Seizing the opportunity

Economic outlook and priorities for Northern Ireland

February 2022

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Introduction

1 Introduction

It's been a tough few years for the Northern Ireland economy. As we begin to see light at the end of the pandemic tunnel, what does the future hold? This report reviews the evidence and argues that our future success will depend on us working together to tackle issues and seize opportunities in relation to three key areas:

Education and skills

We need to attract new talent into the NI labour market; do more to ensure skills meet the needs of local businesses; and intervene once and for all to ensure that every teenager leaves school in NI with useful, relevant qualifications.

Trade and investment

It's crucial that we reframe the narrative about the NI economy in a way that leverages NI's unique trading position, and does more to promote a positive story about NI to the rest of the world.

Climate and energy

It's incumbent on us to accelerate the transition to 'green' skills and 'green' jobs; build on NI's position as a global leader in renewable energy production; and invest further in sustainable transport.

And there's a 'golden thread' running through all of this which is around everyone working together in a true spirit of partnership. The issues and opportunities are complex, and no one organisation or type of organisation can tackle them successfully on their own. Rather, the business community needs to work alongside government and other stakeholders to drive sustainable change through meaningful collaboration.

We hope you find the report insightful and constructive. Please don't hesitate to reach out directly to me and my team if you would like to follow up on any of the issues.

Dr David Armstrong
PwC NI Partner
E: david.m.armstrong@pwc.com
T: +44 (0)7713 680266

At a glance

2 At a glance

Performance and prospects

Our estimated outturn for GDP growth in 2021 is 5.8%-6.4% for NI, compared to 7.0%-7.1% for the UK. Our predictions suggest that economic growth rates in NI in 2022 will similarly be a little lower than elsewhere in the UK. We expect the NI economy to return to pre-crisis levels (i.e. Q4 2019) in early 2022 under our 'accelerated growth' scenario, and no later than the end of 2022 under our 'limited growth' scenario.

Table 1: Growth projections for the NI economy

Real GDP growth	2020		2021e		2022p		2023p	
	UK	NI*	UK	NI	UK	NI	UK	NI
Accelerated growth scenario	-9.8%	-9.5%	7.1%	6.4%	5.1%	4.2%	1.8%	2.0%
Limited growth scenario	-9.8%	-9.5%	7.0%	5.8%	4.5%	3.9%	1.3%	1.7%

Sources: ONS, PwC analysis.
Notes: (*) NI GDP in 2020 is estimated and based on industrial mix as regional data are only available until 2019.
'e' stands for estimates and 'p' stands for predictions.

Education and skills

NI school pupils perform well at the 'upper end' of secondary education.

NI has an ongoing problem with underachievement at the 'lower end' of secondary education.

More than one in four students from NI (16,500 in total) left the region to study at higher education institutions in GB in 2019/20.

Trade and investment

NI has a smaller share of exports and Foreign Direct Investment (FDI), as a proportion of GDP, compared to the UK average.

By the first half of 2021, NI's total exports to the Republic of Ireland increased by around 60% compared to the same period in 2020.

The number of new FDI projects in NI increased by 43% between 2017 and 2020 but fell by around 28% in 2020/21.

Climate and energy

NI is now a leader in renewable energy, generating almost half of its energy from renewables in 2020 compared to the G7 average of around 11%.

Over the last 30 years, however, NI has reduced greenhouse gas (GHG) emissions by around 18% which is much lower than other parts of the UK.

Our analysis shows that home energy efficiency improvements could save NI households £230m a year, and cut around 7m tonnes of C02 emissions by 2030.

People and productivity

NI has a young population, and unemployment rates over the past 15 years have been low relative to elsewhere in the UK.

NI rates of 'economic inactivity' – i.e. the proportion of people not in employment or actively looking for work – are persistently high. This suggests an element of 'hidden unemployment' in the workforce.

Labour force participation rates for women are low in NI compared to other regions.

There is currently a productivity gap of around 20% between NI and the UK average.

Based on our evidence and research, this report makes a series of recommendations for policy makers and other stakeholders…

Education and skills

Invest further in business-led re-skilling initiatives

- **Increasing awareness of non-traditional, business-led routes into the labour market** – e.g. apprenticeships and Higher Level Apprenticeships, with a focus on marketing and communications to promote the benefits of such pathways to potential students and their families.
- **Creating new mechanisms for SMEs and micro businesses to engage with skills providers** – e.g. the creation of new shared platforms that enable SMEs and micro businesses to participate actively in and benefit from apprenticeships and other similar initiatives.
- **Reinforcing FE and employer engagement through sectoral employer partnerships** – with a focus on updating apprenticeship frameworks and the Science, Technology, Engineering, and Mathematics (STEM) curriculum, and raising levels of intermediate skills.
- **Attracting new talent into the NI labour market** – with a particular focus on women, older workers, and the NI diaspora including young people who are currently studying at university in Great Britain (GB) and elsewhere.
- **Tackling the challenges at the lower end of secondary education** – in particular ensuring that remedial actions begin immediately and in parallel with the ongoing work of the Independent Review of Education.

Trade and investment

Reframe the narrative about the NI economy for local companies and international investors

- **Leveraging NI's unique trading position** – and driving economic activity and growth from the position NI has as part of the UK's customs area and also part of the EU's single market for goods.
- **Promoting NI's key strengths and assets** – with a focus on physical and digital connectivity, talent pool, bespoke training programmes, and track record with international investors.
- **Improving the support available for exporters and investors** – with a focus on ensuring that businesses can navigate the various options for support, and that all support provided is practical, timely and focused on genuine business needs.

Climate and energy

Implement the NI 'Green Growth Strategy'

- **Accelerating the transition to 'green' skills and 'green' jobs** – including in mainstream sectors like electricity and gas, and also the so-called 'circular economy', e.g. jobs involving using waste as a resource, and creating value for secondary materials.
- **Scaling-up hydrogen generation capabilities** – in particular harnessing the technical expertise and market insight that already exists in NI to scale up the hydrogen platform.
- **Investing further in sustainable transport** – including further investment in NI's Electric Vehicle infrastructure and support for other 'green' transport options.

Collaboration and partnership

Redouble efforts by government, business and other local stakeholders to collaborate to achieve shared goals

- Stronger collaboration and coordination across NI government departments.
- More coordination amongst businesses, particularly at sector level.
- Greater alignment across schools, Further Education/Higher Education, and other education and training providers.

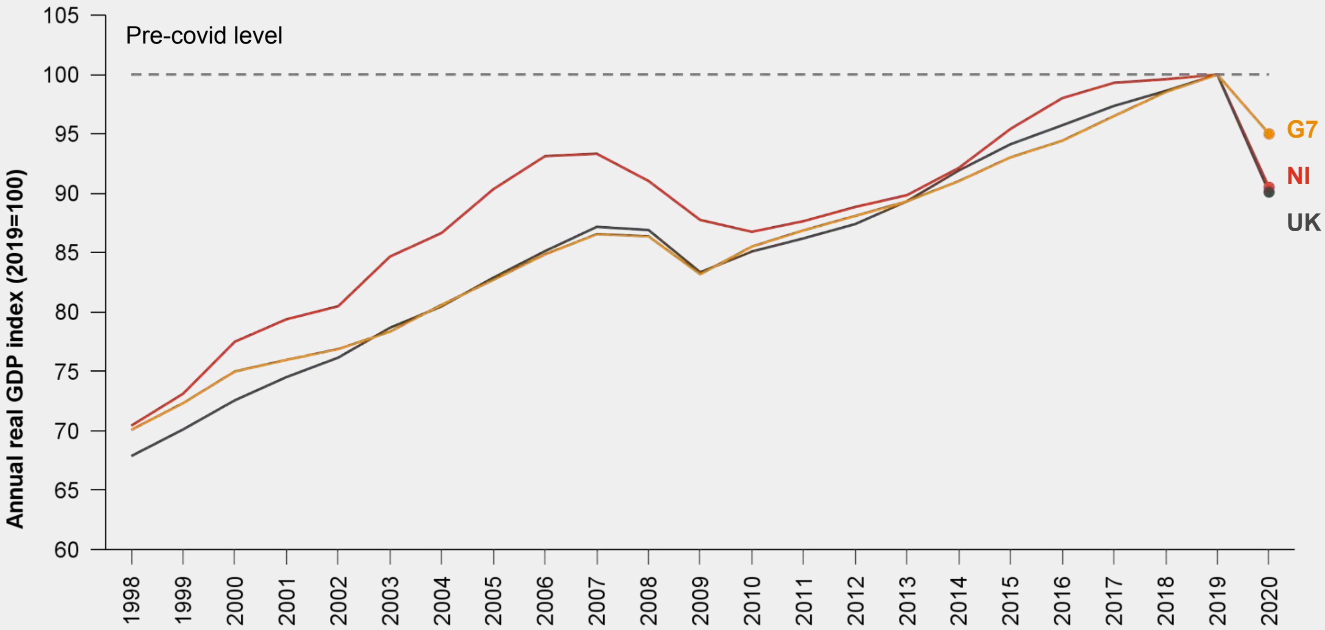
Performance and prospects

2 Performance and prospects

Since 1998, growth in the NI economy has been broadly in line with UK and G7 averages, and it has shown somewhat greater resilience to the impacts of the coronavirus (COVID-19) pandemic than elsewhere in the UK...

In the ten years following the Good Friday Agreement in 1998, NI experienced average growth in real GDP considerably above the UK average (3.2% compared to 2.8% for the UK as a whole). Since 2008, annual growth in real GDP has been similar to, and in some years slightly above, the UK and G7 average. Even though the economy contracted significantly during the COVID-19 pandemic (in NI it dropped by 13.6% in quarter two of 2020, which covers the first period of lockdown), it was relatively more resilient than the UK as a whole, where GDP contracted by 19.6% over the same period[1]. Our estimate of annual regional GDP for 2020 reinforces a slightly more resilient performance of the NI economy during the pandemic, with a year-on-year contraction rate of around 9.5% compared to the UK average of 9.8%[2].

Figure 1: NI has experienced relatively strong economic growth in the recent decades



Sources: Office for National Statistics (ONS), International Monetary Fund (IMF), PwC analysis.
Notes: NI's real GDP for 2020 is a PwC estimate as official data on annual regional output is only available until 2019; G7 countries include Canada, France, Germany, Italy, Japan, UK and US.

[1] Office for National Statistics (ONS), April to June 2020 – link
[2] Our estimation is based on the ONS official data on UK regional GDP from 1998 to 2019 (link), assuming that the region's industry structure in 2020 remains largely unchanged.

Figure 2: During the pandemic the NI economy has been somewhat more resilient than the UK as a whole

Sources: ONS, IMF, PwC analysis.
Notes: NI's real GDP year-on-year growth for 2020 is a PwC estimate as official data on annual regional output is only available until 2019.

We expect the NI economy to grow at a slightly slower pace in the coming years compared to the UK average…

We expect the legacy of the COVID-19 pandemic to have had a greater impact on growth of the NI economy in 2021, compared to the UK economy, due to the relatively high number of cases per 100,000 population in NI[3]. At the time of writing the new Omicron variant is dominant in NI, as it is in the rest of the UK. This led to tightened restrictions being reintroduced by the NI Assembly in December 2021[4]. The current evidence suggests that Omicron has not resulted in additional, serious hospitalisations but, the inflection number has significantly increased since January 2022. The exponential rise in infections and in people having to self isolate will continue to put a strain on businesses and public services as they struggle with staff shortages. It remains likely, therefore, that growth in output will continue to be constrained by the ongoing uncertainty, leading to some delay in the recovery of output over the rest of the year.

We have modelled two main economic growth scenarios for NI – an 'accelerated growth' and a 'limited growth' scenario – including factors such as inflation, possible impact of Omicron, uncertainty over the market's reaction to tightening fiscal policy, and the implementation of new trading arrangements in NI. These factors are also expected to affect the rest of the UK, albeit disproportionally (see our latest UK Economic Outlook for analysis of regional disparities in the economic recovery[5]). For the NI economy, we discuss key assumptions relating to our two growth scenarios in Box A.

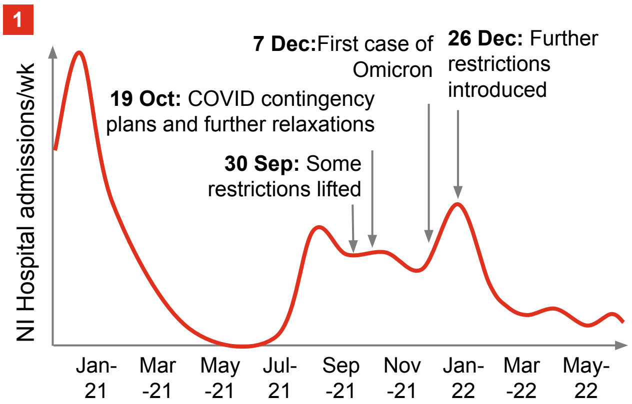
[3] The NI total number of COVID cases per 100,000 population has been the highest compared to other UK nations. Source: Government Coronavirus Healthcare data – link
[4] NIDirect, 2021. 'Coronavirus (COVID-19) regulations and guidance: what they mean for you' – link
[5] PwC, 2021. 'UK Economic Outlook', December 2021 – link

A Box A: Our economic growth scenarios for NI

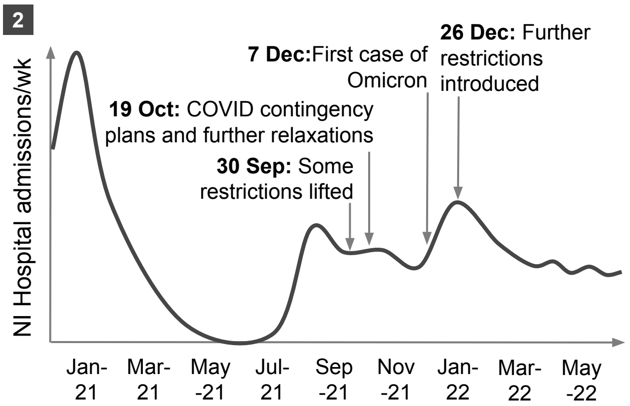
We expect NI economic growth to continue to be impacted by the trajectory of the pandemic (see Figure 3 for our epidemiological scenarios for NI, which are largely similar to the rest of the UK), political uncertainties and the possibility of rising inflation pressures.

Figure 3: Epidemiological scenarios continue to impact the NI economic outlook

Accelerated growth scenario



Limited growth scenario



Sources: Gov.uk, PwC analysis.
Note: The development of new variants e.g. Omicron is still unclear, so there is significant uncertainty associated with these epidemiological scenarios. Our two illustrative scenarios reflect the likely outcomes of those factors in the medium to long term.

1 Our 'accelerated growth' scenario

- New variants, e.g. the Omicron, result in the introduction of stricter COVID guidance including the use of 'COVID passports' in NI. A peak in the number of hospital admissions may occur but at a smaller scale than the peak in January 2021 due to existing immunity and an ongoing booster programme. These could lead to a rapid drop in cases and hospitalisations after a peak in January 2022 and to a lower level than in Autumn 2021, allowing additional measures to be dropped in February 2022. However, during this peak, the number of people infected or self-isolating (around 10% at any one time) is likely to impact businesses and services.
- The economy is resilient to further tightening of the government's fiscal policy over the short to medium term[6].
- Quick progress in easing trade friction post-Brexit, and delivery of local political arrangements in NI. Current supply chain bottlenecks normalise over the next 6-12 months.
- High inflation proves to be transitory and the CPI rate returns to its 2% target in Q4 2023.

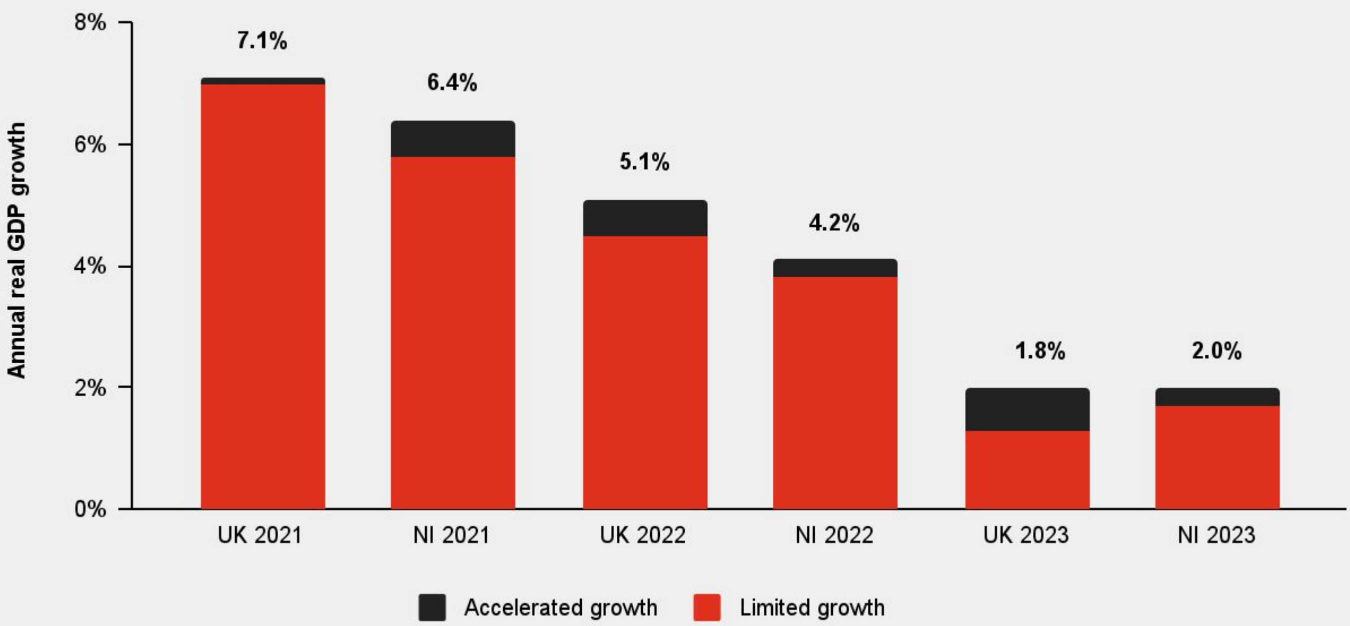
2 Our 'limited growth' scenario

- New variants, e.g. the Omicron, result in the introduction of stricter COVID guidance including the use of 'COVID passports' in NI. A more significant peak in the number of hospital admissions may occur but still smaller than the peak in January 2021 due to existing immunity and an ongoing booster programme. Hospitalisations peak in late January 2022, followed by a return in Spring to levels seen in Autumn 2021. This reduction allows additional measures to be lifted in March 2022. However, during this peak, the number of people infected or self-isolating (around 10% at any one time) is likely to impact businesses and services.
- Economic growth is constrained by further tightening of the government's fiscal policy at least in the medium term.
- Slow progress in easing trade friction post-Brexit, including delivery of local political arrangements in NI. Current supply chain bottlenecks take longer to normalise compared to other advanced countries due to the Brexit effect, and persist into 2023.
- High inflation proves to be transitory, but reaches a higher peak and takes longer to return to its target. Price pressures persist until mid-2023 and CPI returns to its 2% target in Q3 2024.

[6] For example, the Covid-driven prioritisation of the Department of Health in the draft NI Budget 2022-25, at the expense of other departments – see link.

The rate of growth of GDP in NI, under our 'accelerated growth' scenario, is likely to be as high as 6.4% in 2021, and we estimate that it will fall back to 4.2% in 2022 (see Figure 4). Even though these figures may appear to be high, they are associated with the bounce back from the contraction in economic activity in 2021, and are in fact slightly lower than the growth rates predicted for the UK as a whole over the same period; 7.1% and 5.1% respectively. This slightly slower rate of recovery in NI is partly due to the fact that the economy did not shrink as significantly as the UK economy as a whole (also known as 'base effects'). So, the level of growth required to get it back to pre-pandemic levels is relatively low. We expect the size of the NI economy to return to its pre-pandemic level in 2022, with the 2019 levels being met in early 2022 under the 'accelerated growth' scenario, and no later than the end of 2022 under the 'limited growth' scenario[7]. Beyond that, growth in real GDP is expected to slow down to around 2.0% in 2023 as the NI economy returns to its pre-pandemic, long-term growth trend.

Figure 4: We expect slightly slower rates of recovery for the NI economy until at least 2023



Source: PwC analysis.

Note: Data labels show the projected growth rates (%) under the more optimistic scenario, namely the 'accelerated growth' scenario.

[7] We use estimated GDP as a measure for NI output. It is, therefore, different to the Northern Ireland Composite Economic Index (NICEI) which has returned to the pre-pandemic level in Q2 2021. Source: Department for the Economy – link

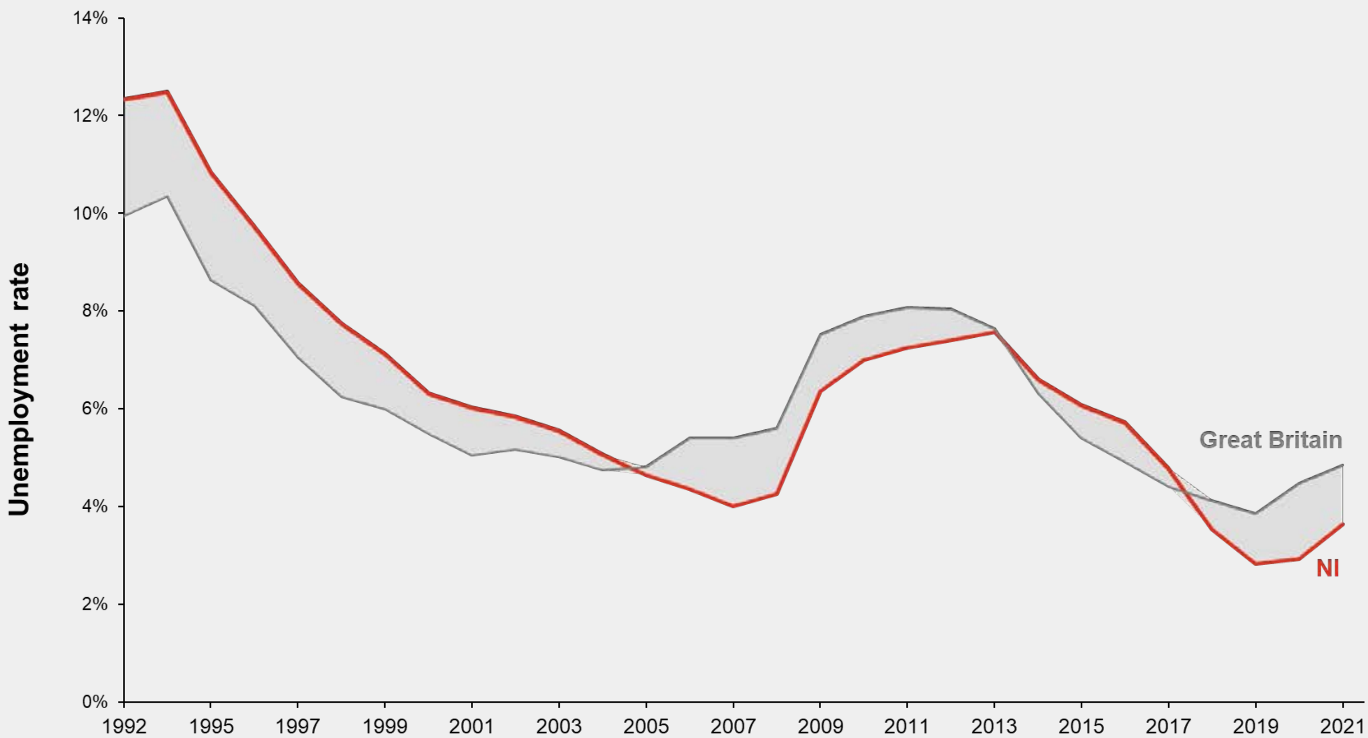
People and productivity

3 People and productivity

Over the past 15 years, NI has had a lower unemployment rate than the rest of the UK but also relatively high levels of 'economic inactivity', particularly amongst women...

Figure 5 shows that over the past 15 years, NI has generally had a lower unemployment rate than the rest of the UK. But, over the same period (see Figure 6), NI has also had a consistently higher level of economic inactivity, suggesting a persistent issue of 'hidden unemployment'.

Figure 5: Since 2005 NI has generally had lower unemployment rates than the rest of the UK



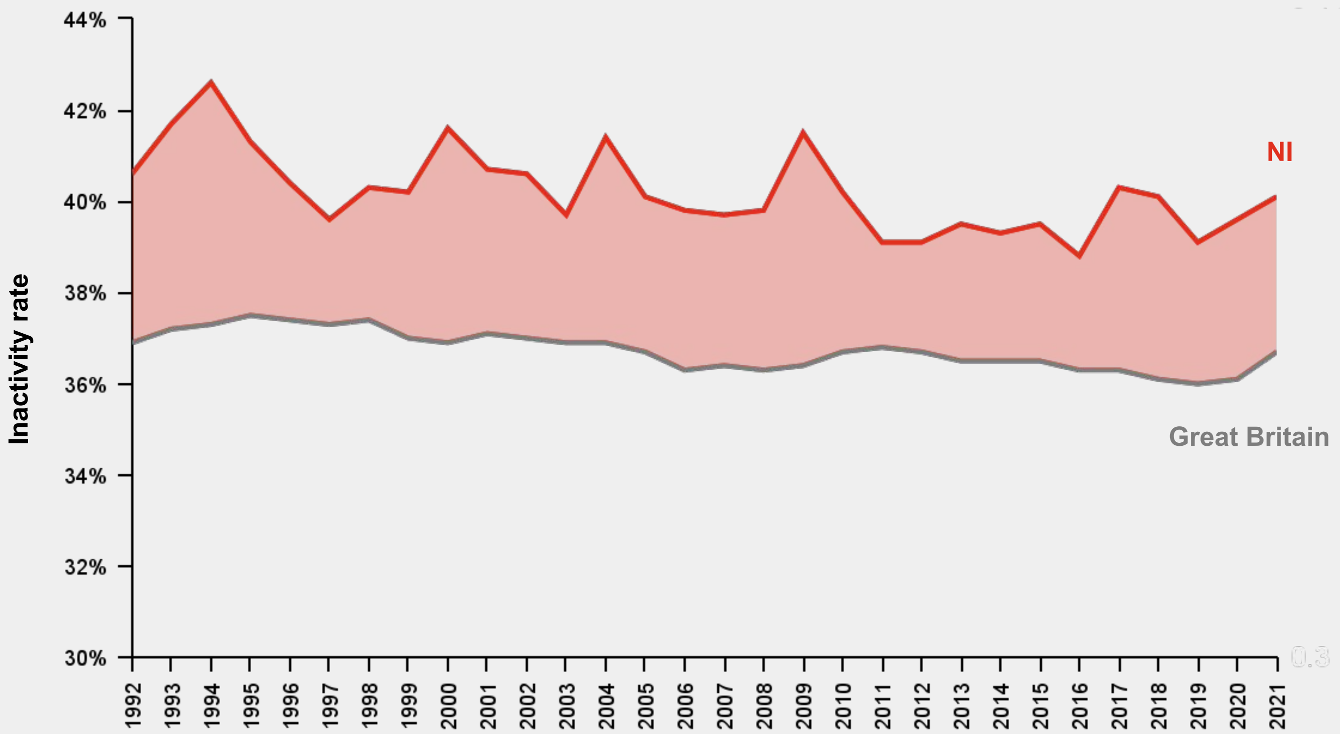
Sources: ONS, PwC analysis.
Note: Eight month average for 2021.

For the NI economy there is an interesting gender perspective on this. For example, our 2021 'Women in Work Index' shows that NI ranks amongst the top three UK regions with a low gender pay gap and relatively low levels of female unemployment[8]. However, it also finds that NI has the lowest rate of female labour force participation compared to other parts of the UK. This has been exacerbated by the pandemic which has disproportionately impacted sectors with more female employment – such as hospitality and arts, entertainment and recreation – placing women's employment opportunities at higher risk than men's[9]. Looking forward, this means that there are likely to be significant 'hidden' pockets of talent in NI – including women who have not been active in the labour market – that can help meet future skills needs and address labour shortages.

NI has a persistent productivity gap with the rest of the UK...

In line with our earlier analysis about the resilience of the NI economy through the pandemic, productivity was quicker to recover in NI during 2020, increasing by nearly 4% over the course of 2020, compared to a UK average increase of just 0.4%[10]. That said, the overall level of productivity in NI remains persistently and significantly below that of the UK. As shown in Figure 7, there is currently a productivity gap of around 20% between NI and the UK average, and this has remained stubbornly in place over the past 20 years[11].

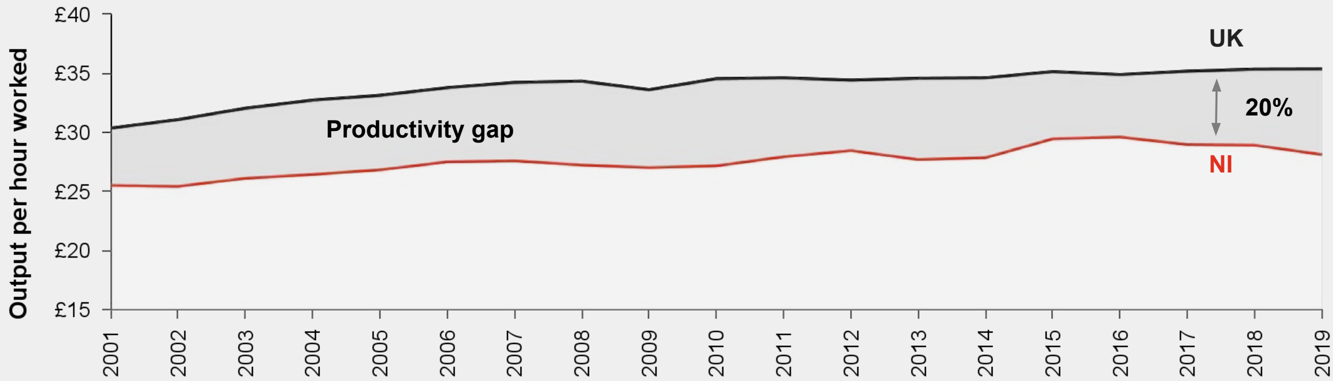
Figure 6: High levels of economic inactivity suggests a persistent issue of 'hidden unemployment' in NI



Sources: ONS, PwC analysis.
Note: 8 month average for 2021.

[8] PwC, 2021. 'Women in Work Index' – link
[9] Globally, 40% of all employed women are employed in 'hard-hit' sectors, compared to 37% of employed men. Source: PwC 'Women in Work Index' 2021 – link
[10] ONS, October to December 2020 – link
[11] The labour productivity gap is defined as the difference in output per hour worked between the UK average and NI.

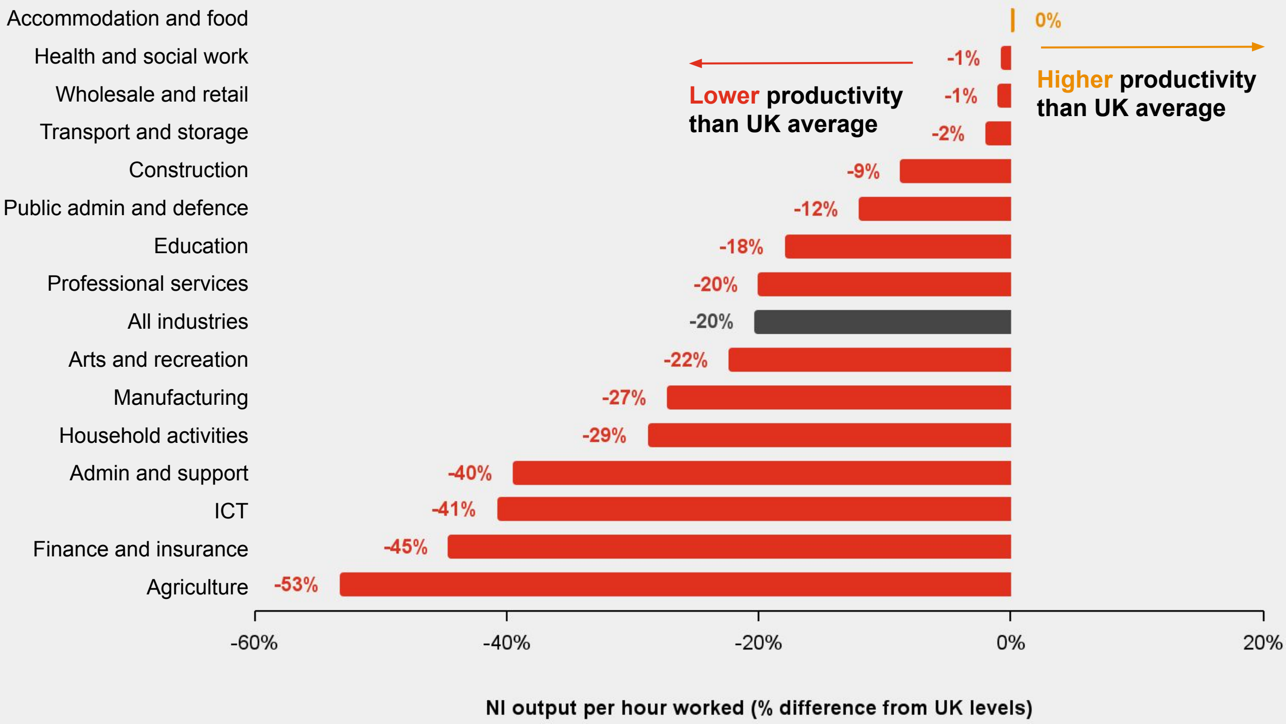
Figure 7: NI productivity remains persistently and significantly below that of the UK



Sources: ONS, PwC analysis

Figure 8 demonstrates that this productivity gap runs right across all of NI's main sectors and is particularly the case for those sectors in which NI has a higher concentration of employment such as, for example, agriculture and manufacturing.

Figure 8: Most of NI's main sectors have a productivity gap with the UK as a whole (2019)



Sources: ONS, PwC analysis.

And so focusing on innovation needs to be a top priority right across the NI economy…

The national and international evidence has established a strong link between productivity and innovation. For example, a study of 36 countries shows clear evidence of innovation contributing to boosting productivity in developed countries[12]. The UK evidence also confirms that innovation is fundamental to productivity growth at both national and regional levels[13].

In this context it is encouraging that stimulating innovation, as part of a wider package of investment to target and accelerate growth in key sectors of the NI economy, is a key commitment in Northern Ireland's 'City Deals'. For example, signed in December 2021, the Belfast Region City Deal (see Box B) backed up this commitment with investment, and also formed a new model through which local and central government, business and other stakeholders can collaborate.

B **Box B:** Focusing on innovation in the Belfast Region City Deal

- Package of investment in five university-led innovation and research centres, to drive innovation activity in partnership with the private sector and contribute towards improvements in regional productivity.
- £120m of funding in digital infrastructure, regional innovation hubs and financial support to innovation-focused enterprises and collaborations.
- Support for ensuring NI has the skills base to respond to the needs of an innovation-focused post-Covid economy.

Further information available here

[12] Hammar, N. and Belarbi. Y, 2021, 'R&D, innovation and productivity relationships: Evidence from threshold panel model', International Journal of Innovation Studies 5(3) pp.113-126 – link
[13] Department for Business, 2021, 'Energy and Industrial Strategy,' 'Evidence for the UK Innovation Strategy' – link. Aston Business School, 2020, 'UK productivity and skills' – link

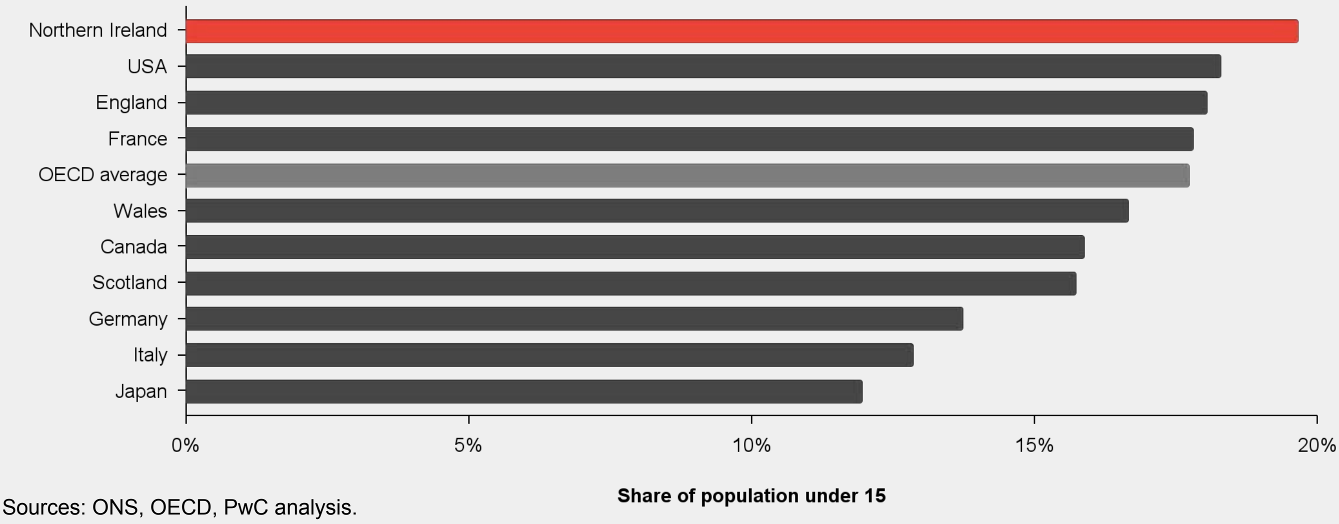
Education and skills

4 Education and skills

NI has a young population and, on some measures, standards of education are relatively high...

The NI labour market is set to expand thanks to its younger population; in 2020, 20% of the NI population was under the age of 15, compared to an OECD average of 18%, and less than 15% in Germany, Italy and Japan (see Figure 9). NI has a higher proportion of under-15s than any other G7 country.

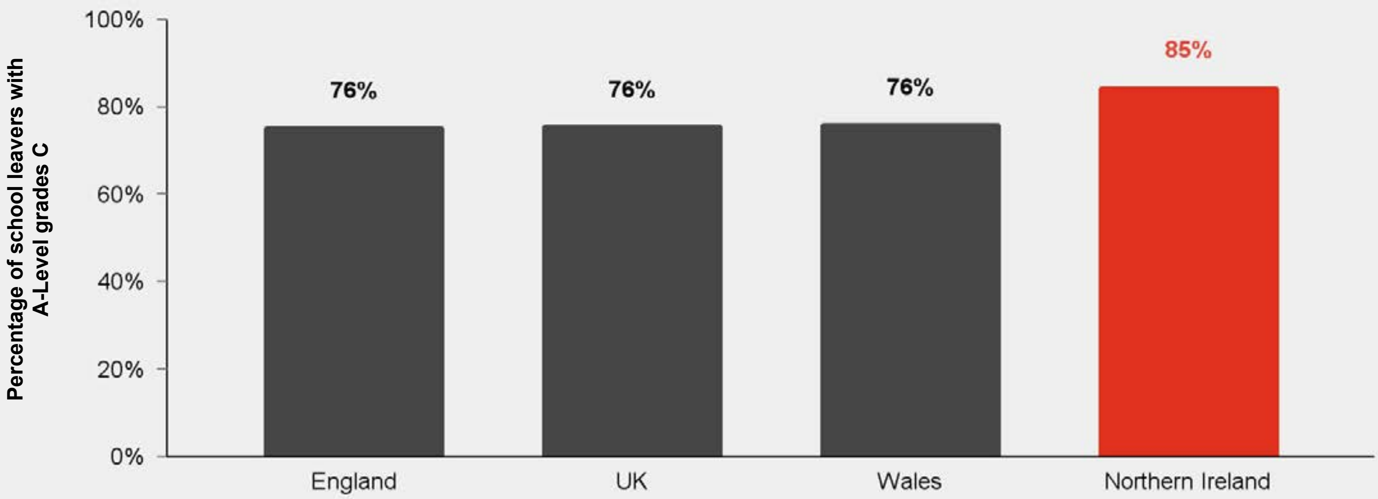
Figure 9: Share of population under 15



Sources: ONS, OECD, PwC analysis.

Many of NI's young people are excelling at school compared to their counterparts in the rest of the UK, e.g. school pupils in NI achieve better A-Level results compared to other parts of the UK (Figure 10). Similarly, a recent University of Dundee study of more than 1.1m young people across the UK has found that NI's pupils surpassed their counterparts in terms of levels of reading comprehension and are now ranked the highest in literacy across the UK[14].

Figure 10: NI has a relatively high share of pupils with A-Level grades C and above than other UK regions (2019)



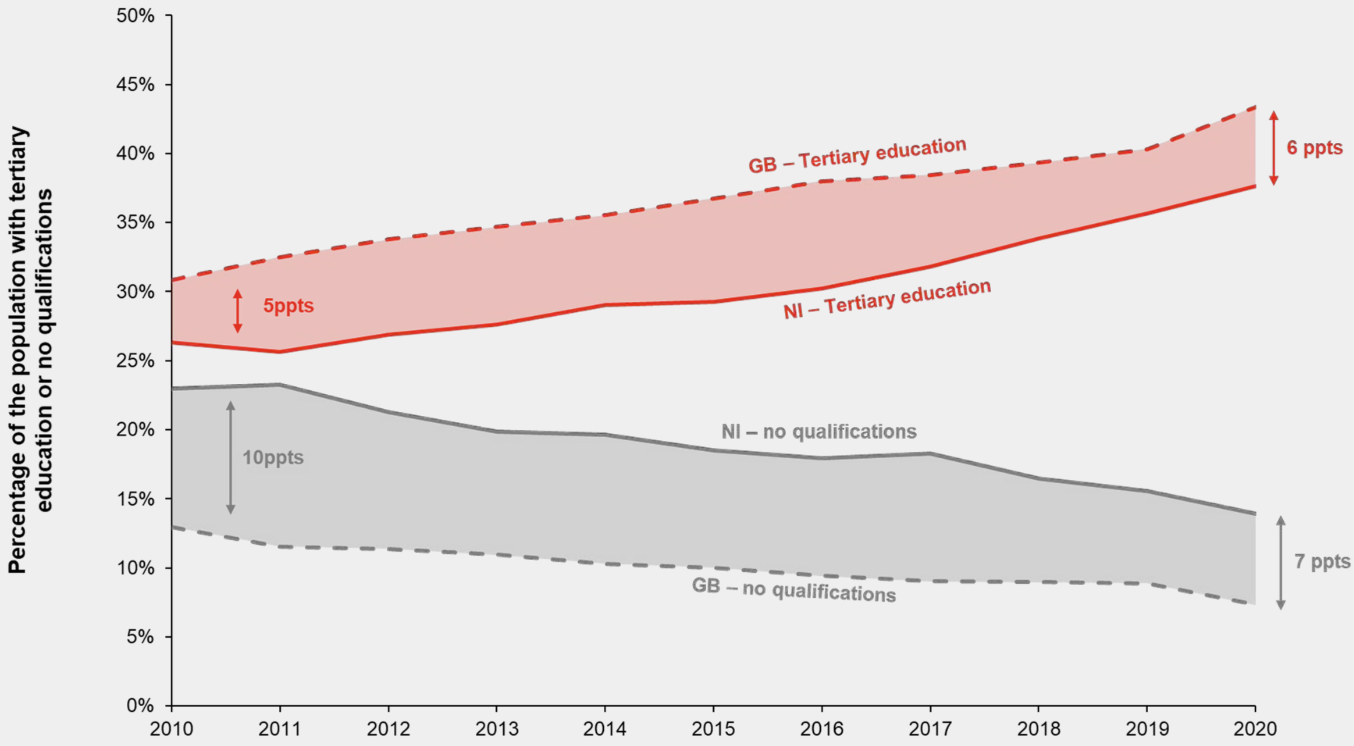
Sources: ONS, OECD, PwC analysis.

[14] University of Dundee, 2020. 'Scottish pupils lose top spot for reading comprehension' – link

NI has a number of significant and persistent skills challenges that need to be addressed urgently…

In spite of the positives, overall skills levels in NI still lag behind GB. For example, one in every seven people in NI had no qualifications in 2020, compared to one in every fourteen in GB; it is encouraging, as shown in Figure 11, that the gap has gradually closed, but it is still relatively big. Likewise, the proportion of the working age population with tertiary education was six percentage points lower in NI than in GB (see Figure 11).

Figure 11: Education levels amongst the NI workforce continue to lag behind Great Britain, albeit the gap at the lower end of attainment has narrowed in recent years



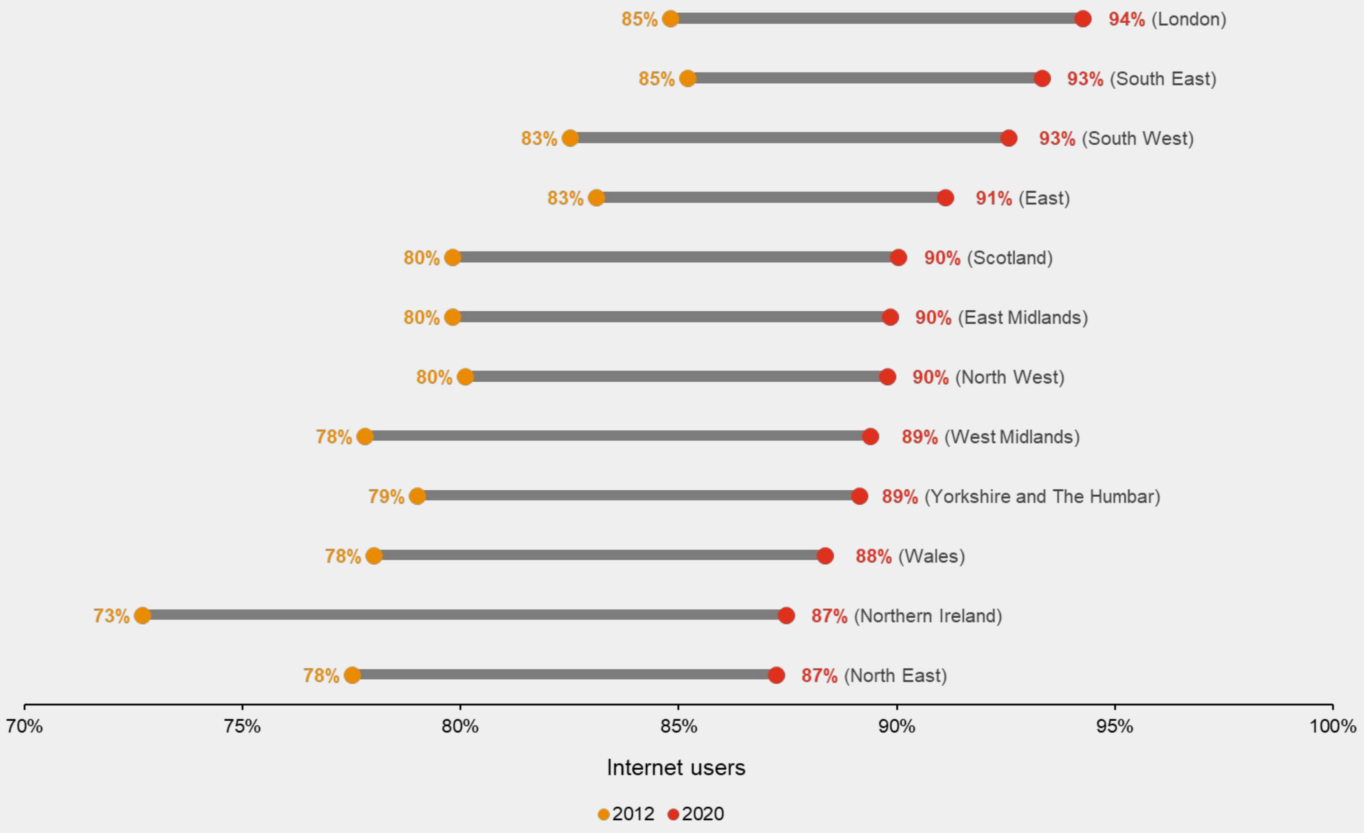
Sources: ONS for 2010-2018, PwC analysis of Annual population survey for 2019 and 2020.

Notes: ppts stand for percentage points which show the unit for the arithmetic difference of two percentages. For example, moving up from 10% to 14% is an increase of four percentage points.

This is important because it is estimated that in the coming years one in every three vacancies for education leavers in NI will require at least an undergraduate degree, and only one in ten future vacancies will be accessible for people with qualifications below so-called 'Level 2' (equivalent to GCSEs A*-C, or NVQ level 2)[15]. In this context, one important area to focus on is digital skills, which are increasingly fundamental to labour productivity. NI has fewer internet users than the UK as a whole – 87% of people in NI had used the internet in the last three months, compared with around 90% for the UK as a whole, and 93-94% in London, the South East and South West (see Figure 12). Linked to this, the Skills Strategy for a '10x Economy' argues strongly that NI also suffers from an under-provision of Information and Communication Technology (ICT) qualifications and computer science degrees[16].

[15] Northern Ireland Skills Barometer, Ulster University Economic Policy Centre, July 2019 – link
[16] Department for the Economy, 2021. 'Skills Strategy for Northern Ireland – A consultation', Skills for a 10x Economy – link.

Figure 12: The share of the adult population that has used the internet in the past three months is lower in NI than elsewhere, but this has improved significantly in recent years



Sources: ONS for 2012, PwC analysis of Jan-March labour force survey for 2020.

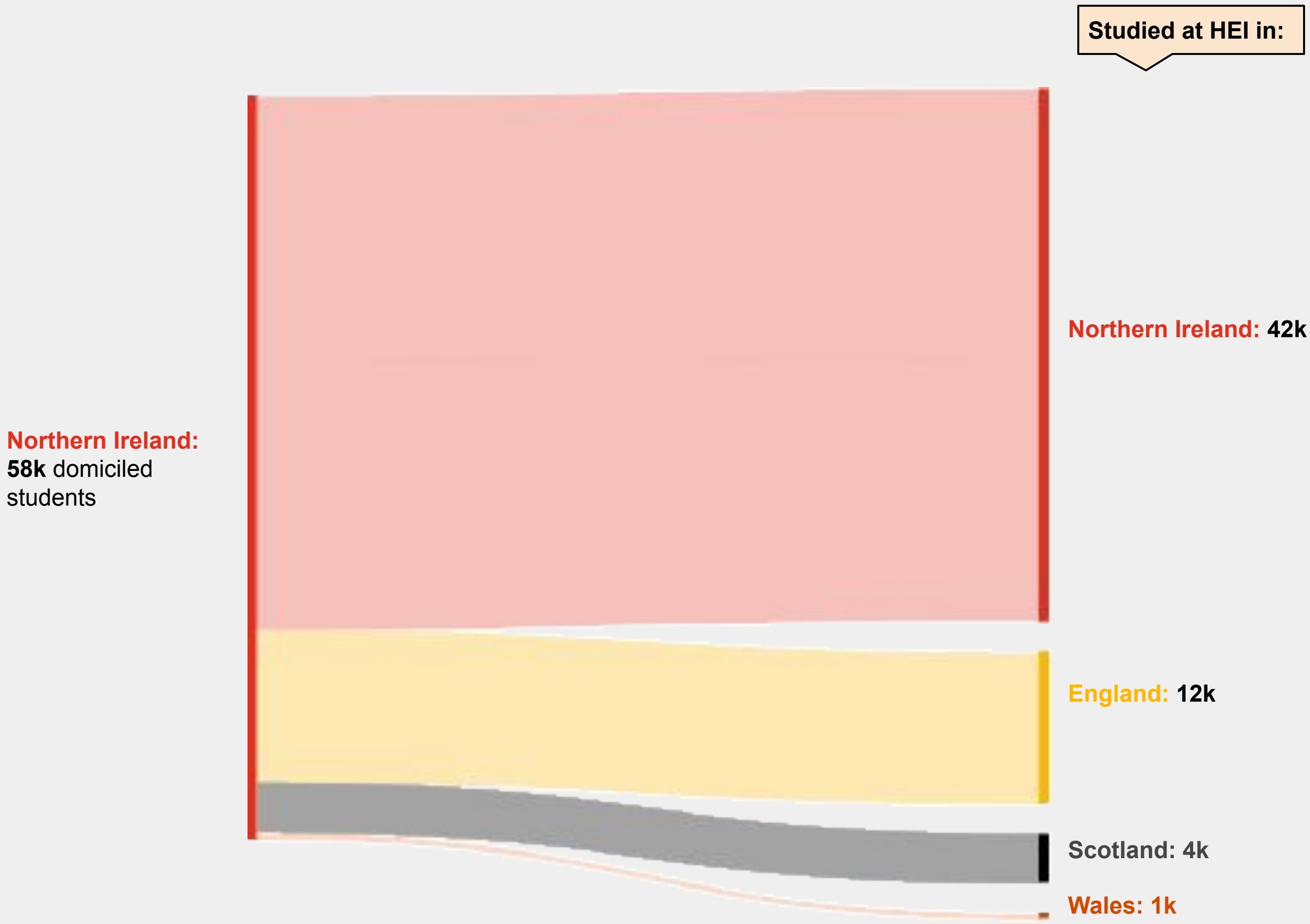
It is also important to note that UK businesses, including in NI, continue to face challenges in relation to levels of so-called 'soft skills' amongst the workforce, e.g. the ability to listen and collaborate, emotional intelligence, empathy and creativity. For example, the Organisation for Economic Cooperation and Development (OECD) has identified 'social and emotional skills' as one of the three essential building blocks of successful skills strategies in all industrialised countries[17]. Consistent with this, our PwC 23rd Annual Global CEO survey also finds that workforce skills, such as resilience and agility, are at the top of businesses' upskilling agenda[18]. And in NI, a number of large employers have been collaborating recently with Business in the Community to develop a series of 'soft skills' programmes targeted at learners and their families[19].

[17] OECD, 2020. 'OECD Skills Strategy Northern Ireland (United Kingdom)'– link
[18] PwC, 2020. 'Upskilling: Building confidence in an uncertain world' – link
[19] See for example, Business in the Community, 2020. 'Soft skills to be one of the most important attributes for the workforce in the next ten years says leading businesses' – link

These skills challenges are reflective of and exacerbated by migration of students out of NI…

More than one in four students from NI (16,500 in total) left the region to study at Higher Education Institutions in GB in 2019/20 (see Figure 13), and an additional 1,600 left to study in Dublin and other locations in Ireland. On average, around two in three of these 16,500 students are currently not expected to return to NI six months after they graduate[20]. This outflow of students means that NI is losing skilled labour, holding back its potential to innovate and increase workforce productivity, and in part explains the gap between the percentage of the workforce with tertiary education in NI compared to GB.

Figure 13: Around 28% of NI domiciled students enrolled at Higher Education Institutions (HEIs) in other UK regions (2019/20)



Sources: Department for the Economy, PwC analysis.

[20] Pivotal, 2021. 'Retaining and regaining talent in Northern Ireland'– link

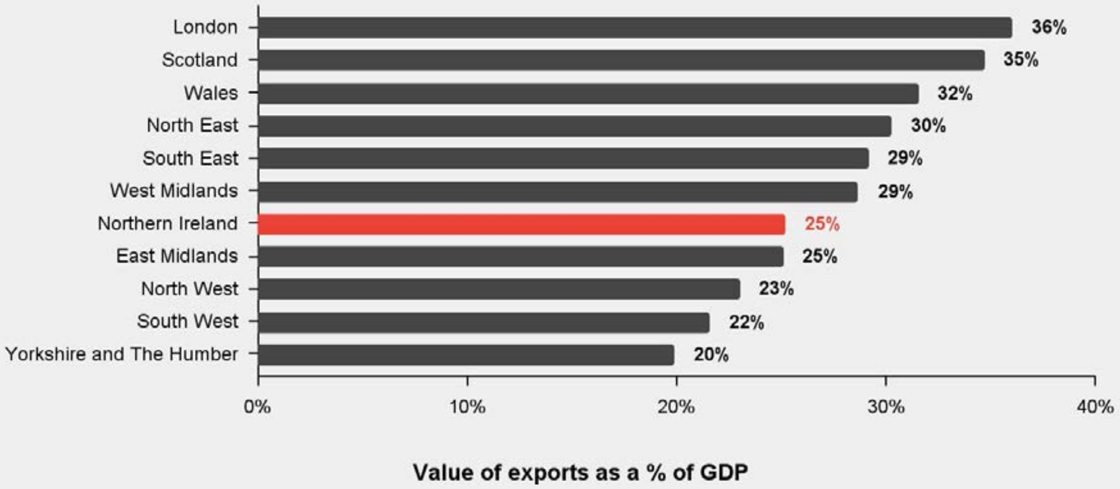
Trade and investment

5 Trade and investment

NI's recent performance in relation to exports and inward investment has been mixed…

Figure 14 shows that in 2019, total value of exports accounted for around 25% of NI's GDP, lower than most UK regions except Yorkshire and the Humber (20%), the South West (22%) and the North West (23%).

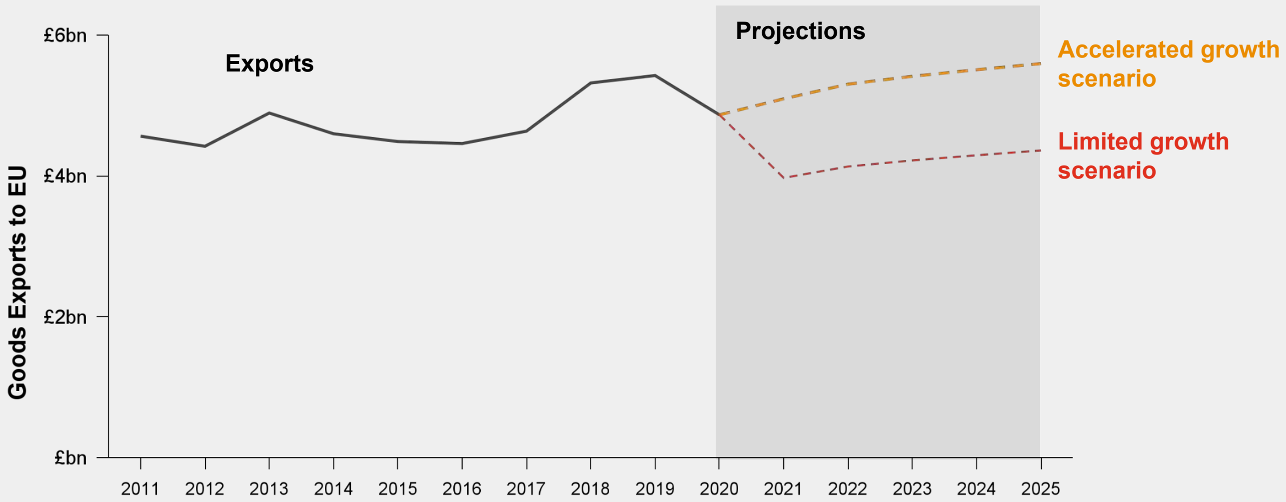
Figure 14: NI lags behind Scotland and Wales in terms of total value of exports as a percentage of GDP



Sources: ONS, PwC analysis.

Internationally, when compared to other small advanced economies of similar size (in GDP terms), NI has a lower level of exports than many, e.g. Croatia, which had total exports of around 52% of GDP, as well as Estonia, Latvia and Cyprus which all had total exports of greater than 60% of GDP[21]. Under the current political arrangements, goods can flow from NI to the Republic of Ireland (ROI) without any need for checks or tariffs. This, in principle, creates a unique export opportunity for NI businesses, and recent data have begun to show early signs of this opportunity being realised. For example, by the first half of 2021, NI's total exports to the Republic of Ireland increased by around 60% compared to the same period in 2020[22]. This is consistent with our projections shown in Figure 15 (under our 'accelerated growth' and 'limited growth' scenarios), which expect NI exports to the EU to have resumed their upward trajectory in 2021 ('accelerated growth') or by 2022 ('limited growth') at the latest.

Figure 15: NI goods exports to the EU is expected to recover no later than 2022 under our scenarios

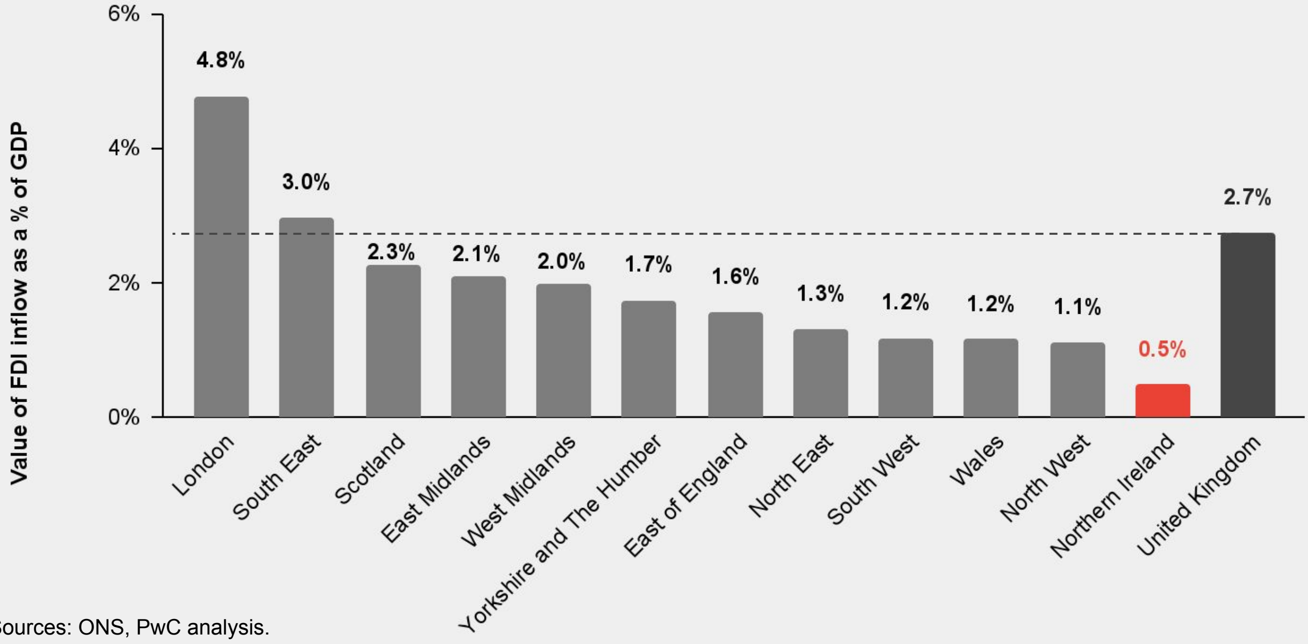


Sources: ONS, PwC analysis.

[21] The World Bank, 'Exports of goods and services (% of GDP)' – link
[22] This increase did not take place over a 'normal' period, as the base year of 2020 included the impact of COVID-19. However, exports from NI remained stable even during COVID-19, increasing by 9.9% between 2019-20 – link

Prior to the pandemic, the value of NI's FDI inflows as a percentage of GDP was lower than all other UK regions. On average, between 2017-2019, NI's FDI performance on this metric – at 0.5% of GDP – was five times lower than the UK average (see Figure 16)...

Figure 16: The value of NI's net FDI inflows as a proportion of GDP ratios has lagged behind other UK regions (2017–2019 average)

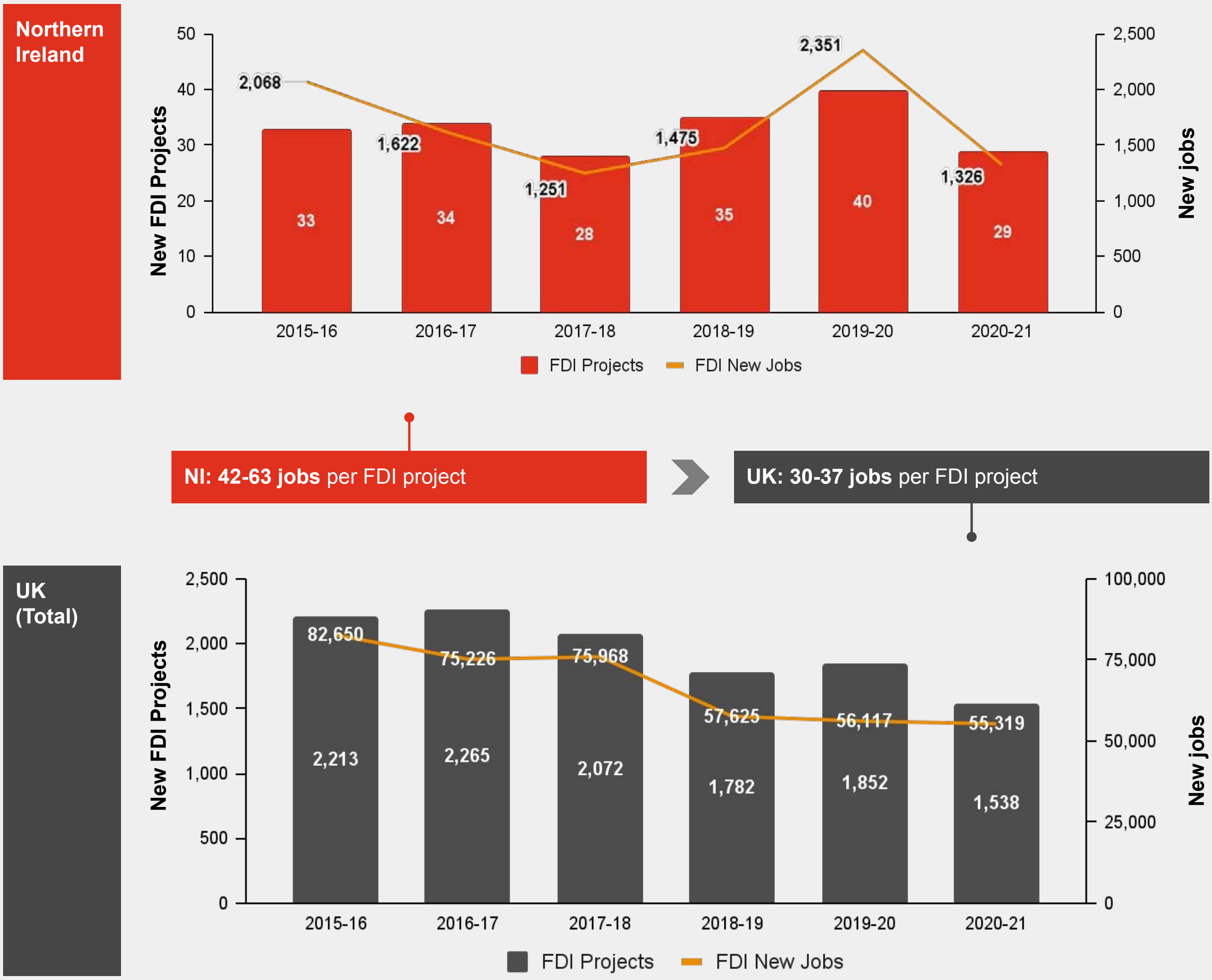


Sources: ONS, PwC analysis.

But, there were also some promising signs for NI in relation to FDI before the economic impacts of the pandemic began to be felt. For example, Figure 17 shows NI's performance in relation to the number of FDI projects and the number of jobs created by those projects. The number of new FDI projects in NI increased by 43% between 2017 and 2020, while new projects in the UK fell by 11% over the same period. Similarly, FDI projects in NI in this period tended to have larger job multipliers than elsewhere in the UK – for every new FDI project there were 16 more jobs created, on average, in NI than in the UK as a whole. Global investment levels fell by around 42% in 2020. NI has clearly felt the impact of this, with the number of new FDI projects declining by around 28% in NI in the year to 2020/21. Nevertheless, this slowdown is likely to be temporary, and forecasters expect global investment to rebound, and that more than 70% of the FDI loss in 2020 will have been recovered during 2021[23].

[23] World Investment Forum, 2021. 'Investment Trends Monitor' – link

Figure 17: In the run-up to the pandemic, NI had relatively strong growth in the number of FDI projects, and also higher job multipliers than the UK average



Sources: fDi Intelligence (2018/19 and 2020), Cushman & Wakefield, InvestNI, Ulster University, DIT, PwC analysis.

The evidence suggests that NI has a great opportunity to stimulate exports and attract more FDI in 2022 and beyond...

The Department for the Economy's '10x Economy' strategy has set out an economic vision for NI for the next decade. A core component of this vision, particularly in relation to stimulating exports and FDI, is the identification of a number of technologies and clusters in which NI has genuine strengths and, in principle, can become a world leader in coming years (see Box C)[24].

C **Box C:** Priority technologies and clusters in the NI '10x Economy' strategy

"Focusing on our areas of strength…

Our ambition is centred on focusing on the core technologies and clusters where Northern Ireland can be a global leader within the next decade."

Source: Department for the Economy

Linked to this, Belfast has recently been ranked independently as the most business-friendly city of its size in 2019, and came second in terms of FDI strategy[25]. Belfast is also regarded as a tech-friendly city, listed in the top 15 'Tech Cities of the Future' in 2021 by fDi Intelligence based on five categories: cost effectiveness, economic potential, FDI performance, innovation and attractiveness and start-up environment[26]. More generally, a recent PwC study found that NI, compared to elsewhere in the UK, ranked amongst the best places to set up a business and bring up a family[27]. This is consistent with a study of 25 major UK cities which found Belfast to be the best city to start a new business based on a wide range of factors, such as utility bills, broadband speeds, and levels of public sector support[28]. Box D provides further information about some key business-friendly features of NI.

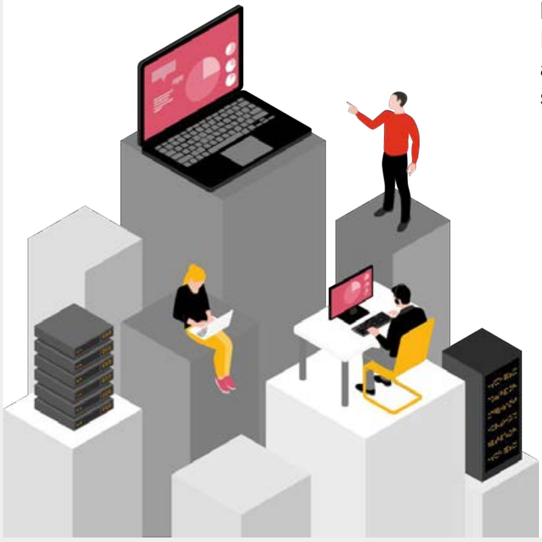
[24] 'A 10x Economy', Department for the Economy, May 2021 – link
[25] fDi Intelligence,2018. 'fDi Global Cities of the Future 2018/19 – FDI Strategy' – link
[26] fDi Intelligence, 2021. 'fDix TNW Tech Cities of the Future 2021'– link
[27] PwC, 2021, 'Northern Ireland best place to live and start a business', press releases on 17 February 2021 – link
[28] Hitachi Capital Invoice Finance, 2021 – link

D Box D: Key features of NI for businesses – Talent, cost and reputation

Talent pool

Young and highly educated workers – with NI students outperforming those in other UK regions in A-Level results. Compared to its international counterparts, the evidence suggests that NI also has the best outcomes for primary maths in Europe, and the seventh best in the world[29].

Business-led skills and training support – for foreign investors and indigenous businesses through programmes such as 'Assured Skills Academies' and 'Skill Up' programmes. Such programmes show NI's commitment to upskilling and retaining talent, and its ability to mobilise local stakeholders and providers to this end.



Cost base

Lower operating costs – overall business operating costs in NI are about 30% lower than similar locations in other parts of the UK and Europe[30]. Linked to this, average weekly earnings in NI were around £601 in the period April-June 2021, 11% lower than in Great Britain (approximately £677 for the same period)[31]. An investor survey also shows that NI employees have a can-do attitude and strong work ethic, resulting in a lower level of employee turnover and further cost savings compared to other UK regions[32].

Affordable office space – in 2019, prime office space in Belfast was priced around £34 per square foot, much lower than similar space in Dublin (£68 per square foot) and London (£107 per square foot)[33].

Global reputation

NI currently has over 1,100 international companies investing in the region – of which around 75% of inward investors have already planned for further expansion[34]. Its knowledge economy, which focuses on skills, innovation and start-up support, is also among the fastest growing in the UK, providing a strong foundation for new businesses[35].

NI's global standing as a business-focused region has been widely recognised – for example, Belfast has been ranked the second most successful city (after London) in attracting FDI projects from the US[36], and NI is now the top international investment location for US cybersecurity development projects[37]. Belfast is also ranked 16th in the top 30 European headquarter locations, surpassing large European financial hubs, such as Frankfurt and Geneva[38].

Strong transport connectivity between Europe, the UK and the US – located between Europe and the US, and situated within a strong transport network with other parts of the UK, NI is well connected with these three main trading partners. Also, NI's port system, including Belfast Harbour (the second busiest port in the island of Ireland[39]), continues to act as an important commercial and industrial base for trade with other countries and the rest of the UK.

[29] Invest NI, 2020. 'This is Northern Ireland' – link
[30] Ibid
[31] ONS, link
[32] Invest NI, 'Why Northern Ireland?' – link
[33] CBRE, 2019. 'Global prime office occupancy 2019' – link
[34] Invest NI, 2020. 'This is Northern Ireland' – link
[35] Ulster University, 2019. 'Knowledge Economy report'– link
[36] Invest NI, 'Why Northern Ireland?' – link
[37] fDi Intelligence, 2020. 'fDi Strategy Awards' – link
[38] fDi Intelligence, 2020. 'Dublin tops European HQ location rankings' – link
[39] Invest NI, 'Why Northern Ireland?' – link

Climate and energy

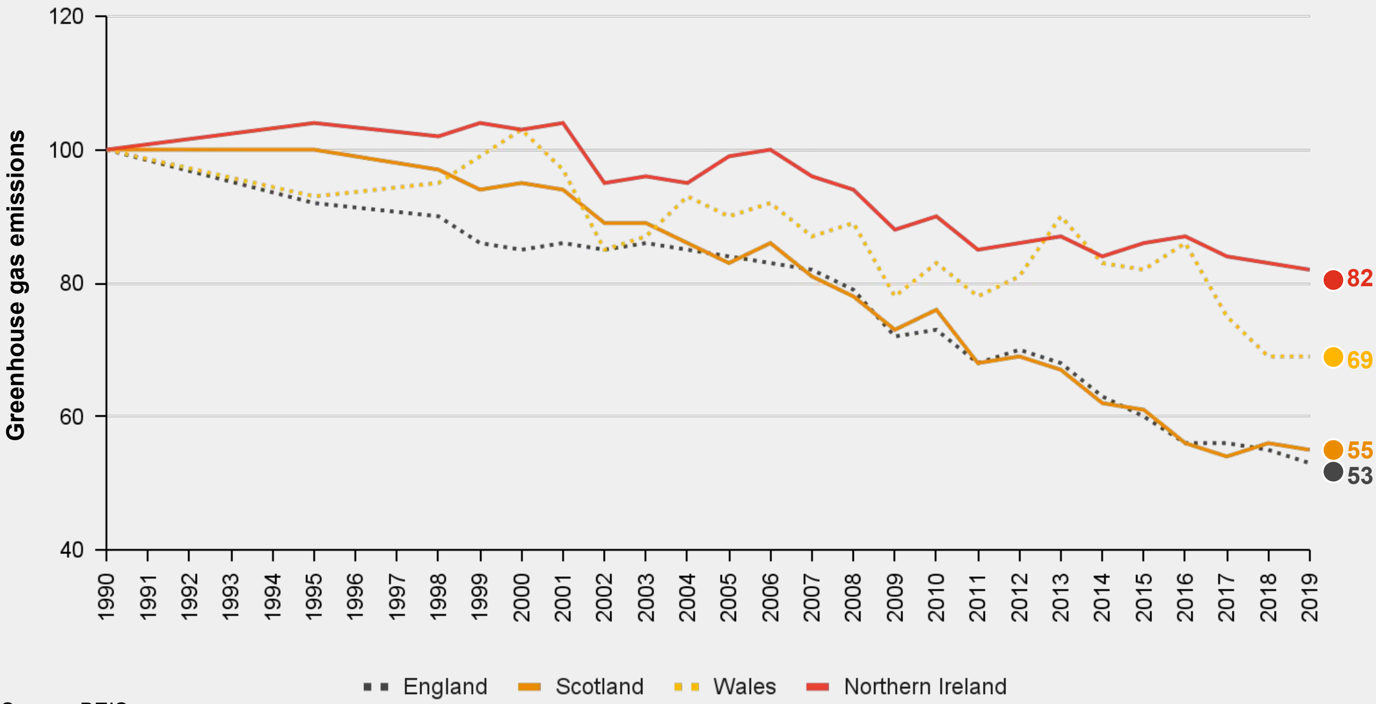
6 Climate and energy

NI has lagged behind other parts of the UK in terms of cutting greenhouse gas emissions...

NI currently has the highest carbon emissions per employee in the UK[40]. Over the last 30 years, NI has reduced greenhouse gas (GHG) emissions by 18%, compared to 45% in Scotland and 47% in England (see Figure 18). NI's relative underperformance in relation to GHGs is recognised in the NI Executive's Draft 'Green Growth Strategy'[41] (which closed for consultation in December) and is likely to be due to a number of structural challenges including:

- **Availability of natural gas** – our PwC Green Jobs Barometer has found that the limited availability of natural gas in NI has led to combustion of more carbon intensive fuels instead, such as coal and oil[42]. In the housing sector in 2019, for example, around 68% of households in NI relied on an oil boiler[43] compared to only 3% in England[44]. Oil powered boilers produce around 0.1kg more carbon dioxide per kilowatt hour than gas boilers[45].
- **Agriculture and rurality** – NI has a relatively large agricultural sector, with 2.6% of jobs and 1.7% of output attributed to agriculture (compared to around 1% and 0.6% respectively for the UK as a whole). The agriculture sector produces over a quarter of NI's greenhouse gases[46]. Linked to this, 36% of people in NI live in rural areas, compared to around 17% in England and this results in NI relying more heavily on cars for transport than the rest of the UK[47]. In 2019, for example, 71% of journeys in NI were made by car compared to 60% in England[48].

Figure 18: NI has cut its greenhouse gas emissions in recent years but at a slower pace than other parts of the UK (1990 = 100)



Source: BEIS.

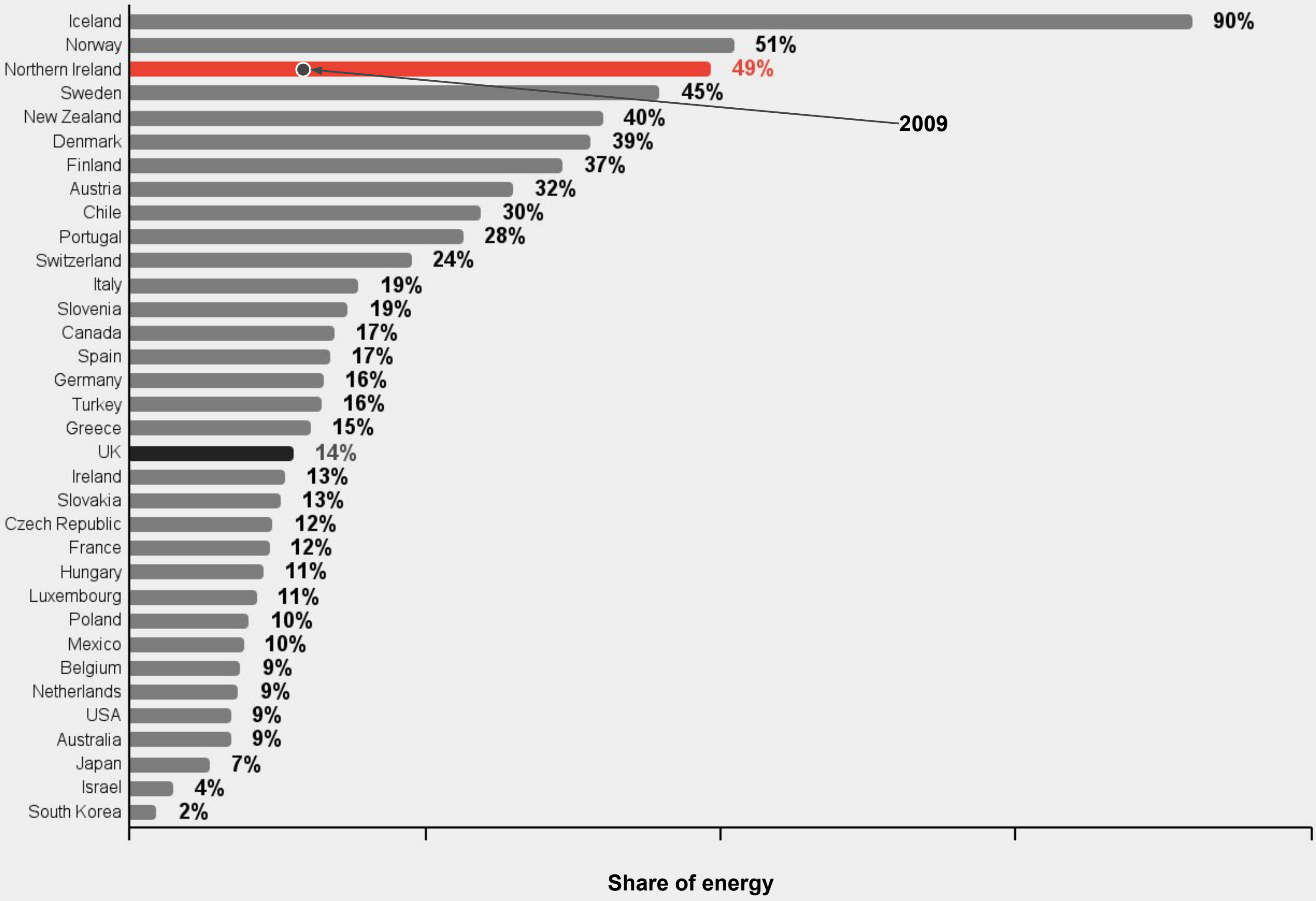
[40] PwC, 2021. Green Jobs Barometer' – link. Note that carbon emissions are a subset (and the largest part) of GHG emission inventory. Globally, it accounts for around 76% of total GHG emissions. Source: Center for Climate and Energy Solutions, 'Global Emissions'– link
[41] Northern Ireland Executive, 2021. 'Draft Green Growth Strategy for Northern Ireland' – link
[42] PwC, 2021. 'Green Jobs Barometer' – link
[43] The Consumer Council, 2019 'Domestic Heating Oil and Fuel Poverty' – link
[44] Ministry of Housing Communities and Local Government, 2021. 'English Housing Survey: Energy report 2019/20' – link
[45] Energy Saving Trust, 2021. 'Climate change targets in Northern Ireland: progressing towards net zero' – link
[46] Energy Saving Trust, 2019. 'Northern Ireland: reducing dependency on oil–fired heating' – link
[47] McKibbin D., 2020. 'Decarbonising Transport in Northern Ireland', Northern Ireland Assembly –link and Department for Environment, Food and Rural Affairs (DEFRA), 2021. 'Population statistics''– link
[48] Department for Infrastructure, 2021.'Travel Survey for Northern Ireland' – link and Department for Transport, 2020. 'National Travel Survey: England 2019' – link

NI has more recently become a leader in renewable energy, and has developed an exciting platform in relation to hydrogen creation...

As can be seen from Figure 19, in 2020 around 49% of energy generation in NI was from renewable sources[49] – e.g. wind, solar and biofuels – compared to a UK average of 14%[50]. This represents a significant improvement in NI renewable energy contribution from just 11% in 2009[51]. While more recent data shows that the share of renewable energy in NI has decreased slightly to about 42% in the 12-months to September 2021[52], this is still significantly higher than the majority of countries in the OECD region. As a result, the energy sector has been the biggest driver of emission savings in NI, accounting for two-thirds of the reduction in emissions since 1998.

The creation of hydrogen gives NI another carbon free energy source, and further commercial opportunity associated with this has begun to be acted upon. For example, Translink has recently introduced hydrogen buses built locally by Wrightbus, and is also procuring a new hydrogen fuelling station. Belfast Metropolitan College has been leading on a Europe-wide research programme to pilot approaches to generating Green Hydrogen, and is currently developing new apprenticeship qualifications to support job opportunities in this sector[53].

Figure 19: NI is a global leader in terms of the share of renewable energy in total primary energy creation in 2020



Sources: OECD, Northern Ireland Statistics and Research Agency (NISRA), PwC analysis.

[49] Department for the Economy, 2021. 'Issue 18 – Electricity Consumption and Renewable Generation in Northern Ireland January 2020 to December 2020'– link
[50] OECD, 2020. 'World Energy Statistics' – link
[51] Department for the Economy, 2021. 'Issue 18 – Electricity Consumption and Renewable Generation in Northern Ireland January 2020 to December 2020' – link
[52] Department for the Economy, 2021. "Electricity consumption and renewable generation in Northern Ireland: Year ending September 2021" - link
[53] Interreg North-West Europe, "GENCOMM: Generating energy secure communities through Smart Renewable Hydrogen" – link

NI must now accelerate progress towards Net Zero targets, particularly in relation to 'green' jobs, sustainable transport and home energy efficiency...

There are a number of opportunities for NI to accelerate progress towards Net Zero targets and, at the same time, make a tangible contribution to jobs, skills and economic growth:

- **'Green' jobs** – the UK government has made a commitment to create 2m 'green' jobs by 2030[54]. In this context, PwC has recently developed a Green Jobs Barometer[55] to track job creation, wider employment benefits, job loss, carbon intensity of employment, and worker perceptions in relation to the transition to a green economy. Generally, our analysis suggests that NI is facing some significant challenges across the different dimensions of the Green Jobs Barometer (see Box E). For example, in terms of the overall 'green' jobs ranking – the share of 'green' jobs in the economy – NI ranks 11th out of 12 UK regions in the Barometer, below all other regions except Wales. However, the analysis also suggests some clear opportunities for NI. Firstly, it recommends a renewed focus on and investment in green energy in NI where, as discussed above, NI already has an excellent platform and is making strong progress. In doing so, the Barometer also highlights the fact that the knock-on/multiplier effects on employment elsewhere in the economy are likely to be larger for 'green' jobs – particularly in the energy, utilities and manufacturing sectors. Secondly, in relation to existing jobs, the Barometer makes a strong case for 'greening' existing jobs. For example, only 47% of survey respondents stated that they had received training, education or communication in relation to environmentally-focused practices; and 56% stated that their employer encouraged them to adopt sustainable workplace practices (e.g. cycle to work, reduced business travel or encouragement to invest in green pensions). There is clearly an opportunity for NI businesses to do more in this regard.

E **Box E:** Key pillars of PwC's Green Jobs Barometer

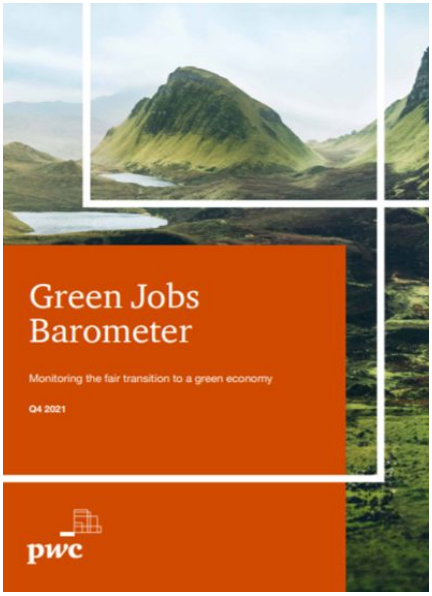
Pillar 01: 'Green' job creation
The relative density of 'green' job advertisements as a total of job advertisements.

Pillar 02: Wider benefits from 'green' jobs
The multiplier effect of direct new 'green' jobs in creating additional employment whether indirectly or induced via employment effects.

Pillar 03: Sunset jobs to disappear
The number of jobs lost as a result of the transition to environmental sustainability, in the absence of worker reallocation or upskilling.

Pillar 04: Carbon intensity of jobs
Carbon dioxide emissions per employee. This provides information about the carbon intensity of different sectors and regions.

Pillar 05: 'Green' workplaces
Worker sentiment about what the green transition means for their own role and workplace.



Source: PwC, 2021. 'Green Jobs Barometer' – link

- **Sustainable transport** – NI could potentially achieve a rapid transition towards electric vehicles (EVs), contributing further to reducing both transport emissions and energy consumption, which currently account for 20% and 13% respectively of NI total GHG emissions[56]. A survey in NI shows that 25% of the respondents said they would consider EVs for their next purchase[57]. The rapid shift to active travel habits, such as walking or cycling, provides a further opportunity for NI to reduce the level of GHG emissions. In 2019, active travel made up only 19%[58] of all travel in NI. This is likely to have increased sharply during the pandemic (figures for England suggest that walking trips per person increased by 34% and cycling by 26%[59]), but there is still plenty of room for further improvement.

[54] Government press release, 2020. 'UK government launches taskforce to support drive for 2 million 'green' jobs by 2030', 12 November 2020 – link
[55] PwC, 2021. 'Green Jobs Barometer'– link
[56] Northern Ireland Statistics and Research Agency (NISRA), 'NI Greenhouse gas emissions 2019'– link
[57] Department for Infrastructure, 'Attitudes to Electric Vehicles in Northern Ireland 2019/2020'– link
[58] Department for Infrastructure, 2021.'Travel Survey for Northern Ireland' - link
[59] Department for Transport, 2021. 'National travel survey 2020' – link

Home energy efficiency – the housing sector in NI currently contributes around 14% of NI's total GHG emissions[60]. Transitioning to lower-carbon heating – in particular moving away from the use of conventional oil boilers – and improving the energy efficiency of homes, could therefore reduce carbon emissions significantly, and also realise significant savings for consumers in relation to energy bills. Our recent UK-wide analysis of home energy efficiency[61] shows that NI households could in principle save around £230m per year in energy bills,if they made improvements to their homes and upgraded to EPC band C[62], in line with the UK's target in the 'Clean Growth Strategy'[63]. In doing so, NI would be likely to save around 7m tonnes of C02 emissions by 2030[64], equivalent to around 33% of current emissions[65]. Our study also finds that despite growing public awareness and willingness to invest in energy efficiency, high upfront costs[66] are one of the main reasons preventing households (especially those in the lower end of the income distribution) from investing in energy efficiency upgrades.

[60] NISRA, 'NI Greenhouse gas emissions 2019' – link
[61] PwC, 2021. 'UK Economic Outlook', July 2021 – link
[62] EPC stands for Energy Performance Certificate, with A being the most efficient and G least efficient.
[63] HM Government, 2017. 'UK Clean Growth Strategy''– link
[64] PwC, 2021. 'UK Economic Outlook', July 2021 – link
[65] Estimate based on the Northern Ireland greenhouse gas statistics. Source: Department of Agriculture, Environment and Rural Affairs – link
[66] 'On average, we find that from energy savings alone it can take at least 10 years for upfront costs of upgrades to be fully clawed back.' Source: PwC, 2021. 'UK Economic Outlook', July 2021 – link

Actions and recommendations

7 Actions and recommendations

Education and skills

Invest further in business-led re-skilling initiatives – the NI Department for the Economy has made significant progress with a range of upskilling initiatives such as 'Skill Up', 'Assured Skills Academies' and Apprenticeships. A number of factors have contributed to the success of these initiatives, including the role of businesses in shaping the course content, and also the fact that government, training providers and businesses have worked closely together to deliver the programmes (see Box F for an example). Further investment is required, including:

- **Increasing awareness of non-traditional, business-led routes into the labour market –** attitudes to Apprenticeships, Higher Level Apprenticeships and other business-led routes into the labour market are changing in NI. However, more needs to be done to promote these non-traditional routes to prospective students and their families, and deliver 'parity of esteem' in NI for what is now a diverse range of possible labour market pathways. This will require further targeted investment in marketing and communications to promote the key benefits of such pathways to students and their families.
- **Creating new mechanisms for SMEs and micro businesses to engage with skills providers –** the vast majority of businesses in NI are SMEs and micro businesses – around 99%[67] – but many of the current success stories in relation to business-led skills initiatives, are driven by the role of larger businesses in the NI economy. This is partly because SMEs and micro businesses do not have the scale and resources to work alongside others to design and deliver bespoke programmes. There is, therefore, a clear need to prioritise the creation of new shared platforms and cluster-driven ways of working that enable NI SMEs and micro businesses to participate actively in and benefit from Apprenticeships and other business-led skills initiatives[68].
- **Reinforcing FE and employer engagement through sectoral employer partnerships to update apprenticeship frameworks, the STEM curriculum and intermediate skills –** the evidence suggests strongly that there is an under supply of STEM qualifications and intermediate level vocational skills (at Levels 3-5) and, particularly in relation to the latter, these are areas in which NI's FE Colleges can – in principle – make a significant contribution. The proposed new NI Skills Council needs to ensure that FE Colleges and businesses are central to any new initiatives to tackle this issue and, in particular, that Apprenticeships and Higher Level Apprenticeships are leveraged in doing so.

F Box F: PwC's Assured Skills Academy

PwC's Assured Skills Academy programme is currently the largest in operation in Northern Ireland. It targets the delivery of 600 high-quality training places in partnership with the government, Belfast Metropolitan College and Ulster University. To date, there have been 14 Academies, all targeting the specific skills needed for the priority clusters outlined in the '10x Economy' vision, and so far 94% of participants have successfully secured a job at PwC, after completing the programme.

- **Attracting new talent into the NI labour market –** our analysis shows that labour force participation is relatively low in NI, particularly amongst women. This presents an opportunity to address some of NI's future skills needs by attracting women and other talented workers back into the labour market (e.g. older workers and the NI diaspora, including young people who are currently studying at university in GB and elsewhere). In relation to this, consideration should be given to tailoring some of the successful existing skills initiatives (e.g. Assured Skills Academies) so that they are designed around and targeted towards specific groups of these new workers. This may require some prior, quick-turnaround research, to ensure that the specific challenges faced by such workers are understood properly and evidence on this is fed into the design process.
- **Tackling the challenges at the lower end of secondary education –** the 'Independent Review of Education' announced in December 2020[69] provides a new opportunity to deal decisively with the challenges at the lower end of secondary education which, as discussed earlier in this report, result in a significantly higher proportion of workers in NI having low or no qualifications. The first substantive Interim Report from the Review is due to be published in October 2022. What NI stakeholders must not do is hold back on substantive action until this and other reports from the Review team are published. Many of the issues are understood well enough to ensure that focused remedial action can begin now. For example, a major review of educational underachievement in NI was published in May 2021 – see 'A Fair Start'[70] – which sets out a robust, coherent and evidence-based 'Action Plan' that should be delivered in parallel with the work of the Independent Review.

[67] Department for Business, Energy and Industrial Strategy (BEIS), 2021. 'Business population estimates 2021' – link
[68] For example, 'Workplus' is a network of 45 employers from various sectors that are collaborating to make it easier for people in NI to find apprenticeships. Many of these organisations are employing apprentices for the first time and being part of an employer network has allowed them to share knowledge and ideas with others. By creating an online platform which contains all the apprenticeships available across the network, Workplus is making it easier for aspiring apprentices, schools and/or parents to find an apprenticeship. Further information is available – here
[69] Further information about the Independent Review is available here.
[70] The Expert Panel on Educational Underachievement, 2021, 'A Fair Start', May 2021 – link

Trade and investment

Reframe the narrative about the NI economy for local companies and international investors – government, business and other stakeholders need to work closely together to reframe the narrative about economic opportunity in NI. NI needs a simple and concise narrative that is positive, forward-looking and unerringly focused on seizing the economic opportunities that, as outlined in this report, clearly exist. There should be one shared narrative, in which the voice of the business community is writ large, and it should include amongst other things:

- **Leveraging NI's unique trading position –** the current trading arrangements in which NI is part of the UK's customs area and also part of the EU single market for goods are politically sensitive, and have also created some uncertainties and additional costs for NI businesses. Aside from this, these trading arrangements are unique to NI and, in principle, create a corresponding opportunity for the NI business community. Many NI businesses recognise this; for example, 70% of NI Chamber of Commerce members recognise that the unique arrangements present opportunities for NI, as do around 80% of NI manufacturers[71]. Similarly, business representative bodies such as the Confederation of British Industry and the Institute of Directors have signalled that the current arrangements present a unique opportunity; e.g. the Institute of Directors has talked about NI now having a 'foot in both camps' that in principle can give NI businesses long-term competitive advantage, and the CBI has highlighted that the current arrangements present exciting opportunities for NI, bridging a combined market of 500m people[72].
- **Promoting NI's key strengths and assets –** this report has presented extensive evidence to demonstrate that, both for indigenous companies seeking to export and for international investors, NI has many strengths and assets, e.g. physical and digital connectivity, talent pool, bespoke training programmes, and track record with international investors. Building further evidence and case studies on these, including in relation to NI's unique trading position, needs to be at the centre of the reframed narrative about the NI economy.
- **Improving the support available for exporters and investors –** in the current environment, NI businesses have a strong appetite for support from government and other organisations, to help them navigate the economic challenges and opportunities they face. However, many businesses are still not completely clear about what government support is available, be that for NI businesses seeking to export, or international businesses seeking to locate to or expand further in NI. And when they actually receive the support, there has been feedback suggesting that it is not focused or practical enough to provide tangible benefit to the businesses[73]. Some recent developments in the UK should help with this, e.g. the new Export Plan from the Department for International Trade provides a helpful new framework for the provision of business support for exporters (see Box G).

G Box G: The Department for International Trade's strategic approach to supporting exporters

Businesses throughout the UK have asked for consistency in policy. DIT will therefore continue to:

Encourage and inspire businesses that can export but have not started or are just beginning.

Inform businesses by providing information, advice, and practical assistance on exporting from the public or private sector, or their peers.

Connect UK businesses to overseas buyers, international markets, and each other.

Put **finance** at the heart of NI's offer.

This strong platform is the basis for NI's action-oriented, refreshed strategy. It will enable us to adapt to the changes demanded by the COVID-19 pandemic and make the most of the legislative freedom.

Source: Department for International Trade, 'Made in the UK, Sold to the World' – link

[71] Northern Ireland Chamber of Commerce and Industry, 2021. 'The latest at NI Chamber', 26 November 2021 – link, and for Manufacturing NI: RTE news, 2021. 'Protocol an opportunity not obstacle, say NI manufacturers', 10 November 2021 – link

[72] See, for example: 'It is incumbent on both sides to work together and settle outstanding issues' – CBI Director-General on NI Protocol', 24 June 2021, CBI – link, 'Our response to UK Government statement on Northern Ireland Protocol', 21 July 2021, CBI – link, and Institute of Directors, IoD Blog: 'The Northern Ireland Protocol', 10 May 2021 – link

[73] For example in Spring 2021, PwC undertook a 'pulse check' series of in-depth qualitative interviews with around 20 international investors which found that businesses welcomed support from government and others, but often found it difficult to understand who was providing what, and that the advice itself was not as timely or practical as they would have liked.

Climate and energy

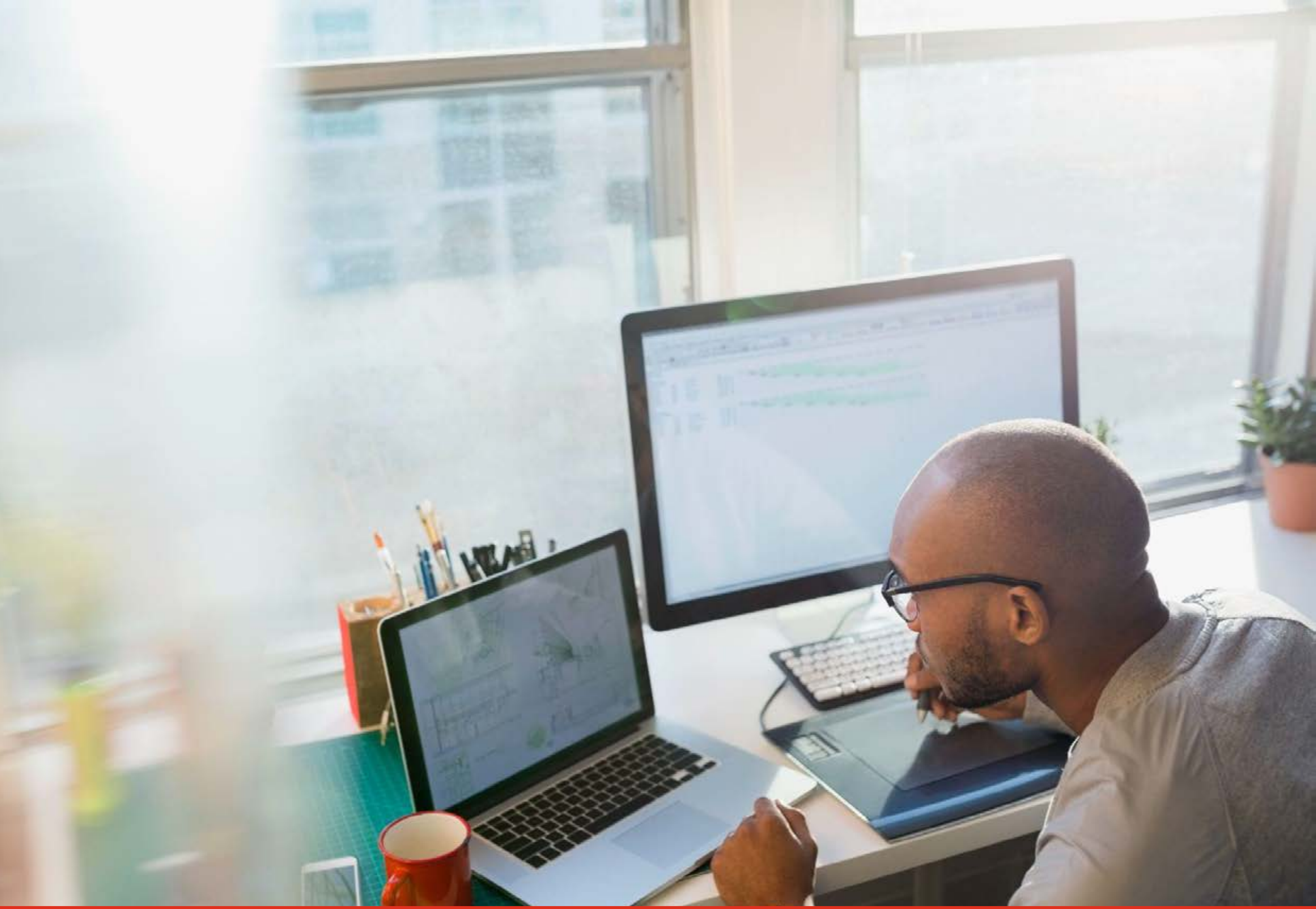
Implement the NI 'Green Growth Strategy' – this draft strategy was launched in October 2021 and the deadline for submissions to the consultation was 21 December 2021. The draft strategy is clear and coherent, it has received significant endorsement from across the political spectrum in NI, and much of its analysis is consistent with our own. It is important to note that the title of the strategy is 'Today we act. Tomorrow we thrive'. This rightly signals that the focus now for government, business and other stakeholders should be on action, delivery and implementation. The challenges and opportunities are well understood and, subject to the feedback from the consultation, NI has a clear and ambitious strategy to tackle them. The key now is working together to take action, and this should include:

- **Accelerating the transition to 'green' skills and 'green' jobs –** the UK government has prioritised the growth of 'green' jobs, and the analysis underpinning our PwC Green Jobs Barometer demonstrates there are likely to be greater knock-on/multiplier effects in relation to the creation of 'green' jobs compared to other jobs in the economy. Government, business and other stakeholders in NI should therefore double down on the creation of new 'green' jobs across the full range of sectors, and the provision of tailored education and training associated with these. This should include so-called 'circular jobs', for example, jobs involving using waste as a resource, extending the lifetime of products, and creating value for secondary materials. A renewed focus on 'green' jobs in NI could involve, for example, sharing best practice across industry bodies, private and public sectors, and potentially using the Challenge Fund model to encourage new ideas and innovation.
- **Scaling-up hydrogen generation capabilities –** building on its status as a leader in renewable energy production, NI should focus on and invest more in hydrogen generation. This is one area in which business, government and education/training providers have already been collaborating well to develop a strong position in what is clearly an important global market. There is a clear opportunity to harness the technical expertise and market insight that already exists in NI, and move quickly to scale up the hydrogen platform to drive clean economic growth and support new 'green' jobs and 'green' skills.
- **Investing further in sustainable transport –** government, business and other stakeholders in NI need to work closely with other UK devolved administrations to align plans for rolling out electric vehicles. This should be led by the government, but involve extensive collaboration with business in relation to investing in a comprehensive and consistent charging network in NI. In addition, there needs to be further promotion of and investment in 'green' transport options, e.g. further investment in cycle routes and green spaces to make cycling and walking a more viable option for travel in NI. Raising awareness of the environmental and health benefits of 'green' travel, and improving engagement with initiatives such as the cycle to work scheme, can in principle make an important contribution towards the UK overall Net Zero target.

Collaboration and partnership

Redouble efforts by government, business and other local stakeholders to collaborate to achieve shared goals – no one organisation or type of organisation can address these challenges on their own. Rather, successful change and better outcomes will only happen through meaningful collaboration and partnership between diverse organisations and stakeholder groups. This 'spirit of partnership' is essential for driving better outcomes in NI. There are already many examples in NI of this happening (for example, through the Belfast Region City Deal, highlighted earlier), but more needs to be done, including:

- **Stronger collaboration and coordination across NI government departments –** government officials in NI already collaborate well across different departments. However, the structure of government in NI sometimes works against this (e.g. the Department for Economy is responsible for the skills agenda, and a separate department, the Department for Communities, is responsible for employability). Given the scale of the challenges, outlined above, government officials need to re-focus on collaboration, and redouble their efforts in this regard. The policy areas this report identified – e.g. skills, investment and climate – are all very relevant in this regard. For example, although the Department for Education is leading the 'Independent Review of Education', it is essential that it works closely with the Department for the Economy, and indeed businesses and their representative bodies, to ensure that decisions on the curriculum are future proofed in relation to the needs of businesses and the wider economy.
- **More coordination amongst businesses, particularly at sector level –** many of the successes in relation to business-led skills initiatives are based, in part, on the involvement of large NI businesses. However, the vast majority of businesses in NI are small and education and training providers sometimes struggle to understand exactly what the needs of such businesses are. Linked to this, smaller businesses tend to struggle to understand, navigate and engage with what can often feel like a complicated system of education and training provision. In this context, there needs to be a more structured approach to sectoral employer partnerships, to ensure that NI businesses have 'one voice' in relation to their future skills needs, so that education and training providers can understand the strategic asks and respond accordingly.
- **Greater alignment across schools, Further Education/Higher Education, and other education and training providers –** education and training providers in NI currently compete vigorously with each other for students and funding. Whilst such competition can, in principle, drive efficiencies and value for money, the environment in which it is happening means there are extensive overlaps between different types of providers. This results in a lack of clarity about who is responsible for what, in relation to education and skills provision. The 'NI Skills Strategy', needs to tackle this issue head on and bring more cohesion and policy alignment in this regard. Doing so ought to enable education and training providers across the board to identify and focus on their 'core business', to drive stronger outcomes in line with the NI economy's pressing needs.



Technical annex:

NI export forecast model

8 Technical annex:

NI export forecast model

General model

Our forecasts are based on PwC's long-term global growth model, which uses UK trade data on goods and service exports from 1999-2019 to estimate coefficients of the benefit of being in the EU compared to being in a Regional Trade Agreement (RTA). The equation used to predict exports was as follows, with variable descriptions in Table A:

$$\ln(Exports_{jt}) = \beta_0 + \beta_1 \ln(GDP_{jt}) + \beta_2 Distance_j + \beta_2 ComLang_j + \beta_3 EU_{jt} + \beta_4 RTA_{jt} + \lambda_t + \varepsilon_{jt}$$

Table A: Variables used in our modelling specification include GDP, distance, language, and existing trading arrangements

	Variable	Definition	Data Source
Dependent variable	$\ln(Exports_{jt})$	Log of UK exports to country *j* at time *t*	OMS
Explanatory variables	$\ln(GDP_{jt})$	Long of the GDP of country *j* at time *t*	OECD IMF
	$Distance_j$	Distance between the UK and country *j*	CEPII
	$ComLang_j$	Dummy variable equal to one if the UK shares a common official or primary language with country *j*	CEPII
	EU_{jt}	Dummy variable equal to one if both the UK and country *j* are members of the EU at time *t*	CEPII PwC Analysis
	RTA_{jt}	Dummy variable equal to one if the UK has a regional trade agreement with country *j* at time *t*	CEPII WTO PwC Analysis

Table B: Our estimated gravity model shows that all of those variables contribute to explaining UK exports

Dependent Variable	Log of UK exports
Log of partner country's GDP	0.92***
Log of the distance between UK and partner country	-0.57***
Common language	1.08***
EU Membership (dummy)	0.61***
Regional Trade Agreement (dummy)	0.11***

*** Statistically significant at the 1% level, ** statistically significant at the 5% level, * statistically significant at the 10% level

Source: PwC analysis

Our model found that GDP positively increases trade with the UK, while distance has a negative effect on trade. Having a common language, having an EU membership and regional trade agreement with the UK also have positive effects.

Applying the model coefficients to estimate NI exports

The 'EU membership' coefficient is then used to estimate what the benefit would be if NI remained in the EU as normal, compared to a counterfactual of greater friction. We assume that the counterfactual lies between the 'EU membership' and RTA coefficients, given that a slow implementation of the Northern Ireland Protocol (NIP) is likely to resemble an intermediate scenario lying between full EU membership and an RTA.

Key assumptions

- Northern Ireland coefficients which estimate the relationship between exports and our independent variables are the same as for the UK.
- In order to estimate a slow implementation of the NIP with frictions, we assume that the coefficient for this scenario is between the coefficient for EU membership and the RTA (average of the two).
- We assume that the coefficients estimating goods exports to the EU are the same as the coefficients estimating total exports (both goods and services). This is a reasonable assumption, given we estimate the impact of being in the EU over and above the impact of being in an RTA. If the composition of export and service rules within an EU agreement is similar to a regional trade agreement (i.e. the gap is the same) then the impact size should be the same.

Contacts

For more information about this report, please contact:

Dr David Armstrong
Partner
E: david.m.armstrong@pwc.com
T: +44 (0)7713 680266

Aine O'Hare
Partner
E: aine.h.ohare@pwc.com
T: +44 (0)7718 979433

Rachel Wilson
Senior Economist
E: rachel.x.wilson@pwc.com
T: +44 (0)7483 392750

Hoa Duong
Economist
E: hoa.t.duong@pwc.com
T: +44 (0)7753 459022

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