*117*	*257*

Source: PIAAC, own analyses.

Early School Leaving and NEET

Early school leaving is known to be a particularly damaging form of educational failure, severely hampering an individual's chances of obtaining quality employment and wage progression (Brunello and De Paola, 2014). From the data it is possible to derive three alternative measures of early school leaving: (1) the PIAAC/OECD definition of persons aged 16 to 24 not in education qualified to lower secondary level or below; (2) the EU definition of persons aged 16 to 24 not in employment, education or training (NEET) educated to lower secondary level or below; and (3) persons aged 20 to 24 who are NEET and educated to lower secondary level or below. Although the three measurement approaches differ somewhat, a consistent trend emerges, with the Northern Ireland early school leaving rate in 2014 much higher than that of Ireland (Figure 3.3). Based on the OECD definition used by PIAAC, 14.1% of 16-24 year olds in Northern Ireland were early school leavers in 2014, while the comparable figure for Ireland was 5.6%. The results for early school leaving based on PIAAC data are consistent with those reported by Bergin and McGuinness (2021).

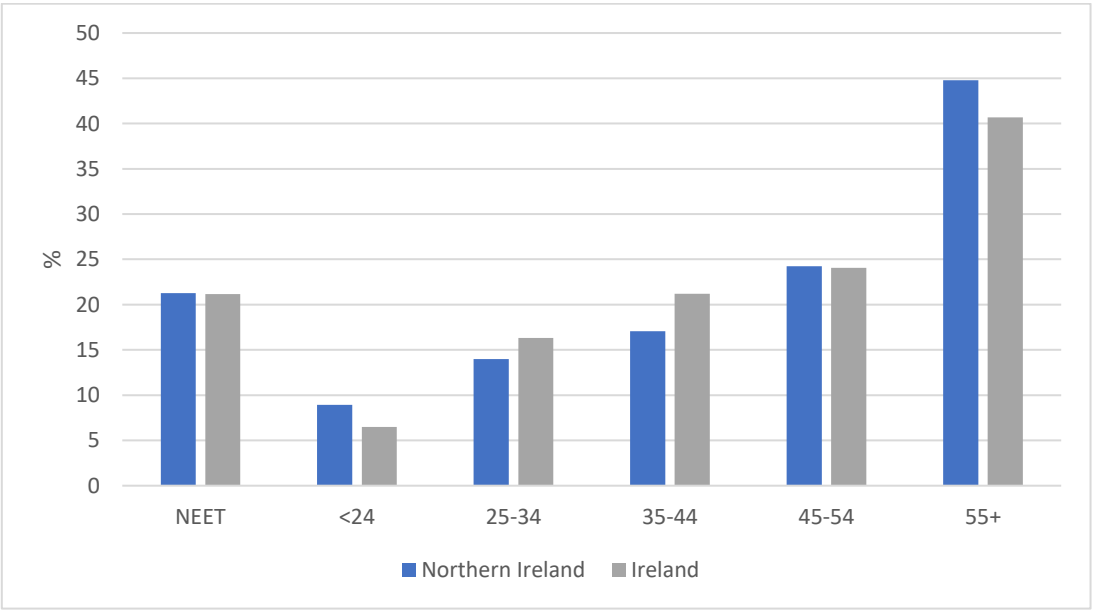
FIGURE 3.3 EARLY SCHOOL LEAVING IN 2014 (USING DIFFERENT DEFINITIONS)



Source: PIAAC, own analyses.
Note: The number of observations for early leavers, EU early leavers and PIAAC/OECD early leavers respectively are 723, 1,293, and 1,290.

Next, we examine comparative rates of educational and employment exclusion focusing specifically on those who are NEET. Figure 3.4 shows that while the overall rate of NEET is highly similar for both jurisdictions, at approximately 21%, some differences do occur when we measure the NEET incidence within particular age groups. The NEET rate was higher in Northern Ireland among those aged below 24 and over 65 years; in contrast, NEET rates were higher in Ireland among those aged 25 to 44.

FIGURE 3.4 NEET BY AGE GROUP IN 2014



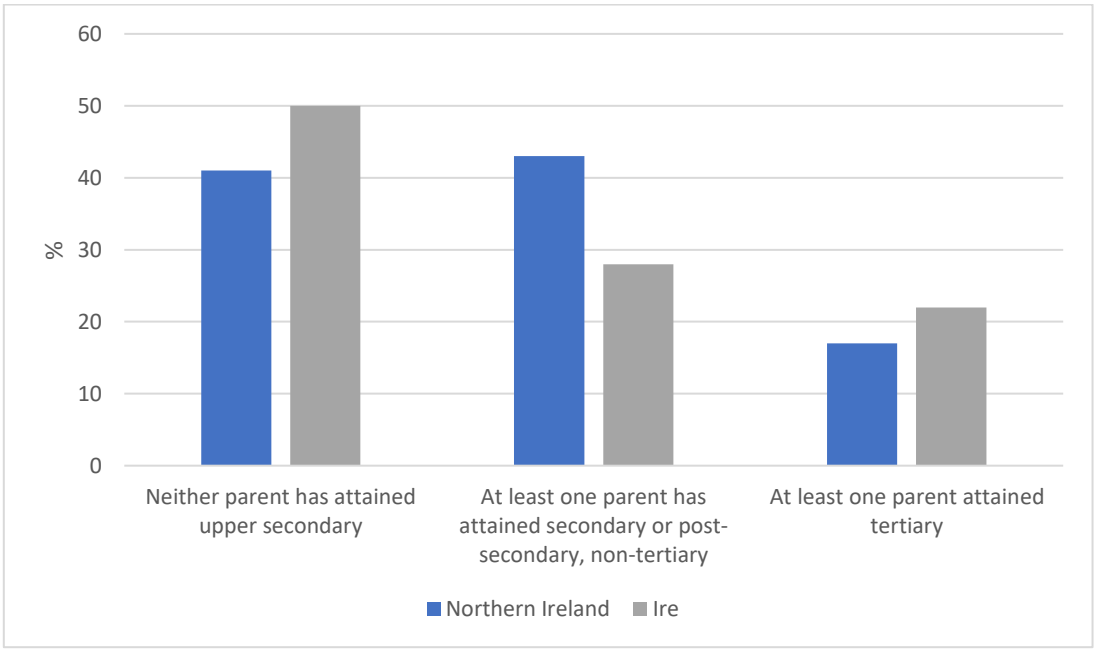
Source: PIAAC, own analyses.
Note: N = 3,761 for Northern Ireland and 5,983 for Ireland.

How social background relates to educational attainment, early school leaving and NEET

Social background is well documented as having a strong relationship with both education and economic outcomes for individuals (Hill, 2017; OECD, 2005). In particular, there is an extensive literature on the impact of parental educational attainment and/or occupation on child educational attainment (OECD, 2005; Shavit and Blossfeld, 1993). However, the extent to which parents' educational attainment is a predictor of education varies between countries (OECD, 2005).

Figure 3.5 presents parental educational attainment for all age groups in the two jurisdictions using the PIAAC dataset. It shows that 50% of those in Ireland report that neither parent had attained an upper secondary education, compared to 41% in Northern Ireland. On the other hand, 22% of those in Ireland have at least one parent who attained a tertiary level education, compared to 17% in Northern Ireland.

FIGURE 3.5 PARENTAL EDUCATIONAL ATTAINMENT FOR ALL AGE GROUPS COMBINED, 2014



Source: PIAAC, own analyses.
Note: N=3,397 for Northern Ireland and 5,677 for Ireland.

We then look at how the educational attainment of parents measures against individual education level. In Northern Ireland, those individuals whose parents have the lowest levels of education are less likely to have higher levels of education than their counterparts in Ireland; 21% in Northern Ireland whose parents have no upper secondary education attain either a post-secondary or higher education, compared to 53% in Ireland (Table 3.5). These individuals whose parents have the lowest levels of attainment are much more likely to have a primary or below education; 27% of individuals in Northern Ireland whose parents have no upper secondary qualifications have at most a primary education, while for those who have one parent with at least a secondary education this figure falls drastically to 4%.

TABLE 3.5 EDUCATIONAL ATTAINMENT AND PARENTAL EDUCATION BY JURISDICTION

	Primary or below	Lower secondary	Upper secondary	Post-secondary	Degree or above	*N*
Northern Ireland						
No upper secondary	27.1	15.4	36.3	9.5	11.8	*1,411*
At least 1 has attained secondary or post-secondary, non-tertiary	4.4	9.6	42.6	12.9	30.6	*1,414*
At least 1 attained tertiary	0.0	1.5	21.8	17.7	59.0	*572*
Ireland						
No upper secondary	4.7	18.8	23.6	35.2	17.8	*2,826*
At least 1 has attained secondary or post-secondary, non-tertiary	0.9	6.7	21.6	40.9	29.9	*1,601*
At least 1 attained tertiary	0.6	4.0	13.2	32.2	50.0	*1,250*

Source: PIAAC, own analyses, all age groups.

These differences between the two jurisdictions are stark and suggest that social background is a greater predictor of educational attainment in Northern Ireland than in Ireland. We use a probit model to formally estimate this relationship between social background and low educational attainment. In our social background model, Table 3.6, the dependent variable is binary, indicating whether an individual has low educational attainment across a range of measures. In columns 1 and 2, the dependent variable in the model captures NEET status, in columns 3 to 5 the model captures early school leaving using the three different measures previously mentioned and columns 6 and 7 report results from models where the dependent variable captures whether the highest level of education achieved is primary or below. In columns 2 and 7, the sample is restricted to those who are 25-34 years of age.

Our models also include a control for gender that takes the value one if the individual is male and zero for females. Parental educational attainment is also a binary variable, whereby those individuals who had neither parent with an upper secondary education are coded as one and zero otherwise. Table 3.5 shows the results of these models, which were run separately for Northern Ireland and Ireland; marginal effects are displayed.[6] In Northern Ireland, individuals are 19 percentage points more likely to be NEET if their parents have low educational attainment compared to 18 percentage points in Ireland. However, when we look at this among those aged 25-34 years, the results differ to a much greater extent. Among this age group in Northern Ireland, individuals whose parents have low educational attainment are 20 percentage points more likely to be NEET compared to ten percentage points in Ireland. In terms of early school leaving, the same pattern emerges. Individuals in Northern Ireland whose parents have low educational attainment are 27 percentage points more likely to be early school leavers (PIAAC using the OECD definition of early school leaving) compared to those in Ireland who are 13 percentage points more likely to be early school leavers. Thus, using this definition of early school leaving, the estimated impact of social background is twice as large in Northern Ireland

[6] Marginal effects can be interpreted as the percentage point difference in reporting as the outcome variable, e.g. NEET, early school leaving or having a primary education.

than it is in Ireland. Primary-level education is also twice as likely to be affected by parents' education in Northern Ireland than is the case in Ireland (22 percentage points versus 11 percentage points). When we restrict the sample to those aged 25-34, again the difference is much greater; those in Northern Ireland whose parents have low educational attainment are 13 percentage points more likely to attain a primary education compared to four percentage points in Ireland.

We can see from Table 3.6 that gender is not associated with educational attainment when parental education is controlled for, at least to the level that may be anticipated. This is particularly the case in Northern Ireland, which is of interest given the ongoing policy debate there on the educational attainment of working-class Protestant boys.[7] It should be noted that religious affiliation is not collected in this survey so social background and community membership cannot be disentangled here. The Expert Panel on Educational Underachievement concluded that while gender and religious differences do occur, social background (based on free school meal entitlement) was where the greatest attainment differences were evident.[8] That the social background effect remains so apparent among those aged 25-34 years in Northern Ireland is particularly concerning.

TABLE 3.6 PROBIT REGRESSION MODEL OF GENDER AND PARENTAL EDUCATION ON EDUCATION OUTCOMES

	NEET	NEET (25-34 years)	Early school leaving	Early school leaving EU	Early school leaving PIAAC	Primary	Primary (25-34 years)
Northern Ireland							
Male	-0.048***	-0.122***	-0.036	-0.032	-0.011	0.016	-0.010
Parents have low educational attainment	0.192***	0.199***	0.195***	0.153***	0.266***	0.224***	0.134***
N	*3,385*	*694*	*270*	*471*	*471*	*3,393*	*694*
Ireland							
Male	-0.068***	-0.072***	0.006	-0.012	0.028*	0.022***	0.005
Parents have low educational attainment	0.176***	0.099***	0.112***	0.092***	0.130***	0.112***	0.038***
N	*5,675*	*1,328*	*397*	*720*	*720*	*5,677*	*1,329*

Source: PIAAC, own analyses.
Notes: Marginal effects are displayed. ***p<0.01, **p<0.05, *p<0.1.

4. PERFORMANCE AT LOWER AND UPPER SECONDARY LEVELS

This section looks at the extent to which exam performance at lower and upper secondary levels varies by gender and social background across the two jurisdictions. Given differences in the curriculum and assessment systems, outcomes cannot be directly compared. Instead, the analyses focus on the

7 While gender does not significantly impact outcomes when social background is controlled for, it is an important predictor of performance within education levels.

8 It is often cited that working-class boys, in particular working-class Protestant boys, underperform in school. This was a key finding of the Expert Panel on Educational Underachievement in Northern Ireland published in 2021 (Purdy et al., 2021).

proportion of students achieving benchmarks that are commonly used in each system. At lower secondary level, the standards used are five or more GCSEs at grades A*–C grade (Northern Ireland) and six or more D3 or merit grades, of which two are A–C at higher or common levels (Ireland). At upper secondary level, the standards are three or more A-levels at A*–C grades (Northern Ireland) and six or more grades at H1–H6 or O1–O6, of which two or more are at H1–H4 (Ireland). The data used relate to 2019 as the assessment approach in both settings differed in 2020 and 2021 because of the pandemic. The exam data do not contain detailed information on social background. However, in Northern Ireland receipt of free school meals (FSM) is a long-established, if not always uncontroversial, proxy for socio-economic disadvantage (Taylor, 2017). Similarly, in Ireland being eligible for an exam-fee waiver can be taken as a proxy for disadvantage. Furthermore, the concentration of disadvantage at the school level can be measured using the same proxy.

TABLE 4.1 PROPORTION WHO REACHED SPECIFIC GRADE STANDARDS AT LOWER AND UPPER SECONDARY LEVELS BY GENDER AND FSM STATUS, NORTHERN IRELAND, 2019

	Males		Females	
	FSM students	Non-FSM students	FSM students	Non-FSM students
% 5+ GCSEs A*- C	74.2	87.8	82.1	93.6
% 3+ A-levels A*- C	57.9	71.8	63.1	75.9
N (Year 12)	*2,703*	*7,304*	*2,935*	*10,085*
N (Year 14)	*803*	*4,379*	*1,348*	*5,545*

Source: Department of Education (2019). Year 12 and Year 14 examination at post-primary schools in Northern Ireland 2018/2019 tables.

Table 4.1 shows that exam performance in Northern Ireland varies by both gender and FSM status. Females achieve higher grades than males at both GCSE and A-level. Disadvantaged students achieve lower grades than non-disadvantaged students at both levels, with male disadvantaged students achieving the lowest exam results overall. Other published exam data (Department of Education, 2019, Tables 10 and 11) allow us to examine whether the concentration of disadvantage at school level (that is, the proportion of students in the school with FSM status) makes a difference to exam performance. Unfortunately, the figures are presented separately for grammar and non-grammar schools. This makes it difficult to look at the overall relationship between school-level disadvantage and academic outcomes because grammar schools typically have much smaller numbers of students with FSM status. Overall, students attending grammar schools with the most advantaged profiles receive higher grades at GCSE and A-level. Performance among students in non-grammar schools does not vary as markedly by the concentration of disadvantage at school level.[9]

[9] Published exam data also indicate variation in exam performance among non-grammar schools in terms of their governance structures, so this may complicate the pattern of variation by disadvantage.

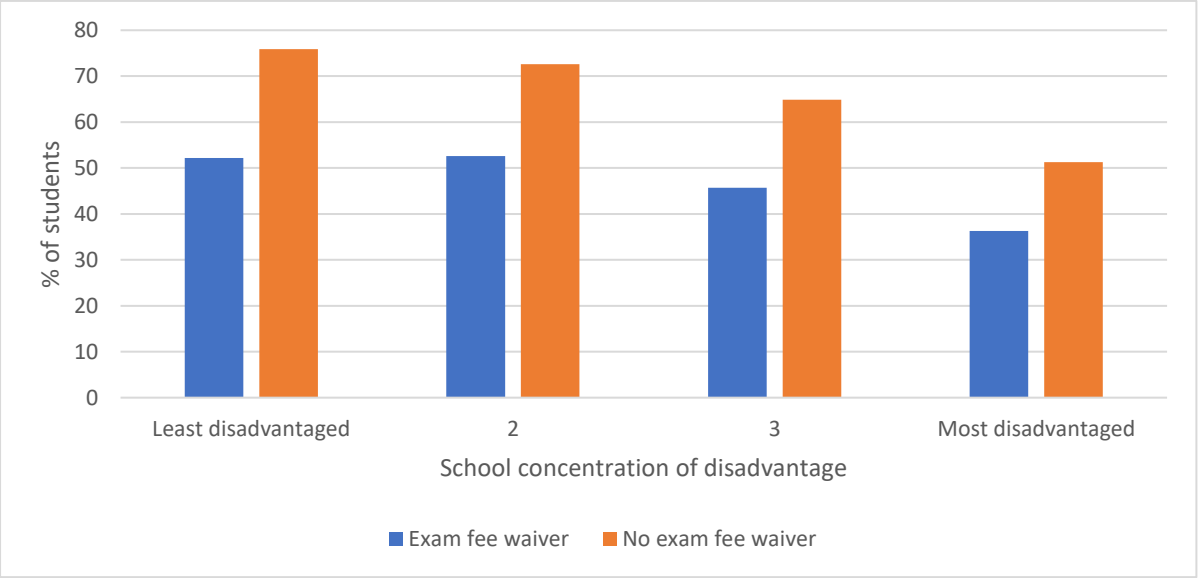
TABLE 4.2 PROPORTION WHO REACHED SPECIFIC GRADE STANDARDS AT LOWER AND UPPER SECONDARY LEVELS BY GENDER AND EXAM-FEE STATUS, IRELAND, 2019

	Males		Females	
	Exam-fee waiver students	Non-exam-fee waiver students	Exam-fee waiver students	Non-exam-fee waiver students
% JC 6+ 'passes' and 2 'honours'	52.5	77.0	67.1	87.7
% LC 6+ 'passes' and 2 'honours'	38.5	62.7	49.0	73.5
N (JC)	*11,025*	*21,333*	*10,664*	*20,729*
N (LC)	*8,529*	*18,929*	*9,231*	*18,959*

Source: State Examinations Commission micro-data, own analyses.
Note: JC = Junior Certificate; LC = Leaving Certificate.

Analyses for Ireland also show variation by gender and socio-economic disadvantage (Table 4.2). Females achieve higher grades at both lower and upper secondary levels, and these gender gaps are relatively larger than in Northern Ireland. Disadvantaged students achieve lower grades than non-disadvantaged students at both levels and the relative gaps are larger than in Northern Ireland.

FIGURE 4.1 PROPORTION OF STUDENTS ACHIEVING SIX OR MORE LEAVING CERTIFICATE GRADE 6, OF WHICH TWO OR MORE ARE GRADE 4, IRELAND, 2019



Source: State Examinations Commission micro-data, own analyses.
Note: Leaving Certificate grades run from 1-8, within levels, with H1 being the highest grade which can be achieved.

Analyses of exam micro-data allow us to disentangle the impact of disadvantage at individual and school levels. At the individual level, disadvantage is measured by whether the student has an exam-fee waiver or not. Schools are then divided into quartiles on the basis of the proportion of their students who have an exam-fee waiver. More disadvantaged students achieve lower grades than non-disadvantaged students, regardless of the school context (Figure 4.1). Furthermore, students in

schools with a greater concentration of disadvantage achieve lower grades than those in schools with more advantaged profiles.

TABLE 4.3 CORRELATIONS AT SCHOOL LEVEL BETWEEN % OF DISADVANTAGE AND % REACHING LOWER AND UPPER SECONDARY EXAM GRADE STANDARDS, IRELAND AND NORTHERN IRELAND, 2019

	Disadvantaged students in the school (%)	Students who reach lower secondary grade standards (%)
Northern Ireland		
% Disadvantaged (FSM status)		
% reaching lower secondary grade standards	-0.780***	
% reaching upper secondary grade standards	-0.539***	0.660***
Ireland		
% Disadvantaged (exam-fee waiver status)		
% reaching lower secondary grade standards	-0.688***	
% reaching upper secondary grade standards	-0.709***	0.802***

Source: State Examinations Commission micro-data, own analyses; Department of Education school-level data and results of school league tables published in the Belfast Telegraph.[10]

The figures presented above indicate that academic performance varies by the social composition of schools in both jurisdictions. As context, it is worth examining the extent of social segregation between schools in both systems; such segregation can result from neighbourhood segregation, school choice and (in Northern Ireland) the selection system. An index of dissimilarity provides a useful summary measure to compare segregation in the two settings; it measures the extent to which a certain proportion of the population would have to move schools so that there would be an equal distribution of groups of students across schools (Duncan and Duncan, 1955). For these purposes, free school meal receipt and exam-fee waiver status are used as proxies for disadvantage in Northern Ireland and Ireland respectively. To calculate these measures, we use State Examinations Commission microdata on lower secondary students in Ireland and published figures for the number of students with and without FSM status in individual Northern Ireland schools.[11] The analyses indicate that social segregation is greater in schools in Northern Ireland, with an index of dissimilarity of 24.4 compared with 18.4 in Ireland. In other words, almost one-quarter of students in Northern Ireland would have to move school to achieve an equal distribution of disadvantaged students across schools. It should

[10] See https://www.belfasttelegraph.co.uk/news/education/league-tables/.

[11] Unfortunately, school-level data in Northern Ireland relate to the total number of students with and without FSM status and so the extent to which between-school segregation is greater at lower or upper secondary level cannot be examined.

be noted that this measure does not take account of more nuanced measures of social background (such as parental education or social background) or religion/community.

Analyses were conducted at the school level to examine the extent to which average exam performance reflected the concentration of disadvantage (Table 4.3). In both systems, exam performance decreases with increasing levels of disadvantage. At lower secondary level, this relationship was somewhat stronger in Northern Ireland, suggesting that the above analyses, which distinguished between grammar and non-grammar schools, somewhat obscured the extent of educational disadvantage. At upper secondary level, the relationship between disadvantage and average grades is less marked in Northern Ireland than in Ireland. This appears to reflect the impact of patterns of early school leaving, which are higher in Northern Ireland (see Section 3), making those who remain for A-levels a more selective group in terms of social background and prior achievement. Using the difference in student numbers in Year 8 and Year 14 as a proxy for drop-out, a correlation of 0.48 is found between early school leaving and school-level disadvantage in Northern Ireland. In other words, the level of early school leaving is much greater in schools serving more socio-economically disadvantaged populations.

5. SKILL DEVELOPMENT OVER THE LIFECOURSE

This section looks at skill development from entry-level to primary education and through to adulthood, drawing on international comparative studies in which both Ireland and Northern Ireland participated, as well as on survey data collected on five year olds. The analyses focus on differences by gender and parental education (and, in the case of adults, their own level of educational attainment). The analysis of other axes of differentiation, such as migrant status, is beyond the scope of the current study. However, it is worth noting that the Irish school-going population is more diverse than that of Northern Ireland; analyses of PISA data indicate that 18% of the 15 year olds surveyed in Ireland were first- or second-generation migrants, compared with just 9% in Northern Ireland (PISA, own analyses).[12]

Skills at the time of primary school entry

Insights into skill development around the time of primary school entry can be gleaned from the *Growing Up in Ireland* (GUI) study and from the Northern Ireland sample of the Millennium Cohort Study (MCS).[13] Both studies followed children and their families from nine months to five years of age, collecting detailed information on family background characteristics, such as parental education and household income. Both studies involved the administration of the British Ability Scale vocabulary measure at age five. In addition, the teachers of the participating children were asked to report on competencies in relation to five domains: (1) attitudes to, and engagement with, school (including concentration); (2) language for communication and understanding (such as talking and listening confidently); (3) linking sounds and letters (including hearing and saying vowel sounds); (4) reading (including understanding story); and (5) numbers (including counting). The measures were identical in both countries, with the scales scored from zero to nine. However, the data were gathered at different time points; the survey for Ireland was conducted in 2015–2016, while the Northern Ireland one was carried out in 2006–2007.

[12] Migration integration will be addressed in a forthcoming study under the Shared Island Unit research programme.

[13] The Millennium Cohort study covered Northern Ireland, England, Wales and Scotland.

TABLE 5.1 VOCABULARY TEST SCORE AND TEACHER-RATED CHILD COMPETENCIES AMONG FIVE-YEAR-OLDS IN IRELAND AND NORTHERN IRELAND

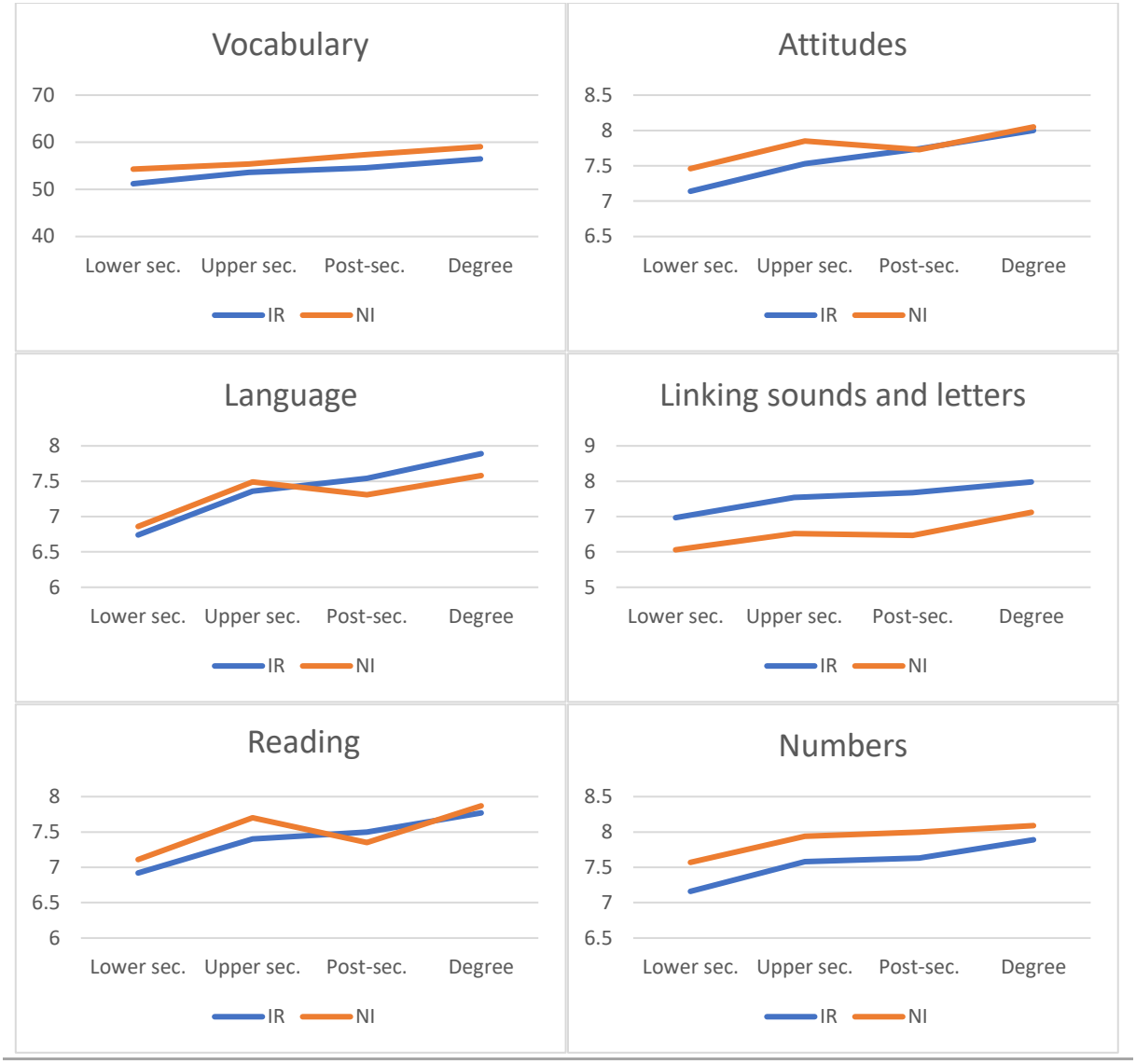
	Ireland		Northern Ireland	
	Male	Female	Male	Female
Vocabulary	54.45***	55.45	56.07	56.23
Attitudes	7.56***	8.00	7.43***	7.98
Language	7.38***	7.83	6.76***	7.58
Linking sounds and letters	7.53***	7.94	6.18**	6.69
Reading	7.36***	7.75	7.24**	7.57
Numbers	7.63***	7.77	7.66**	7.91
N	*4,169*	*4,116*	*498*	*520*

Source: *Growing Up in Ireland* Cohort '08, Waves 1–3; Millennium Cohort Study, Waves 1–3.
Note: *** p<.001, ** p<.01 for within-country gender differences.

Table 5.1 shows the average test scores and teacher ratings among five year olds, by gender. Overall, vocabulary test scores are slightly (but not markedly) higher in Northern Ireland,[14] but the teacher ratings of child competencies tend to be somewhat higher in Ireland (with the exception of number skills). In Ireland, girls have significantly higher vocabulary scores and more positive teacher ratings than boys, while in Northern Ireland, though girls are more positively rated by teachers, the objective vocabulary levels do not differ significantly by gender. These between-system differences may relate to differences in the home learning environment (e.g. the frequency with which parents read to children) and/or differences in curricular approaches (e.g. the timing of formal reading instruction), either within schools or in early years provision. Average differences may also reflect differences in the composition of the two populations in terms of factors such as education, social background, income and migrant status.

[14] Previous research also using the MCS data (Taylor et al., 2013) indicates that, controlling for a range of family background factors, vocabulary scores at age five are significantly higher in Northern Ireland than in England, Scotland or Wales.

FIGURE 5.1 VOCABULARY TEST SCORE AND TEACHER-RATED CHILD COMPETENCIES AMONG FIVE YEAR OLDS IN IRELAND AND NORTHERN IRELAND, BY MATERNAL EDUCATION



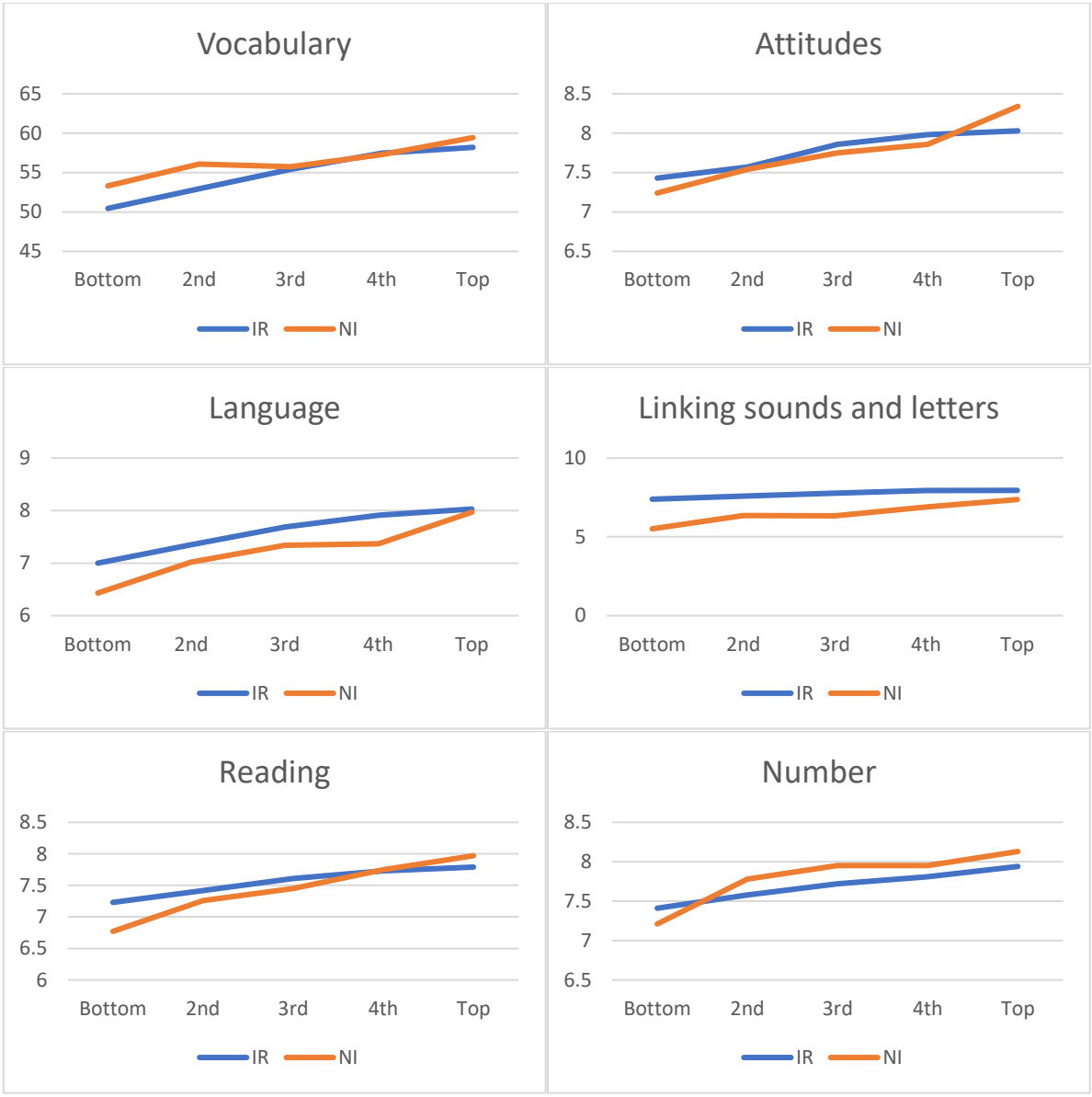
Source: *Growing Up in Ireland* Cohort '08, Waves 1–3; Millennium Cohort Study, Waves 1–3.

The extent to which a child has already developed skills when they start their formal education has implications for their longer-term outcomes (Chowdry and McBride, 2017). For this reason, it is worth looking at potential inequalities in skill development by family background, using measures of maternal education and household income quintile collected when the child was nine months old.[15]

The highest skill levels are found among those whose mothers have a degree (or higher qualification) and the lowest levels found among those whose mothers have lower secondary education or less (Figure 5.1). This pattern is found across both jurisdictions. However, the gap between the highest and lowest groups is slightly greater in Ireland than in Northern Ireland (with the exception of linking sounds and letters, where the reverse is true).

[15] Household income was equivalised to take account of household size and composition.

FIGURE 5.2 VOCABULARY TEST SCORE AND TEACHER-RATED CHILD COMPETENCIES AMONG FIVE YEAR OLDS IN IRELAND AND NORTHERN IRELAND BY HOUSEHOLD INCOME QUINTILES



Source: *Growing Up in Ireland* Cohort '08, Waves 1–3; Millennium Cohort Study, Waves 1–3.
Note: All differences are significant at the p<.001 level.

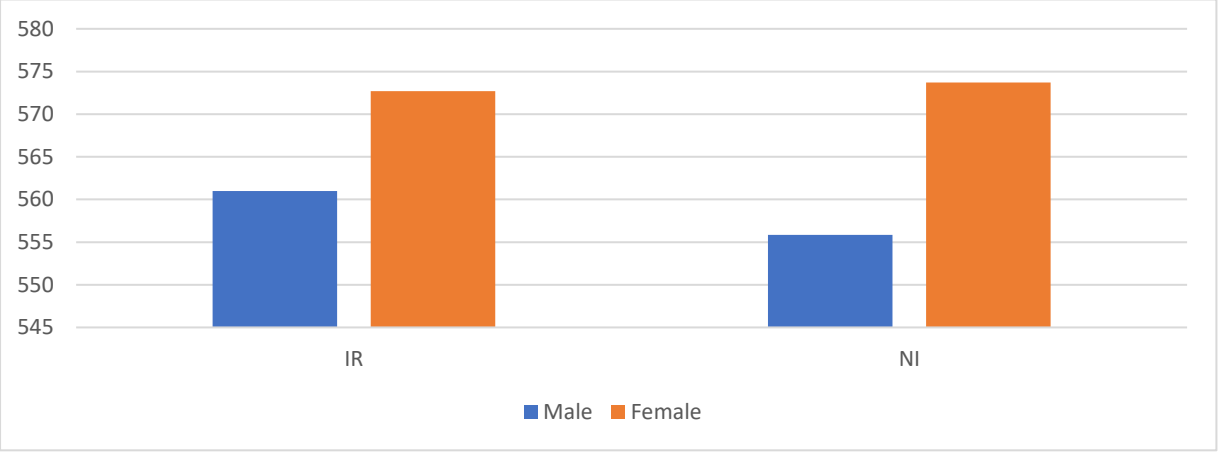
The picture is somewhat different when patterns are examined by household income (Figure 5.2). In both countries, skill levels are higher among children from higher income households. In relation to vocabulary, the gap between the top and lowest income groups is somewhat greater in Ireland than in Northern Ireland. However, for the teacher-rated skills, inequality tends to be greater in Northern Ireland. This seems to be driven by better ratings in Ireland among those in the very lowest income group. While not definitive, this pattern is likely to reflect the strong emphasis on promoting literacy and numeracy skills in Delivering Equality of Opportunity in Schools (DEIS) schools, those serving the most disadvantaged populations.

Skills in middle childhood

Two sets of studies can be used to look at skill development at fourth grade of primary education (around nine to ten years of age): the Progress in International Reading Literacy Study (PIRLS) conducted in 2016, which assessed reading comprehension, and the Trends in International

Mathematics and Science Study (TIMSS) conducted in 2019, which assessed maths and science literacy. It is worth noting that the use of plausible values in the test scores for PIRLS, TIMSS and PISA requires the use of the bespoke IEA International Database Analyzer (IDBAnalyzer) to analyse the data. This package produces 'side-by-side' analyses of the two countries rather than integrating the two datasets to directly test the significance of any differences. The tests of significance presented are therefore based on whether or not the confidence intervals overlap for the specific groups examined.

FIGURE 5.3 AVERAGE READING LITERACY SCORE AMONG 9-10 YEAR OLDS BY GENDER IN IRELAND AND NORTHERN IRELAND



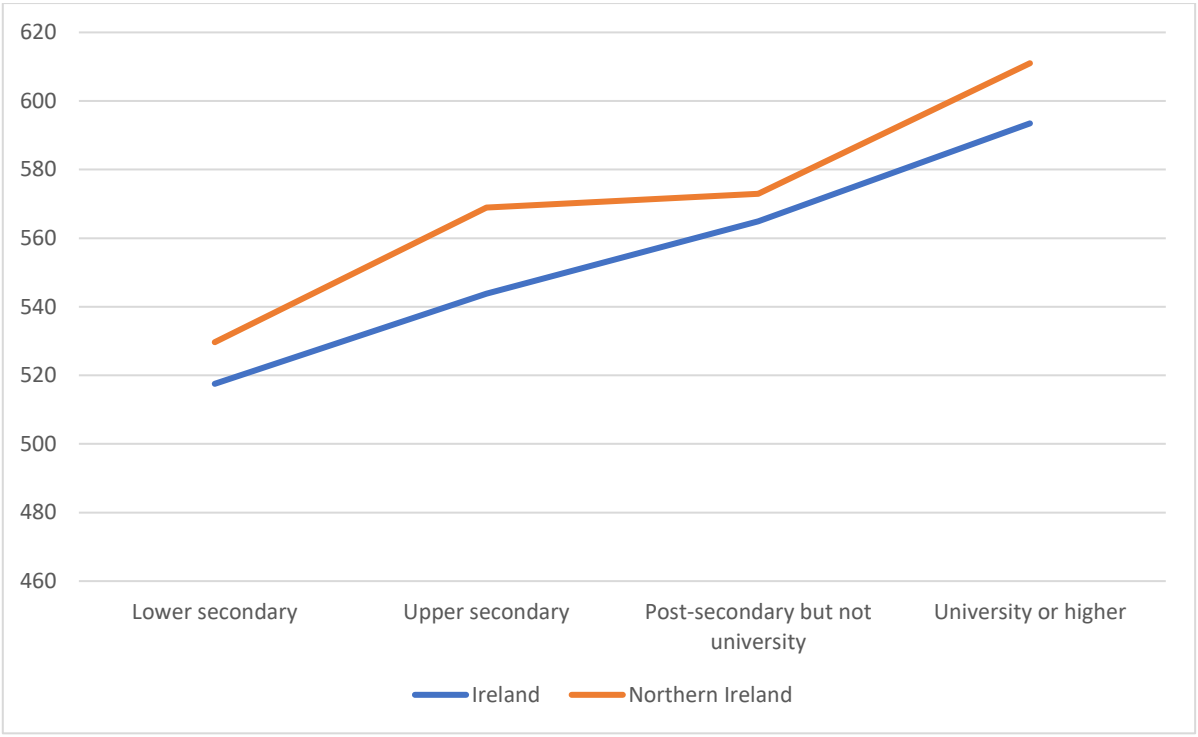
Source: PIRLS 2016 data, own analyses.
Notes: The sample sizes were 2,353 male and 2,240 female in Ireland and 1,846 male and 1,833 female in Northern Ireland.

Both Ireland and Northern Ireland emerge as high-performing countries in reading literacy (Sizmur et al., 2017), with no significant differences in average scores between the two jurisdictions. The spread of scores, that is, the difference between the highest and lowest attainers, is wider in Northern Ireland than in Ireland and other comparator countries, except New Zealand (Sizmur et al., 2017).[16] It is not possible to determine the reasons for this pattern but it may be, at least in part, related to the much greater use of ability grouping for reading in Northern Ireland than in comparator countries. Furthermore, the proportion of students who 'very much like reading' is lower in Northern Ireland than in Ireland (39% compared with 46%) and the international average (43%) (Sizmur et al., 2017).

In both systems, girls score significantly better in reading literacy (Figure 5.3). Students from more highly educated families have higher reading literacy scores than those with lower levels of education (Figure 5.4), with a similar relative gap between the top and the bottom groups in both settings. Reading literacy appears slightly higher in Northern Ireland than Ireland for those whose mothers have upper secondary or tertiary qualifications.

[16] The gap in scores between the fifth and 95th percentile scores was 267 points, compared with 243 in Ireland and 259 in England (Sizmur et al., 2017).

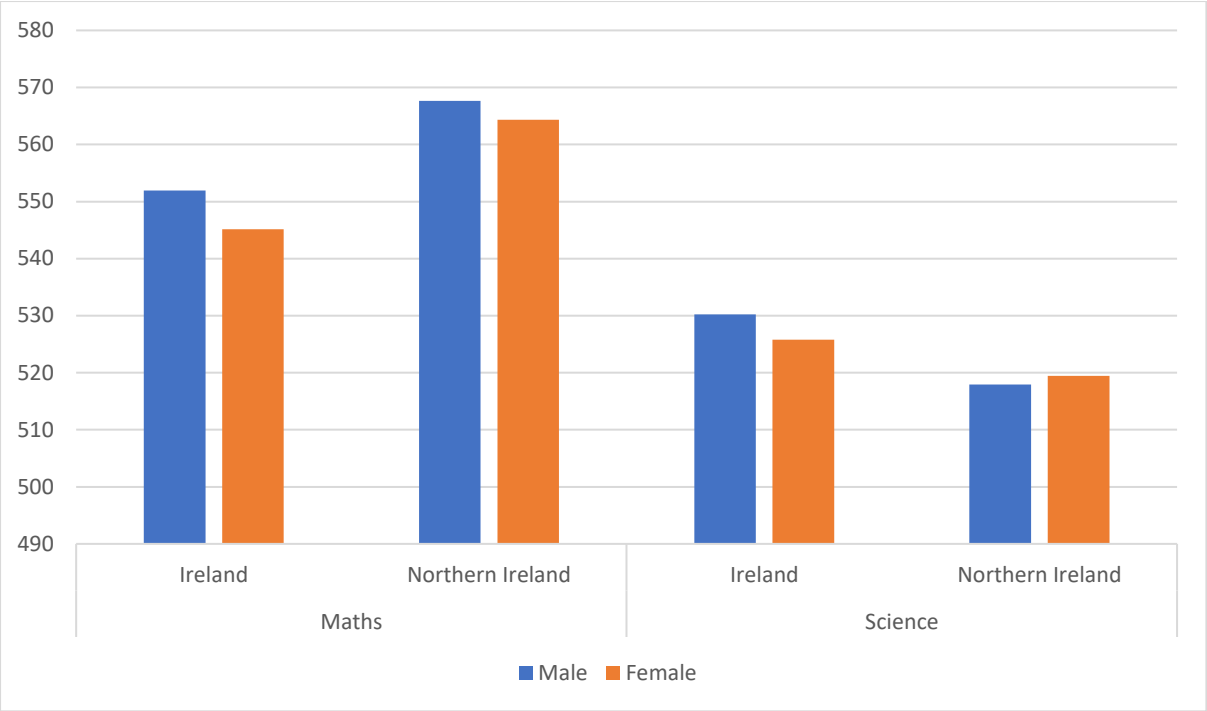
FIGURE 5.4 AVERAGE READING LITERACY SCORE AMONG 9-10 YEAR OLDS BY MATERNAL EDUCATION IN IRELAND AND NORTHERN IRELAND



Source: PIRLS 2016 data, own analyses.

Children in both jurisdictions do relatively well in maths and science literacy. Average maths scores are significantly higher in Northern Ireland, while average science scores are significantly higher in Ireland (Mullis et al., 2020). As with reading, the spread of scores in maths between higher and lower attainers is wider in Northern Ireland than in comparator countries, though this is not the case for science (Burge et al., 2020). There is no significant gender difference in maths or science literacy in either country (Figure 5.5). The proportion with very positive attitudes to maths is lower in Ireland and Northern Ireland than in many other countries, while attitudes to science are slightly more positive than the international average (Burge et al., 2020).

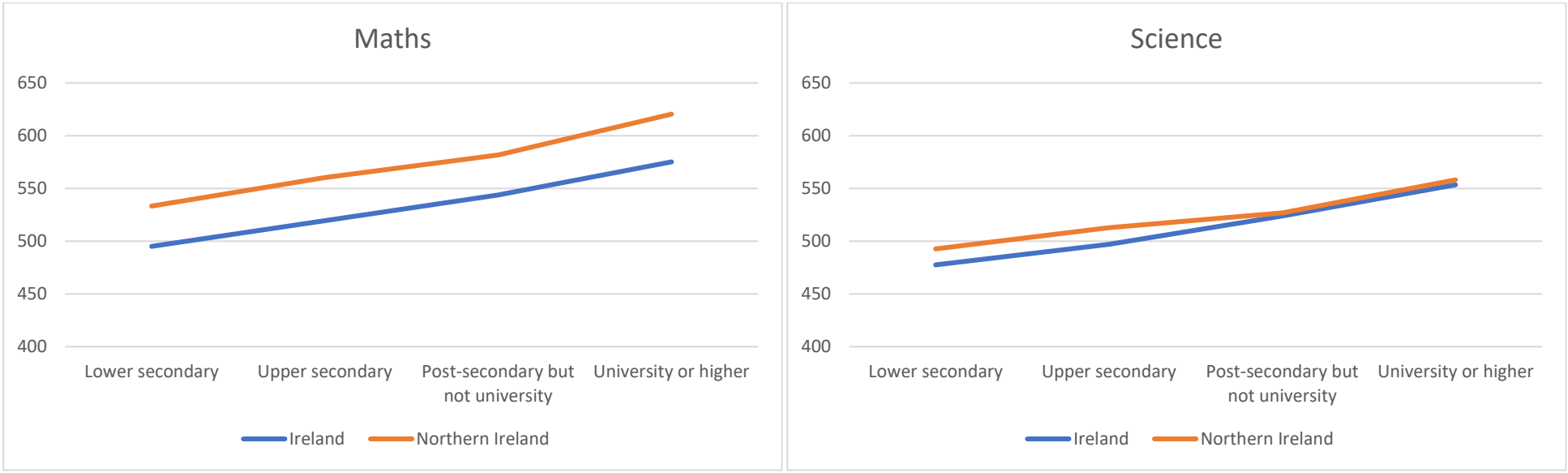
FIGURE 5.5 AVERAGE MATHS AND SCIENCE SCORES AMONG 9-10 YEAR OLDS BY GENDER IN IRELAND AND NORTHERN IRELAND



Source: TIMSS 2019 data, own analyses.
Notes: The samples sizes are 2,254 for males and 2,311 for females in Ireland and 1,756 males and 1,733 females in Northern Ireland.

In both Ireland and Northern Ireland, children from more highly educated families do significantly better in both maths and science, with a similar gap between the top and bottom groups in the two settings (Figure 5.6). Maths scores are higher in Northern Ireland for all education groups, with no significant between-jurisdiction differences in science for any of the education groups.

FIGURE 5.6 AVERAGE MATHS AND SCIENCE SCORES AMONG 9-10 YEAR OLDS BY MATERNAL EDUCATION IN IRELAND AND NORTHERN IRELAND

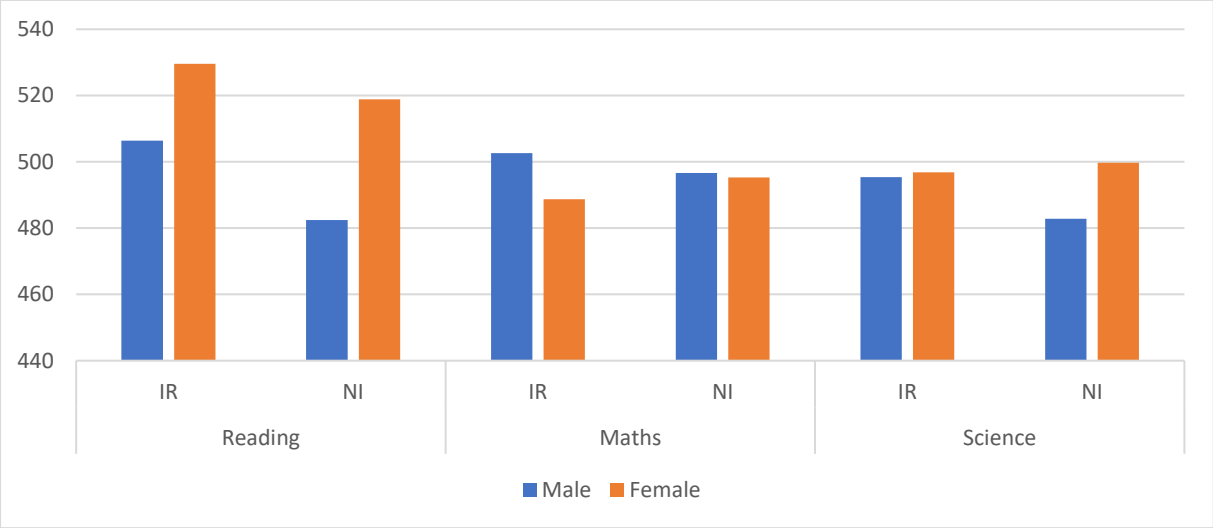


Source: TIMSS 2019 data, own analyses.

Skills in adolescence

The PISA 2018 study provides information on the reading, maths, and science literacy levels of 15 year olds. For this wave, reading was the major domain assessed, with maths and science assessed as minor domains. Both countries were high performing in reading in comparative terms, with higher average scores in Ireland than Northern Ireland, but around the OECD average and not significantly different from each other in maths and science (Sizmur et al., 2019). Within the UK, reading scores were above average for all jurisdictions but students in England outperformed those in Northern Ireland, Wales and Scotland in maths and science (Sizmur et al., 2019). The selective nature of secondary education in Northern Ireland means that reading literacy varies much more between schools than it does in Ireland (34% compared with 11% of the total of the variance in reading is due to the school level) (OECD, 2020b).

FIGURE 5.7 AVERAGE READING, MATHS AND SCIENCE SCORES AMONG 15 YEAR OLDS BY GENDER IN IRELAND AND NORTHERN IRELAND



Source: PISA 2018 data, own analyses.
Note: The samples sizes are 2,800 for males and 2,777 for females in Ireland and 1,194 for males and 1,219 for females in Northern Ireland.

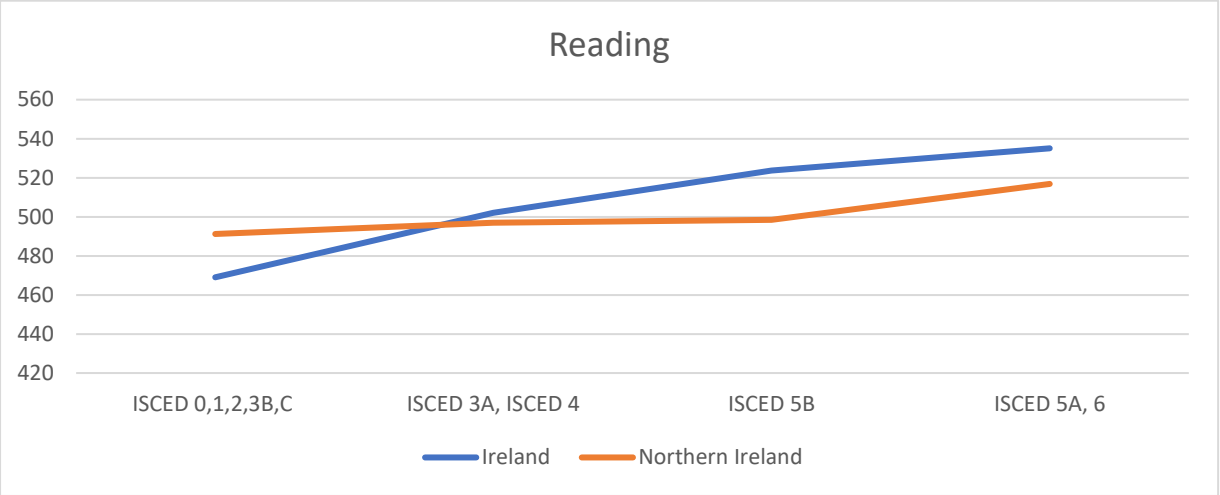
In both systems, female students achieved significantly higher reading literacy scores than males but no significant gender differences were evident for maths or science (Figure 5.7). Maths and science scores did not differ between the two systems. The overall gap in reading literacy was driven by the differences in male scores.

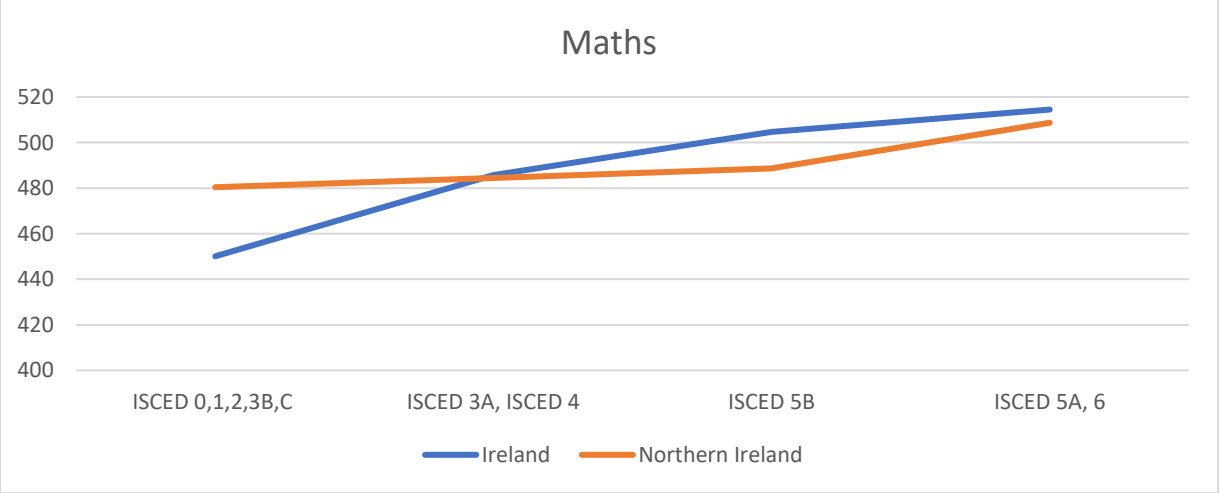
In both systems, the children of mothers with degree or postgraduate qualifications achieve significantly higher scores in all three domains than those in the lowest education group (vocational upper secondary or less).[17] The differentiation by maternal education is more marked in Ireland than in Northern Ireland (Figure 5.8). For reading, scores are higher in Northern Ireland than Ireland for the lowest education group but significantly lower for the sub-degree and degree-level groups. Scores in

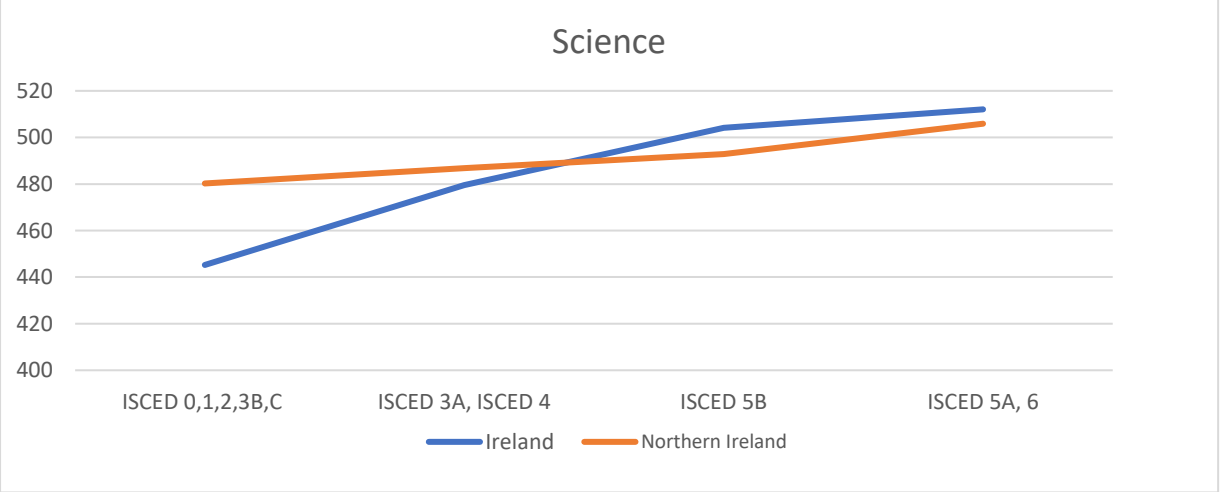
[17] It should be noted that PISA uses a pre-grouped classification of educational levels; levels 3B and C are combined with 0, 1 and 2 here because of small cell sizes.

maths and science are also significantly higher in Northern Ireland than Ireland for the lowest education group, with no significant differences for the other groups.

FIGURE 5.8 AVERAGE READING, MATHS AND SCIENCE SCORES AMONG 15 YEAR OLDS BY MATERNAL EDUCATION IN IRELAND AND NORTHERN IRELAND







Source: PISA 2018 data, own analyses.

The PISA study can provide useful insights into specific school experiences that may be linked to subsequent early school leaving. Attitudes to reading were found to be more negative in Northern Ireland, with 43% strongly disagreeing that 'reading is one of my favourite hobbies' compared to 29% in Ireland; the figures for not reading for enjoyment were 61% in Northern Ireland and 47% in Ireland. However, truancy levels were somewhat higher in Ireland (30% compared with 25% skipping a whole day in the past two weeks and 28% versus 22% skipping some classes). Other aspects of school engagement were otherwise broadly similar.

TABLE 5.2 LOGISTIC REGRESSION MODEL OF EXPECTATION TO GO ON TO DEGREE-LEVEL OR POSTGRADUATE EDUCATION IN IRELAND AND NORTHERN IRELAND (POOLED DATA) (ODDS RATIOS)

	Model 1	Model 2
Male	0.438***	0.485
Parental education:		
Upper secondary	1.535***	1.469***
Sub-degree	2.176***	2.033***
Degree or higher	4.872***	4.324***
Northern Ireland	0.770***	
School type:		
Non-grammar		0.396***
Voluntary secondary		0.838
Vocational		0.530***
Community-comprehensive		0.717*
(Ref.: Grammar school)		
School type*gender:		
Male*non-grammar		0.625*
Male*secondary		0.983
Male*vocational		1.015
Male*comm./comp.		0.816
Nagelkerke R^2	14.8	17.5

Source: PISA, own analyses.
Note: *** p<.001, * p<.01.

Fifteen-year-old students in Ireland were significantly more likely than those in Northern Ireland to expect to go on to higher education (58% compared with 49%) and to expect to obtain a higher status job, with an average ISEI score of 67 compared with 63.6. A logistic regression model (Table 5.2) allows us to examine the between-jurisdiction differences in educational expectations. Males and those whose parents have lower levels of education are less likely to expect to go on to higher education.[18] Even controlling for these factors, expectations are significantly lower in Northern Ireland. Model 2

[18] The coefficients are reported as odds ratios. An odds ratio of less than one indicates a reduced chance of expecting to go on to higher education while values of more than one indicate an increased chance.

shows the extent to which these patterns vary across different types of school. Controlling for parental education and gender, the highest expectations are found among students attending grammar schools (in Northern Ireland) or voluntary secondary schools (in Ireland). The lowest expectations are found in non-grammar schools in Northern Ireland, with male students in these schools having significantly lower expectations than that of any other group.[19]

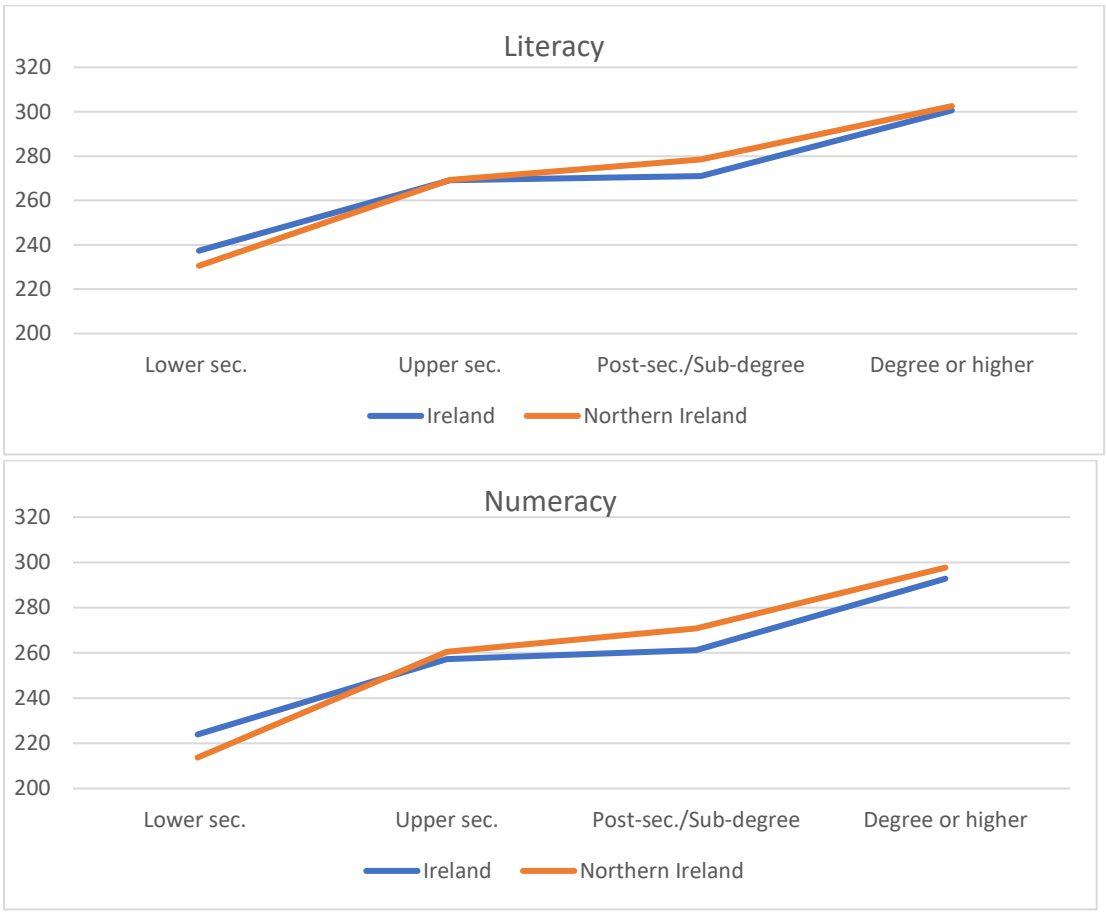
Skills in adulthood

PIAAC 2012 provides insights into the literacy and numeracy skills of the adult population. In both jurisdictions, there are no significant gender differences in average literacy scores but males tend to score significantly higher in the numeracy tests. Figure 5.9 shows patterns by highest level of educational attainment. In both settings, there is a clear gradient, with those with degree-level qualifications having higher literacy and numeracy scores than those with lower levels of education.[20] There is no significant difference in average scores between the two settings, except for higher numeracy scores among the post-secondary/sub-degree group in Northern Ireland compared with Ireland. The relative gap in scores between the highest and lowest educational groups is slightly larger in Northern Ireland than Ireland for both literacy and numeracy.

[19] Because it can be difficult to interpret interaction effects in logistic regression models (see Norton et al., 2004), separate models were also run for males and females. These confirmed the finding that the lowest expectations were found among males in non-grammar schools.

[20] The educational classification is slightly different to that used earlier in the paper to have enough cases for analysis.

FIGURE 5.9 AVERAGE LITERACY AND NUMERACY SCORES BY EDUCATIONAL ATTAINMENT



Source: PIAAC 2012 data, own analyses.

6. DIFFERENCES IN RATES OF PAY AND THE RELATIVE RETURNS TO EDUCATION

Recent times have seen increased attention paid to the differences in living standards across the two regions. It can be difficult to get reliable measures due to differences in data collection approaches and peculiarities in national accounting frameworks, particularly when relying on per capita income measures. These difficulties in obtaining reliable measures of comparative income are discussed extensively in Bergin and McGuinness (2021), in which the authors conclude that purchasing power parity (PPP) adjusted household disposable income is a reliable available metric of relative living standards. Using this metric, Bergin and McGuinness (2021) conclude that income levels are approximately 12% higher in Ireland than in Northern Ireland. However, given the recent debate on this issue, it is useful to explore some additional arguments related to the comparability of earnings or income data across the two jurisdictions.

PIAAC data advantages and caveats

The PIAAC data provide us with another very important insight into differences in living standards, as it constitutes a common survey-based measure of hourly earnings that has also been adjusted for differences in prices between Ireland and the UK. It is important to note that while total household

income is made up of a number of elements, including labour market earnings, social welfare transfers and income from assets, the measure used here focuses exclusively on income from employment. As such, our measure will more closely reflect differences in productivity levels between both regions.

Within the field of labour economics, earnings from employment are considered to be the most crucial aspect in determining an individual's decision to invest in education. Higher rates of return to education will tend to incentivise greater investments in educational qualifications and differences in wage rates are often an important component in explaining differences in rates of educational attainment across countries or regions. However, this view is contested by sociologists, who maintain that the decision to invest in education is much more nuanced, with a range of factors impacting the choice. The often-cited work of Côté and Levine (1997) attributed the decision to continue with post-secondary education to five key factors: monetary gain and career progression; personal growth; to be in a position where they could help others; expectations from friends and family; and seeing university as better than the alternatives. Other theorists (see, for example, Breen and Goldthorpe, 1997) view educational decision making as reflecting the relative costs and benefits of participation for different social groups, with middle-class young people going on to higher education to avoid social demotion relative to the position of their parents. School factors, in particular the orientation of the school in terms of preparing students for higher education, have also been found to have a significant impact on young people's post-school pathways (Smyth and Banks, 2012).

PPP adjustment does not take explicit account of differences in housing costs. Bergin and McGuinness (2021) report that housing costs account for around 20% of disposable household income in both Northern Ireland and Ireland. However, these figures have attracted some criticism on the grounds that higher proportions of young people in Ireland live in the parental home, suggesting that average costs are lower as they are spread over a greater number of household members. Eurostat data show that in 2018 in Ireland 41% of those aged 25-29 years lived with a parent. However, while the Irish figure has increased in recent years, it is by no means the highest in Europe (the figure is over 60% in Bulgaria, Croatia, Greece, Italy, Malta, Portugal, Poland, Romania, Slovakia and Spain).[21] Furthermore, the 25-29 age group accounts for just 6% of the Irish population, so the fact that around 40% of this group live with their parents (as opposed to 25% based on the UK average)[22] will not have a large impact on overall household composition in Ireland compared to Northern Ireland. This would only be a factor if the pattern persisted into older age groups and raised overall average household size. The fact that average household sizes (2.5 in Northern Ireland and 2.7 in Ireland)[23,24] are broadly similar, based on 2016 estimates, suggests that this issue does not have a significant impact and that housing costs in both jurisdictions are similar when expressed as a share of disposable income.

Another potential weakness of the data is that the PPP adjustment is carried out for the UK, rather than Northern Ireland specifically. If there are large variations in price levels between regions, this will potentially result in some inaccuracies in the relative wage data. Data on relative regional consumer price levels (RRCPL) produced by ONS in 2016 indicated that average living costs were just 2.3% below

21 See https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Young_people_-_social_inclusion&oldid=526294.

22 See https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/datasets/youngadultslivingwiththeirparents.

23 For Northern Ireland figure, see https://www.communities-ni.gov.uk/system/files/publications/communities/ni-housing-stats-18-19-tables6.ODS.

24 For Ireland figure, see https://www.cso.ie/en/releasesandpublications/ep/p-cp4hf/cp4hf/hhlds/.

the UK average,[25] suggesting that such regional disparities will have minimal distortionary impacts on the PPP adjustments used here. Nevertheless, we have re-adjusted the earnings data from PIAAC with this regional price index and inflated the Northern Ireland wage data by a factor of 2.3% to account for marginally lower prices (and greater purchasing power) in Northern Ireland compared to the UK average. Therefore, our wage estimates will now fully reflect regional differences in prices between Northern Ireland and Ireland. Based on the PIAAC data, this PPP re-adjustment has the impact of increasing average hourly earnings in Northern Ireland from $15.97 to $16.35.

It is often claimed that such a PPP adjustment may be flawed as it fails to take account of the fact that house prices in Northern Ireland lie well below the UK average, suggesting that the failure to explicitly account for this within a regional-specific PPP adjustment could have potential extortionary impacts on the data. However, this is a somewhat misleading argument as only a small proportion of homeowners, or renters, will have housing costs that reflect current house prices. Housing costs will tend to be higher for new buyers; however, many households with long housing tenure tend to have lower mortgage costs. Within the rental sector, many households receive subsidies that reduce rents well below market value. Data from ONS for 2017 indicate that average household net weekly rents in Northern Ireland were £9.60 below the UK average and comparable to regions such as Humberside, the North-East, the North-West, Scotland, Wales and Yorkshire.[26] Average weekly mortgage repayments in 2017 were £11.90 below the UK average and broadly comparable to Scotland and the North-East.[27] This suggests that the issue of regional variations in housing costs, relative to the UK average, would not heavily impact our estimates if they were incorporated into the PPP calculations.

Theoretical framework of educational investment decisions

Standard economic theory provides a framework by which we can understand why individual differentials in investments in education might exist between countries and regions. The standard framework used for explaining differing levels of investments in education is human capital theory (Becker, 1964). The typical human capital model assumes that an individual will participate in schooling up until the point where the present value of the nth year of schooling equals the cost. An individual will continue to invest in education up until the point where they can no longer enjoy a positive earnings return. Therefore, this theoretical framework suggests that countries and regions with higher returns to investment will have higher levels of educational attainment and schooling.[28]

Earnings and returns to schooling by level of schooling

Figure 6.1 plots average hourly earnings, PPP adjusted, by level of education in Northern Ireland and Ireland in 2014. It shows average hourly earnings in Ireland exceed those in Northern Ireland for all levels of educational attainment, with the gap appearing relatively constant throughout the educational distribution. Overall, hourly wages are 31% higher in Ireland compared to Northern Ireland. By education, mean hourly earnings favour Ireland by 33% for primary education, 38% for lower secondary education, 21% for upper secondary, 11% for post-secondary and 35% for a higher education.

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25 See https://www.ons.gov.uk/economy/inflationandpriceindices/articles/relativeregionalconsumerpricelevelsuk/2016.

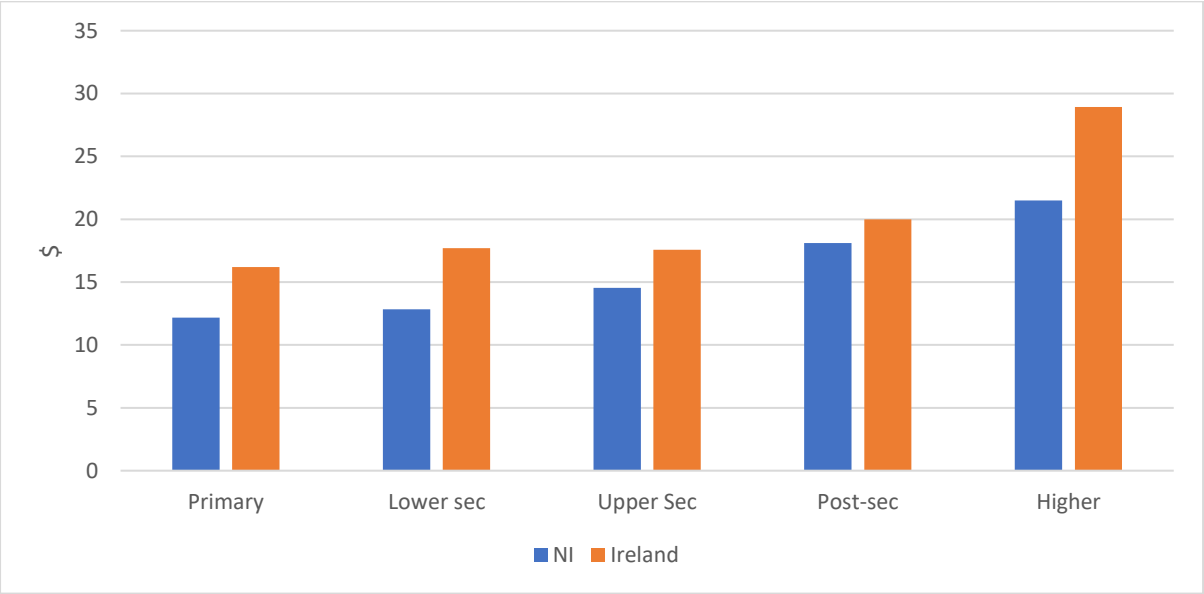
26 This figure is less housing benefits rebates and allowances.

27 The data come from UK Housing Expenditures by countries and regions (ONS).

28 It is recognised other theoretical perspectives exist.

The consistency in the earnings gap across education levels suggests that pay rates in Ireland are also consistently higher for most occupations.[29] Alternatively, differences in rates of pay may be partly explained by workers in Ireland having higher levels of occupational tenure and/or labour market experience. To get a more accurate measure of differences in the rates of return to education, we estimate a wage equation using a basic Mincer specification (Patrinos, 2016).

FIGURE 6.1 MEAN HOURLY EARNINGS BY EDUCATION, ADJUSTED FOR PURCHASING POWER PARITY



Source: PIAAC data, own analyses.
Notes: Number of observations: Northen Ireland: 2,007; Ireland: 2,769.

We begin by estimating a model using Equation 1. The dependent variable is the log of hourly earnings, while 'exp' is a measure of labour market experience.[30] A polynomial of this term is also included to reflect the convex relationship between experience and earnings. 'Sch' is a variable measuring educational attainment and the coefficient β_1 measures the percentage difference between the return to a given level of schooling and the reference category, which in this case will be primary-level educational attainment. It can be shown that the β_1 coefficient will approximate the rate of return to education consistent with human capital theory (see McGuinness, 2006). We begin by estimating Equation 1 for both jurisdictions separately, with the results shown in Table 6.1.

$$lnW_i = \alpha + \beta_1 Sch + \beta_2 exp + \beta_3 exp2 + \varepsilon \qquad (1)$$

In both regions, the pattern of educational returns seems very similar; for instance, in both Northern Ireland and Ireland, individuals with lower secondary attainment earn around 10% more than those educated to primary level only. At the upper end of the spectrum, in both jurisdictions individuals with third-level qualifications earn around 65% more per hour than those educated to primary level only. The only marked difference between the pattern of returns in both labour markets relates to post-

[29] This is based on the well-established relationship between educational attainment and occupational entry requirements.

[30] Labour market experience is measured by the number of years an individual has been in employment.

secondary attainment, where the wage premium appears significantly higher in Northern Ireland compared to Ireland.

TABLE 6.1 EARNINGS EQUATION, NORTHERN IRELAND AND IRELAND, 2014

	Hourly wage PPP corrected	
	Northern Ireland	**Ireland**
Experience	0.037***	0.044***
Experience squared	-0.001***	-0.001***
Primary (ref)	0.000	0.000
Lower secondary	0.094**	0.114*
Upper secondary	0.259***	0.220***
Post secondary	0.447***	0.303***
Higher	0.648***	0.684***
N	*2,005*	*2,769*
R2	*0.370*	*0.340*

Note: *** p<0.01 ** p<0.05 * p<0.1

While Equation 1 provides important insights, it does not allow us to directly compare wage returns to levels of education in Northern Ireland and Ireland. In order to do this, we estimate a model using pooled data for both areas and estimate Equation 2 (Table 6.2). By interacting education level with an Ireland dummy variable, we can now generate a set of educational coefficients for both regions that all relate to a common reference case: primary level educational attainment in Northern Ireland. We can see that the Northern Ireland coefficients align directly with Table 6.1, although there will be some variation due to the fact that the intercept term will be different compared to Equation 2. Focusing on the Northern Ireland coefficients, those with lower secondary schooling again earn a 10% premium relative to those with primary education, while Northern Ireland graduates again earn a return of approximately 66%. However, crucially, Table 6.2 now lets us also compare earnings in Ireland to the reference case; for instance, an employee in Ireland with lower secondary level education earned a premium in 2014 of 38% relative to the Northern Ireland reference category, contrasting with a premium of 10% for employees in Northern Ireland educated to lower secondary level. Relative to the Northern Ireland reference case, employees with third-level qualifications in Ireland earn a premium of 95%, which compares to a premium of 66% among Northern Ireland employees educated to third level.

We can get a much clearer picture of relative returns from Table 6.3, which reports the results of post-estimation tests comparing the estimated rates of return from Table 6.1 for similar levels of schooling in the respective jurisdictions. It is very clear that the returns to education in Ireland substantially exceed those in Northern Ireland at all levels of educational attainment. This is true even at low levels of educational attainment; for instance, employees educated to the two lowest levels of schooling (primary and lower secondary) earn 27 and 29 percentage points respectively more in Ireland. At the other end of the spectrum, employees with third-level qualifications earn a premium that is nearly 30 percentage points higher than their counterparts in Northern Ireland. The premium is somewhat lower for workers holding upper secondary and post-secondary qualifications; however, they remain

substantial, standing at 22 and 12 percentage points respectively. The results again support previous analysis that concluded that productivity levels in Northern Ireland lie substantially below those of Ireland.[31] Lower productivity jobs will tend to place a wage ceiling on workers, irrespective of their capabilities, and this is likely to an important explanation for the large differentials in the returns to education that we observe here.

$$lnW_i = \alpha + \beta_1 Sch * RoI + \beta_2 exp + \beta_3 exp2 + \varepsilon \qquad (2)$$

TABLE 6.2 EARNINGS EQUATIONS, NORTHERN IRELAND AND IRELAND, 2014, POOLED MODEL

		Hourly
	Experience	0.042***
	Experience squared	-0.001***
Northern Ireland	Primary (ref)	0.000
	Lower secondary	0.096*
	Upper secondary	0.268***
	Post secondary	0.451***
	Higher	0.655***
Ireland	Primary	0.269***
	Lower secondary	0.384***
	Upper secondary	0.485***
	Post secondary	0.571***
	Higher	0.950***
	N	*4,774*
	R2	0.39

Note: *** p<0.01 ** p<0.05 * p<0.1

[31] Differences in job types and in the importance of various sectors in the two jurisdictions may also play a part in explaining the differences in wages; however, this could also be reverse causality in that sectors with high productivity and high wages may be more likely to locate in Ireland as a result of the highly educated population. The same can be said for the higher levels of FDI in Ireland.

TABLE 6.3 DIFFERENCES IN RATES OF RETURN

	Rate of return relative to Northern Ireland primary		
	Northern Ireland	**Ireland**	**Percentage point difference in rate of return**
Primary	*Reference*	27%	27***
Lower secondary	10%	39%	29***
Upper secondary	27%	49%	22***
Post-secondary	45%	57%	12***
Higher	66%	95%	29***

Note: *** p<0.01 ** p<0.05 * p<0.1

7. CONCLUSIONS

Levels of educational attainment in Ireland and Northern Ireland have increased in recent times, although the improvements have been much greater in Ireland. In 2019, 41% of the working-age population in Ireland had a high level of education compared to 36% in Northern Ireland. Looking at those aged 25-34 years to provide a better representation of the current output of the education system, Ireland again outperforms Northern Ireland in terms of attainment; 7% of this age group in Ireland attained a low education compared to 18% in Northern Ireland. Ireland has seen considerable improvements in this regard in the last 15 years, which have not been seen in Northern Ireland. These figures use EU-LFS data and we also look at attainment using PIAAC data which use five categories of qualifications. PIAAC data show that having no more than a primary education is more than five times more likely in Northern Ireland among young people (25-29 years) than it is in Ireland. The most striking difference is in those who complete a post-secondary (but not degree-level) qualification; 30% of those of a working age hold such a qualification in Ireland compared to only 11% in Northern Ireland. When we look at the younger age cohort, this pattern for post-secondary qualifications holds. This pattern has significant implications for vocational/intermediate skill development in the two settings.

Early school leaving is also examined given the importance for future employability, potential earnings and broader life chances. Three different measures of early school leaving are presented, with rates being considerably higher in Northern Ireland regardless of the definition used. Based on the OECD definition (the proportion of those aged 16-24 years not in education who have a lower secondary or below education level), 14% of those in Northern Ireland are early school leavers compared to 6% in Ireland. We then look at those not in education, employment, or training more broadly (the NEET rate), and find little difference between the two jurisdictions, with NEET approximately 21% in both.

In spite of marked differences in qualification profiles, broadly similar patterns of skill development are found in the two jurisdictions at primary and secondary levels and among the adult population. Among adults, despite differences in the level of educational attainment between the two settings, there are remarkable similarities in literacy and numeracy skills at a given educational level.

An important focus of the current study is on the extent to which educational outcomes are socially differentiated in the two settings. There is a well-documented body of literature on the relationship

between social background and education and other economic outcomes. In both jurisdictions, literacy, numeracy and science test scores are socially differentiated, being higher among those with graduate mothers and those from the highest income quintile families. However, we find using PIAAC data that social background is a much stronger predictor of educational attainment in Northern Ireland than is the case in Ireland. These findings suggest the (negative) impact of academic selection in Northern Ireland and the (positive) impact of the DEIS programme in supporting schools serving socio-economically disadvantaged students in Ireland.

Exam performance in the two jurisdictions is then examined with reference to social background. At both lower and upper secondary levels, students from disadvantaged backgrounds in Northern Ireland and Ireland achieve much lower exam grades than other students.

Taking the findings on educational attainment and academic performance in tandem, it is evident that the two systems differ in the way in which inequality is manifest in educational outcomes. Intergenerational educational mobility rates are found to be lower in Northern Ireland than in Ireland, with lower levels of parental education being much more predictive of early school leaving in Northern Ireland. In Ireland, young people from disadvantaged backgrounds are more likely to stay in school until the end of upper secondary education but social differentiation in the grades received is more evident than in the Northern Irish context. This reflects the fact that in Northern Ireland those who may have achieved poorer grades leave the education system before reaching this level while those who would be higher performers and who are from less disadvantaged backgrounds are likely to stay on. A smaller proportion of 15-year-olds in Northern Ireland plan to go on to higher education, a pattern that largely reflects lower expectations among those, especially male, students attending non-grammar schools.

Implications for Policy

This study points to a number of areas where policy could be improved in both jurisdictions. Firstly, the research indicates that there remain substantial barriers for students from disadvantaged backgrounds in both regions; however, these barriers were more pronounced among students from Northern Ireland. Just 21% of students in Northern Ireland whose parents have no upper secondary education go on to attain a post-secondary or higher qualification, with the comparable figure for Ireland standing at 53%. Furthermore, the incidence of early school leaving in Northern Ireland was more than twice that of Ireland and, while children from socially disadvantaged backgrounds were more likely to be early school leavers in both jurisdictions, the class effect was considerably larger in Northern Ireland. While the role of social disadvantage was less pronounced in the Ireland in terms of levels of educational attainment, it was still evident in other areas of educational performance, such as exam outcomes. In Ireland, students from disadvantaged backgrounds are much less likely to obtain high grades in Leaving Certificate examinations compared to those from more affluent households. While respondents to our study across all spectrums of educational provision, from both Northern Ireland and Ireland, were highly complimentary about DEIS provision, there remains more work to done in Ireland in providing DEIS schools with the level of resources needed to address the complexity of need among their student body and in providing supports for disadvantaged students who attend non-DEIS schools. With respect to Northern Ireland, we conclude that the continuation of the transfer examination system, which segregates children into comprehensive and grammar schools at the age of 11, is likely to remain a significant contributory factor to the much higher levels of educational inequality observed there. Transfer test preparation often involves private tuition outside school, with

take-up rates higher among higher-income groups; such private tuition thereby confers an advantage in grammar school access among higher-income groups. At the same time, lessons from Ireland highlight that the removal of school selection is a necessary but on its own insufficient condition for bringing about greater equality between schools. Attention must be paid to the complex ways in which choice of school and residential segregation at local level contribute to the reproduction of inequality in educational outcomes and supports provided to schools and students to mitigate these effects.

Further education provision in both areas faces a number of ongoing challenges related to a perceived inferior status, compared to higher education options, and a need for improved pathways from schools to further education and from further education to higher education, in order to facilitate meaningful progression routes. In Northern Ireland, the issue is further complicated by a lack of a clear identity of purpose for the sector, with many schools and higher education providers offering post-secondary vocational options, while further education colleges also offer A-level provision, more typically the remit of schools. Our findings also point to substantial disparities between the proportion of students qualifying at post-secondary level in Northern Ireland and in Ireland, an important driver of the gap in educational attainment between the two jurisdictions. While the proportions of young people obtaining third-level qualifications is broadly similar across both areas, just 11% of young people in Northern Ireland are educated to post-secondary level compared to 36% in Ireland. The data point to a need to rapidly expand further education provision in Northern Ireland, in order to facilitate growth in the intermediate skills base and bring provision more in line with that of Ireland. Simply expanding further education places is unlikely to provide a solution to the problem of lower relative educational attainment in Northern Ireland if it occurs in the absence of policies designed to demonstrate the value of taking-up of further education routes among young people (and their parents). The necessary reforms of the further education and training (FET) sector in Northern Ireland are likely to require substantial investments and need to be underpinned by a medium-term strategy.

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