Patently Absurd

Why Britain Is No Longer an Innovation Nation

By Ayushma Maharjan

Centre for Policy Studies

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About the Author

Ayushma Maharjan is a researcher at the Centre for Policy Studies. She holds a Master's degree in Public Policy from the University of Oxford. Ayushma began her career at Samriddhi Foundation, a Nepal-based free market think tank, where she contributed to policy research and advocacy initiatives. Her work primarily focused on improving the business and investment climate, strengthening public financial management, and promoting better governance.

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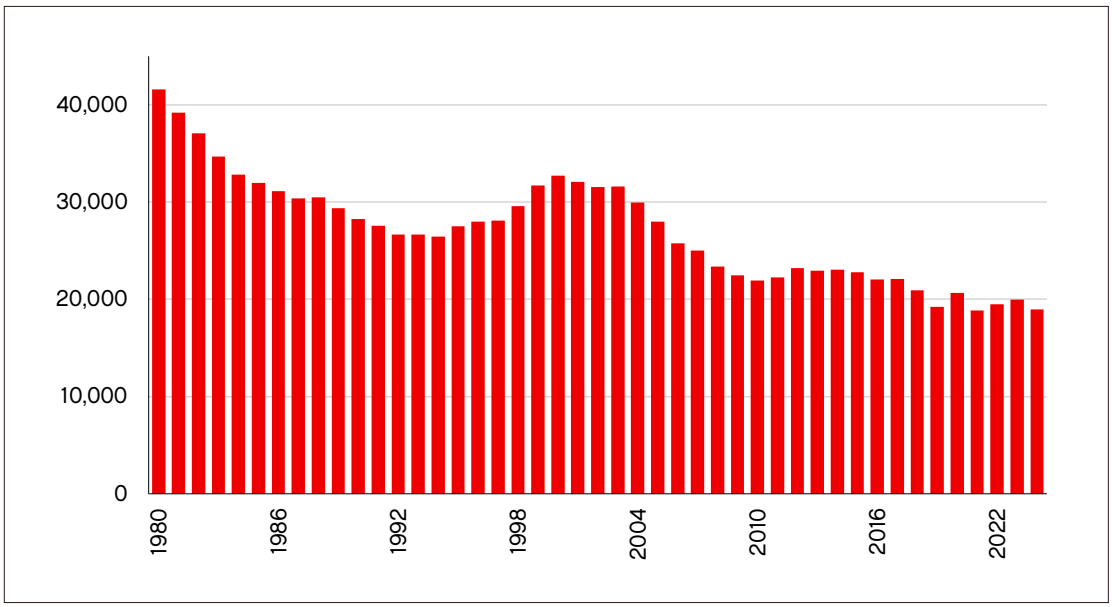
Introduction

British scientists, inventors and entrepreneurs were at the heart of the Scientific and Industrial Revolutions upon which modern civilisation is built. Right up until the 1940s, Britain was still in many ways the most scientifically and technologically advanced society in the world. And in the decades since the Second World War, the dream of restoring Britain's prowess in scientific and technological innovation has been a constant theme of British politics, animating figures as diverse as Harold Wilson and Dominic Cummings.

Those calling for an innovation renaissance have rarely been short of ambition. Under the last Government, the aim was to make the UK a science and technology superpower by 2030.[1] Most recently, the Tony Blair Institute called for science and technology to become part of the UK's 'new national purpose'.[2]

Total number of patent applications filed in the United Kingdom



Source: World Intellectual Property Organisation

In many ways, this vision is more urgent than ever. But at the same time, it also looks wildly optimistic. The data in this report shows that the UK's relevance in the global innovation economy is slipping fast: patent filings have fallen, and innovation output has flatlined, especially in the sectors likely to be crucial to economic growth.

1 Boris Johnson, 'We are injecting funds to restore Britain's status as a scientific superpower', *The Telegraph*, June 2021 Link

2 Tony Blair Institute, 'A New National Purpose: Reimagining UK Science and Technology Through Lovelace Disruptive Invention Laboratories', November 2025 Link

- The average number of patents filed annually with the UK Intellectual Property Office (UKIPO) has declined from roughly 29,000 in 1990s to 21,000 post-2010, even as filings in South Korea, the United States, Singapore and China have multiplied several times over

- In 2000, the UK produced 727 patent applications per million people. Today, that figure has fallen to 677, a 7% decline

- Despite world-class universities and a strong science base, Britain produces fewer patents per person than most major economies, including France, Germany, Sweden, and the United States

- Foreign inventors now file 61% fewer patents in Britain than in 1980 — a sign that global firms no longer see the UK as a key market to protect innovation

- Technology-related patents have remained virtually flat for two decades, even as global filings have surged

- The UK has fallen out of the world's top five in the Global Innovation Index for the first time in over a decade

'The UK's relevance in the global innovation economy is slipping fast: patent filings have fallen, and innovation output has flatlined'

This paper will argue that the core problem is not the quality of UK institutions or the amount of R&D spending, but a failure to translate research into commercial success.

- Only 69% of R&D in Britain is performed by businesses, compared with nearly 80% in the United States, South Korea and China

- In leading innovation economies, businesses tend to spend between $7 and $9 on research for every dollar spent within higher education. In the UK, the figure stands at $2.90

Successive governments have launched new R&D funds, tax credits, industrial and innovation strategies. Yet business participation in innovation keeps falling. The problem is deeper: a structural failure of the British innovation system, in which world-class science is undermined by weak industrial diffusion and low commercial confidence.

We argue that Britain doesn't need another paper strategy. It needs to rebuild the conditions that make firms choose to innovate, build, and scale on British soil. Until that changes, the dream of being a 'science and technology superpower' will remain just that.

1) The Decline of British Innovation

From Boris Johnson's pledge to make Britain a 'Science and Tech Superpower by 2030', to Rishi Sunak's Science and Technology Framework,[3] and now Keir Starmer's Digital and Technology Sector Plan[4] backed by an industrial strategy[5], every recent administration has declared innovation to be central to national renewal.

For the most part, this conviction rests on a familiar confidence that Britain's world-class universities, rich research base, and long history of invention naturally position it to lead the next technological revolution. As the Science, Innovation and Technology Secretary Liz Kendall recently put it, 'in science and technology, Great Britons have led the world. Pushing the boundaries of human knowledge and endeavour… and creating the jobs and opportunities on which so many of us rely'. She went on to announce £86 billion in research and development (R&D) spending until 2029/30 to back 'brilliant universities and companies… so they continue to lead the world'.[6]

'Patent activity, which is one of the key indicators of technological dynamism, shows that Britain is faltering, with a widening gap to faster-moving economies'

But are they actually leading the world? In 2025, for the first time in 13 years, the United Kingdom slipped out of the world's top five in the Global Innovation Index.[7] And the evidence from the patent system, on which this report will focus, tells a very different story from politicians' rosy words.

Patent activity, which is one of the key indicators of technological dynamism, shows that Britain is faltering, with a widening gap to faster-moving economies.[8] And by clinging to previous successes and overstating its research capabilities, Britain risks ignoring the policies needed to rebuild its innovation engine for the modern era.[9]

3 Department for Science, Innovation and Technology, 'UK Science and Technology Framework', March 2023 Link
4 Department for Business and Trade, 'Digital and Technologies Sector Plan', June 2025 Link
5 Department for Business and Trade, 'The UK's Modern Industrial Strategy', June 2025 Link
6 Science, Innovation and Technology Secretary Liz Kendall's Speech at Labour Party Conference 2025 Link
7 World Intellectual Property Organization, 'Global Innovation Index 2025', Link
8 SCI, 'Fall off in overseas patent filing is impacting UK economic growth warns CIPA', August 2024 Link
9 UK Parliament, 'Written evidence submitted by the Council on Geostrategy (SDY0023), May 2025 Link

Why patents matter

Patents, a widely used proxy for innovation activity, provide legally enforceable protection for inventions that are novel, and capable of industrial application.[10] In exchange for this limited-time protection, inventors must publicly disclose technical details of their invention. This makes patents a valuable and transparent record of new technological knowledge.

Of course, patents do not measure innovation in its fullest sense, because innovation ultimately requires successful commercialisation. But they do capture invention: the point at which R&D is translated into a clearly defined, legally recognised technological asset.[11] A country's patent stock therefore tells us about its technical capabilities, its ability to capture returns from R&D, and firms' expectations about future commercial value.

That said, patent data has certain limitations.[12] Not all innovation is patented as firms can rely on trade secrets. In highly litigious jurisdictions, such as the United States, strategic patenting, patent thickets and trolling can inflate patent counts without reflecting genuine inventive activity. Patent data must therefore be interpreted with care.

Despite being an imperfect proxy, patents send a broader signal. While many market leaders engage in strategic patenting to block competitors, aggregate patenting activity is still positively correlated with indicators of technological progress,[13] including new product introductions, technical improvements, and R&D intensity.[14]

Some studies have shown that winners in the patent race are 14% more likely to conduct follow-on research and about 11% more likely to pursue related innovations, while losers are still likely to invent around the protected technology.[15] So trends in patenting do contain useful information about the technological engagement and direction of a given industry or country. In this context, declining patent activity in a country with a strong scientific base and a high-quality patent regime, such as the UK, points to a shift in country's participation in technological progress, and/or weaker expectations that domestic research will translate into scalable, commercially viable innovation.

Accordingly, patent numbers, when analysed alongside R&D spending, sectoral dynamics and firm behaviour, offer a valuable insight into the health of the innovation system.[16]

10 Enterprise Research Centre, 'Doing innovation. Creating value from innovation: How does IP protection help? A UK analysis with a focus on smaller firms', February 2023 Link

11 Simon Apartis, et al. 'Open Science Impact Indicator Handbook' 2024 Link

12 Enterprise Research Centre, 'Doing innovation. Creating value from innovation: How does IP protection help? A UK analysis with a focus on smaller firms', February 2023 Link

13 David Argente, et al., 'Patents to Products: Product innovation and firm dynamics', March 2023 Link

14 Matt Clancy, 'Patents (Weakly) Predict Innovation', April 2024 Link

15 Neil C. Thompson and Jeffery M. Kuhn, 'Does winning a patent race lead to more follow-on innovation?', February 2026 Link

16 Josef Taalbi, ' Innovation with and without patents - an information-theoretic approach', Scientometrics. August 2025 Link

Diminishing global innovation relevance

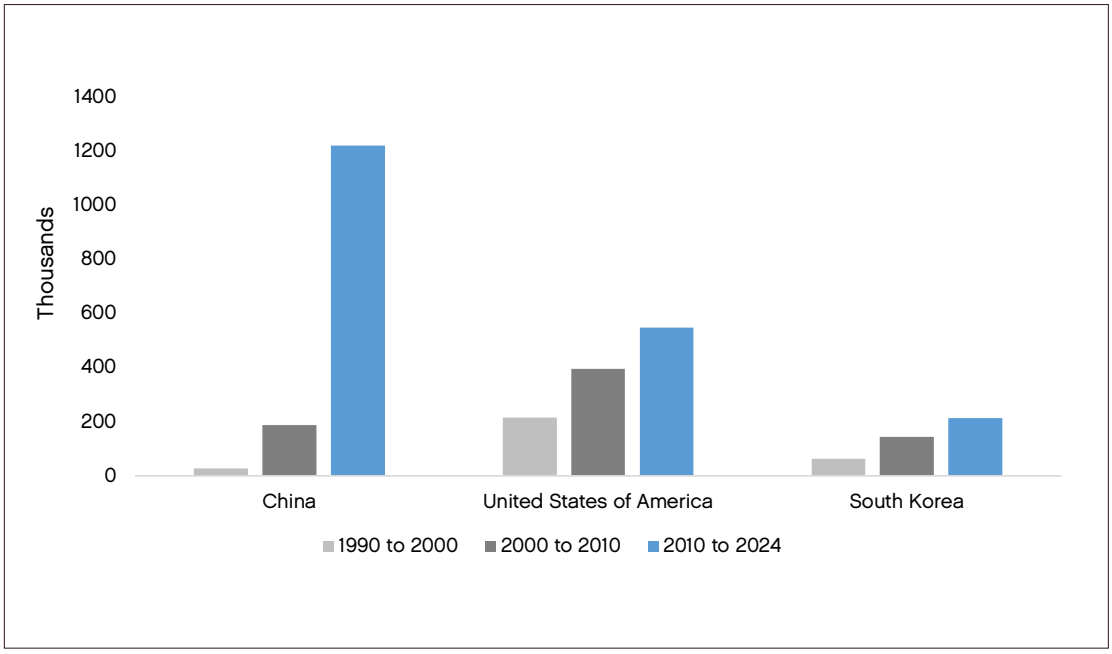
Patent filings in the UK Intellectual Property Office (UKIPO) by British as well as foreign residents demonstrates how central Britain is within the global innovation ecosystem. The more inventors seeking patent protection in the UK, the more commercially and technologically relevant it is perceived to be.

‘Between 1990 and 2005, roughly 29,000 patents were filed annually at the UK Intellectual Property Office. Between 2010 and 2024, filings fell to an average of 21,000 per year. Meanwhile, filings have continued to rise sharply in the US and across major Asian economies’

By this test, the UK’s position is eroding. Between 1990 and 2005, roughly 29,000 patents were filed annually at the UKIPO. Between 2010 and 2024, however, filings fell to an average of 21,000 per year. And the 1990-2005 figure was itself sharply down on the levels back in the 1980s.

The fall in UK patent filings is especially notable since filings have continued to rise sharply in the United States and across major Asian economies.

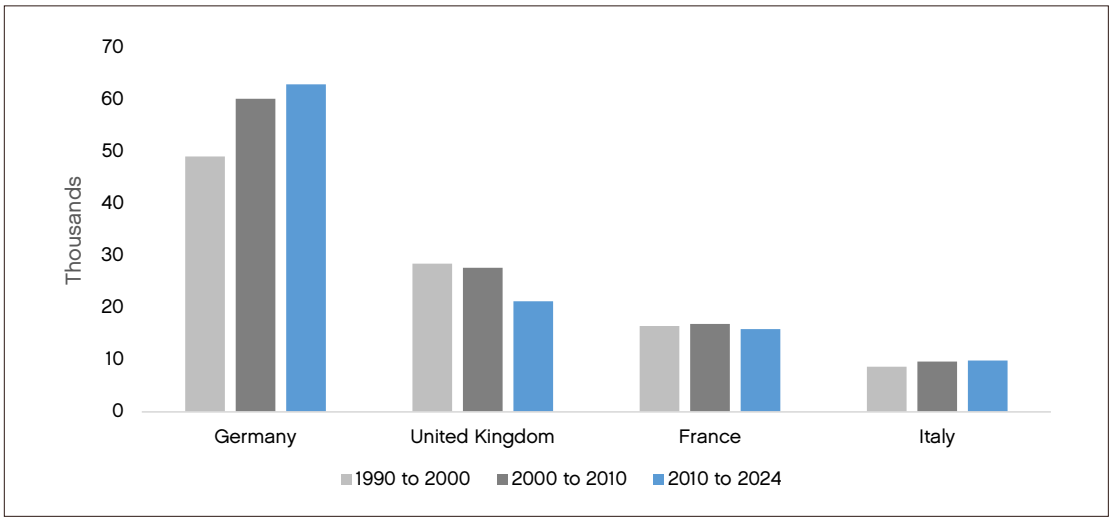
Average annual patent filings in China, United States and South Korea



Source: World Intellectual Property Office

Even within Europe, Germany has managed to increase its number of filings, while France and Italy have more or less held steady. Among major economies, the decline is uniquely British.

Average annual patent filings in major European countries



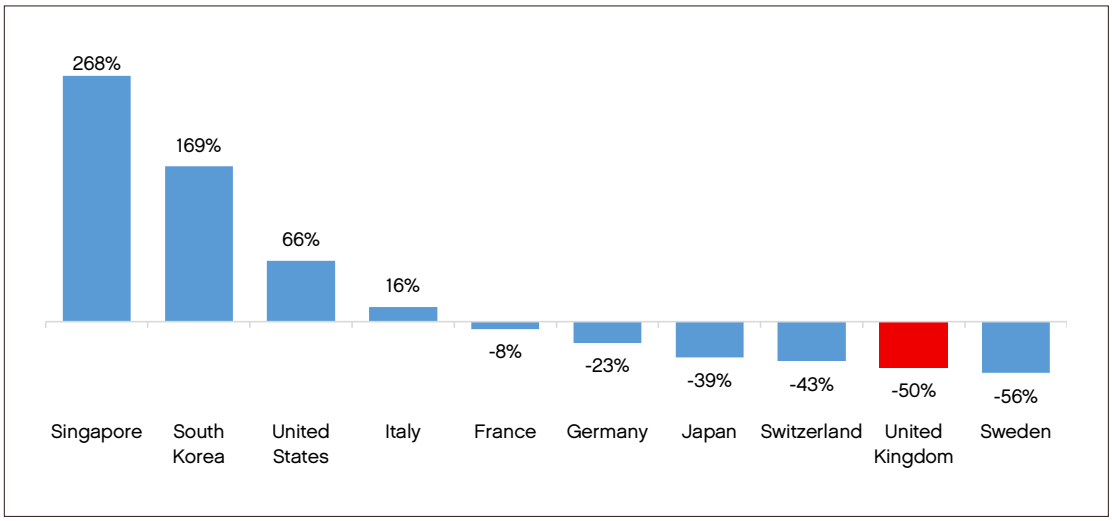
Source: World Intellectual Property Office

It is also worth pointing out that patent offices accept applications from both domestic residents and foreign applicants. Resident filings reflect the inventive activity generated within a country, while foreign filings reflects the perceived attractiveness of a jurisdiction as a place in which to seek patent protection.

A decline in foreign filings indicates that overseas firms have weaker expectations that their technologies will be copied, competed against, or commercially challenged within a jurisdiction. As mentioned above, technologically competitive countries exhibit high levels of domestic and foreign patenting.

By contrast, the UK has experienced a decline across both indicators. Britain is now the only G7 economy where patent filings by resident inventors are below 1980s levels, down 43%. Since 2000, many advanced economies, especially European, have seen some decline in resident filings, but the UK's contraction is among the most severe.

Change in resident filings in 2024 compared to 2000

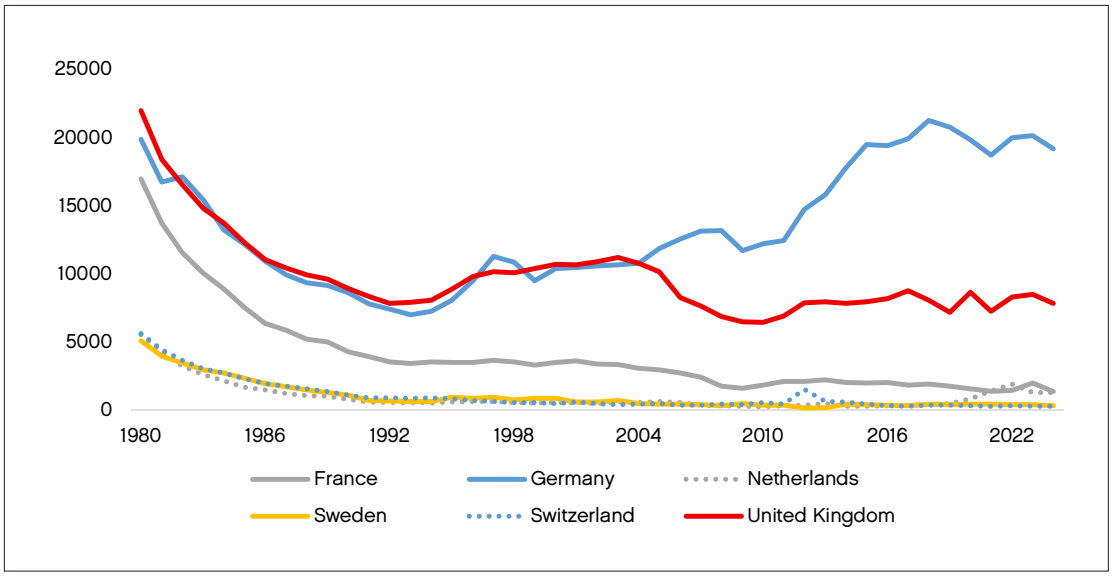


Source: World Intellectual Property Office

The erosion in patent filings by foreign inventors is even more telling. Foreign patent applications in the UK are now 61% lower than in 1980 – a clear signal that the UK is losing relevance as a market worth protecting intellectual property in. Canada, with a smaller population and economy, attracted almost four times as many foreign patent applications as the UK in 2024 (31,070 versus 7,847). Singapore, smaller than London in terms of both population and GDP, drew over 11,000 foreign filings.

To be sure, the UK decline is part of a broader European trend. Foreign filings have fallen in France, the Netherlands, Sweden, and Switzerland, with only Germany achieving a modest gain. Yet this is a low bar: for a country that really wants to be a scientific superpower, matching European stagnation should not be the goal.

Patent filings by non-residents in major European countries



Source: World Intellectual Property Office

This tendency is reflected by the falling number of patents, of all kinds, that were seeking protection directly in the UK market, rather than internationally. In the period 1990-2005, this stood at 97%. More recently, it has dropped to 90%.

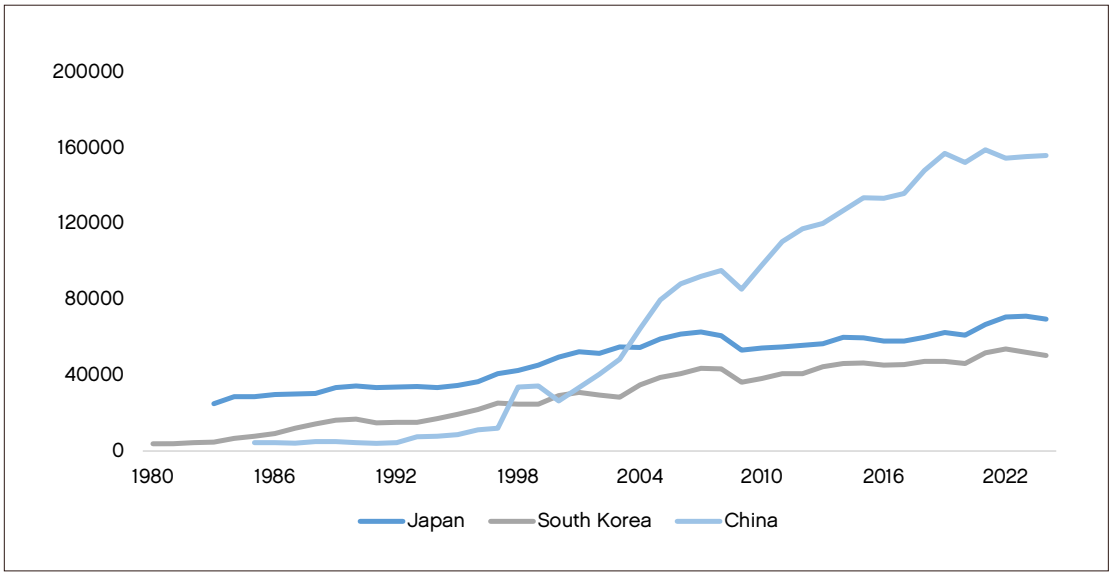
This trend should be concerning to the UK, because patent filing decisions reflect firms' assessments of where protection will deliver commercial value. According to the World Intellectual Property Office (WIPO), major innovation hubs and large markets attract high levels of foreign and multi-jurisdictional filings.[17] In other words, people tend to file for patents in key markets with good growth prospects, strong competition or where the innovation is actually taking place.[18] Lower levels of direct filing could therefore indicate declining importance of the UK as a venue for innovation and commercialisation.

17 WIPO, 'World Intellectual Property Indicators 2025: Highlights', 2025 Link

18 Asia IP, 'In which markets should you file for patent protection?', July 2025 Link

And while Britain, and Europe, have drifted, the innovation centres of Asia and North America are surging ahead. In South Korea, foreign patent filings grew from under 2,000 in the 1980s to nearly 200,000 in the 2020s. Japan, despite an overall decline in total filings, saw foreign applications rise from around 50,000 per year in the 2000s to over 70,000 after 2020. Likewise, in the United States, foreign filings increased by more than 650% over the same period.

Patent filings by non-residents in major Asian countries



Source: World Intellectual Property Office

The decline is all the more alarming given that UKIPO is regarded as one of the most efficient and high-quality patent offices. UKIPO typically grants patents within two to three years, compared to three to five years at the European Patent Office. (It is worth pointing out here that patents have always been managed on a national basis, so were unaffected by Brexit: the UK remains a member of the EPO, as are other non-EU members such as Turkey and Switzerland.)

Filing and examination fees are also substantially lower, making the UK one of the most cost-effective jurisdictions for first filings. In 2025, the UKIPO was ranked as the top global IP office for service quality and innovation by the World Trademark Review, reflecting strong digital capabilities, SME support, and good dispute resolution mechanisms.[19] Patent practitioners commonly advise applicants to file nationally in the UK as a first step,[20] citing the office's efficiency, quality of examination, and patentee-friendly procedures.[21] So it is all the more alarming that fewer and fewer are doing so.

19 World Trademark Review, 'EUIPO and UKIPO ranked most innovative IP offices in the world', December 2025 Link

20 Mathys & Squire, 'Patent protection in Europe: Reasons to file nationally in the UK', March 2022 Link

21 Reddie & Grose, 'Where should I first-file my patent application?', November 2025 Link

Stagnant innovative output

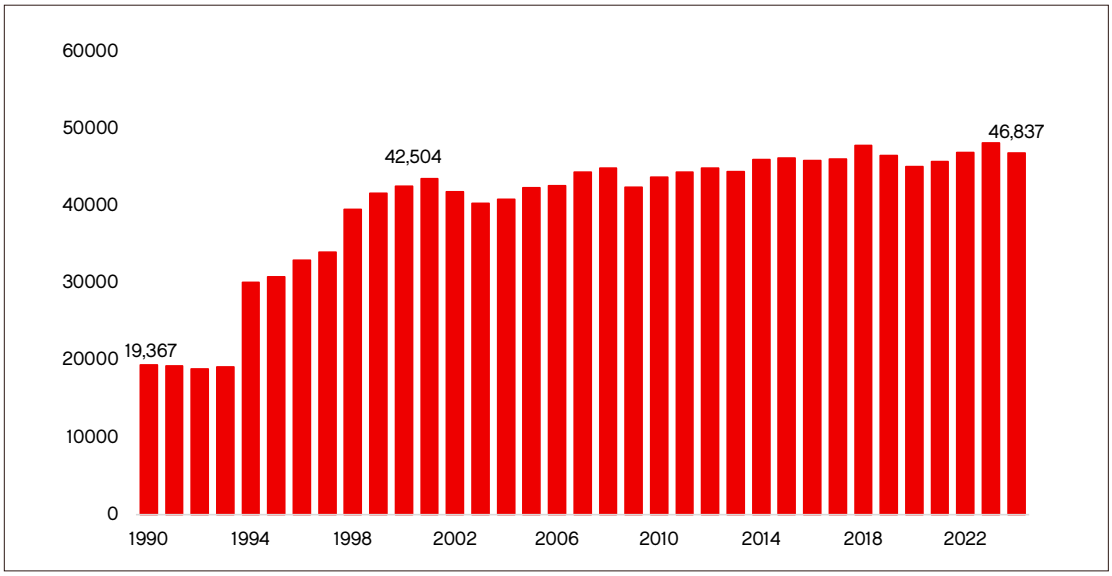
Over the past two decades, the UK's innovation output has remained flat even as other major economies have multiplied theirs several times over — a divergence that demonstrates the UK's shrinking weight in the global innovation economy.

We can demonstrate this conclusively by digging into how many new inventions have been patented by British citizens, firms, or institutions, both within the UK and globally. Patent filing data by inventor's country of origin gives us a stock of new inventions generated by British citizens and residents.

In 1990, there were 19,367 patent applications (worldwide) with ideas that originated in Britain. By 2000, that figure had more than doubled to 42,504 – a 120% rise, representing annual growth of around 4%.

But this increase was not what it seemed. In the mid-1990s, there was a change across Europe in the statistical treatment of international patent filings, which saw previously uncounted patenting activity became visible in national totals. Sure enough, by 2024, the UK total had crept up to just 46,837 – a mere 10% increase over more than two decades.

Total number of patent worldwide applications filed by UK inventors



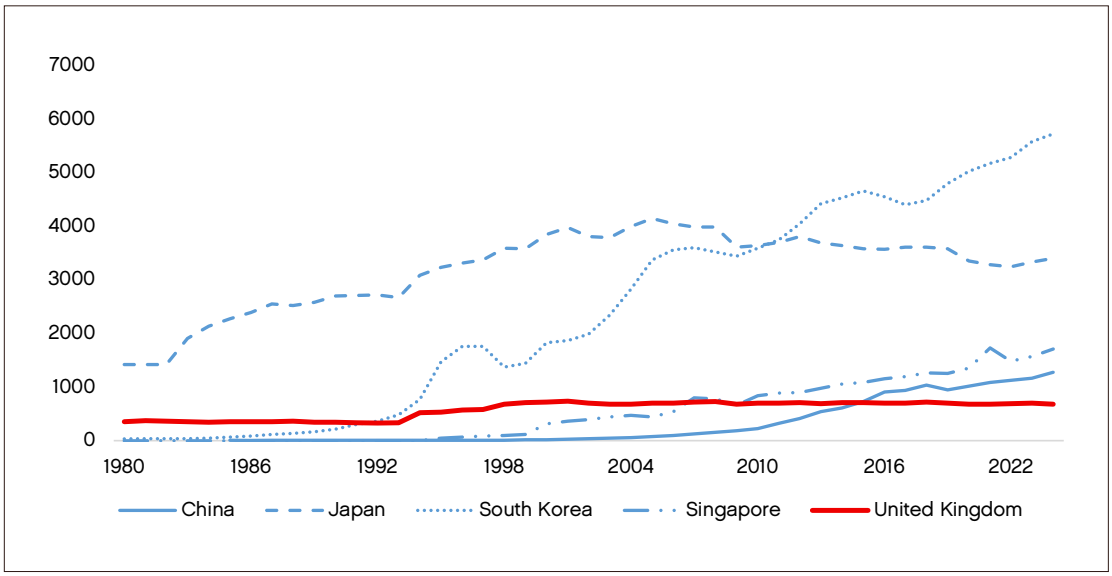
Source: World Intellectual Property Office

By contrast, over the same period, total patent filings increased by 80% among US citizens, 155% in Switzerland, 245% in South Korea, 718% in Singapore, and an extraordinary 6,000% in China.

Britain's innovation slowdown becomes even more clear when viewed on a per capita basis. In 2000, there were 727 patent applications originating from the UK per million people. Today, that figure has fallen to 677, a 7% decline. No major economy, except Japan, has seen a similar drop.

Countries that were once far behind Britain in technological capacity have surged ahead. On a per capita basis, China files 90% more patents than the UK. In Singapore, that figure rises to 150%; in Japan 400%; and in South Korea, an extraordinary 745%.

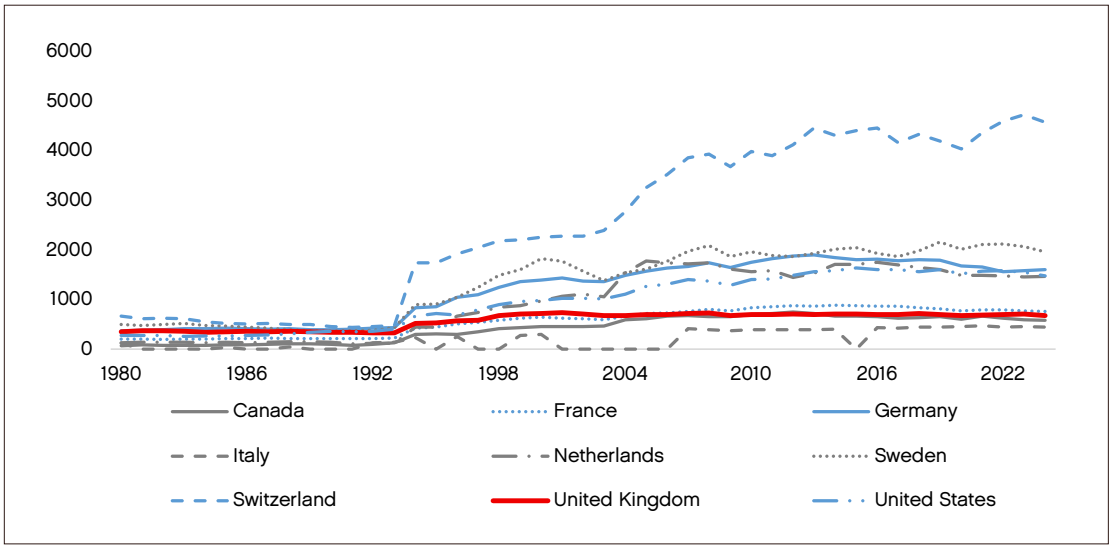
Patent applications by country of origin, per million inhabitants (Asia vs UK)



Source: World Intellectual Property Office

The story is similar across advanced Western economies. Americans file roughly twice as many patents per capita as Britons, Swedes nearly three times as many, and the Swiss almost seven times as many.

Patent applications by country of origin, per million inhabitants (West vs UK)



Source: World Intellectual Property Office

Whichever way you slice the data, it is clear Britain is losing the innovation race.

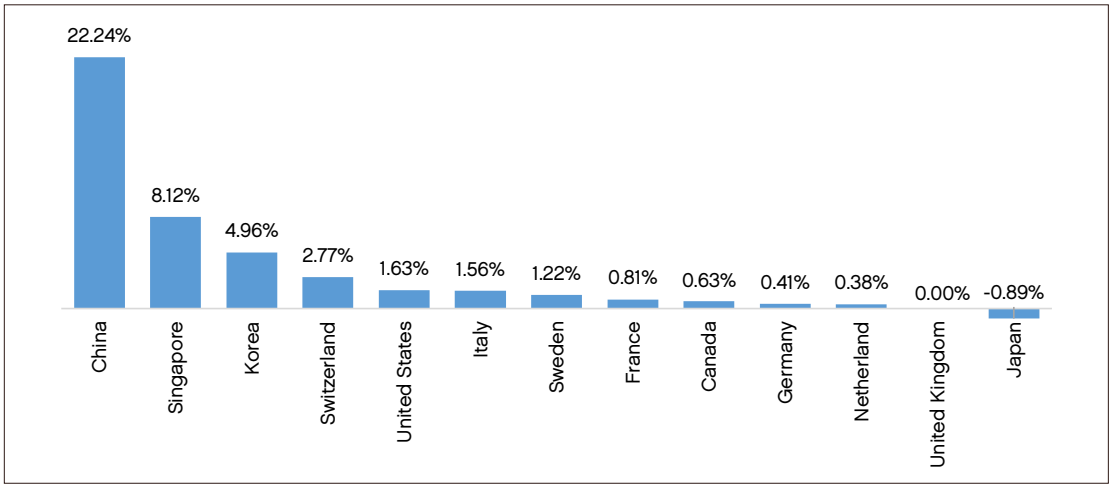
2) Britain is Falling Behind in the Technology Race

In the previous section, we showed that Britain's overall patent performance is alarmingly weak. But of course, not all patents are equal. What should particularly alarm policymakers is Britain's weak performance in high-technology areas.

Patent publications classify patent applications into specific domains, such as pharmaceuticals, computer technologies, artificial intelligence, or chemicals, using standard international taxonomies. This disaggregation enables an assessment of sectoral innovation and patterns of technological specialisation across countries and firms.

Alarmingly, patent publications in these advanced sectors have remained virtually flat over the last two decades. From 2000 to 2005, the UK published an average of 36,096 technology-related patents annually. From 2018 to 2023, that figure stood at 36,069. While this is a modest decline in absolute terms, it is a striking one in terms of relative performance. Over the same period, the global volume of technological patent publications increased many-fold, with countries such as China, Singapore, and South Korea expanding at record pace.

Annual average growth rate in total technology-related patent publications (2000 to 2023)



Source: World Intellectual Property Office

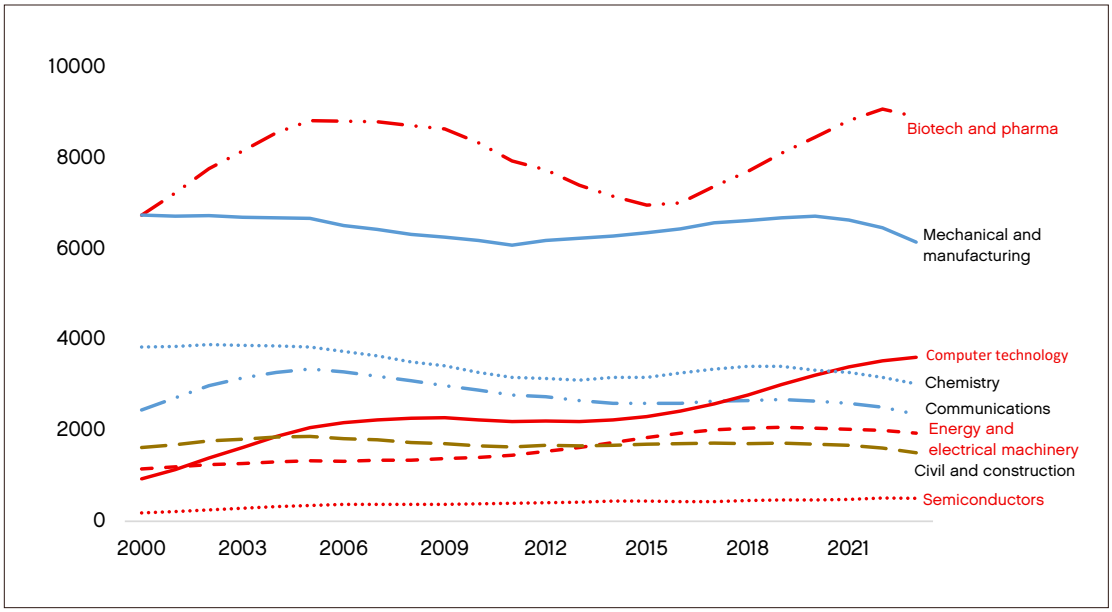
This patent trend is consistent with broader indicators that point to Britain's weakening position in frontier technology. Notably, no UK-based organisation appears among the top 100 global innovators.[22] The top 100 list consists of companies with larger share of world's most valuable inventions, mostly in fast-moving technological domains such as industrial systems, aerospace and defence, software, electronics and computing, and automotive technologies. The countries hosting the majority of these frontier firms are Japan, the United States, China, Taiwan, South Korea and Germany.

22 Clarivate, 'The Top 100 Global Innovators', January 2026 Link

Japan here is an outlier. Despite declining patenting activity over the past two decades, given broader economic headwinds, it has one of the largest patent publications. This is attributable to the presence of globally dominant and high-quality innovators, who account for 32 of the world's top 100 innovators. However, no such case can be made to defend the UK.

In the UK, decline in technology-related patents are concentrated in core industrial and scientific fields. These include mechanical and manufacturing, chemistry, and civil engineering. This aligns closely with real economy performance in the same sectors. For example, the global market share of UK chemical industry fell by 21.5% between 2022 and 2024,[23] with only a few industries remaining operational. Likewise, UK is no longer among the top 10 manufacturing nation as opposed to its top-five position in 2000s.

Growth of technology-related patent publications



Source: World Intellectual Property Office

Computer technology is one domain in which we have experienced consistent growth in patent publication. Britain is in fact the world's third largest destination for AI investment and home to second largest number of AI start-ups. However, this has not translated to scale-ups or frontier leadership. Among advanced economies, the UK records one of the lowest per-capita patent publication rates in this domain and has no representation among the AI firms with the highest global market capitalisation.[24]

Structural capacity indicators reinforce this gap. The UK, with 120,000 H100-equivalents units, ranks eighth among the top ten countries by total AI compute power. However, this scale is far less compared to approximately 39.7 million units in the United States, 5.1 million in South Korea, and 2.4 million in France.[25] Likewise, the UK hosts only six major AI datacentre clusters, compared with 187 clusters in the United States, 18 in France, 13 in South Korea, and 12 in Germany. The UK's AI

23 Chemical Industries Association, 'Why the UK's modern Industrial Strategy should prioritise the chemical industry', December 2024 Link

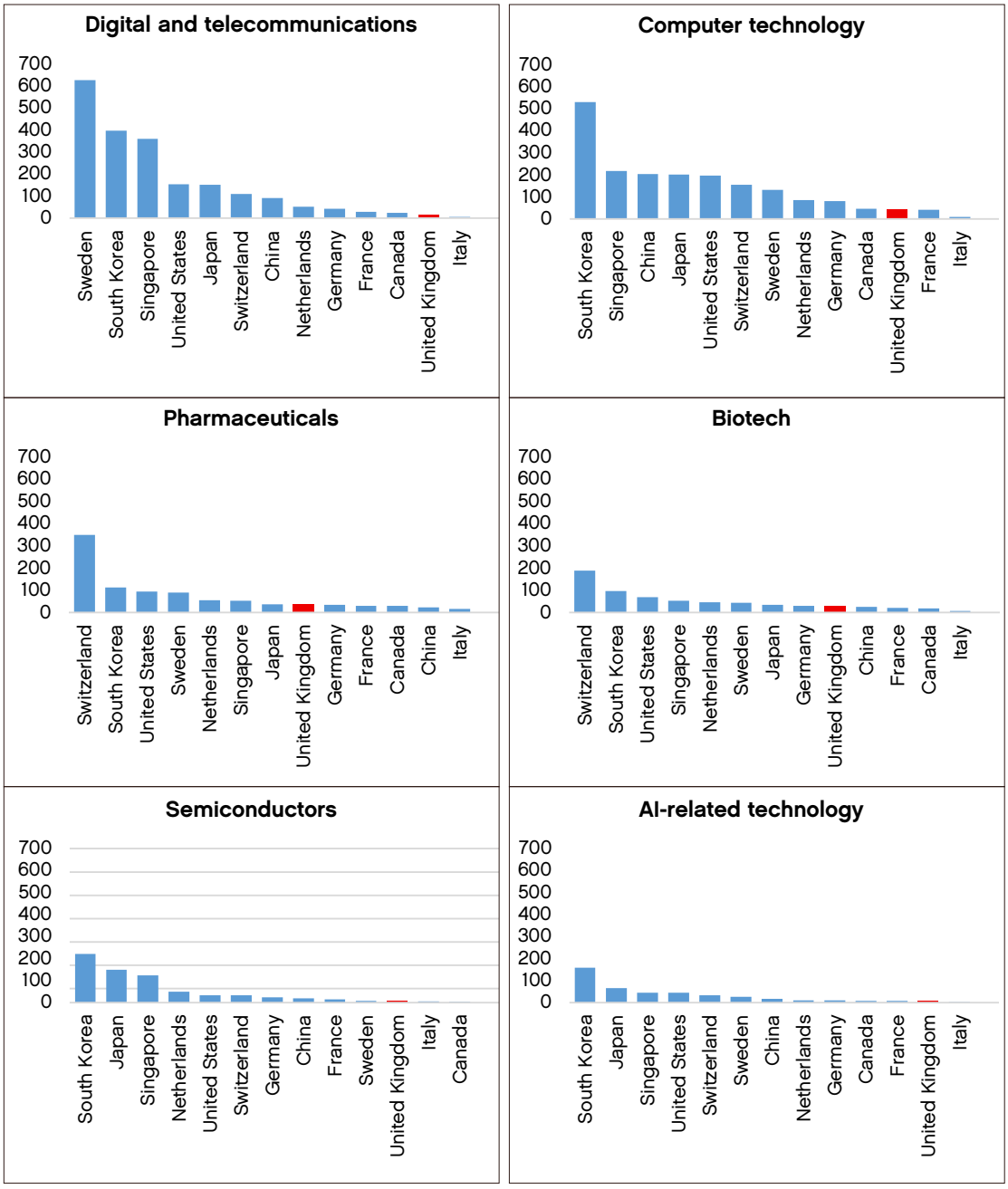
24 Companies Market Cap, 'Largest AI companies by market capitalisation', January 2026 Link

25 Forbes, 'Top 10 AI Nations: Global AI Superpowers Ranked in Industry Report', September 2025 Link

adoption rate by businesses is merely 16% as opposed to over 30% in the United States and South Korea.

The evidence suggests that Britain remains a follower rather than a leader in sectors that are widely thought to define the next wave of economic growth.

Patent publications by technology, per million inhabitants, 2023



Source: World Intellectual Property Office

British innovators are not competing globally

In 2024, UK-based innovators filed 5,878 international patent applications under the Patent Cooperation Treaty (PCT) – the primary route firms use to secure global intellectual property protection. This represents an increase of just 22% since 2000, equivalent to an average annual growth rate of 0.7%. Over the same period, South Korea's PCT filings rose by 1,407%, and China's by an extraordinary 8,861%.

Country	PCT Application by Origin (2024)	Change from 2000
China	70,077	8861%
South Korea	23,848	1407%
Singapore	1,870	742%
Japan	48,421	406%
Switzerland	5,335	167%
France	8,135	97%
Netherlands	4,303	47%
United States	54,152	42%
Germany	16,745	33%
United Kingdom	5,878	22%
Sweden	3,760	22%

France – similar in population and economic size – produced 8,135 PCT filings, around 40% more than the UK. Germany filed nearly three times as many.

The numbers are unambiguous: Britain's innovation performance is weak across all major indicators. At their current pace, Asia and the United States are firmly on the path to becoming the true science and technology superpowers, while Britain risks being left behind.

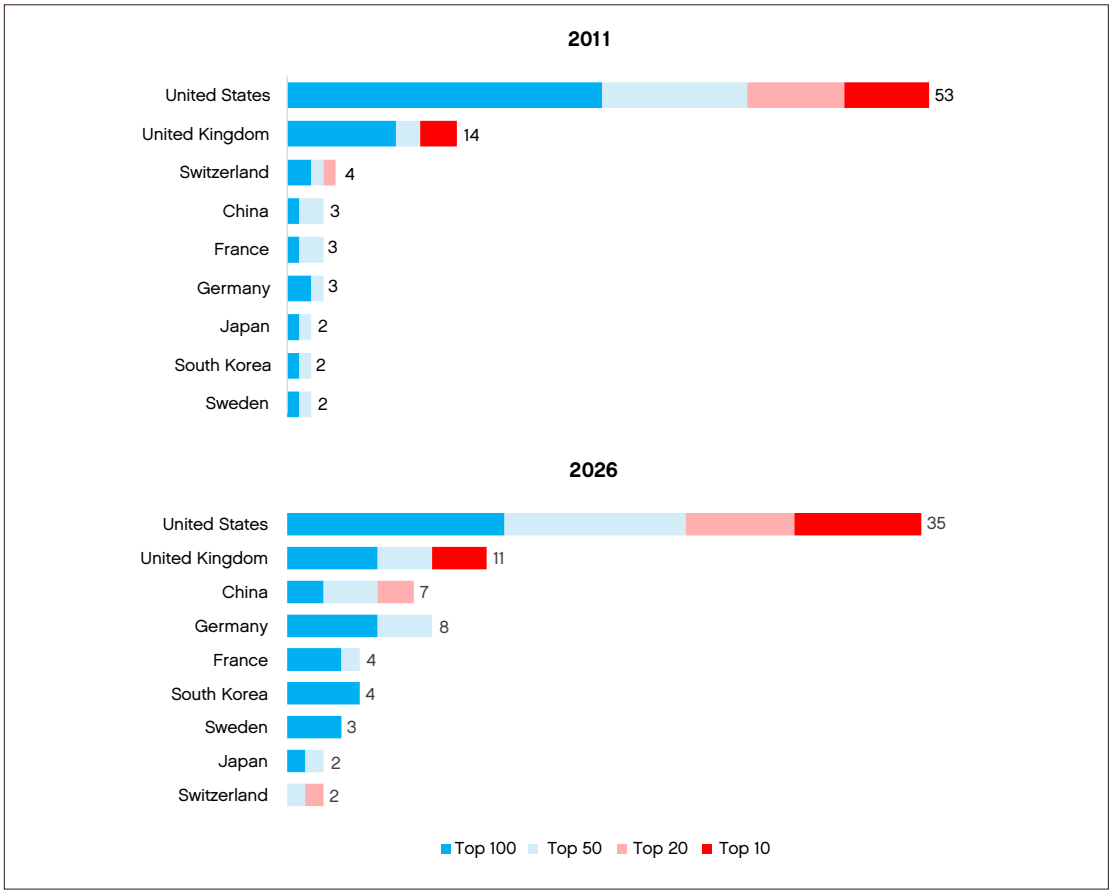
3) What is to Blame for Britain's Innovation Stagnation?

Britain's failures on innovation are especially alarming because of the continuing strength of its primary research output.

With less than 1% of the world's population, the UK still produces 6% of all academic publications.[26] Across a host of scientific fields, UK scientists are among the most-cited researchers in the world.[27] As of 2025, Cambridge produces the highest number of scientific publications per capita globally, followed by Oxford.[28]

Similarly, since 2011, British universities have consistently ranked among the top 10 worldwide, second only to the United States. Adjusted for population, Britain outperforms every major economy.

World university ranking, top 100



Source: Times Higher Education

26 Department for Science, Innovation & Technology, 'International comparison of the UK research base', June 2025 Link

27 Elsevier, 'Updated science-wide author databases of standardized citation indicators', October 2023 Link

28 WIPO, 'Global Innovation Index 2025: Ranking of World's Top 100 Innovation Clusters', 2025 Link

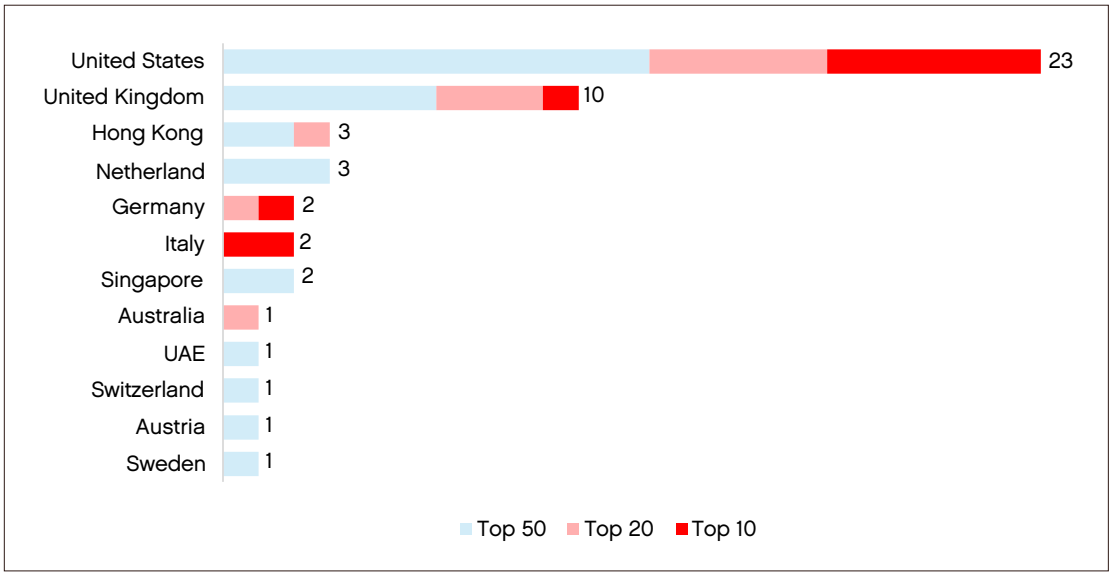
While the number of UK universities in the global top 100 has fallen slightly from 14 in 2011 to 11 in 2026, the country remains a scientific heavyweight in the university sector. The United States and the United Kingdom continue to dominate the global top 20.

Top 100 United Kingdom universities by scientific field

Subject	Top 100	Top 50	Top 20	Top 10
Medical and health	14	8	5	4
Life sciences	11	6	4	2
Physical science	9	5	3	2
Engineering	9	5	3	2
Computer science	7	5	3	3

The dominance of British universities is also highlighted when measured in terms of research quality – citation impact, research strength, and research influence. In 2025, out of the top 50 universities known for their exceptional research quality, 10 were based in the United Kingdom.

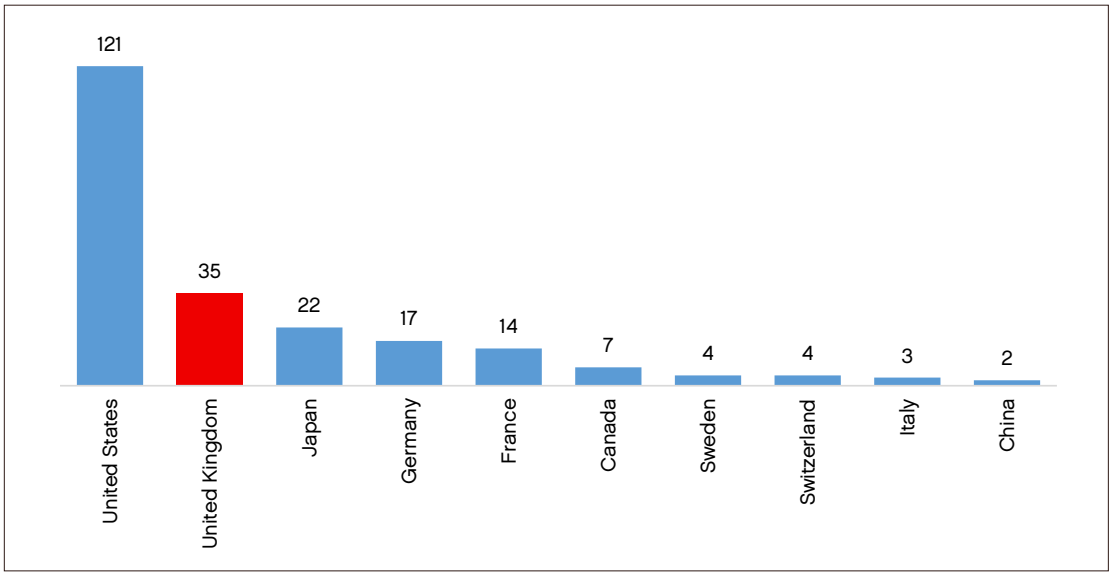
University ranking by research quality, 2025



Source: Times Higher Education

The country's record of STEM Nobel laureates since 2000 further underscores its strength in fundamental research, particularly when adjusted for population.

Nobel prize winners in science, technology, engineering, and mathematics (STEM), 2000 to 2025



Source: The Nobel Prize

However, scientific strength alone does not guarantee economic impact. Innovation emerges not from universities in isolation, but from innovation clusters. These are geographically concentrated ecosystems where universities, R&D-performing firms, entrepreneurs, investors, and skilled workers interact.

These clusters are critical because they enable research to be translated into patents, new firms, and scaled commercial activity. The Global Innovation Index measures and ranks such clusters based on their combined shares of patent filings, scientific publications, and venture capital activity. The 2025 edition of the index found that, while Oxford and Cambridge consistently rank among the world's top five universities, their surrounding regions rank only 77th and 69th respectively out of 100 global innovation clusters.

> **'Despite exceptional research quality, areas such as Oxford and Cambridge lack the density of firms, patenting activity and scale-up formation seen in the growth hubs of the US and Asia'**

This indicates that, despite exceptional research quality, these regions lack the density of R&D-active firms, patenting activity, and scale-up formation seen in leading innovation hubs in the United States and Asia – a gap that indicates persistent weaknesses in the UK's ability to convert research excellence into scalable technologies, sustained patenting, and durable industrial growth, without which ambitions of becoming a science and technology superpower are unlikely to be realised.

So why is the UK such a laggard? The drivers of this outcome are various, and not captured by patent metrics alone. It is therefore necessary to examine where and why inventive activity fails to translate into economic impact, and to consider its policy implications.

First, there is the nature of Britain's economic model. A UKIPO-commissioned study found that half of UK firms considered their most valuable innovations 'not patentable', often because they were service or marketing innovations rather than technological ones.[29] The country's innovation base is heavily weighted towards knowledge-intensive business services, such as finance, consulting, and creative industries, where innovation tends to be intangible and less suited to patent protection.

The report interprets this as evidence that low patenting does not necessarily mean weak innovation. But an alternative, equally plausible interpretation is that the UK is innovating, but not in ways that generate protectable, commercial technologies — the kind that drive productivity, exports, and strategic advantage.

The UK's AI position certainly appears to fit with this pattern. Despite having one of the highest levels of AI investment and large number of start-ups, the UK still has limited computing and infrastructure capacity. Unless investment is converted into domestic compute, scale-up capacity and broad-based deployment, much of the resulting value will be captured elsewhere.

> **'The UK may be innovating, but not in the ways that drive productivity, exports and strategic advantage'**

Some studies argue the root cause of the UK's innovation problems lies in long-term underinvestment in R&D.[30] The UK experienced a sharp decline in R&D intensity between the 1980s and mid-2000s, allowing emerging innovation powers such as China and South Korea to catch up.

Since 2016, however, spending has increased rapidly, driven by generous R&D tax credits and new public programs. Successive governments have made R&D intensity a central pillar of their science and technology strategy. The creation of the Advanced Research and Invention Agency (ARIA) to fund high-risk, high-reward innovation, and the National Science and Technology Council (NSTC) exemplify this renewed focus. The current Labour government has confirmed that it will channel £55 billion in R&D investment into leading research and innovation bodies by 2029/2030,[31] with plans currently being developed for the deployment of the remaining funds from Kendall's £86 billion commitment.

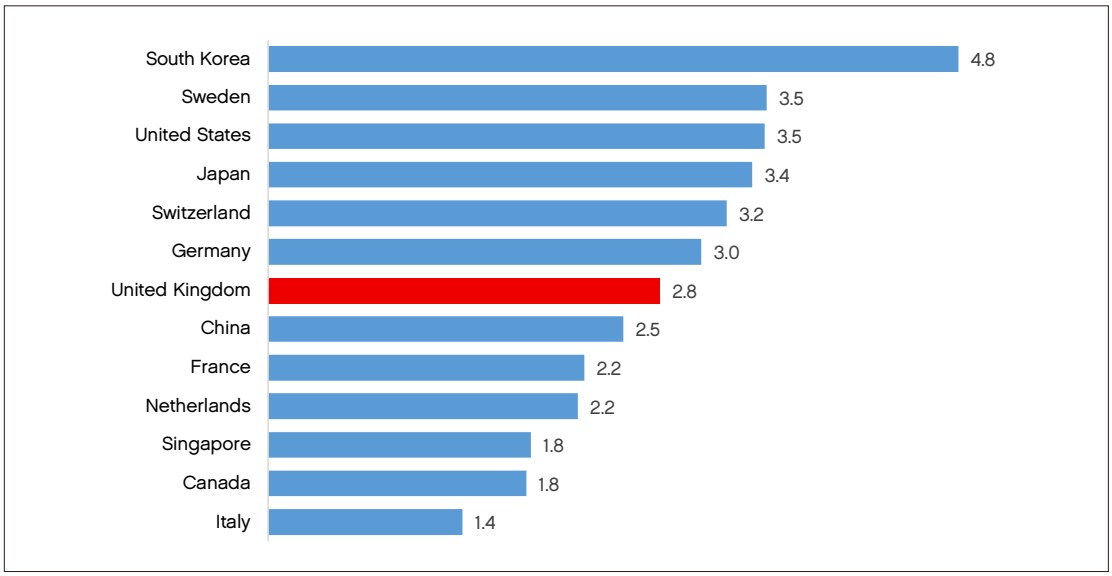
As it stands, the UK's R&D investment as percentage of GDP is respectable – higher than France, Netherlands, and Singapore and roughly on par with the China and Germany. However, it still trails some innovation-intensive economies, including the United States, Sweden, and South Korea.

29 Intellectual Property Office, 'When do firms not use patents and trademarks to protect valuable innovations?' 2018 Link

30 The Productivity Institute, 'Productivity, Innovation, and R&D', November 2023 Link

31 Department for Science, Innovation and Technology, 'DSIT Research and Development (R&D) plans to 2029/2030', October 2025 Link

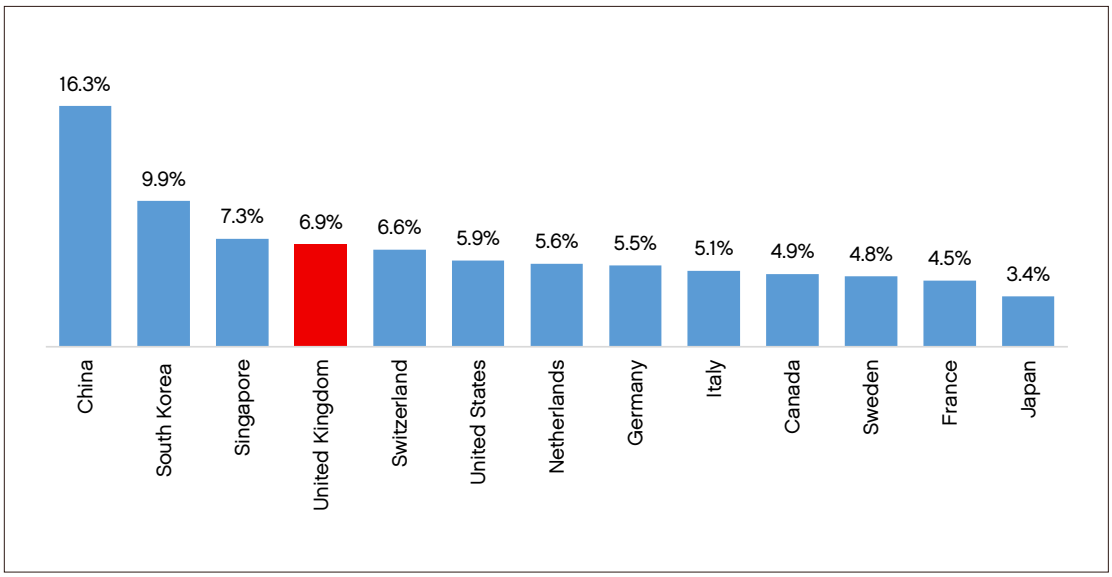
R&D spending as a percentage of GDP



Source: OECD

It is also worth noting that, thanks in part to the public spending and tax breaks described above, the UK's gross expenditure on research and development (GERD) has grown at an exceptional rate annually.

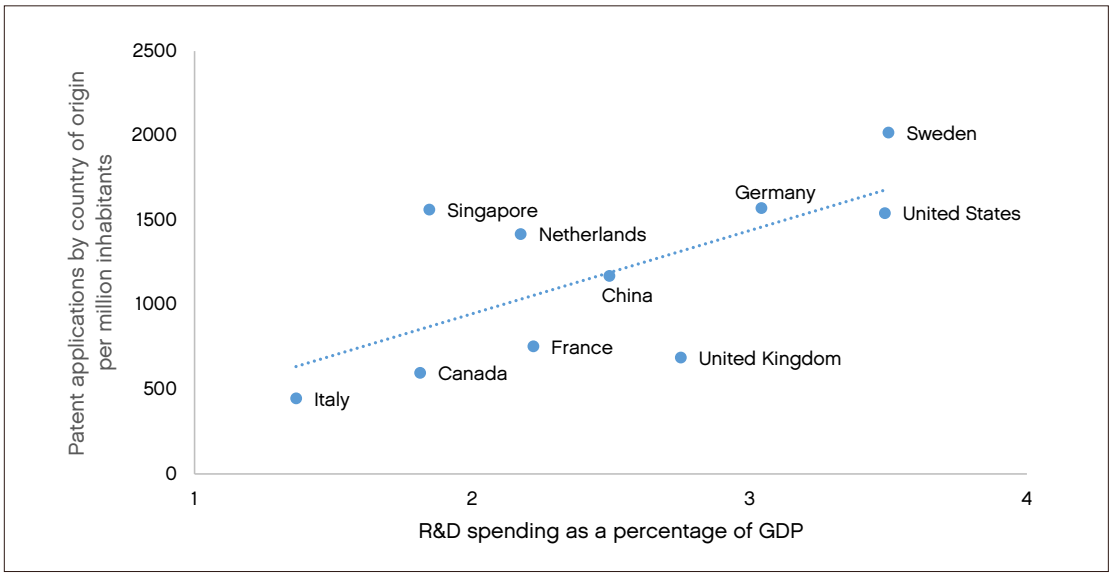
Average annual growth rate of total R&D spending, 2000 to 2023



Source: OECD

However, the UK has not been able to translate the higher R&D spending into patentable ideas. Several economies with smaller R&D to GDP ratio outperform Britain in converting research into patents and marketable technologies. Singapore, the Netherlands, China, and France all produce more patent applications per million people despite lower or comparable spending levels.

R&D spending vs patent applications

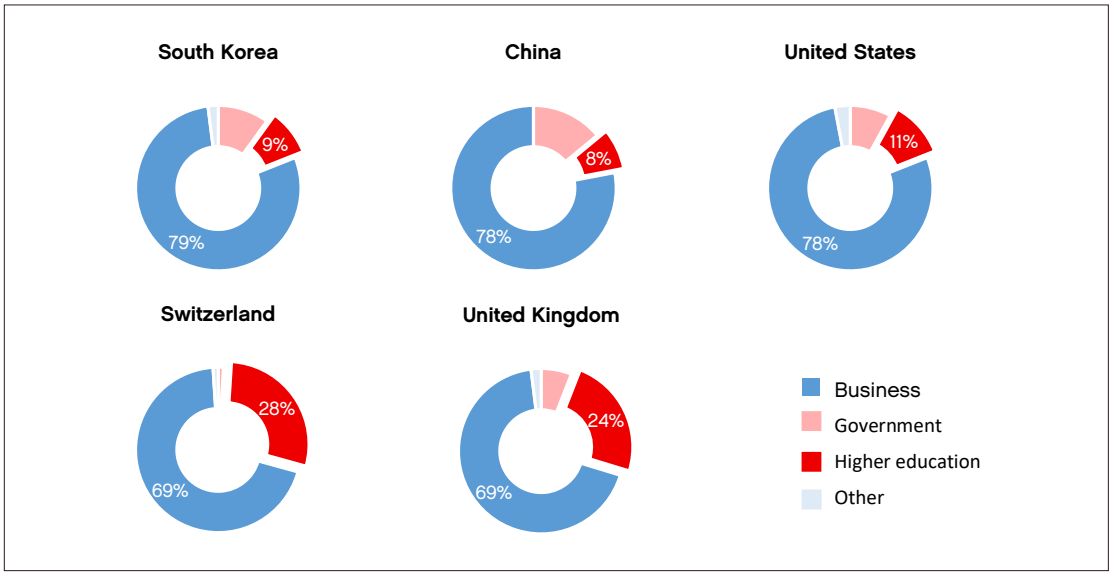


Source: World Intellectual Property Office and OECD

The inability of UK to diffuse innovation might therefore not be a problem of insufficient R&D spending, but of where and how that spending is distributed.

When R&D is broken down by sector of performance – in other words, by who performs the research – a pattern emerges. In China, South Korea, and the United States, around 78% of GERD is performed by the business sector. In the UK, that share is roughly 10 percentage points lower. By contrast, Britain allocates a much larger portion of R&D to higher education institutions. In the UK, 24% of GERD is performed in universities, compared with only 8% in China and 9% in South Korea.

R&D spending by sector



Source: OECD

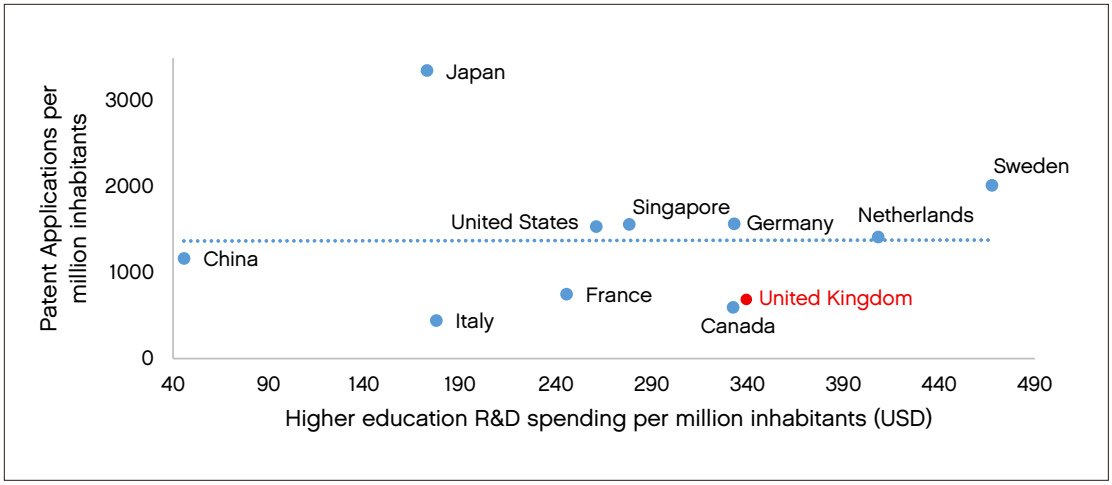
Switzerland represents a notable exception to this pattern. Although business R&D accounts for a similar share of business R&D as in the UK, Switzerland combines significantly higher R&D spending per capita (of approximately $2,000 per million inhabitants) with a strong and concentrated corporate R&D base.

This seems to be a successful recipe. In 2024, Switzerland spent approximately $22 billion on R&D compared with the UK's $109 billion, yet Swiss inventors filed roughly 41,000 patent applications – close to the UK's total of 44,000, and a far higher patent output per capita.

This performance can be attributed to an industrial structure that is anchored by globally integrated, patent-intensive multinationals that conduct and retain R&D domestically, notably in pharmaceuticals, medical technologies, precision engineering, and advanced manufacturing.[32] Indeed, despite a population of only around nine million and a GDP roughly one-third the size of the UK's, Switzerland hosts 14 of the world's top 500 corporate R&D investors, whose combined R&D spending of 34 billion euros exceeds that of UK-headquartered firms (30 billion euros).[33] And the average R&D investment of Switzerland's top three firms is 46% higher than that of UK.[34]

Countries that spend heavily through universities do not necessarily produce more patents, because much of that research is fundamental or pre-commercial. In fact, there is almost no relationship between higher education spending on R&D and patent applications, as the graph below shows.

Higher education R&D spending vs patent applications



Source: World Intellectual Property Office and OECD

Sure enough, a report commissioned by the Department for Science, Innovation and Technology (DSIT) found that, as of 2017, 33% of UK higher-education R&D focused on basic research, 52% on applied research, and only 15% on experimental development – the stage most closely linked to technological commercialisation.[35]

Moreover, the same report found that only 15% of UK university R&D occurs in engineering and technology, compared with 44% in South Korea, 38% in Singapore, 25% in Germany, and 22% in Japan.

32 Switzerland Global Enterprise, 'Switzerland boasts the greatest density of inventors in the world', March 2025 Link

33 EY, 'Companies worldwide increase their spending on Research and Development – Switzerland ranks sixth globally', June 2025 Link

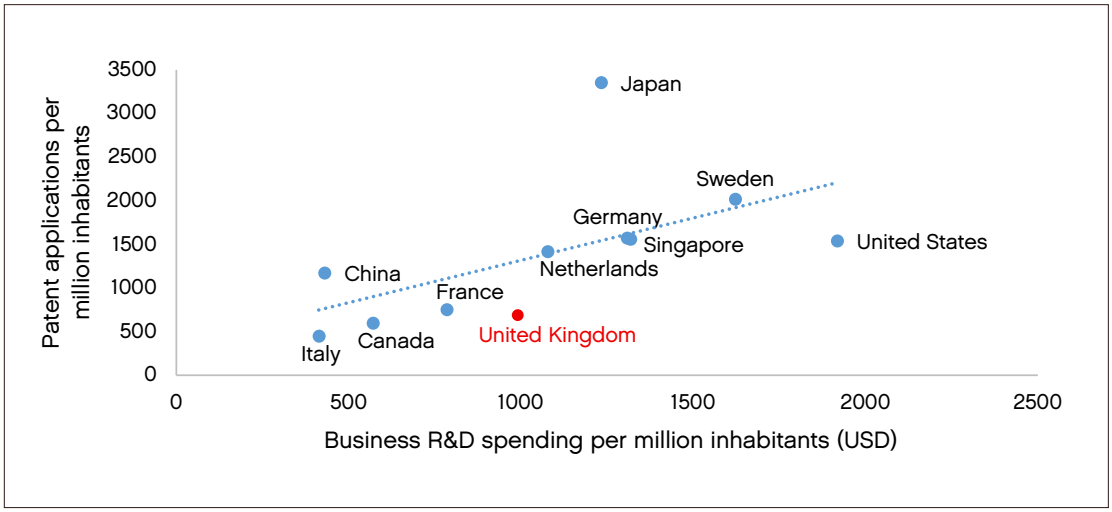
34 WIPO, 'R&D spending by the top 2,500 R&D spenders crossed the €1.3 trillion mark in 2022', April 2024 Link

35 Cambridge Industrial Innovation Policy, 'What makes the UK industrial innovation system different?', September 2025 Link

This is further emphasised by the weak citation presence of UK universities in priority technology areas such as AI. Despite being described as one of the leaders in AI research, Britain's position is largely driven by a single institution – Google DeepMind. Excluding DeepMind, the UK's share of the 100 most-cited AI papers falls from around 7% to 2%. Likewise, no UK-based universities feature among the top 20 global institutions ranked by the number of highly cited AI papers. Similar performance can be observed in other cutting-edge areas like quantum technology and synthetic biology.[36]

This implies that the UK's higher education research base is poorly aligned with industrial and technological advances.

Business R&D spending vs patent applications



Source: World Intellectual Property Office and OECD

For every dollar spent on higher education research and development (HERD), top-performing innovators such as China and the United States spend $7 to $9 on business enterprise research and development (BERD). In the UK, that ratio is less than three.

	BERD: HERD Ratio
China	9.41
South Korea	8.66
United States	7.34
Japan	7.15
Singapore	4.74
Germany	3.93
Sweden	3.47
France	3.20
United Kingdom	2.92
Netherlands	2.64
Switzerland	2.44
Italy	2.33
Canada	1.72

36 Paul Nightingale and James W. Philips, 'S&T – Is the UK a world leader in science?', March 2023 Link

In short, the UK's translation gap is not a crisis of science but of structure. There is a lack of R&D in business environments where patents, prototypes, and industrial diffusion are created. According to the National Centre for Universities and Business, companies also lack incentives to file the patents in the UK – and their confidence is decreasing. Only 36% of UK firms reported any innovation activity in 2020 to 2022, down from 45% just two years earlier, and the lowest rate in more than a decade. Likewise, the Chartered Institute of Patent Attorneys showed that British businesses file 40% fewer patents in the key markets of Europe and China when compared to French and German companies.[37]

The composition of UK business R&D further highlights its fragility. Only 26 UK-owned companies account for 70% of Britain's total business R&D performed globally.[38] Nearly half of this comes from pharmaceuticals – a sector of relative strength – while most other industries contribute little to the UK's global R&D footprint.

'Only 26 UK-owned companies account for 70% of Britain's total business R&D performed globally'

A study by Cambridge Industrial Innovation Policy found that while British universities and startups are highly productive sources of innovation, many of the firms they spawn either relocate or are acquired before reaching maturity. Around 6% of UK startups emigrate and the majority of university spinout IPOs now take place overseas, mainly on NASDAQ.

Meanwhile, nearly half of UK business R&D is performed by foreign-owned firms, and foreign investors drive most large-scale funding rounds. This pattern suggests that the UK's business environment struggles to support commercialisation, allowing the economic gains from British innovation to accrue abroad.

Unless Britain incentivises more businesses to participate and invest in the innovation system, it will continue to witness its innovation base weaken.

37 The Chartered Institute of Patent Attorneys, 'Innovation & Patents in the United Kingdom', 2024 Link

38 Cambridge Industrial Innovation Policy, 'What makes the UK industrial innovation system different?', September 2025 Link

Conclusion

This challenge of innovation stagnation has not gone unnoticed. Successive governments have responded to Britain's innovation challenge with business incentives, new R&D funds, and investment in skills. The UK now offers some of the most generous R&D tax credits and patent-box reliefs in the developed world. For instance, in 2021, the UK offered the highest level of government support for business R&D – 0.48% of GDP, over twice the OECD average.[39] About two-thirds of this came through R&D tax reliefs, with the remainder provided via grants and public procurement.

Likewise, the new Digital and Technologies Sector Plan and Industrial Strategy represent the most ambitious attempt yet to coordinate Britain's innovation policy. On paper, they address nearly every known weakness: increasing public-private leverage, expanding finance for scale-ups, simplifying grants, strengthening university-industry collaboration, and promoting regional clusters. Yet business participation in innovation continues to fall.

'Perhaps the problem is not innovation policy at all, but the wider business environment'

If incentives are strong but outcomes remain weak, the problem may lie elsewhere. The question, therefore, is not what more can government do, but why are firms still reluctant to innovate here?

Perhaps the problem is not innovation policy at all, but the wider business environment — high energy costs, an uncompetitive tax regime, regulatory complexity, an overly risk-averse financial sector, and an industrial base that has thinned over decades.

Recent corporate decisions underscore this. In 2023, AstraZeneca diverted a planned £400 million manufacturing investment from north-west England to Blanchardstown in Dublin, citing the UK's uncompetitive tax environment, limited manufacturing incentives, and delays in clinical trials linked to NHS capacity constraints.[40] The company's leadership argued that the absence of supportive industrial conditions – including regulatory expertise, access to energy, and predictable returns – made large-scale manufacturing investment more viable elsewhere.

A similar pattern is evident in Merck's recent retrenchment from the UK. In late 2025, the company cancelled plans for a £1 billion London-based research centre

39 Cambridge Industrial Innovation Policy, 'What makes the UK industrial innovation system different?', September 2025 Link

40 The Irish Times, 'AstraZeneca chose Republic over UK because of tax and green energy – CEO', February 2023 Link

and announced the closure of multiple UK laboratory sites, resulting in around 125 job losses.[41] Merck cited the UK's uncompetitive commercial environment for life sciences investment, insufficient government support for innovation, and the persistent undervaluation of medicines and vaccines as key factors behind the decision.[42]

The UK's difficulty in establishing a domestic battery gigafactory further illustrates how wider industrial conditions constrain innovation-led investment. The co-founder of Britishvolt – a start-up aiming to build the UK's first large-scale electric vehicle battery factory, which collapsed into administration in January 2023 – claimed that Britain's battery industry has been doomed by the Government, citing excessive bureaucracy, funding delays, and political instability.[43]

Likewise, high electricity costs, slow grid connections and planning uncertainty are fundamental problems leading to deterred investment, which have left planned manufacturing sites repurposed or stalled, including at Northumberland and Coventry Airport.[44]

Similarly, a 2025 survey of 105 IT decision-makers in large UK banking and finance firms found that 57% were delaying AI investment due to uncertainty over future UK regulation, while 98% reported that delays to regulatory approvals had already slowed technology deployment.

'In late 2025, Merck cancelled plans for a £1 billion London-based research centre and announced the closure of multiple UK laboratory sites, resulting in around 125 job losses'

Despite the UK's stated ambition to pursue a pro-innovation approach to AI governance, the firms cited conflicting global regulatory frameworks as a major operational challenge. The impact is already feeding through into employment decisions, with 37% of firms having outsourced or planning to cut UK-based technology roles, and 24% considering reductions to manage compliance costs.[45]

Similarly, the withdrawal of West Cumbria Mining's £165 million underground metallurgical coal project illustrates how major capital investments in the UK can be exposed to prolonged uncertainty, policy reversal, and legal risk even after formal approval has been granted.[46] Submitted in 2017, the project was approved by the local authority in 2020 and subsequently endorsed by central government in 2022, before being quashed by the High Court in 2024 on environmental grounds and ultimately withdrawn in 2025 following the government's ban on new coal mining licences.[47] (A ban which no other G7 country has put in place.)

41 BBC, 'Blow for UK drugs sector as Merck scraps £1bn expansion', September 2025 Link

42 Manufacturing Chemist, 'Merck scraps £1bn UK expansion amid concerns as warnings mount over UK's life sciences competitiveness', September 2025 Link

43 Sky News, 'Britain's battery industry doomed by government, Britishvolt co-founder claims', May 2023 Link

44 BBC, 'Coventry gigafactory in limbo as plan faces expiry', January 2025 Link

45 Telehouse, 'AI Regulation Uncertainty Sees UK Finance Firms Hit Pause on Further Investment', December 2025 Link

46 BBC, 'Deep coal mine plans officially dropped', April 2025 Link

47 Ground Engineering, 'Cumbria coal mine dealt further blow as developer withdraws application', April 2025 Link

This extended and inconsistent decision-making process – spanning eight years – inevitably forced the developer to reassess its investment. Such conditions increase the cost of capital, extend project timelines, and weaken the UK's attractiveness for large-scale, long-horizon investment, with implications extending to capital-intensive sectors such as infrastructure, manufacturing, and clean energy, where policy credibility and regulatory predictability are essential.

Further evidence that the planning system is imposing material constraint on UK innovation is the shortage of specialist laboratory space across the Golden Triangle – Oxford, Cambridge and London. In 2024, demand for laboratory space exceeded 2.2 million square feet, with 42% concentrated in Cambridge alone. Yet Cambridge also faces the most severe supply constraints.[48] According to Bio Science Today, local planning delays have slowed new development, leaving life science firms unable to expand, relocate or upgrade facilities.[49] Cambridge City Council has reported progress in granting planning permission for new laboratory and office developments, but only around 23% of the 4.3 million square feet scheduled for completion by 2030 is currently under construction, severely limiting near-term availability.[50] Similar pressures are evident in London, where the supply of life-science laboratory space in 2024 stood at less than a quarter of demand.

'Industry leaders have explicitly highlighted higher labour and energy costs as a barrier to new investment and expansion in the UK'

This lack of physical infrastructure has constrained firm entry and growth. The supply imbalance has pushed laboratory rents to a record high, placing suitable space beyond the reach of early-stage and scaling firms. This stands in stark contrast to the United States. Boston alone hosts around 56 million square feet of laboratory and R&D space. Moreover, recent oversupply in US hubs has pushed rents down. For example, in Cambridge, Massachusetts, average lab rents have fallen from around $113 per square foot in 2021 to $93 in 2025.[51]

Taken together, constrained supply, rising costs and planning delays risk undermining the UK's innovation clusters and accelerating the relocation of high-growth firms to overseas markets.

Recent policy changes – including increases in National Insurance contributions, a rising minimum wage, and the additional compliance requirements under the Employment Rights Act – have been widely cited by businesses as compounding these pressures. Indeed, industry leaders in science, technology and advanced manufacturing have explicitly highlighted higher labour and energy costs as a barrier to new investment and expansion in the UK.[52]

48 Ministry of Housing, Communities & Local Government & Department for Levelling Up, Housing & Communities, 'The Case for Cambridge', March 2024 Link

49 Bio Science Today, 'Affordable lab space faces 'perfect storm'', 2024 Link

50 Savills, 'Spotlight: Golden Triangle Offices & Laboratories', September 2025 Link

51 Cambridge Day, 'Close to a quarter of Cambridge lab space sits vacant. What happens to it now?', January 2026 Link

52 The Telegraph, 'High energy costs are holding back Britain, US chief warn Starmer', February 2026 Link

At the same time, prolonged economic stagnation and weak real wage growth have contributed to a sustained outflow of skilled talent. Despite ranking third globally in computer science education, the Global AI Index indicates that the UK retains only 48% of its AI and computer science talent, compared with retention rates of 80% in the United States, 69% in South Korea, and 61% in France.[53] The continued accumulation of labour- and tax-related regulatory burdens risks preventing the UK from fully leveraging its existing investment base and talent pipeline.

‘Despite ranking third globally in computer science education, the Global AI Index indicates that the UK retains only 48% of its AI and computer science talent, compared with retention rates of 80% in the United States, 69% in South Korea, and 61% in France’

If firms do not see Britain as a competitive place to build, test and scale, no amount of top-down government planning will change that. Businesses may simply find it easier to develop, test or commercialise elsewhere.

In conclusion, before announcing yet another strategy or fund, the Government should ask a more fundamental question: what conditions make firms choose to innovate or perform commercial R&D in Britain at all?

A genuine science and technology superpower cannot be built by public spending alone. It requires an economy where businesses see long-term value in creating, protecting and commercialising their innovations on British soil.

Until policymakers confront these underlying conditions, every new strategy risks repeating the same pattern: ambitious targets, generous incentives, and disappointing results.

53 The Observer, ‘Why Britain is losing its lead in the AI race’, December 2025 Link

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