

**STUDIES ON FACTORS AFFECTING BUSINESS PERFORMANCE  
OF BIOTECHNOLOGY COMPANIES**

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To the memory of my parents

To my uncle Hassan

To my wife Rania and my big boy Ali

To my sisters Hend and Hoda

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## ABSTRACT

Biotechnology industries are fast growing, technology based and multibillion dollars business. Biotechnology dealt with using biomaterials to produce bioproducts or to provide service in many industrial sectors of health, food, chemical and environmental industries. Like most of high-tech business, biotechnology is long term investment business with high risk. Therefore, based on the unique nature of this business, factors affecting its performance are different from those of ordinary business. Thus, this study is focused on the determination of the current factors affecting the performance of biotechnology business by 46 worldwide experts using mixed research method (a combination between Expert Opinion Assessment EOA technique and questionnaire of closed ended questions). Two rounds of questioning were conducted to identify, categorize and prioritize these factors by mean ranks. In the first round, experts listed all factors affecting business performance. The results of the first round were grouped and returned to the experts in the second round to score the importance of each factor. The second round showed high results consensus among the experts. Based on the favorable Kendall's coefficient of consensus, it was not necessary to run the third round. Based on the results obtained from EOA study, a non-Financial Business Performance Indicator (n-FBPI) was developed for quantitative determination of performance of biotechnology companies. To evaluate the company's performance, another research instrument (questionnaire) was developed. This questionnaire composed of 97 questions to evaluate the company's external and internal environment and strength in points related to the effective factors uncovered in the first part of this study. The developed instrument was tested by 5 companies and gave quantitative measure for companies performance. Furthermore, a new website ([www.biotechhorizon.com](http://www.biotechhorizon.com)) was developed for this study for online assessment of the performance of biotechnology companies. The results of this study will help all stakeholders in biotechnology business either who are new in this type of business or who are well established by providing the current factors which have significant effect on biotechnology business performance. The n-FBPI developed will also be a useful tool for companies to evaluate their non financial performance quantitatively.

## ABSTRAK

Industri bioteknologi merupakan sejenis sektor perniagaan berasaskan teknologi yang semakin berkembang pesat dan bernilai berbillion dolar yang melibatkan penghasilan bioproduct atau penawaran perkhidmatan di pelbagai sektor seperti kesihatan, makanan, kimia dan pengurusan alam sekitar. Perniagaan bioteknologi merupakan sejenis perlaburan jangka panjang yang berisiko tinggi. Oleh itu, faktor yang mempengaruhi perniagaan ini berbeza daripada perniagaan biasa. Kajian ini tertumpu kepada penentuan faktor-faktor semasa yang memberi kesan kepada prestasi perniagaan bioteknologi oleh 46 pakar dari seluruh dunia menggunakan kaedah penyelidikan bercampur (kombinasi “Expert Opinion Assessment, EOA dan borang soal selidik soalan tertutup). Soal selidik sebanyak dua kali dijalankan untuk mengenal pasti dan mengkategorikan faktor-faktor tersebut berdasarkan keutamaan. Dalam soal selidik pertama, pakar-pakar menyenaraikan semua faktor yang mempengaruhi prestasi perniagaan. Permarkahan kepentingan setiap faktor dijalankan dalam soal selidik kedua. Soal selidik kedua menunjukkan keputusan pekali konsensus Kendall yang tinggi dikalangan pakar-pakar. Oleh itu, soal selidik ketiga tidak diperlukan. Petunjuk prestasi perniagaan bukan kewangan telah dikemukakan untuk menilai prestasi syarikat-syarikat bioteknologi. Untuk tujuan ini, satu borang selidik yang terdiri daripada 97 soalan telah disediakan untuk menilai persekitaran dalaman dan luaran syarikat serta permarkahan faktor-faktor penting yang ditemui dalam langkah pertama penilaian prestasi syarikat-syarikat. Instrumen yang dihasilkan digunakan untuk menentukan prestasi 5 syarikat berlainan. Satu laman web ([www.biotechhorizon.com](http://www.biotechhorizon.com)) telah disediakan untuk menilai prestasi syarikat bioteknologi secara “online”. Hasil kajian ini dapat membantu pihak-pihak berkepentingan dalam industri bioteknologi memahami faktor semasa yang mempengaruhi prestasi perniagaan bioteknologi. Selain itu, petunjuk prestasi perniagaan bukan kewangan yang ditunjukkan dalam kajian ini dapat membantu dalam penilaian prestasi bukan kewangan syarikat-syarikat bioteknologi.