

Commentary

Fostering start-ups in the chemical sector through the joint support offered by seed funds and established companies

Philipp Rittershaus*

* High-Tech Gründerfonds Management GmbH, Schlegelstrasse 2, 53113 Bonn, p.rittershaus@htgf.de

The processes in the chemical industry are highly efficient and have been optimized and scaled up over many years. In short, the chemical sector is a mature industry. This mature industry has a highly diversified portfolio of products and raw materials. Maximum efficiency and huge volumes, as well as capital-intensive installations through to integrated production sites play a key role for the industry.

1 Options of external innovation within the chemical industry

Given the huge production volumes in question, even minor improvements can represent a major advantage. A small amount of process optimization and innovation can provide a major boost to chemical companies and give them an edge on the market. In addition, there is a high level of price sensitivity and competitive pressures due to a diverse range of factors. Environmental requirements have become tougher, with material efficiency having to be improved, energy consumption decreased and production downtime reduced. These are tasks that chemical companies face day in day out. These tasks are being addressed by large internal R&D capacities of the corporations that know the own processes best. Therefore: Does the chemical industry need external innovation at all? The answer is yes, it does.

In a nutshell, external innovations enable chemical companies to drive forward their business and secure advantages on the market. The companies are seeking new ways to optimize production. These alternative approaches or new sensors can lead to a reduction in costs. In addition, they are also looking for options to expand their product portfolio. New technical capabilities and the emerging opportunities due to the digital transformation, the impact of which will be felt in almost all areas, represent an additional dynamic that companies face and

that expertise is unlikely being present in-house. But still: all external innovations need to target the specific situation of the chemical industry and facilitate efficient implementation into existing processes of industrial scale.

2 Hurdles to technology transfer and the road to a successful commercialization

The transfer of technology from academic ideas to innovative industrial-scale implementation is often an arduous task. Thus, realization expertise and start-up capital are required. Seed funds such as High-Tech Gründerfonds (HTGF) can forge this link by providing start-up capital and support structures – in a sense, an “entrepreneurial toolbox”.

New technologies are e.g. being developed at universities at a constant rate. At the early development stage, application-based funding can be provided through to “Proof of Principle”, with it supporting commercialization preparations in a protected environment. However, these technologies need to have reached a certain stage of maturity before the technology transfer process is complete and they qualify for commercial use.

This further development and maturity of the technology through to “Proof of Concept”, prototypes or initial scaling stages typically takes place at start-ups. What defines these spin-off technology firms is the fact that they own or have access to a proprietary technology that is to be successfully launched on the market as an application following a phase of validation and scaling.

The path from lab to industrial scale is fraught with numerous challenges. In addition to the development of the technological asset, a transfer into the commercial sector requires additional support in the form of venture-capital financing. In addition, the successful transfer of technology from the field of academic or commercial research frequently requires close ties to established companies as

cooperation partners or users of the technology. This is true for the entire spectrum of chemical focused start-ups, as has previously been illustrated for the industrial biotechnology segment (Festel and Rittershaus, 2014).

To overcome technology transfer hurdles, start-ups require start-up capital as well as a reliable network that provides specialist expertise on realization. The journey towards successful commercialization can be initiated by strong investment partners that provide start-ups with the required capital, offer support with the help of successful methods, and maintain a reliable network of industry partners.

The next sections will detail a number of factors that support successful interaction between start-ups, public-sector support, early-stage venture capital within a mature industry, using the example of HTGF.

3 Sources of capital for start-ups

Before a technological development has reached the necessary level of technical and commercial maturity and market entry has been established, there are different sources of capital for the various phases, as illustrated in figure 1.

In the early stages of a business, start-up capital is mainly provided by business angels, as well as specialist seed funds, in addition to the founders' own funds. Institutional venture capital investors tend to join at a later stage with further maturity, leaving a gap for the early development stages. Another source of capital is provided by established corporations. Their financing is often being based on existing cooperation, indicating a strategic fit between the funded start-up and the firm's current and future portfolio.

4 Value added by corporations

Alongside capital, there is further support provided by funds or corporations that will add value to the technology firms (figure 2). Expertise on industrial processes exists in the established companies, which also enable a scalable market entry, the market itself or licensing options for the technology. In addition, an increasing number of established companies also have the ability to invest at an early stage through the corporate venture arms they have set up. The need of capital and specialist expertise by start-ups can therefore both be provided by established companies which ties in with the mutual benefits enjoyed. This combination is

Figure 1 Stages of financing and typical sources of capital for chemistry-related start-up companies.

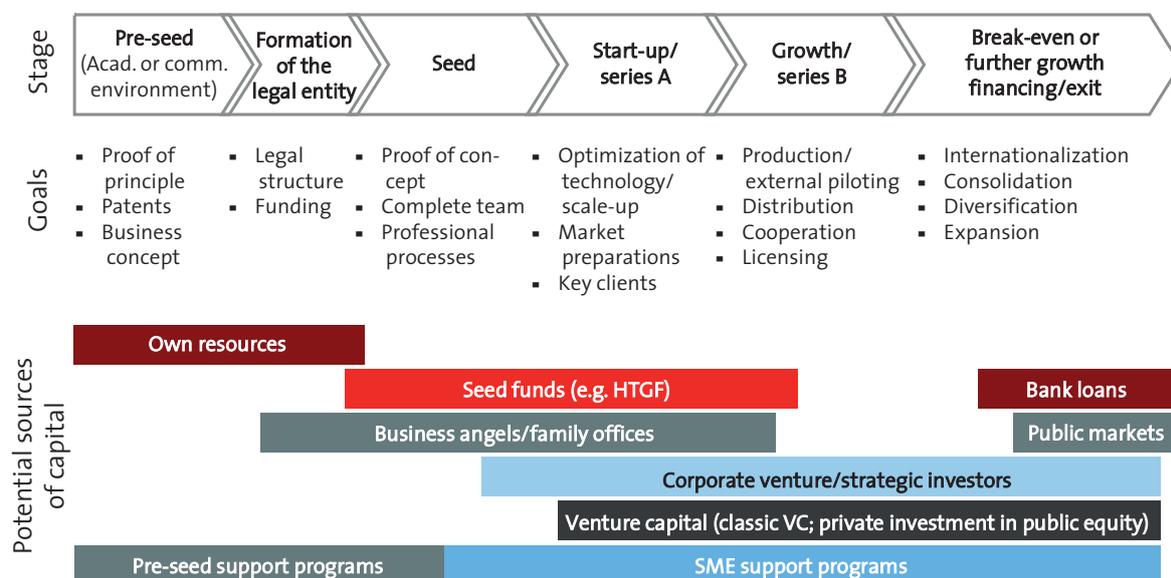
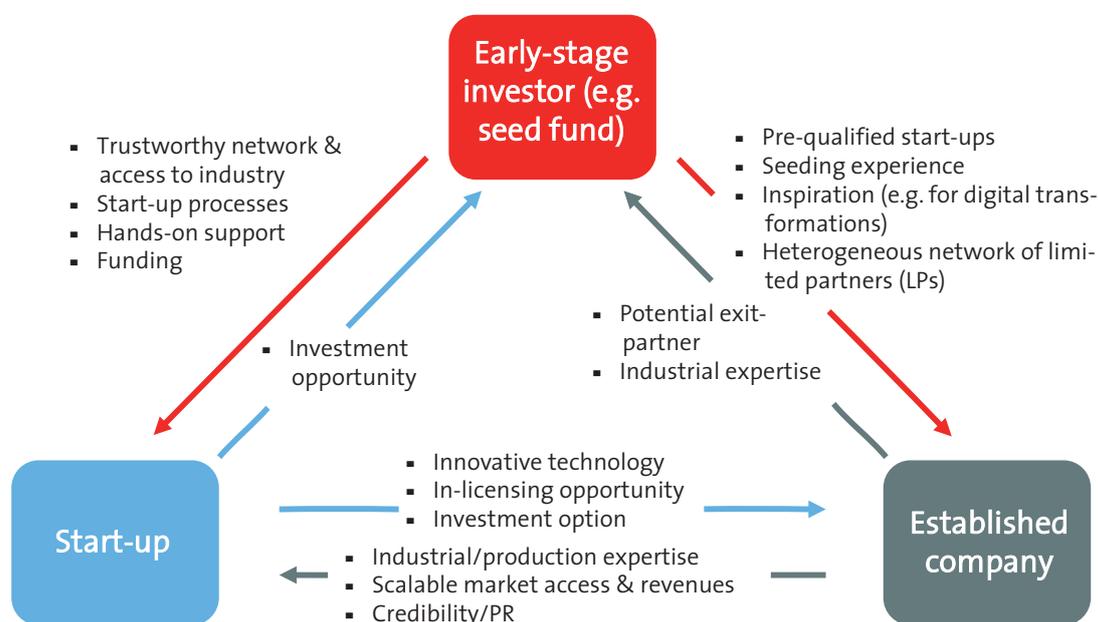


Figure 2 Combination of corporation, seed fund and start-up offers and needs.



also reflected in the sources of capital available at various stages during the preparation and maturity phases of a chemical start-up. However, the financing activities of established companies rather focus on acquisitions of complementing more mature tech-companies than fostering very young ones. Therefore, the initial hurdles that need to be cleared for an established company to invest are very high for start-ups that only find themselves in an early development stage.

5 Active support provided by early-phase investors

Seed investors such as HTGF have specialized in overcoming these hurdles by providing active support and establishing professional processes in the initial phase. They take on a high degree of risk. However, their involvement at such a stage enables them to make a significant difference in the company's performance, even with limited capital investment. They complement this limited level of capital investment with active support structures in the form of an "entrepreneurial toolbox".

They offer hands-on support, especially in the initial phase, as there can be many different iterations before a strategically valid business model is found. Management and documentation process-

es need to be put in place, so that they do not become a limitation for further rounds of financing or an exit. It is also important for the investor to offer a reliable network and foster intensive dialogue with relevant figures in industry. This not only leads to easier access to additional investors for subsequent rounds of financing, but also to a lower hurdle to relevant partners who will play a key role as process or market experts, or even customers. Providing active support to the start-up team is the only way to ensure that the chances of the investment being a success are high.

6 Benefits of fund investments for corporations

By participating as investors in an investment fund and therefore being a limited partner (LP), established companies gain an insight into the innovation landscape and dynamics, while strict confidentiality is maintained. Through regular updates on subjects related to the deal flow, i.e. companies expressing interest and suggesting projects, as well as their involvement in the fund's decision-making process, companies gain a very broad overview of tech trends and future innovations. These pre-qualified start-ups can also become candidates for cooperation or an investment at a later

date – together with the experienced seed fund they have already invested in, if possible. The limited partners (LPs) therefore benefit from the experience that the fund has amassed through its investment activity.

Another benefit for the LPs lies in the fact that their field of view is almost automatically broadened by the cooperation with a seed fund that is investing in different industrial sectors. Even in areas that the LPs are not actively monitoring, they may come into contact with suitable technologies. Investing in a fund can therefore be a source of inspiration that cannot be tapped through an active strategic approach. Especially in situations with an unusual market dynamic and extraordinary innovation pressures – such as through the digital revolution that the industrial sector is currently undergoing – access to supplementary technological areas can represent a key advantage.

In addition, seed investors ideally enable their LPs to regularly interact with one another. Even though LPs appear heterogeneous at first glance, participants from the chemical companies come into contact with like-minded people from other industries and can learn from each other during regular exchanges. The fact that they share the same interests leads to a level of homogeneity that fosters targeted networking and highly effective exchanges.

7 Conclusion

Especially in a field so close to a mature industry like the chemical sector, interaction between start-ups, investors and industry is of paramount importance. This is an area in which close interaction produces synergies. For start-up companies, they enjoy a more targeted start to life and have a better chance of becoming a successfully established company. The investor, meanwhile, has better odds of achieving a positive exit, while the established company can maintain or boost its competitive position by integrating innovative technology.

References

Festel, G., Rittershaus, P. (2014): Fostering technology transfer in industrial biotechnology by academic spin-offs, *Journal of Commercial Biotechnology*, **20** (2), pp. 5-10.
