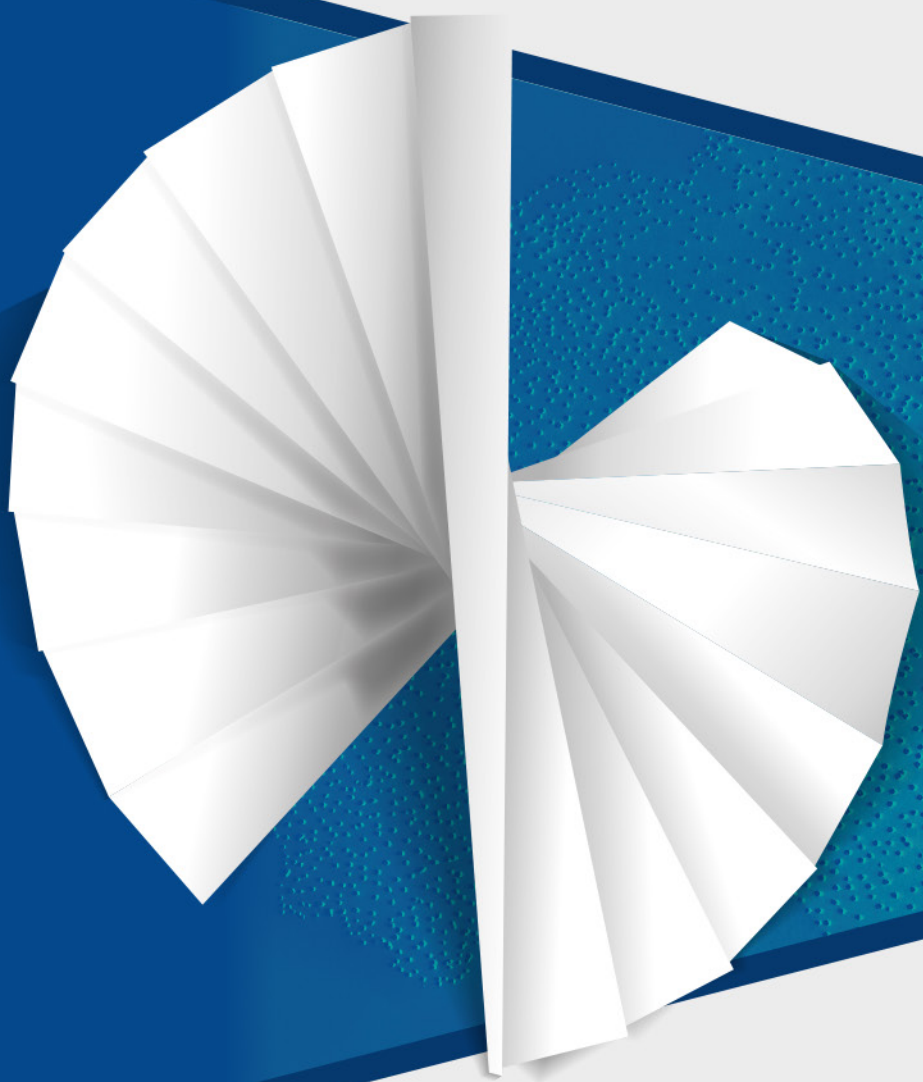




Catalyst Inc



The 2018
Northern Ireland
Knowledge
Economy
Report

overview | performance | challenges

Bank of Ireland 


Ulster
University
Economic
Policy Centre

Chief Executive's View

The increasing pace of change driven by technology. Uncertainty around how the UK will exit the EU. Over two years without a local Executive and Assembly – and counting...

Northern Ireland is in the midst of turbulent times, the effects of which are impacting on our competitiveness, on our access to talent and on our capability to grow our economy.

There is, nonetheless, good news on the horizon. The announcement of the Belfast Region City Deal secures £350M in additional investment to develop a digital and data-driven City region and economy over the next 15 years. Work is also continuing to finalise a City Growth deal in Derry/Londonderry. Both show how local government, academia and business can work collaboratively to drive the economy forward.

Northern Ireland must build on these initiatives to enable businesses to adopt new technologies and equip people with the skills they'll need. Last year our research highlighted the impact of automation, the challenges it brings – as well as the huge opportunities it can present. That message is more urgent than ever.

In this year's report we include research on the potential impact achieving our ambitions for the knowledge economy could have on our overall economy by 2030 – such as adding an additional £3.2bn GVA and 80,000 new jobs. (For every job created in the knowledge economy, another is created in the wider economy – simultaneously driving down economic inactivity and reducing unemployment.) This represents real, inclusive growth across the region.

Over the last 12 months, the UK's national industrial strategy – with its stated aim of boosting productivity – has made significant progress and investment. It has placed R&D and innovation at its heart. In Northern Ireland, however, we have yet to agree a regional industrial strategy. We do not have a sustainable funding model for higher education, and we continue to export our talented young people.

The foundations have already been laid, but we must do more. With ambition and confidence, we can become one of the top knowledge economies in the world, one that attracts investment and talent, that builds on high-quality research and that has innovation in its DNA.

It is time for us to prioritise what we excel at, those areas where we can again lead the world, and use that focus to scale up at an unprecedented level. This is the key to the real prize: to build an economy that truly delivers significant, tangible and enduring benefits for all.



Steve Orr, Chief Executive Officer, Catalyst Inc

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Overview

Characteristics of Northern Ireland's Knowledge Economy

Like any successful knowledge economy, Northern Ireland's is export-oriented and is shaped by a highly skilled labour force. It creates and uses knowledge, data and information to drive growth and productivity, boost competitiveness and generate wealth from outside the country.

Investment tends to concentrate on R&D, and there is a strong focus on innovation and entrepreneurship, notably through close links with science and technology.

Those links extend to an active engagement with the broader education sector, especially with regard to the promotion of STEM disciplines, since the continued development of the knowledge economy is crucially aligned with need to attract and retain skilled labour.



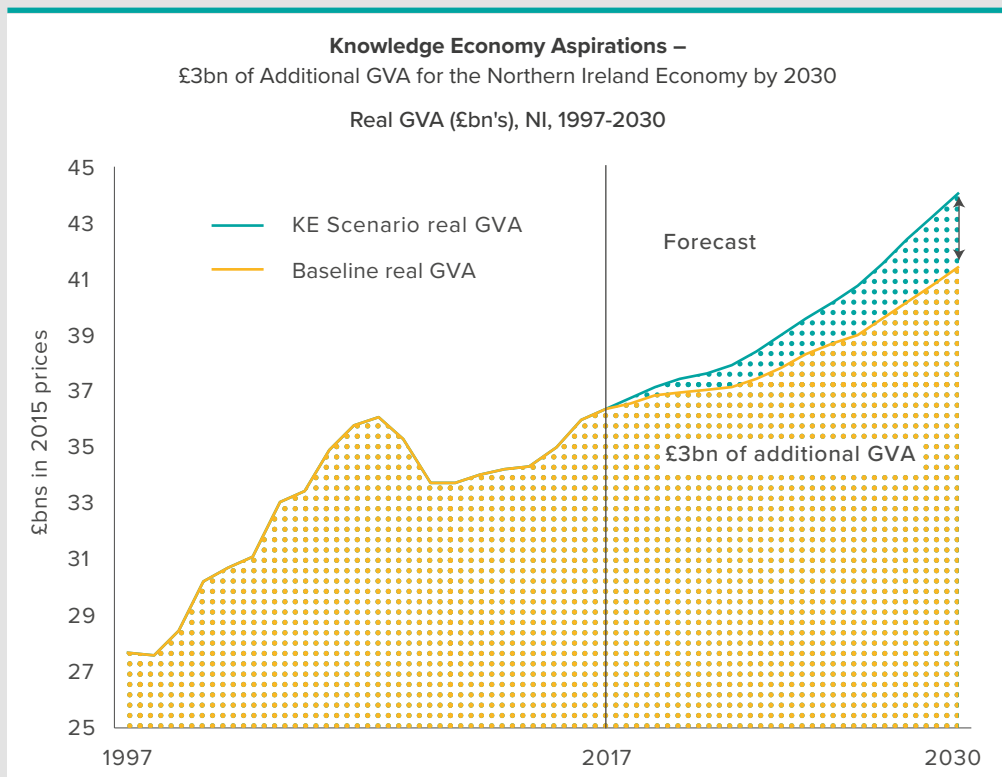
How It Works... And Why It Matters

Throughout the world, local knowledge economies tend to generate high wages, high levels of skill and high productivity. They attract investment, raise standards in technical education and training, and deliver economic growth driven by innovation. That is the case in Northern Ireland too.

Our knowledge economy is intimately linked to the broader economy. That means it doesn't just reward those with advanced skills who work directly in it. It provides benefits to Northern Ireland as a whole.

It generates significant indirect, downstream benefits in, for example, the service sector, in retail markets, in transport and infrastructure – and therefore, of course, in employment.

Indeed, achieving our goals could deliver some £3bn of additional GVA over the baseline forecast and around 80,000 additional jobs – reducing both the unemployment and inactivity rates. This could well mean a shortage of appropriately skilled labour, something that will have to be urgently addressed in the immediate post-Brexit era.



The Net Impact of Automation: A Projection

We can state with confidence two things about automation. Firstly, that it will bring challenges as well as great opportunities. And secondly, that it is inevitable.

Let's consider the potential net impact of automation on job creation across the Northern Ireland economy, based on the research carried out in 2017.

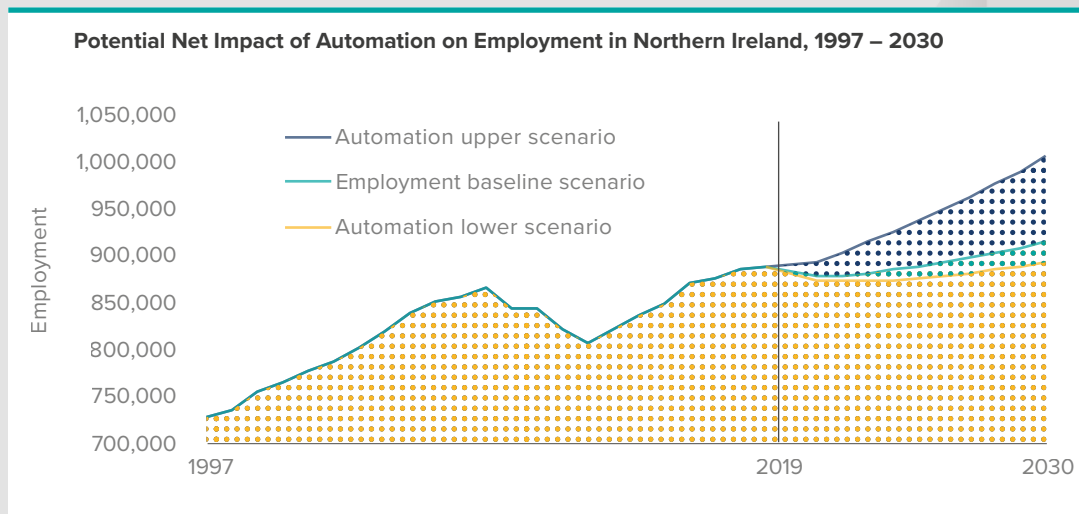


By 2030, employment forecasts indicate:

- knowledge economy aspiration = **955,000**
- baseline = **916,000**
- automation, lower = **903,000**
- automation, upper = **989,000**

Therefore, if the full potential of automation in Northern Ireland could somehow be realised by 2030, according to the upper range of net estimates in published academic research, employment could actually be 44,000 higher than the knowledge economy aspiration.

Note that the impact of automation is economy-wide, while the knowledge economy itself currently accounts for around 4.7% of employment.



Core Industries

These are the sectors that comprise Northern Ireland's knowledge economy. They are export-oriented and offer significant potential for dynamic growth.



Pharmaceuticals & Biotechnology



Medical Devices



Software



IT Services



Creative Content



Hi-tech Financial Services



Technology Consulting



Aerospace & Transportation



Communications



Computing & Electronics

Key Findings

The first report on Northern Ireland’s knowledge economy was produced in 2011. For this, our 8th such annual analysis, we have again commissioned Ulster University’s Economic Policy Centre, who have been able to draw on the most comprehensive range of data and statistical resources available so far. This is what we found.

Activity



During 2018 activity within Northern Ireland’s knowledge economy was the 2nd fastest-growing in the UK for the fifth consecutive year.



Overall, the picture is encouraging, with progress seen in around two-thirds of indicators, driven mostly by improvements in investment activity and R&D.

However, despite some vigorous local activity, it should be noted that within the UK context, Northern Ireland’s knowledge economy is very small. Furthermore, a question mark remains over whether this activity can be translated into substantial, tangible economic outcomes.

Outcomes



Outcomes for the local knowledge economy in 2018 saw Northern Ireland ranked 4th overall among UK regions.

There were particularly strong performances in areas including employment, business stocks, research grants and patents granted. The productivity premium is coming under pressure, but has remained high, and is closing the gap with the rest of the UK.

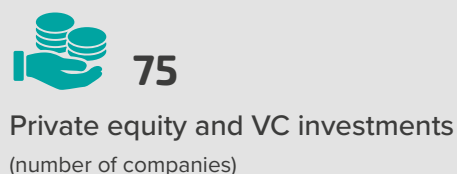
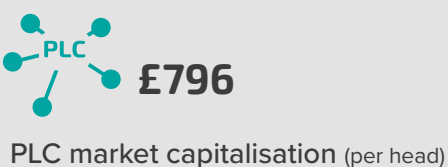
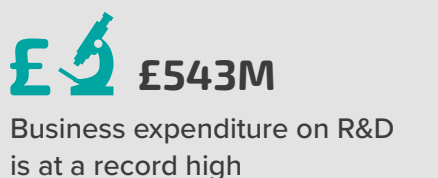
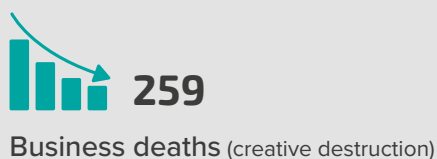
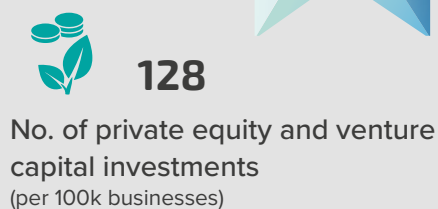
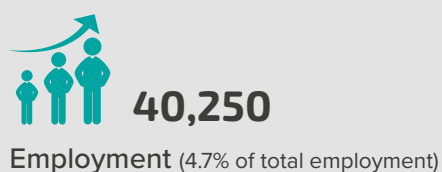


Furthermore, we saw an impressive increase in real Gross Value Added of 6.3% (Compound Annual Growth Rate) – far outstripping the overall figure for the local economy of 1.7% CAGR. This is encouraging, as GVA can be considered an engine of growth.

The latest evidence shows that some significant records were achieved in Northern Ireland – and some significant challenges remain.

Where the knowledge economy did well...

Highest numbers on record:



... and where improvements are still needed



Wage premiums are being squeezed (42% in 2018 vs 45% in 2017)

Productivity premium now at its lowest level since 2009

Figures for PhD numbers and research grants awarded remain low

Investment values remain relatively small, even with substantial increases in activity

Innovation and patent activity remains low

In general, indicators are in growth mode in NI, but other regions are growing too and pulling ahead – leaving us with more to do in order to catch up.

In Detail: Activity And Outcomes

Activity

In 2018 Northern Ireland remained the second-fastest-growing knowledge economy in the UK for the fifth consecutive year.

The survey of activity was broadly positive, with improvement reported in almost two-thirds of indicators.

Taken within the regional perspective, the picture is stable, with some relative improvement as more indicators improved rather than declined.

Viewed over the period of 2009-18, the growth appears to be the result of two distinct factors:

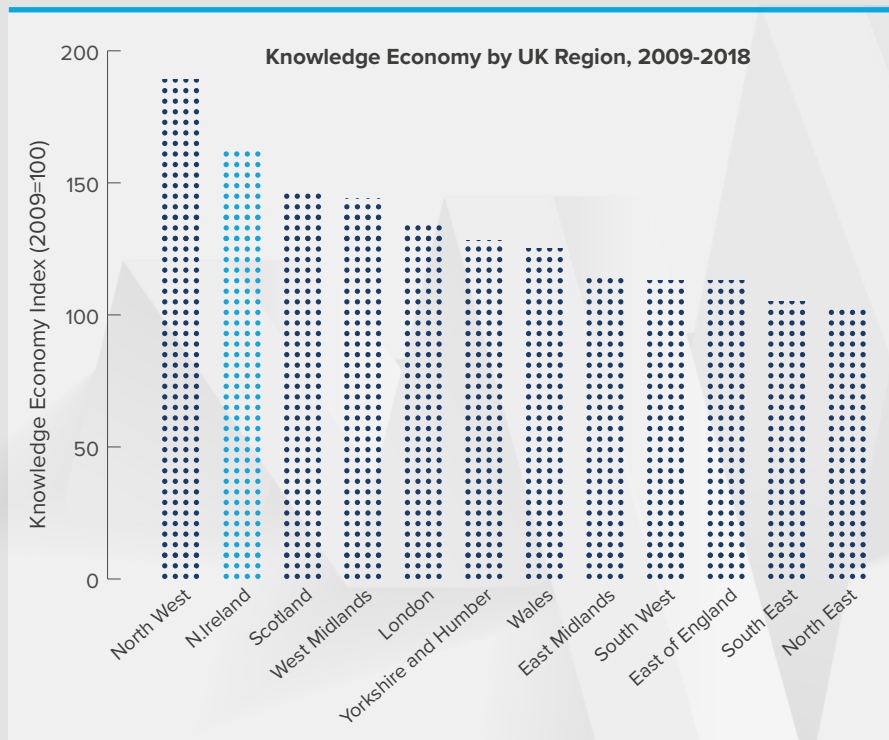


increased R&D in the early period



Private equity and VC investment in the later part.

What does this mean in terms of outcomes? Activity in investment and R&D, though significant, must translate faster into economic outcomes – specifically productivity and GVA.



Outcomes

Real Gross Value Added Growth

Compound Annual Growth Rate: 6.3%

In what is a new indicator, Northern Ireland has the 4th fastest growing knowledge economy in the UK. The rate of growth is good – although it does come from a very small base.

£2.2bn

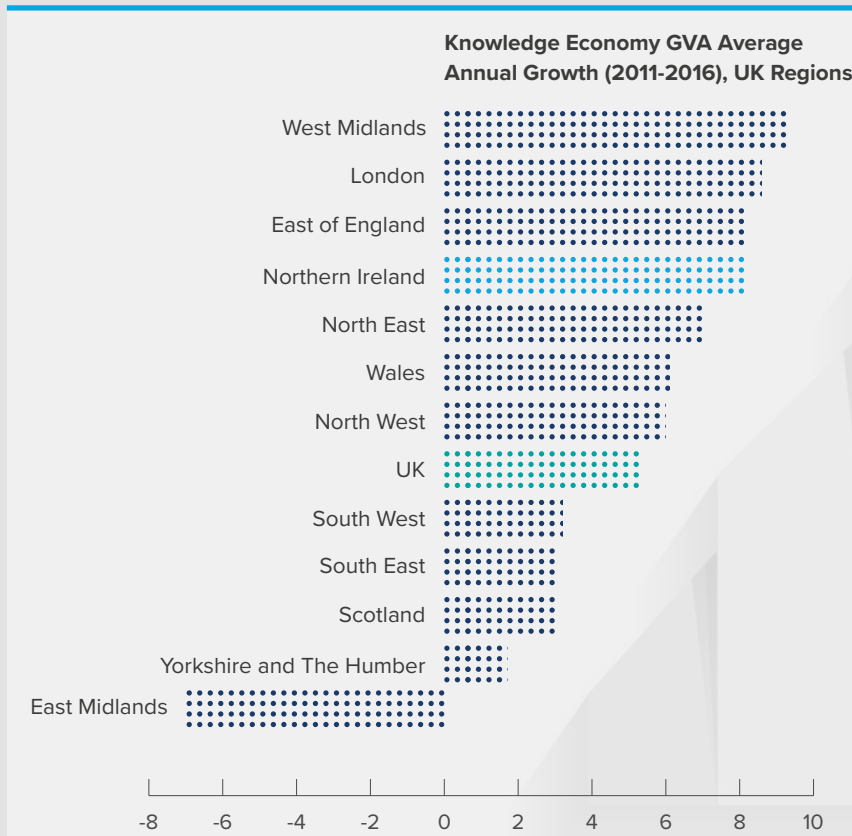
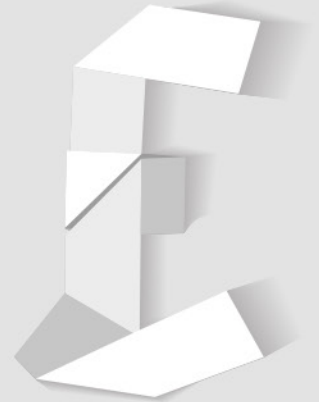
Local GVA (real) was **£2.2bn** in 2016, out of a **£37bn** economy.

5.9%

Knowledge economy GVA accounted for a strong **5.9%** of total GVA.

10th

Northern Ireland remains significantly below the UK GVA average of around 10%, and is ranked 10th among the regions.



Source: UUEPC

Performance

The Four Pillars

Northern Ireland's knowledge economy is founded on four pillars:

Core Indicators, Investment Activity, Research and Development Activity and Innovation & Patent Activity.

These supply the key metrics and indicators that constitute the basis of this report.

Here is a summary of the main findings for each this year.

1 Core Indicators



Average Rank: 11th
Out of 12 UK Regions



The latest available data suggests that Northern Ireland maintained an average annual growth of 5.5% in business starts – second only to London (6.8%).

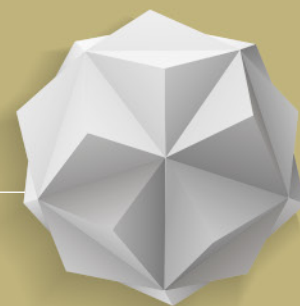
In addition to business starts, churn rates were encouraging.



For the period 2009–16, growth in employment has been the 4th fastest in the UK.

Average knowledge economy earnings fell slightly, and remain the lowest in the UK.

2 Investment Activity



Average Rank: 5th
Out of 12 UK Regions



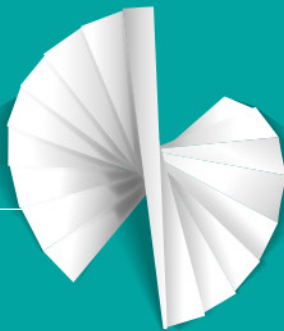
Performance was stable. Maintaining this – and Northern Ireland's overall ranking in this metric – remains a challenge.

In 2017 Northern Ireland accounted for 6.1% of private equity and venture capital activity.



Investment activity was very strong overall, which is encouraging. In 2017, there were 75 VC and private equity investments (against 63 the previous year). However, it should be noted that the actual values of the individual investments are very small.

3 R & D Activity



Average Rank: 8th
Out of 12 UK Regions



Overall, performance has been stable and has improved in university-related indicators. Business expenditure on R&D is above UK and RoI averages – supported by an increase in both indigenous businesses and SMEs.



The number of PhDs awarded and absolute value of HEI grants and contracts won both improved, but there remains substantial scope for improvement.

The number of Northern Ireland graduates with science and technology degrees rose – but the overall percentage remains the lowest in the UK.

4 Innovation and Patent Activity



Average Rank: 11th
Out of 12 UK Regions



Performance has been solid, if unremarkable, with a single indicator improving its ranking.



The number of patent applications granted was 25, helping to move Northern Ireland's overall ranking to 11th – second-last among the UK regions.

1 Core Indicators



Average Rank: 11th



Employment as proportion of total

Rank: **10**
Annual rank change: **+1**
Relative to UK: **79%**

BELOW TARGET



3.2% increase
per annum since 2009

Knowledge economy businesses as a proportion of total business stock

Rank: **12**
Annual change: **-**
Relative to UK: **50%**

BELOW TARGET



Business starts as proportion of total business stock

Rank: **12**
Annual change: **-**
Relative to UK: **50%**

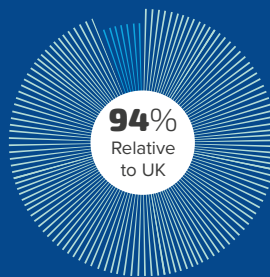
ABOVE TARGET



259 business deaths
400 business starts

Business deaths as a proportion of total business stock

Rank: **12**
Annual change: **-**
Relative to UK: **44%**



Business churn rate

Rank: **7**
Annual change: **+4**
Relative to UK: **94%**



£28,000 average
salary – lowest in UK

Gross annual average earnings

Rank: **12**
Annual change: **-**
Relative to UK: **79%**

BELOW TARGET

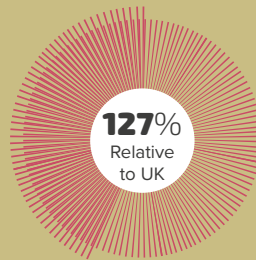
2 Investment Activity



Average Rank: 5th



14.7% average annual growth rate



22% NI is the fastest-growing UK region

Number of private equity and VC investments

UK Rank: **6**
Annual change: **+1**
Relative to UK: **6.1%**

Private equity investment per 100,000 VAT-registered businesses

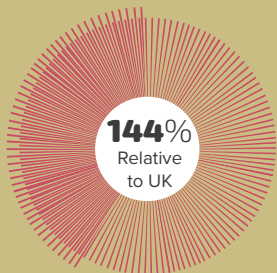
Rank: **3**
Annual change: **-**
Relative to UK: **127%**

ABOVE TARGET

Venture capital investments per 100,000 VAT-registered businesses

Rank: **1**
Annual change: **-**
Relative to UK: **640%**

ABOVE TARGET



M&A and ECM deals per 100,000 VAT-registered businesses

Rank: **2**
Annual change: **-1**
Relative to UK: **144%**

ABOVE TARGET

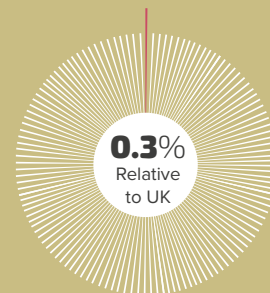


£16M VC investments in 2017

Value of VC investment, £M

Rank: **7**
Annual change: **-3**
Relative to UK: **3%**

BELOW TARGET

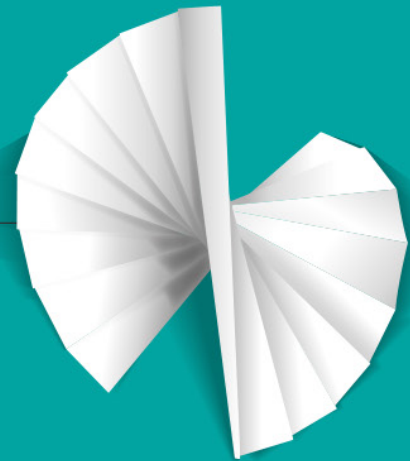


Number of Public Listed Companies (PLCs)

Rank: **12**
Annual change: **-**
Relative to UK: **0.3%**

BELOW TARGET

3 R&D Activity



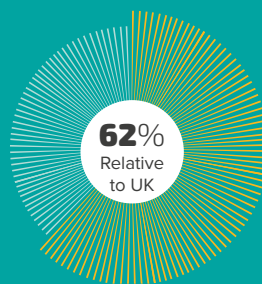
Average Rank: 8th



No. of PhDs per million inhabitants

Rank: **10**
Annual change: **+2**
Relative to UK: **70%**

BELOW TARGET



HE research grants and contracts per 1,000 population

Rank: **9**
Annual change: **+1**
Relative to UK: **62%**

BELOW TARGET



R&D (% of workplace based GVA)

Rank: **5**
Annual change: **-1**
Relative to UK: **98%**

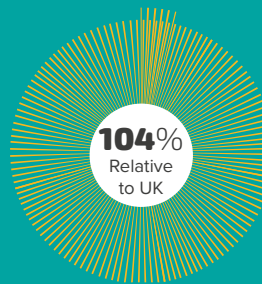
ON TARGET



Science and technology graduates (NVQ Level 4+) as % of workforce

Rank: **12**
Annual change: **-**
Relative to UK: **79%**

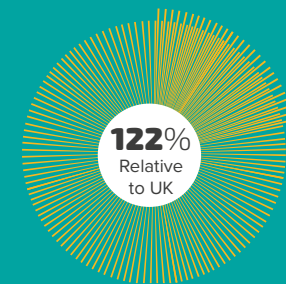
BELOW TARGET



Business expenditure on R&D as % of workplace GVA

Rank: **5**
Annual change: **+1**
Relative to UK: **104%**

ABOVE TARGET



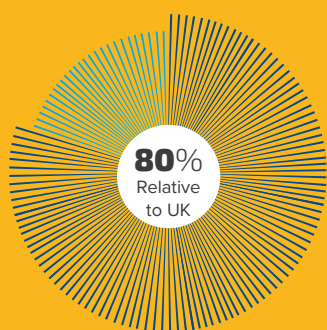
Business R&D personnel as % of total employment

Rank: **4**
Annual change: **-**
Relative to UK: **122%**

ABOVE TARGET

4 Innovation and Patent Activity

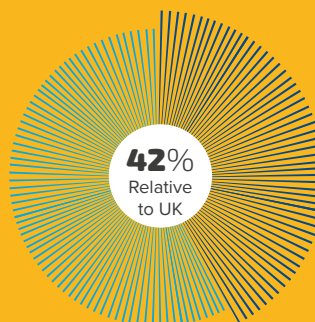
Average Rank: 11th



Proportion of firms stating they are innovation-active

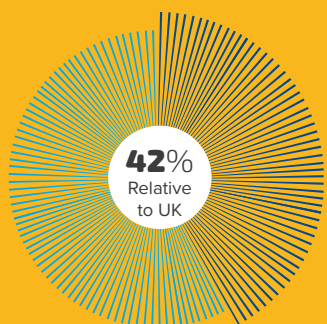
Rank: 12
 Annual change: –
 Relative to UK: 80%

ABOVE TARGET



No. of patent applications filed per million inhabitants (to UK IPO)

Rank: 12
 Annual change: –
 Relative to UK: 42%



No. of patent applications per million inhabitants (to EPO)

Rank: 10
 Annual change: –
 Relative to UK: 42%

BELOW TARGET



No. of patents granted per million inhabitants (to UK IPO)

Rank: 11
 Annual change: +1
 Relative to UK: 50%

Productivity

Rank: **12th** Annual change: – Relative to UK: **58%**

Overview

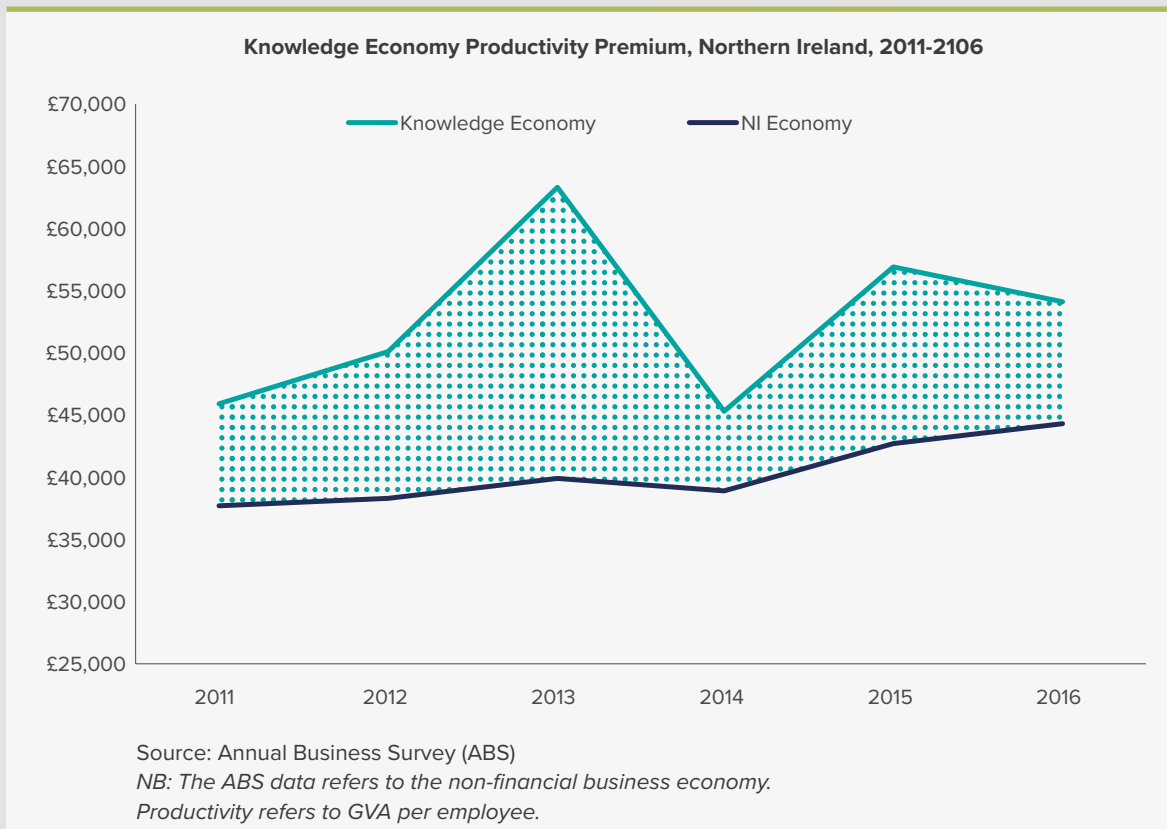
The continuing productivity premium within the knowledge economy compared with other sectors in the Northern Ireland economy is helping to reduce the historic gap with the UK as a whole. The average premium over the period 2011 to 2016 is 30%. However, when viewed against the rest of the regions, Northern Ireland’s knowledge economy productivity is the lowest in the UK. This presents a genuine concern.



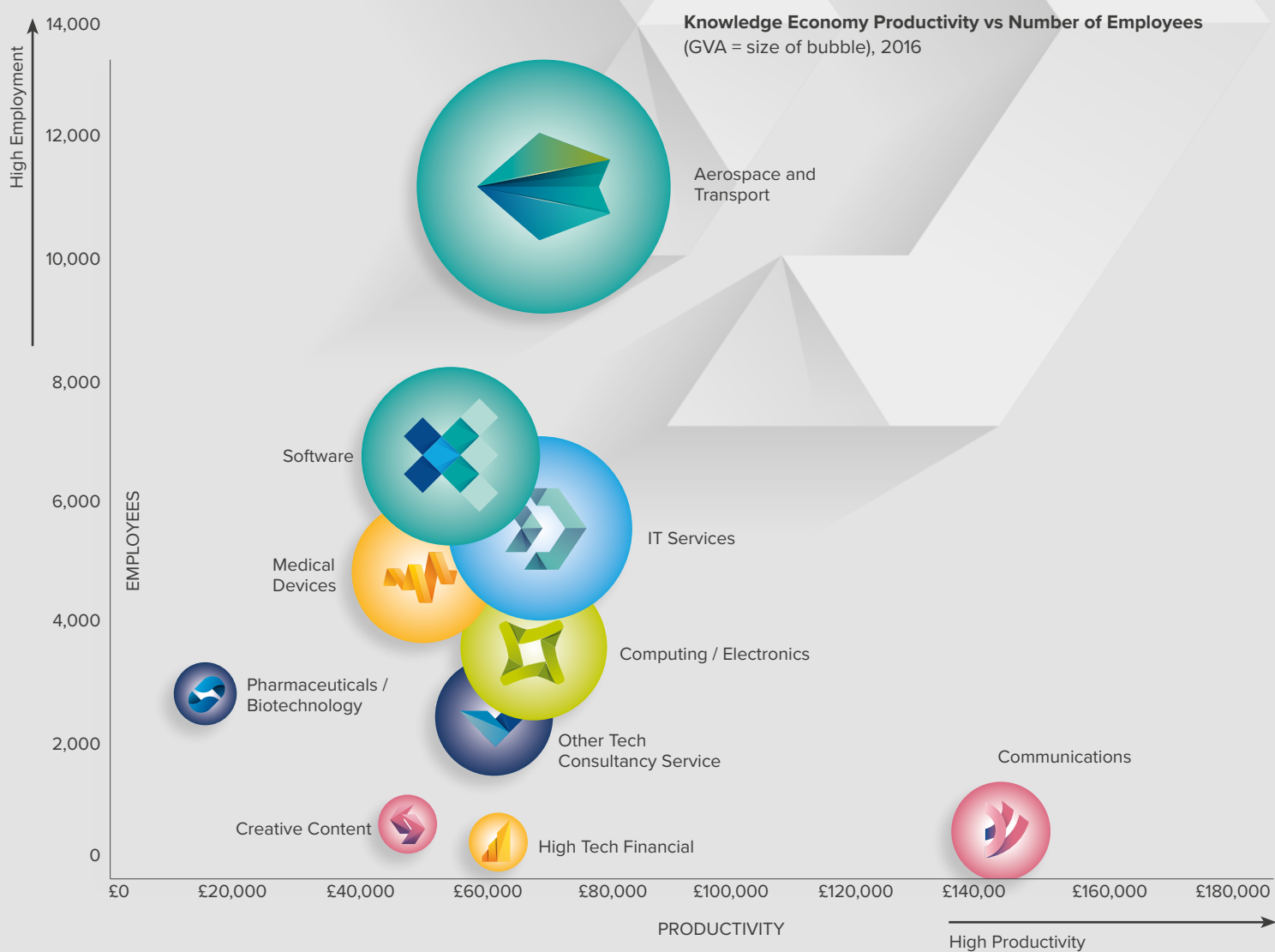
30%

In 2018, knowledge economy productivity in Northern Ireland was relatively higher, which helps reduce the gap with the UK as a whole.

Our productivity premium has narrowed to 30% – the lowest in the UK.



This graph presents a simple analysis of industrial performance by sector relative to the number of employees within each industry. Note the difference in productivity between the industry with the greatest numbers of employees (Aerospace and Transportation) versus the industry with the lowest staffing levels, Communication.



Earnings

Rank: 12th Annual change: – Relative to UK: 79%

Gross Annual Average Earnings

 **£21,000**

The average wage in Northern Ireland in 2017 was around £21,000.

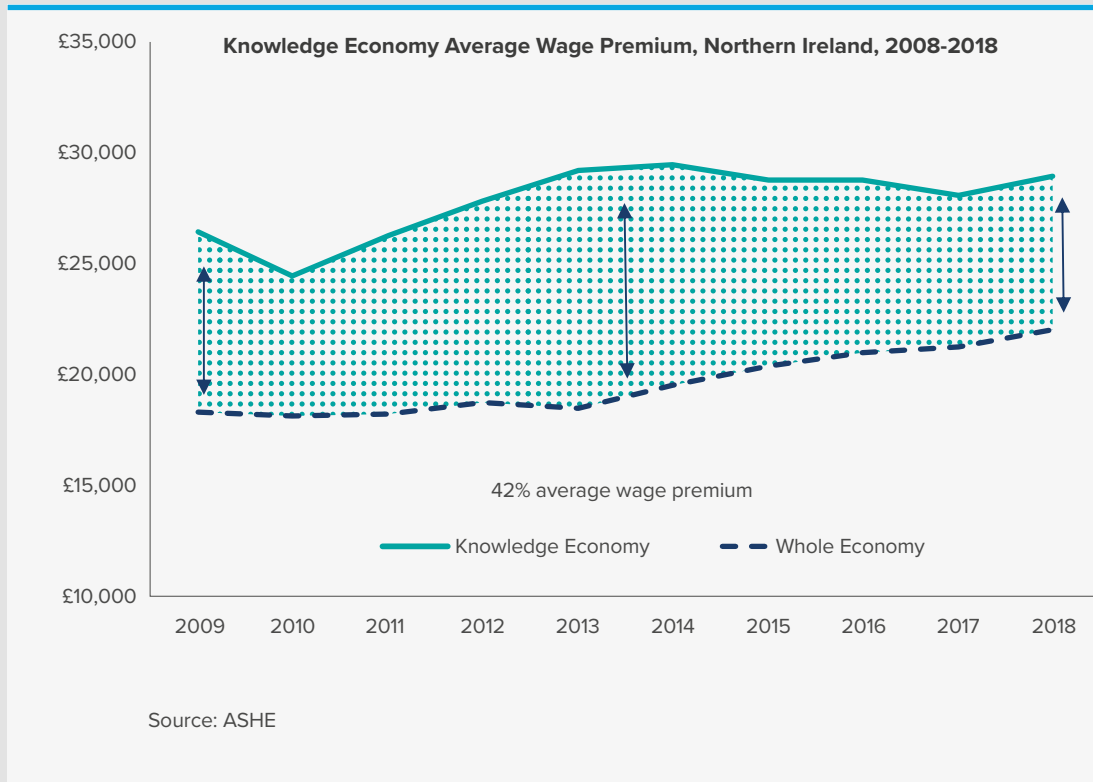
 **£28,000**

Employees in the local knowledge economy earned on average £28,000 pa.

42% 

Over the period 2009–2018 the average knowledge economy wage premium was 42%.

Note: While wages in the broader economy improved, those in the knowledge economy remained largely unchanged. This could suggest a shift towards greater numbers of lower-paid jobs in the knowledge sector. However, more research is needed in order to provide a conclusive explanation.



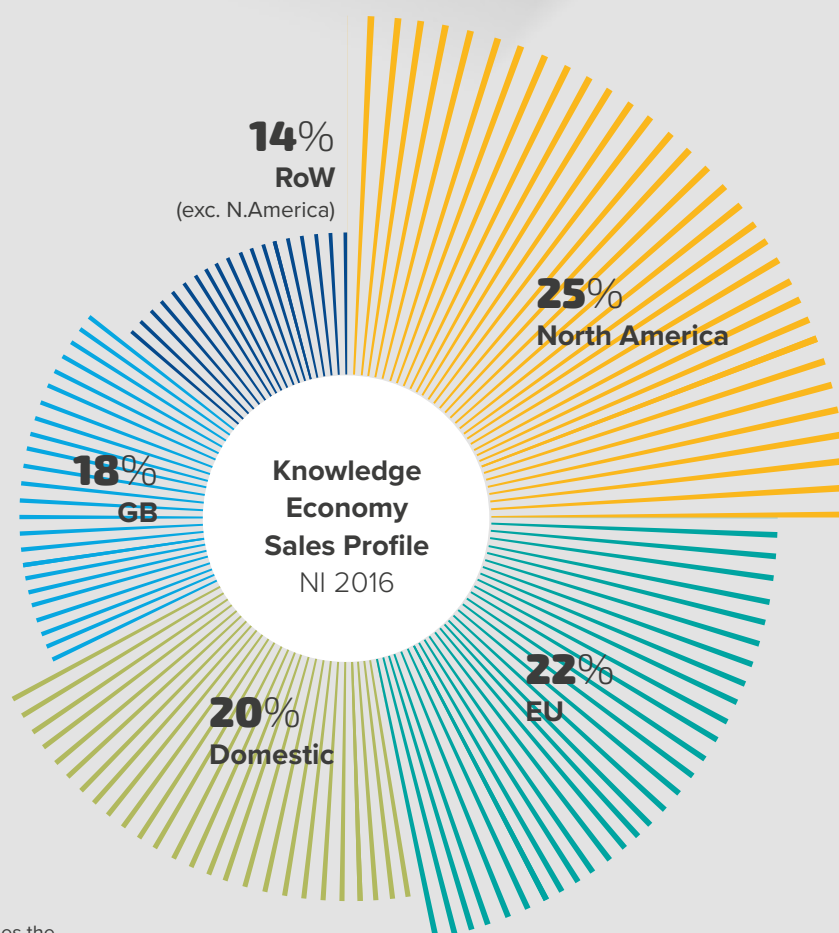
Sales And Exports

Overall, knowledge economy sales growth has been robust, increasing by 6.3% on average per annum in the period 2011-2016 – a record high. However, taken as a percentage of total sales for Northern Ireland, the knowledge economy figure shows a marginal decline, from 19.3% to 18.9%.

Where sales are going

At present, 35% of all Northern Ireland exports are generated by the knowledge economy. Of these, some 64% are outside the EU, which indicates potential for strong resilience in a post-Brexit world. The North American market accounts for 63% of non-EU exports.

Knowledge Economy Sales Profile Northern Ireland 2016



NI Sales (£M) in 2016		
North America	£1,446M	25%
Domestic	£1,157M	20%
GB	£1,051M	18%
EU	£1,265M	22%
Rest of the World	£832M	14%

Source: Broad Economy Export measure, UUEPC.

Note: The BEE is based on ABI data, and therefore excludes the Financial Services sector, including high tech financial services.

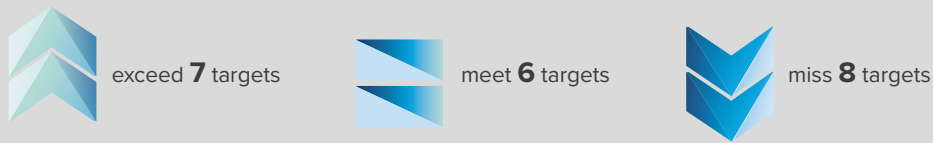
Achieving Our Goals

According to this year's research, Northern Ireland's knowledge economy is on track to:



How does this compare with the 2017 report?

Our previous report indicated that Northern Ireland was on target to:



7 exceed target

- Number of M&A and ECM activity (number of deals)
- Number of private equity investments (number of companies)
- Number of venture capital investments (number of deals)
- Knowledge economy start-ups
- Number of firms stating that they are innovation-active
- R&D personnel, number of employees
- Total expenditure on Business R&D (BERD), £M

2 meet target

- Knowledge economy exports
- Total expenditure on R&D, £M

11 below target

- Knowledge economy GVA
- Knowledge economy employment
- Knowledge economy productivity
- Knowledge economy business stock
- Knowledge economy average wage
 - Number of publicly listed companies
 - Number of PhDs per annum
 - HEI Research grants and contracts
 - Number of patent applications per million inhabitants (to EPO)
 - VC investment, £M
 - Number of science and technology graduates (NVQ Level 4+)

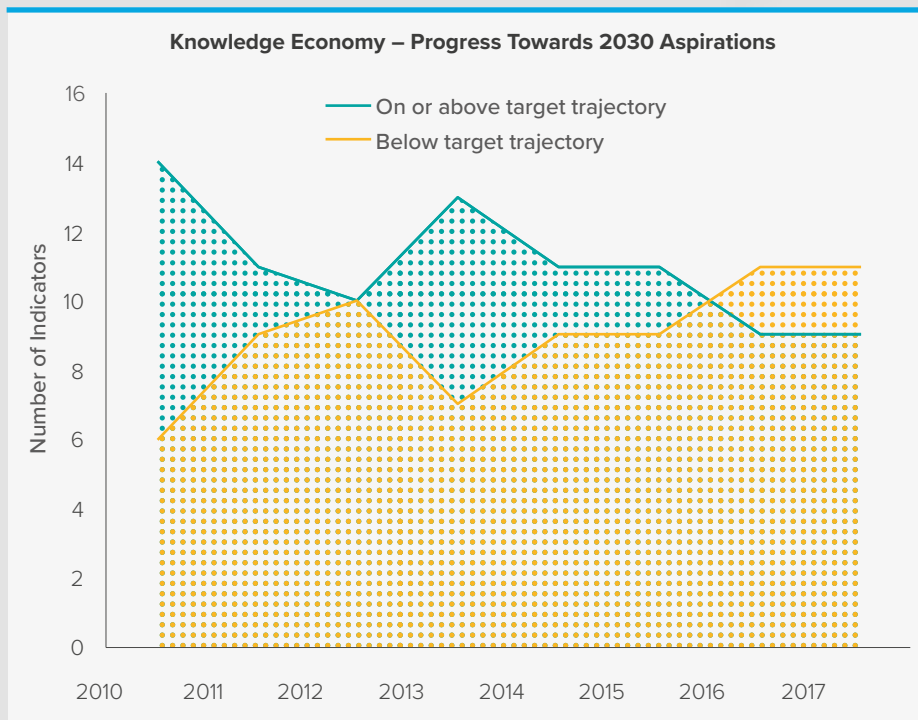
The knowledge economy continues to perform well in areas such as numbers of start-ups; employee numbers (including R&D personnel); VC investments and M&A deals.

It is very externally focused, with 80% of sales outside of Northern Ireland.

Average wage premiums; numbers of publicly listed companies; patent applications; numbers of PhDs and higher education research grants and contracts have all fallen below their aspirational trajectories.

Business expenditure on R&D in NI, at 1.4%, is above UK and RoI averages of 1.3% and 0.8% respectively

In short, progress towards targets is still being made, but it is slowing locally – and falling behind other UK regions.



While many indicators are improving, the rate of growth simply isn't rapid enough to meet aspirational targets.

The View From Industry

Skills



“Attracting talent has become very difficult, and this is definitely a limitation on further growth prospects. There is increased competition in the sector, with the arrival of more software-intensive inward investment into the greater Belfast area.”

Medical imaging and software group

“We have struggled to find good people with solid, hands-on practical experience. Our mantra is now to recruit young and grow from within.”



Automotive emissions specialists

Markets



“Our sales pipeline is growing but we have resourcing concerns on how we can service these opportunities. The shortages of able Sales staff is limiting our ability to explore new markets.”

Medical imaging and software group

Scalability vs Innovation



“We have introduced a range of initiatives to promote awareness at grassroots developer level, to improve mindshare in the tech community, and to raise awareness of the disruptive power of our technology by collaborating with innovators in different fields. In short, innovation is helping us drive expansion.”



Software fintech consultancy

Sourcing Investment Funding



“Over the past year we have invested substantially in R&D into bleeding-edge technologies. We’ve had no real difficulties in sourcing funding, having received significant support from InvestNI, TechstartNI, the Clarendon fund, Queen’s University and a large strategic investor outside the UK.”

Cybersecurity consultancy

Brexit

By the end of 2018, a dispiriting consensus about the continuing uncertainty around Brexit had taken root with many forecasters. There are grave concerns about the impact of a no-deal ‘hard’ Brexit, with business leaders, both locally and nationally, speaking out about the need for a clear path forward. The threat of a hard border on the island of Ireland and the impact on Northern Ireland’s ability to attract talent and investment represent major areas of concern.

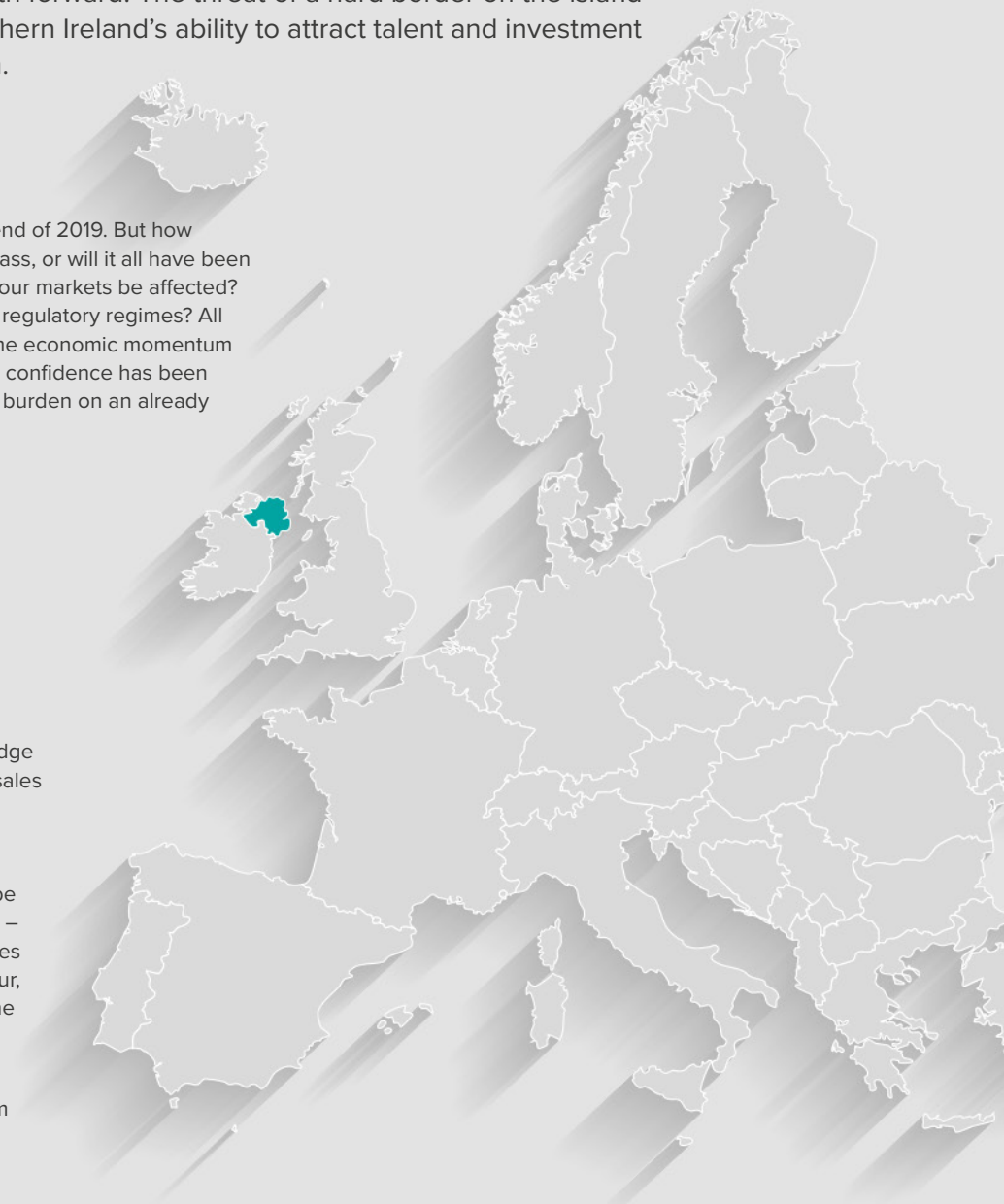
Things will of course look different by the end of 2019. But how exactly? Will the dire predictions come to pass, or will it all have been a storm in a teacup? How will access to labour markets be affected? What will be the impact on regulations and regulatory regimes? All we can say for sure at this stage is that some economic momentum has been lost. Investment has suffered and confidence has been undermined. This amounts to an additional burden on an already sluggish regional knowledge economy.

In-built resilience



The EU, excluding the UK, accounts for £1 in every £5 of Northern Ireland’s knowledge economy sales, meaning that only 20% of sales will be impacted by any potential changes in market access, regulation and tariffs in a post-Brexit world – whatever that world might look like. However, while sales may be resilient – a cause for some quiet optimism – Northern Ireland’s knowledge economy does still depend significantly on the EU for labour, research contracts and grant funding. So the full picture is far from clear.

Nonetheless, we can see that the local knowledge economy is more insulated from Brexit and its immediate consequences than many traditional sectors here, such as agriculture or manufacturing.

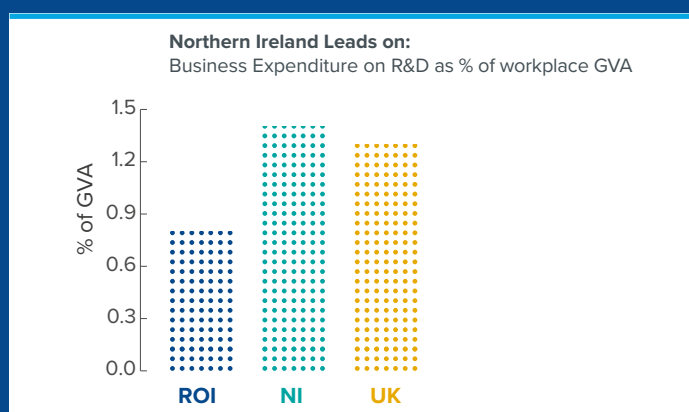


The Republic of Ireland Perspective

Indicators	Ireland	Northern Ireland	UK average
Private equity and VC investments (no. of companies)	198	75	103
Private equity investments per 100,000 VAT-registered businesses	79	36	28
Venture capital investments per 100,000 VAT-registered businesses	8	55	14
Amount of VC investment, £M	£878	£16	£463
M&A and ECM deals per 100,000 VAT-registered businesses	112	295	205
Public Limited Companies	55	4	124
Publicly listed companies: market capitalisation per head	£50,400	£795	£36,000
R&D as % of workplace based GVA	1.1%	1.9%	1.9%
Business expenditure on R&D as % of workplace GVA	0.8%	1.4%	1.3%
Business R&D personnel as % of total employment	1.4%	0.8%	0.7%

There are 10 indicators where comparison can be made with the Republic of Ireland. In the table above, the positive news is with regard to R&D investment, where Northern Ireland is ahead of both ROI and UK.

However, when it comes to VC investment and market capitalisation, the ROI significantly outstrips the UK and Northern Ireland.



Amount of VC investment, £M

This raises questions about how we support companies and entrepreneurs to scale and raise visibility to VCs outside of Northern Ireland, to the potential of early stage and growing companies in Northern Ireland.

A key point of difference

Northern Ireland is a regional economy within the UK.

Ireland is a national economy and its indicators incorporate financial services domiciled in the capital city in the IFSC.

Summary

The knowledge economy remains a vital and growing part of the overall Northern Ireland economy.

This year's report shows that there has been improvement in six of our regional rankings, and our average of all indicators stands at 8.6.

However, the research indicates that if we continue to invest in it and generate the necessary additional activity, some £3bn could potentially be added to our GVA, with 80,000 additional jobs created across our entire economy.



At A Glance

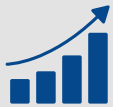
It's still growing

4th

The 4th-fastest growing knowledge economy in the UK (GVA)

2/3rds

Two-thirds of indicators have shown growth



Knowledge economy activity continues to grow at the second fastest regional rate.



Business expenditure on R&D as a % of GVA is now above the UK average

It's still significant



Very externally focused – generating 80% of sales outside Northern Ireland



Characterised by high wages, high skills and high productivity

1 in 12

Employs around one in twelve people here, either directly or indirectly



Aerospace, software development and IT remain the largest sub-sectors

25%

Over 25% of indicators are above trajectory

But it's slowing

2030

Progress towards aspirational targets is slipping



Wage and productivity premiums are lower than other UK regions

50%

Over 50% of indicators are falling below the required trajectory to meet aspirations



PhD investment and HEI grants remain at relatively low levels



Growth in activity is starting to level out

Challenges

The Way Forward

boost | build | balance

This report shows where the risks, challenges and opportunities lie. Locally, there are some positive indicators, but in the context of the broader UK picture, we see an economy that is slowing as other regions are growing. And context matters. We are at or close to the bottom of almost all metrics. If we are to reinvigorate our knowledge economy, we should be attentive to certain specific elements.

What Needs To Be Done: Policy Conversations



Translate activity into outcomes faster

Activity in investment and R&D is strong. However, although we're the fourth-highest ranked UK region for GVA growth (2011–2016), we started from a small base. More of our activity needs to be translated faster into tangible economic outcomes – particularly in terms of productivity, wages and GVA. This remains the key challenge for the knowledge economy.



Stay focused on excellence

Ten years ago, it would have seemed unlikely that we could equal the UK in terms of R&D intensity. And yet we have – through the collective efforts of business, educators, policy-makers and researchers. We must maintain that direction of travel, retaining a focus on quality and our priorities throughout. Achieving this should be seen as one step on the journey, not the destination. Our target for R&D intensity could be re-set at 3% – in line with countries like Sweden, Finland, the US and Japan.



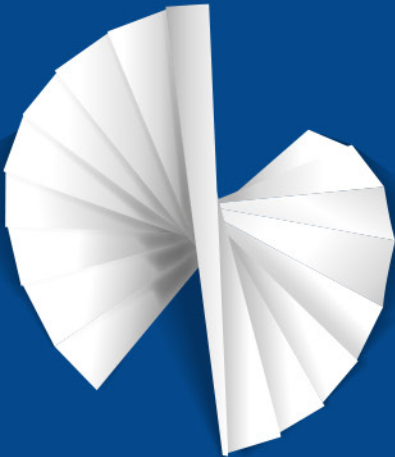
Build on the R&D base

We have seen growth in investment in R&D activity – particularly by business – that in percentage terms put us ahead of the RoI and the UK averages. However, while the number of STEM PhDs is improving, as are figures for research grants and contracts, these are both at very low levels and below the required trajectory. The uncertainty around the funding model for our higher education sector must be addressed.



Educate for tomorrow today

We must ensure that the right skills are available to meet the needs of the new economy – to react to the rapid and disruptive change impacting the way we work. Therefore businesses need to put in place plans now to reskill their current workforce. Ensuring our young people have the skills required for this changing world demands better alignment with the entire education system, from primary up to third level; the public and private sectors. At present our workforce has the lowest percentage of science and technology graduates in the UK. This year's report says: must do better.



Increase Innovation and Patent activity

Innovation is the lifeblood of the knowledge economy. Locally we have seen an annual average growth of 5.5% in innovative start-ups since 2009 – second only to London. However, there has been a decline in the proportion of firms stating they are innovation-active. While we have also seen a decrease in the number of patent applications, our success rate in applications granted has increased. Performance is stable, but increasing innovation activity within businesses is critical if they are to keep up with the pace of technological change and remain competitive.



Maintain investment performance

The Northern Ireland knowledge economy has been very successful in growing the amount of activity across a range of indicators – particularly the Investment and R&D groupings. However, although we are near the top of the table with regard to GVA growth, we need to grow investments that will generate more economic outcomes. This year's comparison with the RoI showed that although we are ahead in VC/PE activity, the RoI far outstrips Northern Ireland and the UK when it comes to values of investments. We need to develop tailored support for our entrepreneurs in order for them to accelerate growth and access investment funding from outside Northern Ireland.



Maximise The Belfast Region City Deal

With £350M to be invested in innovation projects over the next 15 years, this is an example of the type of initiative that can genuinely boost our innovation activity and competitiveness. Ways to use this funding could include ensuring R&D investment growth; maximising the opportunities arising from automation; supporting innovative start-ups; attracting world-class talent; scaling the values of VC & PE investment; and greater investment in PhDs and collaborative research between academia, industry and government.



Establish a knowledge economy policy matrix

Several departments and government bodies manage policies relevant to the knowledge economy. A knowledge policy matrix mapping out programmes, owners, expenditure and impacts would allow Catalyst and other stakeholders to assess policies on a holistic basis, identify gaps, inform the direction of future policy and help direct companies to appropriate sources of funding and other types of support.

Conclusion

The story this year is a mixed bag. Growth has been modest but consistent. Sectors that have performed well in previous years have largely continued to do so, while others have failed to ignite. Previous targets that were missed have not made up the gap: and more have since been added to the list. Northern Ireland's knowledge economy is not stagnating; nor, however, is it growing as fast as other regions.

The research has shown the positive impact that achieving our ambitions for the knowledge economy will have on our economy – £3.2bn additional GVA and 80,000 additional jobs. This is the prize, but it will take a collective effort to build on what has been achieved to date.

Every part of the UK has had to contend to some degree with the uncertainty around Brexit and the impact of automation. But without a functioning Executive and Assembly in Northern Ireland, there is a lack of activity around decision-making and strategic planning, particularly with regard to key issues such as automation, which will radically transform employment over the next ten years.



So then, what do we need?

If we don't increase our efforts and focus on those areas that will make an impact, there is no question that our economy will continue to fall behind. And we all have a role to play.

We need the right support in place to encourage and support our talented entrepreneurs to create and grow innovative companies. We need businesses to invest in innovation and workforce reskilling. And we need government to address the challenges of skills and ensuring UK policies, such as the Immigration Policy, meets the requirements of Northern Ireland. Together, this joined-up, collaborative approach will enable us to do more to prepare our young people, our businesses and indeed our broader community for the future.

The focus should be about taking that collective action now.



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