



The International Competitiveness of the UK Automotive Industry: 2018 report

Updated following peer review by the Automotive
Council

Executive Summary

Since we published our first report, both the automotive sector and the UK as a whole have embarked on profound change. In June 2016, the UK voted to leave the European Union, leading to significant uncertainty for business and creating new, unexpected challenges, especially for the highly integrated automotive sector. At the same time, the automotive sector continues to undertake a technological revolution, with developments in ultra-low emission and connected and autonomous vehicles, as well as data driven manufacture and design, accelerating.

With the international trading environment becoming increasingly competitive, less predictable and more challenging, UK Automotive will have to work hard if it is to continue to build upon the considerable success that it has enjoyed in recent years. Government must support automotive every step of the way, working in partnership with the sector and putting industry success at the heart of all relevant policies. Through the work of the Automotive Council and the Industrial Strategy Automotive Sector Deal, we already have a robust structure in place to support that cooperation.

This report outlines the fundamental drivers behind investment in automotive manufacturing and R&D, based on real industry thinking, and compares the UK against a range of nations competing for that investment using objective KPIs. It explores eight KPIs which are most fundamental to long-term industry success and makes recommendations on how the industry and government can work together to create a business environment that supports efforts to keep the UK at the forefront of automotive manufacturing in the future.

The UK can demonstrate leadership or excellence in several fields. It enjoys an innovative environment for academic research, with some of the strongest collaboration between universities and industry in the world. Labour flexibility is a clear advantage, and despite relatively low productivity across other sectors, in automotive – particularly in OEMs and tier one suppliers – the UK is highly competitive.

There remain weaknesses, however. The most significant area of concern is skills. Rapid technological advances are already creating new skills challenges, while others, including the availability of engineers, remain stubbornly unresolved. UK automotive is in a global race to design, develop and manufacture the next generation of ultra-low emission, connected and autonomous vehicles. If it is to win, automotive needs an agile workforce that is able to utilise a broad skillset in new and creative ways. Investment in skills now will be an investment in the long-term sustainability of UK Automotive.

As well as investing in skills, R&D investment must be brought up to internationally competitive levels. The Industrial Strategy's automotive sector deal is to be welcomed, but Government should go further, revisiting the generosity of incentive schemes for R&D and capital investment and concentrating existing support and funding towards projects which will secure leadership in new technology.

Finally, as the UK leaves the EU, it is vital that its reputation as a politically stable country and a secure destination for long-term investment is not lost. Our industry survey suggests that fewer investors see the UK as a stable place for investment than they did in 2015.

The renaissance of the UK automotive sector in the past two decades is a national success story, but gains that have been hard won can also be easily lost. By continuing to work in partnership, the industry and government can ensure that UK Automotive remains highly competitive and productive at a moment of significant transition.

For the purposes of this report, the assumption has been made that the UK Government and the EU will conclude Brexit negotiations successfully, with an agreement that limits any negative impact of the UK's departure from the EU on the automotive industry to the fullest extent possible. While the main drivers for competitiveness apply to investment decisions in any country, any "no deal" scenario would have a very significant impact on the UK's competitiveness to attract investment in the sector.

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About the Automotive Council

The Automotive Council was established in 2009 to enhance dialogue and strengthen co-operation between UK government and the automotive sector. The Council operates through three major working groups:

- **Technology:** Look to maximise the advantages for the UK auto sector in the shift to clean growth through identifying R&D and development opportunities for low carbon technologies systems and services, which will include industrial opportunities for vehicle electrification through battery development, motors and power electronics, and exploiting the UK’s capabilities in the demonstration and deployment of Connected & Autonomous Vehicles (CAV) technology.
- **Supply Chain:** Focuses on the opportunities and challenges facing the UK automotive supply chain with the strategic transition to ultra low and zero emission vehicles and improve the supply chain’s long-term competitiveness and manufacturing capabilities.
- **Business Environment and Skills (BE&S):** To ensure the UK automotive industry has the best business environment to operate and thrive in, including access to the right skills and talent.

For more information visit the Automotive Council website: www.automotivecouncil.co.uk

Key Performance Indicators

Based on the work carried out to date, the following list of eight KPIs has been selected. This is based on the methodology outlined in Appendix A, and validated by industry members of the Automotive Council as critical for investment decisions in the UK automotive sector.

These eight KPIs are those which were most highly rated as 'important' in influencing potential investment in manufacturing and R&D;

1. Availability of Skilled Labour
2. Labour Productivity
3. Labour Flexibility
4. Infrastructure
5. University / Industry Collaboration
6. Investment in R&D by government
7. R&D Tax Incentive availability
8. Political Stability

Additionally, two more important drivers were identified for which there is no readily available KPI;

- Government Strategic Engagement
- Accessibility of Incentives

A full list of the KPIs considered – including the eight above and the remaining 30 competitiveness drivers – are listed in the matrix accompanying this report.



KPI 1: Availability of Skilled Labour

Skills are a critical factor driving both R&D and manufacturing – and are perceived as a weakness. Government and industry have developed successful programmes to increase availability of skills in automotive, but the pace of change in industry and the economy requires an increasingly coordinated approach.

Availability of engineering skills is the top priority for investment in both R&D and manufacturing, but the shortage of skilled labour continues. The industry is evolving rapidly, with the move to electrification, automation and digitalisation requiring new skills. In addition, as the UK prepares to leave the European Union, there is a risk that skills shortages will become more acute.

The UK should invest in development of skills at all levels – **deepening skills in the existing workforce**, developing skills required for **future industry requirements**, and creating a **strong pipeline towards the future**.

1) Developing the existing workforce in core skills

There are gaps in current core skills provision, as indicated by the Automotive Council’s report “Employers’ Views of the Jobs and Skills Required for the UK Automotive Industry”. Work is ongoing to develop clear standards, courses, and apprenticeships – as demonstrated by the work of the Automotive Trailblazers (see case study). This should continue with urgency and focus – and building close cooperation with other sectors which have similar challenges.

2) New skills in the existing workforce

The industry faces an unprecedented era of change: a shift in product towards electrification and automation, towards digitalisation in production – alongside the potential disruption that leaving the EU will bring. A radical approach will require significant retraining, and this is reflected in the Industrial Sector Deal and Industrial Strategy. The Automotive Council is developing proposals to identify requirements and provision through the whole value chain, integrating technology, supply chain and skills and will put them forward in the New Year.

All this requires a focussed and – critically – collaborative approach by government and industry. It is essential that all involved government departments continually engage and consult with industry both formally and informally – only by doing this will the sector achieve the long-term skills transformation it requires.

3) Strengthening the skills pipeline to fulfil the requirements of the workforce of the future

Engaging young people on the pathway to a rewarding career in automotive requires manufacturing to be perceived as aspirational. Industry initiatives, such as, Industrial Cadets are playing a role in this shift.

At the same time, the changing nature of work and the industry means that leadership competencies are changing – the entry of millennials into the workforce requires a new way of workforce management. Industry should work to foster the culture of innovation in the next generation of leaders which in order to breed the flexibility and creativity that will enable the sector to survive and thrive. The industry should also take action to increase its diversity, broadening the base from which it can draw skills at all levels.

Recommendation: Given the unprecedented level of change in the industry, a targeted programme of skills interventions aimed at making the industry fit for future needs. Industry and all parts of government must work to agree a consistent long-term plan, delivered over successive parliaments, to implement this. This challenge of increasing diversity requires special attention, and the Automotive Council has created a new diversity and inclusion workstream to help identify collective efforts to improve these areas in the automotive sector.

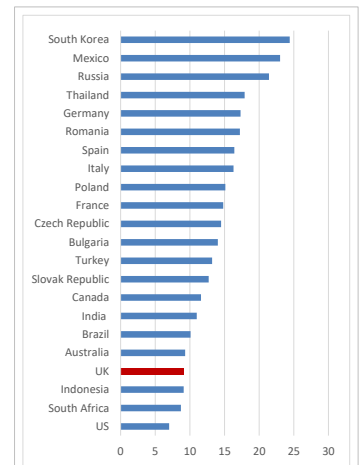


Figure 1: Graduates in Engineering, Manufacturing and Construction %

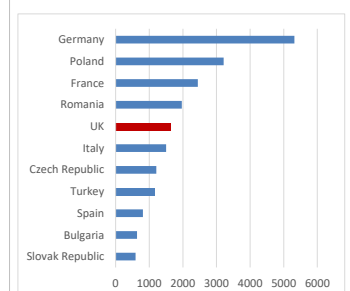


Figure 2: Skilled industrial employees with Upper Secondary education or above, 000

Case Studies

Automotive Trailblazers

The Automotive Trailblazer Group first came together in 2014 through the Automotive Industrial Partnership. The employers who first engaged to raise the standard of apprenticeships felt they could be further improved to fully meet their needs. The initial employers were Jaguar Land Rover, BMW, Toyota, Nissan, Vauxhall and Ford. Soon after, the government announced the introduction of standards to replace existing frameworks, and the Automotive Trailblazer Group was the obvious employer group to take ownership of them in the automotive sector.

Other employers have since joined, such as Bentley and Honda, as have other stakeholder groups such as GTA England, the Cast Metals Federation and Semta. Due to the cross-sectoral nature of the skills, there has also been close cooperation with the aerospace and food and drink sectors and the Ministry of Defence. Up to 2018, this collaboration between employers and across sectors has resulted in 19 apprenticeship standards being developed for the benefit of the automotive and wider engineering and manufacturing sectors. One of the standards is the Engineering Technician L3 and by the end of 2017/18 academic year, there were 3,002 apprentices registered on it.

One of the reasons for the success of the Trailblazer Group is a longstanding tradition of collaboration. When the employers first started analysing the standards, not surprisingly, there was commonality on what subject areas they wanted covered. This sense of direction was important because of the significant time investment that employers have put in during the four years, employer representatives have attended one to two meetings a month, building up trust between companies and showing the importance placed on the work. The Trailblazer Chair reports that a greater willingness among colleagues to be open to good and bad news as well as issues that affect all employers. An example of this is the new T-Level system currently being introduced that will sit alongside apprenticeships.

The “Art of Manufacturing”

One of the Automotive Council’s key engagement activities is the Art of Manufacturing programme, an interactive workshop which engages and educates 10 and 11 year old primary school pupils in the automotive industry by enabling them to experience 21st century automotive design, engineering and manufacturing in practice.

Each school undertakes a project covering the history of the car industry in the UK before a visit to the manufacturing site. The Year 6 Primary school pupils then take part in a hands-on Lego production line, competing in teams to build a model car as quickly as possible. The programme covers teamwork, removing waste, making improvements and quality. Participants also learn about safety and equipment, how to turn steel into parts as well as having an opportunity to work with actual tools, using an impact wrench, removing a dent, manual dexterity exercises and parts selection. The programme has been delivered by multiple OEMs to over 8,000 year six students.

Ian Green, Nissan’s Senior Training Controller, “ *We set out to create a unique and exciting opportunity for children to discover how we manufacture high quality cars at high volumes and to take part in activities which would not normally be available to them ... the programme will ultimately encourage more new talent to join the industry.*”

Automotive Apprenticeship Matching Service

The Automotive Apprenticeship Matching Service was established in 2015 to help address the long-term skills gap in the UK's automotive OEM and wider engineering sector. Whilst the UK has seen significant investment, and the development of some of the world's most innovative technology, there remains a significant mismatch between the talent that is required to continue this growth, and individuals choosing engineering as a career.

In the majority of cases, OEMs have little problem in attracting high quality candidates; their strong consumer brands and highly developed Employee Value Propositions (EVPs) have been developed and refined over many years. As large organisations, their established attraction, screening and recruitment functions can deliver many thousands of suitable candidates.

OEMs do not, however, operate in isolation. As part of the wider engineering sector, and with significant dependence on supply chain businesses, it was identified by the Automotive Industrial Partnership that action was needed to provide support for the wider attraction of the next generation of engineers and technicians.

The Automotive Apprenticeship Matching Service does exactly that. Organisations including Jaguar Land Rover, Nissan, Mercedes, Bentley and BMW all provide details of high quality candidates to a central database and matching team that then support individuals and engineering businesses to explore the opportunities open to them.

With the significant investment in talent attraction made by OEMs, this approach makes effective use of the surplus candidates who have chosen a career in the automotive sector, but were not fortunate enough to be offered a place with their first-choice employer. This UK wide talent pool of over 15,000 high quality surplus candidates are then made available to automotive suppliers; these supply chain businesses are able to access a broader and deeper talent pool with minimal investment.

LAP Electrical

LAP Electrical are designers, manufacturers and distributors of automotive electro-mechanical products. Formed in 1989, the company supplies OEMs, aftermarket and other sectors such as construction and agricultural vehicle producers. Based in Birmingham, LAP Electrical identified a need for an apprentice mechanical and electrical craftsman.

The recruitment team at the Automotive Apprenticeship Matching Service were able to quickly search and screen the talent pool that had been generated by OEMs, and two candidates stood out following the initial screening. Both candidates were then interviewed by LAP Electrical.

As a result of this support for the recruitment campaign, and the quality of candidates that were sourced, both individuals were offered roles at the company. Not only has the company been able to access high quality talent in a cost effective and timely manner, but the individuals who had been attracted to the sector were able to take the first step in their careers.

KPI 2: Labour Productivity

Productivity is a critical factor in encouraging companies to invest in the UK. UK Automotive has been a success story in the economy, driven by innovation and investment at OEMs. Our focus must be to strengthen the whole sector through the supply chain in order to continue to grow the sector's competitiveness.

Productivity in the UK has seen a great deal of media focus, and is frequently described as a major issue for the UK economy. The UK automotive industry, on the other hand, is highly productive, particularly at OEM level. This is due to the high value of vehicles generally produced in the UK, but is also due to ongoing investment in technology and plants. Productivity improvement has been critical to ensure the recent success of vehicle manufacturing. It remains essential that OEMs continue to invest both in equipment and training to improve productivity at all levels. The industry is working to develop a proposal to increase the utilisation of digital design and manufacturing to be presented in 2018.

Productivity through the longer supply chain is more of a challenge, and it is important that the less productive areas are given the opportunity to learn from the highly productive parts of the industry. Companies need to have a good understanding of how they will compete in the future and therefore which business capabilities must be developed in order to remain competitive. Productivity forms a critical part of this wider picture; productive companies can still make the wrong or unreliable products, fail to deliver on time, have excessive lead times or fail to support their products with the right services or customer experiences. Therefore interventions to increase productivity must form a part of a rounded programme of competitiveness improvement.

Over the past four years the Automotive Council Supply Chain Group has run the Long-Term Automotive Supply Chain Competitiveness programme (LTASC) providing help and support to 30 suppliers of all sizes throughout the automotive supply chain to boost productivity. Building on this success, the National Manufacturing Competitiveness Levels (NMCL) programme was announced in January 2018 as part of the Automotive Sector Deal (subject to business case approval). This is an industry-developed national framework aimed at measuring and increasing the competitiveness and productivity of the automotive supply chain. This is a highly welcome initiative for the automotive industry with the potential to replicate the same best practice across multiple industry sectors.

As the UK prepares to leave the EU the requirement for step change in supply chain competitiveness and productivity is both urgent and critical. In addition to the skills and business process transformation support available to companies through NMCL, both industry and government need to support supply chain companies with CAPEX and manufacturing process R&D to further boost competitiveness and productivity.

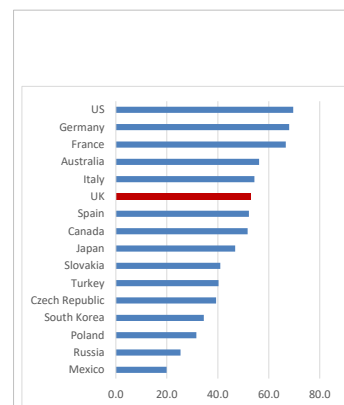


Figure 3: GDP / Hour worked

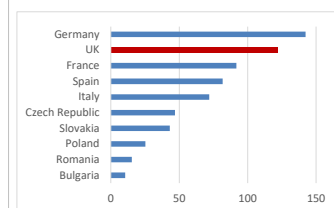


Figure 4: Automotive: GVA / person employed (EU)

Recommendation: Consistency of approach is essential as industry works to boost productivity through the whole supply chain. Government and industry should fully engage in the comprehensive approach to competitiveness set out in National Manufacturing Competitiveness Levels, while investing in both processes and equipment to ensure that productivity gains at OEM level are replicated through the whole supply chain.

Case Study

Long Term Automotive Supply Chain Competitiveness Programme

Started in 2014, the Government-funded Long Term Automotive Supply Chain Competitiveness programme (LTASC) has helped 27 England-based suppliers to compete globally, creating or safeguarding 3,200 jobs and underpinning vehicle assembly at several leading automotive brands. The £13 million that funded LTASC stimulated an extra £41 million from private investment into England's vehicle manufacturing supply base, allowing suppliers to improve their manufacturing processes, R&D capabilities and skills.

LTASC has also been fundamental to the delivery of the UK's Industrial Strategy. The UK automotive supply chain is now enjoying a renaissance with the local content of British made cars increasing to 44% as of 2017, up from 36% in 2011.

VTL Group

VTL Group used LTASC to help fund its expansion to fulfil a major manufacturing contract from Jaguar Land Rover, allowing the OEM to onshore production of a critical engine component. The funding assistance enabled VTL to invest in three major new programs from scratch, involving capital investment in new machining centres, component washing facilities and new measuring equipment, the recruitment of 30 new staff and the re-training of existing workers. It also involved the development of new processes to maximise the potential of the new equipment and the enhanced skill levels of the workforce.

The project was delivered in early 2018 and has led to a growth in productivity, turnover, diversification into new markets and new contracts in existing ones. The investments made have positioned VTL favourably with key OEMs and Tier One suppliers and have won several new contracts. The project is also used by VTL's commercial teams to promote their capabilities with new customers in Europe and in the USA.

KPI 3: Labour Flexibility

Labour flexibility remains a key competitive advantage of the UK, and has allowed rapid expansion in times of industry growth. It is essential to retain this flexibility in all scenarios – while developing the tools to retain industry skill

Labour flexibility - the positive relationship with labour unions and the absence of restrictive practices - remains a perceived strength for the UK among respondents to this survey and in the overall matrix of KPIs. It is of particular importance in encouraging investment in manufacturing.

In times of global uncertainty, being able to provide the opportunity to invest in increased production with lower risk of adding to fixed costs, and easier ability to redeploy labour across operations and production lines, is an attractive competitive advantage when making new investment.

It can also be a short-term risk to the UK's competitive position: UK labour legislation makes it easier for companies to exit as well as enter the market.

Flexibility in agency terms and to working patterns are key to ensure that opportunities for additional business can be taken without excessive downside risk.

Equally, it is important to recognise that automotive manufacturing and R&D will only flourish where there is a skilled and experienced labour pool, able to increase value-add and innovation not only in the OEMs and the cutting-edge of the industry, but through the whole supply chain – and to flexibly move between companies. The industry should investigate and learn from other internationally successful automotive industries where there is incentive to retain skills in the industry, and where there is mutual understanding between OEMs, enabling employees to redeploy between firms in the UK – as well as internationally.

One example of UK manufacturers working together for the benefit of industry is the Apprenticeship Matching Service (see case study under the Skills KPI) – consideration should be given to a similar system for experienced employees. This cooperation across the sector will be a key factor in developing the dynamic, innovative environment which industry and the government outline in the industrial strategy Automotive Sector Deal.

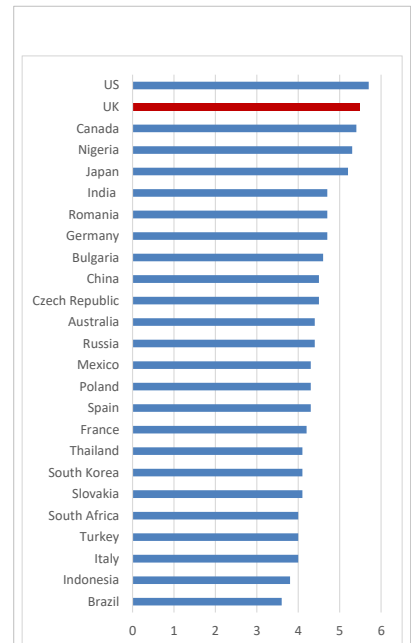


Figure 5: Labour Flexibility

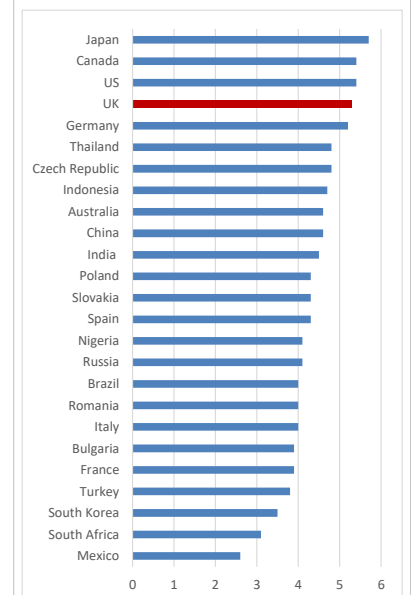


Figure 6: Cooperation in labour / employee relations

Recommendation: Labour flexibility is a key strength of the UK, and it is essential that the industry maintains the constructive and long-term approach which enables this. At the same time, Government and industry should work together with imagination to create tools which will allow the retention of skills and experience in all economic scenarios.

KPI 4: Infrastructure

Infrastructure is critical to developing and sustaining long-term productivity growth. The UK's commitment to infrastructure development through the Industrial Strategy is welcome, and will meaningfully increase the UK's potential as a place to invest.

Infrastructure in this context includes not only “hard” infrastructure (roads, rail, ports) but also the “soft” infrastructure of internet connectivity. Critical for the automotive industry will be provision of energy infrastructure to promote take-up of electric vehicles in volume – not only charging infrastructure, but the stability of energy supply which will be critical as government and industry work towards ambitious targets for uptake of ultra-low emission vehicles, including electric vehicles. Also critical is the IT infrastructure which will enable development and deployment of more autonomous vehicles – and their manufacture in advanced plants employing digital design, testing and manufacturing.

With this in mind, the government’s commitment towards developing infrastructure is positive, and the establishment of a National Infrastructure Commission – together with its first National Infrastructure Assessment, published in 2018 – is a huge step forward towards the long-term vision which is required to create meaningful change.

Automotive welcomes the money set aside by the government on the National Infrastructure Delivery Plan – and the focus that this funding demonstrates. The Industrial Strategy commitments to provide funding for hydrogen transport in order to increase the number of refuelling systems, to support for vehicle-to grid projects and also to develop an enhanced electric car charging infrastructure supported by R&D into charging technologies is extremely welcome.

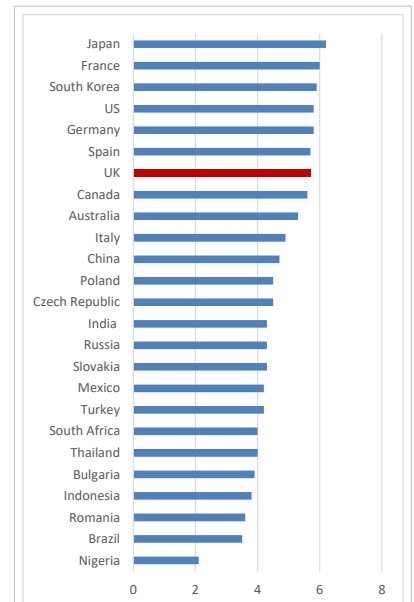


Figure 7: Average of infrastructure ratings (Roads; Railways, Ports; Energy; IT)

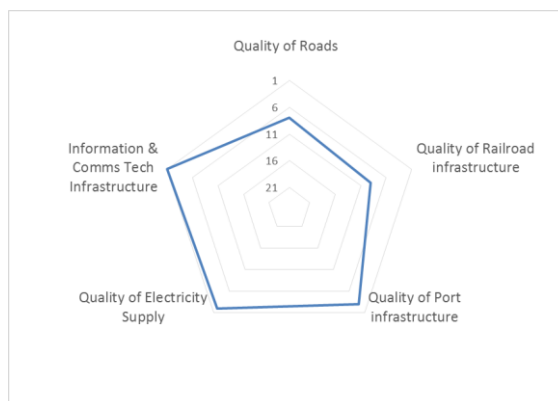


Figure 8: UK ranking for infrastructure, Global Competitiveness Index / Global Innovation Index

Recommendation: The government recognises the importance of infrastructure to a strong and productive economy, and this is reflected in the prominence given to the theme in the Industrial Strategy. Making the required step-change in the infrastructure of the country will require a long-term consistency of direction over multiple parliaments and industry welcomes the government’s commitment to this approach.

KPI 5: University/Industry collaboration

The UK's academic sector is a key competitive advantage in attracting investment. Recently, institutions such as the Advanced Propulsion Centre and the Catapult network have helped increase accessibility to industry and alignment in industry needs.

Collaboration is a key competitive advantage for the UK. The country has world-class academic research institutions and the level of cooperation with industry is extremely high.

The introduction of the Advanced Propulsion Centre and Catapult network in 2013 has taken this to new levels; in particular, this has enhanced the ability of the industry to take advanced research and transfer it to practical application. The APC and Catapult network are able to facilitate funding on collaborative projects between universities, OEMs and small, innovative companies towards practical application in both manufacturing and product R&D. Meanwhile, government, industry and academia continue to facilitate high level collaboration in key strategic areas such as electric vehicles and CAVs – as demonstrated by initiatives such as the Faraday Challenge on electric batteries (see case study).

Key to continuing success will be ensuring the balance between “blue sky” research, which feeds radical innovation, and critically the activity to bring that innovation to market in a way which can benefit the unique automotive industry in the UK: significant investments from global players with major R&D activities from both locally and internationally headquartered organisations. This means encouraging universities to work in partnership with industry from a product perspective – developing the most practical application for innovation on a global level. It also requires an approach where companies can work in collaboration with favourable commercial terms - for example, maintaining ownership of intellectual property generated through collaborative projects

The industry is evolving rapidly. We must supplement the excellent collaboration on materials science and technology with those areas of research which will allow the industry to transition to the world of “big data” and CAV.

It is also critical to ensure the incentive for academic collaboration with our European partners following Brexit – while also pursuing opportunities for international collaboration.

In the context of rapid change in the industry, this must continue and accelerate; the opening of the National Automotive Innovation Centre is a clear sign that industry takes this imperative seriously.

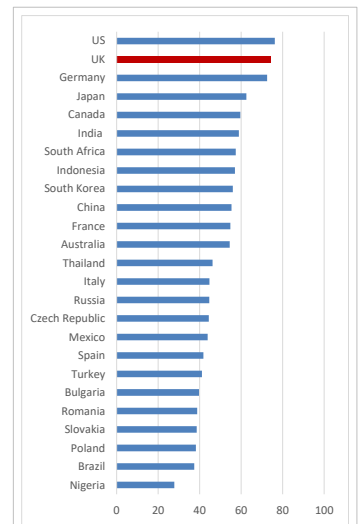


Figure 9: University / Industry Research Collaboration

Recommendation: Industry, government and academia must work together to continue to pursue the activities which have been identified. Through the work of the APC and the Catapult network a practical approach to marrying the best in research to industry needs has been developed; this clear understanding of the real needs of automotive companies – finding solutions to real problems – will be essential as government and industry develop the major projects such as those which form part of the Industrial Strategy Challenge Fund.

Case Study

The National Automotive Innovation Centre

The National Automotive Innovation Centre (NAIC) will provide a critical mass of research capability combining automotive expertise nationally and internationally. NAIC will be a unique resource, with an environment to foster collaboration, cohesion and cross-fertilisation of knowledge. Academic and industrial R&D teams will work together using state-of-the-art equipment and facilities to develop breakthrough designs, technologies and processes. NAIC will address the shortage of skilled R&D staff across the automotive supply chain, developing the talent required for the demands of emerging technologies and engaging future generations of engineers.

£150 million is being invested in the NAIC building and its research activities through a long-term commitment between Jaguar Land Rover, Tata Motors European Technical Centre, WMG and the University of Warwick, along with an expanding network of supplier companies. The government (Higher Education Funding Council England) has also provided £15 million of funding to support the capital project.

The NAIC building will occupy 33,000m² next to WMG's current facilities on the University of Warwick campus, and is designed around a collaborative heart with space for around 1,000 colleagues from the partner companies to work on a range of advanced projects.

NAIC will be the largest research centre of its kind in Europe and will enable industry to work side-by-side with academics on leading edge research to deliver exciting new products, enhancing the UK's capacity and capability in key areas of automotive research including connected and autonomous vehicles, immersive simulated environments and advanced propulsion systems

KPI 6: Government investment in R&D

Government investment in R&D is a critical driver of industry investment in R&D. The Government's commitment to work towards raising the level of GDP to the top quartile of OECD countries is welcome.

Investment in R&D by governments is a critical factor in stimulating R&D investment by industry across all sectors.

As shown in the data, the UK's overall investment is low by international standards – and it is important to ensure that in line with the Industrial Strategy targeted investment increases to encourage the ecosystem of strong academic and applied industrial research.

There is also a risk to research which has benefited from EU funding – and in particular collaboration – and the government must make all effort to safeguard this vital part of the infrastructure supporting high technology industry. The government should commit to safeguard or replace any EU research funding through its own investment as a minimum.

In this context, the government's ambition to raise the percentage of GDP 2.4% by 2027, and to 3% in the longer term is to be applauded.

The UK Government has recently announced investments in the UK automotive sector: both in R&D supporting practical vehicle manufacturing projects – but also in high level research – for example in the Faraday Battery Challenge and the Centre for Connected and Autonomous Vehicles.

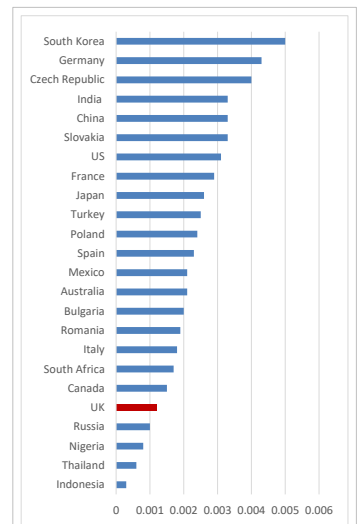


Figure 10: GERD performed by government, % GDP

Recommendation: The government has already committed to work with industry to raise the level of R&D investment in the economy to globally competitive levels, and to work with industry to develop a roadmap to achieving this. As a key industry council, government should consult with the Automotive Council to develop a proposal for how to accelerate long-term investment targeted towards practical delivery of key strategic goals outlined in the Sector Deal: Autonomous Driving, Electrification, and Digital Design and Manufacturing.

It should also commit to safeguard or replace any EU research funding at risk following the UK's exit from the European Union.

Case Study

The Faraday Battery Challenge

The Faraday Battery Challenge was launched in 2017 as part of the Industrial Strategy Challenge Fund. It will invest £246 million over the next four years to maximise the UK's position in the global battery technology race, starting with the automotive market and maximising the potential of developed technologies within this market through to other sectors.

The Challenge is delivered by UK Research and Innovation through:

- The Advanced Propulsion Centre which is delivering an £80m scale-up programme to allow companies to move new battery technologies to market.
- Innovate UK which is delivering an £88 million innovation programme to stimulate collaborative R&D.
- The Engineering and Physical Sciences Research Council, which administers a £78 million “application-inspired” research programme coordinated across UK universities.

The challenge connects fundamental research, innovation and scale-up in a way no other country has done, driving a step-change in translating the UK's world-leading research into market-ready technologies.

Deregallera

One company benefiting from the Challenge is Caerphilly-based Deregallera, which is developing a hybrid energy storage system to extend the life of an electric vehicle battery by 50%. The project aims to increase the range and decrease the risk of energy loss in electric vehicles by combining supercapacitors with traditional lithium-ion batteries to produce a pack that is better suited to handling higher power demands. Currently at the feasibility study stage, Deregallera's project is supported by the University of South Wales and the University of Hertfordshire.

KPI 7: R&D Incentives

The UK's R&D Tax Credit regime design remains excellent, and can be a strong driver for investment. The generosity of the regime has increased in recent years, but is low among comparators for large enterprises; an increasing number of countries also offer more competitive headline rates for SMEs

Incentives for investment in R&D are considered essential to many governments' innovation-led growth plans, and countries offer a range of incentives between 5%-40%. Without such interventions, R&D investment is economically sub-optimal. Incentives therefore provide a key competitive advantage for countries seeking to attract automotive investment – both in innovative research, and in the experimental development required to bring new technologies and products to market leading to enhanced job creation.

Fiscal R&D tax incentives are the norm in OECD countries; an advantage of this approach is that – unlike grants, which are often targeted at specific sectors or companies – they are broad-based in their application, and give private companies autonomy over which innovations they fund.

Due to the variety of schemes globally, comparison is not simple, so an in-depth global investment appraisal has been carried out by the Automotive Council and PricewaterhouseCoopers (PwC). The KPI used to measure competitiveness is the effective cash headline rate of R&D tax incentives based on a simulated investment in R&D. The KPI is split for SMEs and large companies – since many countries, including the UK, offer a split scheme, differentiating between these two enterprise types. An SME for UK purposes is defined as having <250 employees, and either turnover <€100m or balance sheet <€86m (group basis).

Considering availability of funding, the design of the UK's regime is excellent – in particular due to the use of “above the line credit”, which allows companies to claim credits while in a loss-making position rather than just reducing their corporate tax payments. This is particularly beneficial as companies which are undertaking research prior to bringing a product to market are less likely to be in a position to make profit – and incur tax liability – due to the cyclical and long-term nature of R&D investment.

Furthermore, the UK benefits from an open regime. Some countries which may appear to have a highly generous headline figure have more restrictive or advanced approval processes – whereas the UK's scheme is open to all trading companies undertaking eligible R&D activity. The UK's regime is also able to operate without excessive bureaucracy. All of this supports “availability of incentives” – which is another key driver identified in the survey.

Considering the UK regime's generosity – the amount of funding that an enterprise can expect to receive towards an investment – the UK is not competitive. For larger enterprises the level of funding is towards the lower half of comparator countries. Most automotive Tier I suppliers would be treated as large organisations as the SME definition is applied to the global group, regardless of their size in the UK. Even for SMEs, the level of funding available to companies investing in the UK is now exceeded by direct comparators such as France and Spain.

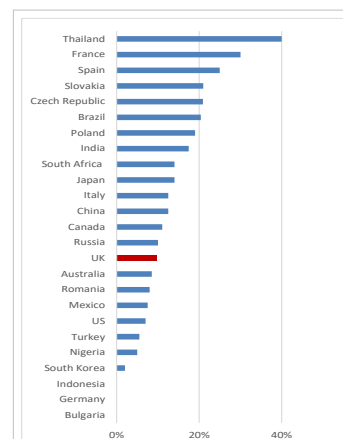


Figure 10: Effective cash rates (large companies)

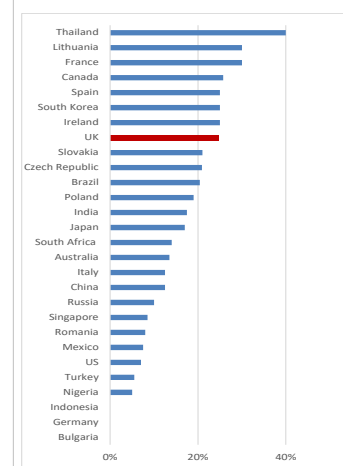


Figure 11: Effective cash rates (small companies)

Recommendation: The UK government has demonstrated a proactive approach to attracting R&D, through introduction of above the line R&D credits and introduction of schemes such as Patent Box to incentivise generation and retention of IP. The opportunity exists to build on this by keeping pace with the competitor countries' tax credit rate for both smaller and larger investors. Action is also required to define and deploy a globally competitive capital investment incentives policy with organisation and processes capable of coordinating national and regional responses.

KPI 8: Political Stability

Political stability is considered critical – and is perceived as less of a strength than previously.

Political stability was previously a strength of the UK – however, the positive perception of this key attribute has been weakened since the country’s vote to leave the European Union.

The KPI is particularly important for longer-term investment – of the kind which will drive the innovation the UK seeks through its Industrial Strategy.

Despite the uncertainty surrounding the country’s future relationship with the EU, the UK remains a country where the rule of law and parliamentary democracy ensure the fundamental stability of the country and economy.

One key challenge facing countries such as the UK where there are frequent changes in government and ministerial posts is the ability to keep clear consistency of purpose over multiple parliaments – which is necessary to take the action required to influence longer term issues such as skills. The Automotive Council seeks to enable this by allowing continuity across successive administrations and taking an evidence-based approach based on total industry needs.

The focus going forward must be to build on the fundamental stability of the UK, and of the collaborative approach to automotive manufacturing and R&D, in order to demonstrate that the UK remains a good place to do business despite the current level of instability.

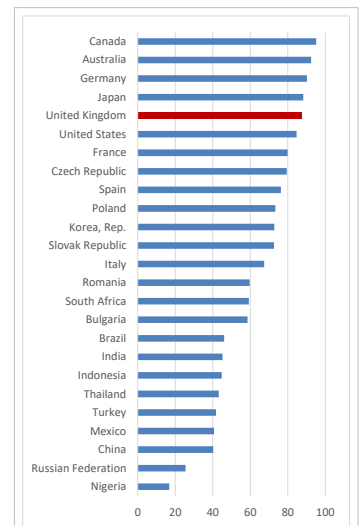


Figure 12: Worldwide Governance Indicators (rank - average of all 6)

Recommendation: It is important to recognise that the UK’s negotiations to leave the European Union have had a negative impact on perception of the country’s stability – an area previously seen as a key strength. While it is critical to approach the negotiations with the best outcome for the country’s long-term future in mind, it is also important to demonstrate the ongoing strength, maturity and stability of the country’s institutions to foreign investors.

Additional drivers

The following drivers are seen as critical – but as yet no KPI has been identified or developed.

Government engagement

The establishment of the Automotive Council in 2009 was an extremely forward-looking step for government and industry, and the Council's ongoing success is a testament to the "team-working" approach this has enabled.

Most recently the Industrial Strategy demonstrates the Government's support for industry, and of its understanding of the challenges that industry faces.

The Government's continued engagement is essential to enable the industry to grasp the opportunity to re-shape towards a future producing new types of vehicles and drive-train. It is doubly so given the challenges industry will face, and radical changes it seems likely industry will need to make, following the UK's exit from the European Union.

In this context the Automotive Sector Deal, the first in a rolling series of intended deals with the sector, is a most welcome start and sets clear visions for the industry's development over the coming years, to create a stable base for the coming decades. Industry and government must focus on strong team working to deliver the first part of the deal – without losing sight of the additional commitments for joint initiatives – for example, digital design and manufacturing, and skills.

Recommendation: The Industrial Strategy, the Automotive Sector Deal and the Government's engagement with the Automotive Council itself demonstrate the strength of the Government's approach in this area. This way of collaborative working should continue and strengthen as the industry and country navigate through a period of change.

Accessibility of incentives

Government support to ensure investment in new vehicles and projects in the UK is extremely positive. It not only helps anchor manufacturing at scale in the UK – critical to ensure a local supply chain as well as to provide a route to production for innovation in SMEs – it is also a clear demonstration to overseas investors of the country's "open for business" approach.

There is also work needed to support investment in supply chain innovation, and in skills development through the supply chain, in order to root greater manufacturing content in the UK. Clarity of how to access funds and support to do so is critical – especially for smaller and more innovative firms who may lack the resource to navigate the complexities of state aid rules and treasury funding rules by themselves. Furthermore, in order to ensure the support required to transition to manufacture of ultra-low emissions and connected and autonomous vehicles, the criteria for granting should focus less on short-term job creation, and more on strategic longer-term industry requirements

As the devolution agenda progresses, it will become increasingly important to ensure that funding through the regions, devolved authorities and LEPs is approached on a strategic basis – particularly given the inherently national nature of firms and supply chains in the UK, which invariably span multiple LEP areas. Without clarity, consistency and a link to the requirements of the broader Industrial Strategy, and Automotive Sector deal, and of local industry requirements, the opportunity to use devolution to strengthen industry at a local and national level would be reduced significantly.

Recommendation: Recent grants to support new projects in automotive have clearly demonstrated the Government's willingness to support the industry's activity to win new investment for UK plants. Government should continue to engage with industry with a responsible, constructive and transparent approach to support the continued health of the industry – and specifically to enable transition to new technologies for the long-term health of the sector.

Recommendations

1. Skills and productivity

Roll-out of the **National Manufacturing Competitiveness Levels** throughout the supply chain, as outlined in the first Industrial Strategy Automotive Sector deal, should be treated as a priority by the industry. This will help **develop the industry's competitiveness across the whole supply chain.**

Government and industry should support skills interventions which will be proposed as part of Automotive Sector deal #2 - towards **developing a workforce with skills in new product and manufacturing technologies** required to **grasp the opportunities presented by the transition to ultra-low emission vehicles, connected and autonomous vehicles and digital manufacturing.**

2. Flexibility

The UK's flexibility in working practices is a key competitive advantage – this must be maintained.

At the same time, the industry should collaborate to develop **innovative tools to ensure that workforce skills can be retained and developed** – **despite likely upcoming turbulence and churn** the sector is likely to experience as it deals with both the UK's exit from the EU, and the industry's transition towards the future of mobility and manufacturing.

3. University / Industry collaboration / Investment in R&D

It is critical to **preserve global leadership in R&D.** The government should support this **by moving to guarantee all funding in sectoral R&D which is currently provided by the EU, and creating a continued environment which enhances internationally collaborative research.**

4. R&D Incentives

Government should **revisit the generosity of tax credits to support R&D, and capital incentives to support investment, to keep pace with the best globally.**

Government's direct support towards the industry is welcome; however, when assessing grant applications, the need for **long-term industry transition** should be treated with at least as much priority as short-term job sustainability.

5. Political Stability

Working to urgently secure a stable, long-term trading relationship with the EU based on free and frictionless trade, and commonality of standards is critical.

At the same time, it is important to preserve the **long-term stability of automotive strategy** embodied by the collaborative approach of the Automotive Council, **building on the fundamental strengths of UK institutions** - whatever political turbulence we the nation may face.

Appendix A: Methodology

While many reports into the international competitiveness of the UK focused on general macro- and micro-economic factors that influence the overall health of the system, our approach has been to consider, investment decisions made in the boardrooms of automotive companies – which will typically be based on a more focussed (and sometimes idiosyncratic) set of drivers. It is vital that the UK works to maintain and improve its competitiveness in these areas to continue the strong record of investment in R&D, supply chain and vehicle manufacture that we have seen in recent years.

As in the first International Competitiveness report, we have focused on investigating the key priorities for taking investment decisions from the view of business people working in the automotive sector. This report is based on the views of the industry members of the Automotive Council and does not reflect government policy.

Research conducted for the report comprised three elements:

1. A list of comparator countries was agreed based on the strength or potential of their automotive sector – with the understanding that as the global economy evolves, this list will evolve with it.

The countries are as follows:

- | | | |
|-------------------------|--------------------|--------------------------|
| • Australia | • India | • Russia |
| • Brazil | • Indonesia | • Slovak Republic |
| • Bulgaria | • Italy | • South Africa |
| • Canada | • Japan | • South Korea |
| • China | • Mexico | • Spain |
| • Czech Republic | • Nigeria | • Thailand |
| • France | • Poland | • Turkey |
| • Germany | • Romania | • US |

2. A long-list of KPIs was developed and, over the course of several months, narrowed down to those factors which were felt to be of greatest relevance. For each of these an ideal data source was identified¹.

Key criteria for inclusion in the list are:

- Credibility of source.
- Timeliness and frequency of data update.
- Range of comparator countries for which the data is available.

In certain cases, where a more comprehensive data source was identified between the publication of the previous International Competitiveness report and this one, the KPI used has been updated.

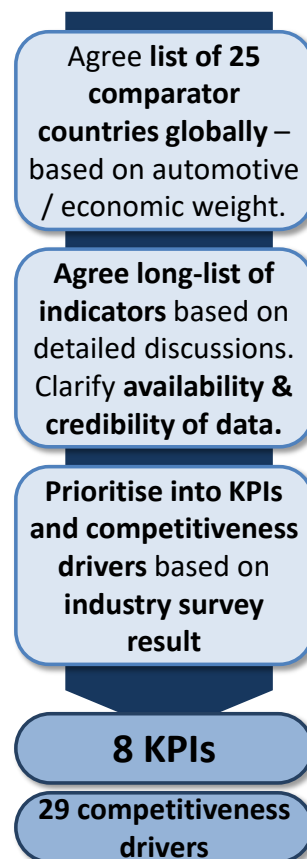


Figure 13

¹ See Appendix C

3. A survey of companies² in the automotive sector to generate a short list of KPIs from the long-list of identified indicators, based on priority in influencing investment decisions in:
 - manufacturing parts and vehicles, and
 - research and development

This approach allowed us to identify the top KPIs affecting global investment decisions, and therefore the UK's position against them, together with a longer list of critical factors to maintain the UK as a competitive candidate for investment.

Our goal is to be among the best in Europe and to compete with the best in the world. Therefore, for each KPI, the UK's performance is rated twofold using a traffic light system: against other countries in the EU Customs Union, and against countries worldwide.

- **Green** – where the UK is in the top 30% (broadly top three) in the EU Customs Union/top 20% (top five) globally;
- **Amber** – where it is above average; and
- **Red** – where the UK's performance is below average – and so requiring urgent action wherever possible

² See Appendix B

Appendix B: Findings – survey of industry’s perceptions of the UK

“Using your professional judgement, please rank the importance and perception of the factors listed below (low/med/high), in terms of influencing decisions to invest in the activity/activities most relevant for your company in the UK.”

To further validate the benchmark KPIs – and to narrow them down to a shorter list – a survey was developed to gather feedback on decision-making criteria used in industry, and to gain insight into potential investors’ perceptions of the UK’s performance.

Participants were surveyed on all KPIs – and the list was then narrowed down to eight KPIs and 30 ‘competitiveness drivers’.

The survey covered two types of investment location decision:

- Manufacture of vehicles and parts
- R&D

The survey results are based on detailed responses from fifty automotive companies active in the UK, including the major vehicle manufacturers and players in the supply chain, companies engaged in significant R&D, and a selection of smaller but active companies.

The summarised results of the survey are shown in Appendix A.

Figure 14a: Survey results ordered by importance

2018

IMPORTANCE

Max	4.27
Min	2.50
0.3 Bottom 0.3	3.03
0.6 Bottom 0.6	3.56

R&D

Availability of skilled engineers	1		4.27
Investment in R&D by government	2		3.85
Government strategic engagement	3		3.81
Political stability	3		3.81
R&D tax relief	5		3.73
Accessibilitiy of incentives	5		3.73
Labour flexibility	7		3.69
Availaibility of skilled operators	8		3.65
University / Industry collaboration	9		3.62
Infrastructure	10		3.50
Energy Cost	11		2.77
Business rates	12		2.69
Capital allowances	13		2.65
Corporation tax	14		2.50

PERCEPTION

Max	3.38
Min	1.85
0.3 Bottom 0.3	2.31
0.6 Bottom 0.6	2.77

Availability of skilled engineers	12		2.31
Investment in R&D by government	6		2.88
Government strategic engagement	3		3.15
Political stability	9		2.69
R&D tax relief	4		3.08
Accessibilitiy of incentives	4		3.08
Labour flexibility	2		3.27
Availaibility of skilled operators	10		2.65
University / Industry collaboration	1		3.38
Infrastructure	8		2.85
Energy Cost	14		1.85
Business rates	11		2.35
Capital allowances	13		2.27
Corporation tax	6		2.88

2018

IMPORTANCE

Max	4.59
Min	2.86
0.3 Bottom 0.3	3.38
0.6 Bottom 0.6	3.90

Manufacturing

Availabilitiy of skilled engineers	1		4.59
Availaibility of skilled operators	2		4.32
Labour flexibility	3		4.23
Labour productivity	4		4.18
Accessibilitiy of incentives	4		4.18
Government strategic engagement	6		4.09
Infrastructure	6		4.09
Political stability	8		4.00
Transport cost	9		3.77
Energy cost	10		3.73
Hourly Labour cost	11		3.50
Busines rates	12		3.18
Capital allowances	12		3.18
Corporation tax	14		2.86

PERCEPTION

Max	3.64
Min	1.73
0.3 Bottom 0.3	2.30
0.6 Bottom 0.6	2.87

Availabilitiy of skilled engineers	8		2.45
Availaibility of skilled operators	7		2.68
Labour flexibility	1		3.64
Labour productivity	2		2.91
Accessibilitiy of incentives	5		2.73
Government strategic engagement	5		2.73
Infrastructure	4		2.77
Political stability	14		1.73
Transport cost	9		2.41
Energy cost	12		2.18
Hourly Labour cost	9		2.41
Busines rates	13		2.05
Capital allowances	11		2.32
Corporation tax	3		2.82

Figure 14b: Survey results ordered by perception of the UK's strength

2018

IMPORTANCE

Max	4.27
Min	2.50
0.3 Bottom 0.3	3.03
0.6 Bottom 0.6	3.56

R&D

University / Industry collaboration	9	3.62
Labour flexibility	7	3.69
Government strategic engagement	3	3.81
R&D tax relief	5	3.73
Accessibility of incentives	5	3.73
Investment in R&D by government	2	3.85
Corporation tax	14	2.50
Infrastructure	10	3.50
Political stability	3	3.81
Availability of skilled operators	8	3.65
Business rates	12	2.69
Availability of skilled engineers	1	4.27
Capital allowances	13	2.65
Energy Cost	11	2.77

PERCEPTION

Max	3.38
Min	1.85
0.3 Bottom 0.3	2.31
0.6 Bottom 0.6	2.77

University / Industry collaboration	1	3.38
Labour flexibility	2	3.27
Government strategic engagement	3	3.15
R&D tax relief	4	3.08
Accessibility of incentives	4	3.08
Investment in R&D by government	6	2.88
Corporation tax	6	2.88
Infrastructure	8	2.85
Political stability	9	2.69
Availability of skilled operators	10	2.65
Business rates	11	2.35
Availability of skilled engineers	12	2.31
Capital allowances	13	2.27
Energy Cost	14	1.85

2018

IMPORTANCE

Max	4.59
Min	2.86
0.3 Bottom 0.3	3.38
0.6 Bottom 0.6	3.90

Manufacturing

Labour flexibility	3	4.23
Labour productivity	4	4.18
Corporation tax	14	2.86
Infrastructure	6	4.09
Accessibility of incentives	4	4.18
Government strategic engagement	6	4.09
Availability of skilled operators	2	4.32
Availability of skilled engineers	1	4.59
Transport cost	9	3.77
Hourly Labour cost	11	3.50
Capital allowances	12	3.18
Energy cost	10	3.73
Busines rates	12	3.18
Political stability	8	4.00

PERCEPTION

Max	3.64
Min	1.73
0.3 Bottom 0.3	2.30
0.6 Bottom 0.6	2.87

Labour flexibility	1	3.64
Labour productivity	2	2.91
Corporation tax	3	2.82
Infrastructure	4	2.77
Accessibility of incentives	5	2.73
Government strategic engagement	5	2.73
Availability of skilled operators	7	2.68
Availability of skilled engineers	8	2.45
Transport cost	9	2.41
Hourly Labour cost	9	2.41
Capital allowances	11	2.32
Energy cost	12	2.18
Busines rates	13	2.05
Political stability	14	1.73

Appendix C: Sources of data

Wherever possible, data has been gathered from readily available sources.

Global Innovation Index (Cornell University, INSEAD, World Intellectual Property Organisation)

<https://www.globalinnovationindex.org>

- University/industry research collaboration
- GERD performed by business
- Information and communications infrastructure
- PISA scales in reading, maths and science

Global Competitiveness Report (World Economic Forum)

<http://www.weforum.org/reports/global-competitiveness-report-2014-2015>

- Gross tertiary enrolment
- Cooperation in labour – employee relations
- Labour flexibility
- Infrastructure (roads, railroad, ports, electricity supply, quality of electricity supply)
- Burden of government regulation

UNESCO Institute for Statistics

<http://www.uis.unesco.org/>

- Graduates in Science and Engineering
- Graduates in Engineering, Manufacturing and Construction
- Gross secondary enrolment
- GERD performed by government

OECD

<http://stats.oecd.org/>

- GDP/hour worked
- Business rates (4100 recurrent taxes on immovable property)

Eurostat (European Commission)

<http://ec.europa.eu/eurostat>

- Productivity in automotive
- Gas price
- Electricity price
- Qualifications in industrial workers

World Bank

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

- Diesel cost
- Manufacturing value added
- Worldwide governance indicators (www.govindicators.org)

US Bureau of Labour Statistics

<http://www.bls.gov/bls/blswage.htm>

- Hourly compensation costs in manufacturing

KOF Swiss Economic Institute

<http://globalization.kof.ethz.ch/>

- Index of Globalisation

Transparency International

<http://www.transparency.org/research/cpi/overview>

- Corruption Perceptions Index

KPMG tax tools and resources

<http://www.kpmg.com/global/en/services/tax/tax-tools-and-resources/pages/corporate-tax-rates-table.aspx>

- Corporation tax rates

Ernst and Young tax Global Tax Guide

<http://www.ey.com/GL/en/Services/Tax/Worldwide-Corporate-Tax-Guide---Country-list>

- Capital allowances

OICA (Organisation Internationale des Constructeurs d'Automobiles)

<http://www.oica.net/category/production-statistics/>

- Production volume
- Production growth (calculated based on 2010 production volume)

A Damodaran, Stern school of Business

http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

- Country Risk Premium

PwC (PricewaterhouseCoopers) – Survey conducted on behalf of Automotive Council UKIC

Further information/details of data derivation available on request

- R&D tax relief for large and small companies

Where different currencies are used in the report, these are as used in the source data – no additional exchange assumptions have been made.

All information correct as taken from source at the time of writing.