

# Northern Ireland competitiveness damaged by graduate skills shortage

## A review of the evidence





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# Introduction

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**Northern Ireland has a skills crisis. Official and academic reports repeatedly warn that Northern Ireland's skills are inadequate to compete in the global economy – especially as this becomes a knowledge economy.**

Northern Ireland has not done enough to become competitive in terms of skills, productivity and graduates. It needs a big increase in graduate numbers to compete internationally, in particular against the Republic of Ireland and Scotland – both of which have invested heavily in student numbers to give them the graduate skills base to attract Foreign Direct Investment and enable indigenous businesses to expand on an international stage.

Northern Ireland loses about 5,000 of its best students every year to universities in Great Britain. Most of these do not return. It is a brain drain of epic proportions.

Northern Ireland has the smallest university sector of any of the UK's four nations. We need to produce and retain at least an extra 2,000 graduates a year to be internationally competitive. Given that most university courses last three years, that equates to at the very least an extra 6,000 undergraduate places in Northern Ireland.

But the projected demands of the economy are substantially greater than this, suggesting more than 6,000 additional graduates are required by the economy each year to meet long term needs. This would equate to about 18,000 additional undergraduate places. More than 15,000 additional student places are required to match the provision, per capita, of England. That gap will increase further this year, with the UK Government increasing the provision of university places by 30,000 places – and by even

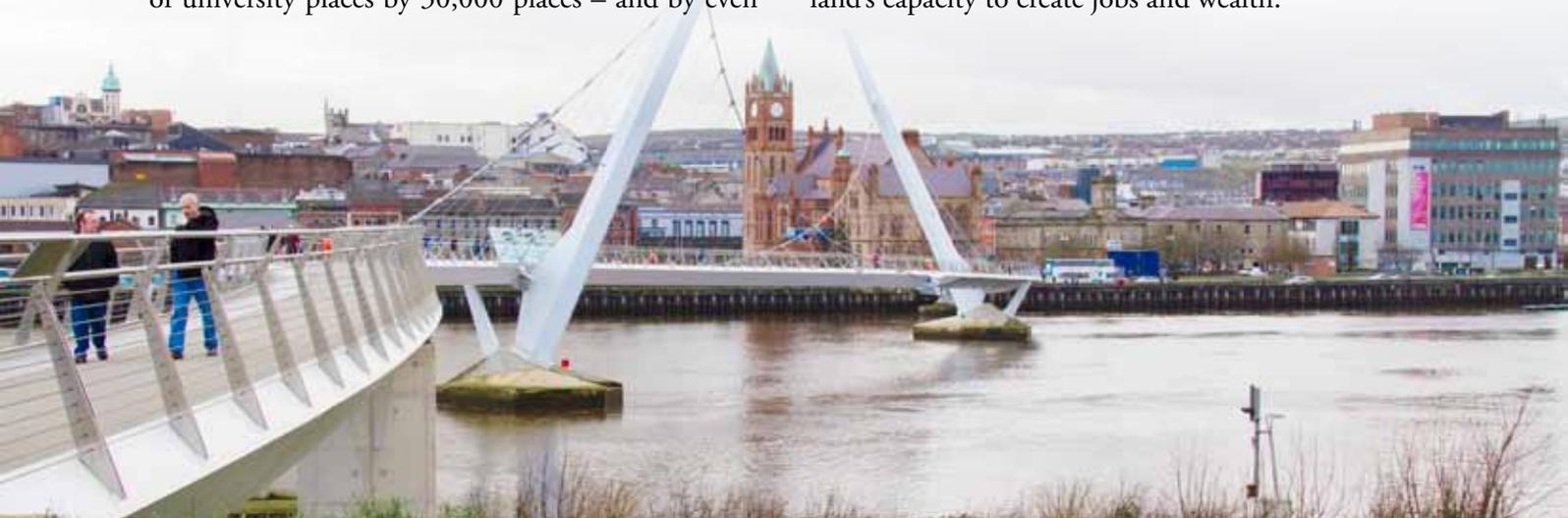
more in 2015, when it removes its remaining cap on student numbers.

Northern Ireland has led the rest of the UK in school pupils going to university. Northern Ireland has the highest rate of young people going on to higher education, with more than 50% doing so. However, Northern Ireland has not matched this with a significant rise in university places. The rise in students going to university has been fulfilled by universities in Great Britain meeting their needs. This has been enabled by England abolishing its MaSN – maximum student numbers – in 2002/3. Meanwhile, Northern Ireland has retained its MaSN, forcing more students to become 'reluctant leavers' to university in Great Britain.

Creating more graduates in Northern Ireland is central to the aim of driving up productivity. Studies show a strong link between the number of graduates in a workforce and the level of productivity – so it is no surprise that Northern Ireland has the worst productivity of any UK region.

If Northern Ireland is serious about moving to a high value, high waged, knowledge based economy, it has to increase the number of graduates in its workforce. If the most deprived region of Northern Ireland – the North West – is to create more jobs and greater wealth for the benefit of its citizens and the whole of Northern Ireland it must substantially increase the flow of graduates into its workforce.

If Northern Ireland does not take this seriously it will be unable to compete effectively, in particular against the Republic of Ireland and Scotland. This would create a severe impediment to Northern Ireland's capacity to create jobs and wealth.



# Executive Summary

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- Northern Ireland produces many more young people going to university than any other part of the UK. (About 50% from NI, compared to 34% in England.)
- A large proportion of Northern Ireland's young people go to university in Great Britain. (27% study at university in GB.)
- There has been an 8% rise in Northern Ireland students going to Great Britain to study at university in the ten years ending 2011/12. This is despite the peace process and the introduction of much higher tuition fees in Great Britain.
- This period of growth in Northern Ireland students going to university in Great Britain has coincided with the date at which England lifted its MaSN cap, 2002/3.
- The rise in the rate of Northern Ireland's young people who go to university has therefore mostly been met through the increase in student numbers in Great Britain and the proportion of Northern Ireland young people who leave to study in GB.
- Most Northern Ireland people who study at university in Great Britain live and work there after graduation. (Two thirds stay in GB after graduation.)
- Very few people from elsewhere come to Northern Ireland to study at university. (4% of university students in NI come from GB.)
- There is a substantial loss of undergraduates from Northern Ireland. Some 2,500 Northern Ireland school leavers each year go to study in Great Britain. But this understates the total loss, when mature students and those who have taken a gap year are taken into account. In 2011/12 there were 8,820 first year students at Northern Ireland HEIs, but 4,800 first year students from Northern Ireland at GB HEIs. Therefore the total annual loss of Northern Ireland students is around 5,000 per year – of whom around two thirds will not return.
- The rate at which Northern Ireland students leave to study in Great Britain has increased, despite the peace process.
- In 1997, the university participation rate in Northern Ireland was 33%.<sup>1</sup> By 2009/10, the participation rate had exceeded 50%.<sup>2</sup> However, with very limited growth in higher education places in Northern Ireland in recent years, this growth has overwhelmingly been serviced by Great Britain.
- An extra 1,575 Northern Ireland students attended first year in university in 2011/12, compared to 2002/3. But only 315 extra university places were created in Northern Ireland in that time. That period coincided with the ending of the MaSN cap in England – so the increase in Northern Ireland's university participation rate has been achieved through increased student numbers in Great Britain.
- Northern Ireland has the smallest proportion of graduates in its population of any part of the UK, substantially below the levels in London, Scotland and the South East of England.
- Northern Ireland has the smallest university sector of any part of the UK.
- Northern Ireland has one of the smallest proportions of graduates in its adult population of any of the advanced economies.
- Northern Ireland underperforms in comparison with the Republic of Ireland in terms of the proportion of young people who achieve a graduate qualification. (45% of young people in the Republic complete their education with a degree or higher, compared to about 31% in Northern Ireland.)
- Northern Ireland underperforms against its competitor nations for inward investment in terms of the proportion of adults who achieve a graduate qualification. (Graduates make up 26% of Northern Ireland's adult working age population, against 31% in the UK, over 35%. In Scotland over 35% in the southern region of the Republic that covers Dublin and Cork.)
- The Republic of Ireland has one of the largest proportions of graduates in its 30 to 35 age range (at 49%).
- While low corporation tax rates were the 'critical factor' in attracting inward investment to the Republic of Ireland, especially from the United States,

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1. [www.ofmdfmi.gov.uk/highereducation.pdf](http://www.ofmdfmi.gov.uk/highereducation.pdf), page 1

2. [www.delni.gov.uk/statistical-factsheet-1-higher-ed-age-participation-index-ni-1989-2010.pdf](http://www.delni.gov.uk/statistical-factsheet-1-higher-ed-age-participation-index-ni-1989-2010.pdf)

a suitable labour market was the second most important factor – in particular, the availability of graduates and other highly skilled workers.

- The Republic of Ireland's 'unique ability' to provide English speaking graduates in sufficient numbers was an essential factor in the Industrial Development Agency's success in attracting large scale inward investment.
- Dublin was the most attractive destination for large scale inward investment for two primary reasons: the location of leading universities and because it has a major airport.
- Prior to the global recession, inward investors played a central role in the Irish economy, with more than 1,200 overseas manufacturing and internationally traded services companies operating in Ireland employing 135,000 people, one third of the country's industrial workforce, and generating 55% of manufactured output and 70% of industrial exports.
- Availability of graduates drives foreign direct investment, but also encourages higher quality FDI – which produces the greatest contribution to growth and economic output. Northern Ireland has the smallest proportion of high quality FDI of any UK region, with about half the proportion of high quality FDI of Scotland.
- A recent report for the Scottish Executive noted: "foreign direct investment is attracted to host countries possessing a skilled and educated workforce".
- As the global economy strengthens, Northern Ireland will have too few graduates to attract much of the desired FDI, unless graduates can be attracted from elsewhere – a difficult and uncertain process.
- There is a high correlation between productivity and the levels of graduates in the adult population.

Northern Ireland has the lowest level of productivity of any UK region.

- A recent study for the UK Government concluded that 20% of the UK's growth in GDP between 1982 and 2005 was the result of the increase in graduate skills in the workplace. Increasing the rate of graduates in the workforce by 1% increases productivity by between 0.2% and 0.5%.
- Increasing the number of graduates in Northern Ireland's workforce can be expected to improve productivity and address this weakness in Northern Ireland's competitiveness.
- There are noted weaknesses of graduate employment in many parts of Northern Ireland's employment, including in agriculture, industry and management.
- There is a continuing problem that Northern Ireland produces too few STEM graduates, with too many graduates in general disciplines and teaching.
- There are around 3,100 skill shortage vacancies in Northern Ireland, with another 58,700 employees in place with skill shortages.
- Northern Ireland needs to reskill its workforce to compete, moving from an economy with many people with low skills, to one that is dominated by people with high skills. It is predicted that in the future we will need to have three times as many people with high, degree level, skills, as with low skills. As recently as 2005, there were more people in Northern Ireland's workforce with low skills than with high skills.
- To match economic projections of our future needs, we must achieve 45% of our adult population with high level skills. To achieve this would require in the region of 6,600 additional graduates being produced in Northern Ireland every year.



## Where Northern Ireland's school leavers went to university (2012)

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6,749 went to a Northern Ireland higher education institution (70.6% of those attending HEIs)

2,562 went to a British higher education institution (26.8% of those attending HEIs)

203 went to a higher education institution outside the UK (2.1% of those attending HEIs)

43 went to higher education, but it is not known where

Source: Department of Education, Northern Ireland<sup>3</sup>

Note: these are the most recent available figures

## 2011/12 First Year Full Time Northern Ireland undergraduates

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8,820 went to a higher education institution in Northern Ireland (64.8%)

4,800 went to a higher education institution in Great Britain (35.2%)



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3. Department of Education, Northern Ireland, by email



## How Northern Ireland compares to Great Britain

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Northern Ireland has substantially fewer of its resident population educated to degree level than do its competitor nations. Indeed, Northern Ireland has one of the lowest rates of graduates per capita of any developed economy.

The percentage of the Northern Ireland population holding a degree is substantially below the rate for the UK as a whole. Northern Ireland has 26% of its population educated to degree level, against 31% in the UK as a whole<sup>4</sup>. This understates the scale of the problem in terms of Northern Ireland's competitive position, as the UK is some way below the average rate of graduates amongst OECD nations.

Northern Ireland outperforms the rest of the UK in terms of the percentage of school leavers who go to university. In the 2011/12 year, 42.3% of NI school leavers went on to higher education institutions<sup>5</sup>, down from 50.7% in 2009/10<sup>6</sup>. This compares to 35.6% in Scotland (2011/12)<sup>7</sup> and 34% in England (2009/10)<sup>8</sup>.

However, more than a quarter of these students do not study in Northern Ireland universities and the number and proportion of Northern Ireland school

leavers who move to Great Britain to study is increasing. In 2011/12, 27% of school leavers went to Great Britain to study at university, with another 7% studying through the Open University and 66% studying at a Northern Ireland higher education institute. That represents more than 2,500 students who left Northern Ireland in 2011/12 to study in Great Britain at university.

There has been an 8% rise in Northern Ireland students going to Great Britain to study at university in the ten years ending 2011/12. This is despite the peace process and the introduction of much higher tuition fees in Great Britain.<sup>9</sup>

There is substantial loss of undergraduates from Northern Ireland. Some 2,500 Northern Ireland school leavers each year go to study in Great Britain. But this substantially understates the total loss, when mature students and those who have taken a gap year are taken into account. In 2011/12 there were 8,820 first year students at Northern Ireland HEIs, but 4,800 first year students from Northern Ireland at GB HEIs.<sup>10</sup> Therefore the total annual loss of Northern Ireland students is around 5,000 per year.

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4. [www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5bf39b64.pdf](http://www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5bf39b64.pdf)

5. [www.delni.gov.uk/qualifications\\_and\\_destinations\\_1112.pdf](http://www.delni.gov.uk/qualifications_and_destinations_1112.pdf)

6. [www.delni.gov.uk/statistical-factsheet-1-higher-ed-age-participation-index-ni-1989-2010.pdf](http://www.delni.gov.uk/statistical-factsheet-1-higher-ed-age-participation-index-ni-1989-2010.pdf)

7. [www.scotland.gov.uk/Publications/2013/06/7503/1](http://www.scotland.gov.uk/Publications/2013/06/7503/1)

8. [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/16217/12-p155-widening-participation-higher-education-aug-2012.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/16217/12-p155-widening-participation-higher-education-aug-2012.pdf)

9. [www.delni.gov.uk/he-enrolments-2011-12.pdf](http://www.delni.gov.uk/he-enrolments-2011-12.pdf)

10. [www.delni.gov.uk/he-enrolments-2011-12.pdf](http://www.delni.gov.uk/he-enrolments-2011-12.pdf), table two



Meanwhile, a mere 4% of the Northern Ireland intake came from Great Britain to study at university in 2011/12<sup>11</sup>. It might have been expected that as the peace process bedded down, the loss of undergraduates would decrease. Instead, the opposite has happened. Over the last 10 years, there has been a rise in first year Northern Ireland undergraduates who study in GB<sup>12</sup>.

The significance of this loss of undergraduates is that most do not return. Of those Northern Ireland students who graduated in GB, around two thirds do not return to Northern Ireland in the short or medium term.<sup>13</sup> The vast majority continue to live in GB.

Northern Ireland has the smallest proportion of graduates in its total population of any UK region and is substantially below the levels in London, Scotland and the South East of England.<sup>14</sup>

There has been an increase of 1,575 Northern Ireland students attending first year in university in the period 2002/3 to 2011/12. However, the rise in Northern Ireland students with places in Northern

Ireland higher education students was a mere 315. While there is a rise in the proportion of Northern Ireland young people – either immediately after leaving school, or subsequently – who go on to university, there are insufficient places available to them in Northern Ireland, forcing thousands of them to migrate to Great Britain if they wish to study.

While student numbers in England have not been subject to a MaSN cap since 2002/3, places in Northern Ireland are still capped, preventing an increasing number of school leavers from studying at university in Northern Ireland.<sup>15</sup> In fact, this rise in Northern Ireland students attending university in Great Britain has coincided with the period since the abolition of the MaSN cap in England.

In 1997, the university participation rate in Northern Ireland was 33%.<sup>16</sup> By 2009/19, the participation rate had exceeded 50%.<sup>17</sup> However, with very limited growth in higher education places in Northern Ireland in recent years, this growth has overwhelmingly been serviced by Great Britain.

*“The number of funded full-time higher education places in Northern Ireland is capped by the government – the Maximum Aggregate Student Number (MASN) - and as a result the demand for places exceeds the supply of places. In these circumstances the asking grades in some instances are higher in Northern Ireland and especially at the University of Ulster than in comparable courses in some universities in Britain.” Higher Education in Northern Ireland: A Report on Factors Associated with Participation and Migration, published by the Office of the First Minister and Deputy First Minister.<sup>18</sup>*

11. [www.delni.gov.uk/he-enrolments-2011-12.pdf](http://www.delni.gov.uk/he-enrolments-2011-12.pdf)

12. University of Lincoln study

13. [www.napier.ac.uk/employmentresearchinstitute/projects/Documents/NIBrief.pdf](http://www.napier.ac.uk/employmentresearchinstitute/projects/Documents/NIBrief.pdf)

14. [www.ons.gov.uk/ons/dcp171776\\_259049.pdf](http://www.ons.gov.uk/ons/dcp171776_259049.pdf)

15. [www.delni.gov.uk/optimum\\_number\\_of\\_undergraduates.pdf](http://www.delni.gov.uk/optimum_number_of_undergraduates.pdf)

16. [www.ofmdfmi.gov.uk/highereducation.pdf](http://www.ofmdfmi.gov.uk/highereducation.pdf), page 1

17. [www.delni.gov.uk/statistical-factsheet-1-higher-ed-age-participation-index-ni-1989-2010.pdf](http://www.delni.gov.uk/statistical-factsheet-1-higher-ed-age-participation-index-ni-1989-2010.pdf)

18. Higher Education in Northern Ireland: A Report on Factors Associated with Participation and Migration, Bob Osborne and Alayne Smith with Amanda Hayes, University of Ulster, Social & Policy Research Institute, <http://www.ofmdfmi.gov.uk/highereducation.pdf>

## The combined impact of MaSN with the introduction of tuition fees potentially discriminates against children from low income families

“It may well be the case that some of those who are currently quite content to leave Northern Ireland for study will feel obliged to try and stay for cost reasons. In other words while some of the determined leavers may well not see cost as an issue others, perhaps drawn from the slightly less well-off groups compared to those from the highest income brackets, may well seek to stay as, in effect, reluctant stayers. In this instance, *the likely increase in demand for places in Northern Ireland, unless the number of places is increased, will increase the asking grades sought by the universities* which are already dealing with the upward drift of A level grades. In these circumstances, in the absence of special measures, *it is quite possible that the intake into the two Northern Ireland institutions* (and other higher education providers) *could become more middle class* and the proportion of better-off Protestants could increase. Several groups could become losers in this scenario. First those Catholics from working class backgrounds, currently

quite well represented in higher education in Northern Ireland, could increasingly find it more difficult for local study. Second, working class Protestants, especially males, already not very well represented in higher education could find themselves even less able to access universities on the basis of their qualifications held. *It is already the case that those with the lowest qualifications tend to be from the lowest socio-economic groups and it these groups who could be forced to leave Northern Ireland to study usually at the post-1992 universities.* Ironically, therefore, not only is it the least well-off who could become the direct major financial casualties of the policy of shifting the costs of higher education onto individual students and their families but they could also lose out additionally as a result of the changes in migration flows.”

*Higher Education in Northern Ireland: A Report on Factors Associated with Participation and Migration*

## Northern Ireland is falling further behind England

Northern Ireland’s comparative position within the UK is getting worse. Not only does Northern Ireland have the smallest university sector, per capita, within the UK, but England’s higher education provision is being expanded significantly.

Chancellor George Osborne announced in the 2013 Autumn Statement, that university provision in England is to be substantially increased.

Osborne said: “This year [2013] is the 50th anniversary of the Robbins Report, which challenged the nonsense that university was only suitable for a small few. In 1963, Robbins said that ‘courses of higher education should be available for all those who are qualified by ability and attainment to pursue them and who wish to do so’. That was true then, I believe it should remain true today.

“Our reforms to student loans, difficult as they were, have put our universities on a secure footing. Some predicted that applications from students from poor backgrounds would fall. Instead I can report that this year we have the highest proportion of young people from disadvantaged backgrounds applying to university ever.

“But there is still a cap on aspiration. Each year, around 60,000 young people who have worked hard at school, got the results, want to go on learning and want to take out a loan to pay for it, are prevented from doing so because of an arbitrary cap. That makes no sense when we have a far lower proportion of people going to university than even the United States, let alone countries like South Korea. Access to higher education is a basic tenet of economic success in the global race.

“So I can announce that next year [2014] we will provide 30,000 more student places – and the year after we will abolish the cap on student numbers altogether. Extra funding will be provided to science, technology, and engineering courses. The new loans will be financed by selling the old student loan book, allowing thousands more to achieve their potential.”

While all these arguments apply in England, they apply even more forcefully in Northern Ireland given the existing gap in provision in comparison with England and key competitor advanced and emerging economies.



## Northern Ireland's position in the world

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Northern Ireland performs extremely poorly in international terms in its ratio of graduates to total population.

Across the 26 OECD member states – the developed economies – the average rate of young people completing university level education is 38%. The highest percentage is recorded in Finland at more than 60%. Finland arguably also has the most advanced high technology sector in Europe, which is not a coincidence. The Republic of Ireland is also above average, at more than 45%. The UK is below average at around 35%.<sup>19</sup>

After excluding those from Northern Ireland who study in Great Britain, the figure for Northern Ireland is less than 31%. Only three OECD countries have rates of school leavers going to university at lower levels than this and all have very specific explanations for this.

One is Luxembourg, which only formed a university for the first time in 2003 and therefore has a long established tradition, as a very small country, of its brightest students going abroad to university. Today the university is small and draws a very international student base, confirming the tradition of the country's own students going abroad to university.

A second is Hungary, where the government has imposed a strict cap on student numbers as part of its austerity programme. Many young people now study at university abroad, where there are better chances of gaining employment upon graduation.<sup>20</sup>

The third country, Germany, has a much stronger vocational training element in its education system and a higher standard of pre-university education, which means that comparisons of undergraduate numbers in Germany and Northern Ireland/the UK are misleading. Moreover, Germany remains the strongest economy in Europe, which is not generally competing for inward investment as a means of resuscitating its economy.

More significant are comparisons between Northern Ireland and the Republic of Ireland. The Republic is educating almost 50% more of its school leavers at university level compared to Northern Ireland.

Other OECD countries have strong advantages over Northern Ireland in terms of their undergraduate and graduate rates - Australia, Denmark, Finland, Iceland, New Zealand, Poland, Portugal and the Slovak Republic all strongly outperform Northern Ireland. Of these, Poland and the Slovak Republic, as well as the Irish Republic, will be strong competitors of Northern Ireland for inward investment.

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19. [www.oecd-ilibrary.org/docserver/download/9610061ec006.pdf?expires=1377274907&id=id&accname=guest&checksum=A203D001A8F2478DCF97E75395C5C216](http://www.oecd-ilibrary.org/docserver/download/9610061ec006.pdf?expires=1377274907&id=id&accname=guest&checksum=A203D001A8F2478DCF97E75395C5C216)

20. [www.bbc.co.uk/news/world-europe-19213488](http://www.bbc.co.uk/news/world-europe-19213488)

Graduates make up 26% of Northern Ireland's adult working age population, against 31% in the UK as a whole<sup>21</sup>. The figure for Scotland – a competitor for inward investment – is over 35%<sup>22</sup>. In the Republic of Ireland, more than 30% of its Northern region have graduate level qualifications and more than 35% in the region that covers Dublin and Cork.<sup>23</sup>

There are a number of different studies that reach slightly different conclusions on the proportion of graduates and higher level skills in the workforce. Oxford Economics' study for DEL reported on comparative levels of graduates and higher level skills in the adult population in OECD areas and found Canada at 46%; London at 44%; United States at

39%; Scotland at 36%; Republic of Ireland at 34%; UK at 32%; and Northern Ireland at 29%. These figures probably understate the rates in the United States and the Republic of Ireland, as their figures, unlike the other areas, exclude high level non-degree qualifications.

Ireland has the highest rate of any country in Europe for graduates as a proportion of adults aged between 30 and 35.<sup>24</sup> Some 49% have a graduate level qualification.

The UK outperforms the OECD average for vocationally oriented tertiary education, but again the Republic of Ireland significantly outperforms the UK.

## Why graduates are important

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The graduate and advanced skill base of a country is important for two key reasons. It enables indigenous businesses to grow, exploiting their skill base. Indeed graduates are more likely to establish businesses and the business they create are more likely to be successful. Secondly, a graduate skill base attracts inward investment, particularly in the high value sectors that can help grow an economy fastest.

It is widely assumed that the Republic of Ireland attracted inward investment through its low corporate tax rate. However, there is clear and strong empirical evidence that three key factors attracted mobile capital to the Republic of Ireland, particularly from the United States.

Those three factors have been tax, grants and skills – especially the availability of graduate level skills. The tax factors have been low corporate tax rates and helpful tax treatment of multinational revenues that were not retained in the jurisdiction. The second factor has been grant support for location in Ireland from the Industrial Development Agency. However, grant assistance in Ireland has been comparable to levels in competitor locations and has consequently not been a deciding factor.

The third key factor has been the availability of a higher skilled workforce in Ireland, with an exceptionally high level of young adults with degree level skills. A 2001 study<sup>25</sup> of United States' investment in the Republic found that the corporation tax rate was the 'critical factor', that grant support was less significant and that the second most significant factor was labour market issues – the combination of relevant skills, a common language, flexibility and availability.

Eight of the ten companies studied located in or around Dublin because of its location near to universities and to a major airport. Studies of cities in England<sup>26</sup> similarly concluded that the four investment location key criteria were closeness to a university, availability of skills, an adjacent airport and good road and rail links.

The benefits to the Republic of its investment in higher education have been substantial. At the time of the 2001 study, there were over 1,200 overseas manufacturing and internationally traded services companies operating in Ireland employing 135,000 people – one third of the country's industrial workforce. These companies generated 55% of manufactured output and 70% of industrial exports. This

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21. [www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5bf39b64.pdf](http://www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5bf39b64.pdf)

22. [www.ons.gov.uk/ons/dcp171776\\_259049.pdf](http://www.ons.gov.uk/ons/dcp171776_259049.pdf)

23. [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Education\\_statistics\\_at\\_regional\\_level](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Education_statistics_at_regional_level)

24. [www.educationmatters.ie/2011/04/19/ireland-best-in-eu-for-number-of-graduates/](http://www.educationmatters.ie/2011/04/19/ireland-best-in-eu-for-number-of-graduates/)

25. THE ECONOMIC AND SOCIAL REVIEW, January, 2001

26. The Centre for Cities, plus private research conducted by the author for a client

represented 24% of all US investment in Europe and 14% of all FDI projects in Europe.

The report cited other evidence to back-up their conclusion that graduate level skills had been important in attracting FDI. “In their study of locations attractive to US foreign direct investment, Cooke and Noble (1998) found evidence that a country’s education and skill base are by far the most critical factors in determining an industrial relation’s systems attractiveness to foreign investment. Likewise, Hannigan (1999) cites the Irish education system as being the most important factor influencing the competitiveness of multinationals located in Ireland. In this context, both McGovern (1998) and Gunnigle, Morley and Heraty (1997) argue that it was Ireland’s unique ability to provide a cheap supply of graduate English speaking labour, that has aided the IDA and other agencies in successfully attracting large-scale investment from multinational companies.”

The Irish government has taken the same view. A 2007 government report stated: “McIver Consulting’s report and other research show that this increase in supply of skilled graduates had a very significant effect in influencing inward investment by multi-nationals both in terms of expectation of an increased supply of skilled graduates and a perception that the Irish government were responsive to the needs of the ICT industry and were prepared to develop rapid policy and practical responses to those expressed needs. The rapid supply of technicians from the Accelerated Technician Programme (ATP) courses particularly contributed to the high growth experienced in the Celtic Tiger years. McIver Consulting’s research also indicates that the programme contributed significantly to the retention of inward investment during the downturn, allowing existing firms to move up the value-added chain, migrating lower added value operations abroad and upgrading operations in Ireland.”<sup>27</sup>

As well as being one of the key factors in attracting FDI, graduate skills also help determine the type of FDI that is attracted. High quality graduates with the relevant skills attract FDI that is of high value, which is also typically a high growth economic sector.

A recent report by RSM Tenon for the Scottish Executive found that Northern Ireland has the lowest percentage of high quality FDI of any UK region. Most FDI in Northern Ireland was of good quality, not high quality. Some 46% of Northern Ireland’s FDI was of high quality. This compared to 99% of FDI in the East of England being of high quality, which is consistent with its location in and near to the so-called Silicon Fen near Cambridge University. It is also noticeable that Scotland – which has strongly marketed its location on the basis of its graduate skills – also strongly benefits from high quality FDI, which accounts for 85% of its FDI (almost twice the percentage of high quality FDI as Northern Ireland). The report for the Scottish Executive commented: “The evidence linking labour force characteristics and FDI is quite consistent. Specifically, foreign direct investment is attracted to host countries possessing a skilled and educated workforce.”<sup>28</sup>

It is clear that Northern Ireland needs more graduates if the economy is to develop in future years. Richard Barnett is Vice Chancellor of the University of Ulster and was appointed by enterprise minister Arlene Foster as chairman of DETI’s Independent Review of Economic Policy. He says: “It is well-recognised that graduate level skills are an essential ingredient for those nations and regions, such as Northern Ireland, that aspire to compete in high value added sectors and thereby deliver high wages for their citizens. Yet Northern Ireland has the smallest number of higher education places per head of population of the four nations of the UK.

“Given the current state of the economy, this doesn’t act as a constraint. But as growth picks up if Northern Ireland is to match performance elsewhere in the UK it will have to import graduate level skills. This means that potential investors will then face the decision of going where graduate level skills already exist, or investing here and facing the additional risk that they’ll be unable to attract those skills from elsewhere. Presenting investors with such an additional risk will clearly put Northern Ireland at a competitive disadvantage and jeopardise the number of high wage jobs that we can sustain.”<sup>29</sup>

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27. EXPENDITURE REVIEW Information & Communication Technologies (ICT) Undergraduate Skills Programme, published by the Department of Education and Science, 2007

28. Inward Investment Research, RSM Tenon, 2013

29. Interviewed by the author and quoted in Business Month, 2013

It needs to be stressed that universities play a wider role than simply creating the skills that attract inward investment. They sustain, grow and even create indigenous businesses. Many of the world's leading entrepreneurs have emerged with the help of management training from universities of excellence. Some of those businesses, in fact, emerged as spin-offs or spin-outs from universities. While the number of these businesses is small as a proportion of new starts, they can be highly significant high growth businesses in key areas of technological and scientific development.

Universities also support the development of industrial clusters, facilitating information exchange and knowledge transfer. Leading companies often develop close technical relationships with universities, sometimes becoming directly involved in the creation of facilities for mutual benefit. This type of relationship can be based around solving specific, one-off, technical problems; enabling the university to be a feeder of specific skills to meet a company's specific needs; or by providing the sponsorship of a course or school, supporting the training of potential employees. In this way, universities can assist with the economic development of a region or city.



## **The productivity gap**

Northern Ireland suffers from very low productivity – the lowest of any part of the UK. Studies show that increasing the proportion of graduates in the workforce directly contributes to increased productivity. The productivity impacts flow from improved technical input, influence on design and through higher level management skills.

A recent study for the UK Government<sup>30</sup> concluded that 20% of the UK's growth in GDP between 1982 and 2005 was the result of the increase in graduate skills in the workplace. The overall impact is probably greater than this, as the analysis fails to take into account indirect effects. The study went on to conclude that increasing the rate of graduates in the workforce

by 1% increases productivity by between 0.2% and 0.5%. This is a long run improvement, with annual improvement between 5% to 15% of this increase.

It is reasonable to conclude that the low levels of graduates in the Northern Ireland workforce is a significant factor in its low productivity.

Increasing the number of graduates in Northern Ireland's workforce can therefore be expected to improve productivity and to significantly address this specific weakness in Northern Ireland's competitiveness. This would benefit indigenous businesses and inward investors, while supporting the case for greater levels of FDI.

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30. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/229492/bis-13-858-relationship-between-graduates-and-economic-growth-across-countries.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229492/bis-13-858-relationship-between-graduates-and-economic-growth-across-countries.pdf)

## How Northern Ireland needs to move forward

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A series of reports for Northern Ireland government departments clearly map out the necessary direction to enable the skill base to improve its competitive position. This will benefit Northern Ireland both in terms of support for indigenous businesses to grow and also to attract FDI, particularly high value FDI.

The NIAES 2011 report, Identification of Priority Skill Areas in NI<sup>31</sup>, found that:

- The supply of skills in Northern Ireland needs to be better aligned with labour market needs
- All sectors in NI analysed – but especially the business, ICT, health and life sciences and renewable sectors - reported a strong need for higher level skills (levels 4 and above)
- There is a shortage of graduate level skills in management, which can drive companies and their creativity and design
- Growth in STEM skills, professional and technical skills and the numbers of scientists and engineers is essential.
- Most sectors reported a need for more STEM skills, particularly at graduate and postgraduate level
- Productivity is closely linked to the number of graduates with relevant skills
- NI is the worst performing UK region in terms both of employment rate and productivity per hour worked.

These might be regarded as the principled or theoretical arguments for boosting the graduate level skills in Northern Ireland. But just as important, there is strong evidence of real level demands for higher level skills. The Northern Ireland economy is already being held back by the shortage of graduates.

- There are around 3,100 skill shortage vacancies in Northern Ireland, with another 58,700 employees in place with skill shortages
- The employment in Northern Ireland of about 52,000 people from outside the UK and Ireland implies they are meeting employers' skill requirements that cannot be met from within the domestic workforce
- There are pressing needs for higher skills levels in the business services sector
- There are significant skills shortages in the ICT sector
- Retail management is characterised by low qualification levels
- The creative skills sector has a particular issue with skill gaps amongst its existing workforce
- Sectors with the biggest skill deficiencies are business services (including ICT); financial services; retail; food and drink / agri food; advanced engineering; and advanced manufacturing and materials. The emerging sectors for which we need to skill up are renewables; health and life sciences; and creative and digital media
- There is strong demand for professional and technical skills
- There is a strong demand for scientists and engineers at all levels (level 3 and above)
- There is demand in the food and drink, advanced engineering, advanced manufacturing, health and life sciences and the renewables sector for electrical, mechanical, power and aeronautical engineering skills (level 4 and above).

The case for a substantial increase in undergraduate places is also made by an Oxford Economics report, produced for the Department for Employment and Learning<sup>32</sup>.

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31. [www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5bf39b64.pdf](http://www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5bf39b64.pdf)

32. [www.delni.gov.uk/del\\_future\\_skill\\_needs\\_final\\_report\\_june\\_09\\_v4\\_no\\_links.pdf](http://www.delni.gov.uk/del_future_skill_needs_final_report_june_09_v4_no_links.pdf)

Oxford Economics concludes on the basis of intensive research that Northern Ireland needs to greatly strengthen its skill base. Its most significant findings are about the future of work, which will mean that far more people will need to be educated to graduate level or above and that the scope for employing people with very low levels of skills will greatly diminish.

Its key findings include:

- Higher level qualifications will be required for about 50% of the employment market in the future. Northern Ireland has about 30% at present. The UK as a whole is underprepared for this shift.
- Only one in six jobs will be available in the future for people with low qualifications, compared with one in five in recent years.
- London has a far higher proportion of higher level skills than any other part of UK.
- Scotland has a much higher proportion of higher level of skills than does NI.
- NI has increased its proportion of higher level skills in recent years, from just over 20%, to nearly 30%, though this remains far below where it needs to be.
- NI levels of higher skills are significantly below those of London, Scotland, the United States, the Republic of Ireland and Finland, but not far off levels in the England's Eastern region and are actually above those in Wales and the industrial parts of the West Midlands
- 1 in 10 Northern Ireland employers considered there to be a skill gap in their workforce, most prevalent in financial services, health and social care and other services.

- There are very low levels of graduates in Northern Ireland's agriculture sector compared with rest of UK. This is also true in manufacturing, construction, retail and hospitality.
- Northern Ireland has a relative under-representation of managerial and professional occupations.
- Northern Ireland is over-represented by graduates holding general degrees such as business and administration and combined degrees and teaching degrees, and under-represented by those holding specialist degrees and even more so in the most relevant STEM, creative arts and design and arts disciplines
- The most productive UK regions have the highest concentration of these graduates
- Northern Ireland is about 20% below UK average productivity, while relative productivity with rest of UK has fallen by 10% in recent years
- Before the recession, Northern Ireland was creating about 5,000 jobs a year, with another 15,000 jobs being reallocated as part of normal churn. The medium and long term aspiration would be to create about 7,300 jobs per year, while raising productivity, average wages and profits. This requires a significantly more skilled labour market.
- Annual average long term demand for high level qualifications – sub degree, degree and postgraduate qualifications (NQF 4-8) - is 9,600 on the baseline projections or nearly 11,000 under aspirational targets. (This would seem to imply an additional 6,600 higher level qualifications per annum in the Northern Ireland labour market, given the number of graduates currently produced.)
- The proportionate increase needs to be significantly higher in the key skill areas, the STEM, creative and arts subjects.



## Conclusion

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There is a strong body of evidence that graduate level skills are an extremely important factor in driving inward investment. Northern Ireland is disadvantaged in this by having one of the lowest rates of graduate level skills of any advanced economy. Moreover, Northern Ireland is particularly disadvantaged by having even lower rates of STEM and creative industries graduates, while producing too many teaching and general discipline graduates.

Inward investment is especially important for Northern Ireland because of the weak indigenous private sector economy. Yet it is disadvantaged in competing for this inward investment by having a corporate tax rate currently of 23%, compared to the standard rate in the Republic of Ireland of 12.5%.

It is therefore essential that Northern Ireland competes more effectively in the provision of degree level skills. Yet the Republic produces far more graduates than does Northern Ireland and has the highest rate in Europe for graduates aged 30 to 35.

Only 31% of Northern Ireland school leavers go to university and do so in Northern Ireland. This is only two thirds of the rate of the Republic, against which it is competing. Some 45% of the Republic's school leavers go on to university and the rate has remained high despite the government's austerity programme.

Globalisation has reshaped the economy in ways that make it impossible for Northern Ireland to compete effectively on the basis of low costs. While locality and access to UK and EU markets can be a positive strength in attracting investment, it is obvious that Northern Ireland must also compete on the basis of skills that are relevant to the knowledge economy. It has two universities that are strong in the knowledge economy sphere, but they produce too few graduates.

Some 27% of our school leavers who go to university do so in Great Britain. Two thirds of these do not return to Northern Ireland in the short or medium term. The proportion of Northern Ireland students who go to GB for university is increasing, representing a worsening 'brain drain'.

Northern Ireland needs to be reskilled on two levels. There are very weak employment prospects for people with a low skills base. As recently as 2005, 29% of workers had low qualifications. This is expected to fall to no more than 16% by 2020 and would be as low as 12% if the economy is reshaped along the lines of hoped for economic growth.

Meanwhile, there is an even more pressing need to raise skills at the highest end. The rate of higher skills in the workforce needs to rise from 28% in 2005 to 43% in 2020 just to continue the pre-recession trend of adding 5,000 jobs a year. To achieve growth of over 7,000 jobs a year, we need 49% of our working population to have higher level skills.

Our future workforce will need to be balanced three to one in favour of people with higher skills, compared to those with lower skills. As recently as 2005, there were more people in the Northern Ireland workforce with low level skills than with high level skills. We are going through a genuine skills revolution and if Northern Ireland does not keep pace with this it will be left behind in terms of jobs and wealth generation.

Such a dramatic improvement in Northern Ireland's skill base requires a strategy with several elements.

1. There needs to be a substantial increase in undergraduate courses, particularly in the STEM and creative industries courses.
2. An extra 15,400 university places are required in Northern Ireland to bring us up to the level, per capita, of provision in England<sup>33</sup>. However, this would be inadequate to match or catch up with the provision in the Republic of Ireland.
3. An extra 6,600 graduates are required per annum in the Northern Ireland labour market to keep pace with projected demand.
4. A strategy is required to attract back to Northern Ireland many of the graduates who have moved away and to bring back into the workforce more people who left temporarily, for example as parents or as unpaid carers of elderly relatives.

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33. University of Lincoln study

5. Northern Ireland's economy cannot operate simply on the basis of university provision responding to immediate demands from employers. Inward investment decisions are based on available supply and that supply must, to an extent, anticipate demand. This is true both in terms of numbers and locations. For example, economic regeneration of the North West requires an increase in the provision of graduate skills in order to attract greater levels of indigenous and inward investment.

6. The move away from a low skilled to high skills workforce cannot be achieved in a simple upskilling of people with low skills. Nor can it be achieved without raising the skills of people currently in work. Therefore it must involve training of people in work with low skills being retrained to intermediate level skills and those with intermediate level skills being upskilled to higher level skills. This transformation involves commitments from employers, colleges and universities and implies a greater provision by universities of post-graduate and part time courses.



# APPENDICES



## Appendix 1

### Summary of Oxford Economics report for DEL, 'Forecasting Future Skill Needs in Northern Ireland', 2009

- Higher level qualifications will be required for about 50% of the employment market in the future. Northern Ireland has about 30% at present. This is an issue for UK as a whole.
- London has far higher proportion of higher level skills than any other part of UK.
- Scotland also has a much higher proportion of higher level of skills than in NI.
- NI has increased its proportion of higher level skills in recent years, from just over 20%, to nearly 30%.
- "NI has one of the best school systems in the UK in terms of leaver qualifications although large numbers still choose to leave to GB higher education institutions and remain working there following graduation".
- NI levels of higher skills are significantly below levels of London, Scotland, US, RoI and Finland, but not far off levels in Eastern region and are above Wales and industrial West Midlands.
- 1 in 10 employers considered there to be a skill gap in their workforce, most prevalent in financial services, health & social care and other services.
- Very low levels of graduates in agriculture compared with rest of UK, also in manufacturing, construction, retail and hospitality.
- NI has a relative under-representation of managerial and professional occupations.
- Higher levels in NI of general degrees such as business and administration and combined degrees, less specialist degrees and much less in the STEM, creative arts and design and arts disciplines.
- The most productive UK regions have the highest concentration of these graduates.
- NI remains a long way below the UK employment rate.
- It is about 20% below UK average productivity.
- Relative productivity with rest of UK has fallen by 10%.
- Annual job creation before recession was about 5,000, with about 15,000 regular job replacements taking place. Aspiration might be to create 7,300 jobs per year, while raising productivity, average wages and profits.
- Upskilling of those not working could increase employment rate, but not counted into these figures.
- Annual average long term demand for high level qualifications – sub degree, degree and postgraduate qualifications (NQF 4-8) is 9,600 on baseline or nearly 11,000 under aspirational targets. (This implies more than 6,600 higher qualifications pa extra, PG).
- The proportionate increase needs to be significantly higher in the key skill areas, the STEM, creative and arts subjects.
- Only one in six jobs will be available from here on for people with low qualifications, compared with one in five in recent years.
- The UK Commission for Employment and Skills suggests substantial upskilling of existing workers in NI is also required: 8,600 persons qualified to NQF level 4-8 per annum required in the baseline and 12,200 in the aspirational scenario. [This implies substantial demand for colleges and universities to provide degree level courses for people in work. People with intermediate skills will need training/support to achieve higher skills, while those with lower skills need to move up to chain to achieve intermediate skills. PG]
- There is a challenging demand for higher workplace skills: the rate of higher skills in the workforce needs to rise from 28% in 2005 to 43% in 2020 under the standstill projections, or 49% under the aspirational strategy.
- The rate of low qualification workers needs to fall from 29% in 2005 to 16% in 2020 under the standstill projections, or 12% under the aspirational strategy.
- Future demands for degrees requires increases in the physical sciences, mathematical & computer sciences, engineering & technology, law and creative arts & de-



sign (the more commercial orientated creative subject such as graphic design, film production etc) subjects and less oriented to medicine and education.

- Even under the baseline projections, there is a shortage of graduates in these skills, which rises higher under the aspiration strategies.
  - NI suffers from an above average proportion of the population without any qualifications, though this proportion is no greater in the working population. [This implies that a lack of basic qualifications is a significant barrier in NI for gaining work and contributes to the size of NI's economic inactivity and unemployment.]
  - There will be a roughly 3 to 1 need in the future for new workers with higher skills rather than for those with low skills.
  - There is a significant weakness of higher skills within the managerial and professional occupations in NI.
  - NI needs to have more people with specialist degrees, rather than generalist degrees.
  - Gaps in higher skills might be partially met by attracting people who are out of the workforce – eg carers – to return, or encourage those who have moved away from NI to return.
- NI trails behind other UK regions on STEM qualifications, but the situation is even worse than it appears because of the high number of people with medicine, dentistry and related subjects, which may be above what the NI economy can sustain. After excluding the medicine subjects, NI lags far behind the UK average. It is 2% behind any other UK region and 7% below the best.
  - Creative art and design are particularly under-represented in NI's manufacturing graduate workforce.
  - There are around 4,000 too few narrow definition STEM graduates in NI workforce and about 7,000 too few creative arts graduates.
  - Regions with the highest levels of people with STEM and creative arts degrees have the highest productivity levels.
  - Comparative levels of graduates and higher level skills in the adult population are: Canada, 46%; London, 44%; US, 39%; Scotland, 36%; RoI, 34%; UK, 32%; NI, 29%. These figures may understate the levels in US and RoI as they only include graduates, not sub-degree qualifications. NI has higher rate than several other UK regions.

[http://www.delni.gov.uk/del\\_future\\_skill\\_needs\\_final\\_report\\_june\\_09\\_v4\\_no\\_links.pdf](http://www.delni.gov.uk/del_future_skill_needs_final_report_june_09_v4_no_links.pdf)

## Appendix 2

### Summary of 'Identification of Priority Skill Areas in NI', NIAES, 2011

- The supply of skills needs to be better aligned with labour market needs.
- All sectors in NI analysed reported a strong need for higher level skills at levels 4 and above, particularly within the business, ICT, health and life sciences and renewable sectors.
- Skills need to drive and manage innovation within companies and drive creativity and design.
- Growth in STEM skills, professional and technical skills and the numbers of scientists and engineers is essential.
- Most sectors reported a need for more STEM skills, particularly at graduate and postgraduate level.
- There is strong demand for professional and technical skills, to at least level 3.
- There is a strong demand for scientists and engineers at all levels.
- There is demand in the food and drink, advanced engineering, advanced manufacturing, health and life sciences and the renewables sector for electrical, mechanical, power and aeronautical engineering skills at level 4 and above.
- NI has more than twice the UK average of working age adults with no qualifications.
- NI is the worst performing UK region in terms both of employment rate and productivity per hour worked.
- NI has 26% of population educated to degree level, against 31% in UK.
- There are around 3,100 skill shortage vacancies, with another 58,700 employees in place with skill shortages.
- The employment of about 52,000 people from outside the UK and Ireland in NI implies that they are meeting employers' skill requirements that cannot be met from within the domestic workforce.
- The most pressing needs for higher skills levels is in the business services sector.
- There are significant skills shortages in the ICT sector.
- Retail management is characterised by low qualification levels.
- The creative skills sector has a particular issue with skill gaps amongst its existing workforce.
- Sectors with the biggest skill deficiencies are business services (including ICT); financial services; retail; food and drink / agri food; advanced engineering; and advanced manufacturing and materials. The emerging sectors for which we need to skill up are renewables; health and life sciences; and creative and digital media.
- <http://www.niaes.co.uk/NIAESSite/files/09/0955d9e2-7b55-4cb2-b19a-db5b5b-f39b64.pdf>



## Appendix 3

### Summary of 'How many young people graduate from tertiary education?', OECD, 2011

- On average across 26 OECD countries with comparable data, 38% of young people complete university-level education.
- Graduation rates range from 10% or less in Luxembourg to 45% or more in Australia, Denmark, Finland, Iceland, Ireland, New Zealand, Poland, Portugal and the Slovak Republic.
- The Republic of Ireland performs significantly better than the OECD average, while the UK is below the OECD average.
- The UK outperforms the OECD average for vocationally oriented tertiary education, but again the Republic of Ireland significantly outperforms the UK.
- The study does not separately report statistics for NI.
- <http://www.oecd-ilibrary.org/docserver/download/9610061ec006.pdf?expires=1377274907&id=id&accname=guest&checksum=A203D001A8F2478DCF97E75395C5C216>

## Appendix 4

### Student Numbers in the Republic of Ireland

- 169,539 – total full time and part-time undergraduate number in 2010/11.
- 25,431 – part time undergraduates in 2010/11
- 56.5% – percentage of females in all enrollments to the universities in 2009/10
- 3926 to 6281 – growth in total PhD student numbers between 2004 and 2010.
- 702 to 1153 – rise in the annual graduation rate of PhD's across the seven universities between 2004 and 2010.
- 65,880 – full time undergraduate enrollments in the universities in 2008/9
- 16,418 – full time postgraduate enrollments in the universities in 2008/9
- 83% – the proportion of those who enter a programme at NFQ Level 8 in Ireland and go on to graduate, compared to an OECD average of 70%. (OECD Education at a Glance, OECD, 2007)

Source: Irish Universities' Association

<http://www.iua.ie/the-irish-universities/university-fast-facts/#>

According to the CIA's World FactBook, the population in the Republic of Ireland is 4,775,982

On that basis, there is 3.54982 university students in Ireland for every 100 of the population – substantially in advance of the situation in Northern Ireland.

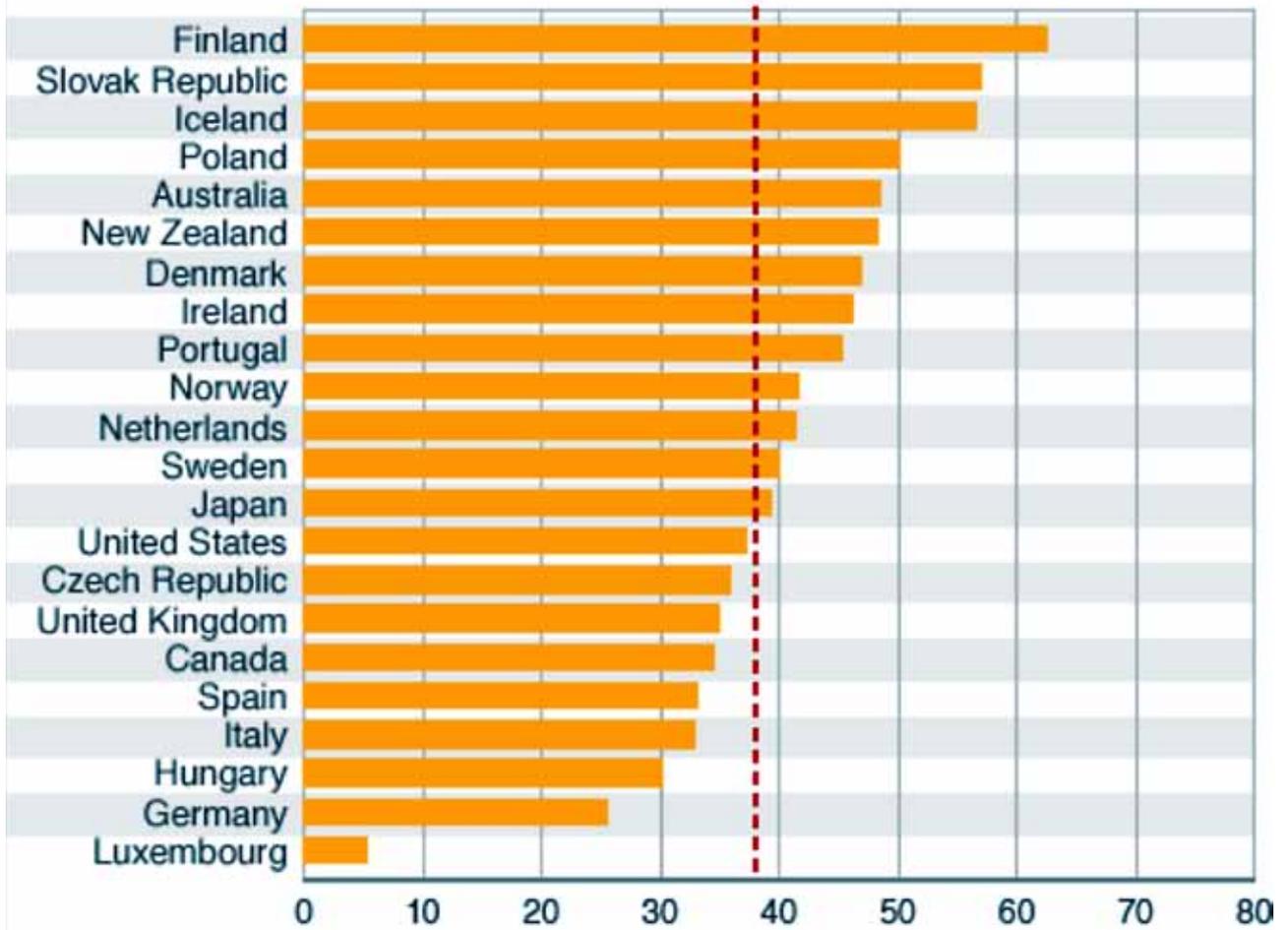
In terms of the proportion of school leavers going to university, the Republic of Ireland is significantly above the average in developed economies – the OECD members. The UK is below the average.

<http://www.bbc.co.uk/news/education-11438140>

Northern Ireland, of course, is significantly below the UK average. Only Luxembourg of the OECD countries is below the level of Northern Ireland – and that is because Luxembourg citizens typically go abroad to study at university. As one of the EU's major cities, Luxembourg attracts large numbers of footloose international citizens, enabling it to be a wealth city/country. There is only one university in Luxembourg, which was only established in 2003. There was, therefore, a long established principle of the best Luxembourg students travelling abroad to study in university. The university in Luxembourg is small, with just 6,200 students, who are attracted there from very many countries.

# Graduation rates in OECD countries

OECD Average  
38.0



Source: OECD



## Appendix 5

### Why has the Republic of Ireland benefited from inward investment?

The Republic of Ireland has been one of the most successful worldwide in attracting inward investment. While low tax rates, and helpful tax treatment of non-retained revenues, have been credited for this, the tax situation is just one factor. Another has been grant support from the Industrial Development Agency for inward investment. The third has been the plentiful supply of skilled labour, much of it at graduate level.

A 2001 study reported previous evidence that ‘There are now over 1,200 overseas manufacturing and internationally traded services companies operating in Ireland which employ approximately 135,000 people with a particular focus on electronics, pharmaceuticals, healthcare, software and “teleservices” (Hannigan, 1999, 2000; Tansey, 1998). (quoted in THE ECONOMIC AND SOCIAL REVIEW, January, 2001] ‘Employment in MNCs accounts for roughly one-third of the industrial workforce. These foreign owned companies account for 55 per cent of manufactured output and some 70 per cent of industrial exports’ ‘The net effect of Ireland’s policy of targeting mobile foreign investment is evidenced today in the locating in Ireland of close to one-quarter (24 per cent) of all available US manufacturing investments in Europe, and close to 14 per cent of all FDI projects locating in Europe (The Economist, 1997).’

The study concluded that the “critical factor” in investment decisions was the low corporation tax rate. Grant support was a less significant factor, given that competitor nations seeking investment offered comparable grant support. The second most significant factor was labour market issues – skills, language, flexibility, availability. Decisions of eight of the ten companies studied to locate in and around Dublin was primarily down to two factors – being near to universities and to a major airport. (This is consistent with studies on location decisions in GB. PG)

The study notes: “The quality of the Irish education system and the existence of a high skills labour pool

has long been recognised as being critically important to the attraction of inward investment. A growing awareness of the need to develop human capital has led to substantial improvements in the provision of education in Ireland since the 1960s and has been seen as contributing to sustained growth in the economy (Tansey, 1998; World Investment Report, 1998). Increased investment in education, particularly at second-level has led to Ireland having one of the highest levels of participation in second and third level education of OECD countries (Leddin and Walsh 1998; OECD, 1997). The Irish education system also holds a high ranking in meeting the needs of a competitive economy (World Competitiveness Yearbook, 1998)”

They added: “In their study of locations attractive to US foreign direct investment, Cooke and Noble (1998) found evidence that a country’s education and skill base are by far the most critical factors in determining an industrial relation’s systems attractiveness to foreign investment. Likewise, Hannigan (1999) cites the Irish education system as being the most important factor influencing the competitiveness of multinationals located in Ireland. In this context, both McGovern (1998) and Gunnigle, Morley and Heraty (1997) argue that it was Ireland’s unique ability to provide a cheap supply of graduate Englishspeaking labour, that has aided the IDA and other agencies in successfully attracting large-scale investment from multinational companies.”

This view was endorsed by an official Irish government report, which stated: “McIver Consulting’s report and other research show that this increase in supply of skilled graduates had a very significant effect in influencing inward investment by multinationals both in terms of expectation of an increased supply of skilled graduates and a perception that the Irish government were responsive to the needs of the ICT industry and were prepared to develop rapid policy and practical responses to those expressed needs. The rapid supply of technicians from the

Accelerated Technician Programme (ATP) courses particularly contributed to the high growth experienced in the Celtic Tiger years. McIver Consulting's research also indicates that the programme contributed significantly to the retention of inward investment during the downturn, allowing existing firms to move up the value-added chain, migrating lower added value operations abroad and upgrading operations in Ireland." [EXPENDITURE REVIEW Information & Communication Technologies (ICT) Undergraduate Skills Programme, published by the Department of Education and Science, 2007]

University strength was cited as one of the most important factors in driving economic development and inward investment into Wales in a Parliamentary report. However, the CBI told the Parliamentary committee that the leading factor in terms of UK conditions of declining international competitiveness in inward investment was in a weaker environment of labour market skills.

<http://www.publications.parliament.uk/pa/cm201011/cmselect/cmwelaf/writev/inwardin/iw12.htm>

## Appendix 6

### The Quality of Northern Ireland FDI

A recent report by RSM Tenon for the Scottish Executive found that Northern Ireland has the lowest percentage of high quality FDI of any UK region. Most was of good quality, not high quality. Typically high quality FDI is driven by high level skills, particularly at graduate and postgraduate levels. Some 46% of Northern Ireland's FDI was of high quality, compared to 99% in the East of England (eg, drawn to Silicon Glen, near Cambridge), 86% to the South West of England and Yorkshire and Humber, and 85% to Scotland.

The report commented: "The evidence linking labour force characteristics and FDI is quite consistent. Specifically, foreign direct investment is attracted to host countries possessing a skilled and educated workforce. On the other hand, higher unit costs of labour discourage inward foreign direct investment, although unionisation, per se is not linked consistently, either positively or negatively to FDI."

Source: Inward Investment Research, RSM Tenon, 2013-08-26



## Appendix 7

### Skills, Article in Business Month, 2013

Northern Ireland has tried to sell itself to inward investors as a place with strong and relevant skills. But there are worries that the claim is being oversold. In particular, many observers suggest we need more university graduates – with more students graduating with the most relevant ICT and science skills.

One of the frequent boasts from politicians is that more Northern Ireland school leavers go on to study at university than in any of the other UK nations. This is true – but many of them do not go to university here. Indeed, Northern Ireland has the smallest university sector of any part of the UK – both in terms of total numbers and as a proportion of the population.

There are 2.4 university students per 100 of population in Northern Ireland, compared to 3.1 per 100 in England, 3.2 in Scotland and 3.4 in Wales, according to analysis conducted in 2010 by the University of Lincoln. An extra 15,400 student places would be required in Northern Ireland, said the study, to bring the undergraduate rate here up to that of England.

In the 2011/12 year, some 66% of university students from Northern Ireland studied in Northern Ireland, while 27% studied in England, Scotland or Wales and 7% studied through the Open University. What is perhaps especially surprising is that even 15 years after the Good Friday Agreement and despite the introduction of high tuition fees in GB, the proportion of students leaving Northern Ireland to study in Great Britain is actually increasing. Over the last 10 years, there has been a rise from 28% to 36% of first year Northern Ireland undergraduates who study in GB. The attractions of having a working life in Northern Ireland appear to be diminishing, not improving.

These figures are particularly important because most Northern Ireland students who go to university in GB do not return here. Of those Northern Ireland students who graduate in GB and obtain a job on leaving university, only 38% returned to work

here. The majority continued to live in GB, allowing the rest of the UK to benefit from our young people. Northern Ireland is in a weak position to benefit from people from elsewhere studying here: only 4% of students at Northern Ireland higher education institutions in 2011/12 were from Great Britain, with 7% from the Republic of Ireland and 7% from overseas.

Richard Barnett is Vice Chancellor of the University of Ulster and was appointed by enterprise minister Arlene Foster as chairman of DETI's Independent Review of Economic Policy. He says the skills challenge here must be taken seriously and is closely linked to the small size of our university sector.

“It is well-recognised that graduate level skills are an essential ingredient for those nations and regions, such as Northern Ireland, that aspire to compete in high value added sectors and thereby deliver high wages for their citizens,” he says. “Yet Northern Ireland has the smallest number of higher education places per head of population of the four nations of the UK.

“Given the current state of the economy, this doesn't act as a constraint. But as growth picks up if Northern Ireland is to match performance elsewhere in the UK it will have to import graduate level skills. This means that potential investors will then face the decision of going where graduate level skills already exist, or investing here and facing the additional risk that they'll be unable to attract those skills from elsewhere. Presenting investors with such an additional risk will clearly put Northern Ireland at a competitive disadvantage and jeopardise the number of high wage jobs that we can sustain.”

There is clear evidence there is already a shortage of relevant key skills in Northern Ireland. One in three vacancies at July 2011 was reported as persistent and 'hard to fill', in a survey conducted as part of the UK Commission's Employer Skills Survey, which was published at the end of last year. In some areas, skill

deficits have been getting worse during the recession. This represents about 5,500 skilled vacancies that are persistently hard to fill. “This high proportion of vacancies that are proving hard-to-fill due to a lack of skilled recruits is higher than seen previously and offers a considerable challenge to Northern Ireland’s recruiting employers, at the same time as individuals are experiencing high unemployment rates,” concluded the skills survey report.

The report stressed that these skill shortages are damaging the economy and impeding recovery. The highest levels of vacancies and of hard to fill vacancies are in Belfast, with a substantial increase in skill shortage vacancies between 2008 and 2011, during which time these rose from 900 places to 3,500 places.

The Department for Employment and Learning recognises the need to address the skills gap and published its ICT Skills Action Plan last year. The plan was produced with the engagement of key players, including the CBI and Momentum, which represents the ICT sector in Northern Ireland.

The report admitted candidly: “With the rate of change and growth within the sector, it is not surprising that a mismatch between the skills of the workforce and the skills needed by the sector to facilitate its growth has developed. Yet the shortage of appropriately skilled people available to work in the sector has the potential to limit the sector’s contribution to economic growth and, therefore, must be addressed as a matter of urgency.”

The survey found skills shortages here in software development, IT infrastructure management and applications management. Another weakness is in ICT professionals with several years’ experience who are capable of moving on to leadership roles. The action plan refers to a “mismatch” between the skills of graduates who have completed ICT courses and the skills required in the software industry. In another complaint – commonly voiced by employers in Northern Ireland – “there are concerns about the provision of Computer Science in secondary level schools”.

The report produced a detailed and challenging agenda for action. Despite this, Momentum, is confident that we are now on the right track. Chief executive

Dr Ian Graham says: “Momentum believes that the initiatives outlined in this plan can deliver the skills required to achieve the vision for ICT industry growth, both indigenous and inward investment.”

The CBI’s assistant director in Northern Ireland, Kirsty McManus, warns that FDI and indigenous businesses can have different skill requirements and that the need for relevant foreign language competence must not be overlooked. She explains: “ICT skills shortages [are] impacting [on] both FDI and indigenous [firms]. We believe that strong export performance will be crucial in driving economic recovery and companies will need many more people with strong language skills – [such as] Mandarin, Arabic, Russian - to help them enter new markets in the future.”

Bro McFerran, managing director of Allstate Northern Ireland, displays serious concern about our skills shortages. He says: “Northern Ireland is one of the best places to get a job in the IT sector today. As a company we currently have quite a large number of positions to fill. However, we are experiencing issues finding skilled software professionals within our marketplace.

“To that end we continue to leverage the strong pool of talented young people in Northern Ireland through reskilling, employing non-IT graduates and retraining them, and upskilling employees as well as recruiting from farther afield in some niche technology areas. Last year we successfully recruited people from outside of Northern Ireland to help meet our demands. This seems hard to believe when the level of unemployment is still so high in Northern Ireland, but we are just not turning out enough students with the right qualifications.

“I truly believe that the IT sector could be the engine for growth in Northern Ireland and tens of thousands of jobs could be created. While I recognize that much is being done to create an expanded relevant talent pool, there needs to be a major rethink on how young people, even down to primary school level are taught the STEM [science, technology, engineering and maths] subjects.”

Seagate is another of the largest inward investors in Northern Ireland. Gerry Kindlon, its executive director of released product performance, also stresses

the relationship between relevant skills and economic performance. “The ability to attract a high calibre workforce has always been a key element to Seagate’s success and the nature of our business means that a high proportion of our recruits come from the STEM disciplines,” explains Kindlon.

“It’s therefore imperative for Seagate, and for many other organisations doing business here or considering investing here, that we develop a future generation of people who are highly qualified in science, technology, engineering and maths. That means we have a responsibility to work with schools to showcase to young people the wide range of careers available in these fields; to guide them in their subject choices; and to ensure that a STEM-focused education prepares them well for the career options open to them. By doing this, we can make a significant impact on the future economy of Northern Ireland.”

Kindlon points to mobility and cloud computing as being key trends that Seagate is watching closely. It is keenly aware that the company may need to recruit skills in these areas – as and when it becomes clearer how these trends will affect the industry.

Recruitment consultant Kim Johnson adds that some of her clients are in desperate need for programmers with skills in Java. With a large number of Java programming vacancies here, she has had to arrange for many people to migrate from elsewhere in Europe to fill positions.

While skills deficits are being addressed, it looks as if Northern Ireland will still need to attract skilled people from elsewhere for some time to come. It is evident that without a stronger skill base the attraction and expansion of ICT businesses here will be hampered.

## Appendix 8

### How Universities Strengthen Competitiveness

Universities’ supply of graduates with the right skills is fundamental to the UK’s international competitiveness. The study ‘**International Competitiveness. Competitiveness & the role of Universities**’, concludes: “The continued international competitiveness of the UK rests on the continuing supply of high quality graduates and postgraduates who have the knowledge and capabilities that knowledge intensive businesses need.”

It makes the point that universities play a particularly important role in the UK economy as it has moved from being a manufacturing economy, to become a high value knowledge economy. “The shift towards a higher value-adding economy has been underpinned and made possible by the considerable growth in the output of graduates and postgraduates in the 1980s and ‘90s,” says the study. It adds: “The importance of the output of our universities has been stressed in surveys by the Corporation of London. These have found that the availability of highly skilled staff was rated by global financial institutions as the most important reason for locating in London.”

Internationally successful businesses have high levels of graduates and postgraduates. “According to the DTI31, overall “innovatively active enterprises” have roughly twice the share of employees educated at degree level than non-innovatively active. Equally, whereas the innovative engineering based manufacturing businesses have some 8% of their employees as graduates with science and engineering degrees and 4% with other degrees, the knowledge intensive service businesses have 24% of their employees with science and engineering degrees and 20% with other degrees.”



## Appendix 9

### Higher education statistics

Of the 65,590 NI students enrolled at UK HEIs in 2011/12, 66% were enrolled at an HEI in NI, 27% at an HEI in GB and 7% were studying through the Open University. In 2011/12, 45% of NI domiciled students at UK HEIs were studying a Science, Technology, Engineering or Maths (STEM) related subject.

Of the 51,905 students enrolled at NI HEIs in 2011/12, 83% were from NI, 7% from the Republic of Ireland (RoI), 4% from Great Britain (GB), 1% from other EU countries and 6% from non EU countries.

Proportionately more NI students now leave NI to study in GB than did a decade ago. Over the 10 year period the number of NI students going to GB to study increased by 24%, those studying through the Open University increased by 38% while NI students at NI HEIs increased by less than 1%. This has had the effect of increasing the proportion of NI students who leave NI to study in GB from 2002/03 to 27% in 2011/12. However, looking at the full-time first year Undergraduate cohort alone, this proportion has increased from 28% to 36% over the ten year period.

There are various reasons why students leave NI to study, including their choice of subject, for example some courses such as veterinary science are not supplied in Northern Ireland. It is also clear from

recent research<sup>2</sup> that the majority of those who plan to leave NI to study do so out of choice. However, figures from the latest Destinations of Leavers from Higher Education survey show that around 60% of full-time students who left NI to study in GB did not return to NI to work six months after qualifying. The following points highlight how many students leave NI to study and where in GB they go.

<http://www.delni.gov.uk/he-enrolments-2011-12.pdf>

- The proportion of school leavers continuing on to Institutions of Higher Education has increased by 2.4 percentage points from 39.9% in 2007/08 to 42.3% in 2011/12.

[http://www.deni.gov.uk/qualifications\\_and\\_destinations\\_1112.pdf](http://www.deni.gov.uk/qualifications_and_destinations_1112.pdf)

- Scotland - More school leavers were in Higher Education (35.6 per cent) than any other individual destination in March 2013.

<http://www.scotland.gov.uk/Publications/2013/06/7503/1>

- In 2009/10, in England it was 34%

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/16217/12-p155-widening-participation-higher-education-aug-2012.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/16217/12-p155-widening-participation-higher-education-aug-2012.pdf)



## Appendix 10

### It is not just about skills

“Universities have a powerful second-order effect in knowledge exchange between firms, by virtue of their role as anchors for clusters of innovative businesses. As our case studies demonstrate, often one of the biggest benefits for firms in setting up near a university is not the academic knowledge of the university itself, but of the presence of other firms attracted by the university.”

<http://www.nesta.org.uk/library/documents/Report%2023%20-%20The%20Connected%20Uni%20v4.pdf>

Benefits reported by firms from interactions with universities:

- Assistance in problem solving 67.3
- Improve understanding 66.7
- Sources of information for new projects 57.5
- Recruitment of postgraduates 42.0
- Downstream-related activities 29.3
- Training of company employees 27.4
- Generation of patents 20.0

Source: D’Este, P. (2008). ‘Gaining from Interactions with University: Multiple Methods for Nurturing Absorptive Capacity.’ Paper presented at the

DRUID Conference on Entrepreneurship and Innovation – Organizations, Systems and Regions, Copenhagen, Denmark, June, 2008.

Quoted in <http://www.nesta.org.uk/library/documents/Report%2023%20-%20The%20Connected%20Uni%20v4.pdf>

The role of universities in the regional innovation process depends on the local economic structure and on the strengths of the university in question. Richard Lester, the MIT industrial innovation specialist, has argued that there are four types of local economic evolution that can be influenced by university business interactions:

- New industry formation: developing entirely new sectors, often based on novel technologies and university research.
- Industry transplantation: bringing existing (but often higher value) industries to a region.
- Diversification into technologically-related industries: for example, in helping ‘phoenix industries’ to develop from declining firms.
- Upgrading of existing industries: providing technical problem-solving advice and skills development for existing businesses.”



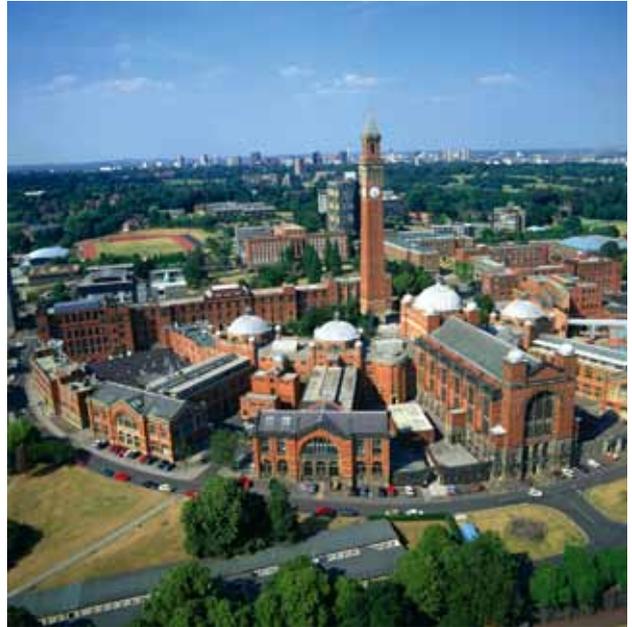
## Appendix 11

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### Universities help sustain local economies

“In 2007/08, the mean total expenditure of full-time English-domiciled undergraduates was £12,254 per student across the three terms.” That is equivalent to £11.5m a year to the Derry economy, with a campus of 9,400 FTE students, without taking into account the impact of employment in the university and the spending by those staff. [source: Centre for Cities]

The University of Birmingham has 27,800 students, who support the employment within the university of 6,146 staff and a much broader economic impact. “The University generated over £1 billion in additional spending in the West Midlands in 2011/12, translating to a £530 million value-added contribution to the region’s economy and supporting 11,830 jobs.” [The Impact of the University of Birmingham, Oxford Economics.]



### Attracting investment in Northern Ireland

*By Professor Tony Gallagher, Pro Vice-Chancellor, Queen's University Belfast*

Northern Ireland's two universities, Queen's and the University of Ulster, play a central role in the social, political, cultural and economic life of society. Both universities draw the majority of their students from the local region and many of the leaders in politics, business, professions and the wider community are graduates. Both have an enduring commitment to a mission of service to the region. Central to this is their economic impact. They attract significant levels of foreign direct investment, directly through research contracts and indirectly through the pipeline of innovative and employable graduates. Both universities lever additional funds, above their direct government grant, to generate significant economic activity. And higher education is recognised as central to the creation of a dynamic, innovative economy, the primary focus of the Northern Ireland Executive Programme for Government.

Both universities lever funds additional to their direct grant, with Queen's leveraging an additional £166, and the University of Ulster an additional £119, for every £100 of direct grant. Furthermore, both generate additional economic activity beyond their core income: from a combined income of almost £500m, Queen's generates an additional £400m and the University of Ulster an additional £275m in economic activity. The two universities directly employ 6,500 people, but generate at least the same again through the multiplier effect, making higher education a major player in supporting and sustaining employment in the region.

In today's challenging economic climate, regions such as Northern Ireland must identify and build on their strengths if they are to emerge from recession as a strong global player. A clear strength of Northern Ireland lies in its people, so we have a commitment to retain and develop that talent and build on its reputation as a region that values and invests in this most

important asset, human capital. Indeed, a number of major inward investment announcements have cited Northern Ireland's talent pool and highly skilled graduates as the main reason for investing in the region. In explaining CitiGroup's decision to invest in Northern Ireland, their CEO stated that it was the quality of graduates and their loyalty to Northern Ireland, which underpinned such a compelling case for investment.

A number of major inward investment announcements have cited Northern Ireland's talent pool and highly skilled graduates as the main reason for investing in the region.

Queen's has a long established strategy of fostering an entrepreneurial culture and promoting the successful transformation of good research into good business through innovation and commercial development. The University's venture spin-out company, QUBIS, has generated companies with an annual turnover in excess of £100m and almost 1,000 high value jobs. Despite the economic downturn, QUBIS has created five new high-tech companies in the last three years. One of the most successful spin-out companies is Andor Technology plc. Andor was set up in 1989 and now employs over 260 people in 16 offices worldwide distributing its products to 10,000 customers in 55 countries and has now surpassed market capitalisation of £100m.

Small and medium sized enterprises (SMEs) in Northern Ireland have benefited considerably from technology transfer. The Knowledge Transfer Unit was established at Queen's in 1993 to provide a focal point for the promotion and support of knowledge transfer activities, in particular to increase the involvement of SMEs with the University, by developing collaborative projects through Knowledge Transfer Partnerships (KTPs). KTPs allow

young graduates to be employed by business, but continue to be supervised by academics from the relevant university department, providing a very useful bridge between academic departments and businesses. This facilitates the transfer of expertise from the universities and colleges to the private sector. There are currently 70 KTP programmes in Northern Ireland: 40 are led by Queen's, 17 by the University of Ulster and 13 by the Further Education Colleges.

In today's challenging economic climate, regions such as Northern Ireland must identify and build on their strengths if they are to emerge from recession as a strong global player.

The two universities have also developed strong partnerships with larger companies. Queen's, for example, works in partnership with companies such as Bombardier, Wrightbus, FG Wilson, Randox and Almac, all of whom value the University's research strengths and mention them as a key factor in their continued commitment to investment in the province. The current development of the Northern Ireland Advanced Composites Engineering Centre, a collaboration between Queen's, the University of Ulster and Bombardier is a further example.

Research undertaken by the universities has a critical role to play in inward investment. If Northern Ireland is to be successful in attracting and retaining hi-tech, high-value inward investment, then it is essential that a high priority is given to protecting the existing skills base and ensuring that Northern Ireland has the internationally recognised research infrastructure it needs. Investment follows excellence and companies at the cutting edge want to be located close to centres of excellence.

All of these achievements are built on foundations of academic excellence and a commitment to inspire participation. Queen's and the University of Ulster encourage the brightest and best amongst our young people to stay in Northern Ireland, while seeking to attract the brightest and best from across the world to study and work here. Realising the full benefits of higher education will only be achieved, however, if Northern Ireland maintains levels of investment in higher education and this, unfortunately, is currently under threat.

*Tony Gallagher is Professor of Education and Pro Vice-Chancellor at Queen's University Belfast. He has acted as a consultant for many government departments, non-governmental public bodies and a range of international organisations.*

## Higher Education and economic growth – a Scottish perspective

*By Dr Lena Wilson, Chief Executive of Scottish Enterprise*

It may surprise some to know that Scotland is a world leader in higher education. We have the highest concentration of universities in Europe and the highest ratio of research publications per head of population in the world. Almost 225,000 students are registered with Scottish universities – 15% of whom are from outside the UK.

Our universities employ more than 35,000 people and have a combined turnover of more than £2.5 billion – almost half of which is sourced from the private sector and competitively won sources. Export earnings, alone, are estimated to be worth more than £500 million.

If we are to accelerate economic recovery, we need more companies operating internationally and we need better leaders who can spot these opportunities and are not afraid to go after them.

The sheer scale of some of these numbers demonstrates the critical role that universities already play in Scotland's economic performance. But we believe they offer even greater potential and are working together to identify how we can capitalise on the research strengths across all of our universities to create even more value for Scotland's economy.

We've seen some of the biggest medical and scientific breakthroughs occur in our universities. This includes some of the more notorious developments such as Dolly, the first cloned sheep, but also less well known breakthroughs such as penicillin, the cervical cancer vaccine and CT and MRI scanners. However, we recognise that it is not enough to just be a nation that produces outstanding research. We want to be known as a country that exploits that research to generate more wealth, more jobs and more investment.

To do that, we need to get better at growing the companies that emerge from the commercialisation of research and develop greater links between our universities and businesses that will help fuel growth in Scotland's key industries. That includes promoting the capabilities of our universities internationally so they can act as a magnet for attracting new investment from global companies looking to partner in new research or establish a new R&D base. It also includes creating a culture of entrepreneurship within our universities to help spark more spin out companies while at the same time helping our existing company base to access technology being developed in our universities that will help them develop new products or open up new markets.

In Glasgow, we've announced our ambitions to establish the International Technology and Renewable Energy Zone (ITREZ) – a cluster of activity that draws on both the academic expertise and capabilities at the University of Strathclyde alongside the private sector that will establish Glasgow as a powerhouse of green energy developments. The growth of the renewables sector is a top priority of both the Scottish and UK governments. Our universities have a fundamental role to play in helping us to achieve those ambitions.

The greatest flow of knowledge from universities to industry is through the recruitment of graduates.

ITREZ will transform Glasgow city centre and act as a hub for Scotland's research, development and commercialisation activity in renewables. Scottish, UK and international companies will be able to access cutting edge research and some of the best people working within the sector to develop new products that will shape the renewable energy industry of tomorrow.

We recognise that universities can also help to address challenges that have permeated our business base for a number of years and affected overall productivity levels. Specifically, issues around internationalisation and leadership. Both of these areas are hugely important in the current climate. If we are to accelerate economic recovery, we need more companies operating internationally and we need better leaders who can spot these opportunities and are not afraid to go after them.

The international reputation of Scotland's education sector means that our universities are pushing at an open door in emerging economies like China and India, which have experienced the fastest growth in recent years and offer some of the biggest opportunities for Scottish companies. We're working with our university base to identify how we can make more of these international networks to enable our company base to internationalise and exploit new opportunities in key sectors and attract new inward investment.

Higher education also has a significant role to play in enhancing the leadership capabilities within our companies. The greatest flow of knowledge from universities to industry is through the recruitment of graduates – Scotland's future business leaders. The increasing focus on enterprise skills across undergraduate courses can only enhance this future supply. But today, too many of our companies are underperforming because their leaders can't see their potential or how to improve the way they do business. We need to encourage our business base to be more ambitious, to raise their aspirations.

A number of our universities, including Glasgow Caledonian University and Napier University, already have real strengths in MBA provision and research. We are also working with other universities to explore how we can compete with global business schools and enhance the provision of strategic business leadership.

While all of these activities – developing better links with industry, commercialisation and knowledge transfer, internationalisation and leadership – can support economic growth, they can also transform the performance of individual universities.

The economic environment across the UK is going to remain pretty tough and the higher education sector has its own challenges to deal with, particularly around the public funding environment. However, there's no doubt that universities can continue to play a leading role in the country's economic recovery and, at the same time, identify exciting new opportunities for themselves.

***Lena Wilson is Chief Executive of Scottish Enterprise, working with businesses across Scotland to stimulate economic growth and improve the business environment.***

# Siemens and the University of Lincoln Engineering Hub

*By Professor Andrew Atherton, Deputy Vice-Chancellor (Research, Enterprise and Innovation), University of Lincoln*

When the University of Lincoln campus was founded in 1996 with investment from local businesses and authorities, a primary aim was to set up a school of engineering that would work closely with the energy and power generation engineering companies that cluster in and around Lincoln.

The new school of engineering was founded in order to develop local capacity to produce industry-ready graduates, provide new opportunities for staff to undertake personal and professional development and to establish world-class expertise in gas combustion and related technologies.

At the heart of this cluster is Siemens Industrial Turbomachinery Limited, which has been manufacturing gas turbines for industrial and corporate clients world-wide from its base in Lincoln for more than 150 years.

Since that time, the university's partnership with Siemens has grown to the extent that in June 2009 a joint submission to the Strategic Development Fund was submitted to support the creation of a new school of engineering; the first purpose built engineering school to be created for more than 20 years.

The new school of engineering was founded in order to develop local capacity to produce industry-ready graduates, provide new opportunities for staff to undertake personal and professional development and to establish world-class expertise in gas combustion and related technologies.

The UK, in common with many of its European partners, can't get enough engineering graduates from engineering degrees. It is estimated that the power industry sector alone will need up to 34,000 new graduates, and 'green engineering' sectors, including wind power, between 50,000 and 70,000. This helps explain the rationale behind the new engineering school; it will create the engineers of the future.

As such, an initial stimulus for the partnership was the need to identify and attract bright graduates into engineering at a time when enrolments on degrees in

this subject were falling and interest in it as a career was waning.

The University of Lincoln worked with Siemens to develop a framework that would attract students to study engineering at Lincoln and provide a means of selecting the strongest for employment in Siemens. Generous scholarships to cover tuition fees, along with a bursary based on academic excellence, paid work during vacations, and work experience as part of the degree were agreed forming the basis of recruitment of the first full-time cohort of undergraduate students in September 2010. Students performing well academically and demonstrating the ability to apply this in the workplace in Siemens will be offered graduate entry jobs on graduation.

To enhance this, the Siemens' product training team, which is co-located with school of engineering staff in a dedicated on-campus building, provide almost 300 hours a year of training in Siemens product technology to students, offering real experience of engineering products and an introduction to Siemens' production and field engineering services. Co-location of the Siemens' training team and academic staff from the school of engineering is also expected to lead to accreditation of some of Siemens' training, personal development of Siemens staff through enrolment on postgraduate taught and research degrees, and mutual understanding and empathy. Siemens' customers will also attend courses in the building, which is joint-branded.

An initial stimulus for the partnership was the need to identify and attract bright graduates into engineering at a time when enrolments on degrees in this subject were falling and interest in it as a career was waning.

Part-time provision has also been developed, in partnership, so that Siemens could shape the curriculum content and mode of delivery to its staff development needs, starting with a part-time undergraduate degree that is delivered alongside the full-time degree. Members of Siemens staff now study part-time with full-time undergraduates over a five-year period to receive their degrees.

A postgraduate masters course, the MSc Energy and Renewables, was developed through internal competition within Siemens, reflecting the increasing investment of the company, and other businesses, in renewable energy and energy management.

Demonstrating the power of this embedded and genuine partnership, a wide portfolio of research projects has also been developed. These range from developmental R&D through to commercial research and commercialisation of intellectual property. Commissioned on a project-by-project basis, the research has to make a clear case for a return to Siemens. In order to enhance academic output, a formal intellectual property agreement has been signed and a process for publishing research results in peer-reviewed academic journals and other outlets agreed.

And the effects are being felt further afield. As well as the close collaboration between the University of Lin-

coln and Siemens, the school has developed close ties with local engineering businesses – undertaking commissioned research, Knowledge Transfer Partnerships, and access to part-time degrees. This has enhanced Siemens' supplier network locally, and builds greater capacity within the engineering, power and energy cluster of businesses located in and around Lincoln.

All this and the school only opened its doors in 2010. The partnership is firmly established but with so much activity underway we can only glimpse at the potential impact for our regional economy and for future generations of engineering students to study at Lincoln.

*Andrew Atherton is Deputy Vice-Chancellor (Research, Innovation & Enterprise) and Professor of Enterprise & Entrepreneurship at the University of Lincoln. He has responsibility for the University's research, enterprise and employability agendas.*

## Universities and the five drivers of productivity

*By Ed Cox, Director, IPPR North*

Universities are a key resource in closing the productivity gap between the North and South of England and facilitating the growth of the Northern regions as they act on each of the five drivers of productivity – investment, innovation, skills, enterprise and competition.

IPPR North's Northern Economic Futures Commission is considering ways in which the Northern regions and LEPs can further exploit their university assets to drive productivity.

Universities encourage investment by providing the potential for high-value added business activity and the availability of highly skilled workers; evidence published by the OECD suggests that investment in universities is more effective in generating research-intensive foreign direct investment than offering financial incentives to foreign investors. Numerous examples can be found of firms that cite universities as their reason for investing in the Northern regions, especially where Science Parks are located.

Universities are important innovation assets, as the nature of academic research is to challenge and

improve on current ways of thinking and doing. The university environment is one of constant innovation and a resource for local businesses to tap into through formal (e.g. consultancy work) and informal means (e.g. spillover effects). Indeed, the UK government's own research has found that those firms that engage with universities show higher market share, better product quality and a greater product range. For example, universities in the North East are heavily involved in innovation in the region's automotive production industry; Newcastle University is working with private sector partners to develop more efficient electric cars and the University of Sunderland has specialised in working with domestic and foreign firms to develop hydrogen fuel cell prototypes.

Universities are the main providers of higher level skills training and therefore act to attract and retain skilled workers within local economies, providing the potential for areas to diversify their economic base and facilitate the creation and location of high value added firms. Research has also found that universities tend to increase the demand for highly skilled workers in the local economy beyond the direct ef-

fect of those employed by the university. Universities play a crucial role in upskilling the local population and increasing social mobility. An interesting example is the University of Cumbria, which is at the forefront of innovative ways of delivering learning over a wide geographic area via learning centres and online resources, providing easy access for local people to increase their skills.

Universities are becoming increasingly important in the creation of new enterprise through the commercialisation of academic research, the formation of firms exploiting the expertise of university staff and new graduates getting involved in start-ups. Recognising the potential of students and graduates in driving local business growth, the Liverpool John Moores University's Enterprise fellowship programme provides business support for graduate start-ups in Merseyside. This year Liverpool City Council have launched a sponsorship scheme to fund 30 places on the programme which seeks to create additional businesses in the city, especially in the digital and knowledge-based industries.

Firms that engage with universities show higher market share, better product quality and a greater product range.

Taking the above together, universities help to lower the costs of production and encourage new entry into markets leading to greater competition between firms.

It is welcome that university representation appears integral to most of the recognised Local Enterprise Partnerships (LEPs). IPPR North's Northern Economic Futures Commission is considering ways in which the Northern regions and LEPs can further exploit their university assets to drive productivity improvements as part of a wider programme of work into the critical issues facing the economy of the North and new approaches to local and regional economic policy.

Recent research by Imperial College London found that the £3.5 billion annual research council funding resulted in a £45 billion annual increase in the output of UK firms. Given how important private sector growth is to the economic recovery and reducing regional disparities, policymakers would be foolish to ignore the centrality of universities to this objective.

*Ed Cox is Director of IPPR North and Deputy Chair of the recently launched Northern Economic Futures Commission. The Commission is aiming to articulate a 10-year strategy for economic growth across the North of England.*

These essays are from a collection entitled 'University Alliance', a campaign that promotes understanding of the role of the university sector in driving the economy. The campaign's lead essay is contributed by secretary of state for business, innovation and skills, Dr Vince Cable.



# UNIVERSITY FOR DERRY (U4D)

University for Derry (U4D) is a group established by leaders of the business and community sectors in the North West of Ireland. Its aim is to substantially expand the provision of undergraduate and post-graduate education in Derry~Londonderry. U4D believes that this is essential to address the serious economic weakness of the region and related poverty. Increased university provision would raise skill levels, increase employment, attract higher levels of inward investment and improve the prospects of locally owned businesses.



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