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The impact of the R&D tax relief reform on the biotech and pharmaceutical industry in the UK

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Abstract. This paper examines the impact of the UK's R&D tax relief reform on its biotech and pharmaceutical industries. As a global R&D leader with pharmaceutical investment exceeding 25% of total R&D expenditure, the UK's 2023 policy restricting relief to domestic activities creates both opportunities and challenges. The analysis demonstrates that tax relief significantly reduces R&D costs, enhances corporate financial indicators, and stimulates innovation investment. However, limitations on outsourcing increase operational costs and restrict international collaboration. While the policy strengthens local R&D ecosystems and attracts investment, it simultaneously hinders global knowledge exchange. The study concludes that despite implementation challenges, the reform's benefits outweigh its drawbacks. Recommendations include industrial adaptation through R&D expansion and governmental policy optimization to balance domestic innovation with global cooperation.

Keywords: R&D tax relief, pharmaceutical industry, R&D investment

1. Introduction

The UK is a world leader in R&D, with a 40-year high of £14.9 billion in government spending on R&D between 2021 and 2022. But some issues are holding back the UK's science and technology innovation, and the government is taking steps to better the situation [1]. The newly created tax relief implemented in April 2023, but the relief is limited to activities carried out in the UK and overseas expenses are ineligible. The move is designed to stimulate companies to undertake R&D activities in the UK to create a virtuous cycle of increased spending, higher investment and more job creation. The UK government is committed to attaining the target of spending 2.4% of the entire UK economy's GDP on R&D by 2027 [2].

The UK is a major pharmaceutical country, with pharmaceutical companies accounting for more than 25% of total investment in R&D [3]. Renowned pharmaceutical companies in the world contain AstraZeneca, GlaxoSmithKline, etc. This industry requires a high level of technology, and the development of innovative drugs requires a substantial number of resources, which is characterized by high investment, high risk, high return and long cycle time [3]. Therefore, the implementation of the government tax relief policy will create considerable impacts, including opportunities and challenges, to UK biotech and pharmaceutical companies.

2. Main analysis

2.1. The impact of R&D on the company

For pharmaceutical companies, R&D activities are the main source that can lead to high-tech pharmaceutical technologies, and are more intensive and heavily invested in R&D than in other industries. Especially in the UK, where one-fifth of the world's top 100 prescription drugs are developed, the amount of R&D investment is even more significant [3]. GSK, for example, has maintained an average annual investment of around £1 billion in vaccine R&D alone, with R&D investment remaining at 2% of annual operating revenue. Recently, it also announced that it will invest 1 billion pounds over the next 10 years to accelerate R&D related to the prevention and treatment of specific infectious diseases [4].

R&D is the basis of enterprise survival and development, and R&D investment in pharmaceutical enterprises is closely related to enterprise performance. R&D is the main way for enterprises to acquire technological capabilities. Having new technologies through innovation, and thus mastering the initiative, can then form a company-specific competitive advantage. Increasing R&D efforts to update existing technologies can improve the production process to reduce costs and bring sustainable

and stable economic benefits to the enterprise. If the quality of drugs is improved through R&D, forming the advantage of product cost performance, it can improve the market share and brand recognition [5]. So, tax relief has a significant impact on R&D, which also has a significant impact on pharmaceutical companies.

2.2. Impact of tax relief on R&D

This change in government policy is intended to provide relief on R&D tax while covering eligible expenditures such as data sets and cloud computing, and including national insurance contributions for employees and the company itself in the cost. All of these measures have been served to reduce the cost of R&D. For companies, R&D is costly and carries high risks, but the benefits are unknown. Biogen announced the early termination of its global phase III study of the Alzheimer's drug aducanumab, and the failure of the trial caused Biogen's shares to fall nearly 30% and its market value to shrink by $15 billion [6]. For shareholders, R&D affects their interests and will not be passed, which is the current obstacle. This policy reduces the cost of R&D for companies that are conducting R&D and for companies that apply for tax credits through RDEC/SME, driving R&D incentives. China has experimented with another government policy subsidizing pharmaceutical companies, Fosun Pharmaceuticals, and confirmed that the stock market value is positively correlated with the amount of the subsidy and that there is an induced effect of government subsidies on R&D activities [7]. Japan's strategy to promote the development of orphan drugs includes tax breaks, and according to the survey, R&D investment increased year by year after being affected by the policy and entered a small peak within three years [8]. But the policy change will inevitably bring some one-time costs, for example, companies that are applying need to update their application documents to adapt to the new policy or to respond to the UK-focused adjustments made in the R&D process [9]. These changes can temporarily increase the cost of R&D, but the impact is short-lived.

A license can be understood in two senses, a shareholder's consent to conduct a particular R&D and approval of a particular R&D by the relevant governmental authority. The issuance of tax relief by the government shows the government's recognition of the importance of R&D. Large companies are usually willing to follow the government's direction and in turn, R&D-related decisions are more likely to be passed [9]. At the same time, the uncertainty that investing in R&D brings to the company is reduced due to the reduction in R&D costs. This allows shareholders to focus more on the social value of a particular R&D rather than the financial, and thus decide to invest [10]. In the case of trypanosomiasis, for example, poses a heavy health problem in developing countries, but biopharmaceutical companies have little economic incentive to invest in R&D in this area [11]. Tax relief may play a role in this type of problem. The behaviour of government project approval departments is often aligned with government decisions. Due to the government's push for R&D, relevant departments also make adjustments to accommodate this change. For example, the review process is updated and additional reviewers are added to increase the efficiency of the review process and to drive compliant R&D activities to get licenses and research sooner [9].

This policy focuses relief on innovation in the UK, which does help the UK maintain its position as a major R&D nation. However, this decision limits outsourcing and is a double-edged sword. It is detrimental to companies that use cheap foreign capital and labour, increasing costs and making it difficult to diversify risks and achieve cost efficiencies. It also limits collaboration with other countries to enjoy the comparative advantages of internationalization. Like China's WuXi AppTec, whose main business is pharmaceutical R&D outsourcing services, restricting outsourcing will be a heavy blow to such companies [12]. But the challenges it presents also add to thinking about how to reduce costs on their own. This provides opportunities to reform technology and R&D processes [13]. Although, even if the reform is successful there is still the possibility of causing the original assets to be stranded and face the risk of transformation. However, once adopted, it will allow for good control of R&D costs and achieve the UK's goal of being a priority beneficiary.

3. Impact of tax relief on company

First of all, this change will have an impact on the company's financing activities. The reduction in costs increases the bottom line of the income statement and financial ratios such as ROE become better, which can present better financial information and thus attract potential investors to enter [14]. Of course, the resulting negative effects, such as restrictions on outsourcing, can also be identified during the fund managers' due diligence and influence their decisions. However, it is still beneficial to keep a long-term perspective on financing activities.

The risk dimension can be discussed from two perspectives. On the one hand, tax relief reduces costs and encouraging R&D increases the possibility of generating new profits [15]. The change in financial position has increased the solvency of the company and diminished the risk of facing debt distress. On the other hand, increased R&D and development have increased the breadth of marketable drugs in the future [15]. Diversification also diversifies the market risks faced by the company.

Taking GSK as an example, a large number of pharmaceutical companies today are aware of the importance of social responsibility and consciously comply with ESG [16]. This policy limits outsourcing and some pharmaceutical companies will move their R&D sites back to the UK. However, to continue to enjoy cheap resources and labour is likely to challenge corporate

credit in increasing the problems of non-compliance with ESG such as polluting the environment and not protecting human rights [17]. However, the tax relief also promotes companies to undertake the R&D of drugs that benefit society but do not have significant benefits, to assume their social responsibility [11].

This policy is generally beneficial to companies, and regulators will naturally increase their supervision to avoid those companies that do not qualify to be included in the exemption list. Therefore, companies need to improve their reports or applications to get themselves through the government's scrutiny [18]. This will increase the cost of internal audits for companies, which is a challenge for companies that do not have perfect internal audits.

4. The local and global impact of tax relief

The policy of tax relief initially shows the government's attitude, and often the relevant departments will take more measures to promote the government's objectives and improve the incentive policy for R&D behaviour [19]. It facilitates the focus on R&D at the level of society as a whole, prompting asset owners to invest more in R&D-related thematic investments and attract more resources for R&D projects. This creates excellent external conditions for R&D activities in the country as a whole and facilitates the development and expansion of R&D projects in UK pharmaceutical companies.

At the global level, showing the importance of innovation in the UK can attract more foreign investors and further increase the financial reserve for R&D [20]. The R&D locations of pharmaceutical companies can be globally distributed, for example, GSK's main R&D locations are in the UK, US, Belgium and Italy [21]. The limitations of the tax relief policy limit the location of R&D and affect the cooperation of national pharmaceutical companies with pharmaceutical companies from other countries. It is not conducive for pharmaceutical companies, whose main driving force is R&D, to interact with other advanced companies internationally.

5. Conclusion and recommendations

The UK is a country that values innovation and will use tax relief to reduce R&D costs. This policy has significant implications for the biotechnology and pharmaceutical industry.

Pharmaceutical companies survive and grow based on R&D, but often with high investment and high risk, and tax relief is exactly the measure to reduce the cost of R&D. For R&D activities, this policy can reduce costs and lead to more projects being approved more quickly. However, there are some one-time costs associated with it, and the restriction on outsourcing can limit the use of cheaper inputs, but it also provides an opportunity to change the R&D process and find new resources. For companies, the reduction in costs is good for financing and risk control. But it may also be accompanied by ethical challenges and stricter regulation. Finally, the adoption of policies and the emphasis of governments provide a good environment for R&D activities and facilitate the attraction of new dynamics to join. However, restrictions on global technology exchange should also be considered.

According to this article, it can be concluded that the policy has both advantages and disadvantages, but the overall advantages outweigh the disadvantages. The industry should be aware of the government's intention, grasp this opportunity to expand its R&D sector, and take the initiative to adapt to the new environment to bring higher revenue to the company and make new contributions to pharmaceutical R&D. At the same time, the government should also be aware of the disadvantages of this policy and actively adjust its policies to provide a better social environment for pharmaceutical R&D activities to promote the development of R&D activities.

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