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# HAS THE UK PATENT BOX REGIME ACHIEVED ITS GOAL OF STIMULATING R&D INVESTMENT IN THE AUTOMOTIVE SECTOR? A COMPARATIVE ANALYSIS OF POLICY DESIGN AND INDUSTRY OUTCOMES

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## ABSTRACT

This article evaluates whether the United Kingdom's Patent Box regime has achieved its stated objective of stimulating research and development in the automotive sector between 2013 and 2024. Drawing on HMRC statistics, automotive R&D expenditure data, and case studies of Jaguar Land Rover and McLaren, it argues that the regime has been moderately successful as a mechanism for retaining and rewarding high-value intellectual property within the UK, particularly for large, profitable original equipment manufacturers with substantial patent portfolios. However, there is limited evidence that the Patent Box has generated additional R&D across the sector as a whole, especially among small and medium-sized enterprises and loss-making innovators, reflecting its profit-based, ex-post and administratively complex design. The article identifies four structural weaknesses (high concentration of relief among a small number of large claimants, pronounced regional disparities, barriers to SME participation, and a timing mismatch between long development cycles and the deferred nature of the relief) which together constrain the regime's capacity to alter marginal investment decisions. It then stipulates the UK regime in comparative perspective, contrasting it with Netherlands, Germany and Italy, and concludes that while the Patent Box is effective in influencing IP location and post-tax returns, it is a relatively weak instrument for driving new automotive R&D investment.

**Keywords:** International Tax Law, UK Patent Box, Nexus Approach, Intellectual Property Taxation, UK Patent Box, Automotive Sector

## Introduction

The United Kingdom had introduced the Patent Box regime in April 2013 as a targeted corporation tax relief incentive and was designed to encourage innovation by reducing the effective tax rate on profits derived from patented intellectual property to 10%.<sup>1</sup> The policy aimed to incentivize companies to conduct Research and Development (R&D), retain high-value Intellectual Property (IP), and commercialize innovations within the UK with an emphasis on tech-intensive sectors.<sup>2</sup>

The automotive sector is a critical target for this policy. Contributing over £64 billion in turnover and £12 billion in value added to the UK economy, it represents a substantial share of manufacturing employment, exports, and technological capability, particularly with the industry transitioning towards electric vehicles, autonomous systems, and low-carbon mobility solutions.<sup>3</sup>

## Patent box and Research question

This article evaluates whether, between 2013 and 2024, the UK Patent Box has achieved its objective of stimulating R&D investment in the automotive sector. The analysis concludes that while the Patent Box has been moderately successful as a retention and reward mechanism for the large, profitable automotive firms with substantial patent-portfolios, there is limited evidence that it has stimulated further R&D investment across the sector as a whole. The regime's design as profit-based, ex-post and administratively-complex makes it better suited to influencing the location and taxation of existing IP than to generating new innovating activity, particularly among Small Manufacturing Entities (SMEs) and loss-making entrants.<sup>4</sup>

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<sup>1</sup> HM Revenue & Customs, 'Patent Box relief statistics: September 2025', available at: <https://www.gov.uk/government/statistics/patent-box-reliefs-statistics/patent-box-relief-statistics-september-2025> (Last Modified September 25, 2025); ForrestBrown, 'Patent Box explained – what is Patent Box? Who is eligible?', available at: <https://forrestbrown.co.uk/patent-box-explained/> (Visited on December 23, 2025); MPA, 'Patent Box – what is it and how do I qualify?', available at: <https://www.mpa.co.uk/what-we-do/tax-services/patent-box/> (Visited on December 23, 2025).

<sup>2</sup> Alexander Israel Silva Gámez, Silvia Mariela Méndez Prado and Andrés Arauz, 'What's Happening with the Patent Box Regimes? A Systematic Review' (2022) 14(18) Sustainability 11423, available at: <http://dx.doi.org/10.3390/su141811423> (Visited on December 23, 2025).

<sup>3</sup> Society of Motor Manufacturers and Traders, 'Written evidence', available at: <https://committees.parliament.uk/writtenevidence/53170/pdf/> (Visited on December 23, 2025); Society of Motor Manufacturers and Traders, 'Industrial strategy can be springboard for UK auto success', available at: <https://www.smmt.co.uk/industrial-strategy-can-be-springboard-for-uk-auto-success/> (Visited on December 23, 2025).

<sup>4</sup>Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at:

This article includes four parts. Part-I examines the design and evolution of the Patent Box, including the modified-nexus approach and the 2023 corporation tax increase. Part-II analysis automotive sector outcomes, drawing on HMRC statistics, R&D expenditure data, and case studies of Jaguar Land Rover and McLaren. Part-III identifies structural limitations relating to concentrated benefits, regional disparities, and SME barriers. Part-IV situates the UK regime in a comparative perspective before drawing conclusions.

## PART I - POLICY DESIGN & EVOLUTION

### 1.1: Design and objectives

The UK Patent Box was formally established under the Finance Act 2012, with its provisions taking effect on April 1, 2013. The regime's introduction followed the 2010 Corporate Tax Roadmap. The Patent Box provides a preferential 10% effective rate on IP-derived profits, with three policy objectives: incentivize high-value job location in the UK, encourage IP commercialization domestically, and prevent asset migration to lower-tax jurisdictions.<sup>5</sup>

The relief is delivered through an additional deduction in the corporation tax computation, equivalent to a 10% effective rate, phased in to 2017-2018. Early adoption was rapid: 835 companies elected into the regime by 2013-2014, rising to 1,295 by 2015–2016. However, even in this early stage, a significant concentration of relief was observed among "Large" companies, a trend that would persist throughout the decade.<sup>6</sup>

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<https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025); EU Science Hub, 'Patent Boxes design, patents location and local R&D', available at: [https://joint-research-centre.ec.europa.eu/system/files/2015-08/JRC96080\\_Patent\\_boxes.pdf](https://joint-research-centre.ec.europa.eu/system/files/2015-08/JRC96080_Patent_boxes.pdf) (Visited on December 23, 2025); Parliament of Australia, 'A literature summary of recent patent box related papers', available at: <https://www.aph.gov.au/DocumentStore.ashx?id=fd803c5d-de4d-4060-9d79-68d9f4ce5354&subId=408835> (Visited on December 23, 2025); TaxWatch, 'The great pharma tax giveaway', available at: <https://www.taxwatchuk.org/wp-content/uploads/TaxWatch-Patent-Box-Final.pdf> (Visited on December 23, 2025).

<sup>5</sup> HM Revenue & Customs, 'Patent Box relief statistics: September 2025', available at: <https://www.gov.uk/government/statistics/patent-box-reliefs-statistics/patent-box-relief-statistics-september-2025> (Last Modified September 25, 2025); HM Revenue & Customs, 'Patent Box reliefs statistics', available at: <https://www.gov.uk/government/statistics/patent-box-reliefs-statistics> (Visited on December 23, 2025); MPA, 'Patent Box – what is it and how do I qualify?', available at: <https://www.mpa.co.uk/what-we-do/tax-services/patent-box/> (Visited on December 23, 2025).

<sup>6</sup> HM Revenue & Customs, 'Patent Box relief statistics: September 2025', available at: <https://www.gov.uk/government/statistics/patent-box-reliefs-statistics/patent-box-relief-statistics-september-2025> (Last Modified September 25, 2025); Saffery, 'UK Patent Box: R&D tax relief', available at: <https://www.saffery.com/insights/articles/uk-patent-box/> (Visited on December 23, 2025); Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at: <https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on

## 1.2: Nexus reform and Tax changes

The most significant structural change occurred on 1<sup>st</sup> July 2016, when the UK introduced the ‘modified-nexus-approach’ in response to OECD pressure under the Base Erosion and Profit Shifting (BEPS) initiative. The OECD had identified the original regime as potentially harmful as it permitted companies to claim relief on UK profit without demonstrating that the underlying R&D had been performed domestically. The modified nexus approach requires companies to link the amount of relief claimed to the proportion of qualifying R&D expenditure incurred in the UK, calculated through a ‘nexus-fraction’.<sup>7</sup>

The nexus fraction calculates relief as: **[(Qualifying expenditure on UK R&D + Acquisition costs) × 1.3] / [Total expenditure including outsourced and acquired R&D]**. The 1.3 ‘uplift’ provides flexibility for companies that have acquired IP or outsourced some R&D to connected parties, provided they have conducted significant R&D themselves. For automotive companies with globally distributed R&D operations, this formula creates a direct fiscal incentive to locate inventive activity in the UK.<sup>8</sup>

The nexus approach introduced ‘track and trace’ requirements, obliging detailed mapping of R&D to patents. For automotive firms with thousands of patents, this creates substantial compliance costs—particularly burdensome for SMEs lacking dedicated tax departments, explaining low take-up.<sup>9</sup>

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December 23, 2025).

<sup>7</sup>Annette Alstadsaeter and others, ‘The real effects of tax havens’ (2025) *SSRN Electronic Journal*, available at: <https://doi.org/10.2139/ssrn.5388439> (Visited on December 23, 2025); Shorts Accountants, ‘The modified nexus approach to Patent Box’, available at: <https://blog.shorts.uk.com/the-modified-nexus-approach-to-patent-box> (Visited on December 23, 2025); Carpmaels & Ransford, ‘The UK Patent Box – eight years on’, available at: <https://www.carpmaels.com/the-uk-patent-box-eight-years-on/> (Visited on December 23, 2025); EU Science Hub, ‘Patent Boxes design, patents location and local R&D’, available at: [https://joint-research-centre.ec.europa.eu/system/files/2015-08/JRC96080\\_Patent\\_boxes.pdf](https://joint-research-centre.ec.europa.eu/system/files/2015-08/JRC96080_Patent_boxes.pdf) (Visited on December 23, 2025); ForrestBrown, ‘Patent Box nexus fraction – what you need to know’, available at: <https://forrestbrown.co.uk/news/patent-box-nexus-fraction/> (Visited on December 23, 2025).

<sup>8</sup>ForrestBrown, ‘Patent Box explained – what is Patent Box? Who is eligible?’, available at: <https://forrestbrown.co.uk/patent-box-explained/> (Visited on December 23, 2025); Shorts Accountants, ‘The modified nexus approach to Patent Box’, available at: <https://blog.shorts.uk.com/the-modified-nexus-approach-to-patent-box> (Visited on December 23, 2025); ForrestBrown, ‘Patent Box nexus fraction – what you need to know’, available at: <https://forrestbrown.co.uk/news/patent-box-nexus-fraction/> (Visited on December 23, 2025); Tax Justice Network, ‘Indicator deep dive: “patent box regimes”’, available at: <https://taxjustice.net/2025/12/02/indicator-deep-dive-patent-box-regimes/> (Last Modified December 2, 2025; Visited on December 23, 2025).

<sup>9</sup>MPA, ‘Patent Box – what is it and how do I qualify?’, available at: <https://www.mpa.co.uk/what-we-do/tax-services/patent-box/> (Visited on December 23, 2025); Shorts Accountants, ‘The modified nexus approach to Patent Box’, available at: <https://blog.shorts.uk.com/the-modified-nexus-approach-to-patent-box> (Visited on December 23, 2025); Carpmaels & Ransford, ‘The UK Patent Box – eight years on’, available at:

A significant development occurred on 1 April 2023, when the main corporation tax rate increased from 19% to 25%. This mechanically increased the value of the Patent Box: whereas previously it offered a 9-percentage-point saving (19% - 10%), it now provides a 15-percentage-point saving (25% - 10%). This represents an approximately 66% increase in the post-tax benefit to profitable companies using the regime. HMRC statistics indicate total relief increased from £1.3 billion in 2021-22 to a projected £2.0 billion in 2023-24, despite the number of companies using the scheme remaining broadly stable at around 1,650.<sup>10</sup>

## PART II - AUTOMOTIVE SECTOR OUTCOMES

### 2.1: Automotive R&D profile

The UK automotive sector is among the most R&D-intensive areas of manufacturing, characterised by high capital requirements, product development cycles of 5-10 years, and continuous technological evolution. Major Original-Equipment-Manufacturers (OEMs) and Tier 1 suppliers have invested substantially in next-generation powertrains, electric vehicle platforms, battery systems, lightweight materials, and autonomous driving technologies. This innovation profile makes the sector a logical target for patent-based tax incentives.<sup>11</sup>

HMRC statistics consistently show that manufacturing companies dominate Patent Box claims. In 2022-23, manufacturing represented approximately 61% of all companies electing into the regime and captured 41% of total relief by value—an estimated £816 million of the £1.98 billion total. Within manufacturing, the automotive sector is a significant contributor, investing approximately £1.9 billion annually in R&D and accounting for roughly 10% of total UK goods

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<https://www.carpmaels.com/the-uk-patent-box-eight-years-on/> (Visited on December 23, 2025); Taylor Wessing, 'Time to tinker? The UK Patent Box', available at: <https://www.taylorwessing.com/en/insights-and-events/insights/2024/passle/time-to-tinker---the-uk-patent-box> (Visited on December 23, 2025).

<sup>10</sup> ForrestBrown, 'Patent Box statistics 2025: insights into HMRC stats', available at: <https://forrestbrown.co.uk/news/patent-box-statistics/> (Visited on December 23, 2025); MPA, 'Patent Box relief statistics 2025: a bigger prize, still pursued by the few', available at: <https://www.mpa.co.uk/news-insights/knowledge-hub/patent-box-statistics-2025-a-bigger-prize-still-pursued-by-the-few/> (Visited on December 23, 2025); K 38 Consulting, 'The smart business guide to patent box scheme and R&D tax benefits', available at: <https://k38consulting.com/patent-box-scheme-rd-tax-benefits/> (Visited on December 23, 2025).

<sup>11</sup> Innovation News Network, 'Adapting to change and driving the future of the UK automotive industry', available at: <https://www.innovationnewsnetwork.com/adapting-to-change-driving-future-of-uk-automotive-industry/34477/> (Visited on December 23, 2025); Imperial College London, 'Opportunities arising from disruption in the automotive sector: a UK perspective', available at: <https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/centre-for-sectoral-economic-performance/UK-Automotive-Sector-Brochure.pdf> (Visited on December 23, 2025); Society of Motor Manufacturers and Traders, 'Written evidence', available at: <https://committees.parliament.uk/writtenevidence/53170/pdf/> (Visited on December 23, 2025).

exports. The sector's reliance on 'tangible' patentable innovations—mechanical components, electronic control systems, and manufacturing processes—makes it particularly well-suited to a patent-based incentive compared to sectors dependent on softer IP such as brands or trade secrets.<sup>12</sup>

## 2.2: Case studies: JLR and McLaren

Jaguar Land Rover (JLR) provides the clearest example of how the Patent Box influences UK automotive strategy. JLR's 'Reimagine' strategy, launched in 2021, represents a multi-billion-pound commitment to becoming a net-zero carbon business by 2039. In the financial year ending March 2024, JLR reported record revenue of £29 billion and profit after tax of £2.6 billion, driven by strong demand for luxury models including the Range Rover and Defender.<sup>13</sup>

JLR's UK R&D footprint develops Modular Longitudinal Architecture (MLA) platforms and battery-electric powertrains, retaining 'inventorship' in the UK to maintain high nexus fraction compliance. For luxury OEMs like JLR, the 'golden screw' principle applies: a single patented component (battery management, aluminium chassis) can render entire vehicle profits tax-eligible at 10%, making Patent Box particularly attractive for high-margin, IP-dense products.<sup>14</sup>

However, JLR's turnaround programmes and strategic decisions appear driven primarily by

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<sup>12</sup>Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at: <https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025); ForrestBrown, 'Patent Box statistics 2025: insights into HMRC stats', available at: <https://forrestbrown.co.uk/news/patent-box-statistics/> (Visited on December 23, 2025); Society of Motor Manufacturers and Traders, 'Written evidence', available at: <https://committees.parliament.uk/writtenevidence/53170/pdf/> (Visited on December 23, 2025); Saffery, 'UK Patent Box: R&D tax relief', available at: <https://www.saffery.com/insights/articles/uk-patent-box/> (Visited on December 23, 2025).

<sup>13</sup>Tata Motors, 'Integrated annual report 2023–24' (2024), available at: <https://www.tatamotors.com/wp-content/uploads/2024/05/tata-motor-IAR-2023-24.pdf> (Visited on December 23, 2025); Tata Motors, 'Jaguar Land Rover annual report 2020–21' (2021), available at: <https://www.tatamotors.com/wp-content/uploads/2023/10/jlr-annual-report-2020-21.pdf> (Visited on December 23, 2025); Jaguar Land Rover, 'Annual report 2024' (2024), available at: <https://www.jlr.com/annual-report-2024> (Visited on December 23, 2025); Tata Motors, 'Jaguar Land Rover Automotive plc annual report FY23–24' (2024), available at: <https://www.tatamotors.com/wp-content/uploads/2024/06/JLR-AR-FY23-24.pdf> (Visited on December 23, 2025).

<sup>14</sup>Saffery, 'UK Patent Box: R&D tax relief', available at: <https://www.saffery.com/insights/articles/uk-patent-box/> (Visited on December 23, 2025); Hogan Lovells, 'Thinking in the box – but should it be the UK patent box or the Dutch innovation box?', available at: [https://hoganlovells.com/~media/hogan-lovells/pdf/publication/thinkingintheboxbutshoulditbethukpatentboxorthedutchinnovationbox\\_pdf.pdf](https://hoganlovells.com/~media/hogan-lovells/pdf/publication/thinkingintheboxbutshoulditbethukpatentboxorthedutchinnovationbox_pdf.pdf) (Visited on December 23, 2025); Jaguar Land Rover, 'Annual report 2024' (2024), available at: <https://www.jlr.com/annual-report-2024> (Visited on December 23, 2025); Securities and Exchange Commission, 'Form 6-K', available at: <https://www.sec.gov/Archives/edgar/data/926042/000119312519189413/d769105d6k.htm> (Visited on December 23, 2025).

market demand, brand positioning, and regulatory compliance (including emissions standards and the UK's Zero Emission Vehicle mandate) rather than by tax considerations. The Patent Box functions as a valuable enhancement to after-tax returns on UK-based innovation, but there is limited evidence that it has altered the scale or location of JLR's R&D investment decisions at the margin.<sup>15</sup>

McLaren represents a different Patent Box use case. As a low-volume, ultra-high-performance manufacturer, McLaren's entire brand is predicated on patented performance technology— aerodynamics, carbon-fibre monocoques, and hybrid powertrains. In 2023, the company increased intangible capital expenditure to £204.2 million, focused on models like the Artura hybrid supercar. For such a manufacturer, where per-unit margins are extremely high and IP content is dense, the Patent Box is particularly valuable, maximising return on innovation for shareholders.<sup>16</sup>

### 2.3: Additionality and Timing

The central challenge is distinguishing correlation from causation. UK automotive R&D peaked at £3.4bn (2016-18), declining to £2.4bn by 2020. Attributing growth to Patent Box requires isolating it from three confounding factors:

- Regulatory pressures (Euro 6, EV mandates) compel investment regardless of tax incentives;
- Global technological disruption (batteries, autonomous systems) drives sector-wide R&D;
- R&D tax credits (upfront relief) may outweigh Patent Box's ex-post design.<sup>17</sup>

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<sup>15</sup>Innovation News Network, 'Adapting to change and driving the future of the UK automotive industry', available at: <https://www.innovationnewsnetwork.com/adapting-to-change-driving-future-of-uk-automotive-industry/34477/> (Visited on December 23, 2025); Jaguar Land Rover, 'Annual report 2024' (2024), available at: <https://www.jlr.com/annual-report-2024> (Visited on December 23, 2025).

<sup>16</sup>McLaren Holdings Ltd, 'Annual report 2023' (2024), available at: <https://investors.mclaren.com/~media/Files/M/McLaren-Services/results-centre/2024/2023-mclaren-holdings-limited-annual-report.pdf> (Visited on December 23, 2025); McLaren Holdings Ltd, 'Q3 2024 condensed interim report' (2024), available at: <https://investors.mclaren.com/~media/Files/M/McLaren-Services/results-centre/2024/q3-ytd-2024-mclaren-holdings-limited-interim-report.pdf> (Visited on December 23, 2025); McLaren Group Ltd, 'Annual report 2022' (2023), available at: <https://investors.mclaren.com/~media/Files/M/McLaren-Services/results-centre/2023/mgl-annual-report-2022.pdf> (Visited on December 23, 2025).

(Your final line "MGL Annual Report 2022 ..." is a duplicate of the third source, so it should not be repeated in the ILI footnote.)

<sup>17</sup>Society of Motor Manufacturers and Traders, 'Written evidence', available at: <https://committees.parliament.uk/writtenevidence/53170/pdf/> (Visited on December 23, 2025); AAB, 'R and D

Academic research on patent box regimes internationally suggests they have a ‘strong effect on attracting patent filings’ but ‘no corresponding growth in levels of local inventorship.’ This implies that such regimes may influence where companies register patents and book profits, but not necessarily where they conduct underlying R&D. In the UK automotive context, the Patent Box appears effective at anchoring IP ownership for companies already committed to UK R&D, but there is limited evidence of additionality—that is, R&D that would not have occurred absent the relief.<sup>18</sup>

A structural limitation is the timing mismatch between automotive R&D cycles and the Patent Box’s ex-post design. Automotive platforms typically require 5-10 years from concept to commercialisation, with massive upfront capital commitments. The Patent Box provides relief only once the product generates taxable profit, potentially a decade after initial R&D decisions. This makes it poorly suited to influencing investment decisions at the critical early stage, compared to upfront incentives such as R&D tax credits or direct grants.<sup>19</sup>

## PART III – STRUCTURAL LIMITATIONS

### 3.1: Concentration and regional disparities

A striking feature of the Patent Box is the extreme concentration of benefits. HMRC data for

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tax incentives & Patent Box’, available at: <https://aab.uk/services/tax/rd-tax-relief/> (Visited on December 23, 2025); Innovation News Network, ‘Adapting to change and driving the future of the UK automotive industry’, available at: <https://www.innovationnewsnetwork.com/adapting-to-change-driving-future-of-uk-automotive-industry/34477/> (Visited on December 23, 2025); Pavel Hájek, ‘Patent Box – a measure for sustainable development’ in *Interaction of Law and Economics: Sustainable Development* (Sciendo 2024), available at: <http://dx.doi.org/10.2478/9788367405331-008> (Visited on December 23, 2025); TaxFlare, ‘R&D tax relief & Patent Box (2024 update)’, available at: <https://taxflare.co.uk/rd-and-the-patent-box-rd-tax-relief-2024-guide-key-updates-patent-box-change/> (Visited on December 23, 2025); ForrestBrown, ‘R&D tax credit statistics 2024: HMRC stats analysis’, available at: <https://forrestbrown.co.uk/news/hrmc-r-and-d-tax-credit-statistics-2024/> (Visited on December 23, 2025); Imperial College London, ‘Opportunities arising from disruption in the automotive sector: a UK perspective’, available at: <https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/centre-for-sectoral-economic-performance/UK-Automotive-Sector-Brochure.pdf> (Visited on December 23, 2025).

<sup>18</sup>EU Science Hub, ‘Patent Boxes design, patents location and local R&D’, available at: [https://joint-research-centre.ec.europa.eu/system/files/2015-08/JRC96080\\_Patent\\_boxes.pdf](https://joint-research-centre.ec.europa.eu/system/files/2015-08/JRC96080_Patent_boxes.pdf) (Visited on December 23, 2025); Tax Justice Network, ‘Indicator deep dive: “patent box regimes”’, available at: <https://taxjustice.net/2025/12/02/indicator-deep-dive-patent-box-regimes/> (Last Modified December 2, 2025; Visited on December 23, 2025); Parliament of Australia, ‘Attachment A: literature summary of recent patent box related papers’, available at: <https://www.aph.gov.au/DocumentStore.ashx?id=fd803c5d-de4d-4060-9d79-68d9f4ce5354&subId=408835> (Visited on December 23, 2025).

<sup>19</sup> Joohyun Kim, Byungjoo Paek and Heesang Lee, ‘Exploring innovation ecosystem of incumbents in the face of technological discontinuities: automobile firms’ (2022) 14(3) *Sustainability* 1606, , available at: <http://dx.doi.org/10.3390/su14031606> (Visited on December 23, 2025).

2023-24 shows that approximately 95% of the £1.98 billion in total relief is claimed by 'Large' companies (those above SME thresholds). In the automotive sector, this concentration likely reflects the dominance of major OEMs such as JLR and a small number of large Tier 1 suppliers.

This distribution raises fundamental questions about the regime's policy objectives. If the goal is to stimulate additional R&D investment, concentration among established, highly profitable incumbents suggests the Patent Box may function primarily as a windfall, rewarding R&D that would have occurred regardless of the tax relief. TaxWatch has characterised the regime as an 'inefficient subsidy,' arguing that relief is captured by companies least likely to alter behaviour in response to marginal tax incentives.<sup>20</sup>

Geographic distribution of Patent Box relief reveals further structural imbalances. London and the East of England together account for approximately 65% of total relief by value, despite representing 21% of companies in the scheme. In contrast, the North East (home to Nissan's Sunderland plant and a significant cluster of automotive suppliers) receives only 1% of total relief. The West Midlands, another traditional automotive hub, captures just 3%.

This regional mismatch is particularly problematic for industrial strategy. The UK automotive manufacturing base is concentrated in the Midlands, North East, and North West, yet Patent Box benefits accrue overwhelmingly to the 'Golden Triangle' of London, Oxford, and Cambridge. This suggests either that:

- a) R&D performed in traditional automotive regions is not generating UK-owned patents (perhaps because IP ownership sits in parent company headquarters); or
- b) manufacturing-focused companies in these regions are less able to navigate the Patent Box regime than research-intensive firms in the South East.

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<sup>20</sup> Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at: <https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025); Taylor Wessing, 'Time to tinker? The UK Patent Box', available at: <https://www.taylorwessing.com/en/insights-and-events/insights/2024/passle/time-to-tinker---the-uk-patent-box> (Visited on December 23, 2025); ForrestBrown, 'Patent Box statistics 2025: insights into HMRC stats', available at: <https://forrestbrown.co.uk/news/patent-box-statistics/> (Visited on December 23, 2025); TaxWatch, 'The great pharma tax giveaway', available at: <https://www.taxwatchuk.org/wp-content/uploads/TaxWatch-Patent-Box-Final.pdf> (Visited on December 23, 2025); Tax Justice Network, 'Multinationals' IP tax break like seven month tax break for workers', available at: <https://taxjustice.net/press/multinationals-ip-tax-break-like-7-month-tax-break-for-workers/> (Visited on December 23, 2025).

Either interpretation indicates the regime may reinforce existing regional inequalities rather than supporting the government's 'levelling up' objectives.<sup>21</sup>

### 3.2 SMEs and design bias

For the UK automotive sector to maintain global competitiveness, innovation must occur throughout the supply chain, not merely at OEM level. However, the Patent Box has largely failed to penetrate the SME tier. Small companies account for only 1% of total relief claimed, despite representing 26% of companies formally electing into the regime.<sup>22</sup>

Several structural barriers explain this under-representation:

- **Cost & profitability barriers:** Filing costs (£5,000+) and 20-year maintenance are substantial; SMEs are often loss-making during development. Unlike R&D credits offering cash refunds to loss-makers, Patent Box relief requires taxable profit—potentially a decade away.
- **Administrative complexity & expertise:** Modified nexus requires forensic 'track and trace' accounting expensive for SMEs. Large firms have dedicated advisers; SMEs lack expertise and awareness, preferring simpler R&D credit systems.
- **Practical design mismatch:** The regime excludes precisely where cutting-edge automotive innovation (battery chemistry, software, power electronics) occurs—in smaller, specialist firms.

The cumulative effect is that the Patent Box, while theoretically available to all companies, operates in practice as a relief for established, profitable, patent-rich incumbents. This design weakness is particularly problematic for automotive innovation, where much cutting-edge development—in areas such as battery chemistry, power electronics, and software—occurs in

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<sup>21</sup> Innovation News Network, 'Adapting to change and driving the future of the UK automotive industry', available at: <https://www.innovationnewsnetwork.com/adapting-to-change-driving-future-of-uk-automotive-industry/34477/> (Visited on December 23, 2025); HM Revenue & Customs, 'Patent Box relief statistics: September 2025', available at: <https://www.gov.uk/government/statistics/patent-box-reliefs-statistics/patent-box-relief-statistics-september-2025> (Last Modified September 25, 2025); Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at: <https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025).

<sup>22</sup>Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at: <https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025); Cooper Parry, 'HMRC shows Patent Box underclaimed', available at: <https://www.cooperparry.com/news/hmrc-shows-patent-box-underclaimed/> (Visited on December 23, 2025).

smaller, specialist firms.<sup>23</sup>

## PART IV - INTERNATIONAL COMPARISON

International comparison situates the UK Patent Box within a broader competitive landscape for automotive R&D investment.

### 4.1: EU regimes: Netherlands, Germany, Italy

**The Netherlands** operates an 'Innovation Box' offering an effective rate of 9% and with notably broader scope. This regime extends to non-patented intangibles that originate from certified R&D activities, making it particularly attractive for software-intensive automotive innovation where formal patenting may be slower than the pace of development. For connected and autonomous vehicle technologies, where much value lies in algorithms and data processing, the Dutch regime may offer greater flexibility than the UK's patent-centric approach.

**Germany** has traditionally eschewed profit-based 'boxes,' viewing them as potentially distortive and vulnerable to profit-shifting abuse. Instead, Germany focuses on cost-based incentives. The Research Allowance Act (FZulG) provides a 25% tax credit on R&D wages and contract research costs, capped at €2.5 million annually for large firms. This approach ensures that incentive is tied directly to R&D effort (wages paid to researchers) rather than commercial outcomes (profits from innovation). German policymakers argue this creates more

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<sup>23</sup>Raphael Kaplinsky and Erika Kraemer Mbula, 'Innovation and uneven development: the challenge for low and middle income economies' (2022) 51(2) *Research Policy* 104394, available at: <http://dx.doi.org/10.1016/j.respol.2021.104394> (Visited on December 23, 2025); Sergius Fribontius Bon and Sri Hartoko, 'The effect of dividend policy, investment decision, leverage, profitability, and firm size on firm value' (2022) 7(3) *European Journal of Business and Management Research* 7, available at: <http://dx.doi.org/10.24018/ejbmr.2022.7.3.1405> (Visited on December 23, 2025); Cooper Parry, 'HMRC shows Patent Box underclaimed', available at: <https://www.cooperparry.com/news/hmrc-shows-patent-box-underclaimed/> (Visited on December 23, 2025); Forrest Brown, 'R&D tax credit statistics 2024: HMRC stats analysis', available at: <https://forrestbrown.co.uk/news/hrmc-r-and-d-tax-credit-statistics-2024/> (Visited on December 23, 2025); TaxFlare, 'R&D tax relief & Patent Box (2024 update)', available at: <https://taxflare.co.uk/rd-and-the-patent-box-rd-tax-relief-2024-guide-key-updates-patent-box-change/> (Visited on December 23, 2025); MPA, 'Patent Box relief statistics 2025: a bigger prize, still pursued by the few', available at: <https://www.mpa.co.uk/news-insights/knowledge-hub/patent-box-statistics-2025-a-bigger-prize-still-pursued-by-the-few/> (Visited on December 23, 2025); Taylor Wessing, 'Time to tinker? The UK Patent Box', available at: <https://www.taylorwessing.com/en/insights-and-events/insights/2024/passle/time-to-tinker---the-uk-patent-box> (Visited on December 23, 2025); Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at: <https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025); Saffery, 'UK Patent Box: R&D tax relief', available at: <https://www.saffery.com/insights/articles/uk-patent-box/> (Visited on December 23, 2025); MPA, 'Patent Box – what is it and how do I qualify?', available at: <https://www.mpa.co.uk/what-we-do/tax-services/patent-box/> (Visited on December 23, 2025).

predictable support and better targets genuinely additional R&D, particularly in the capital-intensive automotive sector where development costs are high but profit margins can be thin.

**Italy** has recently reformed its regime, transitioning away from a traditional patent box toward a 110% 'super tax deduction' for costs related to eligible intangible assets. This shift reflects growing international scepticism about whether profit-based incentives genuinely stimulate innovation or merely facilitate tax planning.

#### **4.2: Shift towards input-based incentives**

These comparisons highlight a global policy trend: movement away from output-based (profit) incentives toward input-based (cost) incentives. The rationale is that cost-based systems more directly subsidise R&D activity, are less susceptible to profit-shifting, and provide support when companies need it most (during the expensive development phase) rather than years later when projects reach profitability.

For the UK automotive sector, this raises strategic questions. While the Patent Box is valuable for luxury, high-margin products (JLR, McLaren) where substantial profits can be allocated to patented innovations, it may be less effective than alternative designs for stimulating R&D in volume manufacturing or supporting early-stage technological development.<sup>24</sup> The international evidence suggests that the UK's regime is effective for influencing IP location and rewarding successful innovation, but structurally weaker at stimulating new R&D expenditure compared to input-based alternatives. The Patent Box enhances the attractiveness of retaining

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<sup>24</sup>Tax Justice Network, 'Indicator deep dive: "patent box regimes"', available at: <https://taxjustice.net/2025/12/02/indicator-deep-dive-patent-box-regimes/> (Last Modified December 2, 2025; Visited on December 23, 2025); Hogan Lovells, 'Thinking in the box – but should it be the UK patent box or the Dutch innovation box?', available at: [https://hoganlovells.com/~media/hogan-lovells/pdf/publication/thinkingintheboxbutshoulditbetheukpatentboxorthedutchinnovationbox\\_pdf.pdf](https://hoganlovells.com/~media/hogan-lovells/pdf/publication/thinkingintheboxbutshoulditbetheukpatentboxorthedutchinnovationbox_pdf.pdf) (Visited on December 23, 2025); AAB, 'R and D tax incentives & Patent Box', available at: <https://aab.uk/services/tax/rd-tax-relief/> (Visited on December 23, 2025); Tax Justice Network, 'Multinationals' IP tax break like seven month tax break for workers', available at: <https://taxjustice.net/press/multinationals-ip-tax-break-like-7-month-tax-break-for-workers/> (Visited on December 23, 2025); CFO Connect, 'R&D tax credits: a comparison of the UK, Ireland, France, Germany, the US and the Netherlands', available at: <https://www.cfoconnect.eu/en/resources/finance-insights/r-and-d-tax-credits-a-comparison-of-the-uk-ireland-france-germany-the-u-s/> (Visited on December 23, 2025); Imperial College London, 'Opportunities arising from disruption in the automotive sector: a UK perspective', available at: <https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/centre-for-sectoral-economic-performance/UK-Automotive-Sector-Brochure.pdf> (Visited on December 23, 2025); Securities and Exchange Commission, 'Ferrari N.V. annual report 2021 (race 20211231)', available at: <https://www.sec.gov/Archives/edgar/data/1648416/000164841622000032/race-20211231.htm> (Visited on December 23, 2025); Ferrari N.V., '2023 annual report and Form 20-F' (17 April 2024), available at: <https://cdn.ferrari.com/cms/network/media/pdf/Ferrari-2023-annual-report-april-17-2024.pdf> (Visited on December 23, 2025).

patents and IP ownership in the UK, but does not substantively reduce the upfront cost of conducting R&D—the key determinant of investment decisions, particularly in the capital-intensive automotive sector.

## **Conclusion**

### **Overall assessment:**

Has the UK Patent Box regime achieved its goal of stimulating R&D investment in the automotive sector between 2013 and 2024? The evidence supports a negative conclusion. The regime has successfully provided targeted financial benefits that enhance after-tax returns on patent-based innovations, particularly for large, profitable OEMs such as JLR and McLaren.<sup>25</sup> However, there is limited evidence that it has stimulated additional R&D investment across the sector as a whole. The Patent Box functions primarily as a retention and reward mechanism for established innovators, not a stimulus for new innovative activity.

### **Four structural features explain this outcome:**

(a) 95% of relief going to large companies and 56% to just ten claimants, suggesting windfall effects rather than marginal influence on behaviour.

(b) Regional disparities show that 65% of relief accrues to London and the East of England, while traditional automotive regions such as the North East and West Midlands capture minimal benefit, indicating the regime may reinforce rather than redress geographic inequalities.

(c) The profit-based design excludes loss-making SMEs during the critical development phase, limiting the regime's reach into the supply chain where much cutting-edge innovation occurs.

(d) The ex-post nature of the relief creates a timing mismatch with automotive R&D cycles of 5-10 years, making it poorly suited to influencing initial investment decisions.<sup>26</sup>

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<sup>25</sup> Society of Motor Manufacturers and Traders, 'Written evidence', available at: <https://committees.parliament.uk/writtenevidence/53170/pdf/> (Visited on December 23, 2025); HM Revenue & Customs, 'Patent Box relief statistics: September 2025', available at: <https://www.gov.uk/government/statistics/patent-box-reliefs-statistics/patent-box-relief-statistics-september-2025> (Last Modified September 25, 2025).

<sup>26</sup> Leyton, 'Key findings from the Patent Box relief statistics 2025 report', available at:

**Reform options:**

Targeted reforms could enhance effectiveness. Simplifying nexus compliance for SMEs through deemed ratios or safe harbours would improve accessibility. Introducing a regional uplift for R&D conducted in traditional automotive areas would align the regime with levelling-up objectives. Broadening the IP scope to include certified green innovations and embedded software (following the Dutch model) would better reflect modern automotive technology. More fundamentally, policymakers should consider whether the UK's automotive competitiveness would be better served by reallocating Patent Box expenditure toward input-based R&D credits or direct support for high-risk, early-stage innovation in battery technology and autonomous systems.

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<https://leyton.com/uk/insights/articles/key-findings-from-the-patent-box-relief-statistics-2025-report/> (Visited on December 23, 2025); ForrestBrown, 'Patent Box statistics 2025: insights into HMRC stats', available at: <https://forrestbrown.co.uk/news/patent-box-statistics/> (Visited on December 23, 2025); Society of Motor Manufacturers and Traders, 'Written evidence', available at: <https://committees.parliament.uk/writtenevidence/53170/pdf/> (Visited on December 23, 2025); Taylor Wessing, 'Time to tinker? The UK Patent Box', available at: <https://www.taylorwessing.com/en/insights-and-events/insights/2024/passle/time-to-tinker---the-uk-patent-box> (Visited on December 23, 2025); AAB, 'R and D tax incentives & Patent Box', available at: <https://aab.uk/services/tax/rd-tax-relief/> (Visited on December 23, 2025); TaxWatch, 'The great pharma tax giveaway', available at: <https://www.taxwatchuk.org/wp-content/uploads/TaxWatch-Patent-Box-Final.pdf> (Visited on December 23, 2025); Innovation News Network, 'Adapting to change and driving the future of the UK automotive industry', available at: <https://www.innovationnewsnetwork.com/adapting-to-change-driving-future-of-uk-automotive-industry/34477/> (Visited on December 23, 2025); Cooper Parry, 'HMRC shows Patent Box underclaimed', available at: <https://www.cooperparry.com/news/hmrc-shows-patent-box-underclaimed/> (Visited on December 23, 2025); TaxFlare, 'R&D tax relief & Patent Box (2024 update)', available at: <https://taxflare.co.uk/rd-and-the-patent-box-rd-tax-relief-2024-guide-key-updates-patent-box-change/> (Visited on December 23, 2025).