

Dissertation title:

The lead model of a cluster as an adaptive system with reference to the real option method

Kristina Dewes

New Challenges like the globalization of competition, the transition from seller markets to buyer markets and the increasing demand for individualized products necessitate crucial adjustments in corporate policies that have to promote flexibility and adaptability. Especially small- and medium-sized companies (SME) are often not able to cope with these requirements. The essential financial and personal resources are often missing, which prevents them from dealing with the growing pressure of innovation. Innovation clusters, which exist in many industrialized countries, are usually understood as firm networks and a promising way to overcome the problems mentioned above. In addition, they are able to support the introduction and the exchange of new technologies. The peculiarity of clusters, in contrast to other company networks like joint ventures and strategic alliances, consists in their regional concentration and the simultaneous existence of cooperation and competition. In this way, innovation becomes possible. Another specific characteristic of a cluster is its openness for new members, which enables a rapid and flexible reaction on changing environmental conditions.

In the case of SMEs, and, in particular, of SMEs in Baden-Wuerttemberg, complications arise on the one side, since they are very skeptical about firm networks like clusters, while, on the other side, they are aware of the need to overcome their limitations in capabilities and strive to fulfill the sophisticated demands of their customers. Torn between these two opposite positions the aim of this work is to identify the critical incentives that would be necessary for SMEs to enter a cluster. Firstly, a literature review and an empirical study are used as a basis, then the results obtained are applied to create an evaluation model that is able to consider all the identified influencing factors and to derivate recommendations for action.

Despite or just because of the boom of clusters, which started in 1990 and is still ongoing nowadays, abundant research in this area can be found. However, the available literature provides a partly confusing and fragmentary picture. This appears remarkably clear in each aspect of the subject, even in the basic definition of a cluster. Instead of a comprehensive conception of it, there exist numerous divergent definitions that, in turn, complicate the comparability of the empirical results.

Therefore, the basic idea of the following work is to build an appropriate definition for a cluster. Starting from this, the identified factors that influence a cluster entry decision are derived from the existing literature and compared with the results of the empirical study. An accurate analysis of different types of clusters is carried out. The variety of

distinguishing features found out throughout the analysis allows to argue that a detailed comparison of one cluster to another is almost impracticable. This can have a crucial impact on the determination of the factors that influence a cluster entry decision because a common identification of the incentives is difficult due to the individuality of each cluster.

The results of the comparison between the existing literature and the empirical study represent the basis for the evaluation model that shall deliver recommendations for action for or against a cluster entry. Beside chances and disadvantages of a cluster membership, the role of the cluster manager and the determination of the appropriate evaluation method are important incentives for a cluster entry decision. Furthermore, behavior uncertainties between companies and the possibility of a trial membership must not be neglected in the cluster entry decision. The challenge of the work consists in the simultaneous consideration of these different incentives and barriers as well as their combined estimation in one evaluation model.

In order to construct such an evaluation model, first of all the essential information has to be delivered. Ratio systems may be employed for this. While qualitative information can be evaluated with a utility analysis combined with a risk analysis, quantitative data can be taken into account by means of the discounted cash flow method. By modification of the discount rate, the behavior uncertainties mentioned above can be included as well. The application of real options as an extension of the discounted cash flow approach enables to involve a defer option that may arise in the case of a trial membership. Ultimately, the results of the utility analysis and the results of the real option method are combined into a utility-expanded net present value-diagram that delivers recommendations of action.