



Birmingham Economic Review 2018

Chapter 1: Ideas

UNIVERSITY OF
BIRMINGHAM

BIRMINGHAM
BUSINESS
SCHOOL

CITY
REDI



West Midlands
Growth Company

Introduction

The annual Birmingham Economic Review is produced by the University of Birmingham's City-REDI and the Greater Birmingham Chambers of Commerce, with contributions from the West Midlands Growth Company. It is an in-depth exploration of the economy of England's second city and is a high-quality resource for organisations seeking to understand the city to inform research, policy or investment decisions. This year's Birmingham Economic Review has been organised according to the five foundations of the UK's Industrial Strategy, which aims to boost productivity and the earning power of the national economy. We hope this review will help to inform Birmingham's approach to the UK's Industrial Strategy and a more productive and inclusive local economy that draws on the strengths of the city and works across industry, academia and civil society.

Index

Foreword and Executive Summary: Scorecard for Birmingham

Chapter 1: Ideas

Chapter 2: People

Chapter 3: Infrastructure

Chapter 4: Business Environment

Chapter 5: Places

Conclusion: A Local Industrial Strategy for the West Midlands

All Chapters of the *Birmingham Economic Review 2018* can be found online on the [Greater Birmingham Chambers of Commerce website](#) or via the contact details at the end of this document.

Ideas

Aim: “To be the world’s most innovative economy” UK Industrial Strategy

The Industrial Strategy identifies the UK as a global leader in science and research. To build on this strength and innovation more broadly, it demands better partnerships between universities and industry to enable more translation of research into commercial products. This is something which Birmingham’s universities are already focused on.

Increasing investment in R&D and increasing growth of specialist innovation strengths across the UK, while maintaining our world-leadership in global science and innovation collaboration, are also highlighted as crucial to becoming the world’s most innovative economy.

In Birmingham, local networks, universities, business parks and the City Centre Enterprise Zone are supporting businesses in reaching the full potential of their innovations. Particularly innovative local sectors include digital, advanced manufacturing, energy, healthcare, and the creative industries.

Grand Challenge: “putting the UK at the forefront of the artificial intelligence and data revolution” UK Industrial Strategy

Innovation

Innovation can be defined as the ‘commercialisation of new ideas’. The UK has historically been very good at creating new ideas, but not great at commercialisation. We are still something of a nation of inventors rather than innovators. This is important. Firms that are more innovative are also more competitive and adaptable in the face of external threats and opportunities. They tend to export more (a result of their competitiveness and a factor behind their resilience) and they employ higher-skilled, more productive and higher-paid employees and therefore produce larger positive multiplier effects for their host regions. So, more innovation benefits not just firms but employees and the regions that attract them and support their development.

How Innovative are the Firms in our Region?

Ideas, people, infrastructure and the business environment combine to create the innovative potential of places. Firms rely on their regional innovation systems, including a good skills base, science and technology infrastructure and strong university-based R&D, in order to innovate. The Birmingham city-region has a number of regional strengths, but how innovative are the firms based in the region?

According to the national UK Innovation Survey (2017) we are well above average, coming fourth out of nine English regions and ahead of all three of the devolved nations, with over half of our firms seen as 'innovation active'¹. We also have a healthy regional share of jobs in 'science and technology' sectors, compared to other UK regions. This amounts to around 360,000 employees in total, or about 1/5 of all jobs.² A number of outstanding science, technology and engineering clusters are part of the reason for this, including:

- Edgbaston for life sciences
- Gaydon, Warwickshire for automotive technologies and home to Jaguar Landrover and Aston Martin; the region accounts for almost 10% of UK manufacturing and a significant proportion of automotive exports
- South Coventry for advanced materials and automotive engineering
- Warwick and Leamington Spa for computer games software

Universities are central to many of these technology clusters, including: the University of Birmingham's Institute of Translational Medicine and the High Temperature Research Centre, with Rolls Royce as partners, at the Manufacturing Technology Centre in Ansty; the University of Warwick's Advanced Propulsion Centre Hub and Warwick Manufacturing Group (HVM Catapult); the Institute for Advanced Manufacturing and Engineering (IAME), a collaboration between Coventry University and Unipart Manufacturing Group and the National Transport Design Centre (NTDC), based at Coventry University. Universities produce both new ideas and specialist expertise in the form of graduates and we have seen a growing number of these staying in the region to work after graduating³.

Local Barriers to Innovation

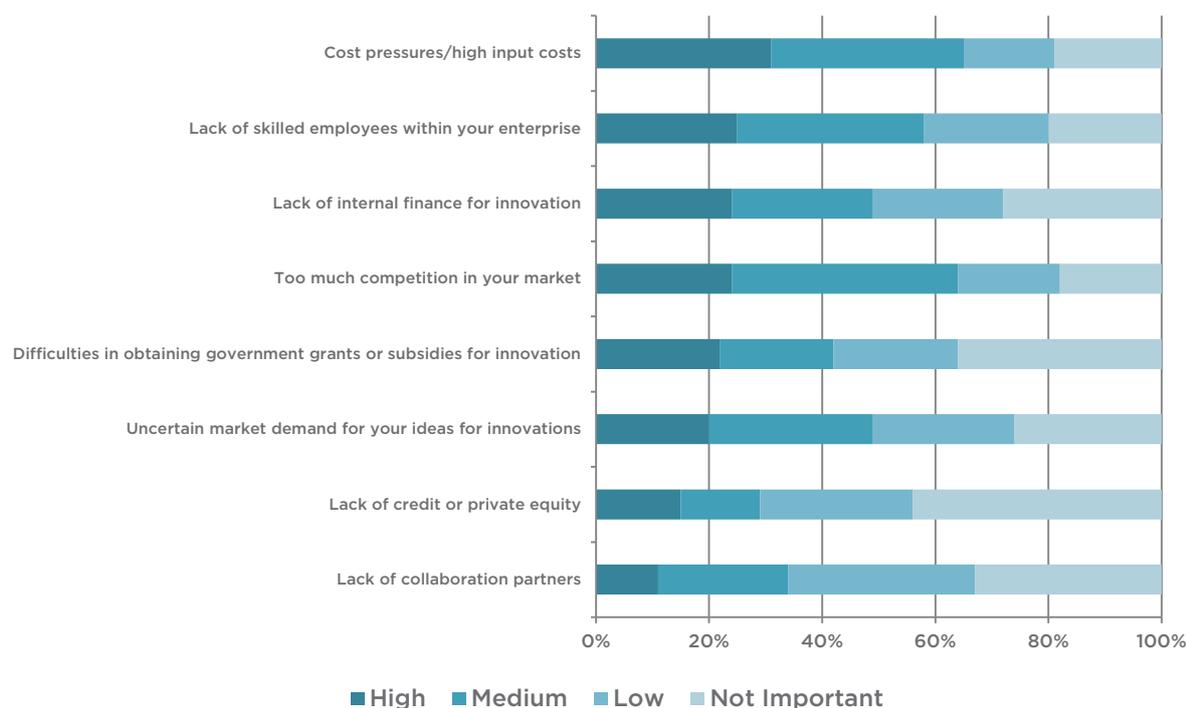
However, firms in the region report a range of barriers to innovation limiting their ability to improve products and services or the way these are produced and sold. This undermines firm-level competitiveness, but also reduces the positive effects that innovation has on the region's economy. City-REDI and the Greater Birmingham Chambers of Commerce worked in partnership to extend the Quarterly Business Report (QBR) regional survey of firms to better-understand these local barriers to innovation. Over 200 firms responded and by comparing these responses with the findings of the national UK Innovation Survey (2017) we can gain some insights into how our region differs from the UK average. Figure 1 shows a ranking of managers' lists of barriers to innovation taken from this local survey.

¹ [UK Innovation Survey \(2017\)](#)

² [WMCA \(2017\) Science and Innovation Audit for the West Midlands](#)

³ [See: Greater Birmingham Chambers of Commerce 'Invest to Grow' blog; Simon Collinson \(2018\) 'The Birmingham City-Region Needs Investment to Drive Innovation'](#)

Figure 1: Barriers to Innovation in the Birmingham City-Region



Source: City-REDI and Greater Birmingham Chambers of Commerce; analysis of 2018 QBR Survey Responses

Birmingham firms rate ‘cost factors’ as the most pressing constraint, as do UK firms generally. But ‘competition in the market’ comes second and ‘lack of skilled employees’ ranks third amongst Birmingham respondents. These factors are rated lower by UK firms generally, with skills ranked fifth as a national constraint on innovation, matching other research showing that skills gaps are a key problem for the region⁴. Conversely, Birmingham firms rank ‘lack of finance’ as a lesser barrier to innovation and ‘uncertain market demand’ much higher than the average for UK firms overall.

Both product and process innovation influence firm-level productivity and some of these factors, notably skills shortages, also undermine productivity levels in the region. The UK lags behind other advanced nations but productivity levels in our region are about 89% of the national average.

It is also significant that regional firms rank ‘uncertain market demand’ much higher than the average for UK firms overall. Across the country there has been a marked decline in investment in R&D, technology and training, partly due to the above barriers and partly due to growing uncertainty regarding market conditions and the Brexit process. This is one of a number of indicators that suggest this lack

⁴ Deniz Sevinc (2018) Mind the Gap! Qualification Shortages in the West Midlands, City-REDI blog (03/7/2018).

of confidence to invest is more prevalent in our region than nationally, despite the relatively higher availability of finance.

In order to incentivise innovation in both the public and private sector, it is crucial that Birmingham's R&D and educational infrastructure creates a supportive environment. This infrastructure includes: (i) technology & artificial intelligence; (ii) universities; (iii) business parks; and (iv) enterprise zones. It is also important that local businesses take advantage of the national R&D tax relief that is offered by central government to support innovative companies working in science and technology.

Technology & Artificial Intelligence

The emergence of advanced technologies and artificial intelligence is creating opportunities in the city for employment, growth and investment. According to Tech City UK, a publically and privately funded body to accelerate the growth of digital businesses across the UK, in 2017 Birmingham had a total of 36,802 digital jobs contributing £1.4 billion to GVA⁵. This growing digital technology ecosystem has been supported by the planned HS2 rail link and the recent arrival of big banks (e.g. HSBC) and professional services firms. Funding support for local businesses is provided through Finance Birmingham, which offers flexible funding packages between £250,000 and £2 million for digital start-ups. Local networks, including Innovation Birmingham and Silicon Canal, are also influential in the sector's strength. Innovation Birmingham, part of Birmingham Science Park Aston, supports start-ups and growing digital and technology companies in the City. Silicon Canal is a not-for-profit organisation with the aim of creating a world-class technology ecosystem in Birmingham.

In September 2018, Birmingham hosted an A.I. Camp delivered by Kainos, a leading provider of digital services and platforms for public and private organisations around the globe. This offered ten undergraduate students the opportunity to hear about the latest industry developments from local leaders in artificial intelligence, as well as the chance to improve their business skills and develop their own machine learning models.

Universities

Universities are critical sites for innovations. They educate prospective workers and produce technological and scientific results that can be turned into patents and products. The city's three largest universities (University of Birmingham, Aston University and Birmingham City University) are actively engaged in research and knowledge transfer at a regional, national and international scale.

These three universities have a range of internationally recognised strengths in the fields of:

⁵ [Tech City UK 2017](#).

- Advanced material characterisation and use - including nanotechnology and composites
- Energy - including hydrogen and fuel cells, bioenergy
- Low carbon technologies - including low carbon vehicles
- Innovative healthcare - ranging from medical devices to clinical trials
- Digital technologies - including the use of social media and 3-D imaging

The University of Birmingham is part of the Russell Group of leading UK universities and is ranked among the top 100 universities globally. The UK University League Table 2019 placed the University of Birmingham 15 out of 131 universities for overall ranking, including factors such as research quality and intensity, entry standards and student satisfaction.

The city's three largest universities also offer specialised innovation services and collaborations with industry in the city. For instance, the University of Birmingham is home to Alta Innovations. Alta Innovations works with academics and industry to bridge the gap between research and commercial application. They work with academics to protect their inventions and make sure that world-class technologies and innovations developed at the University of Birmingham can have the widest possible benefit.

Similarly, Birmingham City University offers Innovate for Advantage. Innovate for Advantage is aimed to support businesses to improve their performance by helping them to develop new products and services and to streamline processes. It taps into a range of expertise such as design, engineering, digital technology, e-business, social enterprise, business process improvement, marketing, web design and green technologies.

University College Birmingham also has excellent links with industry, particularly in the food sector. Aston University has received a Business School's Business Charter Gold Award and has a number of initiatives in place, such as the Aston Centre for Growth.

Commercialisation

The University of Birmingham was awarded £5 million by Research England to lead a connected system of incubators and accelerators to boost jobs and economic growth in Birmingham and the wider Midlands region.

The Midlands Innovation Commercialisation of Research Accelerator (MICRA) is the largest formal technology transfer network in the UK. It provides a single platform to the collective intellectual property resources of eight universities based in the Midlands, including Aston, Birmingham, Cranfield, Keele, Leicester, Loughborough, Nottingham and Warwick. The MICRA programme, working across industry from all sectors, will support entrepreneurs and enterprise development and investment in the Midlands region.

Business Parks

Birmingham has a number of high tech business parks that are helping to foster innovative practices and high tech industry. These business parks provide crucial opportunities for businesses and key stakeholders to network, broadening their potential resource base and maximising their opportunities. This is particularly valuable for smaller, younger and thus more vulnerable firms.

Birmingham's business parks and related initiatives include:

- **Innovation Birmingham Campus at Birmingham Science Park Aston** - an increasingly high-tech and young-entrepreneur focused science park in the centre of Birmingham.
- **Birmingham Research Park at the University of Birmingham** - a number of spin-outs from the city's universities have started on these sites, with many still located there.
- **Longbridge Technology Park and Innovation Centre** - situated on the former MG Rover site, this is a key link in the Central Technology Belt (CTB), the high technology corridor running along the A38 from the centre of Birmingham southwest to QinetiQ in Malvern, Worcestershire. Other developments along the CTB include the Queen Elizabeth hospital which is a leading centre for healthcare R&D with a key role to play in the development of the city's life sciences sector.
- **Birmingham Science City** - Birmingham was awarded Science City status by the Chancellor of the Exchequer in 2005, in recognition of the city's strong science-based assets. The Birmingham Science City partnership provides a means to collaborate amongst the research community, private and public sectors, leading to the commercialisation of research strengths.
- **Institute of Translational Medicine** - Birmingham Health Partners led the development of a new Institute of Translational Medicine (ITM), a new world-class clinical research facility in Birmingham, opened in 2015. The centre helps progress the very latest scientific research findings from the University of Birmingham into enhanced treatments for patients across a range of major health issues including cancer and liver disease. The Institute will build on Birmingham's excellent track record in clinical trials by increasing capacity and enabling more patients to be co-located alongside clinicians and researchers. It will also make it easier for both SME and large pharma and biotechnology firms to work more closely with clinicians and academics, bringing additional investment into the city.
- **Birmingham's Smart City Commission** - the Commission has representatives from academia, business, health, transport, education, utilities and local government. It was established in 2012 to drive the long-term vision and strategic leadership that will lay the foundations for Birmingham's future. It

shapes technological solutions and partnerships to deliver a joined-up approach to deal with the immediate and future challenges the city faces around:

- Sustainable economic growth
- Connectivity and infrastructure
- Climate change and the green agenda
- Digital inclusion and skills

Birmingham City Centre Enterprise Zone

Birmingham City Centre Enterprise Zone is comprised of 39 sites across the city, in seven clusters at Westside, Snow Hill District, Eastside, Southern Gateway, Digbeth Creative Quarter, Birmingham Science Park Aston and the Jewellery Quarter. The Enterprise Zone is one of the major projects for the GBSLEP, with the potential to create 40,000 new jobs, add £2 billion a year to the economy and make available 1.3 million square metres of floor space over the lifetime of the project. The Enterprise Zone (EZ) is focused on the following economic sectors: Business and Financial Services, ICT, Creative Industries and Digital Media.

A simplified planning regime has been introduced across the whole of the EZ in addition to Local Development Orders (LDO) being used in Digbeth and Birmingham Science Park Aston, which remove the need to apply for planning permission for a wide range of changes of use, making it easier for growing small businesses to be mobile. The EZ provides superfast broadband focused on the clusters of IT, creative and digital businesses in Digbeth, Eastside, the Jewellery Quarter, Southern Gateway and St George and St Chad Quarter.

Over its 25-year lifetime, the retained uplift in business rates will enable investment in a range of infrastructure, business support, employment and skills and access to finance projects to support its priorities.

Uptake of R&D Tax Credits

R&D tax credits is a national scheme that supports companies working on innovative projects in science and technology. Recent analysis has found that companies in the West Midlands are under-claiming via this scheme, with much more scope for future uptake.

Jumpstart, a leading UK R&D tax relief firm, reports that HMRC figures for the fiscal year end in 2016 indicate that businesses in the West Midlands made up just 8% of total claims (2,165 claims out of 26,255 nationally). This suggests that businesses are missing out on tax savings in comparison to companies in other parts of the UK. PwC found similar results, with their recent analysis showing that

innovative firms in the West Midlands are potentially missing out on more than £60 million a year in unclaimed tax breaks.⁶

To help businesses boost productivity through investment in innovation, R&D, technology & machinery, the Greater Birmingham Chambers of Commerce have recently run a content-led campaign aimed at sharing best practice, briefing information and businesses views on investment in innovation, research & development, technology and machinery called Invest to Grow. More details on the campaign, including case studies and an introduction to the support and tax breaks available to businesses can be found on the Greater Birmingham Chambers of Commerce website.

⁶ <https://www.greaterbirminghamchambers.com/latest-news/news/2017/10/13/midlands-innovators-missing-out-on-60m-in-tax-breaks/>

Expert Comment

Professor Simon Collinson, City-REDI, University of Birmingham



Innovation is an essential – perhaps *the* essential – driver of firm-level competitiveness and regional economic growth. Firms succeed or fail on the basis of their ability to (1) continuously create new products and services that customers are willing to pay for, and (2) develop processes for delivering these products and services more cost-effectively. Both underpin improvements in productivity and GVA levels. But firms do not innovate in isolation. They rely on regional, national and/or international networks of partner organisations, including suppliers, contractors, universities and consultancies that provide components, technology, skills, knowledge and expertise as an input into the innovation process.

For these reasons, developing a strong regional system of innovation should be at the heart of any economic growth strategy. More so, because the benefits are realised not just by firms but more widely, through the creation of higher-value and higher-paid employment opportunities and by multiplier effects which benefit others in the region. Firms, universities and regional policymakers all have a key role to play.

Firms need to invest. Innovation is driven by firm-level investment in skills, new equipment and new processes. Current political and economic uncertainties are constraining this investment at a time when business leaders need to aggressively develop new competitive advantages. They need to be agile and adaptable to changes in the cost base and the UK domestic market and to develop export capabilities to reduce dependence on this market. Innovation underpins all of these strategic opportunities and a confident, proactive approach to competitive markets means investment.

General discussions about innovation tend to focus on R&D and technology-related developments. We need to remember that most innovation is driven by people having the capability and incentives to continually improve processes, products and services. ‘Non-technological’ innovation is responsible for twice as much firm-level innovation as technology-related innovation according to the UK Innovation Survey. ‘New business practices’, ‘new methods of organising work responsibilities’ and ‘changes to marketing concept or strategies’ top the list of innovation-related activities that make a difference in innovative firms. It is appropriate therefore that this was the focus of the Greater Birmingham Chambers of Commerce ‘Invest to Grow’ and ‘Growth Through People’ campaigns.⁷

⁷ <https://www.greaterbirminghamchambers.com/research-campaigning/hot-topics/growth-through-people/>

Universities need to connect. The role of universities is emphasised in the Government's Industrial Strategy and related reports, including the Science and Innovation Audit's (SIAs). The regional SIA highlights Warwick University (including Warwick Manufacturing Group), JLR, the University of Birmingham and the Manufacturing Technology Centre (MTC) as 'nationally and internationally significant science and innovation assets'. Both universities were recently ranked in Europe's 100 most innovative universities by Reuters and account for two-thirds of all Innovate UK funding into the area over the 2010-15 period.

However, we need better mechanisms for translating good ideas in our universities into successful commercial businesses. We have a number of outstanding science, technology and engineering clusters, including hotspots in life sciences, low-carbon energy, automotive technologies, rail transportation and advanced materials. We need a wider range of innovation pipelines to exploit this scientific creativity, generating new products, services and processes that will improve competitiveness. This will result in more productive, high-value, high-salary jobs, attract more firms and more talent to the region and drive a local growth cycle to benefit everyone.

But we also need better connections between our universities and local businesses to bridge the supply-demand skills gap and support the development of new practices, processes and business models. The region boasts several leading UK business schools which are already working with local firms but a wider range of stronger collaborations, from apprenticeship programmes to export promotion workshops to small-business mentoring is needed.

Regional organisations need to cooperate, coordinate and prioritise support programmes to focus limited resources to reduce the most significant barriers to innovation and build on the region's distinctive advantages. The challenge for local government, enterprise partnerships and public agencies is to identify the potential future areas of regional competitive advantage, attract new investment from existing firms and attract new firms to the region to complement existing strengths as part of a smart specialisation strategy. This includes a focus on 'scale-ups' as well as start-ups, given the high business mortality rate in the region.

The evolving regional skills strategy should match this industry focus. Matching developments in local infrastructure, including transport, housing and digital as well as cultural amenities to attract skilled workers will help improve the attractiveness of the region for retaining existing talent and bringing new capable and creative people to the region. In parallel with this we need to devote resources to promote innovation in the public services to reduce costs and improve the well-being of those dependent on these services.

Business Insight

Andy Dawson, Director and Co-Founder, Curium Solutions



Greater Birmingham is one of the UK's major digital hubs, with more than 6,000 tech firms employing around 38,300 people. Thousands of students are here studying computer science or business at schools, colleges and some of the UK's leading universities.

Our region has a long history of leading technological change. At the vanguard of the industrial revolution, Midlands manufacturing and natural resources helped shape the world as we know it.

In 1770, Matthew Boulton claimed that Birmingham's superiority as a manufacturing town was largely due to the "superactivity" of its people and the "mechanical contrivances and extensive apparatus which we are possess'd of".

Man and machine – working together – powering the country forward. That spirit of innovation continues today. Midlands' manufacturers have long adopted technological and robotic advances to improve productivity. Artificial intelligence (AI) is the next step.

With our rich automotive heritage, it's fitting that we are driving developments in autonomous and connected vehicles (CAV). Led by the University of Warwick's WMG, Midlands Future Mobility brings together academics, policymakers and businesses to establish the Midlands as a world-class centre for the development and evaluation of CAV and related technologies and services.

However, our regional strength could also be our Achilles' heel. Being an early adopter may put the region at risk of a greater share of job losses as roles for humans become roles for machines.

Generating GVA of 15% (UK Office of National Statistics, 2016), manufacturing accounts for 13.6% of Midlands employment compared with a national average of 9.8%. Services also play a large role in the regional economy, employing almost half of the working population. Other key sectors are engineering, transportation and storage, construction, energy and public administration.

Unfortunately, according to this year's 'UK Economic Outlook' from PwC, many of these sectors are those most likely to see a net decrease in jobs due to AI.

Broadly positive about the impact of AI on job creation v job losses, PwC estimates that the share of existing jobs displaced by AI (c. 20%) is likely to be approximately equal to the additional jobs created.

However, it does note potential regional variation, with more jobs likely to be lost rather than created in the Midlands. By PwC's analysis, this is due to the proportion of jobs in sectors more likely to see net job losses: manufacturing (-

25%); transportation and storage (-22%); and public administration and defence (-18%) in this region.

By PwC's own admission, these figures represent its best estimate based on models of potential economic performance and the adoption of new technologies. And, while there will be inevitable change to employment tasks and roles, AI will bring opportunities, many of which have not even been thought of.

I'm not at all pessimistic about our region and its ability and appetite to innovate and change. Everything in our history says that we are more than capable of leading technological change.

We've got world-beating universities. The region is home to industries already using AI and robotics (manufacturing, legal) or ripe for doing so (healthcare). We're seeing strong leadership from Mayor Andy Street and the West Midlands Combined Authority, which is currently surveying businesses in the region to see how ready they are for AI.

In the public and third sectors, we have data-rich organisations for whom AI has to be part of the solution to meeting rising need with smaller budgets. I'm pleased that Curium is supporting Public Sector Digital Midlands, an event on 27 September for people involved in public sector digital.

Showcasing the work of digital teams in central and local government, the NHS, the police and education, the event will include Andy Street, Mayor of the West Midlands and Kevin Cunningham, Director General of the Government Digital Service, among the speakers and panellists.

In our business experience, we come across individuals and organisations who want to change but are finding it hard to do so. AI is just one of the many business challenges they face alongside managing their business-as-usual.

For them and for our region, there's no easy solution. But, I believe that by investing and by harnessing the talent, political will and business need for better ways of working, Birmingham and the region has the potential to lead the UK through this 'fourth' industrial revolution.

Contact Us

For queries related to the *Birmingham Economic Review 2018* please contact:

Emily Stubbs

Policy and Patron Advisor
Greater Birmingham Chambers of Commerce
E.Stubbs@birmingham-chamber.com

Rebecca Riley

Business Development Director
City-REDI, University of Birmingham
R.L.Riley@bham.ac.uk

Project Coordinators

Dr Charlotte Hoole

Policy and Data Analyst
City-REDI, University of Birmingham

Emily Stubbs

Policy and Patron Advisor
Greater Birmingham Chambers of Commerce

Data Prepared By

Dr Tasos Kitsos

Research Fellow
City-REDI, University of Birmingham

Greater Birmingham Chambers of Commerce

75 Harborne Road
Edgbaston
Birmingham B15 3DH
t 0121 607 0809
e policy@birmingham-chamber.com
w greaterbirminghamchambers.com

