

題目	生技產業兩階段研發效率分析
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摘要	全球生物科技研發得耗費龐大的時間與資金，因此如何提高研發效率，是本研究進一步探討的主因。研究根據先前學者分析構建了兩階段網絡模型，並透過行動者網絡理論觀點分別加入產學合作密度及外部法人投資，並進一步探討生物科技研發效率。接著對全球排名前 33 家生技企業進行分析，根據其相關效率值給予建議，並運用管理決策矩陣得知生技企業應藉由專利技術合作運用。研究結果發現，在第一階段技術創造必須注意對於研發的投入與產學合作的密度；而第二階段價值創造則是必須仰賴外部法人投資及內部資源投入相互運行串聯及整合，以創造更大營收及提高總市值。就區域別而言，歐洲之技術創造表現最佳，美洲為價值創造效率較佳，亞太地區則是兩者均衡發展。最後，研究發現學術及法人投資機構皆為影響生技產業研發的重要關鍵，因此不容忽視。
關鍵字	行動者網絡、生技產業、運營表現、資料包絡分析法
Title	Two-Stage R&D Efficiency Analysis of the Biotechnology Industry
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Abstract	The development of global biotechnology R&D has consumed enormous time and money. This study is mainly focus on further explore how to increase the efficiency of research and development. In this study, a two-stage network model was constructed based on previous scholars' analysis, and the industry-university cooperation density and external corporate investment were added respectively through the Actor-Network Theory to further explore the efficiency of biotechnology research and development. Then, we analyzed the top 33 biotech companies in the world and found out their relative efficiency values. Lastly, Using the Management Decision Matrix to learn that biotechnology companies reinforce the shortcomings in the first phase of research and development through patent and technology collaboration reinforcement. In addition, in the second stage, investors should be informed more about company operations and research and development projects, thereby increasing the relative value of the company's second phase. The results of the study found that most manufacturers did not fully invest in technology creation in the first stage, which led to a significant drop in the overall efficiency value. Therefore, attention must be paid to R&D investment and the density of industry-university cooperation; in the second stage, value creation must rely on

	<p>external legal person investment and internal resources. Therefore, we should actively connect and integrate all parties, use inseparable cooperation and division of labor, and reduce costs to create greater revenue and increase total market value. In terms of regions, Europe performed best in technology creation, the Americas performed better in value creation efficiency, and the Asia-Pacific region developed in a balanced manner. Finally, the study found that both academic and corporate investment institutions are important factors that affect the research and development of the biotechnology industry, so they cannot be ignored.</p>
Keyword	Actor-Network, Biotechnology Industry, Operation Performance, Data Envelopment Analysis