OPPORTUNITIES AND CHALLENGES IN THE EMERGING INDUSTRIAL BIOTECHNOLOGY SECTOR

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In March 2015, Gunter Festel from FESTEL CAPITAL, the Swiss Federal Institute of Technology Zurich and the Technical University Berlin, and Christian Rammer from the Centre for European Economic Research published a White Paper with the title “Opportunities and Challenges in the Emerging Industrial Biotechnology Sector - Recommendations for a European Policy”. Aim of this publication is to show the importance of industrial biotechnology or the bioeconomy for the economical development in Europe and the role of private investors and especially venture capital (VC) for this technology driven sector.

IMPORTANCE OF BIOECONOMY

Industrial biotechnology is the commercial application of biotechnology using cells or components of cells, like enzymes, for industrial production processes. An increasing number of chemicals and materials, like base chemicals and polymers, as well as high value products, such as consumer chemicals and specialty chemicals, are produced using biotechnology in one or more of the process steps.

In 2010, the sale volume of biotechnology products was around €92 billion worldwide. Sales are estimated to increase to around €228 billion in 2015 and to around €515 billion in 2020. On a sector level, the largest market potential lies in the production of biopolymers and active pharmaceutical ingredients.

IMPORTANCE OF YOUNG COMPANIES

In recent years, industrial biotechnology has gone through a fast technological development resulting in a high number of basic technologies based on research efforts at universities and research institutions. As a rule, commercial development is mainly driven by multinational enterprises, whereas small and medium enterprises contribute primarily to the technological development.

As in the medical biotechnology area some decades ago, the fast technological development within industrial biotechnology has caused numerous new ventures. The technology transfer gap between basic research and development and the commercialisation of the results can be closed by academic spin-offs which manage the technology transfer from universities and research institutions to industrial companies.

After the spin-off process, the technology is further developed within the new venture normally using additional resources from external investors. As soon as the technology reaches a certain grade of maturity, the spin-offs can co-operate with an established company and work for them as a service provider or be acquired. Whereas multinational enterprises are very active in making new technologies available both by acquiring spin-offs or engaging them as service providers, small and medium enterprises are focused on partnering with spin-offs, due to limited financial and management resources.

IMPORTANCE OF PRIVATE INVESTORS

VC has become a major capital source for young industrial biotechnology companies. Since the early 2000s, the global net stock of VC investments in industrial biotechnology companies has continuously increased and exceeded US$ 3.5 billion at the end of 2013. In 2013, the gross amount of VC money was US$ 386 million distributed to 20 companies corresponding to an average amount of US$ 19.3 million for each company. Analysing the VC investments by segments shows that there is a strong preference for biofuels and biochemicals. The regional breakdown of VC activities shows that the Americas are the leading region followed by Europe.

The rising capital contribution into the emerging industrial biotechnology sector indicates that it is seen as an attractive investment opportunity for VC investors. But the situation is changing. Most VC investors have shifted their focus toward more mature and thus less risky investment projects during the last years. Before 2009, a significant share of the total VC investment volume was allocated to new companies with an age of up to 3 years. After the financial market crisis, the vast majority of VC was directed to more mature companies with an age of more than 3 years. This conservative investment policy of VC investors presents a worrisome trend for new industrial biotechnology ventures as it inhibits access to external capital.

VC investors prefer to finance R&D based companies and especially firms with an established stock of technologies that are protected by patents. As patenting by industrial biotechnology firms in the post-investment periods is falling significantly, this shows a focus of VC investors on commercialization rather than developing new technology. The engagement of VC investors tends to shift the focus of industrial biotechnology firms towards transferring technology into innovation and growth, rather than on continuing to fund new technology development.

For young industrial biotechnology firms, the current VC policy implies a stronger emphasis on offering a consolidated and patent-protected technology portfolio to attract external capital for financing the commercialization of technology and the firm's expansion opportunities.

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