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A resource-based analysis of strategic alliances between knowledge intermediaries in regional innovation and entrepreneurial ecosystems

ifh Working Paper, No. 36/2022

Provided in Cooperation with:
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Suggested Citation: Bäumle, Philipp; Bizer, Kilian (2022) : A resource-based analysis of strategic alliances between knowledge intermediaries in regional innovation and entrepreneurial ecosystems, ifh Working Paper, No. 36/2022, Volkswirtschaftliches Institut für Mittelstand und Handwerk an der Universität Göttingen (ifh), Göttingen

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ifh Working Paper No. 36/2022

A resource-based analysis of strategic alliances between knowledge intermediaries in regional innovation and entrepreneurial ecosystems

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Abstract

Notwithstanding a recent upsurge in interest in knowledge intermediaries and their roles in innovation and entrepreneurial ecosystems, we know little about the interplay between the activities of academia driven intermediaries and their publicly financed counterparts. Building upon a combination of principles derived from the resource based theory and the entrepreneurial ecosystems literature, this paper investigates the potentials of cooperation between different knowledge intermediaries. Therefore, we analyze the alignment of financial, knowledge, market and network resources in politically funded regional alliances between university internal and university external intermediaries by the means of a qualitative approach. We find that while knowledge intermediaries can benefit from access to additional ecosystem specific resources, the urge to improve the own position within the ecosystem hampers the will for cooperation and can lead to non performing resource alignments. This paper contributes to current scholarly discussions by suggesting and testing a theoretical foundation for analyzing the cooperative behavior of knowledge intermediaries in innovation and entrepreneurial ecosystems.

JEL: I29, O31, O39
Keywords: resource-based view, strategic alliances, knowledge intermediaries, innovation and entrepreneurial ecosystems, qualitative case study

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1. Introduction

The reciprocal transfer of knowledge between academic and non-academic actors in innovation and entrepreneurial ecosystems has long been seen as an important conduit of innovation and knowledge-based regional development (Rothwell and Dodgson 1992; Hassink 1996; Etzkowitz and Leydesdorff 2000). In this context, knowledge intermediaries have gained scholarly and political attention as a concept and instrument for describing organizations that foster knowledge exchange between academic and non-academic stakeholders in innovation and entrepreneurial ecosystems (Smedlund 2006; Clayton et al. 2018).

Knowledge intermediaries represent an increasingly heterogonous group of actors including university administered transfer and start-up support units as well as public agencies established by municipalities, ministries or other political actors (Yusuf 2008; Wright et al. 2008; Villani et al. 2017). Despite their acknowledgement as important supporters of innovation and entrepreneurial ecosystems and a concomitant upsurge in interest in their roles and functions, relatively little is known about the requirements for successful knowledge intermediation (Larty et al. 2017; Silva et al. 2018) and about the interdependencies between the work of different intermediaries and accruing potentials for cooperation (Hayter 2016; Clayton et al. 2018; Wright et al. 2017; Caloffi et al. 2015).

In Germany, the promotion of academic entrepreneurship and, more specifically, innovation and entrepreneurial ecosystems, has been high on the agenda of national and federal ministries (see i.e. Federal Ministry of Education and Research 2020). However, policy actors can only provide a regulatory frame and top-down incentives for cooperation while it remains difficult to incorporate regional actor constellations and peculiarities that result from path-dependencies. Therefore, this study focuses on investigating the adoption of policy incentives for cooperation by knowledge intermediaries in three regions in the federal state of Lower Saxony (Northern Germany).

We use resource-based theory (Wernerfelt 1984; Barney 1991) as a theoretical foundation to develop a framework capable of elucidating cooperation between different intermediary organizations. More specifically, we use an explorative, qualitative approach based upon the resource-based theory of strategic alliances (Das and Teng 2000) in combination with empirical insights by Larty et al. (2017) and Silva et al. (2018) who suggest that intermediaries mostly benefit from acquiring additional financial resources (*financial*), new technical and operational capabilities (*knowledge*), up-to-date information concerning 'their' ecosystem and its' actors (*market*), and access to more networks and contacts (*network*) that are indispensable for successful intermediation. By the means of this approach, the study aims to find out how cooperation with other intermediaries affects every day work and activities of organizations and individuals supporting academic entrepreneurship and technology transfer. The research question we address is:

RQ *How do financial, knowledge, market, and network resources align in alliances between different knowledge intermediaries and affect their cooperative behaviour?*

The paper contributes to current debates about knowledge intermediaries in entrepreneurial and innovation ecosystems in three ways. Firstly, we analyze a novel policy instrument that shifts the focus onto cooperation between different knowledge intermediaries. We pick up themes raised by Wright et al. (2008) and elaborated on by e.g. Hayter (2016), Wright et al. (2017) and Clayton et al. (2018) by showing that different knowledge intermediaries are tied to different entrepreneurial subsystems and thus, even if well designed, may have difficulties in connecting different groups of actors. Secondly, this paper provides empirical support for recently expressed calls for holistic approaches to analyze regional innovation and entrepreneurial ecosystems and their dynamics (Good et al. 2019). Consistent with the ecosystem analogy, understanding fragile and idiosyncratic regional cooperation structures and networks contradicts isolated analyses of regional subsystems and, consequently, such that focus on individual intermediaries. Thirdly, this paper questions the predominant image of knowledge intermediaries as will-less supporters and administrators of regional entrepreneurs (Dalziel 2010;

Yusuf 2008) by focusing on their organizational missions and objectives. Additionally, this paper derives policy implications for the design of knowledge intermediaries and thereby addresses recent calls for the identification and evaluation of appropriate public policies for the support of innovation and entrepreneurial ecosystems (Feldman et al. 2019) and the roles of universities in them (Schiuma and Carlucci 2018).

We adopt the broad understanding of academic entrepreneurship that is commonly used in the context of entrepreneurial ecosystems. Therefore, we perceive innovation and entrepreneurial ecosystems as interconnected networks of academic, industrial, and public actors operating in the context of co-evolving institutions to foster all kinds of spin-off creation, patenting, licensing, and university-industry collaboration for the sake of utilizing academic research (Fuster et al. 2019; Lahikainen et al. 2019; Grimaldi et al. 2011; Hayter 2016). Consequently and in line with the exploratory research focus, the results of this study comprise a broad variety of different topics and motives.

The remainder of this paper is organized as follows. In section two, we commence by outlining central insights into the roles of knowledge intermediaries in regional innovation and entrepreneurial ecosystems and basic principles of resource-based theory in order to develop the theoretical framework for our analysis. In section three, we describe our methodological approach and introduce the assessed cases. In section four, we present central empirical findings. In section five, we discuss these findings against the background of existing research before we bring the paper to round figures by deriving initial implications and identifying opportunities for future research in section six.

2. Theoretical framework

In line with prior approaches on regional innovation dynamics, such as the Regional Systems of Innovation (Autio 1998), conceptualizations of entrepreneurial ecosystems act on the assumption of a segregation between academic and non-academic networks whose overcoming represents a major challenge and objective of innovation and entrepreneurial ecosystems (Miller and Acs 2017). At the centre of policies that aim to address this challenge are actors that develop and process manifold activities to interconnect academics with their local environment.

2.1. Knowledge intermediaries in regional innovation and entrepreneurial ecosystems

Alongside an increasingly systemic perception of innovation as the outcome of multilateral and reciprocal exchange of knowledge between different organizations and individuals, the concept of intermediation within systems of innovation gained significant attention in innovation studies during the recent two decades (Howells 2006; Smedlund 2006; Pollard 2006). Intermediation describes a broad set of activities that aim to establish and shape regional structures, networks and channels that foster inter-organizational knowledge exchange (Dalziel 2010; Nauwelaers 2011; Pollard 2006).

One of the main and most vibrant scholarly debates about intermediation arose in knowledge transfer and entrepreneurship literature and discusses *knowledge intermediaries* as organizations fostering reciprocal knowledge exchange between academic and non-academic actors (Yusuf 2008; Pollard 2006). Hayter (2016, p. 636) broadly defines knowledge intermediaries as “organizations that facilitate knowledge exchange between universities and external stakeholders through the creation of bi-directional, value-added network relationships”.

Most earlier research on knowledge intermediaries focused on the role of universities’ technology transfer offices (TTO) in supporting the commercialization of academic knowledge via licenses and patents (Siegel et al. 2007), fostering linkages between university and firms (Debackere and Veugelers 2005), and promoting academic entrepreneurship in the form of start-up and spin-off firms (Markman et al. 2005). Studies reviewing the results of these works usually conclude with a critical perception of TTOs and their incapability of creating

additional value (see Siegel and Wright 2015a for a brief summary of the arisen discussion; see Hülsbeck et al. 2013 for empirics regarding the situation in Germany). These studies provide first hints on the importance of structured support for academic entrepreneurship (Wright et al. 2004; Etzkowitz and Göktepe-Hultén 2010). More recently, novel approaches shifted the focus of the discussion towards the formation of nascent, university-centered ecosystems, in which multiple intermediaries and stakeholders enhance "their" regions' entrepreneurial potential (Miller and Acs 2017; Breznitz and Zhang 2019; Wright et al. 2017; Feldman et al. 2019; Heaton et al. 2019). Knowledge intermediaries represent important constituents of these ecosystems as their functionality has proven to be an important determinant of the whole systems' orientation and functionality (Good et al. 2020; Hayter 2016; Clarysse et al. 2014; Vedula and Kim 2019).

This progression of the scholarly discussion indicates that knowledge intermediaries advanced from their prior role of supportive administrators of knowledge commercialization towards important actors in entrepreneurial ecosystems. However, research on cooperation between them within entrepreneurial ecosystems is emerging at best. This scarcity of research prevails despite several indicators for the desirability of cooperation between knowledge intermediaries (Sinell et al. 2018; Schaeffer and Matt 2016)

2.2. Rationale for cooperation between knowledge intermediaries

As mentioned above, knowledge intermediaries can be grouped into those established and administered by universities to proactively foster entrepreneurship as a part of the emerging third academic mission (e.g. TTOs, incubators, start-up support services) and those operated by public or private actors (i.e. regional innovation agencies, chambers of commerce, accelerators, firms) (Czarnitzki et al. 2001; Wright et al. 2008; Hayter 2016). Wright et al. (2008) synthesize this observation in a dichotomous differentiation between "university-internal" and "university-external" knowledge intermediaries and emphasize different roles and self-perceptions that emanate from their respective organizational affiliation and the resulting superordinate missions and objectives. Table 1 illustrates the differences between the two groups.

Table 1. Differentiation between university-internal and university-external knowledge intermediaries (content based upon Wright et al. 2008; dimensions based upon suggestions by Mignon and Kanda 2018)

Dimension	*University-internal*	*University-external*	
		Public	*Private*
Source of funding	University	Government (national, regional or local)	Private firms, MNEs
Scope of action	Identification of commercializable knowledge stocks, stimulation of academic entrepreneurship	Identification and articulation of SME needs for innovation; matching identified demands with applicable knowledge	Identification of ideas and teams that fit own topics and business models; fostering of entre- and intrapreneurship
Recipients of support	Scientists; Students; emerging Start-up/Spin-off companies	SMEs; emerging Start-up/Spin-off companies	Emerging Start-up/ Spin-off companies
Related literature	Yusuf 2008; Wright et al. 2008; Hayter 2016; Villani et al. 2017; Rasmussen and Wright 2015	Nauwelaers 2011; Fiore et al. 2011; Bramwell et al. 2019; Kolodny et al. 2001; Reischauer et al. 2021	Abbate et al. 2013; Parker and Hine 2014; Kodama 2008; Blanka and Traunmüller 2020

Accordingly, university-internal knowledge intermediaries focus on the identification and support of academic entrepreneurs to foster financial returns for "their" universities and the fulfilment of knowledge transfer as the third academic mission. They aim to create innovation and entrepreneurial ecosystems that provide

academics with support required for research commercialization via industry collaboration or spin-off firms (Siegel et al. 2007; Siegel and Wright 2015b; Cesaroni and Piccaluga 2016). In contrast, publicly financed university-external intermediaries focus on the support of regional firms, especially SMEs, by trying to establish institutional settings that foster the articulation of firm demands for innovation and match them with appropriate knowledge from academia (Nauwelaers 2011; Fiore et al. 2011; Bramwell et al. 2019; Kodama 2008; Kolodny et al. 2001). Privately funded knowledge intermediaries usually are much more limited in their focus and purposefully search for ideas and teams that work in their own field of specialization and yield a financial reflux (Abbate et al. 2013; Kodama 2008).

The different foci lead to scenarios, in which knowledge intermediaries find themselves tied to the context of their main recipients of support and struggle with overcoming the chasm between academic and non-academic systems (Fernández-Esquinas et al. 2016) or, as Hayter (2016, p. 648) puts it from the perspective of university-internal knowledge intermediaries, "TTOs and other academic contacts may or may not possess relationships with non-academic contacts". Consequently, recent research on innovation and entrepreneurial ecosystems emphasizes that knowledge intermediaries' services can benefit from an overall enhancement of regional cooperation structures (Goswami et al. 2018) and, more specifically, university-internal knowledge intermediaries rely on actors with a complementary, non-academic focus in order to enhance their services (Schaeffer and Matt 2016; Sinell et al. 2018; Rasmussen and Wright 2015). Sinell et al. (2018, p. 87) sum up these insights by concluding that "if transfer offices were to more actively network within the innovation ecosystem, they could increase their collaboration opportunities and access to resources such as funds, knowhow, and labs." Consequently, recent research articulates a need for research emanating from the ambiguity and apparent overlaps between different knowledge intermediaries in order to investigate "taxonomies of these support mechanisms" (Wright et al. 2017, p. 920).

The paper takes these conceptual approaches and empirical insights as a starting point to shed further light onto the requirements for and effects of cooperation between knowledge intermediaries. We work upon the assumption that the focus of university-internal intermediaries on academic entrepreneurs in combination with their organizational affiliation ties them to the academic context and endows them with an advantage in meeting academics' demands. Accordingly, the focus of university-external intermediaries on firms' supply with resources required for innovation makes them experts in firm support. Since the interconnection of academic and non-academic entrepreneurs is at the heart of innovation and entrepreneurial ecosystems, a coordination of the two specializations seems highly desirable. This paper provides empirical in-depth insights into the organizational logics and motivations of the presumed cooperation partners.

2.3. Towards a resource-based approach

2.3.1. The resource-based theory of strategic alliances

Originating from management literature, the *resource-based theory* focuses on firm-internal characteristics to analyze strategies for the creation of competitive advantage (Peteraf 1993; Barney 1991). According to the seminal work of Wernerfelt (1984), firms are perceived as a particular, idiosyncratic combination of resources with resources being defined as "those (tangible and intangible) assets which are tied semi permanently to the firm" (Wernerfelt 1984, p. 172). Despite the strong focus on firm-internal characteristics, overlaps between firms' resource endowments lead to complementarities and favour the formation of inter-organizational alliances (Mowery et al. 1998)[1], which extend and diversify firms' resource endowments (Lavie 2006). From a resource-based perspective, strategic alliances are a costly yet effective means of mutually accessing additional resources, which are required to gain competitive advantage but not accessible on an alternative way (Eisenhardt and Schoonhoven 1996; Wernerfelt 1984; Tsang 1998).

[1] We follow Tsang (1998, p. 209) who defines a strategic alliance from a resource-based perspective as „a long-term cooperative arrangement between two or more independent firms that engage in business activities for mutual economic gain."

The *resource-based theory of strategic alliances* divides the analysis into formation, structural preferences, and performance. The formation of strategic alliances depends on the characteristics of the sought resources. Alliance formation is favoured by an imperfect mobility, imitability, and substitutability of the sought resources (Das and Teng 2000). These characteristics determine the value of resources and preclude other ways of access (Barney 1991). Firms will be willing to form alliances if the resources they seek to acquire meet these criteria as well as the firms' individual needs and opportunities (Eisenhardt and Schoonhoven 1996).

Das and Teng (2000) explicate how the alignment of shared resources affects the performance of strategic alliances. The framework considers strategic alliances as performing, i.e. achieving the agreed alliance objectives and yielding a competitive advantage for the alliance partners, if the alliance partners manage to integrate the additionally accessed resources. Therefore, the model differentiates between *performing* resources that facilitate the agreed alliance objectives and *non-performing* resources that are usually shared in alliances because they are inseparably tied to performing resources. The resources shared in an alliance can either be *similar* or *dissimilar*. Similar resources can align either *supplementary* or *surplus* while dissimilar resources can align *complementary* or *wasteful*. Strategic alliances will only be performing if the relation between alliance partners' respective resources is either supplementary or complementary but will not yield any benefits if they align in a surplus or wasteful way (Das and Teng 2000).

The resource-based theory of strategic alliances represents a well-established framework to analyse the cooperative behaviour of separate actors. However, being penned by management researchers, the empirical utilization of the framework is mostly restricted to the analysis of private actors (i.e. firms). This is despite several extensions of resource-based principles that have shown the approaches' value for analysing strategy development in public (Bryson et al. 2007) and not-for-profit organizations (Arya and Lin 2007). Arya and Lin (2007, p. 699) argue that "although not-for-profit organizations do not compete in the traditional sense, they do compete for clients, funds, and government approval" and therefore require a set of valuable, idiosyncratic resources as well in order to strive for "organizational competitive advantage". Hence, the resource-based perspective represents a promising framework for elucidating cooperative behaviour between knowledge intermediaries.

2.3.2. Intermediary resources

To make the resource-based theory of strategic alliances applicable to our research interest, we complement it with empirical insights from two of the few studies with a distinct focus on the requirements for successful intermediation.

Larty et al. (2017) investigate combinations of resources that underpin intermediaries' capabilities to create and expand industry-specific regional innovation networks between regional firms. The authors emphasize the importance of *knowledge resources* and *network resources* that are required to comprehensively address all regional actors and subsequently facilitate knowledge sharing between them. Accordingly, possessing trust-based networks that include individuals in neuralgic regional positions while at the same time possessing sufficient knowledge resources to grasp the range and depth of the own clients' innovative endeavours represents a crucial prerequisite for successful innovation networks (see Larty et al. 2017, p. 10 for details).

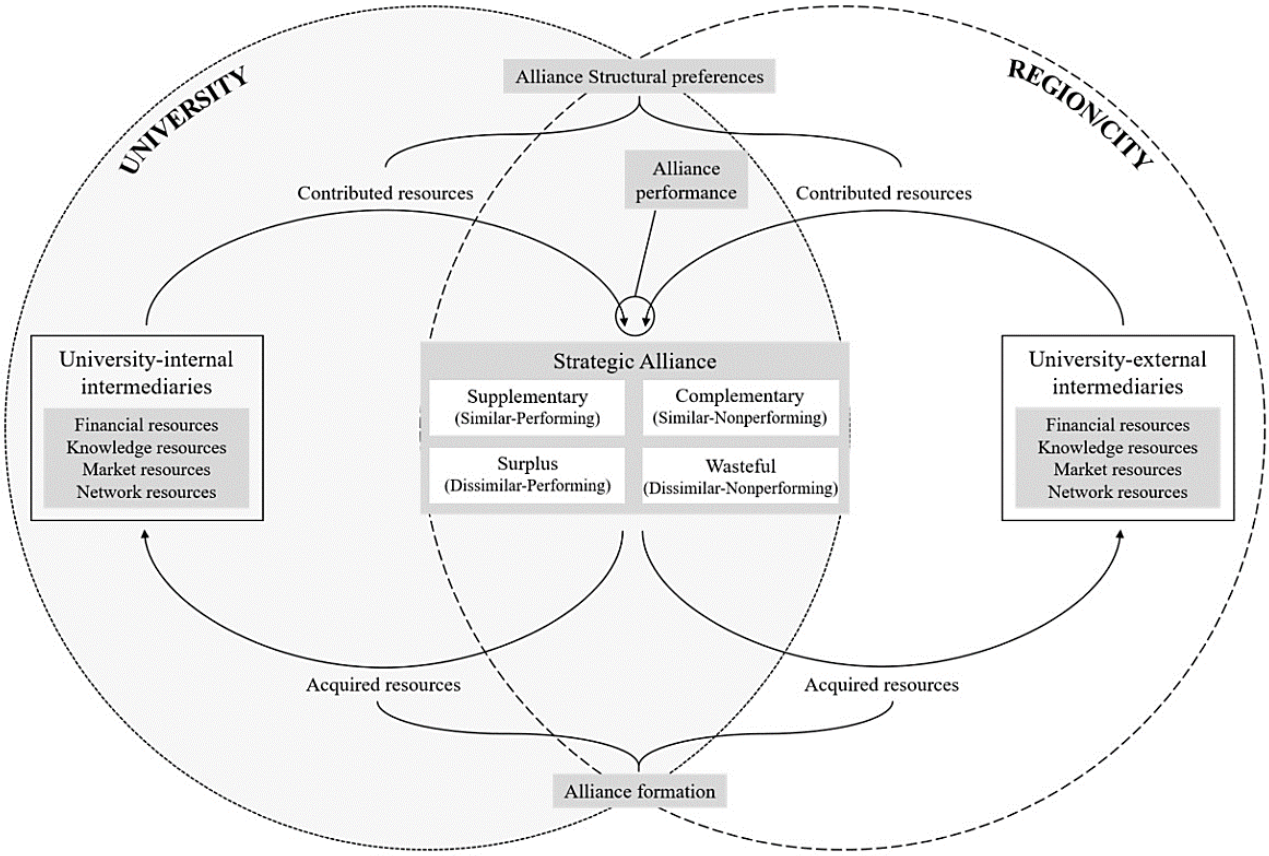
Silva et al. (2018) assess how intermediaries create internal value from knowledge-based cooperation with their clients. Therefore, the authors deduce four main values sought and required by intermediaries and validate their relevance. *Financial values* represent a basic requirement for implementing and processing intermediation activities. *Knowledge values* are required to spot, capture and articulate innovative knowledge. *Market values* describe information concerning the region, its' ecosystem, the constituent actors, and their current and planned demands and activities, i.e. a detailed overview over the entrepreneurial ecosystem. Finally, *Network values* relate to the bandwidth of own contacts that are indispensable in order to quickly convey appropriate partners to the own clients (see Silva et al. 2018, p. 71 for details).

Table 2. Assessed resources and current understanding in literature (based upon Larty et al. 2017 and Silva et al. 2018)

Resources	*Current understanding in literature*
Financial	Revenues and funding required for qualified staff and activities
Knowledge	Technical capabilities required to understand clients' demands and projects; knowledge of particularly relevant sectors
Market	Improvement of own activities in accordance with ecosystem demands due to "ecosystem knowledge" (Silva et al. 2018, p. 73); reputation with clients
Network	Contacts that grant access to new markets and distribution channels; Networks with regional firms and stakeholders

For our analysis, we build upon the resources suggested by Silva et al. (2018) complemented by Larty et al. (2017)'s insights regarding the recurring knowledge and network resources. Table 2 sums up the current understanding of intermediary resources as reflected in extant studies. Figure 1 sums up the aspects discussed above in a comprehensive conceptual framework that builds the theoretical foundation for our empirical investigation.

Fig. 1. Theoretical framework (own compilation)



3. Case context and methodological approach

This paper draws upon an exploratory multiple case study approach (Yin 2009) to gain in-depth insights into the alignment of resources in alliances between knowledge intermediaries. Crediting the dynamically evolving character of our research topic, we adopt an explorative approach that allows us to direct the focus onto particular resources and their alignment. Such qualitative approaches have proven to be feasible in researching knowledge intermediaries and their behaviour in innovation and entrepreneurial ecosystems (Larty et al. 2017; Hayter 2016; Good et al. 2020; Goswami et al. 2018; Lahikainen et al. 2019).

3.1. Case context

Discussions about innovation and entrepreneurial ecosystems usually focus on a regional scope. This scope is also reflected in policy initiatives that aim to foster and strengthen knowledge and technology transfer. Consequently, this paper adopts a regional scope to analyse publicly funded alliances between different knowledge intermediaries.

The assessed cases are recently formed alliances between knowledge intermediaries in the regions of Goettingen, Hanover and Osnabrueck. All alliances are funded from the same funding guideline by the federal government of Lower Saxony for a five year period (2019 – 2024). To apply for public funding, the intermediaries in all regions formed consortia and commonly identified fields of activities and developed strategies for cooperation in accordance with existing regional innovation strategies and specializations (see Eickelpasch and Fritsch 2005 for an overview of the funding approach). Each alliance consists of a variety of different actors and pursues specific, commonly identified and agreed objectives with a university leading and coordinating each alliance.

Case I) On the one hand, Goettingen region is characterized by an economy mostly consisting of SMEs while being home to only a handful of MNEs. On the other hand, the region is characterized by a remarkable scientific landscape consisting of a big research university including a medical faculty, a technical university, an applied university, a private university and numerous non-university research institutions. However, as indicated by a recent study “an open-up towards regional companies had only been happening over the last seven years” (Bennat and Sternberg 2020, p. 329). One result of this opening is the formation of the Southern Lower Saxony Innovation Campus (SNIC). Including the four aforementioned higher education institutions (HEIs) with their transfer units, eight non-university research institutions and eight university-external intermediaries (mostly municipal innovation agencies), the alliance aims to strengthen the ties between science and industry and foster the formation of start-up and spin-off firms.

Case II) Hanover region, including the eponymous capital of the federal state of Lower Saxony, represents the political as well as the economic centre of the state. Being home to numerous large companies, a large research university, a medical university, a university of applied sciences, a university of arts as well as various non-university research institutions, the region unfolds a considerable innovative potential already. Nevertheless, the Hanover Transfer Campus, consisting of the above mentioned HEIs, several university-external intermediaries and non-university research institutions, aims to strengthen the reciprocal exchange of knowledge between regional firms and entrepreneurs.

Table 3. Overview over cases and individual objectives (own compilation based upon alliance websites)

No.	*Region*	*Objectives (according to alliance websites*)*
1	Goettingen	• Build bridges between universities and firms and link them with municipalities and chambers of commerce to foster innovation • Ease firms' access to knowledge stocks and skilled labour • Strengthen regional entrepreneurial spirit
2	Osnabrueck	• Orchestrate knowledge transfer structures between research university and applied university • Establish regional innovation networks in Agriculture/Food, Health, Digitalization • Develop and establish professional approach in innovation management
3	Hanover	• Intensify reciprocal exchange between actors from science, firms, society, and policy • Incentivize/foster cooperation between scientists and entrepreneurs as the main players of knowledge transfer • Develop legal agreements to lower transaction costs in knowledge transfer

* No. 1: https://snic.de/ No. 2: https://www.tim-osnabrueck.de/ No. 3: https://www.hannover-transfer-campus.de/

Case III) Osnabrueck region and its innovation system are characterized by a predominance of SMEs and a strong focus on agricultural machinery and equipment. This focus is also reflected in the research focus of a comparably large applied university that, in addition to a medium-sized research university, builds the scientific core of the region. The alliance *PROACTOS*, centred on the two HEIs and municipal innovation agencies, aims to strengthen this specialization by streamlining knowledge transfer activities and establishing specific innovation networks.

Table 3 summarizes the alliances' self-proclaimed objectives in accordance to the respective websites. In sum, being part of the same federal funding program, the analysed alliances share some key characteristics in composition and superordinate goals. Notwithstanding the differences arising from different regional peculiarities and actor constellations, we expect to find similar utilizations and alignments of resources.

3.2. Data collection and analysis

The analysis is mainly based upon explorative semi structured interviews (Yin 2009). The selection process focused on intermediaries from the operational level for whom cooperation with other intermediaries represents a central part of their daily business. Hence, the set of interviewees mainly consists of employees in TTOs and municipal regional innovation consultancies (see Appendix B). Based upon a semi structured questionnaire, the interviews commenced by collecting information on personal backgrounds of each interviewee before broaching the issues of valuable intermediary resources and the effects of their alignment on cooperation in strategic alliances (see Appendix A).

A total of 15 interviewees was identified and selected from initial dialogue with persons in charge and online research. Because of the Covid19-pandemic, interviews were conducted via online conferencing tools. Interviews were conducted in 2021, lasted from 38 to 81 minutes and were recorded and transcribed. In addition to the interviews, documents and information published on the intermediaries' websites were reviewed as well as regional and federal innovation strategies. In addition, both authors have been involved in strategic support of Case I, granting insights into additional internal documents and discussions for this particular case. Further, impressions and information from an online conference centred on the alliances were incorporated. Furthermore, preliminary results were presented and discussed at an online conference and during an internal research seminar.

The empirical data was analysed by the means of a qualitative content analysis (Mayring 2014). Coding commenced on the basis of the conceptual framework and was then supplemented by inductive coding along the transcripts. Informed by the conceptual framework, we started the process of analysis by deductively coding notions of the different types of resources by the different intermediaries and subsequently applying the different forms of resource alignment suggested by the framework during an iterative coding process. A detailed overview over the data structure is presented in Appendix C.

4. Results

We find different forms of alignment that directly affect alliance performance for all assessed resources (see Appendix D for an overview). We structure the presentation of our empirical results in accordance with the categories derived from our conceptual framework (Appendix C).

4.1. Alignment of financial resources: New sources of funding vs. forced cooperation

Our analysis reflects three ways in which knowledge intermediaries rely upon financial resources: First, some of their activities, require a certain budget for things like locations, technical equipment, catering, and key note speakers. Second, interviewees perceive the diversification of their fields of activity as highly time consuming. Therefore, access to an extended base of qualified personnel represents an important success factor. Third, interviewees from all alliances emphasized the importance of innovation spaces such as maker spaces, incubators and start-up accelerators. Providing their clients with access to such innovation spaces is a third, indirect form of financial resources sought by knowledge intermediaries.

Operating in regional alliances enables knowledge intermediaries to *supplement* each other's budgets for particular activities. For instance, interviewees reported to benefit from extended budgets for events hosted in cooperation. Accordingly, cooperating for networking events allows for addressing bigger audiences, acquiring famous speakers, using prestigious locations, testing new formats, and differentiate the regional offer to adjust it to more specific groups (Row 1 in Appendix D).

> "Of course, sharing budgets is attractive to us, just to hold bigger events. Offer more. Eventually pay a well-known keynote speaker from an additional budget." [No 2, Pos. 29]

The pooling of resources also includes the immanent upsurge in personnel that enables additional activities. Interviewees welcome the opportunity to share tasks with colleagues from other organizations (Row 2 in Appendix D).

> "We don't have to do the research ourselves. That means that Mr. [X] who has been doing this job since 2012, formerly did both the scouting and the consulting" [No. 3, Pos. 27]

In addition to supplementing already available money and personnel, operating in an alliance yields the opportunity to access *complementary* public and private funding sources. University-external intermediaries maintain strong networks with regional firms that in some cases chip in with financial resources for new projects and personnel. For example, interviewees from one alliance reported that close connections to innovative firms enabled the establishment of a new regional innovation network (Row 3 in Appendix D).

> "The [external intermediary] chipped in with money from regional firms and secured the funding. They contacted 50 to 100 firms to secure the private funding of the project." [No. 9, Pos. 36]

Further, collaboration in an alliance allows for the placement of clients in appropriate facilities. This aspect was mainly brought forward by university-internal start-up support units. According to German regulations, universities are not allowed to maintain their support once a spin-off has been founded. Because the need for support does not abate as quickly, they are reliant on university-external partners that proceed the support (Row 4 in Appendix D).

> "Everything about facilities. Because start-ups need to leave the academic context after being founded. But also the knowledge about how to continue. There are other, next players. We are familiar with the funding programs applicable as a university. But of course there are other programs after being founded." [No. 6, Pos. 70]

On the downside, the new institutional settings that emerge from regional intermediary alliances can lead to an inefficient *surplus* allocation and utilization of existing financial resources. Interviewees reported the incidence of surplus alignments due to the new regional division of work. Accordingly, alliance partners' extended activities in fields that were formerly ascribed to one actor are not always compensated adequately, which leads to bitterness among involved persons (Row 5 in Appendix D).

> "I would say, on an average, I work for the HEI for two hours a day. But we don't get anything from them and that's a little bitter. I would appreciate a partnership at eye level, in which they cherish our work. And I know their budget situation. The money is available." [No. 9, Pos. 31]

Furthermore, the federal funding of the assessed alliances required detailed cooperation strategies and working plans. According to the interviewees, these specifications did not always reflect regional peculiarities and may have led to *wasteful* scenarios, in which the applications did not automatically represent the most effective solution regarding the partners involved and the topics addressed (Row 6 in Appendix D).

> "In the end, everything is very much top down instead of bottom up. Casually speaking, someone tries to think of something nice and then there are several requests or must-haves in the calls. You need to cooperate for this topic. You need to include this actor." [No. 11, Pos. 13]

4.2. Alignment of knowledge resources: including new skills and perspectives vs. maintaining individual status

Our interviews reflect a differentiation between two sorts of relevant knowledge. First, a minimum of technological understanding is essential to grasp, articulate, and handle their clients' demands. Second, in addition to technical aspects, formats of knowledge intermediation often include support in strategic questions. This makes a high level of expertise in business strategy, models, and development as well as fund acquisition indispensable.

Interviewees state that the different knowledge resources in an alliance can be *supplementary* since cooperation enables them to provide their clients with expertise that cannot be held available in-house. For instance, university-internal start-up support units report increased requirements concerning multiple aspects of tax law. Highly individual and sophisticated demands cannot be met for all disciplines and business models that emerge in universities. Close collaboration with university-external experts increases the chances of meeting the existing demands (Row 7 in Appendix D).

> "Then there are mentors for particular expertise. For instance, we can draw upon the knowledge of law experts. Oftentimes, students address us with questions concerning tax law. It would be insane to cover all topics on our own and therefore it is important to work with different actors." [No. 8, Pos. 20]

Furthermore, interviewees emphasize that their alliance partners possess *complementary* technical and managerial competences and combining them in an alliance enables them to specialize in certain aspects. According to this, one expert or one organization cannot address all challenges arising in knowledge transfer and entrepreneurship. Instead, interviewees view it as desirable to develop a regional pool of experts that collaboratively supports local entrepreneurs (Row 8 in Appendix D).

> "That means exchange on a short way. Fast exchange and clearly defined contact persons. This is very, very important. Because they have different competences. […] There is little value in having one person

> for everything. It is better to have experts for particular topics that meet up with other experts and identify matches." [No 1, Pos. 43]

However, this collaborative development is often hampered by non-performing alignments of knowledge resources. A main reason for *surplus* knowledge resources being pooled in knowledge intermediary alliances is the intentional provision of improper knowledge in order to strengthen the position and the image of the own organization. Interviewees reported that alliance partners in some cases claimed to be capable of fulfilling certain tasks although it later turned out that the provided knowledge was not applicable. This behaviour resulted in a breach of trust and an avoidance of future cooperation (Row 9 in Appendix D).

> "But I don't need to ask ten [internal intermediaries] if they have anyone who can do a certain thing. Five will say 'yes', but in the end it turns out 'no, not really'. So for me it's more important to talk to an expert right away. And that's why it works that way and not the way, the [internal intermediaries] would prefer." [No. 3, Pos. 17]

In addition, some interviewees emphasized significant discrepancies in approaches between university-internal and university-external intermediaries. The interviews revealed that the science-based approach of university-internal intermediaries is only partially compatible with existing demands and challenges of regional firms. The firm-focused approach of university-external intermediaries in turn does not necessarily address high-tech aspects but puts a distinct emphasis on current challenges rather related to selection and implementation than development of technologies. These different approaches can lead to inapt forms of knowledge and in turn to a *wasteful* resource alignment (Row 10 in Appendix D).

> "From my perspective, we have a different depth, or how you want to call it, in which we work with firms. We indeed develop funding proposals with them. But concerning the current state of technology, we do not really address the current international state of technology. That's not the case." [No. 12, Pos. 27]

4.3. Alignment of market-based resources: Extending ecosystem knowledge vs. dissolving specialization

According to the interviewees, bundling and *supplementing* each other's information about regional actors led to an acceleration of the identification of entrepreneurs and innovation potentials. Each of the intermediaries tracks and screens the activities in "their" innovation subsystem in order to identify innovative knowledge stocks and entrepreneurs. Without cooperation, the results of this screening run the risk of ebbing away due to a lack of matching contacts. Especially the current demands of regional firms are considered to be very fast moving and require on-time support (Row 11 in Appendix D).

> "Because the [external intermediaries] simply lacked the connection into the universities. That means, they inquired potentials, barriers, and demands for innovation in regional SMEs but they had no contact person in academia. They had to search for contacts and by the time that happened and they had made a contact, the topic had already become irrelevant" [No. 1, Pos. 37]

According to the interviewees, supplementary pooling of contacts within innovation subsystems is fuelled by *complementary* insights and understandings of modes of operation in the respective innovation subsystems. This results in a mutual "translating" (No. 9, Pos. 11; No. 14, Pos. 15) function of all alliance partners to foster the understanding of mechanisms and demands (Row 12 in Appendix D).

> "The partners are some kind of translator for ways of thinking and operation by other target groups. For instance, the [external intermediaries] know how firms think and work and we have insights into science and can translate for each other." [No. 5, Pos. 66]

Furthermore, this particular understanding is reinforced by a higher level of trust that results from experience within the respective innovation subsystem or, in the case of university-internal knowledge intermediaries, an affiliation to the same organization. Interviewees report higher trust levels shown by academic as well as non-academic entrepreneurs in case their contact person can rely upon experiences in the same sector (Row 13 in Appendix D).

> "If he is from [internal intermediary], there is another leap of faith comparing to someone who comes from a [external intermediary] to ask what they are doing. […] I don't think it's effective to send someone into the firms, who has hitherto only been active in academia. They have to speak the same language. That's an important success factor." [No. 1, Pos. 23]

On the other hand, the incorporation of numerous regional partners in an alliance results in a high level of bureaucracy that may slow down or inhibit innovation processes. The main motive in this aspect is a perceived compulsion to cooperate and include all alliance partners' inputs in a *surplus* way. To push forward innovation projects requires a high level of dynamics that overstrains administrative units (Row 14 in Appendix D).

> "And then the administration cannot cope with it. Somehow the research is too fast and then it is too dynamic to be included in everyday business because meanwhile the agenda has changed. New objectives, new resources et cetera. I think, everything must function more dynamically and faster and that requires a more regular exchange." [No. 14, Pos. 15]

Further, additional activities that emerge from collaborating on a regional level may hamper the participants' original specialization. According to the interviewees, the sheer maintenance of alliances represents a time-consuming activity. While this yields the opportunity to diversify own resources and competencies, it may also distract the original mission and focus. For instance, university-internal start-up support units reported an emerging lack of time for the development of new support instruments due to the necessity of participating in regular exchange formats and an additional focus on regional development (Row 15 in Appendix D).

> "On the one hand, it may improve our service if we can think about additional services demanded by the clients. On the other hand, it also distracts us from our main task. And that is supporting start-ups the whole time." [No. 9, Pos. 13]

4.4. Alignment of network resources: New contacts vs. regional lock-in effects

The interviewees report *supplementary* network contacts with their alliance partners that allow them to extend their range of addressed participants for events. Further, the additional network resources accessed via the alliance comprise supplementary experts and potential key note speakers that are required for the dissemination of knowledge among clients (Row 16 in Appendix D).

> "To raise the number of participants. The [external intermediaries] possess a large network of contacts. That means, if we cooperate, in all probability, we gain a higher number of participants. And of course, they possess contacts to potential key note speakers. Hence, we exchange information about appropriate speakers a lot." [No. 2, Pos. 29]

In addition to this supplementary character of network contacts, networks of university-internal and university-external knowledge intermediaries can align in a *complementary* way as they differ in scope and composition. For instance, university-external intermediaries report to perceive academic structures as very complex and sometimes confusing and thus find it difficult to identify access points to academic networks (Row 17 in Appendix D).

> "It was brought into the HEI by Ms. XY [internal intermediary]. And Ms. XY knows the HEI better. And knows where the strands meet and whom to contact. The HEI itself is a very complex structure of

> more or less autonomous professors and [internal intermediary] has a good overview and can support us." [No. 11, Pos. 21]

These supplementary and complementary alignments of network resources are reported to be especially helpful in the initial phase of an alliance. The more an alliance is established, the more the alignment of different network resources is perceived as *surplus* as the frequent cooperation with different target groups endows alliance partners with own contacts. The remaining urge to coordinate the own activities with all alliance partners can hence turn into an everyday imposition that slows down the activity itself (Row 18 in Appendix D).

> "For example, talking about firm contacts, we always contact the [external intermediary] and we coordinate our activities with them. Even if we have an idea of who to talk to because we know them from previous events." [No. 5, Pos. 40]

Further, close long-term cooperation in a formalized alliance poses the risk of lock-in effects in well-established networks. According to the interviewees, maintaining an adequate level of openness represents a major challenge for the alliances. Hence, restricting the search for contacts and competences to an existing alliance can lead to a *wasteful* alignment (Row 19 in Appendix D).

> "Of course, this poses the danger of people only relying on the networks they already created. To maintain the openness and make sure to include new actors and competences and expand the base is a big and important challenge for the sake of a technology transfer incorporating the whole regional innovation system." [No. 1, Pos. 45]

5. Discussion

Knowledge intermediaries and their roles in entrepreneurial ecosystems are at the centre of an ongoing scholarly debate. The purpose of this paper was to add to this debate by suggesting and testing a well-established theoretical framework for assessing the premises and effects of cooperation between different knowledge intermediaries. This investigation enriches the current debate by three aspects.

Firstly, our results corroborate the importance of *financial resources*, *knowledge resources*, *market resources* and *network resources* for the successful intermediation of knowledge between academic and industrial networks (Silva et al. 2018; Larty et al. 2017). The results of the study show that the suggested resources play important roles for the design and functionality of intermediary cooperation. However, the novel level of granularity that characterizes our investigation of valuable intermediary resources suggests several revisions and addenda regarding the understanding of how these resources unfold their value for knowledge intermediaries. The value of *financial resources* covers basic funding for qualified personnel as well as budgets for particular activities. More specifically, knowledge intermediaries rely upon the access to diversified public and private sources of funding. Valuable *knowledge resources* consist of technological as well as managerial knowledge (Lichtenthaler 2013). Our data emphasizes the dependence on managerial and strategic skills that are in many cases sought by clients. Market resources consist of what Silva et al. (2018, p. 73) term "innovation ecosystem knowledge" and refer to information that helps aligning the own activities with the ecosystem and regional actors' demands. Our results highlight the relevance of university-internal and university-external intermediaries' constant focus on different target groups that leads to an enhanced understanding and a subsequent leap of faith that cannot be obtained by the respective partner. Network building being at the core of intermediary tasks makes *network resources* important. Most notable, interviewees pointed towards the threat of lock-in effects that may emerge from dense regional networks and well-established communication channels.

Secondly, our results support the call for the development of holistic approaches for analyzing entrepreneurial ecosystems (Good et al. 2019). The analyzed cases show that the differences between intermediaries

lead to the creation of highly idiosyncratic resource sets that are not only tied to the ecosystem but to the mainly addressed subsystem. This perspective in turn can serve as an explanation for individual intermediaries' difficulties in connecting academic and non-academic networks as observed in prior studies (Hayter 2016; Clayton et al. 2018; Hülsbeck et al. 2013) as well as shortcomings in individually assessed university innovation strategies (Salomaa et al. 2022). Hence, our study indicates that understanding the roles and potentials of knowledge intermediaries in and for regional innovation and entrepreneurial ecosystems requires approaches that restrict their focus neither to academia nor to industry. Instead, assessing the dynamics of innovation and entrepreneurial ecosystems requires holistic perspectives in order to grasp the complex interdependencies between the manifold, actors, networks, and support mechanisms (Good et al. 2019; Good et al. 2020). In this sense, our findings support the positive effects of ecosystem improvement on the performance of particular actors and actor groups operating within the system (Lahikainen et al. 2019; Goswami et al. 2018). Furthermore, our investigation shows that regional cooperation between intermediaries can support each intermediary in accessing additional resources (Sinell et al. 2018; Larty et al. 2017; Comacchio et al. 2012). However, our resource-based perspective on the peculiarities of long-term cooperation between knowledge intermediaries reveals that close cooperation inevitably provokes the sharing of resource facets that do not align in a performing way. Intermediary cooperation represents a non-trivial objective that requires policy instruments such as publicly financed strategies and alliances in order to commonly define objectives, responsibilities and processes.

Thirdly, our research supports the necessity to align policy instruments with regional structures and characteristics as argued in earlier RIS approaches (Tödtling and Trippl 2005) as well as in recent entrepreneurial ecosystem approaches (Reischauer et al. 2021; Audretsch and Belitski 2022). The assessed initiatives were established in the context of similar political conditions that – presumably – left room for individual adaptations to meet regional demands. Nevertheless, interviewees reported that regional competitions for funding as such can lead to scenarios in which regional actors focus on what is best for fund acquisition and their own position within the emerging setting rather than on what is best for the region. These results question the predominant perception of intermediaries as altruistic actors providing "midwifery" (Yusuf 2008, p. 1170) for their clients' innovation projects since "their purpose is not their own success, but the success of their clients or members" (Dalziel 2010, p. 13). Quite the contrary, our findings outline a picture of knowledge intermediaries as self-confident constituents of entrepreneurial ecosystems that, in addition to supporting others, indeed do strive for their own success. Accordingly, our findings support the perception of knowledge intermediaries as a group of stakeholders in entrepreneurial ecosystems rather than merely a means to an end (Russo et al. 2019).

6. Concluding implications

The starting point of this study were the oftentimes presupposed but insufficiently analyzed interdependencies between different types of knowledge intermediaries in entrepreneurial ecosystems. Aiming to close this gap, the paper builds upon a differentiation between university-internal and university-external intermediaries. We apply a resource-based approach which emphasizes the potential for strategic cooperation in sharing resources between actors, and to assess the peculiarities and effects of cooperation between knowledge intermediaries. Concerning our superordinate research question addressing the alignment between different valuable resources, we find manifold ways of alignment for all assessed resources, of which especially the non-performing ways of alignment yield interesting implications. For instance, merging intermediaries' financial resources indeed yields the opportunity to add up and access new sources of money but inevitably creates a setting, in which money acquisition trumps ecosystem establishment as the major objective. Similarly, relying upon diversified stocks of knowledge in an alliance can enhance the own performance but also can lead to undesirable cooperative behaviour in order to maintain or strengthen the own position within the alliance. A closer look on the alignment of market and network resources reveals the reasons for this behaviour. Being

tied to either entrepreneurial subsystem endows knowledge intermediaries with unique, idiosyncratic and trust-based relationships and networks with their core target groups. Emanating from the own organizational affiliation and experiences, these represent highly valuable resources that cannot be recreated actors operating in other entrepreneurial contexts. Hence, too close cooperation yields the risk of making oneself gratuitous.

From a policy perspective, these contributions are of interest for three reasons. Firstly, the discrepancies between intermediaries' resources corroborate the currently predominant urge to induce cooperation between them in order to cross the chasm between academic and non-academic networks. Secondly, this cooperation implies the perpetuation of separate actors with a distinct focus on particular core target groups. While these foci result in custom-fit resources and capabilities to support the own clients, they simultaneously hinder the support of other actors. Hence, the successful intermediation of knowledge between academia and industry requires separate but orchestrated actors to create an entrepreneurial environment in which all relevant actors are provided with customized support. From our perspective, in order to exploit and align all existing resources this orchestration represents a core task of innovation policy in innovation and entrepreneurial ecosystems.

From a scholarly perspective, our study cannot represent more than a first step in disentangling the interdependencies between different knowledge intermediaries, the peculiarities of cooperation between them and its' effects on entrepreneurial ecosystems. Tailored to the coverage of intermediaries' internal perspectives, our data provides a small yet sophisticated data-base for identifying and illustrating motivations for certain cooperative behaviour. But limitations are obvious: we can neither elaborate on the perception of clients or other stakeholders, nor can we rely upon long time experiences. Finally, our research is limited to spotlighting regions with a strong science base. Our findings can barely translate to ecosystems with a less distinctive scientific landscape.

Future studies could tie their research designs up to these limitations. To do so, future research should incorporate perspectives from scientists, firms, regional policy makers, and members of other relevant stakeholders to create a multidimensional perspective. Further, future studies could enrich current discussions by conducting longitudinal data at different stages of alliance development. Finally, scientifically less endowed regions probably rely on different resource mixes in their innovation support and should be assessed separately.

Acknowledgements

The research is funded by the Lower Saxony Ministry of Science and Culture under grant number ZN3492 within the Lower Saxony "Vorab" of the Volkswagen Foundation and supported by the Center for Digital Innovations (ZDIN).

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Appendix

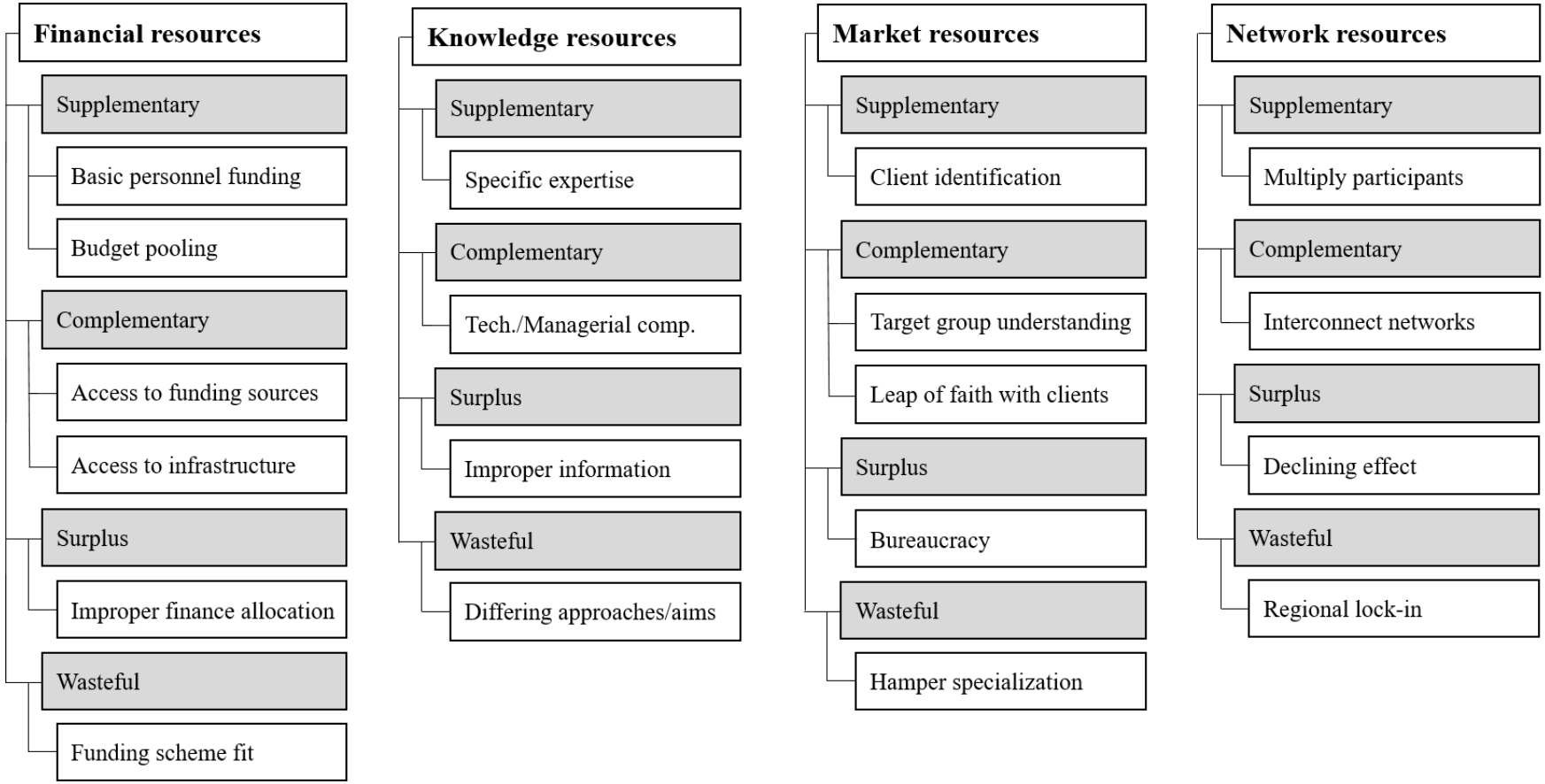
Appendix A: Interview guideline

Category	*Question*
Interviewee characteristics	What are the superordinate objectives and major activities of your position?
Scope of activities	Which knowledge transfer channels does your organization address?
	Which target group(s) do you aim to support?
	What are your main activities to provide this support?
Organizational resources	Which regional prerequisites must be given for successful knowledge intermediation?
	Which tangible and intangible assets must be provided for successful knowledge intermediation?
	In which aspects do you see your organizations' strengths?
	In which aspects do you see your organizations weaknesses?
	What are the major challenges you have to deal with in everyday work?
Personal resources	Which are the most important personal assets and qualifications for your job?
	How can these assets be gathered/refined?
Inter-intermediary cooperation	Which objectives do you pursue by strategically cooperating with other intermediaries?
	Which prerequisites are important for cooperation? How do you design the cooperation?
	Which aspects represent major challenges in cooperating?
	In which ways did intensifying cooperation affect your work?
	How do you benefit from cooperation?
	How do your partners benefit?
	Which role do shared information/access to networks/reputation of your partners/access to individual qualifications play?

Appendix B: List of interviewees

No.	*Organization*	*Region*	*Type*
1	Regional development organization	1	External
2	TTO	1	Internal
3	Regional innovation consultancy	1	External
4	TTO/incubator	1	Internal
5	TTO	1	Internal
6	TTO	1	Internal
7	TTO	2	Internal
8	TTO	2	Internal
9	Start-up Accelerator	2	External
10	TTO	2	Internal
11	Cluster organization	2	External
12	Regional innovation consultancy	2	External
13	Regional innovation consultancy	3	External
14	Regional innovation consultancy	3	External
15	Regional innovation network	3	External

Appendix C: Data structure



Appendix D: Overview over resource alignments and representative quotes

	Resource	*Definition*	*Alignment*	*Explanation*	*Representative quotes*
1	Financial	Basic funding of personnel required for intermediation and specific funding for particular activities	Supplementary	Pooling budgets to organize bigger/better networking events to address more regional actors	"Of course, sharing budgets is attractive to us, just to hold bigger events. Offer more. Eventually pay a well-known keynote speaker from an additional budget." [No. 2, Pos. 29]
2				Support of labour-intensive and time-consuming screening activities for commercially relevant knowledge	"We don't have to do the research ourselves. That means that Mr. [X] who has been doing this job since 2012, formerly did both the scouting and the consulting" [No. 3, Pos. 27]
3			Complementary	Gaining access to additional private sources of funding for a new regional network initiative	"The [external intermediary] chipped in with money from regional firms and secured the funding. They contacted 50 to 100 firms to secure the private funding of the project." [No. 9, Pos. 36]
4				Gaining access to innovation infrastructure after start-ups are required to leave academic facilities and consulting	"Everything about facilities. Because the start-ups need to leave the academic context after being founded. But also the knowledge about how to continue. There are other, next players. We are familiar with the funding programs applicable as a university. But of course there are other programs after being founded." [No. 6, Pos. 70]
5			Surplus	Unvalued taking over of partners' tasks and activities because of improper allocation of financial resources	"I would say, on an average, I work for the HEI for two hours a day. But we don't get anything from them and that's a little bitter. I would appreciate a partnership at eye level, in which they cherish our work. And I know their budget situation. The money is available." [No. 9, Pos. 31]
6			Wasteful	Creation of structures that fit requests of funding schemes rather than regional requirements	"In the end, everything is very much top down instead of bottom up. Casually speaking, someone tries to think of something nice and then there are several requests or must-haves in the calls. You need to cooperate for this topic. You need to include this actor." [No. 11, Pos. 13]
7	Knowledge	Technical and operational capabilities that foster the improvement of existing and the development of new formats and activities	Supplementary	Relying upon regional expertise for particular topics that can or may not be provided in-house	"Then there are mentors for particular expertise. For instance, we can draw upon the knowledge of law experts. Oftentimes, students address us with questions concerning tax law. It would be insane to cover all topics on our own and therefore it is important to work with different actors." [No. 8, Pos. 20]

8			Complementary	Benefitting from diverse technical and managerial competences in different organizations	“That means exchange on a short way. Fast exchange and clearly defined contact persons. This is very, very important. Because they have different competences. […] There is little value in having one person for everything. It is better to have experts for particular topics that meet up with other experts and identify matches.” [No 1, Pos. 43]
9			Surplus	Provision of improper information to foster own organization	“But I don’t need to ask ten [internal intermediaries] if they have anyone who can do a certain thing. Five will say ‘yes’, but in the end it turns out ‘no, not really’. So for me it’s more important to talk to an expert right away. And that’s why it works that way and not the way, the [internal intermediaries] would prefer.” [No. 3, Pos. 17]
10			Wasteful	Different approaches on technology transfer/innovation	“From my perspective, we have a different depth, or how you want to call it, in which we work with firms. We indeed develop funding proposals with them. But concerning the current state of technology, we do not really address the current international state of technology. That’s not the case.” [No. 12, Pos. 27]
11	Market	Information concerning the regional entrepreneurial ecosystem to gear the own formats and activities further towards the demands of regional target groups	Supplementary	Acceleration of client identification and matching due to bundled information	“Because the [external intermediaries] simply lacked the connection into the universities. That means, they inquired potentials, barriers, and demands for innovation in regional SMEs but they had no contact person in academia. They had to search for contacts and by the time that happened and they had made a contact, the topic had already become irrelevant” [No. 1, Pos. 37]
12			Complementary	Long-time focus on specific target groups endows partners with enhanced understanding of academia or firm logic	“The partners are some kind of translator for ways of thinking and operation by other target groups. For instance, the [external intermediary] know how firms think and work and we have insights into science and can translate for each other.” [No. 5, Pos. 66]
13				Leap of faith with core target groups due to experience and/or organizational affiliation	“If he is from [internal intermediary], there is another leap of faith comparing to someone who comes from a [external intermediary] to ask what they are doing. […] I don’t think it’s effective to send someone into the firms, who has hitherto only been active in academia. They have to speak the same language. That’s an important success factor.” [No. 1, Pos. 23]

14			Surplus	High levels of bureaucracy required for inter-organizational cooperation with several participants	"And then the administration cannot cope with it. Somehow the research is too fast and then it is too dynamic to be included in everyday business because meanwhile the agenda has changed. New objectives, new resources et cetera. I think, everything must function more dynamically and faster and that requires a more regular exchange." [No. 14, Pos. 15]
15			Wasteful	New activities hamper original specialization	"On the one hand, it may improve our service if we can think about additional services demanded by the clients. On the other hand, it also distracts us from our main task. And that is supporting start-ups the whole time." [No. 9, Pos. 13]
16	Network	Access to regional and superregional actor networks required for partner and client acquisition	Supplementary	Opportunity to multiply contact persons/experts/participants for particular formats	"To raise the number of participants. The [external intermediaries] possess a large network of contacts. That means, if we cooperate, in all probability, we gain a higher number of participants. And of course, they possess contacts to potential key note speakers. Hence, we exchange information about appropriate speakers a lot." [No. 2, Pos. 29]
17			Complementary	Interconnection of academic and non-academic networks to identify and convey new collaboration partners to clients	"It was brought into the HEI by Ms. XY [internal intermediary]. And Ms. XY knows the HEI better. And knows where the strands meet and whom to contact. The HEI itself is a very complex structure of more or less autonomous professors and [internal intermediary] has a good overview and can support us." [No. 11, Pos. 21]
18			Surplus	Only helpful in the initial phase, partners build own networks over time	"For example, talking about firm contacts, we always contact the [external intermediary] and we coordinate our activities with them. Even if we have an idea of who to talk to because we know them from previous events." [No. 5, Pos. 40]
19			Wasteful	Neglect of options outside the alliance networks poses the danger of regional lock-in effects	"Of course, this poses the danger of people only relying on the networks they already created. To maintain the openness and make sure to include new actors and competences and expand the base is a big and important challenge for the sake of a technology transfer incorporating the whole regional innovation system." [No. 1, Pos. 45]