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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 impact of automation technologies for job quality in Northern Ireland.
- In-depth analysis on the worldwide cost of living and outlook for the rest of 2019.
- How best mobile operators can monetise incoming 5G technology.
- An examination of issues around European innovation and public policy mechanisms to increase private research and development expenditure.
- An explanation for falling amounts of foreign direct investment globally.

** 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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Analytical Services, Department for the Economy ✉ analyticalservices@economy-ni.gov.uk

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

[Worldwide Cost of Living 2019: 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; Paris; Hong Kong; Zurich; Geneva; Osaka; Seoul; Copenhagen; New York; Tel Aviv; and Los Angeles.
- For the first time in the survey's history, three cities share the title of the world's most expensive city: Singapore, Hong Kong and France's capital, Paris.
- The top ten is largely split between Asia and Europe, with Singapore representing the only city in the top ten that has maintained its ranking from the previous year. In the rest of Asia, Osaka in Japan and Seoul in South Korea join Singapore and Hong Kong in the top ten. In Europe, the usual suspects—Geneva and Zurich, both in Switzerland, as well as Copenhagen in Denmark—join Paris as the world's most expensive cities to visit and live in out of the 133 surveyed.
 - Within Western Europe it is non-Euro area cities that largely remain the most expensive. Zurich (in fourth place), Geneva (joint fifth) and Copenhagen (joint seventh) are among the ten priciest. The lone exception is Paris (joint first), which has featured among the top ten most expensive cities since 2003. With Western European cities returning to the fold, the region now accounts for three of the five most expensive cities and for four of the top ten.
- A stronger US dollar last year has meant that cities in the US generally became more expensive globally, especially relative to last year's ranking. New York has moved up six places in the ranking this year, while Los Angeles has moved up four spots.
- Tel Aviv, which was ranked 28th just five years ago, sits alongside Los Angeles as the joint tenth most expensive city in the survey. Currency appreciation played a part in this rise, but Tel Aviv also has some specific costs that drive up prices, notably those of buying, insuring and maintaining a car, all of which push transport costs 64% above New York prices.
- Last year inflation and devaluations were prominent factors in determining the cost of living, with many cities tumbling down the ranking owing to economic turmoil, currency weakness or falling local prices. Places like Argentina, Brazil, Turkey and Venezuela experienced all of the aforementioned conditions, leading to cities in these countries seeing a sharp fall in their cost of living ranking.
- The UK has already seen sharp declines in the relative cost of living owing to the Brexit referendum and related currency weaknesses. In 2019 these are expected to translate into further price rises as supply chains become more complicated and import costs rise. These inflationary effects could be compounded if sterling were to stage a recovery.

PRODUCTIVITY AND GROWTH

[Persistent productivity failure in the UK: is the EU really to blame?](#) Published by National Institute of Economic and Social Research (NIESR), examines whether UK productivity problems are related to the European Union. *This article requires a subscription to access.*

- UK productivity performance has disappointed over much of the post-war period resulting in a significant productivity gap with peer group countries although the extent of this pre-crisis 'failure' is smaller than is often supposed. Supply-side policies, such as the failure to reform industrial relations and a tax system characterised by very high marginal rates, that affected productivity could have been better designed. The policy configurations prevailing both during the 'post-war consensus', and also during the 'post-Thatcher consensus', were flawed in various ways.
- Relative UK productivity growth improved somewhat between the 1970s and the 2000s but this should not be seen as mainly due to joining the EU. Domestic policy frameworks at home and abroad mattered much more than did European economic integration. Nevertheless, EU entry did raise the level of GDP per head by a nontrivial amount.
- After 1973, EU membership helped to address some of the weaknesses which were impairing UK productivity and were amenable to increased competition. It was an important component of the

Thatcher reforms and was vigorously promoted by Mrs Thatcher herself both in the 1975 referendum and in the context of the Single Market. In contrast, Brexit is unlikely to be helpful in addressing today's productivity problems since it is neither necessary nor sufficient for the introduction of better horizontal industrial policies.

- EU membership has constrained UK policymakers notably in the area of selective industrial and competition policies. In the light of the experience of government failure during the 1970s, this has surely been helpful. An important downside risk of Brexit is that it may open the door for a return to interventionism.
- In sum, the EU really is not to blame for UK productivity failures. UK supply-side policies have left much to be desired but EU exit is neither necessary nor sufficient for reform.

[The Decline of British Manufacturing, 1973–2012: The Role of Total Factor Productivity](#), published by NIESR, examines what role, if any, productivity has played in the decline of output share and employment in British manufacturing. *This article requires a subscription to access.*

- As is acknowledged by the UK government, the manufacturing sector makes a far larger contribution to the UK economy (to exports, innovation, other sectors through inter-industry linkages and the employment of highly skilled labour) than would be expected given its output share. This paper has calculated estimates of Total Factor Productivity (TFP) for all manufacturing plants in the Annual Business Survey between 1973 and 2012 to see what role, if any, TFP may have played in manufacturing's continuing relative decline. These show that TFP fell between 1973 and 1982 but had recovered by 1994. Since this date, TFP has increased rapidly. Only a small proportion of the growth since 1994 can be explained by a selection effect, whereby low productivity plants exited the market.
- The continued relative decline of UK manufacturing cannot therefore be attributed to poor TFP performance. Aggregate TFP growth was then decomposed to show the contribution of different sectors. This showed that much of the growth in this latter period comes from foreign-owned plants, industries that are involved in trade and industries with high levels of intangible assets.
- Since the UK government is committed to increasing the role of manufacturing in the economy, it is useful to discuss the policy implications of the results. First, the results support efforts to encourage activities that allow firms to build up intangible assets. R&D tax credits, which have operated in the UK since 2000, are an example of such a policy although a recent meta-analysis finds these have been less effective in manufacturing than services ([Castellacci and Lie, 2015](#)).
- Similarly, the results support assistance such as that offered by UK Trade and Investment to increase exporting, particularly since previous research using micro-data has found that such policies can be effective ([Gorg et al., 2008](#); [Van Biesebrock et al., 2016](#)). They also find that the industries that are most involved in offshoring contribute positively to productivity growth but to a relatively small extent due to the closure of productive plants. This suggests that these firms are moving capacity in order to lower costs, rather than to increase productivity.
- Whether slowing the rate of offshoring is feasible, given the UK's high wage costs, is debatable but recent reductions in the main rate of UK corporation tax (from 28 per cent to 20 per cent between 2008 and 2015, declining to 19 per cent in 2017) may help at the margin. Such a policy may also attract foreign-owned plants that were also shown to have contributed positively to productivity growth.
- More broadly, this research confirms the results of earlier papers ([Disney et al., 2003](#); [Harris and Moffat, 2013a](#)) which emphasise the importance of reallocations of output shares both among surviving plants and most especially the opening of new plants as a source of productivity growth.
- Policy measures to increase competition and thus facilitate the transfer of resources between firms would therefore improve aggregate productivity. By contrast, the government should resist pressures to support unproductive plants in areas where resources are likely to be re-employed quickly, since this will impede the process of 'creative destruction' necessary to generate productivity growth.

[Solving the productivity puzzle](#), published by McKinsey & Company, explains how three waves collided to create historically low productivity growth but finds potential for it to recover.

- Two waves have dragged down productivity growth by 1.9 percentage points on average across advanced economies since the mid-2000s. The waning of a boom that began in the 1990s with the first information and communications technology (ICT) revolution, together with a subsequent phase of restructuring and offshoring, reduced productivity growth by about one percentage point.

Financial crisis aftereffects, including persistent weak demand and uncertainty, reduced it by another percentage point, as investment was low even when hiring returned.

- A third wave, digitization, contains the promise of significant productivity-boosting opportunities, yet the benefits have not materialized at scale. There are several reasons that the impact of digital is not yet evident in the productivity numbers. These include lag effects due to the need to reach technological and business readiness, costs associated with the absorption of management's time and focus on digital transformation, as well as transition costs and revenue losses for incumbents that can drag sector productivity during the transition. As a result, the short-term net impact of digitization is unclear.
 - The authors have found that digitization has not yet reached scale, with a majority of the economy still not digitized. The McKinsey Global Institute has calculated that Europe overall operates at only 12 percent of digital potential, and the United States at 18 percent, with large sectors lagging in both.
 - The authors find that companies are experiencing substantial transition costs. In a recent survey they conducted, companies with digital transformations under way said that 17 percent of their market share from core products or services was cannibalized by their own digital products or services. Today companies are allocating substantial time and resources to changes and innovations; however, these do not yet have a direct and immediate impact on output and productivity growth. As a result, the economy is experiencing a renewal of the Solow Paradox of the 1980s, with the digital age around us but not yet visible in the productivity statistics.
- The importance of these waves was not equal across countries. The first wave mattered more in Sweden and the United States, where the productivity boom had been more pronounced, while financial crisis aftereffects were felt more broadly across countries.
- The findings suggest that unlocking the productivity potential of advanced economies requires a focus on promoting both demand and digital diffusion, in addition to interventions that help remove traditional supply-side constraints such as red tape. To incentivize broad-based change, companies need competitive pressure to perform better, a business environment and institutions that enable change and creative destruction, and access to infrastructure and talent. Yet additional emphasis on digital diffusion and demand is warranted.

Effects of broadband availability on total factor productivity in service sector firms: Evidence from Ireland, published by the Economic and Social Research Institute (ESRI), examines whether the introduction of broadband services increased firms' productivity in nine sub-sectors within the services and distribution sector.

- Previous studies on this topic using region- or country-level data have reported large productivity effects of broadband on services, but that approach is difficult for this type of study to prove that broadband is making firms more productive. For example, such results might partly be explained by factors that both make firms more productive and more likely to use broadband, rather than a causal link from one to the other. Studies using data on firms have tended to find little evidence that there are broad-based gains from this source. The research tries to unpack the service sector to see whether there are identifiable groups of firms that register significant productivity gains after broadband becomes available to them.
- The authors found significant gains from broadband availability in two services sectors: Information & Communication services and Administrative & Support Service Activities. The effects measured for these two sectors are large, equivalent to about a third of the typical variation in productivity among the firms. While most other sectors show smaller positive associations between broadband and firms' productivity levels, none of these effects are statistically significant, and they also find no significant effect looking across all service sector firms taken together. These results are consistent with those of other recent research that suggests the benefits of broadband for productivity depend heavily upon sectoral and firm characteristics rather than representing a generalised effect.
- There is a growing weight of evidence that the local effect of broadband on productivity depends heavily upon the characteristics of firms in each area and the availability of complementary inputs such as highly educated labour and appropriate management. If this is so, the effects of public policies to encourage availability and adoption of broadband will vary considerably across local areas. In addition to any benefits for aggregate productivity, these policies are likely to have distributional effects, with some firms and communities gaining relative to others.

LIVING STANDARDS, WELLBEING AND PROSPERITY

Sustainable growth in the UK, published by the CEPR, examines institutional and policy priorities in four key mutually supportive areas in order to achieve sustainable growth in the UK.

- Innovation is fundamental for productivity and growth, and for getting the most out of the resources that currently exist. But innovation is generally underprovided by the private sector because of 'knowledge Spillovers', which discourage firms from investing in research and development (R&D): innovations by one will potentially 'spill over' and provide valuable information that leads to new inventions in others.
 - The UK government should bring together existing growth and green innovation strategies – in particular the innovation priorities in the Industrial Strategy and the Clean Growth Strategy – to ensure low-carbon and resource efficient innovation is embedded throughout the economy; and
 - Develop UK research priorities based on a range of metrics, including positive technology Spillovers, rather than comparative advantage alone. This approach suggests high productivity benefits from R&D support for areas such as efficient aviation.
- Infrastructure creates networks that spur creativity, innovation and productivity across key economic assets and systems, thereby linking cities and regions. It is an essential input for sustainable and inclusive growth. For example, evidence suggests that a 10% increase in the broadband penetration rate in OECD countries from 1996 to 2007 resulted in a 0.9-1.5% increase in annual per capita growth.
 - The UK government should bring together the Industrial Strategy and the Clean Growth Strategy to create one coherent strategy for sustainable infrastructure investment across the economy; and
 - Develop and publish a pipeline of clean and sustainable infrastructure investments. This would contribute to meeting the UK's 2050 decarbonisation targets, avoid locking into capital assets that could render the UK uncompetitive or require scrapping/retrofitting, and be consistent with the recommendations of the National Infrastructure Commission and other relevant statutory bodies.
- Workforce skills and 'human capital' more broadly are key drivers of labour productivity and crucial for improving economic opportunities and social mobility. As the low-carbon transition intertwines with emerging technologies such as artificial intelligence, the nature of work and skills needed could change radically and rapidly.
 - The UK government should bring together the Industrial Strategy and the Clean Growth Strategy to create a single forward-looking and coherent plan for strengthening the UK's human capital for the low-carbon transition. This would coordinate investments across all levels of government and institutions, including across all stages of education, with the aim of maximising adaptability to technological change, fostering entrepreneurship and increasing the ability of workers to re-skill or up-skill through lifelong learning. There should be a particular focus on improving outcomes and opportunities for disadvantaged students.
 - Devise targeted employment transition policies in areas at high risk of disruption from the forces of change, such as Northeast England and South Wales, to improve the resilience of local communities.
- Cities are central to the UK's economic and social success. Around 55% of UK residents, some 35 million people, live in cities and the four largest – London, Birmingham, Manchester and Glasgow – are home to almost a quarter of the total population. Cities are areas where physical and human capital combine to spur creativity and innovation, which is particularly important in the UK's service-driven 'knowledge economy'. As hubs of productivity and economic growth, the government has rightly positioned them at the centre of UK growth strategy.
 - The UK government should commit to investment in smart cities across all UK regions. This commitment could be supported by a national smart city strategy, which sits at the heart of government and is overseen by a high-level cross-ministerial committee. This should be coordinated and aligned with local industrial strategies, local city development and decarbonisation plans, and aligned with national emissions reduction commitments; and
 - Foster deeper partnerships between universities, business and local policymakers, to help build on local strengths or address local weaknesses.

- The authors conclude that although there are uncertainties with every option, a rigorous risk management strategy should acknowledge the likelihood that the future will be resource-efficient and low-carbon. The UK should capitalise on its strengths in the development of cutting-edge technologies and financial services, and grasp the opportunities from sustainable growth.

[Counting the Cost: UK living standards since the 2016 referendum](#), published by the Resolution Foundation, looks at the impact on household living standards across the UK.

- Household incomes are around £1,500 a year lower today than they were expected to be before the Brexit referendum – with the UK having experienced the sharpest income growth slowdown of any economy for which the OECD publish data.
- The analysis shows that the underperformance since 2016 is largely a UK-specific issue, with global growth over the whole period actually outperforming pre-referendum expectations. The UK has gone from being one of the fastest growing economies in the G7 pre-referendum, to one of the slowest.
- It also demonstrates that the UK's strong performance on employment since the referendum has been outweighed by higher inflation and weaker nominal pay growth. By the end of 2018, real household disposable income was £1,500 a year lower than the Office for Budget Responsibility's pre-referendum forecast – with over half of this income hit due to higher than forecast inflation.
- The publication finds that while income growth across most advanced economies has underperformed in recent years, the UK has experienced the biggest slowdown of all, from 4.9 per cent in 2015 to -0.1 per cent in 2017. Had household incomes grown in line with other advanced economies they would have been £2,000 higher in 2017.

[The Living standards outlook 2019](#), published by the Resolution Foundation, project household income growth for different societal groups.

- The authors 'nowcast' suggests that the Article 50 period (so far) – 2017-18 and 2018-19 – has not been a good one for household income growth. They estimate that the median real non-pensioner income did not grow over this period. The authors await official survey data, but incomes in the bottom half may have fallen due to high inflation and the benefit freeze, amid the broader economic context of stalling business investment and continued policy uncertainty.
- There has been better news for households recently. Inflation has fallen, nominal annual pay growth is at its highest since 2008 (though still relatively low), and the employment rate has continued to increase over the Article 50 period. There are also signs of a small recovery in home ownership rates, and a slowing of private rent increases.
- Even with these trends, and without assuming a negative 'no deal' Brexit, the outlook for household incomes is weak. Typical non-pensioner incomes are projected to remain stagnant over 2019-20 and 2020-21 as a whole, and rise by an average of 0.7 per cent a year in the following three years. Continued weakness can be ascribed to official projections of poor wage growth, significant welfare cuts, the effect of pension auto-enrolment on both employers and employees, an assumed end to significant employment rate increases, and a forecast rise in mortgage costs.
- The outlook for typical incomes is worse for some groups, such as families with children, single adults, social renters and mortgagors. With a new stagnation coming on top of the financial crisis and (for many) a pre-crisis slowdown, income growth over the entire 20 years from 2003-04 to 2023-24 is currently projected to be close to zero for some groups – including low to middle income working households.
- Child poverty is projected to rise by a further 6 percentage points by 2023-24, which (on existing data) would mark a record high, even surpassing the highs of the 1990s. The proportion of parents living in poverty is also forecast to hit a record high.
- In the projection, the majority of children who either have a single parent; are in larger families; are in a household where no-one is in work; or live in private or social rented housing, will be in poverty by 2023-24. But poverty rates for other groups are also projected to rise. The child poverty rate for working households averaged 20 per cent between 1996-97 and 2013-14, but is projected to increase to 29 per cent by 2023-24, while the poverty rate for children living with two parents may have already hit a record high (above 20%) in 2017-18 or 2018-19 and projected to increase to 29 per cent by 2023-24.

- The UK is not projected to meet its Sustainable Development Goal target on inequality over the forecast period, with income growth for the poorest 40 per cent expected to remain lower than overall growth rather than exceeding it.

Innovation and Enterprise

INNOVATION

[The impact of policy support on firms' innovation outcomes and business performance](#), published by the Enterprise Research Centre (ERC), examines mechanisms through which public policy support may lead to increased private-sector R&D and innovation.

- The importance of R&D and innovation in explaining economic growth and productivity is well documented in the research literature.
 - Financial support raises firms' liquidity and financial slack, thus reducing the financial riskiness of R&D and innovation projects ([Zona, 2012](#)). However, slack resources may also encourage laxity in risk taking ([Nohria and Gulati, 1996](#)), hence suggesting an inverted U-curve effect ([Gorg and Strobl, 2007](#)).
 - Cost-sharing resulting from public support reduces the investment required and de-risks this investment in terms of the technologies involved and commercial profitability ([Keizer and Halman, 2007](#)).
 - Public support can play a market-making role in addressing particular social or economic challenges ([Mazzucato, 2016](#)).
 - Policy can enable firms to access otherwise unavailable knowledge, one possible tool being innovation vouchers ([OECD, 2010](#)).
- While some heterogeneities in research results remain, recent evidence confirms that public R&D and innovation policy support can play a significant role in increasing firms' R&D investment and innovation. However, issues such as firms' R&D dynamics and composition ([Zuniga-Vicente et al, 2014](#)), the source of R&D public funding ([Czarnitzki and Lopes-Bento, 2014](#)) and other firm constraints have been largely neglected so far.
- There is substantial evidence that firm size matters in the effectiveness policy support. The additionality effect has been shown to be particularly prevalent for small firms, which are more likely to experience external financial constraints. For small firms there also is evidence of a positive inducement effect. Moreover, many small or micro-enterprises do not have the capacity for an R&D department, while still being very innovative. So to maximize the effectiveness of policy support, it is important to target those types of firms and industries, for which additionality is largest, and to support both innovation input and output.
- Somewhat more heterogeneity exists in the results of the smaller literature on the impact of policy support on firms' business performance. However, overall, findings confirm existence of a positive relationship between public R&D support, innovation and firms' growth. Again firms' size matters, as do productivity levels and sectors (e.g. [Vanino et al, 2018](#)).

[Innovate Europe Competing for Global Innovation Leadership](#), published by the World Economic Forum, highlights the challenges facing Europe on innovation and steps to mitigate these issues.

- The challenges that Europe must overcome are: Private investment in research and development (R&D) lagged that in the United States by about \$90 billion in 2015, while public R&D investment remained below the level of 2010;
 - R&D investment is unevenly distributed: 90% can be found among just eight EU Member States;
 - The situation looks even grimmer for key future technologies: in 2016, Europe attracted only 11% of venture capital (VC) and corporate investment in AI, while the United States and Asia captured 50% and 39%, respectively. As a result, Europe also lags in intangible capital, such as structural and implementation knowledge, strong innovation networks, intellectual property and brand reputation in technology and innovation; and
 - Europe's innovative companies face global competition for technical and entrepreneurial talent, with a projected 760,000 unfilled positions for information and communications technology (ICT) professionals to 2020.

- To overcome these challenges, Europe must leverage industrial assets by funding digital platforms and technologies for strategic European industries. Europe has world-leading innovative SMEs and large incumbents in key industries ripe for disruption as the application of new technologies increasingly focuses on integrating industries. To catalyse innovation, Europe could build on its existing assets and fund national industrial strategies to digitize and integrate at scale;
 - Change data dynamics by leading on governance for data access and trust. European companies have amassed fewer customers and less data than non-European global platforms. To catalyse innovation and level the playing field for European innovation, Europe could open its large vaults of government-owned non-personal and anonymized data for research, while creating new governance rules that give citizens more control over their data and more companies access to them;
 - Boost talent by competing with digital skills and diversity. Europe has strong education systems and a well-educated workforce, but it also has large untapped talent pools both abroad and at home. To catalyse innovation, Europe could attract international talent through its comparative advantages in diversity and quality of life and by improving remuneration options. To tap existing talent pools, Europe could encourage female talent in technology and entrepreneurship and leverage new technologies to up-skill and reskill its population; and
 - Create demand at scale by leveraging public-sector leadership in procurement and standardization. Europe's large public sector is often seen as slowing innovation, but it offers opportunities to intervene on the demand side of innovation, for example in healthcare, education or public works. To catalyse innovation, Europe could maximize public procurement as an innovation driver, establish common digital government standards for public services and thus enable more innovation in government technology ("GovTech").

Innovation, open innovation and intellectual property rights: firm size differences, published by the ERC, examines evidence of SMEs using trademarks to protect intellectual property.

- With growing interaction among firms in the innovation process, the need for efficient protection of intellectual property rights (IPR) also increases. The high costs and lengthy processes associated with patenting call for firms to use other methods of protecting their intellectual property (IP). The low costs and high revenues associated with the use of trademarks entice the adoption of this measure.
- For SMEs however, recent evidence questions the long-term benefits of trademarks, and suggests that industrial designs may be a more efficient form of IP protection. There is little evidence for or against using copyright, possibly due to difficulties in measuring this IPR. As product cycles are shortening, firms increasingly protect IP through speed-to-market and secrecy.
- IP describes unique creations of the human intellect which add value ([Kalanje, 2006, p. 1](#)). From a regulatory perspective, the purpose of IPR is to foster investments in innovation through enabling firms to capture value generated by their innovative activity ([West, 2006](#)). The appropriate type of IPR partly depends on the characteristics of the innovation.
- While patents protect the innovation as such, industrial designs define the appearance of the product. Trademarks protect a brand name or logotype, and copyright is valid for cultural, artistic, or literary work including software. Firms may also rely on trade secrets, e.g. to protect manufacturing processes or customer information ([Jaiya, 2004](#)). The cost and time frame for acquiring the IPR is also a relevant factor. The patenting process can be lengthy and cumbersome, while relying on copyrights requires no registration.
- IPR management now means analysing the available regimes of appropriability with reference to the innovation ecosystem in which the firm is embedded. While sharing knowledge is positive for innovation, firms want to protect themselves against unwanted knowledge leaks by using IPR. The IPR costs to be considered include those of the acquisition process, but also possible costs for defending such rights in juridical disputes.
- IPR management poses a particular challenge for small and medium-sized enterprises (SMEs) due to a lack of financial resources and enforcement abilities ([Jensen & Webster, 2006](#)). SMEs are defined as companies with less than 250 employees, and either less than 50 million Euros annual turnover, or total assets worth maximum 43 million Euros ([European Union, 2015](#)). As SMEs make up more than 99% of all businesses in the European Union, the safeguarding of their IP is a key question for policy makers in Europe.
- Recent evidence suggests that firms of different sizes should follow IPR strategies that are adapted to their available resources. SMEs need to consider whether they have the means to

patent efficiently, or if they should opt for alternative IPRs. Industrial designs are more recommendable, if the characteristics of the innovation permit protection by this IPR. Trademarks and copyrights may be tempting to SMEs due to the low costs, but the potential costs for enforcing such IPRs should also be considered when devising an IPR strategy. Larger, financially strong firms are not only able to assume such legal costs, but the threat of legal battles may deter infractions.

- For policy makers, the increasing importance of SMEs for innovation combined with their struggle to use IPRs, means that streamlining patenting and trademark processes would foment innovation in general, and open innovation in particular. Possible policy initiatives could include directed support for SMEs and differentiated fees depending on firm size.
- Evidence gaps regarding IPR and innovation are particularly salient regarding the use of copyright, and under which circumstances firms can rely on this form of protection. Further research is also needed regarding when and how SMEs use trade secrets ([Almeling, 2012](#)) and speed to market ([Leiponen & Byma, 2009](#)), in order to avoid imitations by others.

[When innovation policy trumped protectionism: the Reagan years](#), published by the Centre of Economic Policy Studies, shows that it was Ronald Reagan's administration's innovation policy – not a retreat from globalisation – that promoted log-run growth of the US economy.

- The research finds that abandoning protectionism for innovation policy was Reagan's winning response to international competition. They focus on the Research and Experimentation Tax Credit, an incentive for innovation that was introduced in 1981, subsequently renewed several times and made permanent in 2015. The author's build a new model of the global economy to assess the effects of R&D subsidies and compare them with the effects of raising trade barriers as a response to growing foreign competition.
- It also highlights the erosion of US technological leadership, measured by the share of patents obtained by US companies in the US Patent Office (USPTO). In the mid-1970s, around 70% of patents in the United States were owned by US firms; a decade later, this share had dropped to a little over 50%. This change is a result of the acceleration of innovative activity by Japanese and European companies.
- They also observe a similar technological convergence in the global distribution of R&D investments and in market shares in medium to high-tech industries. But this trend seems to reverse in the mid-1980s, shortly after the introduction of the R&D tax credit and the other US innovation policies. The share of US patents starts increasing again and there is a simultaneous acceleration of the average R&D share of total sales in US firms.
- In this global scenario, they find that the R&D subsidy introduced in 1981 promoted income growth in the United States in the short run and even more so in the long run. By reducing the cost of innovation, R&D subsidies stimulate firms' investment in innovation, allowing them to regain their technological leadership and bring back profits, wages and jobs to the United States. The 19% reduction in the cost of innovation brought about by the tax credit generates a 1% annual increase in US per capita consumption for the period 1981-2016.
- What would have happened if instead of increasing innovation subsidies, Reagan had followed the protectionist approach of his early period in office? The author's study an alternative scenario in which the United States put a 50% tariff rise on all imports. According to the analysis, this policy would have generated benefits in the short term (10-15 years) because it would have protected US companies in import-competing sectors from foreign competition by helping them maintain their shares of the domestic market. But shielded from foreign competition, US companies would have reduced their investment in innovation, resulting in a slower path of productivity growth and leading to income losses for the US economy in the long run.
- Furthermore, in this scenario, short term benefits are obtained only under zero trade barriers and moderate R&D subsidies constitute the best policy option in both the short and long run assumption that commercial partners do not respond to duties. In the plausible retaliation scenario in which the trade partners introduce equally protective measures, the short-term benefits also disappear, as foreign tariffs damage US exporters, reducing their quotas in export markets and decreasing their incentives to innovate.

RESEARCH AND DEVELOPMENT

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

SECTORS AND TECHNOLOGIES

[The Future of Work: The impact of automation technologies for job quality in Northern Ireland](#), published by the Nevin Economic Research Institute, evaluate previous employment adjustments to understand how automation technologies may affect the quality of jobs in the future.

- The authors find that the trend of occupational polarisation is likely to continue as routine-biased technological change spreads throughout the economy. They also find that some of the industries and occupations with the lowest risk of automation are more susceptible to lower levels of job quality in Northern Ireland. The commodification of labour in some of these poor-quality jobs prevents an upward revaluation of this work and thus, making it is unlikely that job quality will improve without some direct policy intervention.
- While it is understandable that much of the focus at present is on potential job losses due to automation, there is no evidence that policy would be effective in attempting to either prevent or delay these losses. Automation also has the capacity to dramatically improve the working environment and conditions of many workers. These developments are welcome in many instances. This does not detract from the fact that for a sizeable number of workers, automation may result in job loss or negative job change.
- While technological unemployment is unlikely on any significant scale, the authors must accept that a large number of workers will change employment either by sector, occupation or both. The scale of this movement requires a policy platform to directly intervene and ameliorate the transition between different forms of employment. Firstly, a reformed labour market policy is required in order to smooth transitions to new employment and to make allowances for the small number of workers who will not transition. This encompasses skills, social security, regional development, unionisation and collective bargaining capacity. Secondly, the authors suggest that policymakers need to introduce a new occupational infrastructure in what are currently considered low-skilled/low paid sectors of the economy in order to rebuild good quality jobs and provide opportunities for career progression.
- Policy intervention needs to begin with the social security system. At present, in Northern Ireland, both in-work and out-of-work benefits have faced several years of real terms cuts in addition to the curtailment of many entitlements ([Edmiston, 2017](#)). Such an environment is not conducive to large transfers of workers between different forms of employment. Furthermore, if workers are not to suffer significant material loss from automation technologies, then policymakers must address the issue of welfare-wage replacement rates.

[The digitalisation of small and medium enterprises in Ireland](#), published by Department of Jobs, Enterprise and Innovation (DJEI), identifies the barriers to digitalisation of Irish small and medium-sized enterprises (SMEs).

- Traditional sectors are digitalising unevenly, with large disparities, and many businesses are struggling to evolve quickly enough. Studies show that there is room for growth in digital capabilities: utilities, mining and manufacturing, for example, are in the early stages of digitalising and connecting their physical assets, and they could be at the forefront of the next wave of digitalisation. Labour-intensive industries such as retail and health care are expanding digital usage, but substantial parts of their large workforces do not use technology extensively. Industries that are both highly labour-intensive and localised, such as construction, leisure, retail and hospitality, also tend to rank lower in usage.
- Digital transformation requires an enterprise-wide change driven by digital technologies and the integration of transformation processes into every aspect of the company. This transformation should be supported at company level by changes in culture, leadership, skills and processes, as well as at national level by actions encompassing multiple dimensions, from the development of digital competences in the workforce to ensuring a sound environment for the creation and implementation of innovative solutions.
- A thorough analysis of the digitalisation of the Irish economy has revealed a two-speed digital economy. While Ireland is already in a strong position, being among the most digitalised countries in the world (6th in the EU digital index DESI) for many years, the digital economy appears to run at two different speeds, with a small number of foreign-owned multinationals with high digitalisation levels and productivity, and traditional indigenous SMEs, which are slower in leveraging digital solutions to reduce costs, drive innovation and expand market presence.

- Unbalanced digitalisation across firms: 40% of companies (mainly indigenous SMEs) in Ireland completely lack digital technologies, with an additional 30% of businesses having few (from 4 to 6) digital assets. Prevalence of e-commerce vs. e-business: SMEs in Ireland outperform in all the e-commerce dimensions considered in the indicator, with 29.5% of Irish SMEs selling online (more than half of them are selling cross-border), but lag behind leading countries in terms of e-business technology adoption (e.g. supply chain management, enterprise resource planning, customer relationship management, radio frequency identification, etc.)
- The primary barriers to the further implementation of digital solutions across SMEs are a lack of knowledge about digital opportunities, technical know-how and financing issues.
 - Financing gap: issues experienced by SMEs in accessing financing from the traditional banking channels, especially for large-scale digital transformation programmes, derive from a combination of the high cost of funding (the second highest in the EU), low profitability, already high indebtedness and a lack of expertise in the banking sector.
 - Banks often lack the expertise to assess projects with a strong digital and artificial intelligence component, and concentrate therefore on more tangible ones (e.g. constructing a new building or buying traditional equipment) where there is clear collateral available.
 - Knowledge gap: the primary barrier for implementing IT-related process improvements is a lack of awareness of the solutions available and of their potential benefits. With the rapid pace of change in digital technologies, many companies have difficulties deciding when to invest, up to what level and in which innovative field. Often, companies are working with a budgeting logic instead of an investment logic. Digitalisation is considered as a cost factor and not seen as an opportunity. Not enough companies know how to translate the use of technologies into economic impact, and how to build a new incremental business.
- The study recommends that the Irish Government should adopt measures ensuring that: the benefits of digitalising traditional sectors of the economy are well understood by different stakeholders (local business community, high-tech companies, banking sector, investors); traditional SMEs that are willing to seize digital opportunities have access to adequate funding (including grants and loans) and education; tech companies help create an impact locally, by providing digital solutions to SMEs.

Industries in 2019, published by The Economist Intelligence Unit, highlights the major risks that could affect different industries. ***This article requires a subscription to access. Note this was published before the recent Article 50 extension was agreed between the UK and EU.***

- This report highlights five major risks that could affect industry forecasts for the year ahead:
 - The US-China trade war: the EIU have cut 2019 growth forecasts for the automotive and consumer-goods sectors in particular compared with six months ago.
 - A global slowdown: even those countries not directly affected by growing trade barriers could be vulnerable to a change in business confidence in 2019, with the most likely impact being on emerging markets.
 - Brexit: the UK's exit from the EU in March 2019 will be a drag on sectors including financial services, automotive and healthcare, regardless of any deal that is struck.
 - Sanctions on Iran: the US's decision to backtrack from the international Joint Comprehensive Plan of Action could push up global oil prices in 2019.
 - Cybersecurity and technology risks: a tussle for technological dominance is at the core of the US-China trade dispute, while regulators are also struggling to ensure safe connectivity.
- Even so, these remain just risks for now. Unless circumstances worsen, the EIU still expect all six of the industries covered to report growth in 2019, and in most cases it will be strong growth.
 - New-car sales in the 60 markets covered by the report will rise by 2.7%, with commercial-vehicle sales rising at the same rate.
 - World retail sales will increase by 2.8%, led by 6.1% growth in China.
 - Global energy consumption will rise by 1.8%, with particularly strong growth for renewables, while oil prices will firm.
 - Total deposits with the global financial industry will increase by 5.8%, while lending will rise by 6%.

- Healthcare spending will climb by 5.1% worldwide, including 5.7% higher spending on pharmaceuticals.

The McKinsey Global Institute published [Notes from the AI Frontier: Tackling Europe's gap in digital and AI](#), a discussion paper.

- Europe's digital gap with the world's leaders is now being compounded by an emerging gap in its development and adoption of AI technologies; without faster and more comprehensive engagement, that gap could widen.
 - Rather than competing head to head, it should compete in areas where it has an edge (e.g. business-to-business and advanced robotics) and continue to scale up its base of technology developers into a more connected Europe-wide web of AI-based innovation hubs.
- Digitisation is an important technical and organisational precondition for the spread of AI, yet Europe's digital gap – at about 35% with the US – has not narrowed in recent years.
 - Only two European companies are in the worldwide digital top 30, and Europe is home to only 10% of the world's digital unicorns.
- Europe has about 25% of AI start-ups, but early-stage investment lags behind the US and China.
- With the exception of smart robotics, Europe is not ahead in AI diffusion, and less than 50% of European firms have adopted one AI technology.
 - If Europe developed and diffused AI according to its current assets and digital position relative to the world, it could increase output by 19% by 2030.
- With the exception of the UK and some Scandinavian countries, Europe lags behind the US in readiness for AI.
 - Closing the readiness gap could add an extra €900b to Europe's GDP growth by 2030.
- Embracing AI is likely to cause labour dislocation and could create new risks around potential misuse.
 - Frictional unemployment and income wage inequality could increase as the skill shifts associated with AI adoption take time to implement.
 - However, if the transition is dealt with effectively, AI could create sufficient new occupations and jobs to compensate for digital automation.
- Europe needs to focus on five priorities:
 - Continued development of a Europe-wide, vibrant ecosystem of deep tech and AI start-ups
 - Acceleration of digital transformation and AI innovation among incumbent firms
 - Progress on the digital single market
 - Fundamental development of research, education and practical skills
 - Bold thinking about how to guide societies through the potential disruption.

ENTREPRENEURSHIP

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

BUSINESS GROWTH

[Fast-growth firms and their wider economic impact: the UK evidence](#), published by the ERC, investigates the links between fast-growth firms and the rest of the economy using comprehensive UK firm-level data.

- The authors find that in the manufacturing sectors, a higher incidence rate of fast employment growth firms has an overall negative effect on the employment growth of other firms in the same industry-region (a competition-led crowding-out effect). A higher incidence rate of fast labour productivity growth firms instead has overall positive externalities on other firms' labour productivity. This suggests that the policy goals of promoting jobs and promoting productivity are not always complementary, and may in fact conflict.
- Analysis of professional service sectors yields different patterns, highlighting the distinct features of the sectors and the specific challenges faced by the firms. The authors find positive, market-creating impact of high-employment growth firms on employment growth within the same region

and industry, and market replacing effects from suppliers in the value chains, while negative spillovers of high productivity-growth firms on other firms in the same region and sector, and positive spillovers along the value chains. These different patterns highlight the distinct features of these sectors and the specific challenges faced by the firms in the context of rising competitive pressure, digital economy and disruptions of business models.

- There are several policy implications. First, achieving job creation and promoting productivity at the same time may prove challenging. National and subnational policymakers need to be mindful of this tension, and may require prioritising one over the other given specific circumstances in an industry-regional economic and social context.
- Second, the externalities of fast growth firms in the manufacturing sectors seem to show that in the short run, more fast-productivity-growth firms are beneficial to other firms, potentially due to competition effects and knowledge spillovers, while more fast employment-growth firms may put a strain on other firms' abilities to attract skills and labour. This suggests that targeted growth policies can be compounded in their impacts by maximising positive spillovers through a focus on industrial clusters (to exploit the benefits of geographical agglomeration) and vertical integration, whilst at the same time taking into account regional limitations which could lead to negative spillovers arising due to competition-led crowding-out.

[Paths to scale: Finance lessons from European entrepreneurs](#), published by NESTA, provides an understanding of the role of different sources of finance in business growth.

- The stories of European entrepreneurs in the report illustrate various "paths to scale", along with the opportunities and challenges that entrepreneurs face when trying to finance their growing business. The diversity of their experiences demonstrates that there is not one path to growth, but many.
- The type(s) of capital raised is the product of an entrepreneur's assessment of the added-value of one source of capital over the other (e.g., business validation, mentoring, access to networks and markets, etc.), and perceived suitability for their business (e.g., terms of the investment, cost of capital, growth prospects, etc.).
- Combining different types of finance is common practice. Various intermediary tools and steps exist to ease the process and keep the business afloat in between and during funding rounds.
- There is an array of resources and support available for entrepreneurs. From grants to investors' networks, the authors listed both European- and country-level resources that offer support to entrepreneurs throughout their growth journeys.
- Other stories illustrate how particular routes were sought because of their non-monetary benefits, like connections, mentoring, know-how or hands-on support. FacePhi decided to go public because of the credibility and accountability that it would give them would help them to close contracts. AppyParking specifically targeted corporate giants after realising the power of the extra resource and manpower – their persistence even leading to an equity-free corporate investment. In BlaBlaCar's story, VC backers were instrumental in finding complementary businesses to acquire.
- Several of the scaling stories illustrate how funding choices were constrained by circumstances: Fishbrain, for example, knew that because of its "build first, monetise later" model, VC would be the only funding option. Ada Health worked with individual "patient" investors in the early stages, who knew it would take time to develop the concept.

[Drivers of firm relocation](#), published by the Department for Business, Energy & Industrial Strategy, explores the drivers of firm relocation in the modern UK economy.

- Firm relocation can broadly be defined as the adjustment of a firm's spatial distribution (Brouwer et al., 2004). It includes complete relocations, e.g. where a single-site firm moves from one location to another; and partial relocations, e.g. where a multi-site firm moves an individual production unit or establishes a new branch.
- The propensity of firms to relocate is relatively low. Most relocations are 'local', and are undertaken by smaller firms in sectors that require fewer fixed assets. Within the population of interest, the analysis of the IDBR suggests that over the period 2007-2017, 0.47% of 'local units' (1,087 out of 233,561) relocated between Travel to Work Areas (TTWAs) each year. This finding is broadly consistent with academic research from other countries (e.g. Brouwer et al., 2004). When relocations do take place, they are more likely to take place between locations that are closer to each other.

- Firms most often relocate for 'internal' reasons (such as expansion), but local 'push factors' also play a role. Academic literature has concluded that the primary reason firms relocate is to allow for expansion, whereas cost savings and government policy are secondary drivers (Brouwer et al., 2004; Pellenbarg et al., 2002; Hayter, 1997; Chan et al., 1995). Consistent with this, the main reason that 47% of the firms interviewed relocated was due to expansion – including both 'achieved' and 'expected' increases in commercial activity. However, firms interviewed often gave multiple reasons for why they chose to move from their current location. Other 'internal' factors, such as proximity to customers, accessibility for staff, the condition of the current property and lease conditions were sometimes given as contributing factors. Furthermore, it was common for very local and site-specific reasons, such as the availability of parking, to be highlighted as 'push' factors.
- When firms do relocate, they have to exercise a degree of commercial judgement in choosing where to move to. Larger organisations were more likely to undertake a systematic decision-making process, and make more 'objective' choices. Smaller firms were more likely to relocate based on individuals' personal preferences, such as where an owner lives. This is consistent with academic research, including recent UK-specific evidence (Greenhalgh, 2008).
- Overall, evidence from the interviews with various firms suggests that firms place greatest importance on access to transport. However, the importance of factors varies depending on the characteristics of the firm. The interviews suggest that access to transport is the most important factor in the choice of location. It was important for most firms in terms of staff getting to and from work; important for many firms for customer access; and important for some manufacturing companies to transport their products. The importance of national versus local transport infrastructure depended on the geographic market served.

GROWTH FINANCE

[Finance for Sustainable Growth](#), published by Centre of Economic Policy Studies, recommends which priorities should define the strategic agenda for financial institutions within the EU.

- In general, policies to develop the EU financial system further should focus more on access and efficiency than on deepening (increasing its size). Increasing the size of developed financial systems adds little to economic growth, but can make the system more fragile as was demonstrated by the 2007-09 global financial and 2010-12 Eurozone economic crises. Looking at the size of the financial systems in the EU, the member states in the west and north have significantly larger financial systems than those in the east and some in the south. The latter would therefore be better served by a deepening of their financial system than the former, which are better served by measures focusing on efficiency and access. Ongoing digital transformation and climate change actions might work as a catalyst in this respect, while Brexit constitutes a serious obstacle to financial development.
- The development of deep and liquid capital markets should provide SMEs in particular and other businesses an alternative to the currently dominant bank financing as well as facilitate private risk-sharing ([Valiante, 2016](#)). The need for the development of EU capital markets increased during the Juncker Commission with the announcement of the UK's departure, as it currently hosts the largest EU capital market. The UK has a particularly important role in the derivatives market, which led the Commission to launch a proposal covering derivatives clearing in third countries.
- Europe aims to be at the forefront of international efforts to deliver on the UN 2030 Agenda and Sustainable Development Goals and the Paris Climate Agreement. In the context of the Capital Markets Union, the Commission has committed to unlocking the full potential of public and private investment to support the transition towards a low-carbon, circular and resource-efficient economy. The three packages launched so far include: i) a taxonomy for environmental sustainability of investment instruments; ii) rules on disclosure of sustainability risks; and, iii) minimum standards for low-carbon benchmarks.
 - But more will need to be done to mainstream sustainable investments. It is often argued that current market prices do not accurately reflect environmental and social externalities because of the failure to put in place adequate market mechanisms, regulations, taxation or other policies. The integration of Environmental, Social and Governance (ESG) factors would improve the inclusion of these externalities. For this, a workable, flexible and dynamic taxonomy should be developed for integration in investment and advisory processes.

- The use of financial legislation to provide incentives or disincentives for investments deemed sustainable or not should be exercised with caution. For example, lowering the risk weights for the calibration of bank capital requirements or the capital charges for insurance companies' solvency position based on a newly developed EU taxonomy on sustainable activities must have a sound prudential basis. This is essential in order to avoid misallocation of resources.
 - Large companies tend to report more comprehensive ESG metrics and therefore dominate the portfolio of sustainable investment portfolios. However, when it comes to access to sustainable assets/products, a priority should be to ensure that other important economic factors such as SMEs and innovative growth companies are also well represented in the portfolios. Moreover, the investment products should be available to both high net worth individuals, institutional investors and retail investors ([Amariei, 2018](#)).
- Fundamental change is ongoing on the tech side, which provides both opportunities and threats to the financial system. The precise implications of technical developments are difficult to predict, but they are affecting all aspects of the market, from retail to wholesale, the entire value chain, products and processes. In essence, digitalisation will give financial service providers the opportunity to reduce costs and improve intermediation, thereby promoting more accessible and efficient financial markets ([CEPS, UCC and LIST, 2016](#)).
 - In turn, technical developments are also creating some challenges. Financial services are heavily regulated, which limits the possibility for newcomers to enter the market. This raises the fundamental question whether the level playing field should be based on the activities or the level of risks involved. A more proportional approach ('same risks-same rules' level playing field) could spur innovation and new entrants. However, to avoid malpractice and potential destabilisation the new or changing providers, products and services should be closely monitored.
 - Moreover, digital transformation brings specific challenges. Providers can, for example, be based in faraway jurisdictions, subject to different rules, but without the user realising and the supervisor controlling. The dependence on IT also raises fundamental issues for the cybersecurity of networks ([Lannoo, 2018](#)).

BUSINESS REGULATION

Effects of regulation on service quality, published by the European Commission, by analysing the relationship between professional regulation and service quality.

- The authors used a range of case studies to highlight different findings across industries and countries.
- In the market for lawyers, they find little change in the overall quality of legal services following the Polish relaxation of entry requirements, yet the number of complaints per active advocate did decrease and a decline in good manners before a court as a quality component was reported. Prices of legal services providers increase more slowly than the average for all services and Legal counsellors registering their firms increased from less than 100 yearly before the reform to 575 after.
- Overall quality of services provided by architects and engineers decreased with higher market concentration in response to higher insurance costs and higher service prices. Probability of being self-employed decreased by 4% points and the number of employees increased by 6%.
- In the pharmacy market, the availability of pharmacies seems to be correlated with a decrease in the number of hospital admissions related to influenza, suggesting a possible link between the availability of the services offered by pharmacists and consumer health.
- Tourist guides' level of education increase post reform but the guides that entered the market via the new regime are more likely to receive lower consumer ratings.
- An increase in the stringency of regulations pushed many driving instructors out of the market with no evidence of improved quality of instructors or of learner drivers. There was a deterioration in driving test overall pass rates, pass rates at first attempt and zero faults pass rates as well as increase in serious accidents and higher priced 1-hour lessons.
- Finally, more stringent licensing regulations for ride hailing drivers have no effect on customer satisfaction ratings or measures of hard braking and accelerations. There was no evidence of statistically significant differences in hard braking between London and Dublin and no evidence of smoother journeys in Dublin (as measured by hard accelerations).

- Taken together, these case studies indicate that an increase in availability of service providers and/or competition does not necessarily have negative effects on the quality of the services provided or survey measures of consumer satisfaction and well-being. To the contrary, in a number of cases the authors find positive effects of increased availability and competition.

Succeeding Globally

TRADE

[US, China, Brexit... It's all about international trade. But we have to oil the wheels at home too – domestic and export markets should not be seen as separate](#), published by the Centre for Economics and Business Research, examines how countries should treat domestic and export markets as a combination.

- The substance of current trade debate centres on concerns regarding the process through which international trade is managed rather than the principle of free trade itself. This is borne out in:
 - Individual countries making their exports more competitive through currency policy, subsidies or other market interventions, leading to debates regarding the governance of global trade to deal with these distortions.
 - The Brexit debate, dominated by the process question of how the UK's international trade and economic relationships should be managed.
- The economic gains from liberal global trade are less controversial. [Recent Cebr work](#) commissioned by the IEA has sought to illustrate these gains through an Agent Based Model. This approach makes assumptions about process outcomes – but they are agnostic on the politics about how these outcomes are achieved. The goal is to provide another way of illustrating the benefits of trade, utilising gains through scale.
- The work is an illustrative first look covering domestic and international trade, hence the results are very generic and need to be interpreted with care. The model aims to illustrate how the output of countries, and in turn global output, is affected by the presence of distortions and frictions. The main results can be summarised as follows:
 - A between-country trade distortion of 25% acts to lower global output by around 4% relative to the benchmark case with no distortions. With a 100% distortion, global output is around 11% lower than in the benchmark case.
 - A within-country trade distortion of 25% implies that one quarter of beneficial transactions between consumers and firms within a country are prohibited through distortions, and this acts to reduce global output by approximately 14% relative to the benchmark case with no distortions. Meanwhile, a 50% distortion causes a 25% global output drop.
 - If between- and within-country trade distortions are 25%, global output is approximately 17-18% lower than the benchmark case. Within a relatively simple model the effects are additive rather than interactive.
- Domestic distortions are shown to be of greater magnitude than international trade distortions. This is intuitive, as economies trade more internally than they do externally. However, both impacts have significant relative effects. This suggests a necessary commitment to multilateral liberalisation in between countries and within countries such that overall barriers are simultaneously lowered.

[Outperformers: High-growth emerging economies and the companies that propel them](#), published by McKinsey & Company, identifies two key factors that help explain outperforming emerging economies.

- In the paper, McKinsey Global Institute looks at the long-term track record of 71 developing economies and find two key factors that help explain their outperformance: a pro-growth policy agenda of productivity, income, and demand that has driven exceptional economic growth, and the underappreciated but nonetheless standout role that large companies have played in driving that growth.
- While the 18 outperformers vary considerably ranging from Cambodia to Ethiopia—spanning different income levels, sizes, factor endowments, and regions—with the exception of Latin America, the analysis suggests they share foundations of similar pro-growth cycles of rising productivity, income, and demand. Part and parcel of these foundations are competition policies

that created an impetus for productivity growth and helped forge the big companies that have driven a significant part of GDP growth.

- More than two-thirds of the GDP growth in outperforming countries over the past 30 years is attributable to a rapid rise in productivity correlated with industrialization: an annual average productivity gain of 4.1 percent versus 0.8 percent for the other developing economies. That rapid development initially drives the pro-growth cycle by creating wealth and boosting demand, which translates into more jobs.
- While growth-and-development economists over the decades have extensively documented policies that have driven growth in emerging economies, the contribution to the growth of globally competitive, nimbly managed, and highly productive companies has been less studied. In the 18 outperforming countries, the authors find that these companies not only helped boost GDP but that they also are catalysts for change at home.
- Large companies tend to focus on sectors that tap into global demand, which has helped drive a greater share of exports for the outperforming economies. They bring productivity benefits by investing in assets, R&D, and job training at a higher rate than small and midsize enterprises (SMEs)—and they tend to pay higher wages, upward of 75 percent more in countries such as Indonesia and South Korea. Along with these direct effects, large companies indirectly stimulate the creation, growth, and productivity of SMEs in their supply chains—and in turn depend on these SMEs to provide intermediate input for their ecosystem.

'Superstars': The dynamics of firms, sectors, and cities leading the global economy, published by McKinsey & Company, uncovers the dynamics of superstar firms, sectors, and cities in the global economy.

- Over the past 20 years, the gap between superstar firms and median firms—and also between the bottom 10 percent of firms and median firms—has widened. Today's superstar firms have 1.6 times more economic profit on average than superstar firms 20 years ago. Today's bottom-decile firms have 1.5 times more economic loss on average than their counterparts 20 years ago, with one-fifth of them (a growing share) unable to generate enough pre-tax earnings to sustain interest payments on their debt. The growth of economic profit at the top end of the distribution is thus mirrored at the bottom end by growing and increasingly persistent economic losses, suggesting that in addition to firm-specific dynamics, a broader macroeconomic dynamic might be at work.
 - Superstar firms are diverse and getting more so over time. They come from all regions and sectors and include global banks and manufacturing companies, long-standing Western consumer brands, and fast-growing US and Chinese tech firms.
- For sectors, the authors analyse 24 sectors of the global economy that encompass all private-sector business establishments. They find that 70 percent of gains in gross value added and gross operating surplus have accrued to establishments in just a handful of sectors over the past 20 years. This is a contrast to results in previous decades, in which gains were spread over a wider range of sectors.
 - While the superstar effect is not as strong for sectors as it is for firms, the superstar sectors over the past 20 years we have identified include financial services, professional services, real estate, and two smaller (in gross value added and gross operating surplus terms) but rapidly gaining sectors: the pharmaceuticals and medical-products sector and the internet, media, and software sector.
- For cities, the authors analyse 3,000 of the world's largest cities, each with a population of at least 150,000 and GDP (adjusted for purchasing power parity) of at least \$125 million, that together account for 67 percent of world GDP. By the author's definition, 50 cities, including Boston, Frankfurt, London, Manila, Mexico City, Mumbai, New York, Sydney, Sao Paulo, Tianjin, and Wuhan, are superstars. The 50 cities account for 8 percent of global population, 21 percent of world GDP, 37 percent of urban high-income households, and 45 percent of headquarters of firms with more than \$1 billion in annual revenue. The average GDP per capita in these cities is 45 percent higher than that of peers in the same region and income group, and the gap has grown over the past decade.
 - Emerging-market superstar cities have increased their contribution to global GDP by 30 to 40 percent in the past decade, while advanced-economy superstar cities have increased their share of global GDP by 20 to 30 percent. Over the past decade, the paper finds a 25 percent churn rate among superstar cities as some advanced-economy cities, such as Rome, San Diego, and Vienna, have been displaced by emerging-market cities, such as Jakarta, Kuala Lumpur, and New Delhi, with stronger income and population growth

relative to peers in the same region and income group. The growth of superstar cities is fuelled by gains in labour income and wealth from real-estate and investor income, yet many show higher rates of income inequality within the cities than peers do.

- The growth of superstar firms, sectors, and cities also creates policy questions beyond the causes of superstars and their effects on competition and market structure. These considerations include implications for inclusive economic growth that can support and sustain broad-based employment and wage growth.

[Globalization in transition: The future of trade and value chains](#), published by McKinsey & Company, details how global value chains are being reshaped by rising demand, new industry capabilities and a wave of new technologies.

- Although output and trade continue to increase in absolute terms, trade intensity (that is, the share of output that is traded) is declining within almost every goods-producing value chain. Flows of services and data now play a much bigger role in tying the global economy together. Not only is trade in services growing faster than trade in goods, but services are creating value far beyond what national accounts measure.
- Using alternative measures, the paper finds that services already constitute more value in global trade than goods. In addition, all global value chains are becoming more knowledge-intensive. Low-skill labour is becoming less important as factor of production. Contrary to popular perception, only about 18 percent of global goods trade is now driven by labour-cost arbitrage.
- Three factors explain these changes: growing demand in China and the rest of the developing world, which enables these countries to consume more of what they produce; the growth of more comprehensive domestic supply chains in those countries, which has reduced their reliance on imports of intermediate goods; and the impact of new technologies.
- Globalisation is in the midst of a transformation. Yet the public debate about trade is often about recapturing the past rather than looking toward the future. The mix of countries, companies, and workers that stand to gain in the next era is changing. Understanding how the landscape is shifting will help policy makers and business leaders prepare for globalization's next chapter and the opportunities and challenges it will present.

INWARD INVESTMENT

[Thoughts on the demise of FDI](#), published by the Economics Ejournal, addresses the recent deceleration in the pace of global FDI.

- Outbound FDI flows from the OECD and the world overall, while still positive, have flat lined relative to the upward trend prior to the economic crisis of 2008. Just as there are multiple causes of the initial rise in international investment, this change also likely has numerous drivers.
 - First, there is the likely possibility that profitable investment opportunities are starting to dry up. When the transition economies initially opened up, they presented both consumer markets desirous of products from the West and a ready supply of acquisition targets, particularly in the form of formerly state-owned enterprises. Thirty years on, it is looking increasingly as if some of the excess consumer demand is being sated. For example, in early 2019, Apple announced that iPhone sales were much lower than anticipated, down nearly 10% from projections a few months earlier ([Vanian, 2019](#)). This was especially true in the transition economies where indications are that consumers are no longer willing to replace their phones as quickly as they previously had been.
 - Likewise, most state-owned enterprises that can be privatised have been. While low wages in East Asia made expansion of global value chains highly profitable, rising wages have reduced the gains to be had. Thus, the low-hanging fruit to be found in the 1990s and early 2000s is much harder to come by.
 - Second, the global shift towards populism has reversed the trend towards increasing trade liberalization. Most obvious are the headline-grabbing introductions of steel and aluminium tariffs of the US administration and the still-wildly uncertain outcome of the UK's decision to leave the European Union. Indeed, these changes have been shown to have negative impacts on multinationals because of the friction increased trade barriers introduce to the operation of global value chains (see, for example, [Davies and Studnicka, 2018](#), who examine the impact of Brexit). Less dramatic changes are also afoot. In several countries, governments are becoming more aggressive in their ability to halt corporate takeovers.

- Finally, even among pro-globalists, public opinion is becoming more critical of multinationals. While there is still the push and pull of labour and environmental policy, taxation issues have risen to the forefront. While it has long been recognized that multinationals can and do manipulate internal transactions to minimize their tax burden, the extent of the loss in revenues is only now becoming apparent, with some authors suggesting that as much as 40% of multinational profits avoid taxes by the use of tax havens ([Tørsløv, Wier, and Zucman, 2018](#)).
- The author argues that while it may be the case that the astounding growth of foreign direct investment may be largely over, this does not mean they will lose their relative importance. Chief among these reasons is the role that multinationals play on the global innovation stage. The EU's R&D Scoreboard (2017), which surveys the R&D activity of 2500 leading innovators, finds that these firms make up roughly 90% of global business-funded R&D.

TOURISM

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

Economic Infrastructure

ENERGY

[How the UK can make the most of low cost, low carbon energy from Europe](#), published by the Green Alliance, outlines how better interconnection between UK and European energy markets would benefit the UK in 4 ways.

- Lower energy bills for consumers: Despite fluctuations across countries, the UK consistently has the highest electricity price in Europe. In Q1 2018, high UK electricity prices were largely due to higher gas prices for electricity generation.
 - Doubling interconnection by 2021, and importing cheaper power from the EU, could save UK consumers £1bn a year in lower wholesale prices. Sharing back up reserve capacity could reduce Europe-wide costs of balancing services by 35 to 40 per cent.
 - The estimated savings on an average household electricity bill from doubling interconnection would be: £1.59 in sharing network costs, £4.09 trading balancing services, £3.83 in balancing costs and £13.64 in a reduction of wholesale prices.
- Increased energy security: Interconnectors have been available when needed in the past, underpinned by EU internal energy market rules. A Brexit outcome in which the UK was unable to participate in the EU's internal energy market could mean that interconnectors would be less able to provide the UK with electricity at times of high demand. However, there is no reason why the UK and EU could not maintain trade by agreeing to abide by the rules that enable interconnectors to provide energy security.
 - Managing demand response via a better integrated European electricity network could decrease the need for UK grid capacity by 10 per cent and back up capacity by 35 per cent. This is possible because times of peak demand vary across the continent.
- Enabling more and cheaper renewables: Building renewables in optimal locations and trading power with efficient markets could save up to €300bn across Europe in the period to 2030. Shared transmission networks would reduce the need for 73GW of wind and 16GW of solar capacity across the EU because existing power would be used more efficiently. Both factors make renewables cheaper.
 - However, interconnection needs to be prioritised with those countries that are rapidly decarbonising: i.e. France, Denmark, and Norway. Further interconnection with Germany, Ireland, and the Netherlands might increase emissions, unless these countries join the UK in phasing out high carbon fuels.
 - Without interconnection, nearly 30TWh of renewable generation (8.5 per cent of UK demand) could be curtailed in Britain annually by 2030, due to times of very windy or sunny conditions when electricity is produced but there is low demand. But this curtailment could be halved with 19GW of interconnection, as the UK could export its renewable energy at times of low demand and high generation.
 - In addition, interconnection, energy storage and demand response would enable existing renewables to be used more efficiently, reducing the amount of renewables investment.

- Speeds up decarbonisation: Increasing interconnection to 17GW could displace 60TWh of UK gas generation (22 per cent of electricity demand) by the mid-2020s. Fewer gas power stations would need to be built, and those remaining power stations could be run more often to meet demand when necessary, making them more economic and less reliant on government support via the capacity market.
 - Using interconnection instead of gas turbines in this way could keep greenhouse gas emissions 70Mt lower over the course of the 4th carbon budget (2023-27). Trading electricity with neighbouring countries is already displacing high carbon power in the UK: 3.1GW of coal capacity is due to be replaced with interconnectors by the early 2020s, supported by capacity market contracts.
 - More storage would make it cost effective to decarbonise sooner, as cheaper renewables are more widespread. Interconnectors enable the UK to access and share storage in other countries. This is especially valuable for longer term storage of energy from hydro plants, which make up a large share of Norwegian power generation.
 - 30GW of storage would make a power sector emissions target of 0g of CO₂ per kWh by 2030 cheaper than the current target of 100g of CO₂ per kWh, as cheap excess renewable electricity can be stored and released at times of peak demand.
- The UK will double its interconnection capacity to 8GW over the next few years. But optimal levels of interconnection are estimated to be much higher at 17-19GW, as the government has recognised in the Clean Growth Strategy. But how well interconnectors work is only as good as the market trading rules that govern them. These rules enable physical interconnections to act as firm capacity and, as the EU builds a zero carbon electricity grid, they can ensure energy imports to the UK are low carbon.
- To get the most from greater interconnection – i.e. accelerating the development of its low carbon energy system and increasing energy security – the UK should expand its renewable capacity and develop flexibility services like demand response and storage. It can also turn this capacity into a valuable revenue stream in the form of clean energy exports to the EU.

TELECOMS

[Mobile coverage in the UK](#), published by the Commons Library, examines the mobile coverage across the UK and suggests ways to achieve 100% mobile coverage of the UK landmass.

- According to Ofcom's Connected Nations 2018 report, 65% of the UK landmass has 4G data coverage from all four mobile network operators (MNOs) – EE, Vodafone, Three and O2 – but 9.3% of the UK had no 4G data coverage from any operator. In terms of coverage at individual premises, 77% of premises had indoor 4G coverage from all four MNOs and 92% of premises had indoor voice call coverage from all four operators.
- The Government has committed to extend geographic mobile coverage to 95% of the UK by the end of 2022. Since 2016, UK Government policy for improving mobile coverage has focused on coverage obligations for operators and reforms to make it easier to build mobile infrastructure.
- Northern Ireland has the lowest 4G and voice call coverage across the UK. For 4G data, only 75% of indoor premises and 61% of major roads are covered by all mobile operators. For voice calls, only 80% of indoor premises and 78% of major roads are covered by all mobile operators. In rural areas, only 45% of indoor premises are covered by all mobile operators for 4G data, whereas 4.3% of premises have no coverage from any operator. In rural areas, 66% of indoor premises are covered by all mobile operators for voice calls, whereas 1.9% are not covered by any operator.
- However, in terms of 4G geographical coverage, Northern Ireland has 79.9% coverage, compared to the UK average of 65.9%.
- In order to achieve universal coverage, Ofcom has proposed two coverage obligations which would each require the obligated operator, within four years of the grant of new licences (i.e. early 2025) for 4G and 5G coverage, to: provide a good quality mobile service outdoors in at least 90% of the UK landmass, including at least 90% of England, 90% of Northern Ireland, 74% of Scotland and 83% of Wales; provide good quality service outdoors for at least 140,000 premises to which it currently does not provide good coverage; and deploy at least 500 new wide area mobile sites.
- To achieve 100% mobile coverage of the UK landmass, Ofcom has estimated that providing universal coverage to all the UK landmass would cost up to £6bn, and that some form of public subsidy would be required to achieve 100% coverage. Ofcom also described four main policy

levers which they may need to use in isolation or combination, in addition to coverage obligations, to achieve universal coverage. These include:

- Use public subsidy to pay for new coverage roll out - This is most likely to be an effective tool for covering total not spots (areas where no operators are currently present). The cost of covering total not spots will vary, depending on their location. While it is not possible to be certain of the costs, Ofcom estimate that addressing all total not spots would cost £3-6bn, once the 700MHz coverage obligations are factored in. Direct subsidy is less likely to be an appropriate means of tackling partial not spots as funding operators to overbuild their competitors' networks could create distortions to competition.
- Rural wholesale access - This would involve operators allowing customers to roam onto one another's networks in rural areas. It could improve coverage by 2-3 percentage points for the holders of the 700 MHz coverage obligations and by 5-10 percentage for the other operators. Taken together with Ofcom's proposed coverage obligations it could result in customers of all four operators getting coverage in around 90% of the UK. It introduces investment risks and consumer experience issues that could be mitigated to a degree. The surest way to introduce a rural wholesale access arrangement would be with the co-operation of operators. In the past, such arrangements have been strongly resisted by most mobile operators on the basis that the case to impose them is unsustainable, and Ofcom expect they will continue to take that position.
- Infrastructure sharing - Mobile operators have extensive infrastructure sharing arrangements that allow them to share the costs of deploying coverage. Ofcom is considering ways in which they can facilitate further sharing.
- Planning reform and other cost reduction measures - There are a range of measures the UK and devolved Governments could take to reduce the costs of building and operating mobile masts, and thereby facilitate coverage rollout. Ofcom believe the most useful potential measures include aligning the planning regime to give mobile operators the same compulsory purchase rights as other utilities, and extending the business rates relief recently granted for fibre deployment to mobile infrastructure.

[Making 5G pay: Monetizing the impending revolution in communications infrastructure](#), published by PWC, examines how business must overcome challenges if they are to realize a sufficient return on investment.

- Businesses should seek to avoid a repeat of the 4G rollout experience. Although 4G, launched in 2012, catalysed a revolution in the adoption of data services, operators struggled to generate additional revenues from end-users to cover the investments.
- To ensure they reap a fair return for their enormous investments in 5G, operators must think holistically about the monetization opportunities, going beyond simply charging consumers more for faster data. While 5G may present fixed wireless access (FWA) broadband opportunities in certain circumstances, it will be difficult to realize attractive returns on overall 5G investment. In fact, 5G offers not just higher speed but also other valuable attributes. Upcoming releases will deliver a number of 5G attributes, such as higher reliability, segmented network performance, and much lower latency.
- As a result, 5G creates the potential for entirely new service offerings, use cases, business models, and revenue opportunities. Instead of relying mainly on end-users paying telecom companies directly for connectivity, operators in a 5G world could generate substantial revenues by charging the companies that are providing 5G-reliant services to their customers. Variants of this model, which is widely termed business-to-business-to-X (B2B2X), where X can be a consumer, a business, or a public agency, will be suited to a vast array of widely differing use cases. By identifying and tapping into these opportunities, operators have the chance to ensure that the returns on their 5G investments exceed those from 4G. But to achieve this, operators will need to develop or acquire several vital capabilities.
 - As the 5G network is built, it will be vital to ensure sufficient spectrum across various bands, introduce automation and simplification to optimize operation, and identify how to deploy the network efficiently at a specific level of densification (i.e., with enough small cells to provide a high-quality service). Will network sharing reduce the cost to deploy 5G? And if so, which elements should be shared? Network sharing is one way for operators to reduce costs and fast-track deployment, as Vodafone and O2 are doing in the U.K;
 - Operators will need the ability to create or enable new services, pricing models, and commercial partnership agreements in days or hours rather than weeks or months, while also leveraging data analytics and AI to ensure that their services add value for customers

and ecosystem partners. They must ensure that their customer service solutions can handle the increased sophistication needed for customers using 5G applications;

- Operators must develop advanced capabilities in prototyping vertical 5G use cases and demonstrating the benefits. Other important steps will include establishing vertically focused product management, sales, and marketing functions, as well as optimizing the customer relationship management, solution sales platforms, order-to-fulfilment, and post-activation support capabilities; and
- An ability to forge close and trusted partnerships with Original Equipment Manufacturers, over-the-top players, and content providers will be vital to additional monetization of 5G. This will require a collaborative culture put into effect through a well-developed partner engagement and relationship-building capability, coupled with the ability to link into third-party solution catalogues, jointly create bundled products, and articulate each value proposition to partners, customers, and the wider market.

Productivity is higher among some service firms when broadband becomes available, but not all, published by the Economic and Social Research Institute, tries to identify groups of firms that register significant productivity gains after broadband becomes available.

- The author's find significant gains from broadband availability in two services sectors: Information & Communication services and Administrative & Support Service Activities. The effects measured for these two sectors are large, equivalent to about a third of the typical variation in productivity among the firms.
- While most other sectors show smaller positive associations between broadband and firms' productivity levels, none of these effects are statistically significant, and they also find no significant effect looking across all service sector firms taken together. These results are consistent with those of other recent research that suggests the benefits of broadband for productivity depend heavily upon sectoral and firm characteristics rather than representing a generalised effect.
- Overall, it seems that the benefits of broadband to particular local areas may vary substantially depending upon the sectoral mix of local firms and the availability of related inputs such as highly educated labour and appropriate management.

Government

NORTHERN IRELAND

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

ENGLAND

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

SCOTLAND

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

- Following a pick-up in growth in the first half of 2018, GDP growth in Scotland softened slightly to 0.2% in Q3 2018.
 - There was further expansion in both the Services (0.2%) and Construction (2.9%) sectors, however this was partly offset by contraction in the Production sector (-0.9%). The Construction sector contributed most strongly to growth over the quarter followed by Business Services and Finance.
 - The contraction in the Production sector has followed a number of quarters of strong growth. The fall in output was relatively broad based with contractions across Manufacturing (-0.9%), Electricity and Gas Supply (-1.7%) and Water Supply and Waste Management (-0.7%) offsetting growth in the Mining and Quarrying Industries (0.7%). The largest negative contribution to growth came from the Manufacturing sector, and in particular, the Food and Drink sector.
 - GDP per person growth also slowed slightly over the quarter to 0.1% (0.9% annually).

- Stronger global growth, alongside the weaker value of Sterling has fed through to stronger export growth. This can be seen in manufactured exports which make up around half of the total value of international exports from Scotland's onshore economy. Manufactured exports grew 2.1% over the past year (on a rolling annual basis), however the pace of growth has slowed over the year and contracted in the third quarter (-0.7%). This likely reflects the broader slowdown in manufacturing output over the quarter and the slight easing in momentum as the impacts of lower Sterling feed through and growth in the global economy softens.
- Over the year to September-November, the unemployment rate fell to 3.6% - its lowest rate on record.
 - Alongside this, the number of people unemployed fell below 100,000 for the first time.
 - The employment rate increased over the quarter and the past year to 75.3%, with 2.64 million people in employment.
 - The inactivity rate also rose over the quarter and the year to 21.9% - partly off-setting the fall in unemployment.
 - The reduction in the number of people unemployed and employed is reflected by a pick-up in the number of people economically inactive over the past year, which has increased by 4,000 to 21.9% (UK: 21.0%). Tight conditions in the labour market continue to be reflected in business surveys, with firms reporting that vacancies continued to rise in January, albeit at a more moderate pace than in recent months. This, in combination with a decline in the availability of candidates, are signalling that recruitment conditions remain challenging for firms.
- Labour productivity growth was flat (0.0%) in Q3 2018, however increased by 4.0% on a rolling annual basis (up from 2.2%).
 - The increase in productivity over the year reflects that GVA grew 1.5% while total hours worked fell 2.4%.
 - However, despite the slightly weaker quarterly growth profile, on the more stable rolling annual basis (comparing the latest 4 quarters with the previous 4 quarters) labour productivity grew 4.0% over the period, accelerating over the year to its fastest pace of growth since 2010. This reflects that over the year, GVA grew 1.5% while the total number of hours worked fell 2.4%.
 - Recently released data from the OECD shows that between 2000 and 2007, productivity in Scotland grew significantly more slowly than in the rest of the UK and across the OECD as a whole. Over the past decade this trend has been revised. Between 2007 and 2017, Scotland's productivity growth has been noticeably faster than in the UK as a whole, and only marginally behind the OECD average.
- Business activity softened at the end of 2018 and into January, while business confidence also weakened.
 - In Q4 2018, consumer sentiment in Scotland fell to its lowest level on record, driven by weaker expectations for the outlook.
 - Independent GDP growth forecasts reflect the stronger period of growth in 2017-18 estimating between 1.3% and 1.6%, slowing to between 1% and 1.5% in 2020.
 - The RBS Purchasing Managers Index reported slower growth across manufacturers and service providers in the final quarter of the year, with a broad based contraction across December and January. This reflected a drop off in new business/new orders growth. Staffing levels however, appeared to hold up with firms taking the opportunity to clear backlogs of work.

REPUBLIC OF IRELAND (ROI)

[The monthly economic bulletin](#), published the Department of Finance (ROI), details key statistics relating to the ROI economy.

- In the third quarter of 2018, the level of GDP rose by 0.9 per cent relative to the previous quarter (on a seasonally adjusted basis). As a result, the level of GDP was 4.9 per cent higher year-on-year. Overall GDP was up 7.4 per cent over the first three quarters of 2018.
 - Modified domestic demand was up 4.1 per cent in the third quarter of 2018 on an annual basis. This measure, which excludes leased aircraft and foreign owned intellectual

property (IP) assets, is a measure of underlying economic activity. Overall it was up 5 per cent over the first three quarters of 2018.

- Personal consumption (+2.9 per cent) and exports (+9.4 per cent) recorded strong annual growth in the third quarter, while investment (+43.4 per cent) and imports (+16.4 per cent) grew significantly due to acquisitions of intellectual property and aircraft.
- Headline retail sales, in volume terms, was down 0.4 per cent month-on-month (seasonally adjusted) in December but increased by 3.7 per cent in year-on-year terms.
- On a monthly basis, the seasonally adjusted value of goods exports increased by 9.3 per cent, with imports rising by 14.2 per cent. As a result, the trade surplus increased by 1.1 per cent in December to €4,578 million.
 - On a monthly basis, industrial output increased by 16.3 per cent (seasonally adjusted) in January, but fell by 9.2 per cent in annual terms.
 - Output in the modern sector (Chemicals and pharmaceuticals; Computer, electronic, optical and electrical equipment; reproduction of digital media; and medical and dental instruments) increased by 33.0 per cent in January and output in the traditional sector (All industries excluding the “modern” sector) increased by 1.6 per cent in the month.
- On a HICP (Harmonised Index of Consumer Prices) basis, prices in Ireland decreased by 0.7 per cent between December 2018 and January 2019, but increased by 0.8 per cent on a year-on-year basis.
 - The Consumer Price Index (CPI) decreased by 0.7 per cent over the month but increased by 0.7 per cent in year-on-year terms in January 2019.
 - The main sectors impacting on the CPI index over the month were decreases in Transport (-0.45%) and Clothing & Footwear (%). The sector with the largest upward contribution was Alcoholic Beverages & Tobacco (+0.18%) and Restaurants and Hotels (+.11%).
- The seasonally adjusted unemployment rate for February 2019 was 5.6 per cent, down from 5.7 per cent in January 2019 and down from 5.8 per cent in February 2018. January shows a (seasonally adjusted) decrease of 3,200 people on the Live Register on the month and a fall of 37,759 year-on-year.
- Average weekly earnings increased by 4.1 per cent y-o-y to €761.65 in Q4 2018 from €731.86 in Q4 2017.
 - The average number of hours worked per week was 32.5 hours in Q4 2018, down from 32.8 in Q3 2018, a decrease of 0.9 per cent.

Sources

Association for Public Service Excellence

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

Catalyst Inc

<http://www.catalyst-inc.org>

CBI UK

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

CBRE

<https://www.cbre.com>

CBRE UK

<https://www.cbre.co.uk>

Centre for Business Research (CBR)

<https://www.cbr.cam.ac.uk>

Centre for Economic Policy Studies (CEPS)

<https://www.ceps.eu>

Centre for Economics and Business Research (CEBR)

<https://cebr.com>

Centre for Enterprise and Economic Development Research (CEEDR)

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

Centre for European Economic Research (ZEW)

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

Department for Digital, Culture, Media and Sport

<https://www.gov.uk/government/organisations/department-for-culture-media-sport>

Department for Exiting the European Union

<https://www.gov.uk/government/organisations/department-for-exiting-the-european-union>

Department for the Economy

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

Department of Finance

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

Department of Jobs, Enterprise and Innovation (DJEI)

<https://www.dbei.gov.ie/en>

Department of Transport, Tourism and Sport

<http://www.dttas.ie>

Dept for Business, Energy & Industrial Strategy (BEIS)

<https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy>

Economic Advisory Group (EAG)

<http://eaqni.com>

Economic and Social Research Council (ESRC)

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

Economic and Social Research Institute (ESRI)

<http://www.esri.ie>

Economics Ejournal

<http://www.economics-ejournal.org>

Economist Intelligence Unit

<http://www.eiu.com>

Enterprise Research Centre (ERC)

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

Environmental Services Association

<http://www.esauk.org>

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>

Key Cities

<https://www.keycities.co.uk>

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.spatialeconomics.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>