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Part V: Discussion and conclusions
7 An interactive multi-sided market for open innovation

This dissertation contributes to the academic discussion and theory building about networked markets and innovation intermediation in three ways. First, I present the matching process as multi-sided market where network effects based on interactions lead to tie building in networks for open innovation. The conceptual market model provides an economic perspective on matchmaking, as value is created by matching suitable innovation partners for open innovation by an innovation intermediary. Second, the matching process on a multi-sided market for open innovation is introduced as interactive process which provides a more suitable perspective than transaction based reasoning, as property rights cannot be assigned for innovation in the early stage. Matching dynamics along the process are shown as interactions between market agents. A matching matrix for managerial practice between multiple market agents for co-exploitation and co-exploration purposes is made (Parmigiani & Rivera-Santos, 2011). It is assumed that the framework is applicable for a distinction towards transaction-based or interaction-based matching mechanisms. Third, the role of innovation intermediaries in innovation networks is defined as matchmaker, innovation process, project and portfolio manager generating clear economic value to all agents in the innovation network. Thus the innovation intermediary is modelled as an active market agent. The economic value created by innovation intermediaries in networks closes the circle towards the main argument that matchmaking is a process on a multi-sided market for open innovation, leading to new business opportunities in practice.

7.1 An economic rationale for innovation networks

Part II outlines that matchmaking for open innovation can be explained as multi-sided market. I therefore contribute to the theory on two-sided markets (Roson, 2005) by adding a process study about matchmaking on the one hand and providing empirical insights from innovation networks as multi-sided market on the other hand. As described in chapter II, there were at least three or more agents involved along the matching process which allow me concluding that matchmaking for open
innovation is a multi-sided market. Similar to what is reported in literature about two-sided markets, positive and negative network effects (Katz & Shapiro, 1985) were also observed in my cases. Network effects mainly occurred through social interaction between market agents which may end in “virtuous” or “vicious” circles for matchmaking, showing the dynamics along the matching process.

My empirical findings based on qualitative data documentation and active participation in the field, support evidence from Sun & Tse (2007). They state that a monopolised winner takes it all position of an intermediary depends on how many networks individual agents participate in. A social media platform for example is only interesting, when all friends participate on the platform. This provides a monopolised position for the platform owner, as other platforms become obsolete. In innovation networks, agents tend to explore new connections in order to find the unexpected and thus, participate in several networks, but ties in such networks are rather weak (Granovetter, 1983; Granovetter, 1973). It is the task of the innovation intermediary to match suitable ties to become strong connections for joint open innovation projects with strategic long-term impact. Thus, matchmaking as multi-sided market in networks furthers our understanding of this phenomenon as tie building with economic impact towards open innovation for new markets.

The positive or negative network effects on the multi-sided market were generated through interaction between the innovation seeker, innovation provider and the innovation intermediary as active participants on the networked market. Therefore, my work puts interactions in the focus of analysis in contrast to transaction like assumed in transaction cost theory (Williamson, 1989, p. 142). I do not intend to criticise transaction cost theory, my argument is rather a shift of understanding of economic value towards interaction in innovation networks with long-term impact towards a shared vision and a common understanding on a multi-sided market (see part III). I conclude that this statement may solve the market failure on innovation and technology markets.
Commitment of managers as market agents depends on visible results, as evaluation in hierarchic organisations is mainly based on economic short term goals. For this reason, the innovation intermediary has to provide a certain portfolio with potential “deals” showing concrete potential value to all market sides as outlined in part IV, even if a clear outcome lies in the unpredictable future. In particular, I demonstrated in my study that a structured multi-sided market and a coordinated matching process achieve long-term relationships towards successful open innovation “deals”. The findings are in line with earlier discussions in different scientific communities where networks are described as “intermediate systems” between hierarchy of the firm and pure spot market transactions (Bidault & Fischer, 1994; Teubal et al., 1991).

7.2 Theoretical contributions based on interaction

Transaction cost theory builds on the theory of the firm, the reason why firms as organisations exit (Coase, 1937). The reason behind the theory is that firms exist when direct market transactions would be more costly than hierarchical organisation (Williamson, 1973), thus it is a framework for ‘make or buy’ decisions. The development of the internet led to the new research discipline of ‘virtual organisations’ building on the theory of the firm. Business partners are assumed to quickly switch between projects based on operational and direct routines and thus, generate nearly spot market transactions in or between organisations (Mowshowitz, 2002).

“Switching depends on the categorical separation of requirements from satisfiers. At any given moment there is an allocation of satisfiers to requirements, but the particular allocation can change over time. ... The use of switching in business practice is only just the beginning.” (Mowshowitz, 2002, p. 54)

Studies building on these findings assume that resources are dynamically allocated and switched like reported in the competency rallying process in stable supplier networks where network agents already know each other (Katzy & Crowston, 2008). In the early stage of innovation processes, resources or property rights cannot be clearly allo-
cated and assigned. This leads to explanatory limitation of transaction cost theory, either as dynamic switching concept or classical market transaction. Especially in the early stage of explorative innovation partnerships clear matching criteria cannot be formulated. Therefore, matchmaking is an interactive process leading to a shared vision, adaptive goal finding and goal setting. The interactions are comparable to network effects on two- or multi-sided markets with positive or negative feedback loops resulting in un- or successful matches. I therefore argue to put the interaction in the centre of economic analysis instead of the transaction.

Similar to what is stated for the technology transfer process as a processes with several stages and multiple actors (Bessant & Rush, 1995, p. 98), the matching process can be distinguished in a more transaction-based process for joint exploitation or in a more interaction-based process for joint exploration. In my study (part III), I found that matchmaking for explorative innovation projects differs from matchmaking for exploitative innovation or technology transfer projects. In my cases, the innovation intermediary conceptually contributes in establishing new paths and new network connections for co-explorative innovation processes by involving the right partners and building sustainable ties between market agents which might lead to new markets or future transactions later in the process. Literature on technology transactions has mainly discussed technology transfer for exploitation (Tietze, 2012). My findings contribute to matchmaking for co-exploration (Parmigiani & Rivera-Santos, 2011) towards new solutions which is in line with Schumpeter’s evolutionary understanding of innovation and entrepreneurship (Schumpeter, 1942), as matching criteria emerge over time, change and lead to a shared vision.

7.3 Innovation intermediaries as active matchmaker

Based on the findings in part IV, the role of innovation intermediaries on a multi-sided market for open innovation is elaborated. I further contribute to the growing literature on innovation intermediaries, as technology transfer offices or gatekeeper (Allen, 1984), online platforms (Chesbrough, 2006; Lopez-Vega & Vanhaverbeke, 2009), net-
work facilitators (Klerkx & Leeuwis, 2008) or patent brokers (Benassi & Di Minin, 2009) among others, and provide managerial insights how innovation intermediaries create value. It therefore builds on studies about the functionalities of innovation intermediaries and seamlessly follows the proposition for future research on innovation intermediaries (Howells, 2006).

“Further research into the range of intermediaries, the type of functions or roles they offer and how these have evolved over time, clearly still needs to be done, together with coverage of this phenomenon in other national and local systems. In addition, much more research needs to be undertaken into the nature of the relationships that intermediaries exist in, over and above this more detailed outline of their functions and activities. As noted in the above section, most of the discussion about intermediaries has been in the context of their function and not their network relationships. Simple triadic structures are mainly implied, whilst where more complex multi-actor relationships in terms of intermediation are, en passant, acknowledged they are then largely ignored.” (Howells, 2006, p. 725)

Three concrete value propositions of innovation intermediaries on a multi-sided market were identified and extend the detailed analysis on the functionalities of innovation intermediaries from Neumüller (2010, p. 231 ff.). I provide insights in distinct managerial capabilities of innovation intermediaries delivering long-term value to market agents by actively getting involved in the innovation process of the organisations from all market sides. In doing so, the innovation intermediary has to organize and coordinate the interactions on multi-sided markets and thus, needs a project and portfolio management capability. Especially the documentation presentation of potential “deals” in a portfolio (e.g. a large database or an individualized collection) presents a clear market value to all stakeholders. This finding revisits the “facilitation rationale” of public funded non-profit intermediaries such as technology transfer offices or university incubators for start-up firms (see part IV and chapter 8.4).