Chapter 6
Alliances may Explain the Significant Growth of Biotechnology Companies in the Critical Period 1996–2001?

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ABSTRACT
The biotechnology is a very complex sector and its growth depends on many variables like intellectual properties, venture capital, clusters, public policies, alliances, amongst others. In biotechnology, the complexity surrounding alliances can be observed. The market globalization, the exorbitant costs of R&D and the rapid changes in technology, are arguably in the midst of the principal reasons that push companies to establish alliances. Biotechnology companies use this instrument to develop external features in the search for resources and missing expertise. This chapter sets out to identify whether such alliances in biotechnology companies are an advantage in themselves, sufficient for the acquisition of new capabilities and whether they help the growth of these companies. For this approach, a private database of companies (900 companies including years 1996-2001) in the two most advanced countries in this sector: United States and United Kingdom will be used.

INTRODUCTION
The chemical industry, considered as the first to have had a scientific base, constitutes a very heterogeneous sector. Molecular biology is complemented by the chemical industry in its steps, and the integration of two sciences have formed the young biotechnology sector, which is indivisible. In addition, the development of companies from 1920s to now results in the emergence of large multinational companies that work today in biotechnology. The biotechnology companies were restructured while being interested in the always-promising sectors of pharmacy and agrochemicals. These two sectors form oligopoly structures in an environment of very high competition. In these industries, the R&D department is the primary component of importance, and the costs to complete an innovating product are often very high. For example, it will necessarily take from ten to
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twelve years and 500 to 800 million US dollars, on average, for a new drug to be made available on the market, included in these figures are the opportunity costs of development (Sachwald, 1994; Drew, 1999; DiMasi, 2001).

This article has a double profile. The first one implies the ambiguity in reason of a complex causal structural industrial cooperation (asymmetric differences). The second profile involves a small number of studies made on the relationship between alliances, advantages and performance (taken in the broad sense: profitability, but also growth, stability, etc) to explain by them the growth of biotechnology companies occurred in the critical period 1996-2001.

First, the methodology and hypothesis used in this work will be described. Secondly, a literature review regarding the theoretical aspects and forms of alliances will be presented. Thirdly, the way in which these alliances contribute to the strategic aims of the partners and the way biotechnology firms cooperate will be described. Finally, the article shows the results obtained through this research and conclusions are drawn suggesting that alliances by itself neither explain nor justify the pace of growth of emerging biotechnology companies. Within this scenario, the question that we will try to answer is: Why biotechnology managers choose collaborations instead of other possibilities? In addition, we want to know, what are the advantages and the disadvantages that the managers can encounter while engaging in the alliances (does this practice really increase the company’s knowledge, open the door to intellectual property, make easier access to venture capital and ensure growth?).

We created a database of 900 biotechnology companies from more than 3500 biotechnology companies in the world with and without alliances in the United States and United Kingdom. We selected these countries because they are the leaders in this sector, not only by the number of companies, but also by their quality. We will analyze if the biotechnology companies with alliances develop an advantage in the acquisition of new capabilities, in relation to social capital, intellectual property, venture capital and finally, in which sector they are more active (human health, agriculture, environment).

**METODOLOGY**

We used secondary information to create an original and exclusive database of biotechnology companies from the United States and the United Kingdom for the period 1996-2001. SPSS statistical software was used to analyze the data for regressions and correlations. Because several growth promoters are involved in the success or failure of biotechnology companies, we used different dependent and independent variables. The dependent variable was the fast growth of the companies, which was measured by the increase of 50% or more in the number of employees during the period 1996 to 2001. We use the number of employees because we work with private and public companies. We cannot use the income data from private companies, because for these companies that information is not publicly available. The independent variables were treated in a metric approach, for example the age of the companies, or dichotomy form by yes/no (supply/absence of alliances). The variables were: the age of the company (variable metric calculated over a number of years since the foundation), area of exploitation, such a human health or agro/bio (dichotomy yes/no), patents (yes/no), venture capital (yes/no) and finally, alliances (yes/no).

These factors influence the behaviour of the companies at a point in time, such as now, and they show very different performances in an environment of similar characteristics. The literature shows that the companies do not have the same characteristics, nor the same competences or routines; the companies generate a variety of different capabilities, as if each one of them were equipped with limited rationality (Nelson & Winter, 1982).