FINANCING OF BIOTECH VENTURES
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Abstract
Venture capital funds play an important role in financing of biotech. In the current financial crisis a lot of attention focuses on cyclical development of venture capital, which in a great deal is connected to the state of capital markets. It is however also worth to mention another cyclical aspect of venture capital – changes in sector focus. With large share of investments in biotechnology companies during the last decade the attention of venture capital funds is likely to switch to other sectors and business models. Similar changes occurred in the past in computer hardware, software, telecommunications and internet. Although most of the changes seem inevitable and beyond the decision scope of managers and entrepreneurs involved in biotech ventures some new ideas especially related to business model formulation seem to offer interesting alternatives. The author aims to forecast the changes in venture capital financing and outlines possible alternatives to existing business models of biotechnology companies.

Keywords: biotechnology, venture capital, CEE.

1. INTRODUCTION
Innovation is often perceived as a key to national competitiveness and prosperity, and is promoted through various policy initiatives in many countries. The globalization of the world economy and the vigorous pursuit of national innovation policies by developing countries have led to the rise of new centers of high-technology manufacturing and knowledge-intensive service industries [2]. Life sciences and biotechnology is a fast-evolving area with direct or potential significance for European businesses and European policymakers [3]. The industrial landscape in Europe is steadily being transformed by the use of life sciences and biotechnology by a large number of industries, resulting in a wide range of products.

New research results indicate that benefits resulting from innovations are not evenly distributed. In high technology ventures most of the value remains in the country or region that provides for technology, product design, product management and marketing [4]. Location of production, assembly and transportation costs are currently associated with lower profit margins and lower value. This sheds new light on a long term discussion on the importance of location of businesses and production capacities [5],[6].

Many research and development initiatives in Central and Eastern Europe countries end with developing patents or platforms, later sold to large corporations. High potential ventures end up as takeover targets, before even testing the scope of their product life cycles. Developing new ventures into large scale corporations should be the target not only for EU policies but also for countries, regions and even local business communities, as they in particular could benefit from outsourcing, spill-over effects, infrastructure, etc. The role that venture capital could play in developing such businesses is unquestionable, yet entrepreneurs should take into account some very important factors if they are to succeed.
2. BIOTECHNOLOGY VENTURE CAPITAL

Biotechnology, as defined by the OECD is “the application of science and technology to living organisms as well as parts, products and models thereof, to alter living or nonliving materials for the production of knowledge, goods and services”.

The European Venture Capital Association (EVCA) defines venture capital as “professional equity co-invested with the entrepreneur to fund an early-stage (seed and start-up) or expansion venture. Offsetting the high risk the investor takes is the expectation of higher than average return on the investment. Venture capital is a subset of private equity”. Private equity is defined as “providing equity capital to enterprises not quoted on a stock market”. In the United States (National Venture Capital Association, NVCA) venture capital is currently also regarded as a subset of private equity asset class (statistics however are prepared for each class independently).

Venture capital is believed to be a major source of financing for young, rapidly growing, high technology companies.

3. DATA DESCRIPTION

Unfortunately the division into financing of early stage of growth and financing of mature companies within private equity statistics isn’t entirely transparent. Especially comparing EU and US statistics can be misleading as EU statistics include large scale private equity investments (treated separately by US statistics). US statistics regarding private equity investments, on the other hand, are not limited to not quoted companies. EU statistics are also impacted by growing number of member states. Therefore in this paper EU and US statistics are treated separately and conclusions are drawn from historical changes (in EU limited to the period 2003-2009). Data on US venture capital investment used in this research are from Thomson Reuters, published in MoneyTree survey, a quarterly study of venture capital investment activities in the United States. Data on EU and Central and Eastern Europe (CEE) venture capital investment are from the European Venture Capital Association.

4. VENTURE CAPITAL MARKET CYCLES

Growth of venture capital markets is cyclical. Years of dynamic growth are usually followed by periods of decreased fundraising and investment (Fig.1).
Growth and decline on this market is cyclical and has been observed in the past. Gompers and Lerner attribute it to periods of overinvestment followed by disappointing results [1]. The timing of two of the lately observed venture capital cycles follow stock market cycles.

Apart from widely observed cycles with data based on total investments there are cycles that refer to investments in particular industries (Fig. 2.)

![Graph showing US venture capital investments by industry 1995-2009. Data: Thomson Reuters](image)

**Fig. 2.** US venture capital investments by industry 1995-2009. Data: Thomson Reuters

Venture capitalists actual return on investment largely depends upon investment exit possibilities. It is a long established phenomenon of capital markets, that in certain periods, certain industries attract more attention and higher valuations based on higher expectations. Venture capitalists try to foresee the future “hot” industries and increase their involvement in those areas. In the 1990s these areas included telecommunications and networking. During the first decade of this millennium the “hot” sectors were: software, biotechnology, medical devices and equipment and rapidly rising industrial/energy. Areas such as IT services, semiconductors and networking seem to be in decline. For entrepreneurs this means that timing is a very important factor if they want to use venture capital funding.

Biotechnology, medical devices and equipment investments have suffered relatively less during the 2001 and 2002 downturn and seem to be examples of industries attracting focus of venture capital funds in the first decade (Fig. 3). This may indicate that in some periods cyclical trends related to particular industries may be stronger than the general venture capital market trends. The last two years seem to indicate a decrease in venture capital funding in those areas. It is however still too early to state, whether those
changes are caused by general decrease in spending or decreasing interest of venture capital funds in particular industries.

![Graph](image)

**Fig. 3.** US venture capital investments in Biotechnology, Healthcare Services and Medical Devices and Equipment 1995-2009. Data: Thomson Reuters

5. VENTURE CAPITAL AND PRIVATE EQUITY IN CENTRAL AND EASTERN EUROPE

After four years of continuous development private equity investments in Central and Eastern Europe are slowing down (Fig.4). In 2008 and 2009 funds acquired significantly lower commitments (fundraising). That suggests that investments may slow down in forthcoming years, as was the case after the dotcom bubble at the turn of the millennium.

![Graph](image)

**Fig. 4.** Investments and Fundraising for CEE private equity 2003-2009 Source: data EVCA/Thomson Reuters/PricewaterhouseCoopers

The slowdown has already significantly affected venture investments (early stage of growth). In 2009 only 34 young, growing companies were financed (compared to 108 in 2008 and 81 in 2007) [9]. Private equity investments in Europe and Central and Eastern Europe in particular, since many years, are largely
dominated by late stage of development investments (replacement and buyouts). Early stage investments also seem to be more susceptible to shifts in economic conditions.

Summarizing the characteristics of venture capital, it is:

- **Return on investment oriented.** Achieving high return on investment is by definition the only goal of venture capital funds seeking to justify high risk associated with their investments. This unfortunately is still often misunderstood by entrepreneurs who seem not understand that venture capital is a relatively high cost source of financing compared to traditional sources.

- **Cyclical.** For venture capital as a whole peaks of investment activity were observed in 2000 and 2007 (and previously in 1983 and 1987). Current development is showing signs of short or medium term decrease in operations, following the global financial crisis.

- **Industry cyclical.** Venture capital funds focus on selected industries. This focus changes on a cyclical basis. The effect of those cycles may be stronger than venture capital market cycles as a whole. Entrepreneurs should observe those cycles and benefit from periods of growth.

- **Geographically concentrated.** Although most venture capital funds declare a country, or even a group of countries as the area of their operations, research results indicate that current investments are positively associated with historical investments in terms of regions of countries [1]. This is particularly visible in biotechnology venture capital investments [11].

In addition to these characteristics CEE venture capital funds are: generally oriented (as opposed to industry oriented), late stage of development focused (as opposed to early stages venture capital).

6. **CHANGES IN BUSINESS MODELS AND STRATEGIES**

In order to utilize the concept of venture capital, high tech entrepreneurs, operating in CEE countries should investigate certain steps and incorporate them in their business models and strategies:

1. Financing of companies in early stage of development requires the existence of funds oriented at this type of investments, operating in the given region. Such funds require continuous dealflow, which in turn requires a stable supply of new businesses operating in the given area. This problem is clearly visible in CEE, as there are very few early stage investment and industry oriented funds. Large, private equity funds may not be interested and even capable of financing early stage high technology investments. The problem may be based on the difficulty in assessing (or even understanding) the potential of a given technology. Companies should create communities presenting their achievements and success stories globally. A good example of such cooperation is the Czech portal Gate2biotech.com. It is however limited to Czech companies while CEE orientation might provide for stronger leverage taking into consideration that most financial institutions regard CEE (and EU new member states from CEE) as their area of operations.

2. Few high tech businesses financed by venture capital funds in CEE acquire second or third round of financing. Venture capital funds stage their investments in rounds to decrease investment risk. Therefore a continuously growing company is designed to receive two or three rounds of financing from a private equity fund. It seems however, that entrepreneurs and venture capital fund managers operating in CEE are oriented at creating “multimillion” company and selling it to corporate investors. This behavior is unlikely to lead to the creation of corporations based and financed from CEE countries, that could benefit from value driven by their innovations. Those new, high tech corporations could provide foundations for further growth of spin-offs, suppliers and research centers in the region.
3. The third level of development is the creation of local business communities capable of assessing the potential of new ventures and financing them. Many companies from the famous Silicon Valley (Yahoo!, Google, YouTube, Cisco Systems, Amazon.com, Genetech) were financed by founders and former shareholders of Intel, Apple, and Fairchild Semiconductor. Success stories of those entrepreneurs and funds were the foundations of further development of both high-tech entrepreneurship and venture capital funds in this region. Successful entrepreneurs may also be used in forming advisory bodies that could help new ventures with issues such as: forecasting cash flows, identifying and constructing alliances, increasing scale through mergers and acquisitions and of course contacting and negotiating with venture capital funds. Given the complexity of relations between companies and venture capital funds this kind of advise may be very valuable. Those groups in time may transform to venture capital funds.

7. CONCLUSIONS

Venture capital financing is a vital source for young, high technology companies. Currently it is difficult to obtain as most funds, operating in CEE, are focused on buyouts, replacement and expansion of large scale businesses, paying relatively little attention to early stage of development, high technology companies. This may change following success stories of such ventures in the region. Such success stories should include multiple rounds of financing supporting a process of business expansion from research results to large scale corporation. This can be achieved through managing regional resources, forming alliances, mergers and acquisitions. The value of innovation is in a combination of: research results, processes, design and marketing activities. Additional value provided by venture capital funds, operating in CEE is limited (due to limited knowledge of high tech industries). Venture capital should be perceived as a tool rather than a product or service rendered to a business. Both knowledge and experience is necessary to use and expand this tool and high tech entrepreneurs should form think tanks to accumulate these assets. This process should start with creating ventures that explain and promote the potential of their ideas, followed by forming alliances, mergers and leading to the creation of local venture capital funds.

LITERATURE

a) Monographic publication

b) Article in professional journal