

A Study of Future Demand for Higher Education in Ireland

Seamus McGuinness, Adele Bergin,
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Glossary of Acronyms

CAO	Central Applications Office
CEDEFOP	(translated) European Centre for the Development of Vocational Training
CSO	Central Statistics Office
DARE	Disability Access Route to Education
DEIS	Delivering Equality of Opportunity in Schools
DES	Department of Education and Skills (of Ireland)
ESRI	Economic and Social Research Institute (Ireland)
EU	European Union
FE	Further Education
FETAC	Further Education and Training Awards Council
GDP	Gross Domestic Product
GNP	Gross National Product
HE	Higher Education
HEA	Higher Education Authority (of Ireland)
HEAR	Higher Education Access Route
HEI	Higher Education Institution
ICL	Income Contingent Loans
IoT	Institute of Technology
IT	Information Technology
IUA	Irish Universities Association
LII	Living in Ireland (Survey)
MMI	Maximally Maintained Inequality
NCCA	National Council for Curriculum and Assessment
NFQ	National Framework for Qualifications
NMS	New Member States
NUI	National University of Ireland
OECD	Organisation for Economic Cooperation and Development
PLC	Post-Leaving Certificate Qualification
QNHS	<i>Quarterly National Household Survey</i>
SBTC	Skill Biased Technological Change
SILC	<i>Survey on Income and Living Conditions</i>
SLS	<i>School Leavers' Survey</i>
SOC	Standard Occupation Classification
STEM	Science, Technology, Engineering and Mathematics
TFR	Total Fertility Rate

Executive Summary

Despite our current economic difficulties, it is important for Ireland to consider medium to longer term issues and challenges. Since human capital is central to Ireland's growth prospects and as the importance of knowledge activities increases, it is timely to consider and plan for the needs of the Irish economy for graduates to meet future labour market demands. However, it is important to emphasise the limitations of any analysis that attempts to map future labour market requirements for Ireland against the supply of workers, as for other EU countries; uncertainty around (i) rates of graduate immigration (emigration) during different phases of the economic cycle and (ii) the future trajectory of macroeconomic growth, make it difficult to accurately predict exactly how both labour market supply and demand will evolve over time. Nevertheless, this work provides a useful contextual framework within which the debate on the future structure of Higher Education (HE) in Ireland can be placed.

This report provides an analysis of the future demand for HE places in Ireland over the coming two decades. The study is funded by the Higher Education Authority (HEA) and the issues addressed herein represent our attempt to address the requirements of the HEA tender (Appendix 3). The report considers a range of issues pertinent to HE policy, including:

1. The likely balance between the demand for, and supply of, graduate labour in Ireland up to the year 2030;
2. The implications of HE expansion for social inclusion and educational progression;
3. The need for structural reform with respect to both HE funding and educational delivery.

The principal findings of the study are as follows:

THE DEMOGRAPHIC OUTLOOK

Relative to the EU average, Ireland had a uniquely high birth rate until the early 1980s and, as a result, has benefited from a favourable demographic structure compared to other European countries. This suggests that Ireland will have a sufficient number of young people to meet the broad demands of the labour market at least up to the year 2030. However, demographic factors have the potential to constrain the growth of the HE system in the longer term given the expected decline in the growth rate of younger cohorts.

On the basis of current participation rates and demographic projections, the number of potential undergraduate HE entrants is expected to grow from 41,000 in 2010/2011 to 44,000 in 2019/20 (7 per cent) and to just over 51,000 by 2029/2030. The Economic and Social Research Institute (ESRI) estimates are broadly in line with recent projections produced by the Department of Education and Skills (DES). These estimates are not considerably impacted when the underlying assumptions relating to migration are altered. Both the ESRI and the DES estimates lie substantially below the previous DES projections that were used in the *National Strategy for Higher Education to 2030*.¹ The previous DES projections were the latest projections available at the time of writing of the *National Strategy* report. Consequently, any policy suggestions centred on the projections contained in this National Strategy document require re-examination.

THE IMPACT OF HE EXPANSION ON SOCIAL EXCLUSION AND EDUCATIONAL PROGRESSION

The rapid expansion of HE places in Ireland has allowed greater numbers of young people from disadvantaged backgrounds to access HE. However, neither expansion nor the removal of tuition fees has brought about a significant reduction in social inequality in HE access. Even if provision continues to grow, social inequality will only be reduced if the array of factors across both the second-level education system and HE that impact negatively on participation and progression are addressed. These include the level and nature of guidance provision in second-level schools, the degree of support for children and young people from disadvantaged backgrounds attending DEIS² and non-DEIS schools, the level and nature of financial support for HE students, and the financial resources available to families more broadly.

Successful progression within HE is strongly influenced by academic preparedness. Within the HE setting, the evidence points to the value of identifying ‘at risk’ students early in the undergraduate cycle and ensuring that they have the academic, social supports and guidance that they need to enhance their motivation, engagement and performance. Furthermore, some thought should be given to the extent to which individuals at the highest risk of non-completion within HE might be more effectively accommodated within the further education (FE) sector.

¹ Department of Education and Skills (2011). *National Strategy for Higher Education to 2030 – Report of the Strategy Group*. Dublin: Department of Education and Skills.

² DEIS refers to an action plan for educational inclusion by the Department of Education and Science (2005), “Delivering Equality of Opportunity in Schools”.

THE EXPECTED BALANCE BETWEEN DEMAND AND SUPPLY

If HE student demand expands along the lines outlined within the current study, and assuming that resources are made available to facilitate such growth, we estimate that the HE system will supply somewhat more than the number of graduates required to meet the demands of the domestic labour market. On average, annual graduate supply is expected to be around 25 per cent above the level required to meet labour market requirements. However, if the emigration rate by new graduates continues at around 10 per cent (as it has done in the past), the level of actual surplus is likely to be lower at around 13 per cent, implying that graduate employment opportunities in Ireland should remain strong in the face of relatively rapid HE expansion.

While some surpluses are expected to prevail within the graduate labour market over the 20-year period, there is considerable uncertainty about what will prevail in practice as a number of risk factors exist. In particular, graduate shortages could emerge under a scenario of continued trend emigration combined with a relatively modest increase in the demand for graduate labour within high-tech sectors of the economy.

Over the projection horizon, and assuming no major changes in the structure of the economy, the analysis points to surpluses in the areas of law, IT and science, but not in engineering, as the projected level of surplus in this area appears much lower relative to the other subjects.

The analysis shows that the wage premium to third-level qualifications in Ireland held up well over the period 1994 to 2009, which reinforces the notion that the expansion of HE provision in Ireland has been keeping pace with the level of labour demand, as opposed to exceeding it. Furthermore, some preliminary analysis of Central Applications Office (CAO) data suggests that the rapid increase in HE participation has not been associated with any marked decline in the average points score of applicants. However, since the current study could not deal with the issue of grade inflation, this indicative result is somewhat tentative. Bearing this in mind, the CAO data suggest that the provision of HE places has kept pace with rising demand, given that we do not observe any marked increases in either the entry requirements for Level 8 courses, or qualification levels among unsuccessful applicants. If anything, the lowest points requirements for entry to many disciplines actually fell.

Given the longer run demographic constraints facing the Irish labour market as the population begins to age, the analysis considers briefly a number of other

potential sources of supply to the labour market, including a greater focus on the provision of lifelong learning opportunities. Lifelong learning should be seen as an imperative in its own right as well as a strategy for achieving continued upskilling of the workforce in the face of worsening demographics. Available data suggest that Ireland lags substantially behind other countries in its provision of lifelong learning programmes. The research also highlights the current under-utilisation of educated immigrant labour and considers the potential barriers to full labour market integration of this key source of labour.

STRUCTURAL ISSUES: STUDENT FINANCING AND THE NEED FOR A MORE FLEXIBLE LEARNING SYSTEM

In recent years, the scale of the registration charge in Ireland has been rising rapidly to the level of the standard tuition fee charges in many other countries. Despite this increase, there is no public funding mechanism in Ireland to accommodate this new charge, other than the means-tested HE grants scheme. As students from lower-income families have access to both maintenance and fee grants, it is likely that financial constraints arising from increases in the registration fee are being most heavily felt within households just above the grants threshold. Existing evidence suggests that Ireland has the potential to adopt a successful Income Contingent Loans (ICL) system along the lines of those implemented elsewhere. However, careful thought should be given to the design of any ICL system to ensure that HE becomes affordable at the point of consumption, which can be achieved by implementing loans in tandem with means-tested grants or extending loans to cover both living and tuition expenses. The issue of affordability also relates to the costs of the HE system, an important issue which lies beyond the scope of the present study.

THE NEED FOR BETTER DATA

An initial objective of the current report was to assess the most appropriate balance between HE and FE provision in order to meet the requirements of the labour market. Unfortunately, this objective was not achievable due to a lack of detailed data on FE entrants, progression rates and ultimate labour market status. Given the central position of the FE sector in serving the needs of the labour market, much more effort needs to be given to data collection processes within the FE sector in order that policy can be properly informed.

Background and Introduction

The Irish labour market has undergone huge change in recent years. Unemployment has grown from 4.6 per cent in the second quarter of 2007 to 14.3 per cent in the second quarter of 2011. Over the same four-year period, employment contracted by 14 per cent; furthermore, both the participation rate and the size of the labour force also fell. Individuals of all levels of education have struggled to find employment and graduates have not been immune to the impacts of the downturn. The relative position of female graduates has declined substantially. Between the fourth quarter of 2006 and the third quarter of 2011, the graduate share of female unemployment increased from 22.5 to 30.8 per cent while the proportion of female graduates that were long-term unemployed increased from 11 to 25 per cent. In contrast, the share of graduates in male unemployment and long-term unemployment fell slightly over the period,³ suggesting that female-dominated professional sectors were particularly badly hit by the downturn.⁴ While the situation is highly challenging for all graduates, the difficulties faced by individuals obtaining third-level qualifications since 2008 are likely to be immense. Notwithstanding the impact of the likelihood of unemployment (Stevens, 2007), existing research shows that, for new labour market entrants, an economic downturn also has a dampening impact on earnings (Bloom *et al.*, 1987; Shin, 1994). However, there is some debate over the persistence of these unemployment and wage effects (Bachmann *et al.*, 2010; Baker *et al.*, 1994; Oreopoulos *et al.*, 2006; Harris and Holmstrom, 1982; Welch, 1979). Evidence from international studies shows that unemployment impacts for graduates entering the labour market for the first time during a recession tend not to be permanent (Burgess *et al.*, 2003; Raaum and Roed, 2006), suggesting that, despite continued low economic growth, we are unlikely to see a continued substantial build up of unemployed recent graduates. This is supported by data from the *Quarterly National Employment Survey (QNHS)*, which indicates that the number of unemployed graduates who had left university within the previous three years actually declined between 2010 and 2012 from 17,501 (6.0 per cent of the unemployed) to 14,580 (4.7 per cent of the unemployed). It is likely that emigration has been a strong factor in preventing a growth in the numbers of newly qualified graduates.

Despite current difficulties, it is important for policy to ensure that Ireland continues to produce a sufficient number of Higher Education (HE) graduates to

³ The graduate share of male unemployment stood at 16.6 per cent in the fourth quarter of 2006 and 16.5 per cent in the third quarter of 2011.

⁴ The pattern is explained, at least in part, by the fall in public sector employment that took place over the period.

meet future labour market needs. It is this imperative that provides the context for the current study. The study is funded by the Higher Education Authority (HEA) and the issues addressed herein represent our attempt to address the requirements of the HEA tender (Appendix 3). We seek to provide a comprehensive analysis of the future demand for HE in Ireland and consider a range of issues pertinent to HE policy, including:

1. The likely balance between the demand for, and supply of, graduate labour in Ireland up to the year 2030;
2. The implications of HE expansion for social inclusion and educational progression;
3. The need for structural reform with respect to both HE funding and educational delivery.

The report is structured as follows: Section 1 examines the demographic context and develops a framework for projecting the demand for HE places and explores the principal factors driving HE participation rates. Sections 2 and 3 of the report consider the implications of future HE expansion for both social inclusion and educational progression. Section 4 estimates the demand for new graduate labour and maps a series of demand and supply scenarios. Sections 5 and 6 provide evidence of the effect of HE expansion on both labour demand and graduate supply by examining recent movements in both the graduate wage premium and the CAO points profile of entrants to third-level institutions. Section 7 examines alternative methods of improving human capital within the economy centred on the use of skilled immigrant labour and improving links with the Further Education (FE) sector. Sections 8 and 9 consider the need for structural reform in both the funding of HE and the need for a more flexible delivery model centred on lifelong learning. Finally, Section 10 presents a summary and considers a number of policy implications arising from the research. Detailed tables on the profile of HE and non-HE completers over time (discussed in Section 9) are presented in Appendix 1, while Appendix 2 provides details of a demographic-based approach to projecting postgraduate entrants. Appendix 3 contains a copy of the tender document issued by the HEA.

Section 1

Projecting Undergraduate Entrants to Higher Education

INTRODUCTION

Ireland's demographic structure is somewhat unusual in comparison to other EU-15 countries. Following the post-Second World War baby boom, the birth rate remained uniquely high in Ireland until the early 1980s, while it fell much earlier in other European countries. This means that there is now a large cohort of people of working age in Ireland. In addition, the high level of emigration from Ireland up to the 1960s means that many of the people who were born in Ireland then (now in their sixties and seventies) emigrated, reducing the numbers in the older cohorts of the population. The demographic profile has significant ramifications for the economy both now and in the future. Over the time horizon considered in this report, the population structure is likely to remain broadly favourable (i.e. with a relatively low dependency rate) especially in comparison to other European countries. However, the process of population ageing becomes more apparent as we look farther out. Furthermore, there is considerable uncertainty around future migration flows throughout the whole period.

Demographics, and in particular the likely growth of the 17 to 19 year old age cohort, are the primary determinant of the demand for higher education. This section describes the methodology used to project new undergraduate entrants into higher education (HE) out to 2030.¹ Our projections are driven by estimates of the number of people in each relevant age cohort and a series of HE participation rates. This approach is broadly similar to that used in other countries (see Coleman and Bekhradnia, 2011 for the UK, Hussar and Bailey, 2009 for the USA and Hango and de Broucker, 2007 for Canada). The model distinguishes between different types of undergraduates, namely direct (<20 years old, transferring from school), late (20-22 years old), mature (>23 years old) and international entrants. It considers males and females separately and the analysis refers to full-time students only.

We also consider how sensitive the projections are to the key demographic assumptions, especially around migration. The central projections presented in this section, which we subsequently refer to as our Baseline Model, are based on

¹ The data used in this analysis refer to Universities and Institutes of Technology that are funded by the Higher Education Authority (HEA).

unchanged HE participation rates.² However, we also examine two scenarios, one where the participation rate for direct entrants is 5 percentage points higher by the end of the projection horizon and another where it is 5 percentage points lower.

While demographic factors are at the core of these projections, other influences potentially also play a role in driving participation in HE. This section also describes the results from a behavioural analysis that attempts to capture the influence of changes in the labour market and the macroeconomic environment on HE participation rates and assesses the sensitivity of HE demand to changes in these determinants.

METHODOLOGY FOR PROJECTING NEW ENTRANTS TO HIGHER EDUCATION

Demographic Projections

The first factor that determines the future number of undergraduate new entrants is the likely evolution of the population. The CSO produces population projections, typically a couple of years after a Census has taken place.³ The most recent projections are based on the *2006 Census* and were published in April 2008 just before the economic crisis began. As a result, we generate new population projections that make use of the newly-published *Census 2011* data and that incorporate stronger assumptions on net migration, given recent economic activity and the likely future trajectory of the economy.

To generate population projections we use the demographic component method. This involves starting with a base population by single year of age and by gender in a given year. Then the population is projected forward over time using age- (and gender-) specific assumptions about birth rates, death rates and net migration. We use 2011 as the base year for our analysis as this is the year of the most recent Census. By applying assumptions on the three components of population change (fertility, mortality and migration) to the population structure in 2011, we can generate population projections by gender and by single year of age out to 2030. In essence, starting with the population in 2011, for all individuals from the age of one, the population age x in 2012 is given by the population age $x-1$ in 2011 less the number of deaths of people age x that occur in the year less net emigration of people age x and so on for each subsequent year. The number of people aged less than 1 in 2012 is given by the projections

² We define participation rates in terms of the percentage of people within different age cohorts with a Leaving Certificate who enter higher education.

³ See, for example, CSO (2008). The next set of population projections from the CSO should be available in 2013.

for births in that year. This procedure is then repeated for each subsequent year. This is a standard methodology for producing population projections and is used by national statistical offices, as well as international agencies such as EUROSTAT and the United Nations.⁴

In terms of the components of population change, net migration is particularly difficult to predict with recent actual net migration estimates varying considerably. For example the CSO has recently revised the historical estimates for net (in-)migration between 2007 and 2011 by a cumulative 86,000. The total fertility rate⁵ is less volatile and is affected by when women choose to have children as well as the number of children they have. In this report, our projection horizon extends to 2030 and assumptions on the future fertility rate will only affect the projections in the last couple of years as the students entering the system in earlier years have already been born. Finally, improvements in mortality tend to be more gradual and a typical assumption in the literature is to assume that current mortality rates slowly converge to some standard rate of improvement.

We assume that the total fertility rate (TFR) will fall from 2.07 in 2010 to 1.85 in 2016 and remain constant thereafter.⁶ Despite the decline in the overall TFR over the projection period, the projection model uses age-specific fertility rates and allows for an increase in total fertility among women in their mid to late thirties, reflecting a postponement effect whereby women are now having children at older ages.⁷ On mortality, we follow the assumptions used by the CSO (2008) which incorporate continued improvements in life expectancy over the projection horizon. The mortality assumptions translate into an increase in life expectancy at birth from 76.7 years in 2005 to 85 years in 2030 for males and an increase from 81.5 years in 2005 to 87 in 2030 for females.⁸ These improvements in life expectancy have little impact on the population projections for younger age cohorts.

⁴ For example, see <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/population-and-migration/population-projections/methodology---national-population-projections/index.html> for the UK and <http://www.census.gov/population/www/documentation/twps0038/twps0038.html#A> for the USA.

⁵ The total fertility rate represents the theoretical average number of children who would be born to a woman during her lifetime if she were to pass through her childbearing years (ages 15-49) conforming to the age-specific fertility rates of a given year.

⁶ The CSO (2008) consider two alternative fertility assumptions in their *Population and Labour Force Projections*; in one scenario the TFR is around 1.9 and in a second scenario it is 1.65 so the assumption used in this report is between the most recent assumptions of the CSO.

⁷ See, for example, *Perinatal Statistics Report 2010*, available at: <http://www.esri.ie/UserFiles/publications/SUSTAT41.pdf>

⁸ We use the CSO (2008) projections to generate mortality rates by single year of age and by gender.

Migration is the most volatile component of population change and is strongly influenced by the state of the economy. Following more than a decade of net immigration into the country, the onset of the fiscal and banking crisis in Ireland in 2008 saw a reversal to net outward migration. Net emigration is estimated to have been around 30,000 per annum between 2010 and 2012 (CSO, 2012a). Underlying these net migration figures are considerably larger gross outflows and inflows. For example, in 2012 gross outflows and inflows are estimated to be around 87,000 and 53,000 respectively (CSO, 2012a).

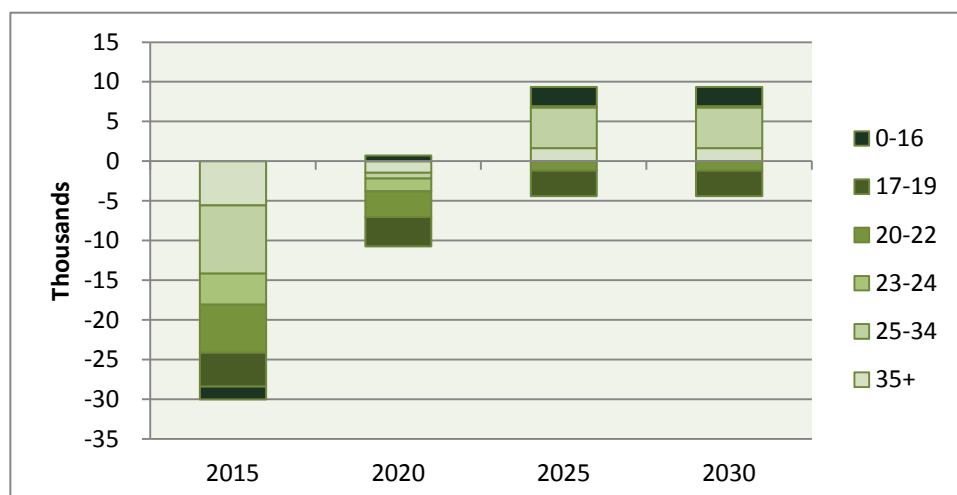
The most recent CSO population projections were produced before the crisis began and, therefore, did not incorporate migration assumptions consistent with the downturn in the economy. As a result, we use alternative assumptions for future net migration. We assume that there will be continued net emigration, averaging around 28,000 per annum out to 2020; with the level of net emigration falling from around 40,000 in 2012 to 10,000 by 2020.⁹ Thereafter, we assume some moderate levels of net immigration of around 5,000 per annum out to 2030. These aggregate migration projections are broken down into projections by single year of age and by gender using weights based on data from the CSO for earlier years on the age of male and female emigrants and immigrants. Figure 1A shows the underlying age breakdown of the aggregate net migration assumption over the projection horizon. Historically, emigration and immigration has been concentrated among those aged 15 to 44¹⁰ and we assume that the age composition of migration will be similar in the future.

There has been a dramatic deterioration in the labour market, owing to the economic crisis, with the unemployment rate rising from 4.6 per cent in 2007 to 14.7 per cent in the second quarter of 2012 (CSO, 2012b). The weakening in the labour market has been particularly marked for younger people, with current unemployment rates of 29 and 15.9 per cent for those aged 20-24 and 30-34 respectively (CSO, 2012b). In addition, between 2007 and 2012, on average 40 per cent of the outflow of people were between the ages of 15 and 24, while a further 50 per cent were in the 25 to 44 age group (CSO, 2012a). Although, the CSO does not produce estimates of emigration by education level, other data sources indicate that graduates comprise a large portion of the outflow. For example, the historical new/recent graduate emigration rate is around 10 per cent (see Flannery and O'Donoghue (2011), estimates based on HEA data for graduates in 2008).

⁹ In the demographic model, we assume that out-migration is constant in the future at 30,000 per year and that all the fluctuation occurs in in-migration.

¹⁰ See, for example, CSO (2012a), 'Population and Migration Estimates April 2012'.

FIGURE 1A: Age-Specific Migration Assumptions



Figures 1B and 1C show the projected population in the relevant age groups for direct, late and mature student entrants. Figure 1B shows there is an increase in the projected population aged 17 to 19 out to 2030. The projected population aged 17 to 19 increases by around 6 per cent between 2011 and 2020 and by around 15 per cent between 2020 and 2030. However, the population aged 20 to 22 falls between 2011 and 2020 (by around 9 per cent), as this age group is more affected by the assumptions on net migration, before increasing over the period 2020 to 2030 (by approximately 26 per cent). Similarly, the projected population aged 23+, shown in Figure 1C, displays muted growth between 2011 and 2020 (of approximately 2 per cent) as it is somewhat constrained by the assumptions on net migration before expanding considerably over the period 2020 to 2030 (by around 10 per cent). The figures suggest that the rate of any HE expansion up to 2030 in Ireland is likely to be constrained by relatively low demographic growth among key age cohorts.

It should be noted that there is substantial uncertainty over some of the demographic assumptions, especially on net migration, as its future path will be strongly influenced by macroeconomic conditions. Therefore, below we conduct some sensitivity analysis on our baseline projections for entrants; we examine the impact on the projections of zero net migration (at an aggregate level) over the entire projection period and also of a higher TFR of 1.95 from 2016 (see subsection on sensitivity analysis on demographic projections).

FIGURE 1B: Population Projections for 17-19 and 20-22 Year Olds

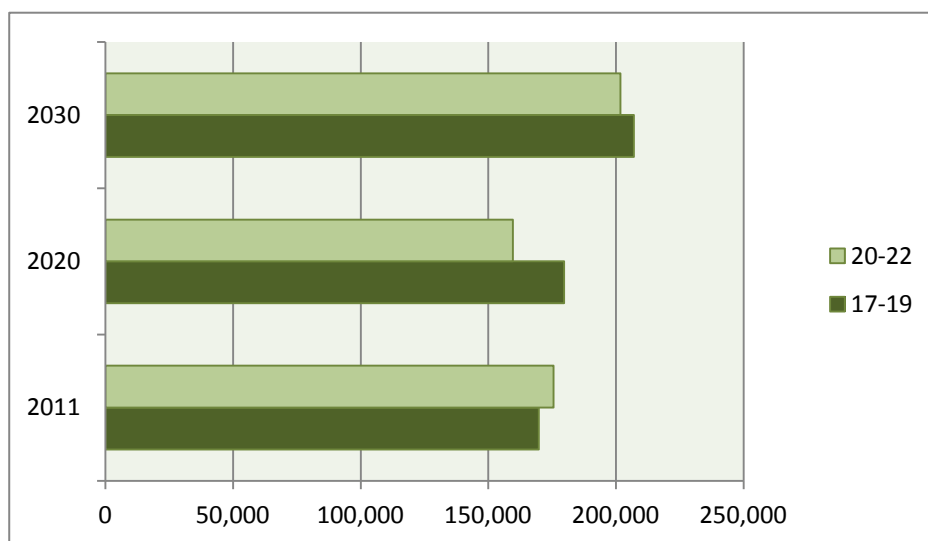
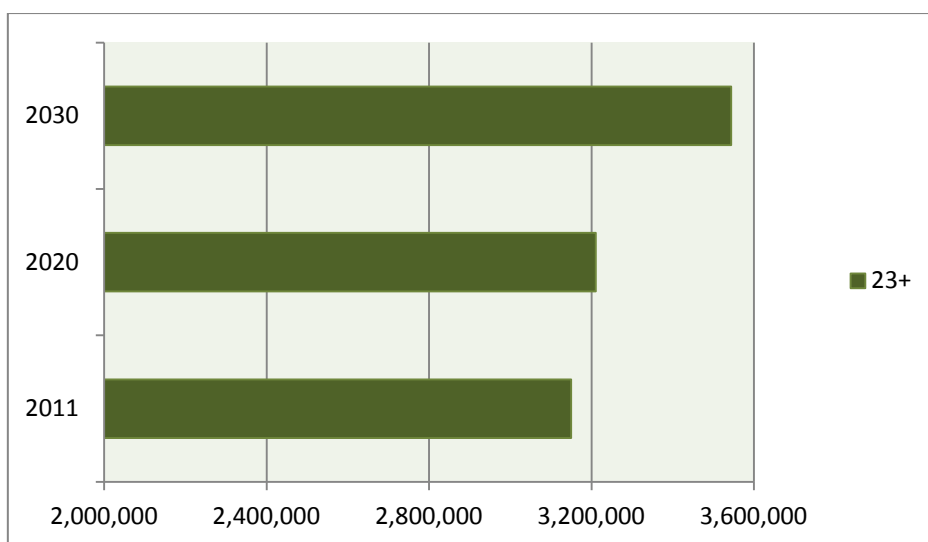


FIGURE 1C: Population Projections for 23+ Year Olds



The second key factor that determines the number of new undergraduate entrants is the likely participation rate in HE. In this section, we define participation rates in terms of the percentage of people within different age cohorts with a Leaving Certificate who enter HE. Ideally, time series data on new entrants would be used to analyse trends in participation. However, while detailed data on new entrants to HE are available for more recent years (from 2006 on), there are significant historical data gaps which have constrained the direction of the analysis on a number of fronts. In addition, somewhat surprisingly, there exists no time series readily available for those who have completed a Leaving Certificate by age group.

To overcome these data barriers, data from the *School Leavers' Survey (SLS)* is used to construct a consistent time series of participation rates for direct entrants to HE. The *SLS* provides an insight into the position, experiences and attitudes of school leavers one to two years after leaving second-level education.¹¹ The Survey ran consecutively from 1980 to 1999 and in 2002, 2004 and 2006, thus facilitating the analysis of long-term trends in participation.¹² In order to determine the participation rates of late and mature entrants, data from the *Quarterly National Household Survey (QNHS)*¹³ are used to calculate the population whose highest level of educational attainment is a Leaving Certificate.¹⁴

Direct Entrants

Data from successive *SLSs* are used to calculate the proportion of people who have completed the Leaving Certificate and who have ever-participated on a full-time basis in HE (including non-HEA funded Institutes). They also take account of those who dropped out before the end of the first year. The derived participation rates for males and females over time are shown in Figure 1D.¹⁵ The figure shows that the female direct participation rate was significantly below the male rate in the early 1980s but it caught up and surpassed the male rate in the mid-1990s. It should be noted that these rates exclude individuals choosing to enter HE institutions outside of Ireland.

To generate projections for the number of direct entrants (< 20 years old) we use historical data on the number of students who have completed a Leaving Certificate¹⁶ and project this series forward by indexing it to the rate of population growth of 17 year old males and females from the demographic model. This yields a projection of the number of students that are 'higher education ready' i.e., that have completed a Leaving Certificate. We assume unchanged gender-specific participation rates of approximately 60 per cent for males and 64 per cent for females.¹⁷ These participation rates for males and

¹¹ The *School Leavers' Surveys (SLSs)* are based on a stratified random sample of those leaving the official second-level system, which includes the Post-Leaving Certificate sector.

¹² The *SLS* was not carried out in the years 2000, 2001 or 2003 and unfortunately has not been carried out since 2006.

¹³ The *Quarterly National Household Survey (QNHS)* is the quarterly labour force survey which is carried out by the CSO.

¹⁴ This constitutes the denominator in any participation rate calculation.

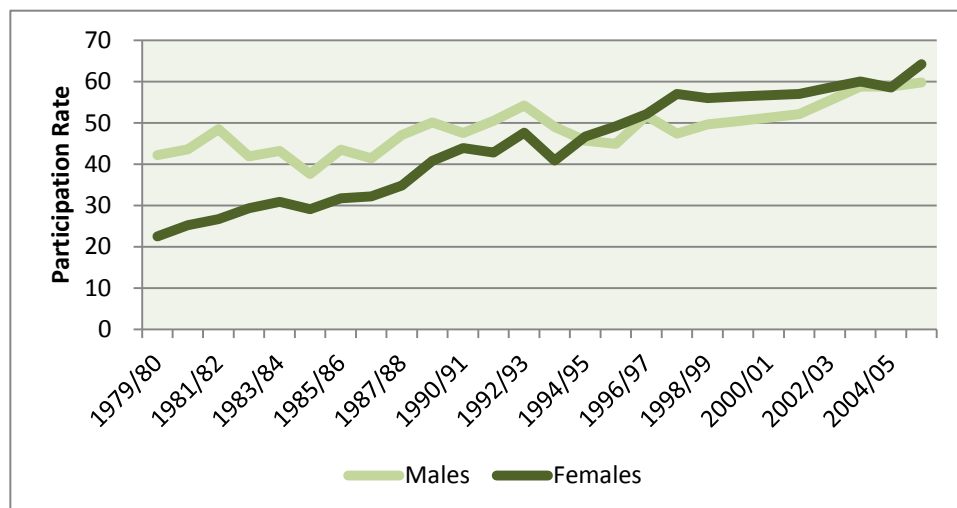
¹⁵ HEA (2012) indicates that the gender difference in new entrants has narrowed in more recent years.

¹⁶ We use data from the Department of Education and Skills on the number of students who sit a minimum of five subjects as a proxy for the number of students who complete a Leaving Certificate. These data also include repeat candidates as data on results by type of candidate are not available.

¹⁷ The gender relativities into the future are likely to reflect broader post-school opportunities for young people, including training and apprenticeship opportunities, the capacity and composition of the further education sector, and the extent to which students get greater opportunities to progress through and between different pathways.

females are multiplied by the numbers that are 'higher education ready' to generate projections of direct entrants to HE.

FIGURE 1D: Direct Entrant Participation Rates



Source: School Leavers' Survey, various waves.

Late Entrants

Late entrants to HE refer to those who enter HE between the ages of 20 and 22. To calculate participation rates for this group we use Higher Education Authority (HEA) data on new entrants by age¹⁸ combined with *QNHS* data on the population in this age group whose highest level of educational attainment is a Leaving Certificate.¹⁹ The calculated participation rates are shown in Table 1A. Although the time series is relatively short, the table shows that there has been a rise in HE participation for those aged 20 to 22 since the beginning of the recession.

Projections for late entrants are calculated by indexing the numbers of males and females aged between 20 and 22 whose highest level of educational attainment is the Leaving Certificate to the rate of population growth in these age cohorts from the demographic model and then applying a participation rate to these figures. As before, we assume unchanged gender-specific HE participation rates from 2010/11 over the projection horizon. However, should the 2010/11

¹⁸ While a longer time series is available for entrants to universities, data on entrants to IOTs are only available from the HEA from 2006/07. Also, these data implicitly include international entrants and an adjustment is made to the participation rates later to separately identify international entrants.

¹⁹ The age data in the *QNHS* is banded so we have extracted the numbers between the ages of 20 and 24 whose highest level of educational attainment is a Leaving Certificate. We assume that 20 to 22 year olds make up three-fifths of the 20 to 24 year old age group.

participation rate estimate transpire to relate to a business cycle effect, as opposed to a trend, this will result in some over-estimation of the projected demand for HE among late entrants.

TABLE 1A: Participation Rates for Late Entrants, First Estimates

	2006/07	2007/08	2008/09	2009/10	2010/11
Males, aged 20-22	5.4	6.8	8.4	9.8	11.1
Females, aged 20-22	8.3	8.9	11.4	10.3	14.5

Source: Calculated using HEA data on new entrants to higher education by age and data from the *Quarterly National Household Survey* on the population whose highest level of educational attainment is a Leaving Certificate by age.

Mature Entrants

An identical approach to that of late entrants to HE is used for mature entrants (23+ years old). Using a combination of entrants' information²⁰ and data from the *QNHS*, we calculate separate participation rates for those aged 23 to 24, 25 to 34, and 35 and over as participation is highly concentrated in the younger age cohorts. The estimated participation rates are shown in Table 1B. As before, we can see a rise in participation rates since the beginning of the downturn in the economy.

TABLE 1B: Participation Rates for Mature Entrants, First Estimates

	2006/07	2007/08	2008/09	2009/10	2010/11
Males 23-24	1.9	2.3	2.7	4.0	5.0
Males 25-34	0.9	0.8	1.3	1.9	2.2
Males 35+	0.3	0.3	0.4	0.5	0.5
Females 23-24	2.7	2.6	3.1	3.6	4.8
Females 25-34	1.2	1.3	1.4	1.6	1.6
Females 35+	0.3	0.3	0.4	0.4	0.4

Source: Calculated using HEA data on new entrants to higher education by age and data from the *Quarterly National Household Survey* on the population whose highest level of educational attainment is a Leaving Certificate by age.

To generate projections for mature undergraduate entrants we index the historical numbers of males and females whose highest level of educational attainment is the Leaving Certificate to the rate of population growth from the relevant age groups. As before, we assume unchanged gender-specific participation rates from 2010/11 and apply these to the projections of the

²⁰ As with late entrants, these data implicitly include international entrants and an adjustment is made to the participation rates later to separately identify international entrants.

population that is 'higher education ready'. Section 9 and Appendix 1 contains a more detailed analysis of the characteristics of individuals without third-level qualifications.

International Entrants

Data on the number of international entrants are not readily available so the historical number of international entrants is estimated using a combination of data from the HEA and Department of Education and Skills (DES). We use data from the DES on the domiciliary origin of all students enrolled in full-time undergraduate education to estimate the number of EU (excluding Ireland) and non-EU total enrolments in the system. HEA data on the year of study for 2009/10 are used to estimate the number of students in year 1 as a proportion of the total number of full-time undergraduates and this is used as a proxy for the proportion of new entrants. We apply this proportion to our estimate of the total number of EU (excluding Ireland) and non-EU international enrolments to generate a proxy for the number of international entrants. Our estimates indicate that the number of EU undergraduate (excluding Ireland) entrants rose from around 760 in 1999/00 to around 1,050 in 2010/11, while the non-EU international entrants rose from around 890 to 2,000 over the same period. These estimates imply that the share of international entrants in total direct, late and mature undergraduate entrants was around 8 per cent in 2010/11.

To project the number of international entrants forward we assume that the share of international entrants will rise to 14 per cent of total direct, late and mature entrants by 2030. This yields a projection for international entrants in 2030. The projection is linearly interpolated back to the 2010/11 figure. The assumption on the share of international entrants in 2030 corresponds to the existing rate of international entrants in the UK system. The UK has one of the highest rates of international student enrolments in the world and so, this assumption is chosen to reflect the maximum expansion that could occur in Ireland.

Adjustments to Participation Rates and Consistency Checks

Before producing our Baseline Model estimates for undergraduate entrants, we must take account of the fact that various sources have been used and historical data, in some places, had to be estimated e.g. for international entrants. Therefore, wherever possible, we need to ensure that the historical data match published sources.

The HEA data on entrants to HE by age that have been used in this analysis implicitly include international entrants and consequently our estimates of international entrants must be subtracted from direct, late and mature entrants. Internal HEA estimates for 2010/11 indicate that around 35 per cent of international entrants are included in the direct entrants group, 52 per cent are incorporated as late entrants and the remaining 13 per cent are in the mature entrants category. To take account of this we apply these proportions to our historical estimates of international entrants to calculate the number of direct, late and mature foreign entrants and these figures are then subtracted from the HEA figures for direct, late and mature entrants for each year from 2006/07 to 2010/11. Then we can calculate revised participation rates for direct, late and mature entrants which apply to domestic entrants. A further adjustment is made to the historical participation rates for the direct (domestic) entrants which were derived from the *SLS* data to ensure that the implied numbers of historical direct entrants broadly add up to the HEA data for direct entrants less international students. The overall adjustment to the direct entrant participation rate is downwards by around 7 per cent or around 4 percentage points.²¹ The analysis confirms the accuracy of our *SLS* time series and, thus, validates the use of these data as the dependent variable within the environmental assessment.

Table 1C shows the adjusted participation rates for direct, late and mature entrants from 2006/07 to 2010/11. The participation rates for 2010/11 for each type of entrant are used in the projections. Finally, the sum of the historical data for direct, late, mature and international entrants is compared to the HEA data for total entrants from 2006/07 to 2010/11 to check the overall model estimates. The model performs very well with an average discrepancy of less than 1 per cent of all entrants over the period.²²

As mentioned before, we assume unchanged gender specific HE participation rates for late and mature entrants from 2010/11 over the projection horizon. There is some evidence indicating that the current high unemployment rate has increased the demand for HE. Conefrey (2011) uses data from the *Quarterly National Household Survey* to examine the fall in labour force participation among the younger age groups from late 2008 and finds that the majority of those who have exited the labour force but remain in Ireland have returned to education. If the 2010/11 participation rates are related to the current

²¹ It should be noted that the participation rates generated using the *SLS* data also include private higher education which helps explain why the initial estimates of the historical participation rates for direct entrants are above the HEA figures.

²² This is equivalent to an average discrepancy of around 347 over the period.

unemployment rate rather than a trend in HE participation, then there may be some over-estimation of projected demand among late and mature entrants.

TABLE 1C: Final Participation Rates for Entrants

	2006/07	2007/08	2008/09	2009/10	2010/11
Direct Entrants:					
Males	56	56	56	56	56
Females	60	60	60	60	60
Late Entrants:					
Males, aged 20-22	3.8	4.8	5.9	6.8	7.8
Females, aged 20-22	5.8	6.2	8.0	7.2	10.1
Mature Entrants:					
Males 23-24	1.7	2.1	2.5	3.7	4.7
Males 25-34	0.9	0.8	1.3	1.8	2.1
Males 35+	0.2	0.3	0.3	0.4	0.5
Females 23-24	2.5	2.5	2.8	3.3	4.5
Females 25-34	1.1	1.2	1.3	1.5	1.5
Females 35+	0.3	0.3	0.3	0.4	0.4

Source: *School Leavers' Survey* for direct entrants. Late and Mature entrants are calculated using HEA data on new entrants to higher education by age and data from the *Quarterly National Household Survey* on the population whose highest level of educational attainment is the Leaving Certificate by age.

Baseline Projections for New Undergraduate Entrants

The approach for projecting direct, late and mature entrants is to apply participation rates, based around historical relationships, to population growth in relevant age groups. International entrants are projected forward in 2029/30 as a share of all direct, late and mature entrants, using a similar share to the prevailing one in the UK, and then this figure is interpolated back to 2011/2012. Then the sum of the projections for direct, late, mature and international entrants provides a Baseline projection of all full-time undergraduate entrants to HE. It is important to note that these projections are driven solely by changes in student demand for HE places over time (through demographic change) rather than an interaction with the supply of actual places in the HE system. It should also be noted that we assume that there is no capacity constraint at this stage, that is, each student seeking a place within an Irish institution gains one. The issue of potential unmet demand and its implications for policy will be considered in Section 6.

FIGURE 1E: Baseline Projections; Total Full-Time Undergraduate Entrants

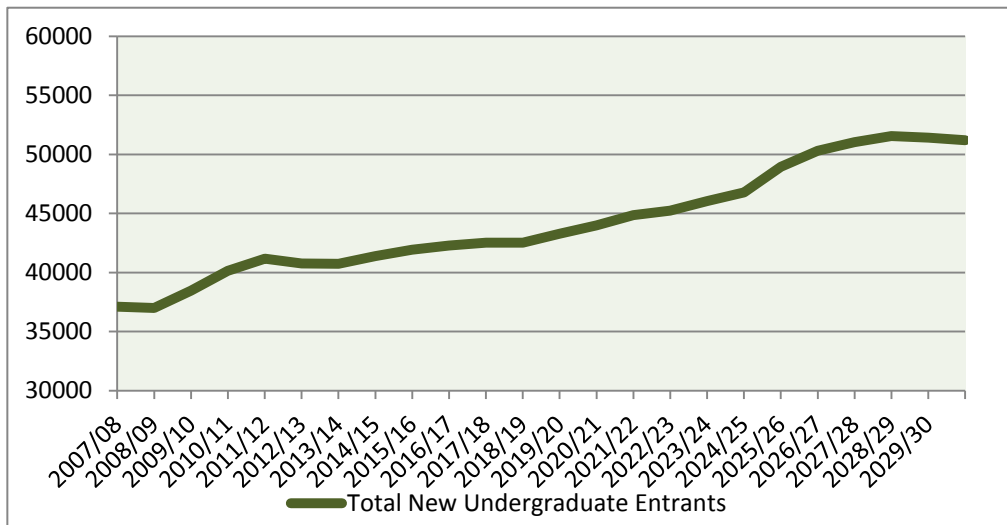


Figure 1E presents our Baseline Model projections for undergraduate new entrants out to 2029/30. The graph shows an increase in entrants from around 41,000 in 2010/11 to just over 51,000 in 2029/30. Figure 1F shows the composition of undergraduate entrants underlying the Baseline Model projections. While the majority of entrants are direct entrants, the graph shows the rising share of international entrants over time.

FIGURE 1F: Baseline Projections: Composition of New Entrants

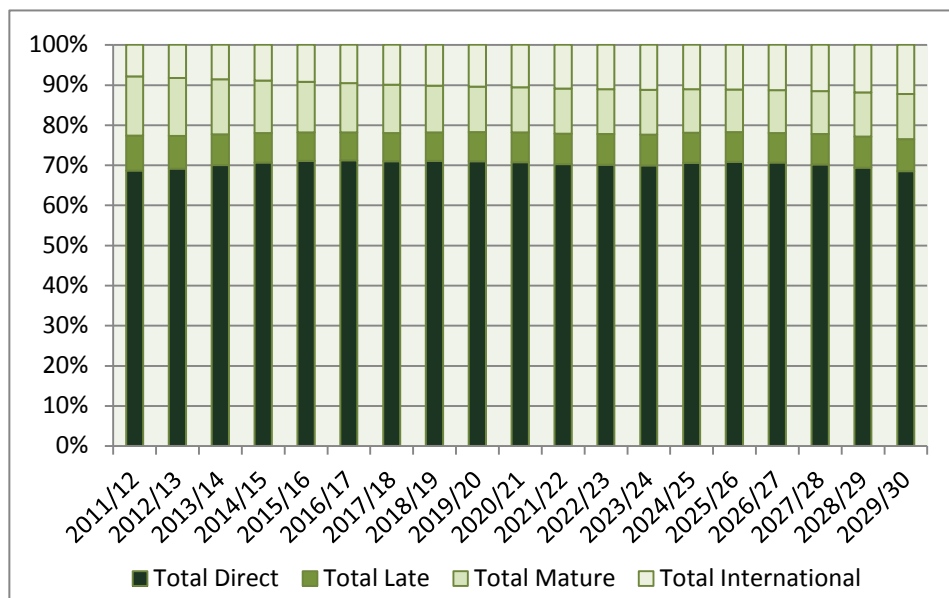


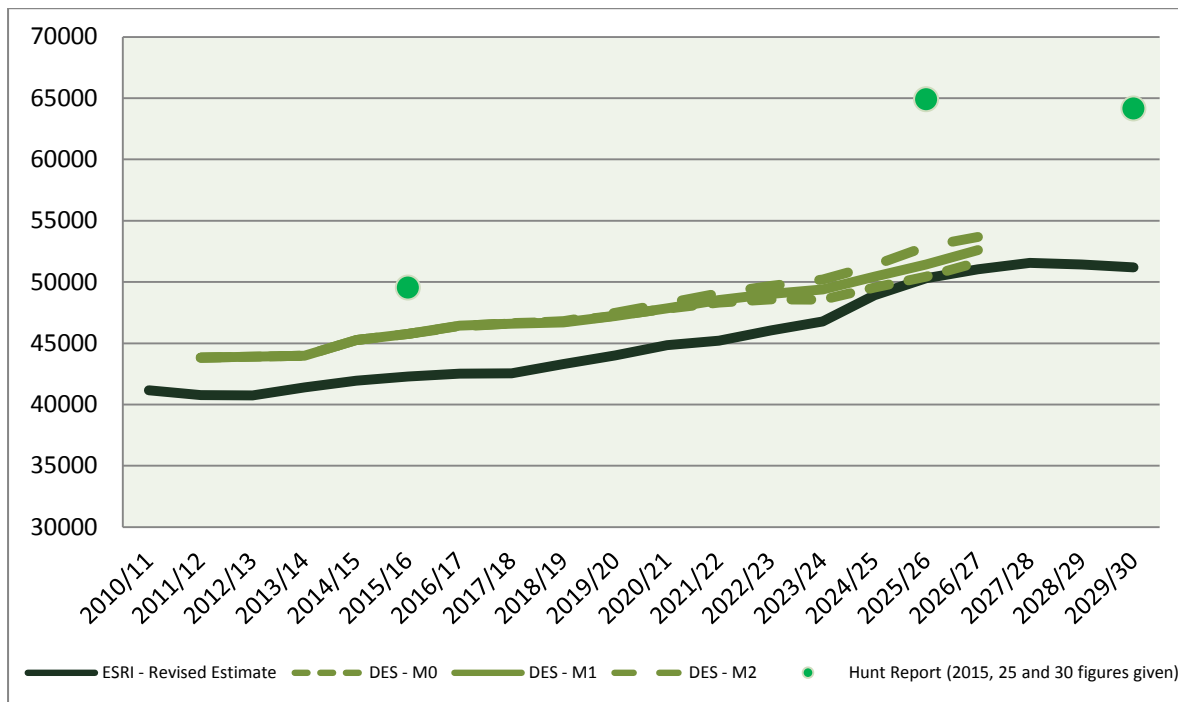
Figure 1G shows the official projections from the Department of Education and Skills (DES), which were published in July 2012,²³ ESRI projections from the Baseline Model and older projections from the DES that were used in the *National Strategy for Higher Education to 2030* (known as the Hunt report).²⁴ The July 2012 DES projections and the ESRI Baseline Model produce broadly similar results, compared to earlier projections that were used in the *National Strategy for Higher Education to 2030*. The previous DES projections were the latest projections available at the time of writing of the National Strategy report. Any discrepancies are relatively minor and are driven by differences in the methodologies employed and some of the underlying assumptions. Specifically, the DES projections refer to all full-time places in third-level institutions funded by the Department of Education and Skills, while the ESRI projections are based on HEA-funded institutions. Part of the gap between the two sets of projections is due to the fact that the DES makes an adjustment for the non-HEA funded colleges namely the National College of Ireland, the Pontifical College, Milltown Institute and the non-HEA funded teacher education institutions (CICE, Marino College and Froebel College). This effectively explains part of the gap between the two sets of projections.

In addition, the DES use recent administrative data to project HE participation rates by age cohort, making no distinction between direct and late entrants. Furthermore, the DES model assumes a much more moderate growth in immigrant students. The ESRI model, on the other hand, although broadly comparable, is driven primarily by a continuation of a direct entrant participation rate derived from a historical time series using the *School Leavers' Survey*. The use of the *SLS* data allows us to investigate behavioural factors that may influence participation and to subsequently test the sensitivity of projected demand to changes in the economic environment. The approach dictated therefore that we distinguish direct from late entrants. In addition, we have allowed for a more rapid expansion of immigrant demand and utilise this as a policy variable within our analysis. Thus, in summary, while the ESRI projections align closely with the official estimates, there are some relatively minor differences driven by both the variation in approach and the fact that the ESRI analysis is more exploratory in nature and allows for changes in participation rates, immigrant demand and responses to external macro-economic influences.

²³ These projections are available at: <http://www.education.ie/en/Publications/Statistics/Projections-of-demand-for-Full-Time-Third-Level-Education-2011-2026.pdf>

²⁴ See Table 3.1 (page 44) of the *National Strategy for Higher Education to 2030*, published in January 2011, available at: http://www.heai.ie/files/files/DES_Higher_Ed_Main_Report.pdf

FIGURE 1G: Comparison of Projections for Full-Time Undergraduate New Entrants with Department of Education and Skills Projections



The ESRI Baseline Model and the July 2012 DES estimates are relatively closely aligned, but both sets of projections show a radical difference from the previous DES projections that were used in the *National Strategy for Higher Education to 2030*.²⁵ The previous DES projections were the latest projections available at the time of writing of the National Strategy report. Consequently, any policy arguments that are based on these older projections need to be updated in light of the new projections.

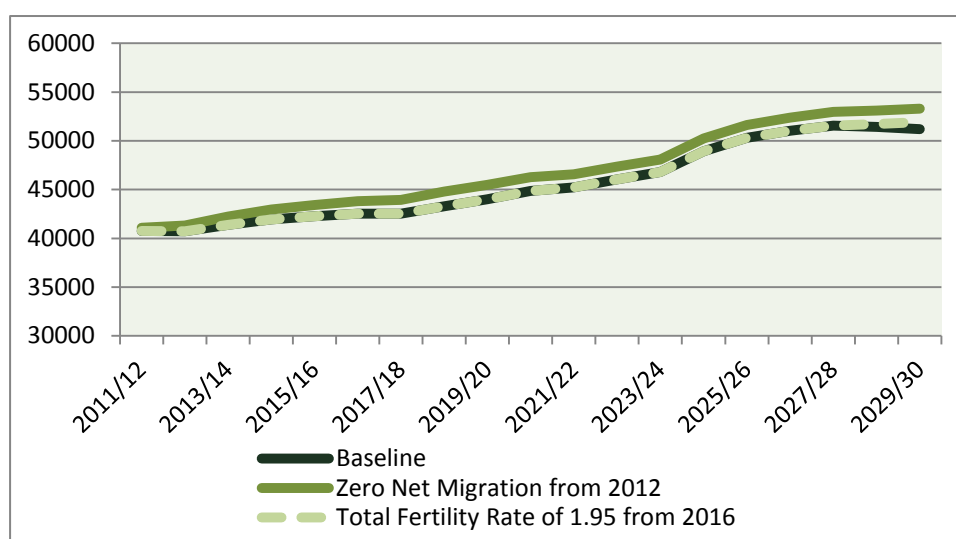
The Baseline Model projections are mainly driven by demographic change so it is important to assess how sensitive the projections are to changes in the main demographic assumptions. Two sensitivity tests are performed that assess the impact on the projections of more positive demographic assumptions. First, we assess the impact of a higher TFR of 1.95 from 2016 compared to the Baseline Model assumption of 1.85. Then, we examine the impact of zero net migration at an aggregate level from 2012 over the projection horizon as compared to the Baseline assumption of net emigration of around 28,000 per annum out to 2020 and net immigration of around 5,000 per annum thereafter. As mentioned before, projections around net migration are very uncertain so it is important to

²⁵ As noted, the earlier DES projections were used in the *National Strategy for Higher Education to 2030*. See <http://www.education.ie/en/Publications/Statistics/Projections-of-demand-for-Full-Time-Third-Level-Education-2011-2026.pdf> for an explanation of the difference between the two sets of projections from the DES.

assess the impact of a different net migration path on our projections. This sensitivity analysis would be consistent with a stronger than expected economic recovery. In each case, the total number of international entrants is held constant in the Baseline Model projections.

The results of the sensitivity analysis are shown in Figure 1H. The higher fertility rate only affects the projections in the last couple of years as the students entering the system in earlier years have already been born. The overall impact of the higher fertility rate is to add approximately 730 entrants to the Baseline Model projections in 2029/30. The impact of zero net migration out to 2030 has a larger impact on the Baseline Model projections; it raises the number of entrants by around 1 per cent over the Baseline Model projections in the short term by around 3 per cent in 2019/20 (or approximately 1,500) and close to 4 per cent in 2029/30 (or approximately 2,100).

FIGURE 1H: Sensitivity Analysis: Total Undergraduate Entrants under Alternative Migration and Fertility Assumptions



Scenarios: High and Low Participation

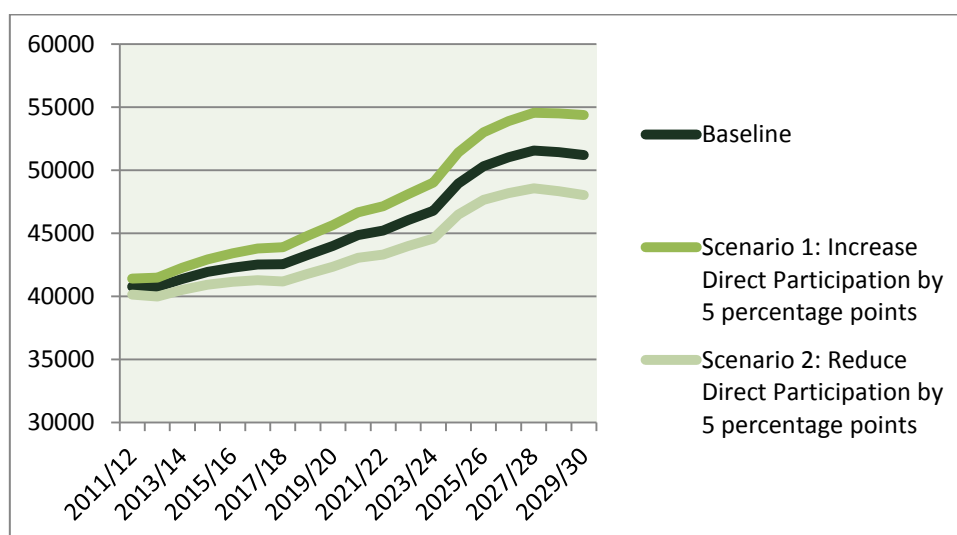
In the Baseline Model we largely assume that HE participation rates will remain constant over the period.²⁶ Here, we examine the impact on the Baseline estimates of higher and lower direct participation rates. Specifically, we assess the effect of the direct participation rates for males and females rising over the projection horizon so that the rates are 5 percentage points above those in the Baseline Model by 2029/30. This raises direct participation rates to 60 per cent

²⁶ This assumption applies to direct, late and mature entrants.

for males and 65 per cent for females, which, might reasonably be considered as an upper limit for any policy target over the forecast horizon. Both scenarios hold the level of international entrants constant at the levels projected in the Baseline Model. In addition, both scenarios keep the participation rates for late and mature entrants constant at the Baseline Model rates as increasing the direct participation rate means the scope for increasing the participation rates for late and mature entrants is more limited.

The results of the high and low participation scenarios are shown in Figure 11. The difference in the number of entrants as compared to the Baseline Model is symmetric; in the high participation scenario, the number of entrants is around 3,200 (or 6.2 per cent) higher than the Baseline Model in 2029/30, while the number of entrants is around 3,200 (or 6.2 per cent) lower than the Baseline Model in 2029/30 in the low participation scenario.

FIGURE 11: Total Undergraduate Entrants under High and Low Participation Scenarios



Although demographics play a central role in determining future student demand for HE, there are other factors that may influence participation. We perform a time series analysis on the direct participation rates for males and females using data from the *SLS* to try to explore the importance of these forces on participation over the period 1980 to 2006. A multiple linear regression model is used to estimate the influence of these different factors on direct HE participation rates.

A whole range of non-demographic factors were considered for inclusion in the behavioural analysis. The factors included the opportunity cost faced by students

which reflects the choice between work and study. The weakness in the labour market since 2008 appears to have encouraged more people into HE.²⁷ Conversely, when the labour market is tight young people may be more tempted to enter the labour market rather than enrol in HE. Variables such as the unemployment rate, the low skilled wage rate²⁸ and employment growth may capture the opportunity cost faced by students. In addition, the decision to undertake HE or to invest in human capital will also be affected by the private rate of return on that investment which is given by expected future earnings.²⁹ Variables such as GNP per capita, GDP per capita or average wages in the economy can act as a proxy for the rate of return to HE. We may also expect HE participation to be affected by the types of student funding available, for example, whether or not undergraduate fees had to be paid³⁰ or the prevailing grant rates. In addition, to capture skill biased technological change, a range of variables such as the share of high-tech employment in total employment and the share of employment by the various levels of education were also included in the analysis. Finally, trends in the level of excess demand for HE among school leavers may also affect participation. This is proxied in the analysis using a variable constructed from CAO data that includes the number of HE applications divided by the number of HE acceptances.

The approach taken was to include different combinations of these variables in models for male and female direct participation rates. The regression results indicate that the male direct participation rate is largely exogenous with respect to the types of variables that we included in the models. However, the model for female participation performs better. The results indicate that the female direct participation rate depends on GNP per capita, real average wages in the economy and the real low-skilled wage rate. The direction of the impacts is as expected; consistent with human capital theory a rise in future earning (captured by GNP per capita and real average wages) serves to increase the female participation rate. Conversely, a rise in the opportunity cost (captured in the model by the real low-skilled wage rate) serves to reduce the female participation rate. The model details are presented in Table 1D below. The natural log of GNP per capita, real average wages and the real low-skilled wage rate are included as explanatory variables in the model. Dividing the coefficient estimates by 100 means the

²⁷ See, for example, Conefrey, T. (2011), "Unemployment and Labour Force Participation during the Recession", *Economic Letters*, Vol. 2011, No. 4, Central Bank of Ireland.

²⁸ In the analysis the low-skilled wage rate is proxied by the wage rate in the clothing sector.

²⁹ See Becker, G. (1964), *Human Capital*, Chicago: The University of Chicago Press.

³⁰ The effect of the free fees initiative can be captured in a model by including a dummy variable that is equal to one from 1996 onwards when undergraduate fees were abolished.

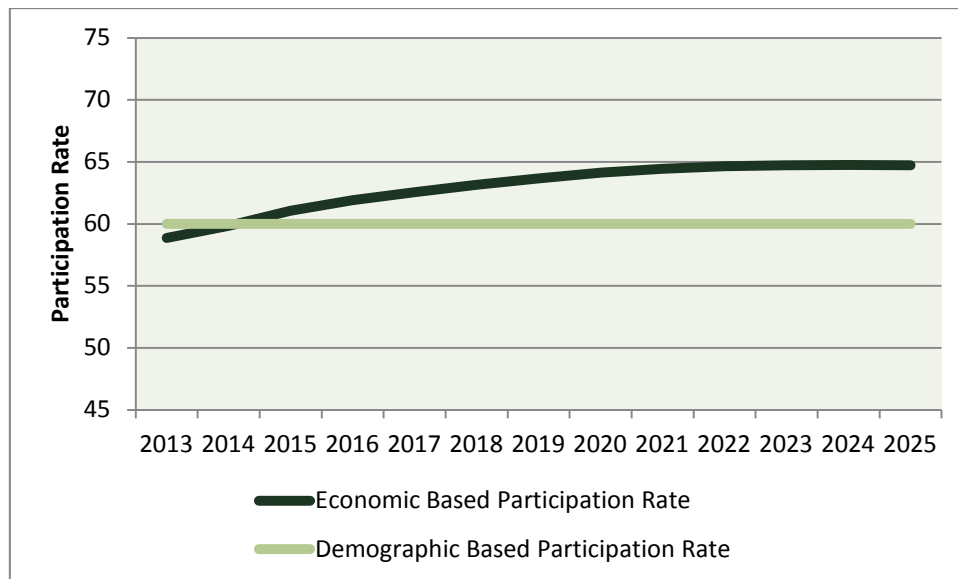
estimates can be interpreted as the absolute change in the participation rate for a percentage change in one of the explanatory variables.³¹

TABLE 1D: Female Direct Participation Rate Regression Results

	Coefficient_Estimates
Ln GNP per Capita	17.0*
Ln Average Wages	133.9***
Ln Low-Skilled Wage	-75.7***
Constant	-238.9***
R ²	0.9746
N	23
Prob > F = 0.0000	0.0000
Range: 1980 to 2005 ³²	

Note: *** p<.001; ** p<.01; * p<.05

FIGURE 1J: Comparison of Economic and Demographic Based Direct Participation Rates for Females



Combining the regression results with projections from the *Low Growth* scenario from the *Recovery Scenarios in Ireland: An Update* published in July 2010, we can estimate the future female direct participation rate that accounts for economic

³¹ As we are working with time series data, we have to consider the possibility that the error terms in the regression model are correlated, in which case OLS estimates will not be efficient. The results of Durbin’s alternative test for autocorrelation and the Breusch-Godfrey serial correlation Lagrange multiplier test indicates that there is no autocorrelation in the error terms of the model.

³² As the *SLS* did not take place in every year, we have no data on participation rates for three years.

factors.³³ Figure 1J shows the estimates of the economic-based participation rate and the Baseline Model demographic-based participation rate for females. Predicated on a recovery in the economy over the medium term³⁴, the results show a rise in the economic-based participation rate for females over the medium term. By 2025, the direct female participation rate is between 4 to 5 percentage points above the rate assumed in the Baseline Model and close to the participation rate used in the high participation scenario. Using the economic-based participation rate for female entrants leads to an increase in the total number of entrants of around 1,500 above the Baseline Model estimates in 2024/25.

³³ This document is available at:
http://www.esri.ie/UserFiles/publications/RecoveryScenarios/QEC2010SumSA_Recovery%20Scenarios.pdf
Projections for the real low-skilled wage rate are not included in the publication, so we assume they grow at the same rate as real average wages.

³⁴ The average GNP growth rate over the period 2013 to 2025 in this scenario is around 2.3 per cent.

Section 2

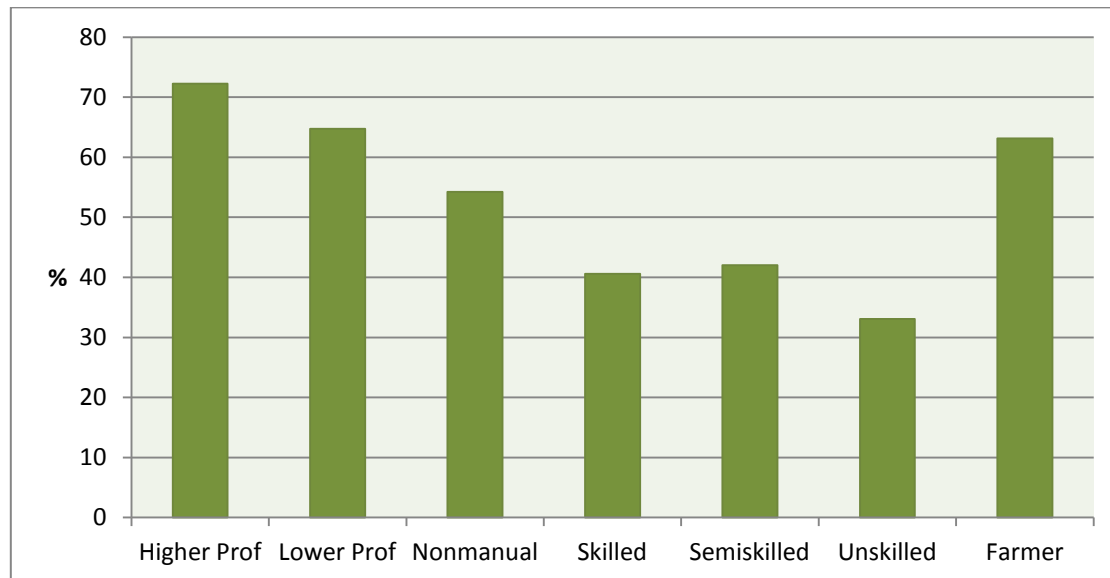
Higher Education Expansion and Social Inclusion

The previous section outlined that the demand for HE places has expanded rapidly as a consequence of rising participation rates and it is envisaged that rising participation will continue into the future. The extent to which the expansion of higher education provision will result in changes in the social profile of higher education entrants has been the subject of much debate internationally. The thesis of maximally maintained inequality (MMI), put forward by Raftery and Hout (1993), suggests that educational inequality will only decrease where the enrolment of advantaged groups is already so high (near saturation) that further expansion is only feasible by increasing the participation rates of more disadvantaged groups. Lucas (2001) has suggested that even very high levels of expansion may not be sufficient to bring about change since more advantaged groups will continue to access more prestigious colleges and courses within a differentiated system. Both sets of theories have focused on the relative position of advantaged and disadvantaged groups. In contrast, Arum *et al.* (2007) argue that while relative differences may prevail, it is important to acknowledge that the absolute number of working-class young people obtaining third-level qualifications has increased significantly as a result of higher education expansion. This section outlines the consequences of higher education expansion in Ireland for social differences in participation rates, unpacking the processes underlying such differences. Much of the discussion draws on a rich body of evidence, gathered over the last decade in particular, and as such there is less reliance on new analysis in this section.

There is now a substantial body of research which documents social inequality in HE participation in Ireland. Existing studies tend to use measures of family social class and/or socio-economic group to explore this differentiation. Looking at the social class background of school leavers (using 2007 data as this is the latest available), taking the higher social class where both parents are employed (a 'dominance approach'), a clear linear pattern is found with the highest participation found among those from higher professional backgrounds and the lowest participation found among those from unskilled manual backgrounds (see Figure 2A). Participation rates are also low among other working-class groups, namely, those from skilled and semi-skilled manual backgrounds. Although those from farming backgrounds can be allocated to a social class category on the basis of acreage, historically farm sons and daughters have been found to have very distinctive patterns of educational participation. Thus, farm families are regarded

as a distinct group in Figure 2A, with their HE participation rates found to resemble the levels among the lower professional groups.

FIGURE 2A: Proportion of All School Leavers Entering Higher Education by Social Class (Dominance), 2007



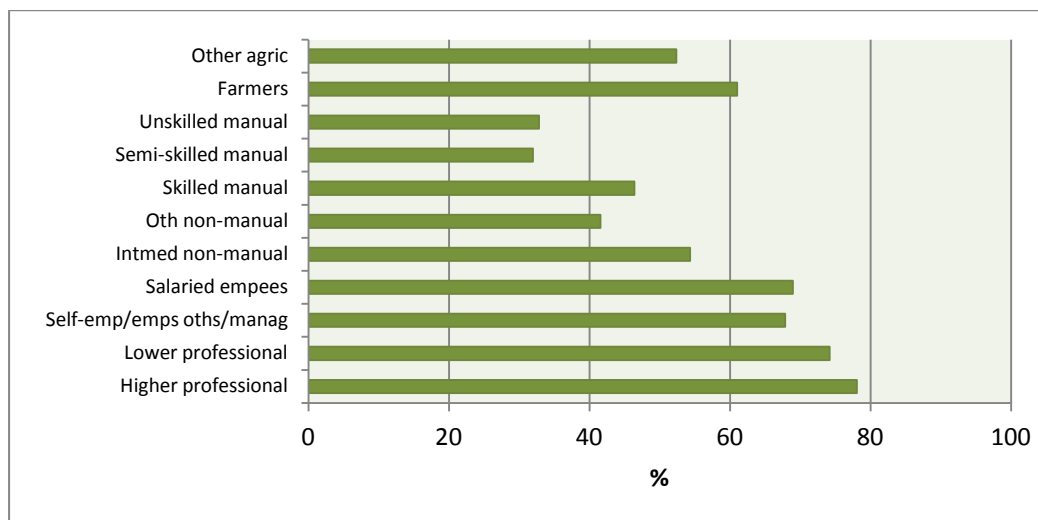
Source: School Leavers' Survey data.

Using socio-economic group as a basis for classification reveals additional insights into the processes of differentiation. The highest participation levels are found among the higher professional group and the lowest among the unskilled manual group. However, there is considerable variation among the other groups, with the 'other non-manual' group having lower rates of participation than the skilled manual group (Figure 2B), all statistically significant differences. Over time, virtually all groups have increased their levels of participation in higher education, although the gains have been greater among less advantaged social groups, in particular the skilled manual group. However, these trends also reflect professional and managerial groups largely reaching 'saturation' in their levels of participation (O'Connell *et al.*, 2006; Clancy, 2007). The other non-manual group is the only group to have seen a fall in levels of entry over the ten-year period between the late 1990s and the late 2000s. Disaggregating the group into 'intermediate non-manual' and 'other (lower) non-manual' groups, a practice not typically used by analysts in the Irish context, reveals stark differences in the profile and HE entry levels of the two groups (McCoy *et al.*, 2010a). This research has been important in highlighting the need to move beyond broad inter-class analysis towards a nuanced approach incorporating intra- as well as inter-class analysis (McCoy and Byrne, 2011; Byrne and McCoy, forthcoming). Over and above the effects of social class and socio-economic group, having non-employed parents is found to reduce the chances of HE entry (McCoy and Smyth, 2011).

Further, the evidence indicates that inequality in access to HE extends to the nature of HE accessed. Expansion in university places over the 1990s in particular drew in large numbers of middle class young people, reflecting the higher direct costs of university entry as well as the risk of social demotion for middle class young people who attend Institutes of Technology. Less advantaged social groups have increased their participation in HE largely through accessing Institutes of Technology and consequently shorter duration courses and less prestigious fields of study (McCoy and Smyth, 2011). These long-standing trends in HE access have also been documented in the work of Clancy (2008, 2007, 1996) and have also been documented in international research examining differentiation in higher education (Reimer and Jacob, 2011; Boliver, 2011; Schindler and Reimer, 2011).

In sum, existing research points to lower rates of HE entry (and access to more prestigious institutions and fields of study) among the 'traditional' working class (manual workers) as well as those in less skilled white-collar jobs and those in non-employed households.

The extent to which HE expansion in Ireland has reduced the degree of inequality in participation has been the subject of much policy attention. The picture is one of continuity and change – expansion resulted in increased HE participation among all social groups but relative differences remained significant (O'Connell *et al.*, 2006; McCoy *et al.*, 2010a). Analyses indicate that the higher professional groups benefited most from the initial expansion of HE places with this differential only declining as they reached near saturation levels, consistent with the thesis of Raftery and Hout (1993). Farm families show a very rapid increase in participation levels over time. There is no evidence that the removal of tuition fees narrowed the social differential in HE participation (McCoy and Smyth, 2011). In sum, HE expansion has meant greater numbers of young people from disadvantaged backgrounds entering college but the social gap in participation has remained largely unchanged.

FIGURE 2B: Proportion of All School Leavers Entering Higher Education by Father's Socio-economic Group, 2007

Source: School Leavers' Survey data.

What accounts for the persistence of these differences in participation? Theorists have sought to distinguish between primary and secondary effects in looking at the processes influencing social class differences in HE participation (Jackson *et al.*, 2007). Primary effects relate to differences in achievement; thus, working-class young people may not access HE either because they do not complete second-level education or because they achieve lower Leaving Certificate grades. Secondary effects relate to differences in behaviour/choice at a given level of achievement; thus, there may be differences by social class in the proportion of young people with particular Leaving Certificate 'points' who go on to HE. Both processes are evident in the Irish context.

Second-level completion varies significantly by social background in the Irish context, with higher rates of early school (pre-Leaving Certificate) leaving found among those from semi/unskilled manual and non-employed backgrounds (Byrne and Smyth, 2010; McCoy *et al.*, 2010a). Furthermore, young people who attend schools with a concentration of students from disadvantaged backgrounds have lower rates of school completion than those who attend mixed or middle-class schools, even taking account of their own social background (Byrne and Smyth, 2010; McCoy *et al.*, 2010a; Smyth, 1999). In attempting to understand why such 'contextual effects' operate in Irish schools, ongoing work by McCoy *et al.* (2011) is examining the role of teacher, student and peer effects in explaining lower performance among students in socio-economically disadvantaged primary schools. Among those who enter senior cycle education, young people from working-class and non-employed backgrounds are more likely than others to enter the Leaving Certificate Applied programme, a route which does not permit

them direct access to HE (Banks *et al.*, 2010; McCoy *et al.*, 2010a). In sum, prior processes shaping school completion and the type of programme taken constrain the potential of working-class young people to access HE.

Not surprisingly, the level of educational performance plays a crucial role in shaping later pathways. At all levels of the educational system, 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). Thus, a good deal of the social background variation in HE participation is accounted for by the grades achieved in the Leaving Certificate (McCoy *et al.*, 2010a; McCoy and Smyth, 2011). In sum, ‘primary effects’ (that is, differences in prior achievement) are evident among Irish school leavers. Turning to secondary effects, we find that social class variation is evident even taking account of these differences in prior achievement. Thus, young people from higher professional backgrounds are more likely than similarly performing working-class young people to go on to HE (McCoy and Smyth, 2011). Overall, and as expected, primary effects are stronger than secondary effects and social class differences in behaviour are weaker at higher levels of achievement. In policy terms, this points to the fundamental importance of enhancing school retention and educational achievement among working-class young people as well as boosting aspirations.

While the distinction between primary and secondary effects may provide a useful way to think about the processes influencing HE entry, in practice levels of achievement and HE intentions are closely intertwined. An emerging body of research indicates the way in which the proportion of young people going on to HE differs across individual schools, even taking account of individual background characteristics (Smyth and Hannan, 2007; McCoy *et al.*, 2010a). In some schools, going on to college assumes a ‘taken for granted’ quality, partly but not wholly related to the social class mix of the school (Smyth and Banks, 2012). A school’s orientation to HE tends to be reflected in concrete practices, particularly the nature of access to higher level subjects and the level and nature of guidance provision. The proportion of students taking higher level subjects varies significantly across second-level schools, reflecting the complex interplay between school policy regarding access, teacher expectations and student expectations (Smyth *et al.*, 2008, 2011). Low levels of take-up of higher level subjects will set a ceiling on student achievement, thus constraining the likelihood of entering HE. Schools with higher levels of guidance provision (as reflected in the number of guidance hours) have a greater proportion of students who apply for HE (Smyth and Hannan, 2007). Even more important than the level of guidance provision is the nature of such provision. Formal guidance provision

plays a more important role in the decision-making of young people from more disadvantaged backgrounds but, in some instances, such guidance is directed at 'realistic' (that is, class-appropriate) options (McCoy *et al.*, 2010a; Smyth and Banks, 2012).

In conclusion, expansion has resulted in greater numbers of disadvantaged young people accessing HE but neither expansion nor the removal of tuition fees has brought out a reduction in social inequality in HE access. The processes influencing school retention and educational achievement are therefore crucial to bringing about enhanced HE entry rates for disadvantaged groups. Projected trends in the level of demand for HE are discussed elsewhere in this report. However, it is worth making a number of explicit points regarding potential trends regarding social inclusion:

- International research has shown that relative inequalities in educational participation decline significantly only when the most advantaged groups have reached saturation levels (Raftery and Hout, 1993). In the absence of specific measures to reduce inequality, this would require very high levels of participation among middle-class students (in other words, very substantial levels of HE expansion) before greater inclusion would be possible.
- There has been a good deal of policy attention to issues of educational disadvantage within primary and second-level education. Current policies focus on designated disadvantaged (DEIS) schools which do indeed have lower retention rates, lower Leaving Certificate achievement levels and much lower levels of HE entry historically (McCoy *et al.*, 2010a). However, the majority of students from disadvantaged backgrounds attend non-DEIS schools (Smyth and McCoy, 2009), raising challenges for promoting the inclusion of these students.
- The current recessionary conditions may encourage young people to remain in, or return to, full-time education in order to avoid unemployment. However, reductions in living standards at the household level along with reduced opportunities for part-time employment for students may constrain the ability of families to cover the costs of HE.
- The removal of ex-quota provision³⁹ for career guidance within second-level schools is likely to disproportionately impact on more disadvantaged students who do not have other sources of information and advice regarding college choices (Smyth and McCoy, 2011).
- The degree of social inclusion will be strongly influenced by the nature and level of financial support for students through the grant system. Earlier research has indicated that HE participation rates are somewhat lower than might be expected at income levels just below the grant threshold (Watson

³⁹ These are additional posts provided outside of the pupil-teacher ratio.

and Smyth, 2003). Furthermore, the lack of entitlement to HE grants has been seen as a factor in the declining participation of other non-manual groups (McCoy *et al.*, 2010a).

- The removal of tuition fees was found to have little impact on inequalities in HE access but this is not to say that a reintroduction of fees or other forms of payment would have neutral effects. International research has indicated that working-class young people tend to be more risk averse (Reay *et al.*, 2005) and so a student loan system, for example, might negatively affect their participation levels.

In sum, future trends regarding social inclusion within HE will not only depend on the degree of expansion in provision but on a complex array of factors, including the level and nature of financial support for students, the financial resources available to families, the degree of support for disadvantaged children and young people attending DEIS and non-DEIS schools, and the level and nature of guidance provision in second-level schools.

Section 3

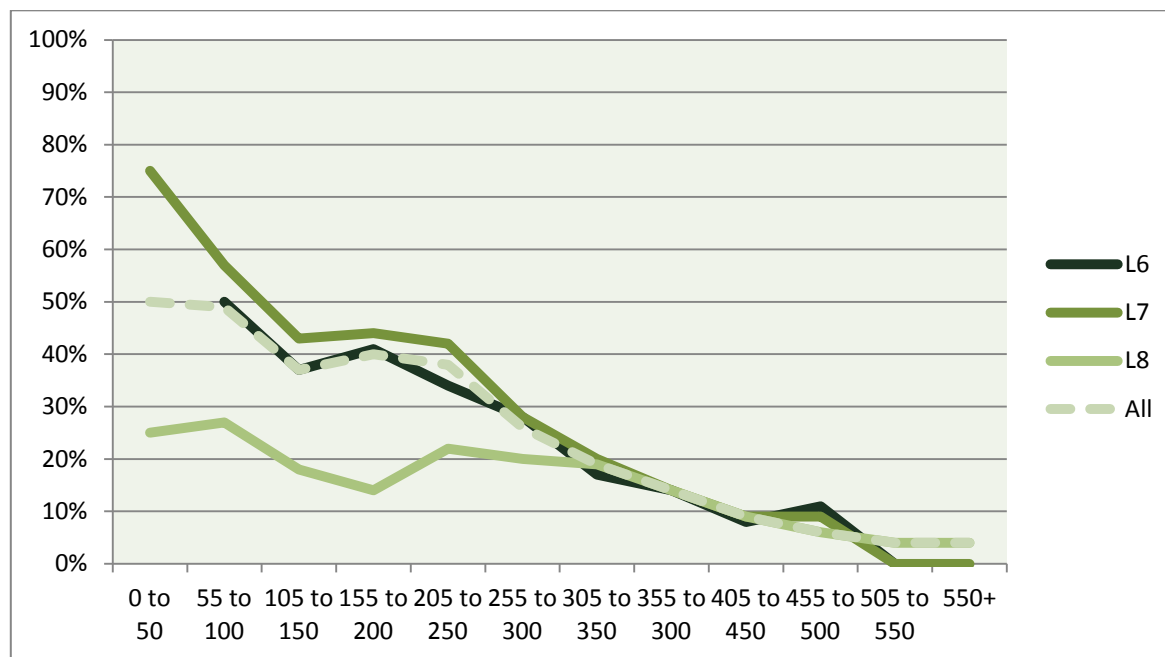
Higher Education Expansion and Progression

To what extent does higher education (HE) expansion have implications for levels of student achievement and successful course completion? While patterns of access to, and participation in, HE are now well established in the Irish context (as discussed in Section 2), it is only in more recent years that we have been able to gain an understanding of the processes shaping student progression and success on entry to HE. There is little doubt that large-scale and rapid expansion in the HE sector has had important implications for extending HE to wider sections of society. However, it is important to assess the extent to which such widening access has implications for students' capacity to benefit from, and succeed within, HE. As acknowledged internationally, improving student retention represents an "...on-going challenge because as the goal of increased student diversity is being embraced, the needs of the student body are shifting" (Thomas, 2002). In a recent Higher Education Authority (HEA) report it is further noted that in the context of growing accountability and efficiency, "...minimising students' non-completion of courses is an important part of ensuring that the resources available to the HE sector are utilised with maximum efficiency" (Mooney *et al.*, 2010, page 10).

In recent years data gathered from all institutions funded by the HEA has allowed research to examine the factors influencing student progression in Irish HE institutions. Drawing on these data, a recent study (Mooney *et al.*, 2010) examined student progression from first to second year across HE institutions, sectors and courses. While research examining HE completion more broadly is somewhat limited in the Irish context (with the exception of Morgan *et al.*, 2001, Eivers *et al.*, 2002 and Kinsella *et al.*, 2006), international research points to the importance of the first to second year transition. In the US context, Porter (1990) found that over half of student attrition occurs in the first year, while Smith and Naylor (2001) had similar results in the UK. Mooney *et al.* (2010) found that an average of 15 per cent of new entrants were not present one year later. While acknowledging serious difficulties in comparing retention and progression rates across countries (Van Stolk *et al.*, 2007), these figures are not out of line internationally, despite a much more rapid HE expansion rate in Ireland than in many other countries. Further, OECD estimates of HE completion published earlier (2009) suggested that Ireland was among the best-performing countries for university completion. The Mooney *et al.* (2010) study provides valuable

insights into the processes and factors shaping non-progression in HE, both at institutional and individual levels, and in the process provides important lessons in terms of expansion of the HE system and its implications for levels of student success and achievement.

FIGURE 3A: Non-Progression Rates by Prior Educational Attainment and NFQ Level

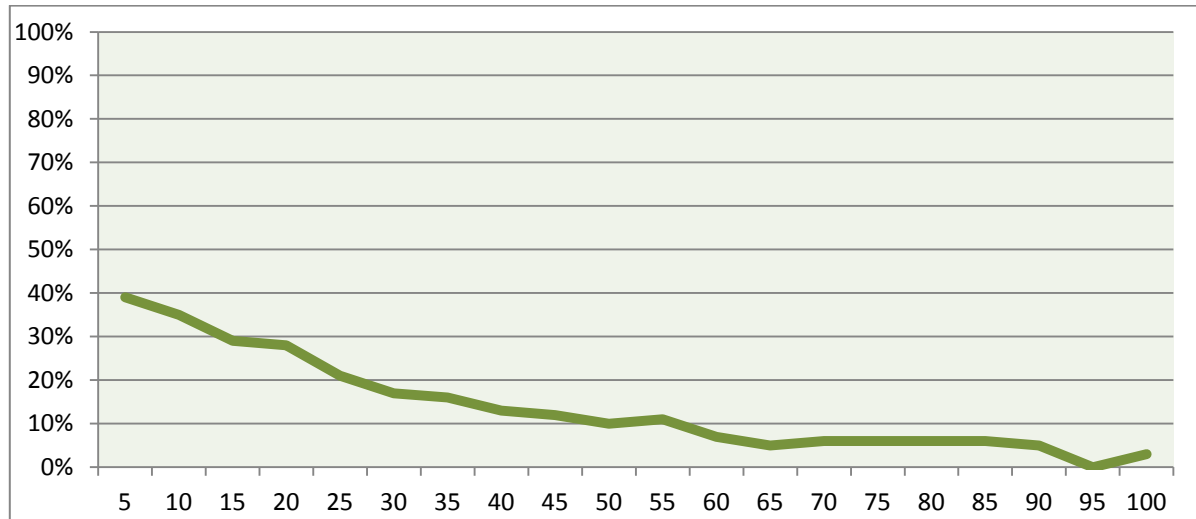


Source: Mooney *et al.* (2010), *A Study of Progression in Irish Higher Education*, based on raw data.

It is clear that prior academic achievement or ‘academic preparedness’ plays a central role in student success at HE. Leaving Certificate performance emerges as the strongest predictor of successful progression within HE (McCoy and Byrne, 2010), in line with research from a wide range of countries. As shown in Figure 3A, Leaving Certificate performance is highly influential – the relationship is linear with rising points predicting lower non-progression, a finding which holds when taking account of field of study and course level. For each additional rise of 50 points, non-progression odds fall steadily: for example, relative to those securing 305-350 points, students who achieved 255-300 points are 1.5 times more likely to drop out, while those with 205-250 points are 2.6 times more likely to not progress to second year. Similar findings emerge in the US context, with Adelman (1999) finding that high school academic achievements, such as grades and test scores, provide the best indicators of success later in college. It is interesting to find that Leaving Certificate Maths performance is a particularly important predictor of HE progression (Figure 3B) – suggesting that students with poor Maths skills, in particular, struggle to meet the academic demands of HE. Finally, McCoy and Byrne (2010) found that any social class effects were largely mediated

through prior achievement – while working-class students are disproportionately less likely to enrol in HE, once the transition is made there are few notable social class differences in progression.

FIGURE 3B: Non-Progression by Leaving Certificate Mathematics Points Attainment



Source: Mooney et al. (2010), *A Study of Progression in Irish Higher Education*.

This evidence is significant and has important implications for ongoing expansion of the HE system. In particular, the results highlight the importance of two key areas: academic preparedness prior to entry (i.e. in the second-level system) and adequate learning supports on entry to HE. The tension between admission standards and widening and increasing HE entry remains. In the Spanish context, Lassibille and Gomez (2008) argue that tighter selection at the point of entry to HE might be needed – but this is in a context where there are few restrictions on HE entry. In the Irish context, given the *numerus clausus* system in operation,⁴⁰ the academic requirements for entry reflect variation in student demand for courses and result in considerable variation between fields of study and institutions (and over time) in the academic ‘standard’ of HE entrants. However, there is also a ‘matriculation minimum’ standard⁴¹ that must be met, along with subject-specific requirements for certain courses.

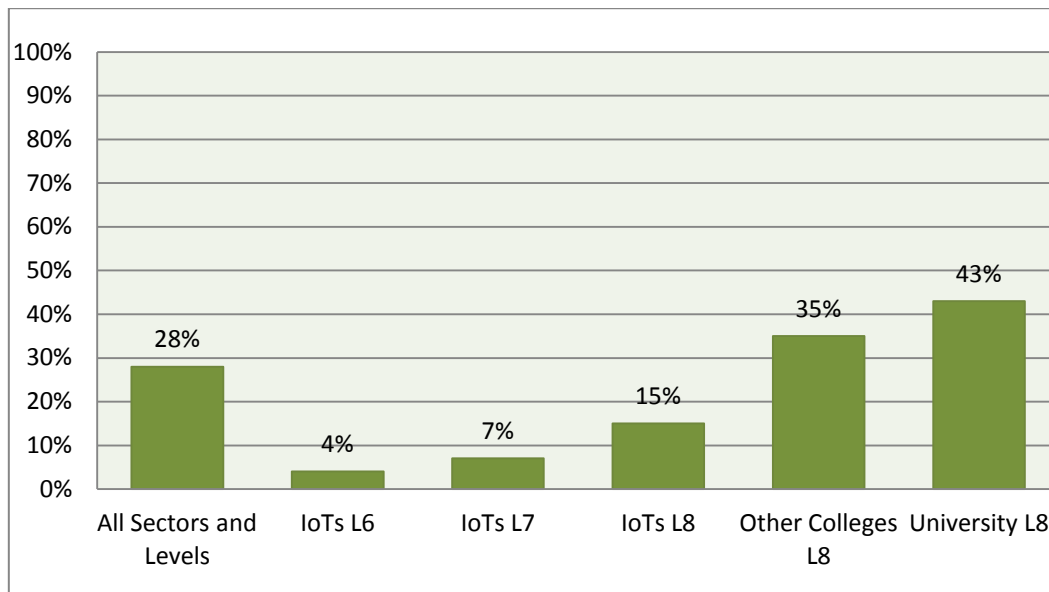
⁴⁰ Because the Irish system operates on the basis of *numerus clausus* (‘closed number’ in Latin), applicants for specific course places are ranked in terms of points (grades) with the highest-ranking candidates offered a college place.

⁴¹ All students wishing to enter a degree course in an NUI Constituent University must meet the Matriculation Requirements of the University. This includes English, Irish, and four other subjects in the Leaving Certificate. A third language must be included among the other subjects for Arts, Human Sciences, Law, Social Science, Commerce, Medicine and Health Sciences and some other degrees. For Commerce the subjects presented must include Maths, and for courses in the Sciences (i.e. Science and also Agriculture, Architecture, Engineering, Food Science and Technology, Medicine, Dentistry and Health Sciences, Veterinary Medicine) Maths and a Science subject.

A second key issue to emerge is that of financial support. Results show that financial support plays an important role in student retention – students in receipt of a state maintenance grant display greater progression rates than those not in receipt of such support, all else being equal. This may be due to greater financial security for students in receipt of a grant, their reduced reliance on (increasingly difficult to secure) part-time work or simply students ensuring that they fulfil the requirements of their courses to retain grant eligibility (since students who fail their exams and are required to repeat the year lose their eligibility for a grant) (McCoy *et al.*, 2010b). This has important implications in the context of debate around fees and in particular points to the need to ensure any policy changes in this regard are offset by an effective and rigorous system of support for students from disadvantaged backgrounds. Internationally, research shows that financial support plays an important role in reducing dropout (for example, Lassibille and Gomez (2008) in the Spanish context, and Dynarski (1999) and Bettinger (2004) in the US context. In the UK, Yorke (1998) concludes “...scholarships and grants tend to have the greatest beneficial effects on [college] persistence” (p.59).

Finally, institutional and sectoral differences in progression warrant particular attention. While initial results (Mooney *et al.*, 2010) showed large differences across institutions – for example, the percentage of honours degree students not progressing ranged from 3 to 25 per cent across institutions – these were misleading. Further analysis revealed that much of these differences reflected the ‘quality’ of the student intake. Much of the apparently wide variation in progression rates across institutions is accounted for by ‘student quality’ measures, particularly prior achievement or academic preparedness. In 2007 the most common range of points attained in the Leaving Certificate examination by new full-time undergraduate entrants to National Framework for Qualifications (NFQ) Level 8 courses of four years’ duration was 450-500 in the University sector and 300-350 in the Institute of Technology sector; the most common points range for Level 6 and 7 courses in the Institutes of Technology was 250-300. Levels of performance in maths are of particular concern in the Institute of Technology sector (Figure 3C). For example, of students enrolled in technology courses at Levels 6 and 7, few had achieved high grades in maths on entry to college. These differences are also significant in understanding gender differences in non-progression. While overall males are 1.4 times less likely to progress from first to second year, this is largely a function of the nature of the courses taken by males. Once account is taken of Leaving Certificate attainment, field of study and course level, males are no less likely to progress than their female counterparts.

FIGURE 3C: Proportion of 2007/08 Undergraduate New Entrants with 60+ Points* in Leaving Certificate Mathematics



Source: Mooney *et al.* (2010), *A Study of Progression in Irish Higher Education*.

* Points from 60 upwards refer to those gaining a C3 or better at Higher Level and an A1 at Ordinary Level.

However, it is important to bear in mind that rapid expansion in the numbers enrolled in the Institutes of Technology has played an important role in greater numbers of disadvantaged students and students with lower levels of Leaving Certificate attainment accessing HE (see McCoy and Smyth, 2011, for a fuller discussion). Given strong differentiation in progression according to Leaving Certificate performance, the question can be asked: are significant numbers of students in the Institutes of Technology struggling to meet the academic demands of their courses? Is it the case, as Smith and Naylor (2001) and Cave *et al.* (1997) maintain, that indicators of non-completion can potentially conflict both with policies of widening access to HE and with the maintenance of academic quality? Further, does the unit cost funding mechanism in operation create an incentive for progression, in the process undermining academic standards in HE institutions? The international move towards the increasing use of performance metrics carries with it the danger of rewarding institutions for student retention, which may be achieved through a lowering of academic standards.

Alongside the issue of academic preparedness, the subjects and programmes students have taken at second level are important, particularly in terms of exposure to the sciences and higher level maths. Smyth and Hannan (2002) found that a significant minority of students enter Level 6 or 7 engineering and computing courses without prior science experience, while almost half of those

entering Level 6 or 7 science have not taken physics or chemistry for the Leaving Certificate. Similarly, the *Task Force on the Physical Sciences Report (2002)* suggests that failure in first year college science exams is correlated with non-take-up of physical science subjects for the Leaving Certificate. Finally, student awareness and understanding of the different choices open to them has also been found to be a significant process in shaping HE decisionmaking and subsequent success within HE. In some cases at least, non-progression may stem from inappropriate choice of course, which reflects on second-level guidance support, an issue which has emerged in recent research examining the processes influencing HE entry (McCoy *et al.*, 2010a; Smyth *et al.*, 2011).

Overall, the evidence highlights that all students leaving the second-level system enrolling in HE should be fully equipped for doing so – in terms of academic preparedness, knowledge and understanding of course content – and the requirements of the course and an understanding of potential career paths (also highlighted by Eivers *et al.*, 2002). Within the HE setting, the evidence points to the value of identifying ‘at risk’ students and ensuring that they have the academic and social supports and guidance they need to enhance their motivation, engagement and performance early-on in their courses. Furthermore, the issue of ‘quality’ should not be ignored – both in terms of the standards required to gain entry to HE – but also in terms of the skills and competencies HE students gain over the course of their studies. Finally, some thought should be given to the extent to which individuals at the highest risk of non-completion within HE might be more effectively accommodated within the FE sector.

Section 4

Mapping New Graduate Supply Against New Graduate Demand

INTRODUCTION

This section focuses on assessing the likely flow of new graduates into the labour market over the coming years and the likely demand for these graduates. For new graduate supply, the data and projections are based on the Baseline Model figures for undergraduate entrants discussed in Section 1 of this report. The number of completions consistent with these entrants' projections is derived using recent HEA data on progression rates by year of study. In addition, we extend our model to include postgraduate completions. It is important to note that within our analysis we implicitly assume that education provision will expand in line with projected student demand; this is obviously a strong assumption and will depend on a number of factors, including the state of the nation's finances and the necessary structural change within the HE system occurring. Exactly how and when HE expansion is to be achieved represents a key research question in its own right and is beyond the remit of this study. To estimate new graduate demand, we use total employment projections by sector for the economy out to 2030 and historical data on the proportion of new undergraduates and postgraduates employed in each sector. Various adjustments are made to our initial projections of new graduate labour supply and demand. On the supply side, an adjustment is made for the fact that not all undergraduates enter the labour market upon completing their studies; a significant proportion continues on to postgraduate study. On the demand side, we take account of the fact that not all graduates are employed in graduate level jobs. In addition, we adjust for the fact that some graduates studied part time while already in full-time employment and so they do not enter new graduate jobs on completion of their studies.

Our projections of graduate supply and the labour market demand for new graduates allow us to investigate the ability of the labour market to absorb graduates and to examine the extent to which there is excess supply or excess demand for graduates. It is important to note that any imbalances between supply and demand create incentives for other actions to occur. For example, relative wages or the level of migration could change in response to imbalances in the labour market.

The estimates for new graduate labour demands are also benchmarked against the projected supply of graduates under the high and low HE participation scenarios considered earlier in this report. We also perform some sensitivity analysis around graduate labour demand and supply. Specifically, we investigate the supply-demand balance when high-technology sectors increase their demand for new graduates above the levels assumed in the Baseline Model projections. We also examine the supply-demand balance when there is graduate emigration.

In addition to mapping aggregate graduate supply against aggregate graduate labour demand we also consider the most appropriate composition of HE places in terms of subject areas. Graduates from certain subject areas with a high vocational component rely on the availability of professional posts in key sectors. Furthermore, there is a belief in some policy circles of the need to produce more graduates in STEM⁴² subjects and our analysis goes some way towards assessing the relative supply of such graduates and the labour market demand for them. Specifically, we provide detailed projections of the supply of graduates by job specific field of study benchmarked against expected labour demand.

LABOUR MARKET SUPPLY OF NEW GRADUATES

Undergraduate Completions

Our projections of undergraduate completions are obtained from applying an overall completion rate to our Baseline Model estimates of undergraduate entrants. Table 4A reports combined progression rates from years 1 to 2, years 2 to 3 and years 3 to 4 for Universities and IOTS in 2007/08 from HEA data.⁴³ We assume an overall pass rate of 97 per cent for an undergraduate qualification resulting in an overall implied completion rate of 74 per cent (i.e. 85% x 93% x 96% x 97% – see Table 4A). We assume that it takes an average of four years to complete an undergraduate qualification. This means that the undergraduate entrants in 2006/07 will complete their studies in 2009/10. Furthermore, we assume that the overall completion rate does not change over the projection horizon. To generate undergraduate completions in year t we apply the overall completion rate of 74 per cent to the projected number of undergraduate entrants in year $t-4$. Finally, we assume that students enter the labour market as soon as they have completed their studies.

⁴² STEM refers to Science, Technology, Engineering and Mathematics.

⁴³ This measure of progression (and non-progression) is based on the student being present in the same institution a year later. They may have changed course, but as long as they are in the same institution they are recorded as present. Students who transferred to another institution are recorded as not present. Hence, the non-progression rate is an overestimate of the level of dropout, and the completion rate is an under-estimate of HE completion levels. It should be noted that the progression rates used in the model exclude repeat students.

TABLE 4A: Progression Rates for Full-Time Undergraduate New Entrants

	2007/08
	%
Progression Rate from Years 1 to 2	85
Progression Rate from Years 2 to 3	93
Progression Rate from Years 3 to 4	96
Pass Rate	97
Implied Overall Completion Rate from Year 1 to Year 4	74

Source: The progression rates for individual years in HE are based on combined progression rates for all new entrants in Universities and IOTS from Mooney *et al.* (2010), *A Study of Progression in Irish Higher Education*.

Postgraduate Completions

The next element of graduate labour supply is postgraduate students. To project postgraduate students we depart from the demographic approach that was used for undergraduate entrants. The reason for this is that postgraduate students are typically in the 22 to 28 year old age group and this age group has a high propensity to migrate⁴⁴ thereby reducing the numbers available for postgraduate study. However, there is considerable uncertainty about how the balance between migration and more intense flows into postgraduate study will evolve over time so we use an alternative approach to estimating postgraduate students.

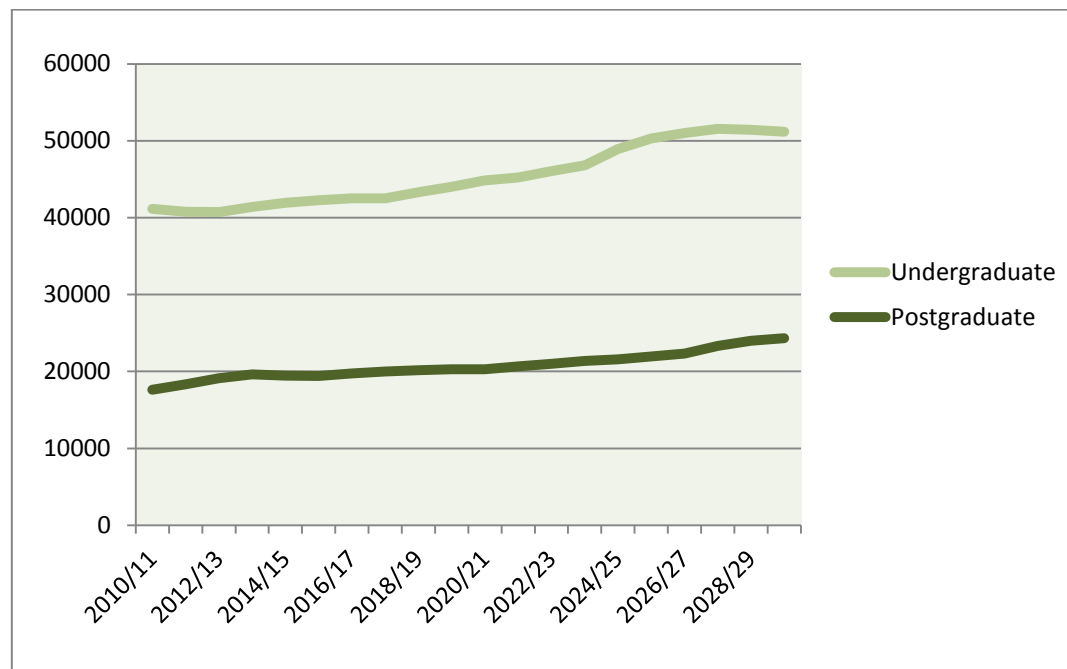
We project the number of full-time postgraduate students as a proportion of undergraduate completions each year. Specifically, we take the ratio of postgraduate entrants to undergraduate completions in 2010/11, which is 65 per cent, and apply it to the number of undergraduate completions each year out to 2029/30. This yields a projection for new postgraduate entrants. Figure 4A shows the projections for postgraduate entrants together with the projections for undergraduate entrants.

We assume an overall completion rate of 76 per cent (which is slightly higher than the undergraduate rate) to the entrants' projections to estimate total postgraduate completions. We assume that this completion rate remains constant over the projection horizon. The gender breakdown is assumed to be the same as for all postgraduate enrolments in 2010/11, namely 46 per cent are males and 54 per cent are females. We further assume that, on average,

⁴⁴ The migration weights applied to the various age groups in our demographic model are based on historical data from the CSO.

postgraduate studies take one year to complete and that postgraduates enter the labour market as soon as they have finished their course.

FIGURE 4A: Baseline Model Projections of Undergraduate and Postgraduate Entrants



Source: Authors' calculations.

It is important to note that our Baseline Model projections for postgraduate entrants may overestimate the student demand for postgraduate study given recent changes in postgraduate funding. Specifically, the abolition of maintenance grants for postgraduates in 2012 may affect participation from students in lower socio-economic groups.

Total Full-Time Enrolments

The projections for undergraduate and postgraduate new entrants can be transformed to produce an estimate of total full-time enrolments in HE. To estimate total full-time enrolments we scale up our new entrants projections for undergraduates and postgraduates by a constant amount in each year. The scaling factor for undergraduates (postgraduates) is calculated as the ratio of undergraduate (postgraduate) full-time enrolments in 2010/11 to total full-time undergraduate (postgraduate) entrants in 2010/11. The scaling factors for undergraduates and postgraduates are 3.4 and 1.2 respectively. Table 4B shows the total new entrants (undergraduate and postgraduate) and the implied total full-time enrolments in HE over the projection period.

TABLE 4B: Total Full-Time Entrants and Enrolments in Higher Education

	2010/11	2014/15	2019/20	2024/25	2029/30
Entrants					
Total Undergraduate Entrants	41,157	41,937	44,002	48,936	51,194
Total Postgraduate Entrants	17,641	19,438	20,280	21,562	24,330
Enrolments					
Total Full-Time Enrolments	160,972	167,225	175,349	193,782	204,921

Source: Authors' calculations.

Adjustments to New Graduate Labour Supply

Figure 4B shows our Baseline Model projections for undergraduate and postgraduate completions, separately for males and females. The number of graduate completions from Figure 4B yields a first estimate of the potential flow of graduates into the labour market. However, not all undergraduates enter the labour market and so we need to adjust the figures to take account of undergraduates who continue on to postgraduate study. Estimates from the HEA (2012), based on data from the *First Destinations Survey*, indicate that, on average over the period 2000 to 2010, 35 per cent of undergraduates were in further study nine months after graduation, and that most of these were in postgraduate study. We assume that this proportion remains constant out to 2030 and we adjust the potential undergraduate labour supply figures downwards to reflect this.

FIGURE 4B: Baseline Projections: Undergraduate and Postgraduate Completions

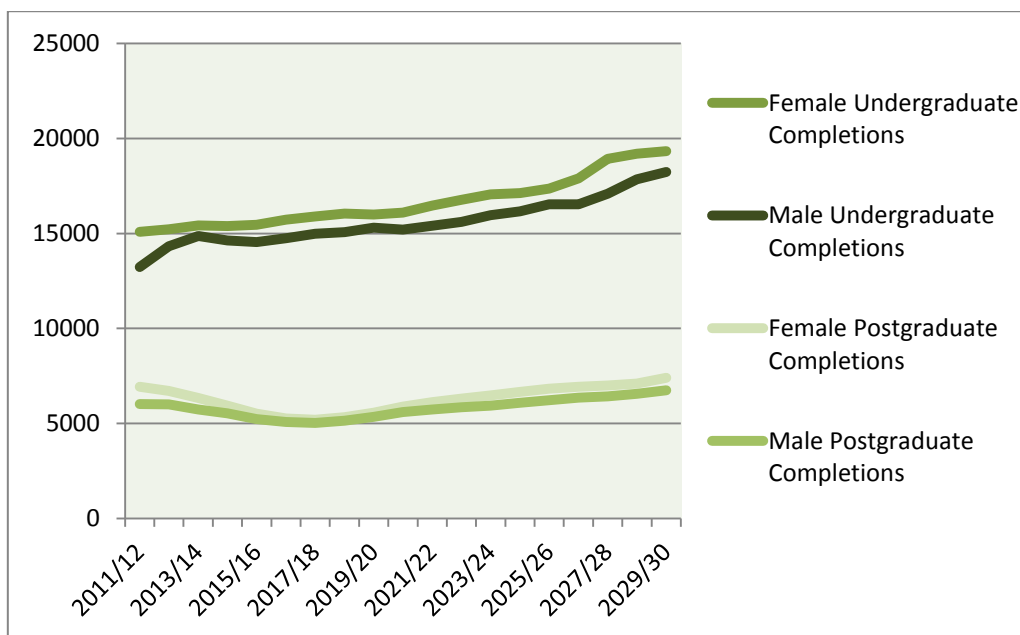
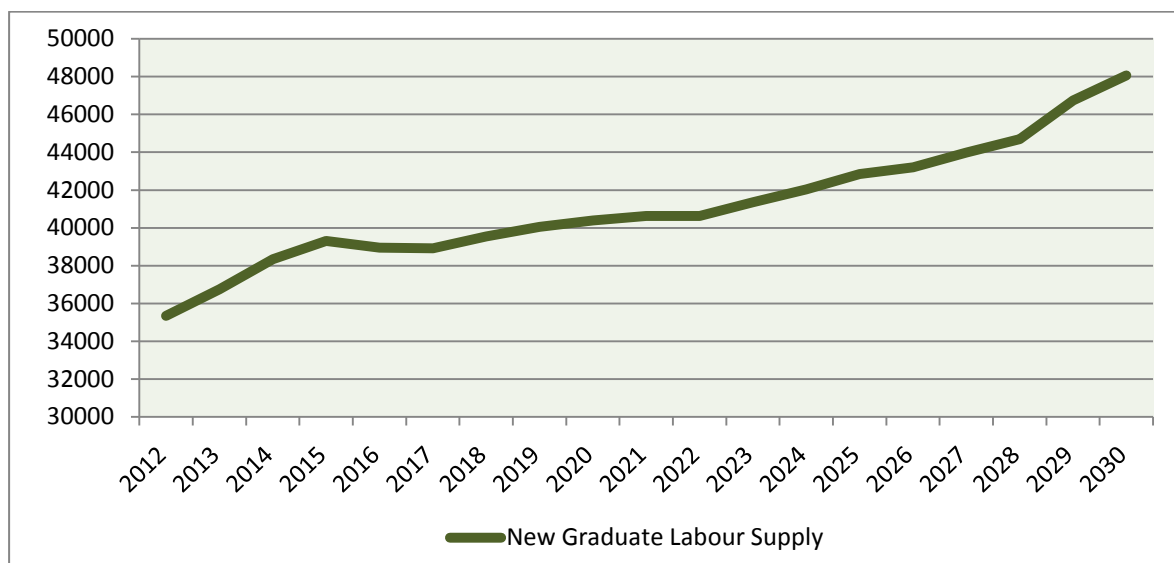


FIGURE 4C: New Graduate Labour Supply

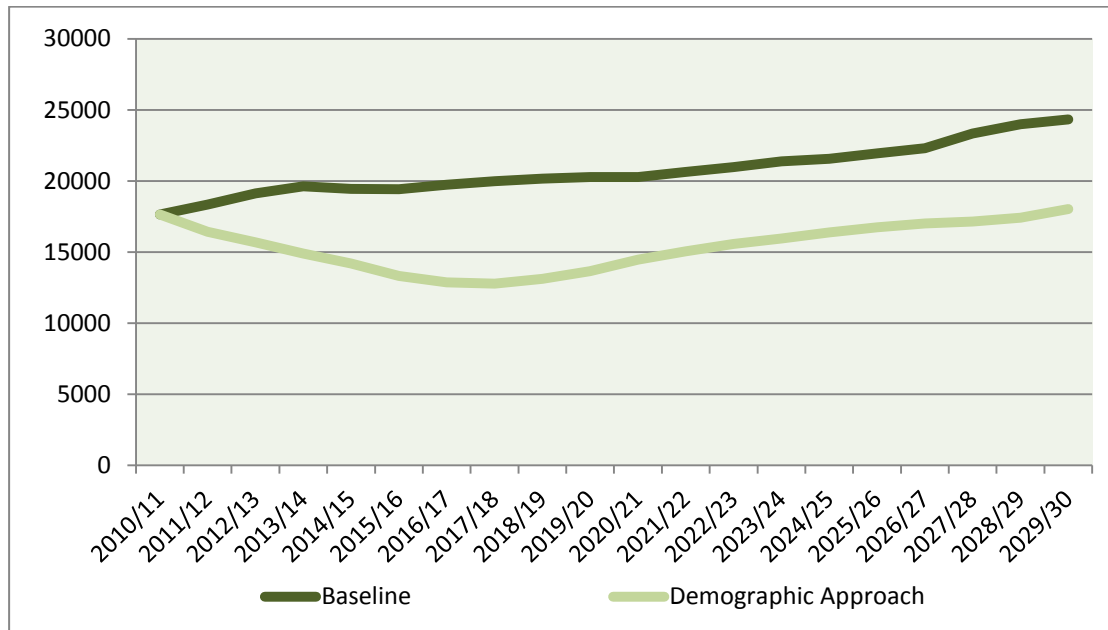


In addition, we assume that postgraduate students who do not successfully complete their studies enter the labour market as undergraduates. Figure 4C shows our estimates of overall new graduate labour supply over the projection horizon when we make these two adjustments. The graph shows a rise in labour supply over the period.

SENSITIVITY ANALYSIS ON POSTGRADUATE ENTRANTS

As mentioned before, there is considerable uncertainty regarding both the future path of net migration and the interplay between migration and flows into postgraduate study. Therefore, we look at some sensitivity analysis on the number of postgraduate entrants; specifically we examine a demographic based approach to projecting postgraduate students. The details of the approach are given in Appendix 2 and Figure 4D shows the number of postgraduate entrants from the Baseline Model and the number of postgraduate entrants derived from the demographic based approach. In the demographic based approach we apply historical participation rates to the projected number of individuals in the 22 to 28 year old age groups. As we have assumed there will be continued net emigration to 2020 and as this group has a high propensity to emigrate there is a dip in the number of postgraduate entrants over the medium term.

FIGURE 4D: Postgraduate Entrants – Sensitivity Analysis



LABOUR MARKET DEMAND FOR NEW GRADUATES

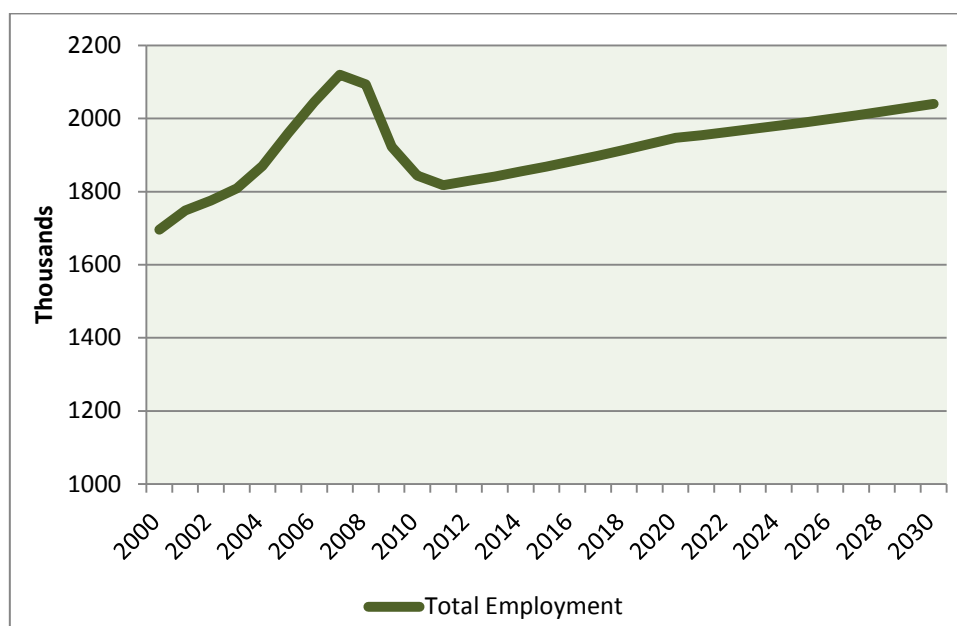
The standard approach to skills forecasting is to utilise macroeconomic models which decompose activity in terms of standard industries in order to forecast the change in the relative employment share of the various sectors and the changing employment share of occupations (or education) within each sector. This approach thus generates forecasts of the changing demand for various occupations or education groupings within the aggregate economy. Whilst the underlying macroeconomic model is typically complex, the occupational forecasts are generally derived by extrapolating historical occupational trends by industry, thus the determinants of occupational change are not modelled explicitly (for more detailed discussions see Borghans and Willems (1998), Barnow (2002), Cörvers and Heijke (2003) and Hughes (2003)). However, as we do not have a sufficiently detailed matrix describing the entry rates of new graduates into the labour market over time we have adopted a more simplified approach. On the basis that long-run entry patterns are no longer highly relevant following the onset of the recession in 2008 and ongoing HE expansion, we have concentrated on projecting forward trends in graduate entry rates over more recent years and we subsequently develop sensitivity scenarios around these projections.

The modelling of labour market demand for new graduates comprises two components: (1) projections of overall employment by sector and (2) an analysis of the proportions of new graduates associated with certain sectors of the economy. The analysis is completed at a sectoral level to ensure that the demand projections reflect any structural change within the economy. As with the labour

supply projections, our approach focuses on labour demand over the medium to long term and aims to provide a good indication of the future direction of labour demand rather than focusing on shorter time horizons.

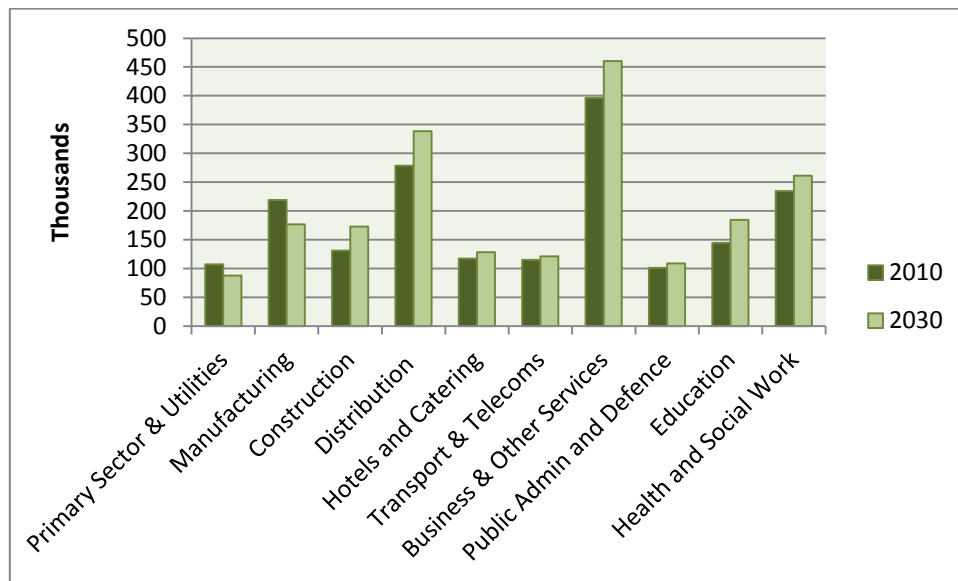
Our estimates of total labour demand come from sectoral employment projections produced by the European Centre for the Development of Vocational Training (CEDEFOP) in March 2012.⁴⁵ The CEDEFOP projections go to 2020 and ESRI medium-term projections are used to extend the projections to 2030.⁴⁶ Figure 4E shows total employment based on the CEDEFOP and ESRI medium term projections. The graph shows that, even though employment is projected to grow over the medium term, employment is only likely to reach its 2006 level by 2030, highlighting the dramatic fall in employment that has taken place over the period 2008 to 2011. While, these employment projections take account of changes in the sectoral composition of the labour market, they do not account for within industry changes in the utilisation of highly skilled labour. We consider this issue in a scenario later on.

FIGURE 4E: Total Employment Projections



⁴⁵ See: <http://www.cedefop.europa.eu/EN/about-cedefop/projects/forecasting-skill-demand-and-supply/skills-forecasts.aspx>

⁴⁶ These projections are based on the *Low Growth Scenario* contained in Bergin, A., T. Conefrey, J. FitzGerald and I. Kearney, "Recovery Scenarios for Ireland: An Update" special article in *Quarterly Economic Commentary*, Summer 2010. The scenario in this publication goes to 2025 and is extended to 2030 by assuming the same annual average employment growth by sector between 2025 and 2030 as between 2020 and 2025.

FIGURE 4F: Sectoral Distribution of All Employment

Source: Based on ESRI and CEDEFOP projections.

Figure 4F shows the sectoral distribution of employment underpinning the total employment projections. The projections show some limited sectoral change, with the share of employment in business and other services rising from around 21 per cent in 2010 to 23 per cent in 2030 while the share of overall manufacturing is expected to decline from around 12 per cent in 2010 to around 9 per cent in 2030. Nevertheless, the magnitude of change is moderate.

TABLE 4C: Share of New Graduates in Each Sector in 2009

	Undergraduate	Postgraduate
	%	%
Primary Sector & Utilities	0.68	0.00
Manufacturing	1.63	0.35
Construction	1.12	0.06
Distribution	2.01	0.22
Hotels and Catering	2.41	0.42
Transport &	1.14	0.24
Business & Other Services	3.08	0.71
Public Admin and Defence	2.40	0.28
Education	3.09	2.20
Health and Social Work	3.15	0.86

Source: Calculated using QNHS micro data.

To capture how many jobs are likely to go to new graduates in the future we examine historical trends in the share of new undergraduates and new postgraduates in each sector using *Quarterly National Household Survey (QNHS)*

micro data. The *QNHS* collects information on each individual's highest level of qualification and the year in which it was obtained; thus new graduates are defined as those who obtained their credential within the year preceding the survey date. Table 4C shows the share of new undergraduates and postgraduates in each sector in 2009.⁴⁷ The table shows that sectors like business and other services and education have a high share of new graduates while the primary sector and utilities has a relatively low share of new graduates. The analysis does not distinguish between new and replacement demand; nevertheless, given the modest growth in employment over the projection period relative to the strong employment growth that took place during the Celtic Tiger period, it is expected that the bulk of demand will be replacement in nature. To estimate new undergraduate (postgraduate) labour demand by sector we apply the share of new undergraduates (postgraduates) in each sector in 2009 (from Table 4C) to the projections of total employment in each sector.

Adjustments to New Graduate Demand

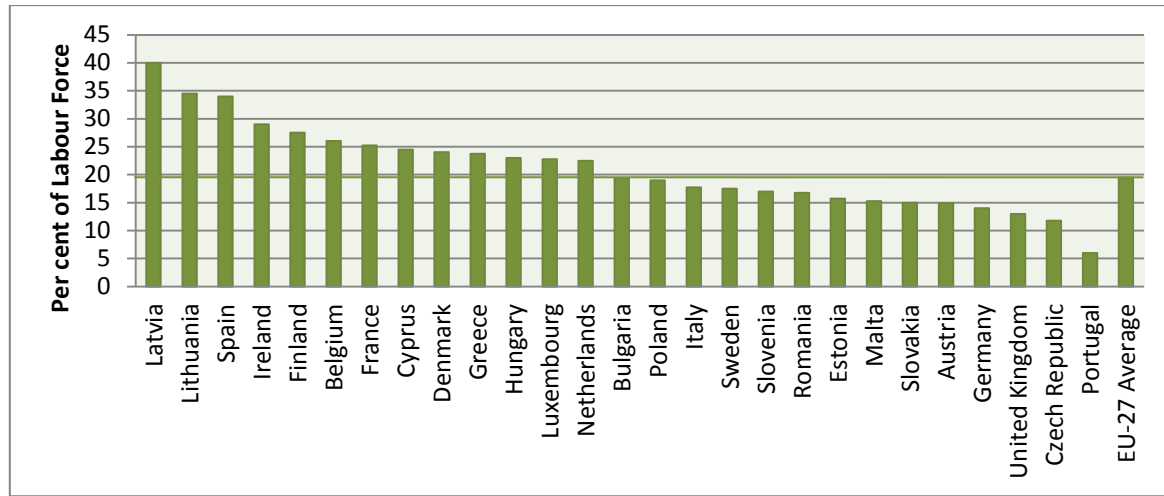
The focus of this analysis is on new graduate jobs and an adjustment is made for the fact that not all graduates are employed in graduate level jobs i.e., there is underutilisation of skills in the labour market. The concept of graduates in non-graduate jobs is generally referred to in the literature as overeducation (McGuinness, 2006). However, in the context of this study we are merely attempting to ensure that we do not overestimate future graduate labour demand by falsely assuming that all graduates are employed in graduate level jobs. It is not clear to what extent individuals' location in non-graduate employment is due to inadequate labour demand or preferences; however, it is undoubtedly the case that many graduates will ultimately choose to trade-off higher wages for other job attributes and may, consequently, choose to locate in non-graduate occupations (McGuinness and Sloane, 2011). Furthermore, information asymmetries between employers and workers will ensure that at any time a certain number of individuals will always be underutilised in employment. As a consequence of uncertainty around worker preferences, information asymmetries, demand/supply imbalances and the effects of migration, a certain level of graduate under utilisation is to be expected.

Based on data from the European Union, it would appear that under-utilisation is a significant feature in the Irish labour market. Figure 4G plots estimates of the

⁴⁷ The shares are calculated as the number of people in each sector who have obtained a third-level qualification in the preceding year divided by the total employment in each sector.

under-utilisation rates within the entire workforce using data from the *European Working Conditions Survey* (2010).⁴⁸

FIGURE 4G: International Under-Utilisation Rates



Source: *European Working Conditions Survey* (2010)

It appears that the under-utilisation rates in Ireland are quite high relative to other countries with almost 30 per cent of workers in posts for which they are over-qualified. However, the figure should be treated with caution as it will be prone to the influences of inward migration since 2004, which saw large numbers of graduates from New Member State (NMS) countries taking employment in non-graduate sectors of the economy (Barrett *et al.*, 2012).

To adjust for the amount of under-utilisation in the labour market, we use *QNHS* micro data to estimate the proportion of all graduates that actually are employed in graduate level occupations. We define graduate level occupations (using Standard Occupation Classification (SOC) groups) to be managers and administrators, professionals, associate professional and sales, while non-graduate level occupations comprise clerical and secretarial, craft, personal and protective services and plant and machine operatives. The classification of a graduate occupation in this way is relatively standard and, according to the *QNHS*, just less than three-quarters of Irish graduates are located in our designated professional SOC groups. Conversely, even at a very detailed level of disaggregation, there are very few occupational groupings outside of the professional SOC categories that are readily identifiable as being graduate level. In estimating the proportion of graduates in graduate occupations, we base our

⁴⁸ This chart is taken from a presentation by Maurizio Curtarelli (Eurofound) entitled "Skill Mismatch in Europe: Evidence from Eurofound's Survey" which was delivered at an Cedefop expert workshop entitled "Skill Mismatch and Firm Dynamics: Integrating Skills with the World of Work" held in London on April 27, 2012.

calculations on the population of all graduates on the grounds that under-utilisation rates are known to be higher among new graduates; thus using data from the new entrant cohort will overestimate the incidence of under utilisation (Dolton and Vignoles, 2000). Table 4D presents the shares of all graduates who are in graduate level jobs by sector.⁴⁹ The average rate of under-utilisation is around 27 (100-73) per cent, but there is considerable variation across sectors. For example, 75 per cent of all graduates in business and other services and 93 per cent of graduates in education are employed in graduate level jobs, while the comparable share is only 36 per cent for graduates employed in the hotel and catering sector. To adjust for under-utilisation in the labour market we assume these sectoral under-utilisation rates remain constant over the projection period and these rates are applied to our estimates of new undergraduate and postgraduate labour demand by sector. Thus, for instance, estimated new undergraduate demand within the manufacturing sector will be total employment in year $x \times 0.0163 \times 0.663$.

TABLE 4D: Proportion of All Graduates in Graduate Jobs

	2005
Primary Sector & Utilities	71.5
Manufacturing	66.3
Construction	56.7
Distribution	79.2
Hotels and Catering	36.0
Transport & Telecommunications	59.6
Business & Other Services	74.2
Public Admin and Defence	47.3
Education	92.5
Health and Social Work	82.2
Average Rate	72.6

Source: Calculated using QNHS micro data.

We also draw on data from the QNHS to adjust for the fact that some new graduates were part-time students and already in full-time employment so they are not entering new graduate jobs. Clearly, failure to adjust in this way will tend to overestimate the demand for newly qualified graduates. The QNHS micro data indicate that, on average, between 2004 and 2007 around 36 per cent of new graduates indicated that they had been in work for more than one year prior to obtaining their qualification. However, using the QNHS micro data, we cannot

⁴⁹ The under-utilisation rates reported in Table 4D are based on data from the QNHS. The average under-utilisation rate is just under 30 per cent and is comparable to that reported in Figure 4G which is based on data from the European Working Conditions Survey.

distinguish between those who were in full-time or part-time employment while undertaking their studies but clearly it seems unlikely that all 36 per cent were working full-time. We assume that 25 per cent of graduates were in full-time employment while studying part-time. This is somewhat less than the 36 per cent of graduates who were working either full- or part-time while completing their studies. While this represents a somewhat arbitrary adjustment we, unfortunately, have no precise way of estimating the incidence of degree level attainment among full-time workers. We assume that this rate remains constant over the period and our annual estimates of new graduate labour demand are adjusted downwards by this percentage.

MAPPING NEW GRADUATE SUPPLY AND NEW GRADUATE DEMAND

Benchmarking the estimated annual supply of new graduates against the labour demand estimates provides an indication of the capacity of the labour market to absorb these graduates and ultimately highlights whether there is excess demand or supply for new graduates. Skill shortages in the labour market can be costly for the economy. They can lead to a worsening in competitiveness if wages are bid up in firms where shortages exist and they can also have a negative effect on productivity if firms put lower skilled workers into skilled positions. As mentioned before, our approach focuses on the future direction of labour supply and demand in the medium to long term rather than on single years or shorter time horizons.

Figure 4H charts the estimates of new graduate demand and supply. From the figure, we can see that, on average, supply exceeds demand over the projection horizon and that the average surplus is around 10,400 per annum or around 25 per cent of average graduate labour supply over the period. The rate of over-supply lies below the aggregate under-utilisation rate for the economy, more generally, suggesting that a good deal of under-utilisation relates to workers with sub-degree level qualifications. From a policy perspective the level of surplus cannot be assessed as excessive particularly in a context where an estimated 10 per cent of new graduates emigrate while others may find themselves in non-graduate occupations as a consequence of either individual preferences or information asymmetries.⁵⁰ Furthermore, it is likely that the majority of non-national students, which are assumed to account for 7 per cent of undergraduate enrolments in 2030, will emigrate on completion of their studies.

⁵⁰ While we have adjusted labour demand estimates for the effects of under-utilisation it is still likely that a certain proportion of graduate supply will become underutilised as a consequence of either preferences or an inability to find a graduate level job.

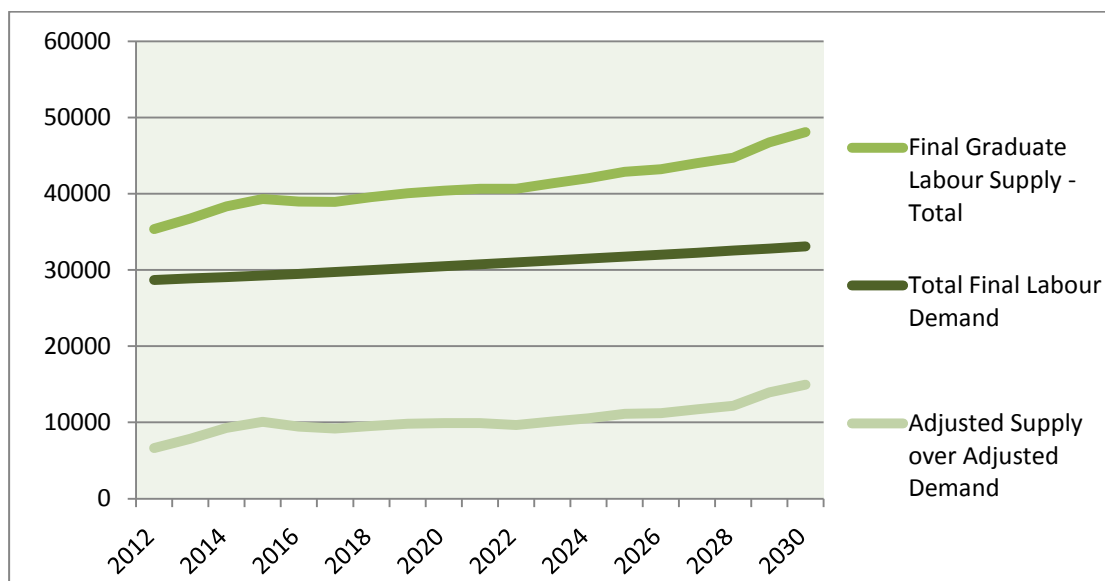
FIGURE 4H: Mapping Final Graduate Labour Supply against Final Graduate Labour Demand

Figure 4I-1 and 4I-2 separate these estimates into undergraduate and postgraduate labour demand and supply. Approximately 38 per cent of the new graduate labour supply has a postgraduate qualification, while the comparable share of postgraduates in total new graduate labour demand is lower at approximately 20 per cent. It is not clear why undergraduates and postgraduates are not demanded in the same proportions as they are produced in the system but it could be related to the fact that individuals with postgraduate qualifications are more likely to migrate. The chart indicates that there is an average surplus of undergraduates of around 1,375 per annum or around 0.5 per cent of undergraduate labour supply, while there is an excess supply of people with postgraduate qualifications of around 9,000 per annum or approximately 55 per cent of postgraduate labour supply. It is important to stress that this does not mean there are too few undergraduates or too many postgraduates coming into the labour market as they are very close substitutes and employers will likely substitute one for the other. Further research is required to understand exactly why we observe relatively small numbers of newly-qualified postgraduates in the labour market.

FIGURE 4I-1: Mapping Final Undergraduate and Postgraduate Labour Supply against Demand

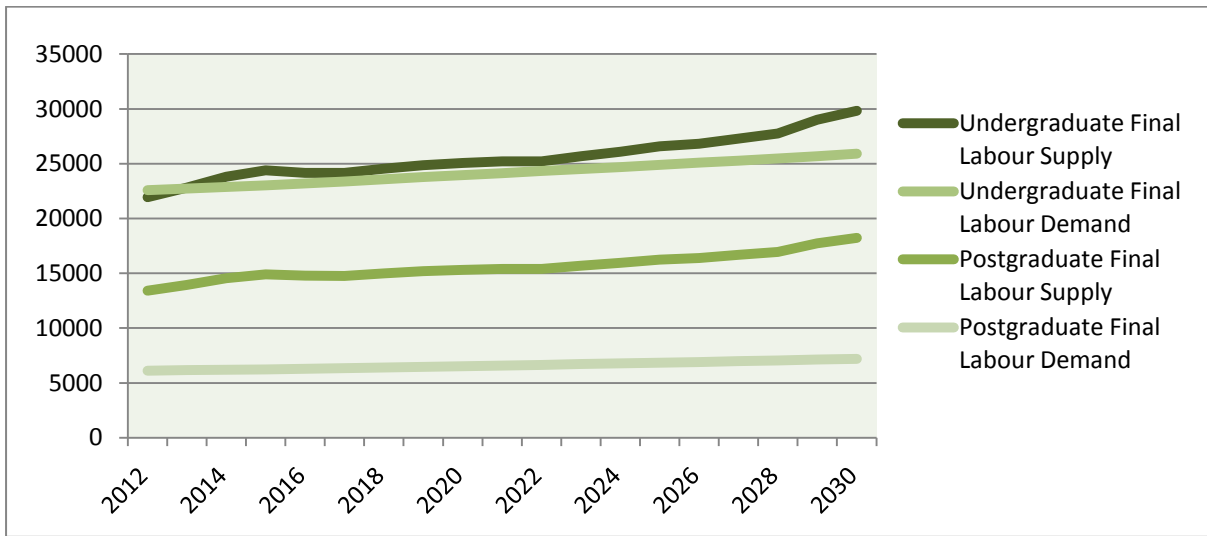
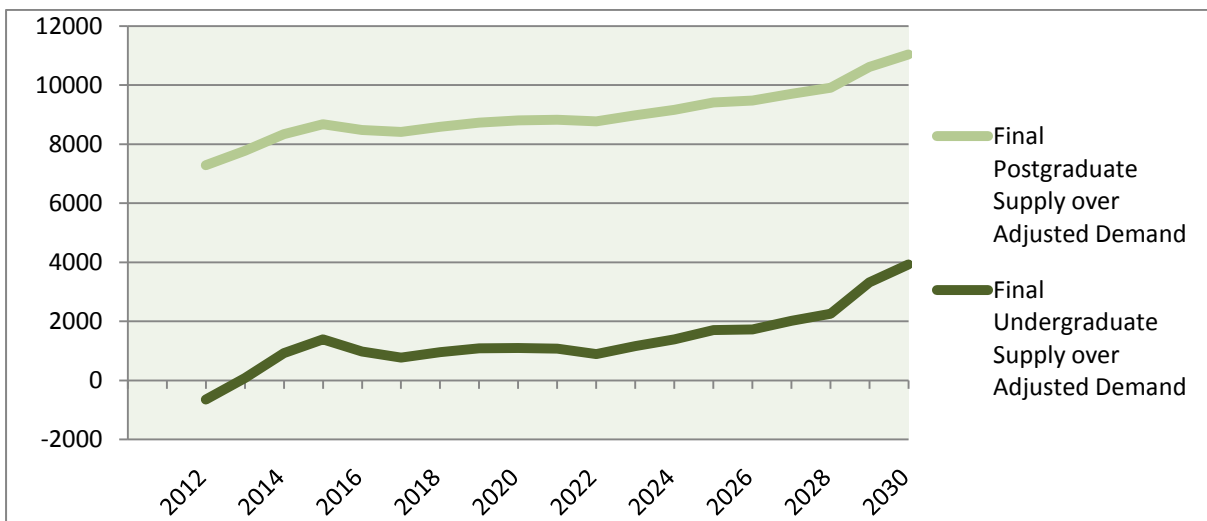
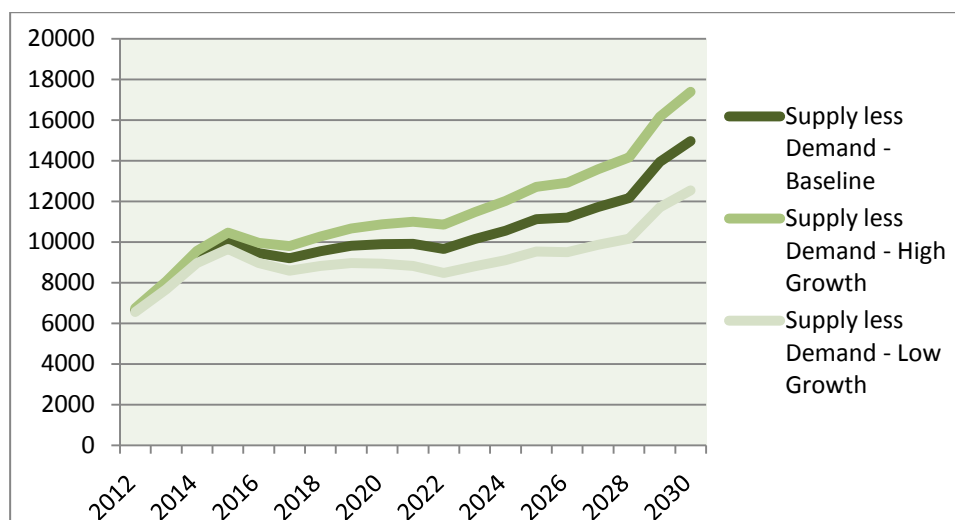


FIGURE 4I-2: Mapping Final Undergraduate and Postgraduate Labour Supply against Demand



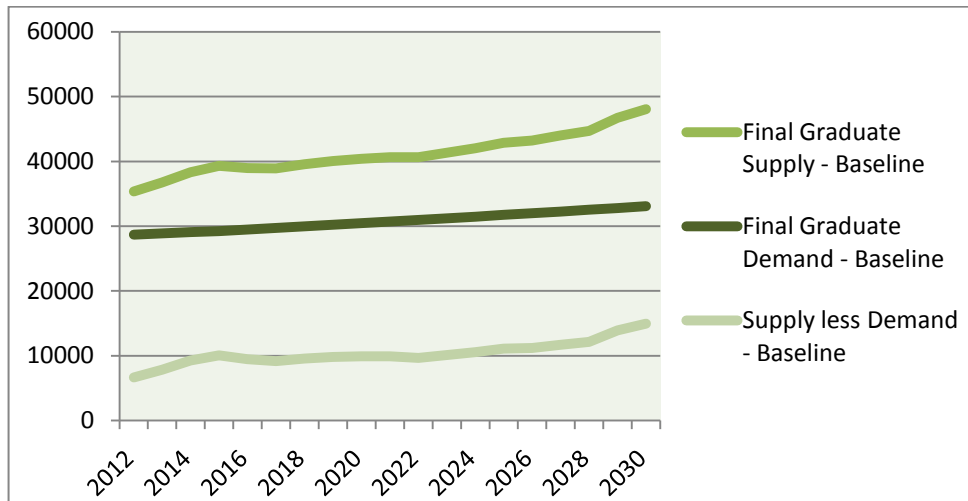
SCENARIOS

We next conduct a series of sensitivity tests to see how the balance between labour demand and supply shifts as a consequence of altering assumptions with respect to both graduate labour supply and demand. Figure 4J shows the annual estimates for new graduate labour demand benchmarked against the projected supply of graduates under the high and low HE participation scenarios considered earlier in this report. Under the higher participation scenario, the average excess supply of graduates is around 11,500 per annum or 27 per cent of projected graduate labour supply, while in the low participation scenario the average surplus is reduced to approximately 9,200 per annum or 23 per cent of projected graduate labour supply. Thus, in general, changes in the participation rate have a relatively modest impact on the degree of balance within the graduate labour market.

FIGURE 4J: Graduate Labour Supply and Demand under Baseline, High Participation Growth and Low Participation Growth Scenarios

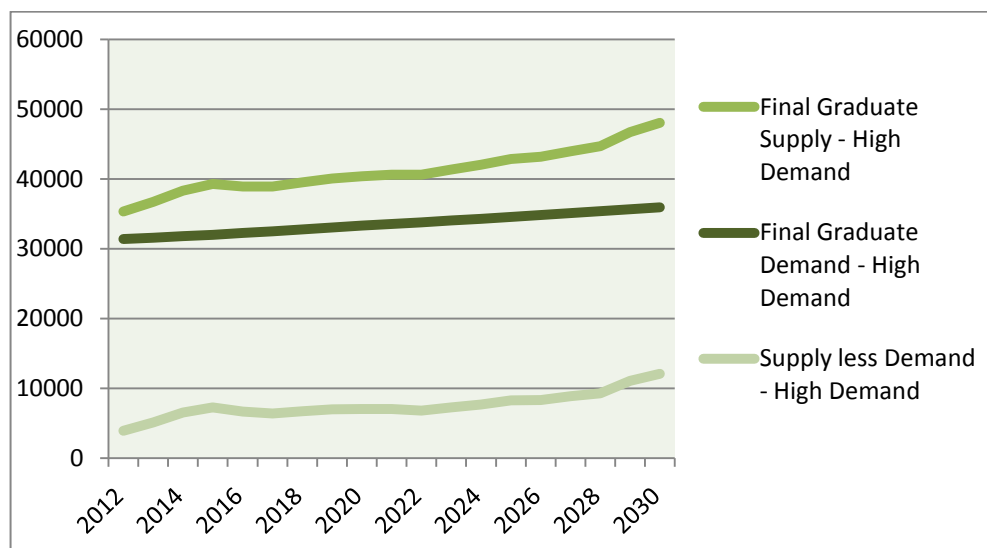
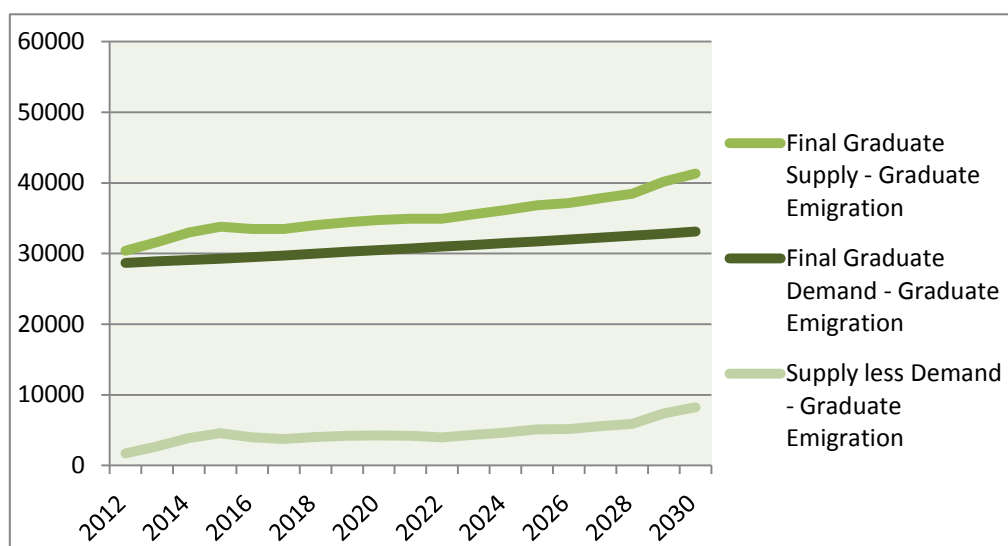
While our demand estimates account for changes in the sectoral composition of the labour market, they do not account for within industry changes in the utilisation of graduate labour. Theories of Skill Biased Technological Change (SBTC) emphasise that technology favours educated labour and, over time, the employment share of graduate workers is likely to rise particularly within high-tech industries. We thus consider a scenario where there is more structural change in the economy than indicated by the sectoral employment projections used in the Baseline Model and this takes place along the lines predicted under SBTC. Specifically, we examine a scenario where the demand for new under- and postgraduates in high-tech sectors, namely in business and other services and manufacturing, increases by a factor of 1.25 over the Baseline estimates. The impact of this higher rate of structural change is that the surplus of graduates is reduced to an average of around 7,500 over the period (see Figures 4K-1 and 4K-2).

FIGURE 4K-1: Graduate Labour Supply and Demand (Baseline)



We also consider how the supply/demand balance would be affected by graduate emigration over the period. The historical graduate emigration rate is around 10 per cent (Flannery and O'Donoghue, 2011). This figure applies to domestic students so to take account of the fact that many international students may also leave we examine a scenario of 14 per cent graduate emigration over the projection period.⁵¹ Exactly how graduate emigration will behave is very difficult to predict as it is endogenous to the processes that we are attempting to model i.e., if there are large surpluses with many graduates unable to find employment then emigration is likely to be high and vice versa. As with many of the other unknowns in our analysis, the best we can do is to assume that recent trends will persist into the future, that is, of course, unless we have good reason to believe that a structural break has occurred. The impact of this level of graduate emigration is to more than halve the surplus of graduates from 10,400 per annum to around 4,600 per annum (see Figures 4K-1 and 4K-3).

⁵¹ This scenario considers a constant 14 per cent graduate emigration rate over the period. As the numbers of international students rise over the projection horizon, this constant assumed rate may overestimate graduate emigration at the beginning of the projection period and under-estimate it at the end of the period.

FIGURE 4K-2: Graduate Labour Supply and Demand (High Demand)**FIGURE 4K-3: Graduate Labour Supply and Demand (Graduate Emigration)**

Thus, the analysis indicates that over the projected horizon Ireland is likely to run a surplus in new graduates; however, the country could face skill shortages in specific areas in the event of significant net graduate migration and/or rapid technological change that substantially raises the demand for graduate labour.

MAPPING NEW GRADUATE SUPPLY AND NEW GRADUATE DEMAND BY FIELD OF STUDY

Given the debate around STEM subjects we provide some assessment of the adequacy of supply to key areas of provision that can be closely tied to the labour market, i.e., IT, Science, Law and Engineering. For each subject area we map the annual level of labour supply against demand. To estimate the supply of

graduates by field of study, HEA data for 2009/10 on total undergraduate and postgraduate enrolments by occupation group are used to approximate the percentage of students in Engineering, IT, Science and Law. The data indicates that Science courses account for over 10 per cent of enrolments for both males and females. Engineering programmes account for approximately 11 per cent of male enrolments but just approximately 1 per cent of female enrolments (Table 4E). Relative to Engineering, IT courses are slightly less popular and again there appears to be a very low take up among females. Finally, Law accounts for between 2 and 4 per cent of enrolments and is more popular among females. We assume that these proportions remain constant over the period to 2030 and multiply them by the projections of undergraduate and postgraduate entrants. To generate the potential supply of graduates in these separate fields, differential progression rates are used for first year undergraduate entrants; thereafter we assume that progression rates are the same as in the Baseline Model.⁵²

On the demand side, we use *QNHS* data to identify the main occupations where graduates from Engineering, Law, Science and IT are employed (Table 4F).⁵³ Then we identify the average share of total new graduates (undergraduate plus postgraduate) in each of these fields in total employment over the period 2004 to 2009. An attempt was made to calculate the average share of total new graduates in each of these occupations in each sector of the economy. However, the weights were unstable over time so we use the average share of new graduates in total employment over the period 2004 to 2009. These average shares of new graduates in these occupations are then multiplied by overall labour demand to generate a series of new graduate demand in each of these fields.

TABLE 4E: Total Enrolments by Field of Study in 2009/10 from HEA

	Undergraduates, Male	Undergraduates, Female	Postgraduates, Male	Postgraduates, Female
%				
IT	8.4	1.5	11.0	3.1
Science	10.0	9.7	15.6	12.9
Law	2.1	2.7	3.2	4.4
Engineering	11.6	1.0	11.1	2.1
#				
Total Enrolments	64,480	69,369	10,440	11,911

⁵² Progression rates by field of study are only available for undergraduate entrants and are based on combined progression rates for Universities and IoTs from HEA (2010), *A Study of Progression in Irish Higher Education*.

⁵³ Under-utilisation is no longer a factor as these all represent graduate professions.

TABLE 4F: Occupations where Engineering, Science, Law and IT Graduates are Employed

Engineering	Science	Law	IT
211 Mechanical engineers	200 Chemists	240 Judges	126 Computer systems managers
212 Electrical engineers	201 Biological scientists	241 Barristers & advocates	320 Computer analyst/programmers
213 Electronic engineers	202 Physicists	242 Solicitors	214 Software engineers
216 Design & development engineers	209 Other natural scientists	350 Legal service & related occupations	
217 Production engineers	300 Laboratory technicians		
218 Planning & quality control engineers	309 Other scientific technicians		
219 Other engineers & technologists			
301 Engineering technicians			
302 Electrical/electronic technicians			
215 Chemical engineers			
210 Civil/mining engineers			
260 Architects			
261 Town planners			
262 Building, mining and other surveyors			
303 Architectural, town planning technicians			
304 Building & civil engineering technicians			
310 Draughtspersons			
311 Building inspectors			
312 Quantity surveyors			
313 Marine, insurance & other surveyors			

The results from the field of study analysis are presented in Figures 4L to 4O. The analysis shows relatively large surpluses in the area of law, IT and science with between 50 and 80 per cent of graduates failing to enter professions closely associated with these subject areas within a year of graduation. In terms of engineering provision within the higher education system, the analysis suggests that there will be surpluses typically below 30 per cent of total field supply. This would be a cause of concern as existing surpluses may potentially be eroded in the event of significant net graduate migration or rapid technological change that raised the demand for graduate engineers.

FIGURE 4L: Supply and Demand for New Engineering Graduates

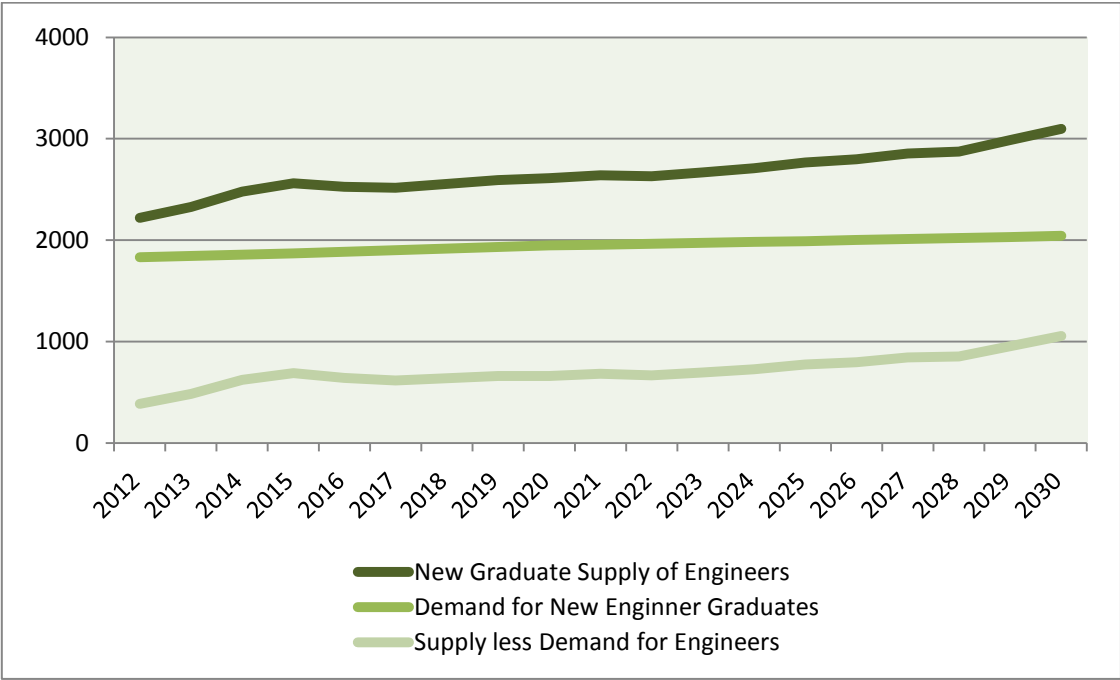


FIGURE 4M: Supply and Demand for New Science Graduates

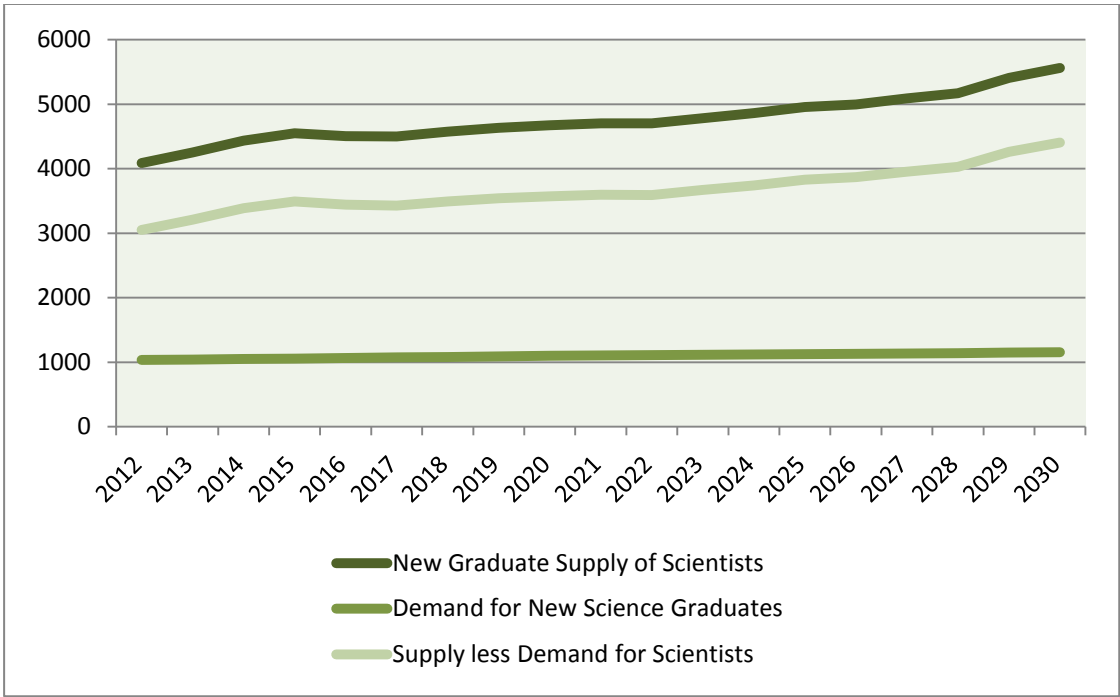


FIGURE 4N: Supply and Demand for New IT Graduates

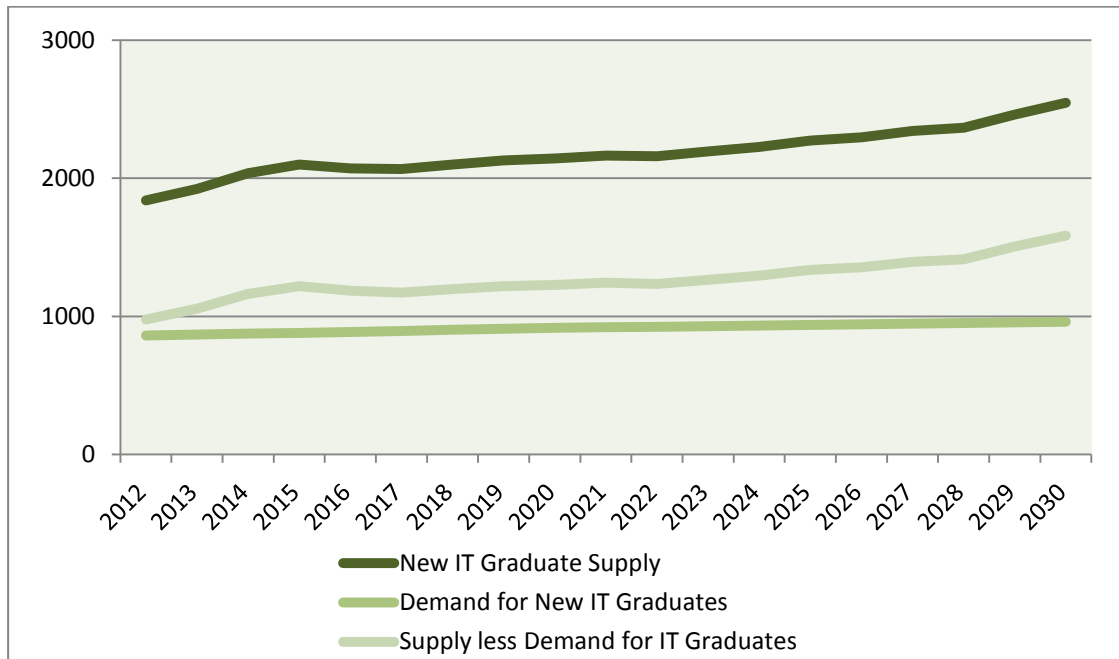
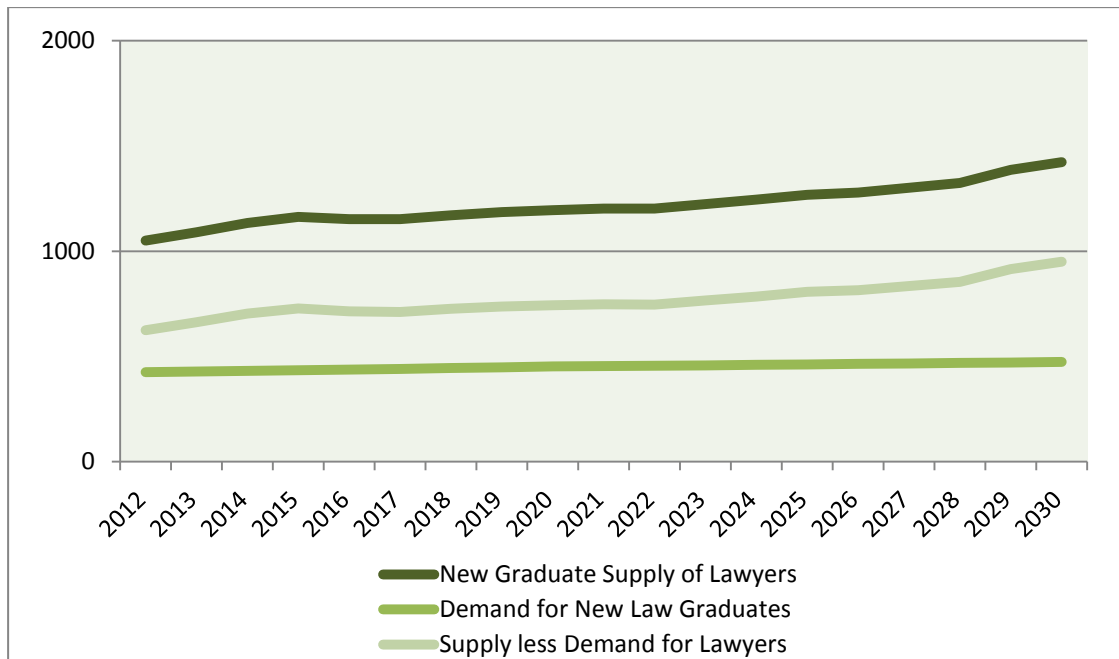


FIGURE 4O: Supply and Demand for New Law Graduates



Section 5

The Wage Premium Associated with a Third-Level Qualification

Our analysis suggests that the labour market for graduates in Ireland does not exhibit surpluses, with the situation likely to remain so over the projection period. Underlying this analysis is an assumption that rates of return to higher education did not fall back as a consequence of recent expansions and that they are likely to hold up in the future. Obviously, evidence of falling rates of return will put a question mark over our assumed HE participation rates and cast doubt around the extent to which any revised funding system, for instance, based on income contingent loans, is likely to be sustainable.⁵⁴ In order to get some indication of the extent to which rates of return have held up in the face of rising third-level participation, we examine the extent to which the premium to third-level qualifications over no qualifications changed during the 1994 to 2009 period. It should be noted that earnings' premiums associated with levels of qualifications do not equate exactly to rates of return; however, it does give an approximate estimate and will provide us with a good assessment of the degree to which rates of return have changed over time.⁵⁵ We estimate premium for the population of working-age⁵⁶ employees in general, and also for particular age cohorts on the grounds that apparent stability in the average education premium can potentially mask more volatile movements in the pay-off to particular groupings, in particular, newer entrants.⁵⁷ In addition, we also examine movements in the premium to post-secondary education on the grounds that

⁵⁴ Falling rates of return imply that student's discounted income stream will be lower, thus lessening the incentive to participate in HE (Becker, 1964). In addition, falling rates of return imply that fewer graduates will meet the repayments threshold set under any Income Contingent Loan system.

⁵⁵ The traditional notion of the rate of return was developed in a seminal work by Becker (1964); however, the empirical framework was put in place sometime later by Mincer (1974). With respect to "the Mincer equation" within which years of schooling and labour market experience are regressed on earnings, it can be shown that under some simplified assumptions related to time and the opportunity cost of education, the coefficient associated with a year of schooling in the Mincer equation will approximate the rate of return to education (see McGuinness, 2006, for a simple proof). The specification here is estimated using levels, as opposed to years, of education and, as such, is termed a modified Mincer equation. The use of a modified Mincer is preferred on the grounds that (a) this will allow us to isolate the premium (approximate return) to a third-level qualification and (b) it has been shown that the assumption of linearity that underpins the Mincer equation tends to have broken down in recent decades (Heckman, Lochner and Todd, 2003), suggesting that education levels are more appropriate as they will capture non-linear effects.

⁵⁶ Defined as individuals aged 16-64.

⁵⁷ It should also be noted that the third-level premium will also vary by field of study (see Kelly *et al.*, 2009, for an example applied to Irish data). However, as we are only concerned with the trend in the average third-level premium as an indicator of historical imbalances between graduate labour demand and supply imbalances, we do not estimate wage premiums by field of study here.

substantial shifts in the labour market for Further Education (FETAC) qualifications will potentially have implications for Higher Education (HE) demand given that, at least to some degree, both qualification pathways can be considered substitutes. Thus, for instance, falling returns to FETAC qualifications may well result in more students opting for HE programmes and vice versa.

The data for the analysis come from two separate sources and, as such, some caution is required as the datasets will not be directly comparable. Education premiums for the period 1994 to 2001 are estimated using data from the *Living in Ireland Survey (LII)*, while the 2004 to 2009 estimates are generated by using data from the *Irish Survey on Income and Living Conditions (SILC)*. Due to the use of two different data sources, it is only reasonable to assess the movement in premiums separately over the two distinct time periods as it is not at all clear how well the *LII 2001* estimates correspond with the 2004 Irish *SILC*-based estimates. The models are estimated separately for each sex and the coefficients relate to the percentage pay premium enjoyed by individuals holding degrees or diplomas relative to persons possessing primary or no formal qualifications. The models also control for a range of other characteristics⁵⁸ that will also influence earnings. It should be borne in mind that rates of pay among the comparison group will have increased rapidly over the time period being analysed, particularly for males, as many will have been employed in the construction sector between 1997 and 2007. Consequently, any decline in the male premium will, to some extent, reflect a failure to keep pace with wage growth among less qualified male workers rather than an actual fall in demand for male graduates.

Tables 5A and 5B document the results for third-level qualifications by gender.⁵⁹ Dealing firstly with males (Table 5A), relative to the comparison group, graduates earned just over 90 per cent more in 1994, with the premium appearing to fall-off somewhat during 1997 and 2001. From 2004 to 2009 the Irish *SILC*-based estimates suggest that the rate of return to a third-level qualification remained relatively constant. Regarding cohort effects, estimates from the *LII* data for new entrants showed a positive premium in only two of the three years, with some decline evident between 1997 and 2001. In contrast, estimates for new entrant males for the period 2004 to 2009 show a rise in the degree premium between

⁵⁸ In addition to educational attainment, the models control for labour market experience, marital status, nationality and economic sector. Furthermore, the female wage equations include a Heckman selection term to control for possible effects of data truncation.

⁵⁹ Generally the wage equations are well specified with R^2 statistics in the range of 0.4 to 0.5. Sample sizes vary from approximately 1,130 observations for both females to around 1,800 for males in both datasets. Typically, under 30s make up around one-third of the samples, individuals aged 31 to 50 accounting for 45 per cent while workers aged 50 and over make up the rest. The relatively small sample sizes associated with the age-specific regressions raise the likelihood of generating statistically insignificant results.

2004 and 2007, with a more significant rise between 2007 and 2009; this rise partially reflects the fall in incomes of less qualified younger workers following the bursting of the property bubble. Regarding our age cohort analysis, the results show a steady decline in the premium for 31 to 50 year olds under both sets of data. With respect to the 50-65 year old age group, the analysis indicates that wage premiums remained relatively stable over the period. Thus, despite the expansion in rates of HE participation and rising earnings among the lower skilled, with the exception of a marked decline between 1997 and 2001, average premiums within the male labour market generally do not exhibit any trend decline over the period. However, the research indicates that the third-level premium for prime-aged males (31 to 50) may have fallen back somewhat over the period.

TABLE 5A: The Premium to a Degree 1994 to 2009: Males

	1994	1997	2001	2004	2007	2009
All	91	97	82	77	76	77
≤30	*	79	41	42	69	136
31-50	104	98	92	80	74	67
51-65	95	128	95	85	85	90

* Indicates that no statistical effect was found. It may be that the lack of a statistical impact was partially driven by data constraints and, in particular, the relatively small sample sizes of the cohort based regressions.

With respect to females (Table 5B), the first thing to note is that the third-level premium for females in Ireland is substantially lower than that for males. The *LII* data suggests that, similar to the case of males, the payoff to a degree declined between 1997 and 2001, before appearing to stabilise again between 2004 and 2009. However, some caution is required regarding this interpretation, as the 2001 estimate appears to be somewhat of an outlier and ignoring it would suggest a pattern of steady to rising returns for females. On the whole, the data suggest that, unlike males, the female degree premium does not become apparent until after the age of 30, which is likely to be related to the impact of childbirth on earnings.⁶⁰ The *LII* results indicate that a rapid fall in the degree premium for females aged 31 to 50 took place between 1994 and 2001; however, the Irish *SILC* results appear to indicate that this pattern reversed itself over the 2004 to 2009 period. The estimated premiums for the oldest cohort (50-65 year olds) look somewhat sporadic under both datasets and no reliable pattern is discernible. Nevertheless, as was the case within the male labour market, there is no evidence of any trend movements in the average wage premium to a third-level qualification.

⁶⁰ This most likely reflects a higher probability that young females will take time out of the labour market for family reasons.

Finally, Table 5C presents the premiums to post-secondary qualifications over the period. At first glance, for both males and females, the data show that payoff to such qualifications fell over the period 1994 to 2001 before recovering again between 2004 and 2009. However, for both sexes the 2001 figure again looks somewhat of an outlier and should be treated with caution. If we discard the 2001 estimate as unreliable, the results are more suggestive of a pattern of steady to rising premiums to post-secondary qualifications for both sexes.

TABLE 5B: The Premium to a Degree 1994 to 2009: Females

	1994	1997	2001	2004	2007	2009
All	93	91	56	94	115	105
≤30	150	*	*	*	*	*
31-50	110	88	71	88	90	100
51-65	85	130	77	*	121	*

* Indicates that no statistical effect was found. It may be that the lack of a statistical impact was partially driven by data constraints and, in particular, the relatively small sample sizes of the cohort based regressions.

TABLE 5C: The Premium to Post-secondary Qualifications 1994 to 2009

	1994	1997	2001	2004	2007	2009
Males	58	62	45	42	50	57
Females	48	49	28	65	89	78

Section 6

Assessing the Extent of Unmet Demand through Central Applications Office (CAO) Data

Our analysis up to this point implies that the vast majority of qualifying students seeking HE places in Ireland will have been successful and that the wage premium to third-level qualifications has generally held up despite rapid expansion of the HE system. Nevertheless, this tells us little about the impact that expansion has had on entry standards and the quality of graduates entering the labour market. We now use CAO data to further explore the extent to which the recent rapid expansion of HE provision has impacted on the profile of HE entrants on the grounds that changes in this area will have implications for future labour market projections. Should demand prove to have been constrained by the lack of available places within Irish HEIs, then our research may be under-estimating potential participation rates and, thus, the future demand for HE places. Conversely, it may be that the supply of HE places has outstripped demand and that expansion has only been facilitated at the cost of lower entry standards within universities and IoTs. This also will have implications for our research, as it may result in falls in future rates of return to HE which then raises questions regarding the sustainability of any funding scheme. An assessment of such issues can be attempted by examining patterns of entry (and rejection) among applicants to Irish HEIs over time. While such information is routinely collected by the CAO, it is only published at the institutional level and, therefore, does not provide a systems-wide perspective.

The CAO very helpfully made available data to assist this study in respect of unmet demand. The volume of data collected by CAO is very extensive and, unfortunately, time constraints meant that it was necessary to focus on a sub set of the population data rather than the full data set. Furthermore, we have combined data for the universities and IoTs and although a separate analysis may also have proved insightful, it was not possible within the constraints of the current study. We would recommend that further research on the full population set be undertaken to extend and complement the analysis set out here.

At a gross level, the number of first preference applications for Level 8 programmes rose from 53,758 in 2000 to 67,360 in 2011. We were further able to consider individual records and in terms of the data from 2000, we analysed records for 42,131 (80 per cent) Level 8 applicants. Regarding the 2011

information, we had full information for 56,979 (85 per cent) applicants. Tables 6A and 6B detail the points profile of Level 8 applications in 2000 and 2011 respectively. Surprisingly, despite a substantial rise in the number of applications to Level 8 courses, the mean point score of applicants remained almost constant over the period; furthermore, the median point score actually increased. This would suggest that rising participation has not resulted in a decline in the overall points profile of applications, although there has been some widening of the average points range within which the majority of applicants fall, implying that both the lower and upper points range for course applications has widened. The rising numbers of applicants are principally a product of an increasing participation rate. With respect to the points profile of applicants by course of study, the mean scores have remained relatively constant while the median point scores of course applicants have generally risen. The exception relates to applications to study Human Medicine, where both the mean and median points score of applicants rose considerably over the period.

While mean point scores have remained constant by course type, the standard deviation has risen for most areas. It is probable that this effect will be, at least partially, related to IoTs offering Level 8 programmes in many more areas in 2011 than in 2000. Entry requirements to the IoT sector are, on average, lower than for universities; thus, the presence of IoTs within more subject areas over time will tend to extend the lower bound of the application points score distribution. Consistent with this interpretation, the standard deviation of human medicine courses (exclusive to the university sector in 2011) actually fell relative to 2000.

It is somewhat surprising that the apparent quality standard of applicants has not deteriorated in the face of such a rapid expansion, raising some questions regarding the issue of potential grade inflation. O'Grady (2009), in an analysis of Leaving Certificate grades over the period 1992 to 2006, concluded that substantial increases in the proportion of A and B grades awarded constituted evidence of grade inflation. In an earlier more detailed study, Kellaghan and Millar (2003) found an increase in the proportion of high Leaving Certificate grades over the 1990s. However, they concluded that this could not necessarily be taken as evidence of grade inflation but could also be attributed to increased professional development for teachers and/or a greater focus on examination preparation. Furthermore, they noted that variation in grades between subjects in a given year was greater than that between years. The establishment of the State Examinations Commission has also meant that the marking schemes for the Leaving Certificate have become more transparent, potentially facilitating more focused examination preparation on the part of teachers and students. In practice, it is difficult to determine the existence of grade inflation without access

to a benchmark external to the examination system. Insights into the potential processes at play can be gained from an exploratory study on mathematical competency among entrants to science and technology courses in a particular university (Faulkner *et al.*, 2010). This study found a decline in the level of maths competency (as measured by a standardised test) over the period 1998 to 2008. This decline was due to a change in the profile of entrants with no significant change in the relationship between test scores and Leaving Certificate Maths grades over time. While potential grade inflation cannot be addressed in the present study, it remains a contentious issue.

While the data are suggestive of a large rise in the demand for higher education over time, it does not necessarily imply that elements of demand have been, or are currently, unmet. The first indication of the extent to which the supply of places has kept pace with demand can be assessed by analysing the average points score of successful applicants. Any substantial rise in the points score of applicants being offered places would be indicative of a rationing in the face of excessive demand. Tables 6C and 6D indicate that the mean points achieved by individuals receiving first round Level 8 offers fell by 5 per cent from 418 in 2000 to 396 in 2011, while the median score fell further, demonstrating that supply had more than kept pace with demand. With regard to the distribution by course type, the data show that the mean points requirement generally fell by between 2 and 8 per cent for most courses, with the movement in the median again somewhat substantial. However, some more exceptional variations were observed in particular areas. The mean requirement for Architecture fell by 25 per cent between 2000 and 2011 which is likely to reflect the bursting of the property bubble.⁶¹ Mean entry points for Law courses fell by 15 per cent over the period, again most likely reflecting the combination of a perceived decline in available jobs and the expansion of provision of courses within this area. Entry requirements for degrees in the area of Other Health Care fell by 40 per cent. It is not clear exactly what has driven this change in the Other Health Care area, but the rapid expansion of places in this category may reflect an increased diversity of course types.⁶² Generally, the data show some fall in mean and median entry requirements and a widening of the point score range for each subject area; however, we suspect that much of these distributional changes are likely to relate to the increased presence of the IoTs within many subject areas over the period. Nevertheless, it is also possible that entry requirements have fallen somewhat and further research is required to determine the exact balance of the two influences.

⁶¹ This would be possible to confirm if the full data set for the period were analysed.

⁶² Tables 7C and 7D suggest that provision in the area increased by over 400 per cent during the period.

As stated, at best our data currently only provide a partial snapshot of provision; however, bearing this caveat in mind, we also observe some change in the distribution of provision across the various fields of study over time. The level of provision in most areas appears to have expanded rapidly over the period, with growth particularly pronounced in the areas of the Arts and Social Sciences. Somewhat worryingly, given current policy objectives, the data here indicate that Level 8 provision in STEM (Science, Technology, Engineering and Mathematics) areas actually fell over the period both in absolute terms and as a proportion of total provision. It should be noted here that the categorisation of course types changed between 2000 and 2011 – such that there are 17 categories in 2011 while in 2000 there were only 15 (Tables 6C and 6D).

Finally, we examine the extent to which there has been any shift in the profile of individuals not receiving offers on their first preference applications. For instance, based on Tables 6C and 6D, it is reasonable to assume that 300 points represents a minimum floor for entry to a Level 8 degree programme in either year. Any movement in the points profile of individuals not receiving offers towards, or above, the assumed minimum Level 8 entry threshold would be consistent with a scenario of unmet demand. The points distribution of students not receiving offers on their Level 8 first preferences are presented in Tables 6E and 6F. The analysis is in line with previous results in that it shows that the average Leaving Certificate performance of unsuccessful applicants actually fell marginally over the period from 245 in 2000 to 239 in 2011. The results again support the view that the supply of Level 8 places has expanded in line with demand and there exists no evidence that substantial numbers of students qualifying for Level 8 courses have been unable to acquire places. However, it is worth noting that the pattern of course preferences means that some unsuccessful candidates will have lower grades than some HE entrants and the points score of unsuccessful entrants to fields such as Pharmacy, Dentistry and Human Medicine increased over the period.

Our limited analysis of the CAO dataset suggests that rising participation rates among students have driven a substantial increase in the demand for HE places over the 2000 to 2011 period and that this has taken place despite substantial falls in the size of the school leaver population. The rapid increase in participation has not been associated with any marked decline in the points profile of applicants to third-level programmes, although the distribution has widened somewhat. The data suggest that the provision of HE places has more than kept pace with rising demand given that we have not observed any increases in either the mean entry requirements for Level 8 courses or mean qualification levels among unsuccessful applicants. In fact, we observe a marginal decline in both

average entry levels and the points profile of applicants not receiving an offer, which would tend to indicate that Level 8 provision has been growing at a slightly more rapid pace than the demand for places.

TABLE 6A: Points of Applicants' First Preferences Level 8 Courses, by Course Type, Year 2000

	Course Type	Observations	Points (Mean)	Points (Median)	Points (St Dev)
01.	Arts/Social Science	9,401	334.14	345.00	106.70
02.	Science/Applied Science	4,283	350.67	360.00	109.98
03.	Agriculture/Horticulture	328	318.29	325.00	94.78
04.	Education	3,819	370.65	385.00	91.29
05.	Administration/Business	10,981	328.92	335.00	111.35
06.	Engineering/Technology	7,992	311.41	315.00	116.59
07.	Architecture	496	374.22	390.00	112.59
08.	Art and Design	138	298.91	330.00	123.23
09.	Law	1,980	410.77	425.00	101.68
10.	Human Medicine	1,078	464.54	490.00	108.95
11.	Veterinary Medicine	383	430.98	445.00	104.27
12.	Dentistry	118	477.33	500.00	94.04
13.	Pharmacy	242	488.55	505.00	81.47
14.	Physiotherapy	484	415.65	430.00	96.04
15.	Other Healthcare	408	402.25	420.00	97.37
Total		42,131	344.39	345.00	114.17

TABLE 6B: Points of Applicants' First Preferences Level 8 Courses, by Course Type, Year 2011

	Course Type	Observations	Points (Mean)	Points (Median)	Points (St Dev)
01.	Arts/Social Science	14,794	328.34	385.00	112.55
02.	Science/Applied Science	7,201	344.47	415.00	115.80
03.	Agriculture/Horticulture	613	350.55	435.00	89.45
04.	Education	5,045	389.64	480.00	101.27
05.	Administration/Business	9,321	321.56	370.00	114.20
06.	Engineering/Technology	5,493	314.99	375.00	120.59
07.	Architecture	555	356.54	380.00	107.46
08.	Art and Design	2,106	307.63	365.00	105.20
09.	Law	1,885	389.46	460.00	126.38
10.	Human Medicine	2,440	500.39	560.00	91.44
11.	Veterinary Medicine	462	452.81	570.00	99.40
12.	Dentistry	182	457.58	580.00	121.34
13.	Pharmacy	331	468.43	555.00	109.38
14.	Physiotherapy	700	428.86	550.00	106.55
15.	Nursing	4,235	304.09	415.00	107.74
16.	Other Health Care	1,409	394.59	510.00	119.63
17.	Built Environment	207	270.34	320.00	119.63
Total		56,979	345.64	400.00	120.81

TABLE 6C: Points of Applicants Offered a Level 8 Course, by Course Type, Year 2000

	Course Type	Observations	Points (Mean)	Points (Median)	Points (St Dev)
01.	Arts/Social Science	6,331	412.04	410.00	61.15
02.	Science/Applied Science	4,268	418.78	415.00	67.92
03.	Agriculture/Horticulture	257	390.02	385.00	54.76
04.	Education	1,375	450.08	450.00	49.64
05.	Administration/Business	6,215	402.41	400.00	72.64
06.	Engineering/Technology	4,387	404.53	395.00	71.74
07.	Architecture	97	507.42	515.00	43.16
08.	Art and Design	44	388.52	397.50	101.33
09.	Law	658	510.36	505.00	37.82
10.	Human Medicine	254	570.93	570.00	21.13
11.	Veterinary Medicine	44	550.91	560.00	73.61
12.	Dentistry	41	557.32	550.00	20.47
13.	Pharmacy	55	567.45	570.00	40.10
14.	Physiotherapy	86	543.14	540.00	19.60
15.	Other Healthcare	115	517.48	520.00	20.82
Total		24,227	417.81	410.00	72.34

TABLE 6D: Points of Applicants Offered a Level 8 Course, by Course Type, Year 2011

	Course Type	Observations	Points (Mean)	Points (Median)	Points (St Dev)
01.	Arts/Social Science	12,062	382.78	335.00	90.00
02.	Science/Applied Science	6,297	411.55	355.00	90.43
03.	Agriculture/Horticulture	355	420.28	355.00	77.08
04.	Education	2,024	456.79	405.00	83.28
05.	Administration/Business	7,497	370.47	330.00	92.03
06.	Engineering/Technology	3,848	379.44	315.00	97.58
07.	Architecture	475	383.67	360.00	95.18
08.	Art and Design	1,127	355.57	310.00	95.90
09.	Law	1,258	436.62	410.00	106.63
10.	Human Medicine	673	536.73	525.00	83.17
11.	Veterinary Medicine	78	549.29	470.00	71.44
12.	Dentistry	62	535.89	500.00	127.35
13.	Pharmacy	194	547.55	500.00	50.14
14.	Physiotherapy	173	531.39	455.00	84.59
15.	Nursing	1,659	395.47	315.00	94.79
16.	Other Health Care	586	478.23	425.00	91.52
17.	Built Environment	237	316.03	285.00	91.52
Total		38,605	396.29	350.00	98.40

TABLE 6E: Points of Applicants Not Offered any Level 8 Course, Course Type broken down by First Preference, Year 2000

	Course Type	Observations	Points (Mean)	Points (Median)	Points (St Dev)
01.	Arts/Social Science	4,304	249.47	260.00	76.50
02.	Science/Applied Science	1,560	240.59	250.00	75.96
03.	Agriculture/Horticulture	145	246.52	265.00	69.49
04.	Education	1,168	272.24	290.00	76.34
05.	Administration/Business	5,265	241.91	250.00	79.25
06.	Engineering/Technology	4,318	231.14	240.00	79.22
07.	Architecture	190	269.00	280.00	88.67
08.	Art and Design	76	227.96	237.50	105.16
09.	Law	426	272.29	290.00	90.77
10.	Human Medicine	201	307.76	320.00	111.05
11.	Veterinary Medicine	58	265.60	272.50	98.62
12.	Dentistry	12	257.50	267.50	93.09
13.	Pharmacy	11	255.45	260.00	101.01
14.	Physiotherapy	96	277.19	290.00	76.17
15.	Other Healthcare	74	249.86	262.50	79.64
Total		17,904	245.04	260.00	80.19

TABLE 6F: Points of Applicants Not Offered any Level 8 Course, Course Type broken down by First Preference, Year 2011

	Course Type	Observations	Points (Mean)	Points (Median)	Points (St Dev)
01.	Arts/Social Science	4,875	230.54	240.00	74.95
02.	Science/Applied Science	2,297	234.89	240.00	80.09
03.	Agriculture/Horticulture	218	279.31	277.50	77.40
04.	Education	988	260.72	265.00	89.27
05.	Administration/Business	3,111	216.64	225.00	75.17
06.	Engineering/Technology	2,196	220.80	225.00	81.01
07.	Architecture	126	241.43	255.00	78.40
08.	Art and Design	839	242.10	245.00	80.08
09.	Law	382	224.75	235.00	91.28
10.	Human Medicine	485	440.95	475.00	125.68
11.	Veterinary Medicine	82	345.49	345.00	113.27
12.	Dentistry	47	348.62	330.00	139.81
13.	Pharmacy	53	306.70	330.00	144.77
14.	Physiotherapy	133	295.23	310.00	108.61
15.	Nursing	2,107	243.30	255.00	86.66
16.	Other Health Care	353	261.36	260.00	105.25
17.	Built Environment	82	200.98	200.00	105.25
Total		18,374	239.23	240.00	90.56

Section 7

Other Aspects of Skill Formation

Over the medium to long term, the declining slope of the New Entrants projections chart (Figure 1E) suggests that it is likely that Ireland's demographic advantage will unwind and, as is the case in many other developed economies, the task of improving the nation's human capital can no longer be exclusively focused around the production of young graduates. Given the demographic risk and also the possibility that projected surpluses could potentially be substantially reduced through migration shocks or unexpectedly high growth rates, it is arguable that policymakers should begin to give more serious consideration to a range of alternative policy options that will help ensure that economic performance is not constrained as a result of graduate-level skill shortages. A more focused approach to lifelong learning should be considered a priority in this respect; however, given the importance of this topic it will be discussed in its own right in Section 9 below. We now consider some alternative sources of skilled labour supply that are likely to become increasingly relevant in the future.

THE ROLE OF SKILLED INWARD MIGRATION

Our analysis suggests that it is entirely possible, given both the results of our Baseline Model and the sensitivity tests, that the labour market for new graduates could face lower surpluses and potential shortages towards the end of the projection horizon. A tight graduate labour market is likely to lead to some wage inflation which, in turn, will reduce the propensity to emigrate; however, a certain level of emigration is inevitable. Of course, it could be argued that immigration may also provide a solution in the event of any graduate shortfall and recent years have seen large flows of young persons from new member states (NMS) enter the Irish labour market in response to labour shortages. To date, the evidence suggests that educated immigrants from NMS economies are disproportionately represented in unskilled occupations in Ireland (Barrett *et al.*, 2012). Using data from the 2006 National Employment Survey, Barrett *et al.* (2012) show that immigrants from NMS educated to post-secondary schooling level have a much higher propensity to be employed in plant or elementary occupations relative to both Irish nationals and immigrants from elsewhere (Table 7A).

TABLE 7A: The Occupational Distribution of Immigrants with Post-secondary Education, 2006

	Native	UK	EU15	NMS	Non-EU, Eng-spk	Non-EU NEng-spk
%						
Managers & senior officials	11.1	13.3	9.0	2.2	10.8	3.5
Professional	34.5	32.4	32.1	8.1	39.7	29.0
Associate professional & technical	12.6	15.2	12.4	3.8	15.1	10.7
Administrative & secretarial	20.6	16.3	26.0	9.8	18.5	11.7
Skilled trades	5.2	3.6	2.1	14.8	1.2	5.3
Personal service	4.1	3.5	4.2	7.3	2.7	10.9
Sales & customer service	4.1	3.8	2.9	6.2	3.1	4.7
Process, plant & machine operative	3.4	4.5	2.1	19.3	3.5	6.6
Elementary	4.4	7.4	9.2	28.5	5.4	17.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
#						
Sample Size	25,784	863	477	533	259	792

Source: Barrett *et al.* (2012).

Exactly why NMS university graduates are failing to access professional level positions in Ireland is unclear; however, five potential explanations present themselves:

1. NMS immigrants are willing to opt into low-skilled occupations due to the higher relative wage vis à vis their home economy;
2. NMS migrants face information barriers with respect to the Irish labour market;
3. The education and skills received in NMS universities are not highly transferable⁶³ to the Irish labour market;
4. Language barriers may be substantial for some NMS immigrants;
5. Irish employers are not sufficiently informed with regard to the quality of university education within NMS countries and, as such, are reluctant to hire NMS university graduates into professional positions.

Skilled inward migration has certainly the potential to provide a safety valve in a situation where new graduate shortages arise; however, it is clear that substantial barriers exist with respect to access to professional labour markets and more research is required in this area if policy is to be properly informed.

ASSESSING THE SCOPE FOR WIDENING ACCESS FROM THE FURTHER EDUCATION (FE) SECTOR

Given the long-term demographic constraint facing Ireland, it is important that all potential sources of student supply are explored. Within many countries, for

⁶³ Generally referred to as location-specific human capital.

instance the UK, progression pathways from the Further Education (FE) sector to Higher Education Institutions (HEIs) are well established, with entry-level criteria to UK universities set in terms of both traditional A-level qualifications and the more vocational credentials acquired through FE study. However, within Ireland it is clear that progression routes from FE to HEIs are much less well defined. In 2010, only 5 per cent of HE entrants held FETAC⁶⁴ qualifications, despite this group accounting for 15 per cent of applications (Irish Universities Association, 2012). In their recently published report, the Irish Universities Association (2012) argues that the HEI entrants system should be modified to place less emphasis on Leaving Certificate points in order to facilitate entry from less established routes such as FETAC, HEAR⁶⁵ and DARE⁶⁶. Similar sentiments were also expressed in a joint publication of both the HEA and NCCA⁶⁷ (HEA and NCCA, 2011).

Nevertheless, any attempt to increase participation from the FE sector is likely to face a number of barriers. Firstly, it is likely that individuals acquiring Post-Leaving Certificate (PLC) qualifications within the FE sector are also likely to have, on average, lower Leaving Certificate points relative to direct HEI entrants. Recent research by McCoy and Byrne (2010) demonstrated that the probability that a student would fail to progress within Irish HEI was substantially linked to lower than average Leaving Certificate performance, and also a low level of attainment in Mathematics. Thus, any policy aimed at widening access from the FE sector requires careful thought about the measures necessary to ensure that any benefits from increased FE participation are not offset by high rates of non-progression. Unfortunately, a lack of appropriate data on the FE sector relating to the number of entrants, enrolments, progression rates and the points profile of PLC participants made it impossible for us to provide further insights regarding the extent to which any policy aimed at widening access will ultimately impact the supply of HE graduates to the labour market.

Any strategy aimed at improving access routes from FE to HE should also consider the potential implications in the labour market for vocationally qualified workers. If the labour market for workers with intermediate qualifications is in shortage, then any policy aimed at diverting supply of such workers to the HE sector will tend to exacerbate the problem and drive up wage costs. Ideally, in order to address this issue, we would wish to replicate our earlier analysis to assess the likely extent of any imbalances in the labour market for FE qualifiers over the

⁶⁴ The Further Education and Training Awards Council.

⁶⁵ The Higher Education Access Route.

⁶⁶ The Disability Access Route to Education.

⁶⁷ The National Council for Curriculum and Assessment.

period; however, the lack of available tracking data on entrants to the FE system excludes this as an approach. We again make use of historical *Quarterly National Household Survey (QNHS)* data and the CEDEFOP/ESRI sectoral estimates to get some sense of recent patterns of labour market demand for PLC qualifiers and the likely future trajectory of this demand. According to data supplied to the ESRI by the Department of Education and Skills (DES), there were 38,650 full-time students undertaking PLC programmes within the FE sector in 2010, of which approximately 55 per cent were female. It is unclear exactly what proportion of these students were in the final year of programmes or what the relevant completion rate was; however, Irish HEIs received 10,711 applications from FETAC students in 2010, the bulk of whom were, presumably, studying for PLC qualifications. The demand for new PLC qualifiers is assessed by tracking the number of full-time employees within the *QNHS* who are recorded as having achieved a PLC qualification within the year prior to being surveyed. The pattern of demand by sector for the period 2004 to 2011 is reported in Table 7B and although the total number of new entrants to the labour market varies at somewhere between 11,000 and 13,000 annually,⁶⁸ there is some sectoral variation in the data.

TABLE 7B: The Demand for PLC Qualifiers by Sector 2004 to 2011

	2004	2005	2006	2007	2008	2009	2010	2011
Primary sector & utilities	334	415	39	280	149	586	286	313
Manufacturing	1,819	1,262	1,240	1,205	917	1,530	611	433
Construction	2,494	2,981	2,634	3,176	2,300	1,669	914	1,009
Distribution	2,133	2,535	1,756	1,692	2,471	2,881	1,629	2,038
Hotels and catering	984	785	856	789	612	1,421	946	1,204
Transport & telecommunications	386	375	456	186	119	207	291	446
Business & other services	2,790	2,662	2,538	2,424	2,070	3,301	2,316	2,483
Public Admin and Defence	671	510	483	267	240	461	355	242
Education	739	712	590	418	786	1,010	540	1,163
Health and social work	996	2,099	2,139	1,393	1,656	3,153	2,770	3,793
Total	13,348	14,336	12,732	11,830	11,320	16,219	10,658	13,123

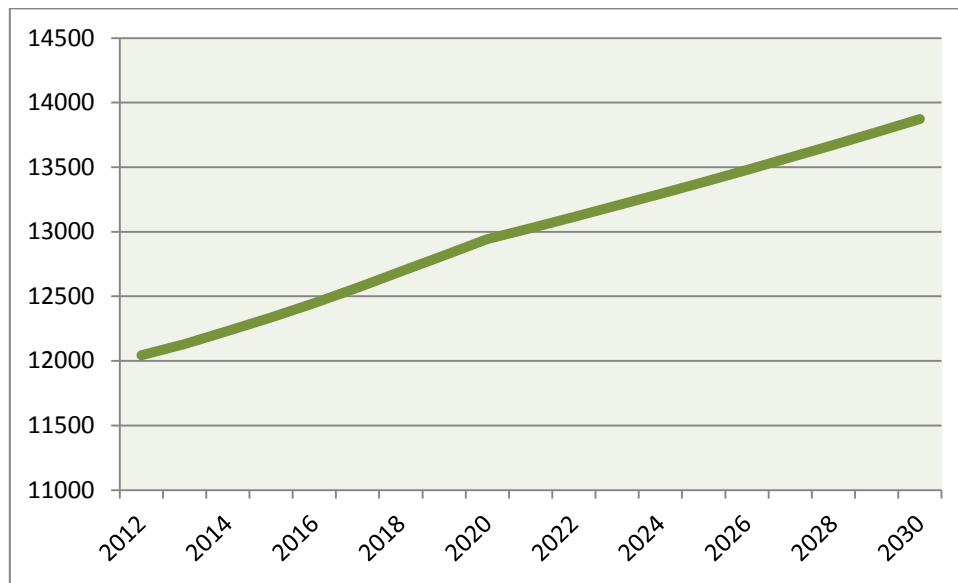
Source: *Quarterly National Household Survey, Q2, 2012.*

Employment levels of PLC graduates have been consistently highest in sectors such as Construction, Manufacturing, Business Services and Health & Social Work; however, more recent years have seen some fall-off in Construction and Manufacturing employment, which has been offset by increases in demand

⁶⁸ 2009 is somewhat exceptional and appears to be driven by larger numbers of entrants Health & Social Work and Business & Other Services.

within the Health & Social Work and Education sectors. Nevertheless, it is difficult to assess the extent to which such movements in the data are driven by short-term business cycle effects or long-term trends; thus, we estimate future demand by applying average sectoral employment shares from 2004 to 2009⁶⁹ to our forecast data from 2012 to 2030. The estimated demand for PLC graduates is presented in Figure 7A: while demand is expected to rise somewhat over the period, the numbers involved remain quite modest, with estimated PLC demand projected to increase from 12,044 in 2012 to 13,873 in 2030 (a growth of 15 per cent).

FIGURE 7A: The Projected Demand for PLC Qualifiers 2012 to 2030



Thus, while the issue of widening access routes from FE to HE should most certainly be explored, it is not without its challenges. Unless properly targeted, the impact of any increase in FE-based enrolments could be severely undermined by the impacts of lower progression rates. More research is required with respect to the educational profile of PLC students and their performance within the HEI sector if policy is to be properly informed. In addition, wage premium data (Section 5) suggests that there has been a steady demand within the labour market for individuals with PLC qualifications, with our projections indicating that the economy will continue to require workers with intermediary vocational level qualifications into the future. It is important, therefore, that any policy initiative aimed at increasing HE participation does not come at the cost of creating skill shortages for intermediately qualified labour i.e., that the growth of the HE sector does not crowd out necessary FE provision.

⁶⁹ We exclude data relating to the worst years of the recession.

Section 8

Higher Education Funding and Higher Education Expansion

The system of funding Irish Higher Education (HE) has shifted considerably over the last two decades. Prior to 1996, the majority of students attending Irish HE institutions paid tuition fees which varied according to the course undertaken and the institutions attended (Flannery and O'Donoghue, 2011). In 1995 around 30 per cent of the cost of HE was privately funded, primarily through tuition charges with the state absorbing the remainder of the cost. Tax relief was available on any tuition fees paid at the top marginal rate of income tax; this reduced significantly the cost for middle-class families. In 1996 the government effectively abolished tuition charges with undergraduate students only required to pay a nominal registration fee of 150 pints. As a consequence of this policy change, the private contribution to HE funding fell from 30 per cent in 1995 to 17 per cent in 2008 (Table 8A). While the public share of HE expenditure in Ireland in 2008 was by no means unique within an OECD context and remains well below that of many Nordic countries, it is in stark contrast to countries such as New Zealand, Canada, Australia and the UK which currently implement Income Contingent Loans (ICL) programmes as a means of financing their HE spending.

As a consequence of the fiscal crisis, the situation in Ireland has changed radically in recent years, with the registration fee increasing from €850 per student in 2008/9 to €1,500 in 2010 (Flannery and O'Donoghue, 2011), then to €2,000 in 2011 with a further rise to a maximum of €2,250 planned for September 2012 and €3,000 in 2014. As a result of the rapid rise in registration charges, the private contribution to HE funding is likely to have risen substantially since 2008. The increase in this student contribution, together with changes in student numbers and funding from 2007 to 2010, is likely to reduce public funding as a percentage of total HE funding by approximately 5 percentage points by 2012, and by approximately a further four percentage points by 2015.⁷⁰ A major difference between the high registration fee paid now and the tuition fees paid up to 1996 is that the former is identical for all students on all courses at all institutions while the latter differed by course, being higher for higher cost courses (e.g., medicine).

⁷⁰ Source: Higher Education Authority.

TABLE 8A: Public HE Funding as a Percentage of Total HE Funding

	1995	2000	2002	2004	2006	2008
English-Speaking Countries						
Ireland	69.7	79.2	85.8	82.6	85.1	82.6
New Zealand	.	.	62.5	60.8	63.0	70.4
Canada	56.6	61.0	.	.	53.4	58.7
Australia	64.8	49.6	48.7	47.2	47.6	44.8
USA	37.4	31.1	45.1	35.4	34.0	37.4
UK	80.0	67.7	72.0	69.6	64.8	34.5
Other OECD Countries						
Norway	93.7	96.3	96.3	.	97.0	96.9
Denmark	99.4	97.6	97.9	96.7	96.4	95.5
Finland	97.8	97.2	96.3	96.3	95.5	95.4
Belgium	.	91.5	86.0	90.4	90.6	89.8
Sweden	93.6	91.3	90.0	88.4	89.1	89.1
Germany	88.6	88.2	91.6	86.4	85.0	85.4
Austria	96.1	96.3	91.6	93.7	84.5	84.7
France	.	84.4	85.7	83.9	83.7	81.7
Netherlands	80.6	76.5	78.1	77.6	73.4	72.6
Italy	82.9	77.5	78.6	69.4	73.0	70.7
OECD Average		75.1	78.1	75.7	72.6	68.9

Source: OECD *Education at a Glance* (1998, 2005, 2007, 2009, 2011).

It should be noted that the registration fee itself is received by the individual colleges. Nevertheless, despite the complexity of the accounting framework, the scale of the registration charge is now more in line with standard tuition fee charges in many other countries. Yet there exists no public funding mechanism in Ireland to accommodate the charge and, therefore, it can no longer be asserted that access to HE in Ireland is free at the point of delivery. Furthermore, as students from lower-income families have access to both maintenance and fee grants, it is likely that financial constraints arising from the policy change will be most heavily felt within households just above the grants threshold. Thus, relative to many other developed countries, a substantial proportion of students in Ireland now face a significant credit constraint that will, arguably, have consequences for HE participation if the situation is not addressed in the near future.

In terms of informing the debate around the consequences of moving away from free tuition, it has been demonstrated that the switch to a fee-free system in Ireland has not resulted in increased participation among individuals from more deprived socio-economic backgrounds (O'Connell *et al.*, 2006; McCoy and Smyth, 2011). Rather, it has been suggested that the abolition of fees effectively represented a net transfer to higher earning households (Flannery and

O'Donoghue, 2011). In addition, over twice as much is spent on each student in third-level education as on those in primary education (attended by children from all social groups); per capita expenditure on higher education is 1.5 times higher than that on second-level education (OECD, 2011), which puts Ireland towards the upper (less equal) end of the European distribution. Thus, from a social policy perspective, there is no strong argument for continued (or future) abolition of tuition fees (registration fees), even in the unlikely event that the country's fiscal difficulties were to radically improve in the short term. Furthermore, the international evidence suggests that the introduction of an ICL scheme will have few negative consequences for the socio-economic patterns of HE participation (Chapman, 2005). However, there is also some evidence of higher levels of risk aversion among school leavers from lower socio-economic groups (Reay *et al.*, 2005), suggesting that any change in funding regimes needs to be accompanied by active measures to maintain and improve participation levels among these groups.

With respect to the mechanism through which increased student contributions can be harnessed, the literature generally considers the implications of either an ICL or a graduate tax. A graduate tax refers to a system whereby graduates pay a supplementary tax throughout their working lives. However, on the grounds that such a system has yet to be implemented by any country, it is not considered here as a possible policy option for Ireland (for a full discussion and analysis, see Flannery and O'Donoghue, 2011). With respect to the ICL, these are characterised by a system whereby graduates begin to repay the loan at a given proportion of taxable income once a set repayment threshold has been reached. The amount to be repaid should, in theory, reflect the risk of default among a given cohort with the interest rate charged, arguably, accounting for the government borrowing costs incurred to finance the ICL system. However, in practice the amount repayable under any ICL system is largely at the discretion of national governments; for instance, both the UK and Australian systems have implemented zero real interest rates in the past. Barr (2005) argues that a successful ICL system should ensure that loans are large enough to cover both tuition fees and living costs in order to ensure that HE is free at the point of consumption. Barr (2005) also argues against a loan system predicated on a zero rate of interest as it will tend to limit the scale of the loans offered which, in turn, may restrict access as the full cost of participating in HE, including living costs, is unlikely to be covered by the loan.

The recent study by Flannery and O'Donoghue (2011) cited above considered the implications of both an ICL and a graduate tax for Ireland.⁷¹ They consider two ICL based scenarios: (a) where a zero rate of interest is charged and (b) where the rate is set at 2 per cent. The authors also consider the potential impact of migration on the repayment rates associated with each scenario. The following table (Table 8B) summarises the results from the Flannery and O'Donoghue (2011) analysis and compares the outcomes with those of a selection of other countries also implementing ICL systems. The Flannery and O'Donoghue (2011) work is based on an annual loan of €2,500 per annum over four years and, as such, the loan is not assumed to make any contribution towards living costs. Furthermore, Flannery and O'Donoghue (2011) assume that the means-tested grant scheme will continue alongside the ICL scheme.

Ignoring migration, Flannery and O'Donoghue (2011) estimate that 82 per cent of loans will be fully repaid, with the figure falling to 74 per cent when the interest rate rises from zero to 2 per cent. As might be expected, repayment rates are substantially lower for females than males. Furthermore, while it is not included in the Flannery and O'Donoghue (2011) paper, it is likely that repayment rate will also vary by field of study. The average repayment term is approximately 15 years under both interest rate scenarios. In general, the projected repayment rates are similar to those for Australia but below those of the UK. The authors find that the ICL system is generally highly progressive, with graduates in the top three deciles of the income distribution paying back 100 per cent of their loans compared to 50 per cent for those in the bottom two deciles. In terms of the average subsidy per loan by the state, this varies from 29 per cent and 45 per cent for males and females respectively under a zero interest rate to 10 per cent and 27 per cent under a 2 per cent interest rate. These estimates which are generated under the zero interest rate scenario produce quite generous subsidies that are well above those of other comparable countries. The Flannery and O'Donoghue (2011) analysis demonstrates that as the interest rate is increased to 2 per cent, the percentage paying back the full loan falls; furthermore, the average level of subsidy falls considerably. Finally, the authors show that migration reduces the viability of the ICL system irrespective of the interest rate charged. Nevertheless, the assumption of a 20 per cent migration rate seems somewhat extreme given that the historical new graduate migration rate has been closer to 10 per cent.

⁷¹ Given that a graduate tax is unlikely to be considered as a policy option, this analysis will focus on the results from ICL.

TABLE 8B: ICL Estimates on Repayment* , UK and Australia

	% Repaying in Full	Average Years to Repay	Years to Repay - Males	Years to Repay - Females	% Average Subsidy/Loan
	%				%
Australia	86	.	12	15	.
UK (1)	.	.	16	22	.
UK (2)	.	14.7	12.7	16.6	21.30
Ireland (1)	82	15	14.4	15.9	35
Ireland (2)	74	15.7	15.4	16.2	18.60
Ireland (3)	65	14.9	14.8	15.1	48.20
Ireland (4)	60	15.3	14.4	16.6	33.90
Ireland (5)	75	15.1	14.2	16.2	40.10
Ireland (6)	67	15.6	15.4	16	25.90

Sources: Australia - Harding (1995), UK (1) - Barr *et al.* (1995), UK (2) - Deardon *et al.* (2008), Ireland (1)-(6) - Flannery and O'Donoghue (2011).

* Ireland (1) – $r = 0\%$, zero emigration; Ireland (2) – $r = 2\%$, zero emigration; Ireland (3) – $r = 0\%$, emigration and no repayment; Ireland (4) – $r = 0\%$, emigration and some repayment; Ireland (5) – $r = 2\%$, emigration and no repayment; Ireland (6) – $r = 2\%$, emigration and some repayment.

Thus, based on the recent micro-simulation research, it seems that Ireland has the potential to adopt a successful ICL system along the lines of those implemented in other countries. However, implicit within the Flannery and O'Donoghue (2011) analysis is an assumption that rates of return to education will remain unchanged over the period. Should it transpire that the future supply of graduates increasingly outweighs demand, then we would expect that rates of return will fall over time and this, in turn, would put a serious question mark over the repayment schedules outlined in the paper. McGuinness and Bennett (2007) found that rates of return to education for newly qualified entrants to the labour market fell in the UK over the period 1991 to 2002, a phenomenon which they linked to increases in the relative supply of workers with various levels of schooling. Nevertheless, based on the projections included within the current study (detailed in Section 1), it seems very unlikely that rates of return to a degree will fall substantially over the medium term, suggesting that the risks to the successful implementation of an ICL system for Ireland are low. Another question that needs to be considered from a policy perspective is whether any ICL scheme should cover tuition fees and living costs or tuition fees only with the current means-tested grant system running in parallel. The introduction of an ICL system will lower the current burden on middle-income families; however, if the current system of maintenance grants are abolished without any future ICL system being of sufficient scope to cover both tuition and living costs, this will place more financial pressure on students from lower income families who will then face a new credit constraint. Furthermore, given the very substantial time lag between the commencement of an ICL system and a repayment revenue flow, the pursuance of such a policy will inevitably have substantial cash flow

implications for government. Given the current state of the government finances, cash flow constraints are likely to restrict substantially the number of available options. Furthermore, it is essential to ensure that the costs structures within HE are efficient so that the ICL can be levied at the lowest possible rate. There is a risk that any ICL initiative launched in the absence of required structural reform will tend to reinforce existing inefficiencies.

The design of any funding system and the need for reform is inextricably linked to the cost of HE and to the level of aggregate HE expenditures and the current fiscal position of government. Consequently, it is useful to assess the cost implications of the projected increase in student numbers over the forecast horizon to 2030. Based on a previous set of projections, the *National Strategy for Higher Education to 2030* (Department of Education and Skills, 2011) estimated that the level of recurrent annual funding would rise from €1.8 billion in 2020 to €2.25 billion⁷² in 2030. The figures in the report appear to be generated by dividing the total number of enrolments⁷³ in 2009/10 into total recurrent expenditure of €1.3 billion for that year, which gives an implied recurrent cost per student of €8,319 and then multiplying this by the projected total number of enrolments in 2020 and 2030. We follow this procedure; however, in order to gross up our new entrants projections to total enrolments, we derive a grossing factor based on the ratio of new entrants to total enrolments in 2009/10.⁷⁴ Based on our models, we estimate that total enrolments in 2020 and 2030 will stand at 168,466 and 196,001 respectively.⁷⁵ These figures imply a rise in nominal recurrent funding to €1.40 billion in 2020 and €1.63 billion in 2030 which compare to estimates of €1.8 billion and €2.25 billion in the National Strategy report. Recurrent expenditure as a share of nominal GDP is projected to fall slightly from 0.81 per cent in 2009 to 0.59 and 0.50 per cent in 2020 and 2030 respectively. It must be noted that the 2009 cost per student figure was substantially below that of previous years due to funding cuts; furthermore, the analysis does not take any account of future capital expenditures.

⁷² These projections from the *National Strategy for Higher Education to 2030* report are expressed in current or nominal prices.

⁷³ Based on public sources this equated to 156,268.

⁷⁴ Total enrolments in 2009/10 were 156,268 while total new enrolments (undergraduate only) were 40,816 which give an undergraduate grossing factor of 3.828. A different approach is used in Section 4, applying an undergraduate-specific grossing factor of 3.4, and a postgraduate-specific grossing factor of 1.2. This yields corresponding total full-time enrolments figures of 175,349 for 2020 and 204,921 for 2030.

⁷⁵ Our undergraduate projections for these years are 44,002 and 51,194.

Section 9

Higher Education and Lifelong Learning

INTRODUCTION

European and national policy has increasingly focused on addressing education and training from the perspective of lifelong learning, looking at interconnections between different levels of the educational system and between full-time and part-time provision. The promotion of lifelong learning policies has been motivated by the desire to provide the workforce with flexible skills but also by the need to respond to unfavourable demographic trends due to the ageing of the population and the lower numbers entering compared with existing employment. As the share of older workers in the labour force rises, human capital adjustments must be increasingly focused on improving the skills of the existing stock of workers rather than relying on the inflow of new workers. The combination of demographic changes and workplace demands that change constantly in the face of technological progress and globalisation, require that education systems should be highly flexible in order to provide firms and workers with access to the necessary skills. Unquestionably, HE provision should be central to any lifelong learning strategy. Analyses in Section 1 have pointed to a recent increase in the number of mature entrants to full-time HE. However, there is a potentially untapped group of adults who do not have third-level qualifications; their profile is discussed in the following subsection. The final subsection looks at the rate of participation in lifelong learning in Ireland in comparison with other countries and draws on international best practice to highlight potential ways in which policy can foster the participation of adult learners in HE.⁷⁶

PROFILE OF ADULTS WITHOUT THIRD-LEVEL QUALIFICATIONS

In this subsection, we use data from the *Quarterly National Household Survey (QNHS)*⁷⁷ to provide a profile of adults (aged 15 to 64) in Ireland that do not have a third-level qualification contrasting them with those with third-level

⁷⁶ Within any lifelong learning framework HE should also focus on services for the continued upskilling needs of existing graduates.

⁷⁷ The *QNHS* is a nationwide survey of households carried out by the Central Statistics Office (CSO). Its primary objective is to provide quarterly labour force estimates but the micro-data also contain a rich array of information on respondents' socio-demographic characteristics. The data are collected throughout the year with 3,000 households surveyed each week, giving a total of 39,000 households each quarter.

qualifications in terms of their gender, age, nationality, marital status, family type, educational attainment, economic status and location (both region and urban/rural). In order to identify whether this education group's profile has changed over time, we present information for quarter 2 (April to June) in 1999, 2003, 2007 and 2011.

Before presenting the characteristics of those with and without a third-level education, Table 9A shows the percentage of the population in the two education groups in 1999, 2003, 2007 and 2011. As can be seen from this table, the proportion of individuals with a third-level qualification in Ireland has grown very rapidly, increasing from just less than a fifth in 1999 (18 per cent) to over one-third in 2011 (33 per cent). The corollary of this is that the percentage without a third-level qualification has declined, falling from 82 per cent in 1999 to 67 per cent in 2011.

TABLE 9A: Percentage of Individuals With and Without Third-Level Education: 1999, 2003, 2007 and 2011

Overall	1999	2003	2007	2011
Third-level	17.9	23.5	28.1	33.4
No Third-level	82.1	76.5	71.9	66.6

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

Since 2007 a slightly higher proportion of those without third-level qualifications are male (Table A1A), with females accounting for a higher share of those with a third-level qualification (Table A1B).

In relation to age, the majority of those without a third-level qualification are aged between 25 and 54, a pattern which has not changed over time. However, there has been a change over time at each end of the age distribution. Specifically, a greater proportion of those without a third-level qualification in 2011 are aged 60 to 64, 9 per cent compared to 6 per cent in 1999, while there has been a decline in the proportions aged between 15 and 24 without a third-level education, decreasing from almost one-third in 1999 (28 per cent) to less than a quarter in 2011 (23 per cent). With respect to those with a third-level qualification (Table A1B), most are aged between 20 and 54. There has been a continual rise in the proportion of people in this education group that are aged between 25 and 44, with most of this increase driven by those aged between 35 and 44. On the other hand, there has been a gradual decline in individuals with a third-level qualification that are aged between 20 and 24, which has fallen from 15 per cent in 1999 to 6 per cent in 2011: part of the reason for this decline will

be due to the fall in the underlying population structure – the proportion of the population aged between 15 and 24 has been decreasing steadily since 1996.⁷⁸ Migration could also be part of the explanation for this decline and/or younger individuals choosing to pursue employment opportunities in the most profitable sectors during the economic boom era (e.g., construction), which did not require third-level qualifications (i.e., Post-Leaving Cert (PLC) courses).

With respect to prior educational attainment, the majority of individuals that do not have third-level education have either Higher or Lower Secondary education, a pattern that has remained consistent over time. The proportion of those without a third-level qualification whose highest level of educational attainment is primary or less has fallen considerably over the twelve year period, from 27 per cent in 1999 to 16 per cent in 2011. There has also been a small decline in the proportion of Lower Secondary individuals, while there has been an increase in the Higher Secondary and PLC qualification groupings, particularly for PLCs. In relation to those with a third-level qualification (Table A1B), just over two-thirds of this group have a ‘Degree or Higher’ qualification with the remainder of this education cohort holding a ‘Non-Degree’ accreditation: apart from 2007, this pattern has remained stable over time.

Married people are over-represented among those with a third-level qualification. Furthermore, those with a third-level qualification are more likely than those without to fall into the ‘couple with children’ family category and less likely to be in lone parent households or not in a family unit (Tables A1A and A1B).

Regarding nationality, Irish nationals are somewhat over-represented among those without third-level qualifications (compare Tables A1A and A1B).

Table 9B presents the education profile of the population within each region (see also Tables A1C and A1D). We can see that the proportion of individuals with a third-level qualification has increased over time across every region. However, some regions continue to have a disproportionate percentage of non-third-level individuals; in particular, the Midlands, South-East and Border regions: in 2011, their share of individuals residing in these locations who did not have a third-level qualification is well above the national average (66.6 per cent).

⁷⁸

Based on Census data, the percentage of the population aged between 15 and 24 stood at 17.5 per cent in 1996 and by 2011 had declined to 12.6 per cent (CSO: www.cso.ie).

Tables 9C and 9D show the economic status of individuals without and with a third-level qualification. The majority of both education cohorts are in employment, mainly full-time, and this pattern is consistent over the twelve years.. However, reflecting the economic downturn, there has been a decline in the proportions of both education groups that are in full-time employment in 2011. Not surprisingly, the fall in employment rates was particularly marked among those without a third-level qualification.

TABLE 9B: Regional Education Profile: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Border:				
Third-Level	10.6	17.7	21.1	27.0
No Third-Level	89.4	82.3	79.0	73.0
Dublin:				
Third-Level	24.3	31.4	35.4	40.4
No Third-Level	75.7	68.7	64.6	59.6
Mid-East:				
Third-Level	19.5	23.7	30.2	35.3
No Third-Level	80.5	76.3	69.9	64.7
Midlands:				
Third-Level	10.5	16.4	19.1	24.7
No Third-Level	89.5	83.6	80.9	75.3
Mid-West:				
Third-Level	16.3	21.1	24.9	32.6
No Third-Level	83.7	78.9	75.1	67.4
South-East:				
Third-Level	13.4	16.4	20.5	26.7
No Third-Level	86.7	83.6	79.5	73.3
South-West:				
Third-Level	17.6	21.9	28.3	32.2
No Third-Level	82.4	78.2	71.7	67.8
West:				
Third-Level	15.7	22.9	28.2	33.7
No Third-Level	84.3	77.1	71.8	66.3

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

TABLE 9C: Economic Status of Individuals Without Third-Level Education: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Economic Status:				
FT Employment	47.1	47.9	49.4	35.0
PT Employment	10.8	11.3	13.0	14.2
Unemployed	4.5	3.4	3.9	12.0
Marginally Attached	0.7	0.6	0.4	0.8
Not Economically Active	36.8	36.8	33.3	38.0

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

TABLE 9D: Economic Status of Individuals With Third-Level Education: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Economic Status:				
FT Employment	77.5	75.2	75.6	68.0
PT Employment	8.4	9.4	10.3	12.3
Unemployed	2.0	2.4	2.3	6.4
Marginally Attached	0.4	0.2	0.4	0.3

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

This subsection has outlined the main characteristics of those without a third-level qualification. Members of this group are more likely to be male, aged 45 to 64, and less likely to be living as a couple with children. However, it is worth noting that the majority of those without third-level education are living with children, which may raise issues regarding childcare needs if they were to return to education. Some locations are found to have a much higher proportion of adults without third-level education, especially the Midlands, South-East and Border regions. However, a significant proportion (25 per cent) of those nationally in this group is located in Dublin.

In relation to the economic status of individuals without a third-level qualification, the majority are in employment. However, the proportions in employment, in particular full-time employment, are smaller compared to those with a third-level education. In addition, the current recession has had a bigger impact on non-third-level individuals than graduates, with 12 per cent of such individuals being unemployed in 2011 compared to 6 per cent of those with a third-level qualification.

The education profile of the non-third-level group is quite divergent, which suggests that a varied approach will be required to upgrade their qualifications.

LIFELONG LEARNING: IRELAND IN COMPARATIVE PERSPECTIVE

The European Commission⁷⁹ stresses the importance of attracting a wider cross-section of society into HE and emphasises the need for HEIs to be much more flexible in their approach to education delivery. The Commission's review identifies a number of key policy challenges for HEIs, including increasing progression rates from the vocational education sectors, ensuring financial support for students from disadvantaged backgrounds, adopting a greater variety of study modes (part-time distance and modular learning, adult continuing education programmes, etc.) and the increased use of ICT in education (eLearning). A number of European countries, particularly the Nordic countries, have been at the forefront of provision for adult learners. As Table 9E demonstrates, it seems that Ireland is a considerable way behind many of its European counterparts with respect to participation in adult lifelong learning.

TABLE 9E: Adult Lifelong Learning Participation, Ages 25-64

	2005	2009	2010
Denmark	27.4	31.6	32.8
Iceland	25.7	25.2	25.1
Sweden	17.4	22.2	24.5
Finland	22.5	22.1	23.0
UK	27.6	20.1	19.4
Norway	17.8	18.1	17.8
Ireland ⁸⁰	7.4	6.3	6.7

Source: http://ec.europa.eu/education/lifelong-learning-policy/doc/benchmarks10/pg7_en.pdf

Certain OECD countries, most notably, Sweden, Norway, Finland, Denmark, New Zealand and Australia, have been successful not only in facilitating participation in adult education and training in general but also in enhancing access to HE in particular. A number of key features can be identified which appear to promote adult participation in education/training, including HE (OECD, 2000a, 2000b, 2001a, 2001b, 2003, 2005):

- There is a policy emphasis on encouraging adult participation in all levels of education. Facilitating access at various levels means adults may be more likely to progress to HE. For HE to be equitable, early childhood education, primary and secondary education must also be equitable (Skilbeck and Connell, 2000).

⁷⁹ 'Mid-term review of the Lifelong Learning Programme' is available online at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0413:FIN:EN:PDF>

⁸⁰ There may have been some under-reporting of Irish part-time lifelong learning student numbers prior to 2010 as they did not become fully eligible for inclusion in the determination of recurrent grant allocations before this point and, thus, data collection processes may not have been rigorous.

- There are flexible policies regarding access to third-level courses, including recognition of prior learning and work experience, and open access to courses. Thus prior learning through work experience is taken into account in Sweden, Finland and Norway, while New Zealand has a policy of open access to university courses for adults, irrespective of their initial qualifications.
- Flexible modes of provision are employed, including part-time and distance education, along with flexible ways of combining work and study. In Finland, provision is available through a range of institutions, including continuing education centres, open universities and open polytechnics. In Sweden, a Network University has been established which offers academic courses and degrees by means of distance education. In general, the proportion of adult learners is higher in systems with high levels of part-time provision (OECD, 2011).
- Financial support is available for adult students and options to pursue study leave are provided in cooperation with employers. Gould (2003), for example, highlights the ease of securing study leave from employers in Sweden.
- These aspects of policy are underpinned by a historical tradition of adult education provision. In Denmark, Sweden and Norway, ‘folk high schools’ which provide adult education have been in place since the nineteenth century.⁸¹

The success of the Nordic model appears to be at least partially predicated on the ability to facilitate the participation of the (initially) less qualified in adult education and training. The OECD report on adult learning (2003) found that the Nordic countries adopted a social model of the distribution of learning opportunities with provision geared towards a larger proportion of adults, a model which results in fewer inequalities in training participation.

This section has placed our analyses of HE provision and participation within the context of the broader issue of lifelong learning. While the rate of entry of adults into full-time higher education has increased in recent years, there is a large untapped group of adults in the Irish population who do not have third-level qualifications. One of the key findings emerging is that adults without third-level qualifications are not a homogenous group. They vary in age, educational background, family circumstances and participation in employment. Therefore, the supports required to facilitate their entry into higher education would need to vary across different groups of adults. Ireland potentially has much to learn from countries which have successfully raised rates of adult participation in learning. Experience in these countries indicates that adult participation in

⁸¹ These are referred to as *Folkehøjskole* in Denmark, *Folkehøgskole* in Norway and *Folkhögskola* in Sweden. Germany also has *Volkshochschule*.

learning, including HE is facilitated by more flexible modes of access and delivery along with financial support and a holistic approach to adult learning, which spans both secondary and tertiary levels.

Section 10

Summary and Policy Conclusions: Social Inclusion, Student Contribution and Progression Issues

This report provides an analysis of the future demand for higher education (HE) in Ireland. The analysis predicts that, on the basis of the current participation rates and known patterns of population growth, the number of entrants to HE institutions is likely to increase from 41,000 in 2010/2011 to 44,000 in 2019/2020 and to just over 51,000 in 2029/2030. Our projected rate of enrolment growth is in line with recent estimates published by the Department of Education and Skills (DES, 2011), but substantially below the previous DES estimates published in the *National Strategy for Higher Education to 2030*. The research suggests that any policy targets or analysis based around the previous DES projections used in the National Strategy report should be reassessed. We find that, under our baseline expansion scenario, supply from the HE sector will more than meet labour market demand for graduates over the period. Nevertheless, despite the general positive outlook, some potential risk factors exist that have the capacity to reduce the surplus, namely, a higher than expected rate of graduate emigration and/or a more rapid expansion of graduate labour demand due to accelerated growth within high-tech sectors of the economy.

This report raises important policy issues for the nature of funding of (higher) education, the potential implications of increased student contributions and student non-progression. The central model of how human capital formation is achieved is assessed and a number of additional strategies for meeting the needs of the labour market are considered. Increasing participation in HE along the lines projected in this report requires maintaining the participation of academically-able students from lower income families. However, research clearly shows that these young people are much less likely to complete second-level education, perform at high levels and actually apply to enter higher education. Government spending on primary and second-level education in Ireland continues to be relatively low, a situation much commented upon by the OECD. Hence, the research clearly points to the need for earlier investment, in pre-primary, primary and early second-level education, in order to address broader issues of equity in educational attainment and preparation for higher education across different social groups (McCoy *et al.*, 2010a; Smyth and McCoy, 2009; Levin, 2009).

With respect to funding, the research has emphasised the urgent need for reform given that Ireland currently imposes a registration charge that is in the region of tuition fees in proximate jurisdictions, such as Northern Ireland. Despite this, there exists no publically managed system that enables the financing of this cost. The research here suggests that Ireland is well placed to introduce an Income Contingent Loan (ICL) system; however, such a funding mechanism requires careful thought in design, planning and implementation. The first issue is the scope of any ICL system and, in particular, the extent to which it is designed to cover both tuition and living costs. In order to prevent the creation of participation disincentive effects, the literature tends to support the view that ICL schemes should cover all costs so that HE is free at the point of consumption.⁸² Nevertheless, such a comprehensive funding programme will be expensive to set up and will involve a substantial time-lag before a pay-back revenue flow is established. As such, an ICL system that covers all costs associated with HE participation may be beyond the reach of the nation given our current fiscal difficulties. Should an all-encompassing ICL system prove unachievable in the short term, an alternative approach might be to introduce a limited ICL scheme designed to cover tuition costs while maintaining a maintenance grant programme; this could replace the current grants system which was designed in different times. However, a mix of ICL and maintenance grants is not without its drawbacks, as such a system will continue to place substantial pressures on families just above the grant threshold. These are likely to be middle income families. In the long run, a fully encompassing ICL system will prove more cost-effective from the perspective of the tax payer, as all high-earning graduates employed within Ireland will be expected to pay irrespective of their socio-economic status at the point of HE entry. In addition to the exact nature of the funding model to be adopted and the degree to which these might evolve over time, careful consideration should also be given to the interest rate levied on any ICL system to ensure that the risk of default and the cost of raising finance on loan markets are reflected. Finally, in order to minimise the costs to students and prevent structural disincentive effects, it is important to ensure that HE structures are functioning as efficiently as possible before any ICL scheme is launched.

As mentioned above, much attention has been placed on student contributions and the potential re-introduction of 'fees', which are significant issues. While the issues of cost effectiveness and the removal of credit constraints will tend to be at the centre of the policy debate, the equity impacts of any change to the HE funding regime must also be given equal consideration. Any policy change in this

⁸² Even such a system is not without its potential drawbacks as higher levels of risk aversion among students from lower socio-economic backgrounds may still impact participation rates.

regard will need to be carefully designed, and attention will have to be paid to the impact of any changes, particularly in terms of the impact they might have on participation levels of different socio-economic groups, some of whom may emerge as more debt-averse (Reay *et al.*, 2005). However, fees are likely to represent a small part of the total financial burden for higher education students, so of particular significance for lower income families is the value of means-tested maintenance grants to support them. Assuming that an ICL system that covers the cost of tuition charges and living costs is not achievable in the near term, the evidence shows that the proportions of young people in receipt of these grants varies considerably across different socio-economic groups, particularly across employee and self-employed groups, and the value of grant payments has declined over time (McCoy *et al.*, 2010b). The decline in grant eligibility by students from lower non-manual backgrounds, such as personal services, sales and clerical workers, is particularly striking. These groups are also likely to be at the margins of the income thresholds in relation to any fee exemptions. Hence, the system of grant payments must be considered alongside any potential change in 'fees', and the research suggests that thresholds should incorporate a tapering of fee payments rather than a single threshold. The current review of the system of means-testing will hopefully lead to the more effective targeting of maintenance and other supports. These issues are all the more pressing in the current climate as families are struggling to provide financial support to their sons and daughters on entering higher education and young people themselves face difficulties in securing part-time employment to support their studies.

Regarding the general nature of HE policy, the emphasis has been very much focused on ensuring that young people continue to participate in third-level education with relatively little reference to other aspects of skill formation and labour market supply. While Ireland will continue to enjoy a relative demographic advantage in terms of the population share of young people at least to 2030, this is not to say that we should rely exclusively on young graduates as a future source of skilled labour supply. There is a large untapped group of adults in the Irish population who do not have third-level qualifications. Arguably policy should focus more heavily on upskilling such individuals through the more effective delivery of a part-time flexible learning HE system that allows more mature students to combine work and study. We have shown that Ireland has much to do in this respect and have outlined a number of key components associated with successful systems of lifelong learning implemented elsewhere. Furthermore, it is apparent that large proportions of migrants, particularly those from New Member State countries, are currently underutilised within the Irish labour market. Ideally, immigration should act as a labour market buffer that alleviates skill shortages if levels of skilled labour demand exceed supply. It is essential that

the barriers to the full labour market integration of skilled migrants are identified and suitable policy initiatives put in place, particularly given the risk factors associated with the labour market for new graduate labour identified within this report, for instance, a growth in the relative demand for new graduates within high-tech sectors of the economy.

Finally, the results highlight the importance of academic preparedness for young people's capacity to succeed within HE. The second-level system has a vital role to play in ensuring that young people are academically prepared, but also in enabling them to have a clear understanding of the content and requirements of the course they wish to pursue. The removal of ex-quota provision for career guidance within second-level schools is particularly significant in this regard, and is likely to impact on more disadvantaged students who do not have other sources of information and advice regarding college choices (Smyth and McCoy, 2011). Given the strong role prior academic performance plays in success within HE, greater attention should be focused on promoting further education for young people performing less well in the Leaving Certificate examination, both as a post-school education choice but also as a means of gaining skills and competencies with a view to progressing on to HE. Finally, the results clearly point to the need for HE institutions to identify students struggling to meet the academic requirements of their courses, with a view to providing additional academic (and social) supports, particularly in the first year of their studies.

Appendix 1

Profile of Individuals With and Without Third-Level Education

TABLE A1A: Demographic Profile of Individuals Without Third-Level Education: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Gender:				
Males	50.2	50.7	52.3	52.1
Females	49.8	49.4	47.8	47.9
Age:				
15-19 years	16.7	14.8	13.6	13.8
20-24 years	11.7	12.3	12.0	9.5
25-34 years	19.3	18.8	19.7	19.5
35-44 years	20.4	20.1	19.5	19.1
45-54 years	18.5	18.9	18.8	20.2
55-59 years	7.0	8.4	8.9	9.4
60-64 years	6.3	6.8	7.6	8.7
65+ years	-	-	-	
Nationality:				
Ireland	97.6	94.6	90.3	90.7
UK	1.6	2.6	2.3	1.6
Other EU	0.3	0.6	0.7	0.5
Non EU-European	0.1	0.8	4.6	5.0
USA	0.2	0.1	0.1	0.0
Other country	0.3	1.3	2.1	2.2
Educational Attainment:				
Primary or less	26.8	23.4	21.0	16.3
Lower Secondary	29.0	28.0	27.5	26.4
Higher Secondary	32.3	35.1	38.1	39.7
Post Leaving Cert	11.9	13.5	13.4	17.6
Marital Status:				
Single	44.5	46.3	47.3	46.7
Married	49.9	47.8	46.8	46.4
Widowed	2.0	1.9	1.7	1.7
Divorced	3.5	4.0	4.3	5.2
Family Type:				
Couple No Children	-	12.9	13.8	14.6
Couple Children	-	39.5	38.5	39.5
Lone Parent	-	12.4	13.2	14.3
Not Family Unit	-	35.2	34.5	31.6
Other/Not Stated	-	0.1	-	-

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

TABLE A1B: Demographic Profile of Individuals With Third-Level Education: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Gender:				
Males	49.7	48.4	45.5	44.7
Females	50.3	51.6	54.5	55.3
Age:				
15-19 years	0.3	0.3	0.2	0.1
20-24 years	14.7	12.4	10.4	6.3
25-34 years	34.7	37.3	38.5	35.9
35-44 years	24.8	25.2	26.0	28.9
45-54 years	16.4	16.1	16.1	18.0
55-59 years	5.4	5.4	5.0	5.9
60-64 years	3.7	3.4	3.8	4.9
65+ years	-	-	-	-
Nationality:				
Ireland	92.7	86.2	82.0	86.2
UK	3.4	4.1	3.4	2.4
Other EU	2.1	2.7	3.0	1.7
Non EU-European	0.2	1.2	5.2	4.4
USA	0.6	0.7	0.5	0.2
Other country	1.0	5.1	5.9	5.0
Educational Attainment:				
Third-level Non-Degree	38.2	38.6	34.2	38.4
Third-level Degree or higher	61.9	61.4	65.8	61.6
Marital Status:				
Single	43.4	44.7	44.9	38.2
Married	52.9	51.8	51.2	57.5
Widowed	1.1	0.9	0.8	0.8
Divorced	2.7	2.6	3.2	3.4
Family Type:				
Couple No Children	-	17.5	18.9	20.0
Couple Children	-	41.1	41.1	47.2
Lone Parent	-	6.5	6.8	7.0
Not Family Unit	-	35.1	33.1	25.7
Other/Not Stated	-	0.0	-	-

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

TABLE A1C: Geographic Profile of Individuals Without Third-Level Education: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Region:				
Border	11.7	11.5	11.8	11.9
Dublin	27.6	26.3	26.0	24.6
Mid-East	10.1	10.7	10.9	12.0
Midlands	6.1	6.2	6.6	6.8
Mid-West	8.8	8.9	8.7	8.4
South-East	11.2	11.7	11.9	12.1
South-West	15.0	15.1	14.6	14.8
West	9.4	9.7	9.6	9.5
Location:				
Urban	59.0	61.7	59.2	56.9
Rural	41.0	38.3	40.8	43.1

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

TABLE A1D: Geographic Profile of Individuals With Third-Level Education: 1999, 2003, 2007 and 2011

	1999 (Q2)	2003 (Q2)	2007 (Q2)	2011 (Q2)
Region:				
Border	6.3	8.0	8.0	8.8
Dublin	40.6	39.0	36.5	33.2
Mid-East	11.2	10.8	12.0	13.0
Midlands	3.3	4.0	3.9	4.4
Mid-West	7.9	7.7	7.4	8.1
South-East	7.9	7.5	7.8	8.8
South-West	14.8	13.7	14.7	14.0
West	8.1	9.3	9.6	9.6
Location:				
Urban	72.7	71.9	68.1	65.7
Rural	27.3	28.1	31.9	34.3

Source: Constructed with data from the *Quarterly National Household Survey (QNHS)*, (Central Statistics Office).

Appendix 2

Demographic-Based Assessment of Postgraduate Demand

In this Appendix, we provide the details of a demographic-based approach to projecting postgraduate entrants. It is similar to the methodology used for estimating undergraduate entrants. The projections are used in a sensitivity analysis in Section 5.

There is no data available on new entrants to full-time postgraduate education but there is data on total full-time enrolments for PhD, Masters and Postgraduate Certificate/Diploma by gender from the HEA.

The following assumptions are made to estimate postgraduate entrants:

1. Masters and Postgraduate Certificate/Diplomas take, on average, one year to complete. Therefore, the total enrolments of students at these levels can be used to approximate the number of entrants.
2. Masters and Postgraduate Certificate/Diploma students are concentrated in the 22 to 24 year old age group.
3. PhDs take, on average, four years to complete.
4. One-third of all PhD enrolments are in year one and we apply this figure to total PhD enrolments to approximate the number of entrants.
5. PhD students are concentrated in the 25 to 28 year old age group.

These assumptions allow us to calculate participation rates defined in terms of percentages of the relevant age groups for different types of postgraduate students. Table A2A shows the estimated participation rates for postgraduate entrants for recent years. As with undergraduates, there has been a rise in participation rates since the beginning of the recession in the economy.

In terms of projecting forward the number of postgraduate completions we index the number of historical new entrants to the rate of population growth of the relevant age groups from the demographic model described in the section on our Baseline Model. We assume unchanged gender-specific participation rates and assume overall completion rates of 80 per cent for Masters and Postgraduate Certificate and Diplomas and 70 per cent for PhDs.

TABLE A2A: Participation Rates for Full-Time Postgraduate Entrants

	2007/08	2008/09	2009/10
Males, PhD	0.5	0.7	0.8
Females, PhD	0.5	0.6	0.8
Male, Masters	4.2	4.9	6.3
Female, Masters	4.6	5.3	6.2
Males, Postgraduate Certificate/Diploma	1.1	1.3	1.6
Females, Postgraduate Certificate/Diploma	2.8	3.1	2.9

Source: Estimated using HEA data on total enrolments in postgraduate education.

Appendix 3

Call For Tender For Data Review Report On Future Demand For Higher Education

HEA

Higher Education Authority
An tÚdarás um Ard-Oideachas

An tÚdarás um Ard Oideachas

Higher Education Authority

DATA REVIEW ON FUTURE DEMAND FOR HIGHER EDUCATION – META ANALYSIS OF EXISTING REPORTS

Request for Proposals

Awarding Authority:

The Higher Education Authority (HEA),

Brook lawn House,
Crampton Avenue,
Shelbourne Road,
Dublin 4.

Telephone Number:	(01) 2317100
Fax Number:	(01) 2317172
E-mail address:	info@hea.ie
Web site:	www.hea.ie

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1. Introduction

1.1 Purpose of Tender Documentation

The purpose of this document is to assist tenderers in preparing proposals for *a data review report on future demand for higher education through a meta-analysis of existing reports, data analysis, projections and assumptions.*

This document remains the property of the Awarding Authorities and is issued only to assist you in submitting a detailed response to the requirements specified. The information contained herein is to be treated as confidential and must not be disclosed to any third party without prior written consent from the Higher Education Authority.

All queries with respect to the Tender Documentation and requests for additional information should be made to:

Mary Armstrong

National Strategy Implementation Unit

HEA, Brooklawn House, Crampton Avenue, Shelbourne Road, Dublin 4.

Telephone: (01) 2317100

Fax (01) 2317172

E-mail marmstrong@hea.ie

1.2 Awarding Authority

The awarding authority is The Higher Education Authority.

1.3 Taxation obligations

It will be a condition of the award of any contracts that the tenderer will be required to produce a valid tax clearance certificate from the Irish Revenue Commissioners. In the case of a non-resident tenderer, a statement of suitability on tax grounds from the Revenue Commissioners will be required. Professional Services Withholding Tax (PSWT) will be deducted from certain payments for audit services provided by the successful tenderer. It shall be the responsibility of tenderers themselves to obtain all necessary documentation and to ensure that they comply with all relevant Irish taxation requirements.

1.4 Overview of Contents

The Tender Documentation contains four sections as outlined below. Section 4 requires specific proposal responses.

- Section 1** Explains the purpose of the document, provides general instruction on the preparation of proposals and gives guidance on how they will be evaluated;
- Section 2** Provides background information on the Authority.
- Section 3** Gives details of the requirements;
- Section 4** Provides a template for Tenderer responses.

1.5 Instructions to Tenderers

- Tenderers must provide all the information requested in Section 4.
- All reasonable requests for additional information will be addressed and such information will be made available to all other tenderers in all cases.
- Tenderers must submit four 'hard' copies of their proposals. The proposals must be enclosed in a sealed envelope marked "Data Review Report on Future Demand" and addressed to

*Ms Mary Armstrong,
National Strategy Implementation Unit
Higher Education Authority
Brooklawn House, Crampton Avenue
Shelbourne Road
Dublin 4*

Closing date for receipt of hard copy tenders is **Friday 30 March 2012**.

No late applications will be considered.

The Awarding Authorities will not be liable for any costs incurred by proposers in the preparation and submission of response(s), including any work, effort or expenses required to complete the proposal. Any materials submitted as part of the proposal shall not be returned save where there is an expressed request for same and any expense incurred for such return shall be borne by the proposer.

The Awarding Authorities reserves the right to amend or alter any information contained in these documents at any time. Participating proposers will be informed of any amendments or alterations.

Unwarranted or inappropriate attempts (including canvassing) to influence the decision of the Awarding Authorities by a proposer, or by any party acting on behalf of a proposer will automatically disqualify the proposer.

During the evaluation process, the Tenderer may be required to give formal presentations of their proposals to representatives of the Awarding Authorities.

Information provided in proposals and in subsequent discussions and written communications, prices, availability dates and services offered by the Tenderers will be considered to form part of the basis of any contractual arrangements in the event of a proposal or proposals being accepted by the Awarding Authority.

The following will form part of the contract document for the proposed services:

This TENDER DOCUMENTATION and

Tenderer responses to the Request for Tender

Modifications and amendments to the above documents formally agreed between the parties to the contract

The final terms and conditions agreed between the parties to the contract.

The official order for the services issued by the Awarding Authorities.

1.6 Qualification process and main award criteria

Any contract (s) that may be awarded will be awarded on the basis of a number of criteria.

- The most economically advantageous tender based on Costs (exclusive of Value Added Tax)
- The capability of the tenderer to satisfy the requirements specified in this document based on the most relevant expertise and experience. Proposers may be required to provide evidence of competence and experience of providing similar studies by providing details of reference studies.
- Technical and management competence
- Capability to meet proposed deadlines and schedules.
- The quality and completeness of the response provided and compliance with any specified numbering and format.
- Satisfactory references

Cost shall not be the sole determining factor.

Tenderers should cover the cost of tendering

2 Background to HEA

The Higher Education Authority is the planning and development body for higher education in Ireland. It was set up on an ad hoc basis in 1968, and was given statutory powers in the Higher Education Authority Act 1971, which were amended in the Universities Act 1997 and the Institutes of Technology Act 2006.

The principal functions of the HEA are:

- to further the development of higher education
- to maintain a continuous review of the demand and need for higher education.
- to assist in the co-ordination of state investment in higher education and to prepare proposals for such investment.
- to allocate among universities and designated institutions the grants voted by the Oireachtas
- to promote the attainment of equality of opportunity in higher education and democratisation of higher education.
- assist the universities and institutes of technology in achieving objectives and review and report on their strategic development plans, policies on access and equality
- determine the amount of money to be allocated to a university or Institute of Technology, receive its budget and be informed of any likely expenditure in excess of budget by it
- approve the form in which university and institute of technology accounts may be kept and determine the form of an annual report by institutes of technology
- agree frameworks under which remuneration may be paid by a university which departs from otherwise approved levels, under which remuneration may be paid to university employees by a university trading, research or other corporation, under which a university or institute of technology may borrow or guarantee or underwrite a loan; make arrangements under which remuneration made be paid to staff of an Institute of Technology by an Institute of Technology company or undertaking,
- review the fees charged by universities and advise the universities on fees which should be charged
- approve pension schemes, with the consent of the Ministers for Education and Skills and Finance and make determinations subject to the agreement of the Ministers for Education and Skills and Finance in relation to disputes on claims to or amounts of pensions

In addition the National Strategy for Higher Education envisages a more strategic role for the HEA in the further development of the higher education system, including monitoring the performance of higher education institutions and providing accountability to the Minister in respect of

performance outcomes for the sector. The HEA is required to ensure an appropriate balance between demand and supply with due regard to the maintenance and enhancement of quality.

A full outline of the role proposed for the HEA in the National Strategy is at Appendix 1.

The HEA has wide advisory powers throughout the whole of the third-level education sector. In addition it is the funding agency for the universities, the institutes of technology and a number of designated institutions of education

The Authority periodically sets up task forces to examine particular matters before the Authority. The task forces report back to the Authority.

The Authority is also the Irish contact point for a number of EU programmes e.g. Socrates/Erasmus, Tempus and Minerva.

The Authority also oversees the budgeting, accounting and financial reporting of universities, institutes of technology and designated institutions.

The National Office for Equity of Access to higher Education is located at the HEA. Its main purpose is to boost participation in higher Education from designated underrepresented groups.

The Authority manages a number of research funding programmes and advises on co-ordination of state investment in research in higher education.

Further details on the HEA may be got from the HEA website – www.hea.ie

The HEA also acts as the administrative agency for the Research Council which funds individual researchers.

3. Requirements

A National Strategy for Higher Education to 2030 was published by the Department of Education and Skills in 2011. The National Strategy suggests that while the Irish higher education system has been excellent in delivering very significant increases in participation over the last decades, and in building research infrastructure, it is relatively uncoordinated. In a context of increasing resource constraints and international competitiveness there is a need for the system to become more coordinated, to improve quality and efficiency, to protect diversity of mission and to enable the achievement of the many objectives for higher education set out in the national strategy.

As part of the process to achieve greater co-ordination and coherence within the higher education system, the HEA will publish an outline structure by the end of 2012 setting out numbers, types and locations and agreed missions of the higher education institutions that comprise the overall system. This outline structure will be informed by the proposals of the HEIs themselves (based on their own strategic plans and on submissions received in response to the attached letter and framework document “Towards a Future Landscape for Higher Education” that issued to all higher education institutions in February 2012), the views of the executive and Board of the HEA, by a process of discussion with the HEIs on their proposals, and by the findings of a study by international higher education experts who will set out from an objective basis the elements of such a coherent system. The international expert study however, will be informed in the first instance by the report which is the subject of this tender as set out at 3.1 below.

The international expert study will involve a review of coherent higher education systems in other relevant countries, identifying best practice and risk factors, a review of the current Irish position by reference to the strategic plans and profiles of the Irish higher education institutions, and advice on international trends in the configuration of higher education systems.

The output from the overall process (data review, international expert study, proposals from and discussions with HEIs) will be a model of the Irish higher education system that identifies -

- an optimal configuration of institution types, including the number of institutions, the role of each institution and the appropriate set of inter-relationships between them;
- opportunities for rationalisation/consolidation of existing institutions, and
- the structures and processes required to create and sustain a coherent system of institutions.

3.1 The Brief for the Report which is the Subject of this Tender

The HEA, through this tender, requests proposals from interested parties to provide a comprehensive report which would constitute an environmental analysis of the demand for higher education, arising from stated policy objectives and demographic, economic and social demand. The report should review the evidence base for the drivers of change in Irish higher education and provide advice on the likely scale of the system over the next 10-20 years based on expected demand and available funding under two funding scenarios – one scenario based on no change in current or announced levels of available funding and one based on growth in funding from non-state sources to meet projected increases in demand at current system average levels of unit cost. The expected approach to the review is

through a meta-analysis of existing reports and research, and the study should

- review the national and regional demographic projections and the assumptions underlying national and regional demand for higher and further education;
- review current national, EU and international skills forecasts for both medium term and longer term 21st century skills requirements, by analysis of existing national reports and advice from bodies such as Forfás , Expert Group on Future Skills Needs, IDA, EI and others, and advice on the relevance of international skills forecasts to and likely impact on future demand for higher education in Ireland;
- review student demand for higher education taking account of academic preparedness of students and taking account of the availability and appropriateness of alternative forms of post-secondary education and training
- provide analysis of current levels of educational attainment of the national population by region and identify areas of significant demand, short term and long term, by full time students and for part-time, adult, continuing and flexibly provided higher education;
- provide analysis of demand for conduct of research by Irish higher education institutions taking account of existing policies and reports such as 'Report of the Research Prioritisation Steering Group 2012', 'Innovation Ireland – the report of the innovation task force 2010', 'Strategy for Science Technology and Innovation 2006-2013', 'Playing to our Strengths – the role of Arts, Humanities and Social Sciences and Implications for Public Policy 2010' and other relevant reports
- provide analysis of demand for access to higher education by under-represented groups taking account of policies and national targets in this regard
- provide analysis of demand for increased internationalisation of the student body taking account of policies and targets in this regard

The successful research consultancy will be awarded the contract to prepare a report which would be available by end June 2012 and would be used to inform the second stage study by international higher education consultants.

Your tender must show in the submission how your company would deal with client's requirements from the point of view of the management of the working relationship, and that you would be able to commence work on this project by early April 2012.

Please submit a list of current clients, details of any awards won, and some samples of previous work.

4. Instructions to Tenderers

4.1 Proposed format

The tenderer's submission should be structured as follows;

- (1) Management summary
 - 1.1 Proposed overview
 - 1.2 Service summary costs
 - 1.3 **Delivery approach and timescale**
- (2) Tenderer profile
- (3) References
- (4) Additional information and appendices

4.2 Management Summary

4.2.1 Proposal Overview

Provide an overview of the structure of the proposal, and a statement that it conforms to the specified format. Outline the key features of the approach to the report, as well as any other relevant information.

4.2.2 Service Summary costs

Provide summary details of costs, (including Value Added Tax as appropriate)

4.2.3 Delivery timescale

A description of the delivery timescale to complete the report.

4.3 Tenderer staff

Tenderers must identify by name those people who will be assigned to this project should they be successful.

4.4 References

List three references including a contact name. Examples of previous work should be provided.

4.5 Contractual Arrangements

The Tenderer must provide a copy of any proposed terms and conditions for the contract with their tenders. This should include the provision of appropriate working papers and files being made available to the Authority, if requested. It should also outline a proposed process to arbitration in the case of disputes or other difficulties that may arise.

Tenderers may provide a proposed payment schedule based on projected costs.

4.6 Additional information and appendices

Tenderers may provide additional information and appendices as they consider appropriate.

Appendix 1

Responsibilities assigned to the HEA by the National Strategy for Higher Education

The HEA is required to provide strong central oversight in the operational delivery of the strategic agenda – the Department is to remove itself from an operational role.

The role of the HEA is to be revised, governance structures revised, with clearer definition of key operation and implementation functions, and clearer definition of its relationship with the HEIs and its role in achieving and maintaining the necessary balance between institutional autonomy and accountability to the State.

The HEA is to be accountable to the Minister for Education and Skills in respect of delivery on agreed performance indicators for the sector.

The HEA will have an inter-agency co-ordinating role in support of the Department implementation oversight group.

The HEA is required to lead the process of change in the system architecture.

The HEA is required to collect and analyse data from the sector to better inform and advise the Minister and to create a fully comparable system database to underpin a new accountability framework to strengthen system governance.

The HEA must lead the implementation of revised funding arrangements to align public investments with strategic objectives, and maintain quality through sustainable growth. Long-term revisions identified for the funding model include:

Revisions to Recurrent Grant Allocation Model to facilitate Access and Life Long learning

Restructuring of overall funding system to incorporate wider base of funding sources including private contributions with due regard to reforms of the student grants system as determined by DES.

Move to a system of Service Level Agreements with the HEIs as part of a broader Strategic Dialogue – including

A performance incentive system

Dedicated funding to promote performance on key national priorities

As part of the Strategic Dialogue, which is to be a key HEA responsibility and a key instrument for delivering the National Strategy, the HEA must engage in strategic dialogue with the HEIs and the sector to align the strategies of individual institutions with national priorities. The strategy is very specific on what the dialogue must cover including:

How national priorities are to be implemented and the coherence of the HEI strategic plans with those national priorities

The development and agreement of performance outcomes and the assessment of performance against them

The sharing and mainstreaming of good practice

The review of overall system coherence and balance of diversity

The HEA is required to lead the process of forecasting demand for higher education taking account of labour market skills needs

The HEA is required to ensure an appropriate balance between demand and supply with due regard to the maintenance and enhancement of quality

The HEA is required to analyse and fund capital infrastructural requirements

The HEA is required to co-operate and engage with international counterparts and in particular with higher education in Northern Ireland

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