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The **Economic Research Digest** monitors recently published research across a number of economic areas relevant to the work of the Department for the Economy such as competitiveness, innovation, enterprise, trade, FDI, tourism and infrastructure. The Skills Research Digest deals separately with recently published skills and labour market research.

In each case, we provide a short summary of the key points and web links to the full article or report*. A full list of sources can be found at the end of the publication.

Highlights this quarter include:

- The potential impact of Automation on the Northern Ireland economy.
- In-depth analysis on the worldwide cost of living and the economic outlook for the rest of 2020.
- The potential opportunities that may be harnessed as 5G technology matures.
- Highlighting a range of measures that can help to foster a more sustainable, carbon neutral economy.
- Most items were researched and/or written before, or in the early days of, the COVID-19 pandemic and its outbreak in the UK.

** Links are correct at the time of publication, however it is likely that some will break over time. The list of sources has more general links, which should help the reader to track down the original report.*

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The research summarised here presents the views of various researchers and organisations and does not represent the views or policy of the Northern Ireland Executive or those of the authors.

COMPETITIVENESS

[OECD Economic Surveys: Ireland 2020](#), published by OECD, elaborates upon the strong economic performance of the Irish economy, alongside highlighting future growth and risks facing the economy.

- Growth is forecasted to moderate over the next two years, with real GDP growth falling from 6.2% in 2019 to 3.3% in 2021. Capacity constraints and weaker external conditions underpin this weaker outlook. The unemployment rate will fall more slowly to historically low levels at 4.7% in 2021, an improvement from 5% in 2019. This labour market tightening is likely to apply upward wage pressure, particularly in those sectors where labour shortages are most apparent.
- Economic uncertainty is predicted to remain very high, as a consequence of the United Kingdom's (UK) departure of the EU. Downside risks include an increase in barriers between the UK and the European Union following the transition period. The Irish economy's trading activity is particularly exposed, due to deep integration with the Northern Irish economy. The impact of such will vary from sector to sector, with strong implications anticipated in the agriculture and food sector.
- Another risk is derived from the high share of foreign-owned firms in Ireland. Rising international tax competition and future OECD international tax agreements could lower the attractiveness of Ireland for foreign direct investment.
- These potential risks and strains highlight the importance of fostering technological adoption and productivity in domestic firms as well as encouraging further skill improvements in the workforce.
- Currently, technological adoption is said to be transforming Ireland's economy, leading to new jobs and innovative products that benefit consumers. However, this uptake has been uneven across sectors and has had a scant productivity impact.
- Skill shortages are becoming more apparent made worse by the low levels of lifelong learning by those with low-skills, partly because many see it as unnecessary and unaffordable. Irish businesses also provide less training to employees than those in other OECD countries. To release the productivity gains made possible by new technologies, complementary skills need to be cultivated.

PRODUCTIVITY AND GROWTH

[Infrastructure: making the most of public investment](#), published by Frontier Economics, explores the role infrastructure can play in enhancing economic performance.

- There are many driving forces of sustained, balanced growth, each of which is likely to be necessary but not on its own sufficient. At a high level these are: labour market and skills, business environment, infrastructure, innovation and quality of place.
- These elements interact with one another, with improvements having both positive and negative knock-on impacts on others. For example, raising skills may not be sufficient if growth is stifled by a hostile business environment.
- The longer term lifespan of infrastructure's role in spurring growth centres on how the role of infrastructure in promoting economic performance can change over time. Transport provides an example here on how the part played by an infrastructure system in boosting growth can change over the years.
 - Transport has to respond to growing demand, so that congestion, travel times and travel costs do not act as constraints when other forces are generating growth. Traditionally, transport enables the potential of other growth elements to be unlocked.
 - Within local economies, transport drives growth rather than just simply facilitating it. By reducing travel times and connecting people, firms and places, transport improvements can produce agglomeration benefits that increase productivity.
 - The reduction in travel times and the resulting rise in productivity increase wages and returns on investment, attracting more high-skilled workers and firms to the area over time. This may also provide an incentive for local people and businesses to invest in education and skills.
- Individual infrastructure assets and networks are dependent upon each other to function effectively as part of the infrastructure system. It is important that this interdependency is taken into account.

This creates an opportunity to improve the value of infrastructure spending by generating additional benefits and reducing costs. However, interdependency potentially increases vulnerability and reduces resilience: if one part of an infrastructure system is affected, others are too.

- Choosing where and when to invest in infrastructure for the future is becoming more complex. This is because infrastructure systems are increasingly interdependent while extreme weather events linked to climate change are occurring more frequently, testing the resilience of assorted infrastructure. Still, if policymakers bear these wider considerations in mind in their decision-making, the returns on public investment in infrastructure can become stronger than ever, whilst adding significant value to local economies.

[The Dynamics of Public and Private sector wages, pay settlements and employment](#), published by the National Institute of Economic and Social Research, addresses the important question of how wage growth in the United Kingdom is determined in the long run and whether wage decisions in the public sector can have spillover effects into the private sector.

- A unique new dataset made up of macroeconomic data on earnings and pay settlements as well as sector-specific data on settlements and cross-sectoral employment flows was compiled to help understand the relationships in question.
- It can be said, that in the long run, wages in the public and the private sector form a persistent relationship. Over time, public sector wages adjust to wages set in the private sector to maintain this relationship.
- Combining evidence from different data sources and modelling techniques, the results highlighted the possibility of statistically significant and economically meaningful wage spillovers from the public sector to the private sector in the short run (within a few months or quarters).
- The size of wage spillovers depends on a combination of factors. In general, it was found that short-run wage spillovers tend to be somewhat larger when the destination sector is less internationally competitive and less productive, with workers' bargaining power playing an additional role.
- An analysis of cross-sectoral employment flows suggests that wage growth can act as one possible pull factor to attract labour inflows from other sectors. This appears to be particularly true for the public sector where worker inflows from other sectors increase significantly in wage settlements.
- A supplementary analysis of the impact of Pay Review Body (PRB) recommendations on private sector wage dynamics suggests that PRB decisions tend to affect pay more in parts of the private sector that are domestically-facing.
- Overall the results suggest that it is important to better understand wage setting processes in the public sector and cross-sectoral interactions. A fifth of the overall workforce in the UK is employed in the public sector. The findings highlight that wage interactions can have important macroeconomic implications beyond the size of the sector alone.
 - Wage negotiators in the public sector, above all PRB members, and monetary policymakers should therefore be mindful of pay dynamics in the public sector and potential wage spillovers into the private sector. They should also be appraised of the external forces which shape the scale of wage movements in the private sector and recognise their pressures onto public sector wage determination.

[Can Good Work Solve the Productivity Puzzle? Collected essays](#). Published by the RSA and Carnegie UK Trust, assesses the possibility that the provision of good jobs can act as one of the foundations to boosting productivity.

- Understanding the roots of the UK's 'productivity crisis' is the signature challenge facing UK economic policymakers; the cost of this crisis is already multiples of even the worst-case Brexit scenario.
- The essays explore the relationship between productivity and work quality, a two-way street.
 - The volume includes contributions from Warwick Institute for Employment Research, McKinsey & Co, ACAS, the Fair Work Convention, the CBI, the Resolution Foundation, the Joseph Rowntree Foundation, IPPR, Investors in People and the TUC.
- Three key themes can be identified:
 - The correlation appears to be strongest at the lower end of the quality distribution; i.e. the greatest benefits to productivity may come from increasing the quality of work among the 'long tail' of companies with the poorest offering.
 - One of the reasons technological advances may not have resulted in higher levels of productivity is because UK workers have lacked the training and encouragement to make best use of it.

- One of the roles of management is to provide the security, opportunity, training and engagement to support productivity; it is therefore unsurprising that the long tail of poorly-performing companies and poorly-paid workers has as its counterpart a long tail of poorly-skilled managers.

LIVING STANDARDS, WELLBEING AND PROSPERITY

[The Homelessness Monitor: Northern Ireland 2020](#), published by the Joseph Rowntree Foundation, analyses the homelessness impacts of recent economic and policy developments in Northern Ireland.

- The total number of homelessness presentations in Northern Ireland has been virtually static over the past few years, but Full Duty Applicant cases have been steadily rising, increasing by 26% since 2009/10. (Full Duty Applicant's, being those who have passed all four tests for homelessness and who have not yet been given a permanent social tenancy).
- There has been a perceived rise in rough sleeping in recent years. This perception is partly related to a visible increase in "street activity" including street begging and street drinking. Nevertheless, given the lack of any historical series it is difficult to judge whether rough sleeping in Northern Ireland is, in fact, changing in scale in any sustained way.
- The Northern Ireland Housing Executive put the November 2018 number of rough sleepers across the jurisdiction at 38. Of these, 16 were in Belfast – up from only five a year earlier. Nonetheless, numbers of people rough sleeping in Northern Ireland remains relatively small in scale compared with other parts of the UK and with the Republic of Ireland.
- The overall scale of annual temporary accommodation placements has oscillated within a fairly narrow band over recent years in Northern Ireland. Nevertheless, the figure for 2017/18 was the highest of the decade, at just over 3,000.
- In 2017/18 lettings to homeless households accounted for no less than 88% of all Housing Executive lettings to new tenants, as compared with 39% of all social lets to new tenants in Scotland, and only 21% of all local authority lets to new tenants in England.
- The private rented sector has grown enormously over the past 20 years and is now a similar size to the social rented sector in Northern Ireland. Its growth has moderated in recent years. There is little evidence of "no fault" evictions rising to anything like the extent that has occurred in England in recent years, and the loss of rented accommodation is cited as a reason for homelessness acceptances in only a relatively modest proportion of total Full Duty Applicant cases (13%).
- In 2018 all Local Housing Allowance (LHA) rates fell below the 30th percentile, and in no broad rental market area were more than 27% of properties advertised at below the LHA rate with many tenants reporting that Housing Benefit did not cover the cost of rent.
- The Welfare Reform "mitigation" package introduced in stages in 2016 and 2017 has succeeded in protecting many low-income households, especially social sector tenants, from significant reductions in their benefits. However, this protection is due to come to an end in March 2020.

[Loneliness in Northern Ireland 2018/19](#), published by NISRA, presents the latest findings on factors associated with feeling lonely.

- Everyone is likely to experience feelings of loneliness at some point in their lifetime and the effects of feeling lonely will differ from person to person. However, feelings of loneliness can negatively impact a person's health, wellbeing and overall quality of life, and so it is important to understand what factors are associated with feeling lonely.
- In 2018/19, 64.8% of respondents (adults aged 16+) reported feeling lonely "hardly ever" or "never". However, 35.2% of respondents reported feeling lonely "occasionally", "some of the time" or "often/always" and were therefore described as "more often lonely". In 2018/19, 5.3% of respondents reported feeling lonely "often/always".
- Female respondents were more likely to feel "more often lonely" (39.2%) than males (30.9%).
- Two-fifths (41.3%) of respondents aged 75+ reported feeling "more often lonely". The age group with the lowest percentage of respondents reporting feeling "more often lonely" was those aged 35-44 (29.6%).
- Those who were widowed (61.3%) were the highest proportion of respondents feeling "more often lonely". Those who are married and living with their husband/wife (24.0%) were less likely to feel "more often lonely" than any other marital status group.

- Of those not in paid employment, 43.8% reported they felt “more often lonely”. In comparison, 28.8% of those currently in paid employment felt “more often lonely”.
- One in every two people without access to a car reported being “more often lonely” (54.9%). Whereas, 31.7% of those with access to a car, felt “more often lonely”.

UK Poverty 2019/20, published by the Joseph Rowntree Foundation, reports on the nature and scale of poverty across the UK and how it affects those caught in its grip.

- There has been little change in overall poverty levels for more than 15 years, rising between 2013/14 and 2016/17, before reducing slightly in the latest year’s data, but remaining higher than in 2014/15. Around 14 million people are in poverty in the UK (more than one in five of the population) made up of 8 million working-age adults, 4 million children and 2 million pensioners.
- Over the last five years, poverty rates have risen for children and pensioners. Poverty rates are highest in London, the North of England, Midlands and Wales, and lowest in the South, Scotland and Northern Ireland.
- Trends in poverty levels are driven by changes in four main factors: the employment rate, earnings, benefits and other income like pensions and housing costs. Since 2004/05, there has not been a sustained period where all four of these drivers have gone in the right direction.
- The proportion of people in employment has risen consistently for six years, to reach record levels. This gives a strong base but has not been enough to stem the rising tide of poverty, especially among workers and families with children.
- Over time, a higher and higher proportion of people in poverty are in working families. Workers in families with children have seen a rising risk of poverty, whereas there has been little change for workers in families without children. Working single parents have seen the fastest increase in poverty.
- Spending on benefits for working-age people is falling, with the system failing to prevent destitution and high poverty rates for recipients of many benefits. Disabled people and carers have high poverty rates. This is partly about improving access to good jobs, but solving it also requires the system to offer better support to these groups.
- Households on low incomes who rent in the private and social rented sectors have seen their housing costs rise. Rising poverty is in part due to more households being stuck in the expensive private rented sector. A raft of changes to social security policy have left more and more people struggling to afford housing, and more 20- to 34-year-olds on low incomes are having to live in their parents’ home for longer, leading to overcrowding and restricting opportunities.

Global Social Mobility Index 2020: Why economies benefit from fixing inequality, published by the World Economic Forum (WEF), benchmarks 82 global economies, providing a much-needed assessment of the current state of social mobility worldwide.

- The WEF Global Social Mobility Index assesses performance across 5 key dimensions: health, education, technology, work, protection and institutions.
- A direct and linear relationship exists between a country’s income inequality and its social mobility score on the index. Low social mobility entrenches historical inequalities and higher income inequalities fuel lower social mobility. Enhancing social mobility can convert this vicious cycle into a virtuous one and has positive benefits on broader economic growth.
- The countries that provide their populations with most equally shared opportunities are mostly Nordic economies: Finland, Norway, Sweden, Denmark and Iceland.
- Most countries tend to underperform in three critical dimensions. Significant difficulty exists worldwide in improving social mobility, particularly as a result of the low wages, lack of social protection and poor lifelong learning systems within underperforming countries.
- There are significant economic and social returns to be harnessed from investing in the right mix of social mobility factors. If countries included in this report were to increase their social mobility index score by 10 points, this would result in an additional GDP growth of 4.41% by 2030 in addition to vast social cohesion benefits.
- Improving and ensuring that individuals have equal opportunities to access the best schools is essential to reviving social mobility. Education is a powerful ‘equalizer’ of chances.

- A combination of technological change, economic trends and talent demand is changing income inequality outcomes within different industries. Workers are likely to face inequalities on the basis of the industry in which they're employed.
- Professional networks, an implicit driver of social mobility, are affected by geography and socio-economic background. For example, individuals in rural areas of the United States (US) face more limited professional networks as do those who grew up in low-income households.
- The geography of social mobility is in part determined by an individual's profession. Different professionals employed in different occupations are more or less 'rooted' in particular geographic areas. Higher paid and skilled professions are more likely to retain their value across different locations.

[Households below a Minimum Income Standard: 2008/09 – 2017/18](#), published by the Joseph Rowntree Foundation, looks at those people with incomes below the minimum income standard.

- The Minimum Income Standard (MIS) reflects what members of the public think is needed for a minimum socially acceptable standard of living in the UK today. This report looks at those with incomes below the MIS, focusing on three groups: children, working-age adults and pensioners.
- The proportion of individuals living in households with incomes below MIS has remained stable in the latest year, 2017/18. Although this remains above the level reported at the start of this series in 2008/09. In 2017/18, 18.7 million individuals in the UK were living in households below MIS.
- Children continue to be the most likely of the three broad demographic groups looked at here to be living in a household with an income below that needed for a minimum socially acceptable standard of living. This year has seen an increase in the proportion of children below 75% of MIS i.e. those living in households with very low incomes. Over 250,000 more children are below this level in 2017/18 compared to 2016/17. In total, around 5.8 million children are in households below MIS in the latest year.
- Children living in lone parent households continue to be far more likely to be growing up with incomes below that needed to provide all that is necessary for a minimum standard of living. Nearly three quarters of children in lone parent households (72.2%) are below MIS, compared to a third (33.3%) of children in couple parent households.
- Pensioners remain the group least likely to be living in a household with an inadequate income, but as noted in the previous year's report, the proportion living below MIS has increased by nearly 50% since 2008/09.
- Pensioners are far more likely to be below the MIS level in 2017/18 than at any previous point since records began. This increase is driven predominantly by what has been happening to the incomes of single pensioners, and particularly single female pensioners, who have been affected by the increase in the state pension age, and the impact of this on incomes towards the end of their working lives.
- Tracking the adequacy of incomes has shown improvements for some groups in society over recent years, but the annual analysis of how people are faring relative to the MIS threshold remains an important task while particular groups continue to live below what is needed for a minimum socially acceptable standard of living.

[What has driven the rise of in-work poverty?](#), published by the Joseph Rowntree Foundation, explains why the UK has seen rising in-work poverty.

- The labour market has seen record employment rates and the introduction of the National Living Wage. Yet despite these positive developments more and more people in working families are trapped in poverty.
- The UK's employment rate over the last 20 years has improved from 70% to 76%, however there has been no improvement in the one in five of working-age adults who are in poverty.
- Before the recession, in-work poverty rose as low income working families saw slower earnings growth and faster rises in housing costs than the average family. Over the last five years, in-work poverty has risen as reductions in benefit levels have left low-income families with little protection to cope with low growth in their earnings.
- A reason for this rise may be the result of a compositional change in families moving from being non-working to working. Having the effect of pushing up the in-work poverty rate due to the higher risk of being in poverty. For example:

- It could be that the rising employment rate has led to more single parent families being in work, but these families are at greater risk of being in poverty than other families so this could have pushed up the overall poverty rate.
- Albeit, with this said, if the rise in poverty isn't being driven by compositional change, other factors must be driving it such as the contribution of earnings, benefits and housing costs.
- The introduction of the National Living Wage has not succeeded in reducing in-working poverty, although it has successfully pushed up the hourly wage of the lowest-paid employees. Two reasons exist for this.
 - The first is that low income families don't keep that much of any extra income they get from work, because they see their social security payments reduced as they earn more. Most Universal Credit claimants only get to keep 37p in every extra pound they earn; some keep even less.
 - Secondly, because poverty is about whether a family's income is enough to meet their necessary costs, hourly pay is just one element; how many hours' members of the family are working, their family composition and their costs all matter too.
- Reversing this trend now requires action to drive up family earnings, including a greater focus on the hours of work that people can find. This means tackling the childcare and transport barriers to working more hours for many low-paid women, as well as addressing structural labour market changes that have reduced the availability of full-time work for others. Employers and the Government are being urged to act in areas involving pay, training and flexibility.

[Precarious Work in Ireland: Evidence of a structural change](#), published by the Nevin Economic Research Institute, distinguishes trends in indicators of precarious employment.

- Evidence suggests that the share of full-time permanent jobs has fallen for younger workers, that part-time work (both permanent and temporary) is more common in new employment and that part-time work and temporary employment have become 'more precarious'.
- The share of permanent full-time jobs in new employment contracts (1 year or less) had just about finally recovered in 2017 from the financial crisis (54.8% compared to 55.1% in 2008). However, the share of part-time work (both permanent and temporary) had not, though they were both trending downward.
- The headline figures for part-time and temporary employment rates mask changes to the nature of those employment types in the Irish labour market. Evidence suggests that higher shares of workers in the same categories experience material deprivation and financial insecurity (as measured by the ability to afford an unexpected expense) than before the crisis.
- The share of employee temporary contracts lasting a year or less has increased significantly, with most of this growth occurring in the most recent years. Having already identified a sharp upward trend between 2016 and 2017, the share of short contracts for temporary employees increased further from 43% in 2017 to 54% in 2018, signalling rising insecurity for temporary workers.
- Though headline figures of part-time and temporary employment suggest a recent 'return to normal' after years of strong economic growth post-financial crisis, several indicators point to increased levels of precarity in these jobs.

[How's Life? 2020: Measuring Well-being](#), published by OECD, charts whether life is getting better for people in 37 OECD countries by assessing a set of over 80 indicators.

- Well-being has, in several respects, improved relative to 2010. Life expectancy has increased by more than one year, with the average baby born today expected to live to over 80 years of age in OECD countries.
- Income and jobs are on the rise – household disposable income and adult employment rates both picked up between 2010 and 2017, increasing by approximately 6 and 5 percentage points, respectively.
- Surveys meanwhile suggest that people are more satisfied with their lives, relative to how they felt in 2013: when asked to rate their lives on a scale from 0 (not at all satisfied) to 10 (completely satisfied), the average evaluation in OECD countries has risen from 7.2 to 7.4.
- Despite gains in current well-being since 2010, there is room for much more improvement. Despite rising household incomes, little progress has been achieved since 2010 with respect to reducing income inequality or improving housing affordability.

- The available data shows that, among OECD countries, people's time off for leisure and personal care has not increased since the mid-2000s.
- While life satisfaction has improved on average since 2010, 7% of the population in OECD countries report very low levels of life satisfaction, and approximately 1 in 8 people experience more negative than positive feelings in a typical day.
- On a per capita basis, OECD average greenhouse gas emissions (GHG) have fallen by around one tonne since 2010, to 11.9 tonnes annually in 2017. However, these reductions are far from sufficient to meet international climate policy goals.
- On the whole, people in OECD countries traditionally associated with high well-being, such as the Nordic countries, the Netherlands, New Zealand and Switzerland, enjoy both higher levels of well-being and lower inequalities across the headline indicators.

[Worldwide Cost of Living 2020: Which global cities have the highest cost of living?](#), published by the Economist Intelligence Unit, assesses the findings from the latest worldwide cost of living survey. *This article requires a subscription to access.*

- The ten most expensive cities in the world are: Singapore, Hong Kong, Osaka, New York, Paris, Zurich, Tel Aviv, Los Angeles, Tokyo and Geneva.
- As with 2019's Worldwide Cost of Living Survey, and for only the second time in the survey's history, three cities share the top spot as the world's most expensive to live in. Hong Kong and Singapore continue to occupy two of those places. However, this year also marks change, with a Japanese city, Osaka, climbing three places to join Hong Kong and Singapore at the top of the rankings.
- Elsewhere, as with Osaka, a strengthening of the yen led Japan's capital, Tokyo, to rise from 13th to joint 8th. Higher prices in two US cities, New York (ranked 4th) and Los Angeles (8th), were influenced by a combination of strong local currency and firm domestic demand.
- Tel Aviv (Israel), the only Middle Eastern city in the top ten, rises from 10th to 7th, with transport costs such as the price of owning a car also continuing to rise.
- Of the 37 European cities surveyed, the index scores in all but four—Moscow, St Petersburg, Kiev and Istanbul—have fallen, with 31 experiencing a fall in overall rank. In addition to Paris and Zurich becoming comparatively less expensive, Geneva, another Swiss city and long-standing member of the top ten, falls from 5th to 10th.
- In contrast to the slide in the rankings by European cities, higher living costs associated with the strength of the US dollar have produced another stark trend in this year's report, with 15 of the 16 US cities rising in the rankings. Indeed, many of the movements in this year's index was driven by currency shifts.
- Taking an average of the indices for all cities surveyed, and using New York as the base city, the cost of living has fallen by around 4% on average across the 133 cities surveyed. This mainly reflects the impact on global currencies of easing monetary policy, uncertainty around the US-China trade war (which has put pressure on some emerging-market currencies) and the strength of the US economy.

Innovation and Enterprise

INNOVATION

[Intelligent Futures report – Impact of Automation on NI economy](#), published by Ulster University Economic Policy Centre (UUEPC), explores the impact of increased automation within the Northern Irish economy.

- Automation is a route to higher productivity and employment (despite the fears), lower prices and higher living standards. Relatively lower productivity than competitor nations is a key economic challenge for NI and there is a significant policy imperative to tackle lower productivity, which features heavily in each and every economic strategy.
- UUEPC estimate that up to 98,600 additional jobs could be created by 2030 in Northern Ireland, and total economic output could range from £44bn to £52bn in Gross Value Added (GVA) terms by 2030, an increase from circa. £38bn in 2018.
- The education system is viewed in a positive light, although most acknowledge that the curricula, assessment systems and careers advice needs to take more cognisance of the rate of technological

change and develop skills, knowledge and attitudes to lifelong learning and flexibility that equip individuals for the workplace.

- Automation can help to eradicate or embed inequalities and therefore monitoring the evidence and developing the appropriate policy response to tackle such issues will be important for how automation is viewed throughout society and also in terms of how public services are funded.
- Certain roles and occupations have remained quite gender-specific in society, but the automation of such tasks could fundamentally change those roles and lead to a different gender balance in various sectors.
- Technology provides the opportunity to work remotely, engage in the gig economy and for additional forms of self-employment. This has implications both geographically for where people work and also with regards to issues such as childcare.
- The implications of automation differ across sectors. According to UUEPC's forecasts, health & social care and professional services may experience the largest net employment gains in NI by 2030. The sectors forecasted to experience losses of net employment include retail, agriculture and public administration & defence.

[Pathways to efficiency, pathways to growth: Evidence from the UK Innovation Survey, published by the Enterprise Research Centre, examines the links between publicly-supported and wholly-privately-funded R&D and innovation and its links to growth and efficiency.](#)

- Using data from consecutive observations on the same firms in the UK Innovation Survey to assess the relationship between innovation, growth and efficiency, two groups of results emerge.
- First, a less straightforward relationship than anticipated was found between innovation and firm growth and efficiency.
- Additionally, the effects of 'innovation' on firm performance two years later sometimes differ between growth and efficiency.
- The key linkages are:
 - Product or service innovation has a positive relationship to employment growth but a negative effect on sales growth and efficiency growth after two years.
 - The negative effect on efficiency is also consistent with some other evidence which find either negative or insignificant efficiency effects.
 - Organisational innovation has a positive sales growth effect, a negative employment growth effect and a net positive efficiency effect. These effects persist but are weaker four years after innovation is measured.
 - Process innovation has a positive effect on both efficiency growth and turnover growth. This result reflects the findings of recent trans-national studies. Employment growth effects are insignificant initially but negative and significant four years after innovation is measured.
- In strategic terms, the results suggest the importance for firms of having a clear view of what they are trying to achieve through their innovation investments: firms prioritising jobs growth should focus on product innovation; those seeking efficiency improvement should focus on organisational or process change.
- The second group of results relate to the impact of R&D on the probability of innovation and the differential impacts of wholly-privately-funded and publicly-supported R&D.
- The results clearly emphasise the importance of R&D to all types of innovation that firms receiving public R&D support are no more likely to innovate in terms of processes or organizational change than those paying for all of their own R&D costs.

[5G is about to change the world in ways we can't even imagine yet, published by the World Economic Forum \(WEF\), discusses the vast potential of opportunities that may be harnessed as 5G technology matures.](#)

- While 3G put the mobile Internet in your hand and 4G gave us mobile broadband – redefining how we interact with our world – 5G will connect everything and everyone.
- 5G will reduce delays and improve reliability, thereby enabling mission-critical tasks such as remote surgery, self-driving cars and enhanced public safety, to make possible secure connections so lightning-fast that an entire movie can be downloaded in seconds.

- What is often forgotten about 3G and 4G is that we had no idea of what new business models and industries would be created in response: the car-hailing services, streaming of movies and live events instantly to and from your smartphone, and so much more we now take for granted.
- The faster smartphones and always-connected personal computers that consumers are already using on the initial 5G networks are just a hint of the transformations to come. The industries and areas of daily life already starting to be changed by 5G include:
 - Private networks for factories and industrial facilities - This includes the 5G-enabled Internet of Things with many devices, sensors, applications and mobile connectivity all aimed at improving product quality, increasing productivity, lowering costs and enhancing safety in industrial workplaces.
 - Agriculture - 5G technologies' promise of expanding and accelerating connectivity without sacrificing battery life will be particularly beneficial to farmers, and are already improving veterinary diagnostics, crop protection, reduction of fertilizer use and smart irrigation systems that conserve water.
 - Sustainability - 5G is being deployed to make energy and water use more efficient.
 - On-device artificial intelligence (AI) - One example is how the combination of AI and 5G allows wearable medical devices and phones to work together in ways that are fast enough and smart enough to identify health problems detected by a wearable device and alert your doctor.
 - Extended reality (XR) - 5G technology is vastly increasing the video bandwidth for XR with powerful computing and minimal delays to, in essence, close the gap between the real and virtual worlds.
- With this said, the potential 5G use cases can be classed as infinite, or at least only as finite as the frontier of human innovation.

RESEARCH AND DEVELOPMENT

[No relevant material sourced for this quarter's release.]

SECTORS AND TECHNOLOGIES

[The Immersive Economy in the UK](#), published by Matrix NI, provides an overview of the scale, nature and economic value of the UK's and Northern Ireland's Immersive ecosystem.

- The immersive economy comprises immersive (virtual, augmented and mixed reality) specialists and participants who contribute to growing the technology's economic potential.
- The Northern Ireland immersive ecosystem is primarily made up of micro-businesses, start-ups and small to medium-sized businesses, with a backdrop of large corporations receiving foreign direct investment.
- Immersive Technology companies based in Northern Ireland are ideally situated between mainland Europe and the US, and there are communications links to match.
 - Almost 900 international companies have invested in Northern Ireland, benefiting from operating costs that average 20–30% less than the rest of the UK and Europe, and some of the lowest prime office rental costs in Europe.
- Northern Ireland receives continuing support from government agencies to drive growth in this sector: Invest NI, NI Screen, Digital Catapult and Innovate UK are all extremely active. A collaboration between higher education institutions and multiple industry partners has been successful in obtaining funding for a five-year project: 'Future Screens NI'.
 - Future Screens NI deliver expert technical skills, opportunity and growth across film and broadcast, animation, games and immersive technologies and industries in Northern Ireland. Through the partnership, Northern Ireland's creative companies develop strategies to grow productivity and maximise their global potential, delivering new jobs and a £400 million increase in GVA to boost the local economy.
 - Future Screens NI provide a range of funding opportunities for those within the Creative Industry. Currently, applications are open for 'Rewriting the Narrative' which involves funding up to 20 projects with a £5,000 grant each to carry research and development into outlined themes.
- Northern Ireland has a diverse and vibrant advanced manufacturing and engineering sector, with companies spanning aerospace and defence, automotive, construction, materials handling, electronics and consumer products.

- There is also a burgeoning creative sector in the region, employing over 5% of the entire workforce in Northern Ireland and contributing nearly £1 billion GVA.
- There are still some scaling challenges facing the immersive sector in Northern Ireland, with many companies still in the early stages of investigating the potential of immersive content. Finding the right balance between investing in resources – skills and technology – while finding fresh and continuing revenue streams can be difficult.

[Industries in 2020](#), published by the Economist Intelligence Unit, highlights the major risks that could affect various industries. *This article requires a subscription to access.*

- The 2019 issue highlighted five major risks that could undermine global business during the coming year. Four of those risks came true: the deepening of the US-China trade war, an emerging market downturn, tussles over technology and sanctions on Iran. These all dented economic growth and consumer confidence, dragging down sales across several business sectors during 2019. The fifth risk mentioned, Brexit, has still not happened, but continues to overshadow business in Europe.
- Key global forecasts for the six industries covered by this report are:
 - New-car sales will recover to grow by 1.7%, but commercial vehicle sales will edge down by 0.1%.
 - World retail sale volumes will increase by 2.2%, slower than the 2.5% reported in 2019.
 - Global energy consumption will rise by 1.8%, with particularly strong growth for renewables, while oil prices will remain range-bound.
 - Bank balance sheets and lending will expand by 6.5%, with Asia leading the expansion.
 - Healthcare spending will climb by 6.2% worldwide in US dollar terms, despite growth of just 3.1% for pharmaceuticals.
 - Global mobile subscriptions will increase by 3%, fixed lines by nearly 2% and broadband subscriptions by 6%.
- While there will be opportunities on offer, there are six factors that will determine the direction of these industries in the coming year:
 - A sporadic recovery: Although the global economy will accelerate, growth will be led by an upturn in non-OECD markets, while OECD markets will remain subdued. However, GDP growth in China will also continue to slow, affecting global demand for many goods and exposing problems with manufacturing overcapacity.
 - A watershed election: The US presidential election in November 2020 will be a turning point for several sectors. The re-election of the Republican president, Donald Trump, would slow the rollout of renewable energy, for example, while a Democrat victory could bring new efforts to reform healthcare, as well as sharp increases in corporate taxes.
 - From trade to regulation: The US-China trade war will broaden to affect markets including the EU and Japan. However, the focus will turn from tariffs to regulation, particularly that of the financial and technology sectors. More US sanctions against Chinese companies are expected.
 - Asian alliances: While the US continues to raise trade barriers, Asia is forging ahead with new trade deals. The 16 countries in the proposed Regional Comprehensive Economic Partnership (RCEP) aim to sign an agreement in 2020, creating the world's biggest free-trade agreement.
 - Brexit hangover: Even as January 31st 2020 has passed, uncertainty will not disappear. The transition period could be fraught, with short-term disruption to trade flows heightening political wrangling over future trade deals.

[Seizing sustainable growth opportunities from zero emission passenger vehicles in the UK](#), published by the London School of Economics and Political Science, explores the future presence, characteristics and size of the UK's zero emission transport industry.

- The rise of zero emission and autonomous vehicles offers a pathway to decarbonise road transport in the UK and provides growth opportunities for the country, part of the whole economy opportunity that sustainable growth presents.
- The UK could sustain nearly 80,000 jobs in 2030 in the production of electric vehicle powertrain components, charge points, fuel cell powertrain components and autonomous vehicle hardware and software – if the UK is globally competitive in these technologies.
- In terms of innovation, the UK's competitiveness varies across technologies and supply chain stages. The UK has a comparatively lower share of global innovation in clean and autonomous car

technologies relative to other countries and is lagging behind on electric vehicle (EV) component innovation; there is still innovation activity in dirty car technologies.

- However, looking at specific technologies within the clean and autonomous car category, the UK has a comparatively greater share of global innovation in connected and autonomous vehicle technologies.
- Innovation policy can also be informed by new measures of the social returns from innovation, which include private returns on innovation as well as direct and indirect knowledge spill-overs. Such measures can highlight areas where the UK returns to R&D are high.
- To meet this diverse range of opportunities and given varying levels of competitiveness, the UK should adopt a portfolio approach to incentive design, targeting a wide range of goods and services that can contribute to zero emission, connected and autonomous road transport.
- The evidence suggests that a more sustainable and inclusive growth path is likely to bring opportunity to the country in the medium to longer term. Conversely, if the UK fails to direct incentives away from high-carbon goods and services, it faces causing harm to its economy and citizens.

[The UK Film industry has trebled in size since 2012, but we're not going to the cinema more often. Why – and is this sustainable?](#), published by the Centre for Economics and Business Research, assesses the economic contribution of the UK's film industry.

- The UK film industry added over £6bn to the UK economy in 2018. This is more than treble the contribution made in 2012 and a number likely to increase based on 2019 trends. In addition, growth has outpaced wider services sector levels. The industry has increased from constituting 0.4% of the total services sector in 2012, to 0.8% in 2018.
- Interestingly, this growth is not driven by increases in UK cinema attendance. In 2018 the average UK resident went to the cinema 2-3 times, precisely 2.7 times. This level is no higher than 2008 records.
- However, this improvement can be attributed to the UK's significant increase in the share of the film industry's global market.
- From 2009 to 2018, global film takings rose from \$29.5 billion to \$41.4 billion, an increase of 40%. Over the same period total global takings from UK films grew by 470%, from \$2.0 billion to \$9.4 billion. Therefore 62% of the global industry growth is attributable to takings from UK films.
- The UK is an attractive location to produce films for several reasons. Extensive infrastructure, studio space, a highly-skilled workforce and technical expertise are all advantages the UK can offer. Generous public funding, with £634 million available in 2017/18, provides a further incentive.
- Future prospects are also promising, as competition and increased demand should continue to stimulate the UK film industry. This is mainly due to the disruptive shift in how audiences view film content and the following 'streaming wars' between major streaming services.
- Any newly forged trading arrangements should seek to continue to allow the industry to flourish. From 2014-18, ONS data shows that total exports from the film industry were worth nearly £10 billion. Exports to the EU accounted for 40% of this, the US 29% and Asia 16%.

[4 ways the way we make things can change for a sustainable world](#), published by the World Economic Forum (WEF), proposes how new technology can be utilised and integrated in industry to provide a more sustainable world.

- The Fourth Industrial Revolution isn't solely about how new manufacturing technologies will benefit companies and consumers. It's also about how industry can usher in a cleaner, more sustainable world. This report discusses four ways Industry 4.0 can manufacture a more sustainable world:
- Tooling-free manufacturing, without scrap
 - Eliminating tooling produces many positive impacts – reduced lead times, lower part costs and decreased warehouse overhead – in addition to mitigating the environmental impacts of manufacturing.
 - Only raw materials – metal powders that can be densely packed – will be shipped, creating a far more efficient supply chain. Parts, meanwhile, will be sent across borders as digital files, and only downloaded and printed when and where they're needed.
 - Powder-metallurgy-based (PMB) additive processes also enable near 100% use of raw materials with little waste or scrap, making it a green and highly circular technology.

- Consolidating assembly
 - Another benefit of additive manufacturing is assembly consolidation, or the combining of several parts into fewer, multi-functional assemblies. This curtails environmental impacts, too. With fewer parts to transport, the process can make shipping more efficient, reducing CO2 emissions.
 - As the 3D printing industry continues to evolve in the coming decades, it will eventually reach the next curve, where companies print complete products using multiple materials, further reducing environmental impacts.
- Generative design
 - Using new generative design tools, engineers outline where a part should exist, what forces are acting upon it and delineate areas to avoid. The rest is up to a computer.
 - The end results are fully optimized parts as much as 50% lighter than conventional designs, without sacrificing performance.
- Circular manufacturing and new polymers
 - With nearly infinite reusability, 3D printed metal parts have begun to open the door to the notion of a circular manufacturing process in which products are designed to fit into sustainable loops, where components can be reused again and again.

[What can the Digital Transformation and IoT achieve for Agenda 2030?](#) Published by the Centre for Economic Policy Studies, illustrates the key features and evolutions of the Internet of Things (IoT), and provides an overview of how the IoT is mostly used today in sectors such as manufacturing, healthcare, energy and smart cities.

- The digital transformation fundamentally impacts our economy, society and environment – both positively and negatively. Given monumental challenges like climate change and global poverty, it is essential that both the private and public sector find a way to harness new technologies like the IoT for economic, but also environmental and social purposes.
 - In this context, the United Nations Sustainable Development Goals (SDGs) provide a universally accepted vision and concrete targets, against which the contribution of new technologies to sustainable development can be assessed. The idea of long-term sustainability is also incorporated in emerging visions, such as the one incorporated in the Society 5.0 concept originated in Japan and now endorsed also at the G20 level.
- The IoT use cases have been analysed in four selected sectors: manufacturing, healthcare, energy and smart cities/mobility.
 - In manufacturing, the IoT can reduce costs and increase efficiencies through predictive maintenance; in healthcare, the medical Internet of Things (mIoT) can enable home healthcare, mobile health and make patients more independent of in-person meetings with medical staff; in the energy sector, the IoT can help integrate sustainable energy sources in the power grid and reduce energy waste through better load management; in smart cities and mobility the IoT can, for example, increase convenience through improved traffic systems, reduce energy consumption through better light management and eventually revolutionise transport through autonomous vehicles.
 - These sectors represent the biggest market share of IoT projects (manufacturing and smart cities/mobility) or are of high social (healthcare) or environmental (energy) importance. The use cases show, that the IoT can be used for diverse economic, social and environmental goals. Despite its potential, the IoT market is, however, still relatively small (but growing) and is slowed down by issues of complexity, interoperability, cost, privacy and security. In addition, negative consequences such as high energy consumption, e-waste, potential job loss through automation and market concentration should be considered.
 - Moreover, despite the IoT's high potential, the main drivers for adoption of the IoT are too often cost savings and increased efficiencies, while its explicit use for environmental and social goals remains underdeveloped on competitive markets with insufficient incentives for sustainable investments.
- In the hope of supporting the search for the most sustainable use cases, a four-step approach has been proposed for prioritising high potential IoT projects and measuring their impact on the SDGs: (1) Use an 'SDG-first' approach and ask three key questions to identify IoT projects with the highest potential contribution to the SDGs; (2) once a high potential IoT project is selected, choose SDG targets related to the project and translate them into measurable KPIs; (3) measure and monitor the impact of the IoT project; (4) evaluate the project and communicate results. It is encouraged that both public and private organisations use similar impact measurement approaches and transparently

communicate the results to help others find the most impactful variants of new technologies like the IoT.

- To conclude, the study provides a mix of policy measures which can help unleash the potential of IoT for sustainable development.
 - First, public investments can support more sustainable IoT projects, which the market would normally neglect, by setting positive economic incentives. These investments should be guided by an 'SDG-first' approach and focus on high impact use cases as outlined, for example by linking sustainability to the award criteria for Horizon Europe funding.
 - Second, negative economic incentives should be used to reduce negative consequences. The planned revisions of the Emissions Trading System (ETS) Directive and the Energy Taxation Directive, for example, provide an opportunity to put a higher price on energy consumption.
 - Third, innovation-friendly regulation can increase transparency and help reduce negative impacts. A revision of the Non-Financial Reporting Directive can empower investors and consumer groups to scrutinise the non-financial impacts of companies and the planned waste reform should be used to tackle the growing problem of e-waste.
- If the right policy environment is created, the market can produce IoT solutions that are both economically viable and contribute to social and environmental goals. The IoT has tremendous potential and can be an integral part of a digital transformation that generates growth and works for the people and the environment. The public and the private sector need to work together to make this a reality.

ENTREPRENEURSHIP

[No relevant material sourced for this quarter's release.]

BUSINESS GROWTH

[High Growth Small Business Report 2019](#), published by Frontier Economics, details the characteristics, performance and potential benefits that can be harnessed from High Growth Small Businesses.

- High Growth Small Businesses (HGSBs) significantly punch above their weight in economic contribution. Despite comprising only 2.9% of registered businesses, HGSBs were responsible for £113 billion in Gross Value Added (GVA) in 2016/17 – almost 8% of total economy-wide GVA.
- High growth small businesses are those with turnover between £1 million and £20 million who have enjoyed turnover growth of 20% or more on average over three years.
- The top 3 sectors for HGSBs in the UK are Construction, Wholesale & Retail, and Administrative & support services.
- HGSBs have been the engine of recent business growth and are 24% more productive than their slower-growing counterparts when productivity is defined as turnover per worker. Looking at GVA per worker, the difference is even bigger: HGSBs are 41% more productive.
- HGSBs accounted for 84% of the net employment growth between 2015/16 and 2016/17, employing an extra 1.9 million workers in the period.
- With attention turning towards regional imbalances in the UK economy, HGSBs could be a key plank to curb these disparities. HGSBs make up a bigger share of business activity outside London, particularly in Northern Ireland – accounting for 7% of GVA in the capital, but between 8 and 12% of GVA in other regions.
- As findings show the pivotal role HGSBs have to play in a successful economy, it is of significant importance that these potential opportunities are not suffocated as a result of difficulty in obtaining finance, labour and a fair market to trade within as the economic and political landscape evolves.

GROWTH FINANCE

[No relevant material sourced for this quarter's release.]

BUSINESS REGULATION

[No relevant material sourced for this quarter's release.]

Succeeding Globally

TRADE

[The Representation of SME interests in Free Trade Agreements](#), published by the Federation of Small Businesses, explores where small businesses want to trade and how the Government can ensure their needs are met, in the UK's future trading landscape post-Brexit.

- Small and Medium-sized Enterprises (SMEs) play an important role in the UK economy, accounting for 99.9% of businesses and 60% of private-sector employment. Nevertheless, SME participation in international trade is known to be significantly lower than the trading activities of larger-sized businesses, and utilisation of the preferential market access afforded by Free Trade Agreements (FTAs) is undoubtedly lower amongst SMEs.
- FTAs can facilitate trade in a number of ways:
 - FTA provisions could reduce variable trade costs such as tariffs;
 - Provisions could reduce trade barriers of a fixed-cost nature such as compliance with product standards;
 - They can provide long-range planning security by locking in conditions of doing business and underpin those conditions and rights with an accessible and effective dispute resolution mechanism;
 - They can reduce informational asymmetries through requirements of information exchange and designated help points.
- This report sheds light on how two recent 'mega-regional' FTAs address SMEs trade concerns, namely the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the EU-Japan Economic Partnership Agreement (EPA).
- In future trade negotiations, the UK Government should support SMEs—like any other UK business—by achieving (i) comprehensive market access; (ii) ambitious regulatory transparency and regulatory cooperation; (iii) substantial trade facilitation, and (iv) reduced administration.
- The most effective way of specifically enabling SMEs to trade internationally is for FTAs to address trade barriers that represent fixed costs, which SMEs will typically find more difficult to surmount than larger businesses. Any flexibility in this regard, e.g. improved ease of registering intellectual property, will be particularly helpful for smaller businesses.
- Trade facilitation through the simplification of cross-border arrangements as well as transparent customs regulation and procedure is critical for UK SMEs to reduce trading costs.
- Even in the most ambitious FTAs to date, a 'best endeavour' language prevails in many subject areas. The value of future UK FTAs for SMEs, in terms of planning security and level of ambition, would increase appreciably. It is important that FTA provisions actually entail a commitment to implement agreed provisions, rather than merely 'encouraging' certain steps to be taken.

INWARD INVESTMENT

[No relevant material sourced for this quarter's release.]

TOURISM

[No relevant material sourced for this quarter's release.]

Economic Infrastructure

ENERGY

[A smarter way to save energy: using digital technology to increase business energy efficiency](#), published by the Green Alliance, explores how digital technologies and government assistance within the field can transform businesses' approach to energy management.

- The UK's ambition to reach net zero greenhouse gas emissions by 2050 has made energy efficiency a national priority. As business is responsible for a quarter of the UK's greenhouse gas emissions, much more energy efficient buildings and industrial processes are needed.

- Investment in energy efficiency is not a priority for many businesses. Improvements have flat-lined, particularly in sectors where energy is a small share of total business costs and payback periods are long. While the government has introduced some regulatory measures, these are yet to drive the kind of step change needed to reach the net zero target.
- What is certain is that, in a net zero world, business as usual is no longer acceptable. A new wave of digital technologies could transform businesses' approach to energy management by:
 - Optimising energy performance with low capital investment;
 - Strengthening the business case for larger capital investment;
 - Enabling new business models and financing schemes;
 - Designing efficient new buildings and equipment.
- The government should lead improvements in business energy efficiency through a more innovative, digital centred approach. It should:
 - Promote the uptake of digital technology for better energy use, by ensuring equipment is smart by default and through business energy efficiency and digitalisation programmes.
 - Boost markets for smart energy efficiency, through mandatory disclosure of business energy performance, coupled with regulation to raise minimum efficiency requirements over time, as well as an energy efficiency obligation scheme to support smaller businesses, delivered by energy service companies.
 - Avoid repeating poor design in new buildings, by using data from existing commercial building energy performance to deliver more efficient assets from the start, and by requiring developers to verify the actual performance of new buildings in use against their predicted performance.
- Government policy has fallen short to date. One reason could be that energy efficiency is often not perceived as an exciting topic to promote, even though it is core to business competitiveness and resilience. Moving forward, the focus on policies that promote energy efficiency should feature more prominently, if the UK are to reap the benefits and meet the set targets.

Balancing the energy equation: three steps to cutting UK demand, published by the Green Alliance, outlines 3 steps that can guide government policy in addressing energy demand.

- The UK has shown leadership by legislating to reach net zero emissions by 2050. Getting to net zero will require a reduction in energy demand right across the economy.
- Most approaches to reduce emissions have relied on decarbonising energy supply: phasing out coal and drastically reducing the price of renewable energy. However, this ignores the potential contribution and benefits of the other side of the energy equation: demand reduction.
- All sectors should incorporate aspects of the following overarching elements:
 - Reduce demand - Just as 'reduction' is the first of the 3Rs (reduce, reuse, recycle) in sustainable resource use, eliminating the need for energy in the first place is the easiest way to minimise the impacts associated with its generation and use.
 - Improve technical efficiency - Energy efficiency means eliminating energy waste and loss. It is achieved by introducing measures that reduce the energy needed to achieve a given benefit.
 - Flex energy demand - Aligning demand to supply will become more important for two main reasons. First, intermittent sources of renewable energy will become the low cost backbone of the electricity system. Second, more efficient technologies reliant on electricity, like electric vehicles and heat pumps, will increasingly be used.
- Here are some examples on how these elements can be applied to important sectors to reduce energy demand:
 - Transport - The top priority should be to reduce the need to own and drive cars, by facilitating shared mobility, walking and cycling, and by improving public transport. Transport and planning objectives should also be aligned to avoid the need to make so many journeys.
 - Buildings - The poor energy efficiency of much of the UK's existing building stock, both housing and commercial, needs urgent attention. It requires real world performance data to inform decisions, and can be done through a £1 billion per year upgrade programme to 2035. This should target low income households and be combined with new incentives for those who are able to pay.
 - Industry - Resource efficiency is the next frontier for action, with great untapped potential to cut energy use by making longer lasting, repairable items, bringing down the demand for products and promoting resource efficient industrial processes.

- Action to reduce energy demand is not only necessary to meet decarbonisation targets, but also highly desirable. These developments have other, far reaching positive impacts, including cleaner air, healthier homes and a more productive economy. Reducing demand is the easiest way forward to support the three pillars of UK energy policy: security, affordability and sustainability.

TELECOMS

[No relevant material sourced for this quarter's release.]

AIR ACCESS

[No relevant material sourced for this quarter's release.]

Government

NORTHERN IRELAND

[Northern Ireland High Growth Firms 1998-2019](#), published by the Department for the Economy, assesses the changing dynamics of High Growth businesses within Northern Ireland.

- The total number of 'in scope' businesses for the latest period (2016-19) was 57,805; 7,575 employed 10 or more staff in the base year and 50,230 employed less than 10 staff in the base year.
- The number of High Growth businesses employing 10 or more staff in the latest period, 2016-19 (1,040) was up from the previous period 2015-18 (895).
- The number of High Growth micro businesses employing less than 10 staff in the latest period, 2016-19 (11,755) was less than the previous period 2015-18 (13,145).
- The High Growth rate for businesses employing 10 or more staff stood at 14% for the latest period.
- Micro businesses employing less than 10 staff as a group experienced higher and more sustained levels of High Growth rates than larger businesses, however the high growth rate for micro businesses is lower for the current period (24%) than the previous period 2015-18 (26%).
- In 2019 High Growth businesses employing 10 or more staff made up 24% of total turnover for in scope businesses, higher than in 2018 (14%), with High Growth micro businesses making up 7% of total turnover, lower than in 2018 (11%).
- The share of total turnover for in scope businesses accounted for by non-High Growth businesses has risen from 59% in 2009, peaking at 80% in 2013 and has gradually fallen to 69% for 2019.
- In 2019 most employees (80%) were employed by non-High Growth businesses. There has been a fall over time in the proportion of people employed within High Growth firms, this fall is mainly accounted for by High Growth firms employing 10 or more staff in base year.

The Department for the Economy (DfE) published six sub-regional Skills Barometer reports, using the same methodology as that developed in the [Northern Ireland Skills Barometer 2019](#).

- The research was produced by the Ulster University Economic Policy Centre (UUEPC) and led by Invest NI; the reports cover:
 - [Belfast City Council](#)
 - [North](#) (Derry City and Strabane, Causeway Coast and Glens)
 - [South](#) (Armagh City, Banbridge and Craigavon, Newry, Mourne and Down)
 - [East](#) (Mid and East Antrim, Antrim and Newtownabbey, Lisburn and Castlereagh, Ards and North Down)
 - [West](#) (Fermanagh and Omagh, Mid Ulster)
 - [Growth Region](#) (Fermanagh and Omagh, Mid Ulster, Armagh, Banbridge and Craigavon).

[The Anholt Ipsos Nation Brands Index](#), published by the Northern Ireland Executive, provides an insight on the international perception of Northern Ireland.

- The Nation Brands Index (NBI) is an annual global survey that attempts to evaluate the international image and reputation of countries around the world across Six Dimensions of national competence: Exports; Governance; Culture; People; Tourism; and Immigration and Investment; hereafter known as the Six Dimensions.
- Northern Ireland's (NI) international reputation remains stable, achieving a mid-level ranking of 22 out of 50 nations.
- NI achieved an NBI score of 59.38 out of 100 – this is the highest score achieved since inclusion in the Index in 2016.
- Those who stated they previously visited NI for holiday and/or business gave significantly higher scores for all Six Dimensions and for their overall NBI score.
- Those who had bought NI products, or visited websites about NI, gave significantly higher scores for all Six Dimensions and for their overall NBI score.
- NI's reputation is strongest with the UK and European nations – in 2019, NI received its highest ranks from France and United Kingdom (20th). The lowest rank in 2019 is from Egypt, who placed NI 35th. Northern Ireland's highest score was from India (68.62) and the lowest score came from Japan (51.28).
- Since 2016, NI has improved its reputation with 17 of the 20 panel countries surveyed – only Canada, Germany and Japan have shown decreases over this period.
- The only country to rank all Six Dimensions more positively in 2019 compared with 2018 was Egypt. Meanwhile the opposite was true for Turkey who ranked all 6 more negatively.

ENGLAND

[No relevant material sourced for this quarter's release.]

SCOTLAND

State of the Economy, published by Scottish Government, details key economic statistics relating to Scotland.

- Economic growth in Scotland slowed in 2019 with growth of 0.4% in the first three quarters of the year compared to 1.4% growth over the same period in 2018.
- Following the Brexit deadline extension in March 2019, output in Scotland, and the UK as a whole contracted in the second quarter of the year as firms unwound safety stocks that had been accumulated in the first quarter. However, economic activity rebounded in the third quarter of the year, with output in Scotland growing 0.3% over the quarter, slightly below UK growth of 0.5%.
- In Q3 2019, business investment contracted by 2.4% over the quarter – its fourth consecutive quarterly fall - and fell 13.5% over the year.
- Alongside weaker output growth in the economy, labour market indicators for Scotland have also softened over the past year. However, the labour market continues to perform strongly by historical standards and overall remains tight.
 - Scotland's unemployment rate fell over the latest quarter to 3.8% in September – November 2019 and is in line with the rate for the UK as a whole. However, unemployment in Scotland has risen from its record low of 3.2% earlier in the year and over the past year the number of people unemployed has increased by 4,000 to 105,000.
 - Alongside this, despite a pick-up in employment in the latest quarter, the employment rate remained at 74.3% and over the past year, the number of people in employment fell by 17,000.
- Productivity (output per hour) growth strengthened slightly in the third quarter of 2019, growing 0.2% over the quarter and 0.8% over the year.
- The slowing in the economy and labour market over the past year, alongside heightened political and economic uncertainty, has been reflected in business sentiment.
 - The latest RBS Purchasing Managers Index reported that business activity remained stagnant in the final quarter of 2019, before picking up mildly at the start of 2020. However, at a sector level, the manufacturing sector has continued to report falling activity amid weak external demand and ongoing uncertainty.

WALES

Wales Tourism Performance: January to September 2019, published by the Welsh Government, provides a comprehensive overview on the most recent quarterly data available for the Welsh Tourism Industry.

- There were increases in visits to Wales in the first 9 months of 2019 compared with 2018: an increase of 4.8% to 8.503 million in terms of trips and an increase of 7.9% to £1,660 million in related spend. The corresponding figures at GB level show smaller increases of 3% and 2.3% respectively.
- Over the 12 months ending September 2019, there were 10.415 million overnight trips to Wales, up by 6.3% compared with the 12 months ending in September 2018. The expenditure at £1,973 million was also up by 9.2%.
- For both Wales and GB as a whole the number of visits and total expenditure increased but the number of nights fell - indicating that visitors take shorter overnight stays but spend more while they are there.
- In the first 9 months of 2019, there were 65.4 million day visits to destinations in Wales, down 13% on the same time in 2018. Related spend (£2,647 million) was down by 16%. The corresponding figures at GB level were down 3% on trips, but up by 3% in terms of spend.
- In the 12 months ending in September 2019, day trips to Wales (86.1 million) were down by 13% and related spend (£3,497 million) was 17% down. The corresponding figures at GB level showed a decrease on trips of 3%, but an increase of 2% on related spend.
- The number of international trips to Wales during the first 9 months of 2019, increased by 4% year on year to 820,000. Visitor spending was £358 million, which was a 12% increase on the same time last year. (This expenditure figure however included one particular outlying figure with high value).
- Hotels saw a slight fall in occupancy rates compared with the first 9 months of 2018 to 67% (from 68% in 2018), but Guest Houses and B&Bs saw an increase to 40% (from 38%). Hostels were up slightly year on year to 55% in 2019 compared to the 54% of the same time in 2018, Self-catering accommodation was 61% compared to 59% in 2018.

REPUBLIC OF IRELAND (ROI)

[No relevant material sourced for this quarter's release.]

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European Association of Research and Technology Organisations (EARTO)

<http://www.earto.eu>

European Commission - Enterprise and Industry - Growth publications

<http://ec.europa.eu>

European Investment Bank (EIB)

<http://www.eib.org>

Eurostat

<http://ec.europa.eu>

Federation of Small Businesses (FSB)

<https://www.fsb.org.uk>

GEM Consortium

<http://www.gemconsortium.org>

Green Alliance

<http://green-alliance.org.uk>

HM Treasury (HMT)

<https://www.gov.uk/government/organisations/hm-treasury>

Imperial College London - Business School

<https://www.imperial.ac.uk>

Institute for Fiscal Studies (IFS)

<https://www.ifs.org.uk>

Institute for Government

<https://www.instituteforgovernment.org.uk>

International Institute for Management Development (IMD)

<https://www.imd.org>

InterTradeIreland

<http://www.intertradeireland.com>

Invest NI

<https://www.investni.com>

Ipsos MORI

<https://www.ipsos.com>

Irish Exporters Association (IEA)

<http://www.irishexporters.ie>

Joseph Rowntree Foundation

<https://www.jrf.org.uk>

Journal of Business Research

<https://www.journals.elsevier.com>

Kiel Institute

<https://www.ifw-kiel.de>

Legatum Institute

<http://www.li.com>

LSE - Centre for Economic Performance (CEP)

<http://cep.lse.ac.uk>

LSE - Spatial Economics Research Centre (SERC)

<http://www.spataleconomics.ac.uk>

McKinsey UK

<https://www.mckinsey.com>

National Assembly for Wales

<http://www.assembly.wales>

National Competitiveness Council (NCC)

<http://www.competitiveness.ie>

National Economic and Social Research Council (NECS)

<http://www.nesc.ie>

National Institute of Economic and Social Research (NIESR)

<https://www.niesr.ac.uk>

Nesta

<http://www.nesta.org.uk>

Nevin Economic Research Institute (NERI)

<https://www.nerinstitute.net>

NI Assembly Research and Information Service (RaISe)

<http://www.niassembly.gov.uk>

NI Council for Voluntary Action (NICVA)

<http://www.nicva.org>

NI Science and Industry Panel – MATRIX

<http://matrixni.org>

NISRA

<https://www.nisra.gov.uk>

OECD iLibrary

<http://www.oecd-ilibrary.org>

Open Europe

<https://openeurope.org.uk>

Organisation for Economic Development and Co-operation (OECD)

<http://www.oecd-ilibrary.org>

Oxera

<https://www.oxera.com>

Oxford Economics

<https://www.oxfordeconomics.com>

Oxford Review of Economic Policy

<https://academic.oup.com>

Parliament Briefings

<https://researchbriefings.parliament.uk>

Peterson Institute for International Economics (PIIE)

<https://piie.com>

PricewaterhouseCoopers (PWC NI)

<http://www.pwc.co.uk>

PricewaterhouseCoopers (PWC)

<http://www.pwc.com/>

Queen's University Belfast – Economics

<http://www.qub.ac.uk>

Queen's University Belfast - Research Centre in Sustainable Energy

<http://www.qub.ac.uk>

Resolution Foundation

<http://www.resolutionfoundation.org>

ResPublica

<http://www.respublica.org.uk>

Scottish Enterprise

<https://www.scottish-enterprise.com>

Scottish Government

<http://www.gov.scot>

Small Business Research Centre (Kingston University London)

<https://eprints.kingston.ac.uk>

Taxpayers Alliance

<http://www.taxpayersalliance.com>

Technical Research Centre of Finland (VTT)

<http://www.vttresearch.com>

Technopolis

<http://www.technopolis-group.com>

The Executive Office (TEO)

<https://www.executiveoffice-ni.gov.uk>

Tourism NI

<https://tourismni.com>

Trinity College Dublin

<http://www.tcd.ie>

Ulster University Economic Policy Centre

<https://www.ulster.ac.uk/business/epc>

University College Dublin (UCD)

<http://researchrepository.ucd.ie>

University of Ulster - Business Management Research Institute (BMRI)

http://uir.ulster.ac.uk/view/research_institutes/

Visit Britain

<https://www.visitbritain.org>

Visit Scotland

<http://www.visitscotland.org>

Wavteq

<http://www.wavteq.com>

Welsh Government

<http://gov.wales>

World Bank

<http://www.worldbank.org/>

World Economic Forum (WEF)

<https://www.weforum.org>