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## The Value Adding Web Concept of Clusters – Strengthening and Extending the Fundament: Resources, Capabilities and Rents

### Abstract

A sound understanding of the key resources and capabilities that span firm boundaries in regional clusters is important for firms embedded in networked structures to exploit strategic opportunities and manage associated challenges. A resource-based perspective of value creation in clusters to develop a better conceptualisation of strategic competitive advantage on different levels is also a relevant topic from a strategic management perspective. Therefore, the aim of this research is to strengthen and extend a resource-oriented perspective on clusters, according to the value adding web (VAW) approach developed by Brown et al. (e.g., 2008, 2010). This contribution complements the state of the art of contemporary concepts with a coherent fundament for the resource-based value adding web concept and thereby develops the basis for further empirical studies. In this conceptual paper, we focus on the interaction between actors and relationships as sources for value creation within clusters as well as gaining a better understanding of value creation based on shared relational resources. We illustrate this approach through a discussion of a maritime cluster. Specifically the role of social capital and the relevance of knowledge-related resources on different cluster levels is elaborated. Building on a descriptive and theoretical fundament, we present a set of propositions reflecting our chain of arguments.

Keywords: value adding web, resource-based view of clusters, theoretical concept, competitive advantage, social capital  
(JEL: A10, M10)

### Introduction: Towards an Improved Resource-based Understanding of Clusters

A resource-oriented perspective on clusters has contributed to a better understanding of value creation in regional agglomerations (Tallman et al., 2004; Brown et al., 2007; Hervás-Oliver & Albors-Garrigós, 2007; Fensterseifer, 2009; Steffen, 2012; Fensterseifer & Rastoin, 2013; Gretzinger & Royer, 2014; Neale, 2017; Rohde,

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2018; Rohde et al., 2018). However, the *resource-based view of clusters* is not a unified perspective. Resource-based approaches lack a common understanding of the underlying behavioural assumptions as well as consistently used definitions of the relevant terminology (Kraaijenbrink et al., 2010). This divergence makes a fruitful discussion of differing concepts about clusters in the academic community difficult, even though: “Geographically defined regional clusters of firms that function as strategic entities in global industries are a matter of considerable interest to regional economic development agencies, corporate managers, and international strategy scholars” (Tallman et al., 2004: 258). Contributing to a better understanding of key resources and capabilities thus holds potential for strategy scholars as well as for practitioners in regional networks (i.e., cluster members or cluster managers) to better understand the opportunities and challenges of clusters in regions.

An example of a maritime cluster may illustrate this proposition. The key resources of the cluster could be the technological knowledge of a shipbuilding company as well as a long-standing relationship between the shipbuilder and a marine screw propeller supplier, leading to the creation of trust between both actors. It is conceivable the shipbuilding company has gained extensive experience in cooperating with others in the industry and thus has established a specific alliance capability. Further, it may be a valuable resource for the shipping company to be located near a large seaport. In summary, the individual ship building company has built firm-specific technical expertise through its continued operation. However, at the cluster level, connections between companies establish new sets of resources and capabilities. The geographical context of the seaport provides a macro level of resources for the companies in the cluster.

This illustration clarifies that understanding value-creating resources in clusters is related to different levels. This situation is in line with Larty et al. (2017) who argue – from a resource-based perspective – for the importance of understanding the management of cluster resources as a multi-level phenomenon. Key actors and the historical, geographical and local context are important for understanding the logic of how resources develop. Even if the value adding web (VAW) concept of clusters (Brown et al., 2007, 2008, 2010, 2013) already represents a “resource-based view of clusters” (Brown et al., 2010: 11), trying to take the sketched resources and capabilities on different levels into account, the multi-level aspect is still underexplored.

The VAW perspective as our point of reference suggests mapping the value creation process in a cluster around a single firm as a focal actor. It is differentiated between horizontal actors (such as a shipbuilder in a maritime cluster), vertical actors (such as a marine propeller supplier) and lateral actors (such as a navigation school). These actors contribute to value creation by exploiting resources and capabilities on different levels, i.e., the firm, the network and the context level.

Following the understanding of the advantages resulting from being located in a cluster, certain disadvantages may accrue from being embedded in a location. These

disadvantages may range from the scarcity of locational resources (Hoffmann et al., 2017) to a lack of openness towards (cluster-) external ideas (García Villaverde et al., 2018). Getting towards a more holistic understanding of beneficial and unfavourable resource constellations on different cluster-levels therefore is also the aim of this contribution. Thereby we take into account that clusters may be “double-edged swords” that cannot be understood as exclusively contributing to value creation – clusters are to be understood as organisational structures that can come with both advantages as well as disadvantages. Taking both their “bright” and “dark” sides into account, we argue, can lead to a realistic mapping to better understand value creation potential in clusters and building on that to establish useful pragmatic implications.

Value creation for customers to generate returns for firm owners is the objective of businesses (Hambrick & Fredrickson, 2001; Porter, 1996). Not-for-profit organisations strive for value creation for relevant stakeholders and invest returns to sustain value (Keast & Brown, 2006). The discipline of strategic management aims to better understand how organisations create value and conceptualises it as competitive advantage. To understand competitive advantage of cluster members, theoretical perspectives stemming from the field of strategic management are a fruitful fundament. The resource-based view (Grant, 1991; Barney, 1991; Peteraf, 1993), dynamic capabilities view (Teece, Pisano & Shuen, 1997; Eisenhardt & Martin, 2000) and relational view (Dyer & Singh, 1998) are approaches with economic roots explaining competitive advantage generation. These approaches conceptualise competitive advantage as different types of rents resulting from valuable resources and capabilities. The interplay of competition and cooperation – with a high relevance in regional clusters (Porter, 2000) – is regarded as increasingly relevant to understand competitive advantage realisation. However, the boundary-spanning aspects of competitive advantage are under-emphasised (Amit & Zott, 2015). To address this research deficit, we focus specifically on the relationships between cluster actors and the associated value creation potential.

In summary, the aim of this contribution is to strengthen and extend the resource-oriented VAW perspective on clusters so to create a sound fundament for further empirical studies and determining pragmatic implications. Building on previous work (Gretzinger & Royer, 2018) we propose to lay a more coherent fundament for the resource-based value adding web concept. Further, we develop a clearer focus on the interaction between the value creating actors and on relationships as sources for value creation within clusters. Finally, we aim to develop a better understanding of value creation specifically founded on shared relational resources. Based on these key determinants, we specifically want to explain the role of social capital in VAWs and highlight the relevance of knowledge-related resources on different cluster levels. Social capital as a relevant determinant of value adding webs in this paper is further elaborated resulting in an additional set of mediating variables to be included in our resource-based approach to value creation in the cluster context. “There is a

strong awareness that knowledge creation and learning [...] is critical to the competitive advantage of firms and regions” (Boschma, 2005: 62). Therefore, knowledge can be regarded as an especially relevant resource for firms embedded in regional clusters with regard to all identified levels. Specifications regarding the resultant rent creation potential including the consideration of potentially destructive constellations are developed.

The remainder of this paper is structured as follows: First, the underlying behavioural assumptions are made explicit and justified. We also clarify the nature of the investigated actors. Further, the central determinants (i.e., actors, resources, capabilities, interaction and resulting rents) are specified regarding the used terminology and relevant variables. The descriptive fundament is outlined. Second, building on the descriptive fundament, we bring the conceptual elements together. We elaborate where they are to be extended to develop the basis for coming to a ‘translation’ of the theoretical chain of arguments of the VAW mapping tool into a model to be empirically tested. We also justify our focus on the network level of the VAW to make the perspective more coherent and further develop relevant elements of social capital and knowledge. We strive for a version of the VAW with a clear focus on the network level that is eligible for being contrasted with the reality in cluster contexts in empirical studies. Therefore, relationships between variables are elaborated and discussed. An extended theoretical fundament is developed in terms of a set of testable propositions. In a concluding summary, we highlight and critically discuss the main findings.

## **Descriptive Fundament: Behavioural Assumptions and Relevant Terminology**

Clusters can be regarded as overlapping networks consisting of ties between actors, bonding actors who control resources and, bridging actors who find opportunities for complementing resources. This overall pattern of connections between vertical, horizontal or lateral actors in a cluster (such as firms or cluster managers) has a huge impact on the use of resources and the development of capabilities and finally on the deduction of value and rents within clusters (García-Villaverde et al., 2018; Pillai et al., 2017). Regarding the cluster actors it is of relevance to come to an understanding of their behavioural characteristics so to understand their role regarding the development, employment and exploitation of resources and capabilities.

Building on this, we understand **clusters** as “overlapping value adding webs” (VAWs) of single firms (Brown et al., 2007, 2008, 2010) so to be able to identify and map actors, their interactions and relevant resources on different levels. According to the VAW reasoning, resources and capabilities are mapped as the basis for value creation on three levels: Actors may employ resources and capabilities on the firm-level so to gain Ricardian or Schumpeterian rents (see Brown et al., 2010). The second level of analysis focuses on the relationships between the actors in a cluster.

Starting from the perspective of one focal actor, different relationships are identified which link this actor with other horizontal, vertical and lateral actors in the cluster. The relationships may be characterised as pooled, sequential, reciprocal or team-oriented and inter-organisational competitive advantages may result in relational rents (see Brown et al., 2010, section 2.5 and there cited references for a more detailed elaboration). Actors according to the VAW reasoning further may use resources embedded into a particular location such as natural resources, attractive industry structures or favourable institutional specificities to realise contextual rents (see Brown et al., 2010).

Building on the outlined understanding of relevant resources and actors, we want to strengthen the fundament of the VAW concept by specifying the underlying behavioural assumptions as well as the nature of the investigated actors. Further, the relevant terminology in terms of resources, capabilities and rents is made explicit.

### Behavioural Assumptions and Relevant Actors

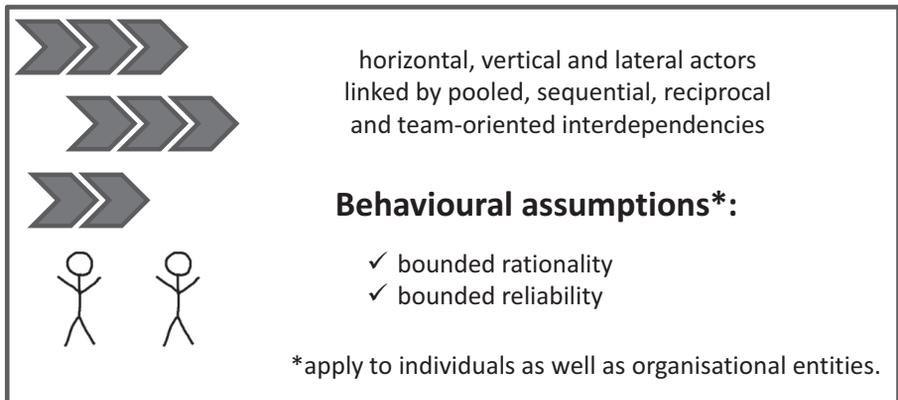
Our reasoning builds on the assumption of **bounded rationality** (see Williamson, 1981: 553, building on Simon, 1957). We model actors as striving for rational decisions but with limitations regarding the fulfilment of this aspiration. This assumption makes it possible to take into account challenges occurring for VAW actors due to their limited cognitive capacity and asymmetric information.

The second relevant behavioural assumption underlying our reasoning is **bounded reliability** (Rugman & Verbeke, 2005; Verbeke & Greidanus, 2009; Kano & Verbeke, 2015). This assumption does not perceive opportunistic behaviour as the only reason for failing to live up to promises as in Williamson's (1981: 554) perspective. Actors bounded in their reliability may behave in the way they behave as a consequence of selfish behaviour with guile but also because they may not fulfil promises due to other reasons such as "benevolent preference reversal" and "identity-based discordance" (Kano & Verbeke, 2015: 98). Thus, it becomes possible to take into account more facets of human behaviour. Actors may show behaviour that originates from their 'wickedness'. Actors also may just change their minds or they may not be able to live up to their promises if they created too high expectations in the past. It also is taken into account that unplanned events may have occurred and made it impossible for actors to keep promises that appeared realistic in the moment they were made.

Underlying behavioural assumptions affect recommendations for organisational design. When we want to understand resources, capabilities and their linkages in VAWs, it is relevant to make use of realistic behavioural assumptions as well as focusing on relevant issues that affect the value creation potential. Choosing our assumptions, we do not solely want to focus on organisational structures that overcome bounded rationality and opportunism. Assuming opportunistically behaving actors would lead to the recommendation of organisational structures that aim at

punishing actors who do not live up to their promises. Organisational design would always build on the assumption of actors who operate with guile. However, punishments or the threat of punishment does not have the desired effect when opportunism is not the underlying problem that causes an issue. Therefore, we regard the behavioural assumption of bounded reliability as more useful even though it may increase the complexity of the theoretical framework that we aim to bring together. We thus assume that actors may act with guile and therefore harm others in VAWs. In addition we take into account that actors may not live up to their promises for different other reasons. Depending on the reasons for behaviours not in the interest of a partner, different types of organisational measures are regarded as optimal to deal with the consequences.

The behavioural assumptions are valid for all types of VAW actors. Based on previous research we differentiate between vertical, horizontal and lateral actors (Brown et al., 2008: 159). To build on this differentiation in a useful sense a further differentiation regarding levels of aggregation is of relevance here (Gretzinger & Royer, 2018). Actors may be individuals or organisations such as universities or firms with different types of relationships among them. In our reasoning all actors may be broken down to the individual level so that it makes sense to use the same behavioural assumptions for all kinds of relationships between actors, for example, between two co-workers or between supplier and buyer firm or cluster management and several different organisations in a cluster setting.



**Figure 1: Actors and behavioural assumptions**

In sum, our conceptualisation builds on horizontal, vertical and lateral actors separately and jointly creating value in VAWs while interacting with each other in different intensity and quality on different levels and who are bounded in their rationality and reliability. Figure 1 summarises our understanding of actors and their behaviour.

## Resources, Capabilities and Rents

Locational, relational and firm resources accessible for a single firm embedded in networks of actors are the relevant units of analysis regarding competitive advantage generation on different levels in the VAW reasoning (Brown et al., 2007, 2008, 2010, 2013).

**Resources** are understood as valuable assets that may be embedded on different levels, i.e., the firm, network/relational and locational/context level (Brown et al., 2007, 2008, 2010). **Capabilities** reflect how “appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment” (Teece et al., 1997: 515) are key elements. Integrating resources and capabilities into our perspective reflects that we are investigating not only existing resources on different levels but also take into account how they are employed, further developed and adapted over time. In accordance with the resource-based view of the firm, resources are understood as being heterogeneous across firms and limited in their mobility (Barney, 1991: 101). Such resources and capabilities on the **firm level** are reflecting assets in the sense of the resource-based view of the firm (e.g., Barney, 1991) respectively the dynamic capabilities perspective (e.g., Teece et al., 1997). In the example of the maritime cluster, a patent of the marine propeller supplier or implicit knowledge about how to hire motivated personnel or to operate a well-equipped shipyard could reflect relevant firm-level resources and capabilities.

Next to the firm-level, the **relational/network level** is crucial regarding the generation of competitive advantage in clusters. The process of exchanging resources may be supported but also restricted due to relationships within clusters or among cluster members with actors from outside the cluster. Relevant resources on this level are inter-organisational resources and relationships. A joint research group between the shipbuilder and the supplier to develop dedicated propellers for specialist ships would be an example of an inter-organisational resource on the relational level. *Inter-organisational resources* are differentiated according to Brown et al. (2010: 25) following Dyer and Singh's (1998: 663) systematisation into relationship-specific assets, knowledge sharing routines, complementary resources and capabilities and effective governance. This understanding is outlined in the following.

Regarding the quality and strength of relationships between VAW actors, we follow Brown et al. (2010: 22 seq.) who transfer Thompson's (1967) categorisation of pooled, sequential and reciprocal interdependencies to the VAW: Relationships are characterised by pooled interdependencies when the linked actors are striving to access the same resources. For example, the case of firms competing for qualified personnel in a specific location. Vertical VAW actors supplying inputs to horizontal actors is an example of a relationship characterised by a sequential interdependency. When VAW actors mutually exchange inputs and outputs, reciprocal interdependencies occur. Team-oriented interdependencies (Picot et al., 2015: 78–79; van de

Ven & Ferry, 1980: 166–168) characterise relationships in which actors are not able to realise a certain output on their own but need each other for example, due to exclusive knowledge they have that is of more value when combined with other valuable resources of a partner. In this way, *complementary resources and capabilities* of VAW actors may create more value for partners when used in cooperation.

Pooled relationships may link shipbuilders when companies in a maritime cluster are dependent on gaining access to qualified employees from the same pool of local labour. The maritime propeller supplier is engaged in a sequential relationship with the shipbuilder. Two shipbuilders may concentrate on different activities regarding shipbuilding and may supply each other with the components they specialise in so that they have a reciprocal relationship. When the shipbuilding company and the propeller supplier engage in jointly developing propellers dedicated to the specialised ships of the shipbuilding company, a team-oriented relationship exists. It becomes obvious that understanding the quality and strength of relationships in terms of the different types of interdependencies gives an indication of the extent of *relationship-specific assets*. From pooled to sequential to reciprocal and team-oriented interdependencies, the extent of relationship specificity increases.

One-sided dependencies may lead to hold-up situations (Grossman & Hart, 1986) that may be exploited by potentially opportunistic actors. One way out of such a dilemma is to establish *effective governance* mechanisms to come to a better balance between actors. Effective governance refers to “third-party enforcement of agreements (e.g., legal contracts)[...] [and] self-enforcing agreements” (Dyer & Singh, 1998: 669). Finally, *knowledge sharing routines* can be potentially valuable inter-organisational resources for VAW actors.

Locational resources refer to the **context-level** in a certain region. A location may be more or less favourable to VAW actors in terms of the industry-related market structure (e.g., Porter, 2008) but also due to other locational and institutional aspects (e.g., Dunning, 2000; Granovetter, 1985). *Locational resources* (defined following Wernerfelt, 1984: 172) as “anything which could be thought of as a strength or weakness” of a given location are therefore differentiated into regional, industry-related and institutional resources (Brown et al., 2010: 28). For example, a major waterway in a region could be a relevant locational resource of a maritime cluster. In line with Rohde et al. (2018), we additionally build on Fensterseifer and Rastoin’s (2013) differentiation between systemic and restricted-access resources. All VAW actors may access systemic resources (such as a pool of local workers or a favourable general infrastructure). Only certain actors may use restricted-access resources. For instance, only firms which have already made relevant investments into a particular technology may be in a position to access knowledge regarding this technology available in a location (for further examples see also Fensterseifer, 2009; Fensterseifer & Rastoin, 2013).

Finally, in a strategic sense we are interested in competitive advantage conceptualised in different ways by investigating different types of **rents** in terms of economic profit resulting from employing the resources and capabilities on different VAW levels. Here, our perspective on single actors embedded into a VAW becomes obvious.

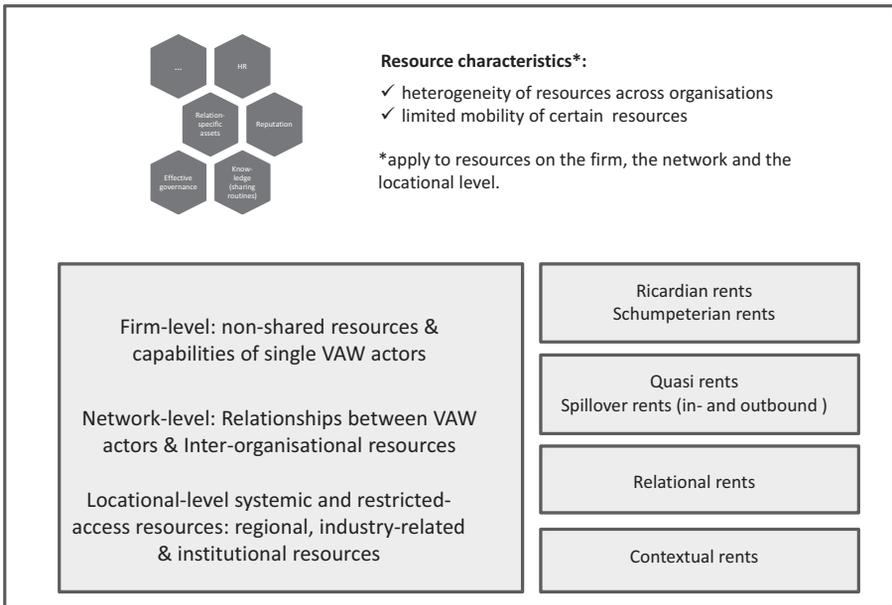
As outlined above we include Ricardian rents (e.g., Peteraf, 1993) and Schumpeterian rents (e.g., Teece et al., 1997) on the firm level into our conceptualisation. Ricardian rents may stem from increasing the willingness of customers to pay for a certain type of speedboat due to the brand name the shipbuilder has established over time. The valuable brand name thus may lead to higher profits for the shipbuilding firm. Schumpeterian rents may accrue when the research and development of digital navigation technology is embedded into a dynamic competitive environment. Here, the development of capabilities may lead to temporary entrepreneurial rents for a first mover; however, the relevant knowledge then diffuses in the marketplace and becomes available for other actors as well. Accordingly, the innovating actor is able to realise extra profits for a certain period in time on the basis of the new technology but has to come up with something new and valuable again to stay successful.

Building on Lavie's (2006) extensions of the resource-based view of the firm regarding the network level we take into account quasi rents, appropriated relational rents and spillover rents. Quasi rents are "the excess of an asset's value over [...] its next best use" (Peteraf, 1993: 184). They are related to specific investments that may lead to imbalanced dependency and thus are relevant regarding different extents of relationship specificity. A team-oriented relationship may be more stable due to underlying specificity and the potential loss of the quasi rent when leaving the partnership. Quasi rents can also be generated on the firm-level. Our interest, however, is directed exclusively to specific investment on the relational level.

Relational rents stemming from cooperative activities are also included in our reasoning. They reflect the "supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of specific alliance partners" (Dyer & Singh, 1998: 662). Relational rents are relevant on the network level. From the perspective of a single firm, Lavie (2006: 644) uses the term "appropriated relational rent" – an example would be positive outcomes of a joint marketing campaign of a shipbuilder and a propeller supplier.

Regarding the outcome of the crucial sharing of knowledge "[...] the ability of alliance partners to generate rents through knowledge sharing is dependent on an alignment of incentives that encourages the partners to be transparent, to transfer knowledge, and not to free ride on the knowledge acquired from the partner" (Dyer & Singh, 1998: 665). We suggest to explicitly include the "dark side" of clusters and cooperation on different levels and not to rely only on a positive perspective.

This approach is reflected in the rents we take into account: With spillover rents we also include unintended gains stemming from shared and non-shared resources (Lavie, 2006: 644) that may destroy synergetic value creation. These rents make it possible to include the return from valuable resources and capabilities of a partner that were not intended to be shared. An example would be the shipbuilder’s backward integration into propeller manufacturing after gaining access to valuable knowledge from the cooperation. From the perspective of the shipbuilder, inbound spillover rents would be generated. Losing profits due to a (former) partner’s exploitation of non-shared resources or shared resources in an unintended fashion would be an example for outbound spillover rents. Spillover rents may lead to unintended leakage of rents to others and the destruction of synergetic value creation.



**Figure 2: Resources, capabilities and rents in VAWs**

On the locational level, we expect contextual rents (Brown et al., 2007, 2008, 2010) in terms of above-average returns accruing from a certain location into which VAW actors are embedded. Depending on the nature of locational resources, single firms in VAWs may exploit these systemic or restricted-access resources to different extents. In the maritime cluster, systemic resources could be general infrastructure in a region in terms of fast internet access or a good connection to highways. Restricted-access resources cannot automatically be used by all cluster actors. For example, only those cluster actors that have the necessary technical knowledge to develop an exchange with scientists may profit from a naval research institute in the region.

Figure 2 summarises the underlying understanding of resources, capabilities and rents in VAW.

## Theoretical Fundament: Towards Testable Propositions and an Extended VAW Framework

Resources, capabilities and resulting rents on different levels of VAWs are conceptualised from the perspective of a single firm embedded into a network of horizontal, vertical and lateral relationships. The contributions to value creation of lateral actors such as cluster managers or research institutions are taken into account as well as the contributions made by vertical actors, i.e., suppliers and buyers. Building on previous research (Brown et al., 2007, 2008, 2010; Gretzinger & Royer, 2014, 2018, Rohde et al., 2018) the aim is to come up with a set of testable propositions that make the concept more coherent and extend it in a fruitful way. After the descriptive fundament has been laid in the previous section, this section builds the theoretical fundament.

### Variables at Work in VAWs

The firm-internal resources, inter-organisational resources and locational resources as well as adherent capabilities can be regarded as *independent variables* (or environmental conditions that may change) which affect competitive advantage or disadvantage conceptualised as rent creation or destruction on different levels (understood as *dependent variables*). Due to the understanding that possibilities exist for cluster actors to have an impact on how the independent variables affect the dependent variables we include *mediation variables* that will be elaborated below. The relationships between all variables are conceptualised on the basis of *behavioural assumptions* (which are not changing) as elaborated above. These assumptions build the fundament for the extended VAW framework and are set for all actors on all investigated levels, no matter if the actors are individuals or entities such as firms consisting of a group of individuals.

### Independent Variables

The different types of resources and capabilities which have been described in the previous section are the independent variables. Resources are organised into the categories of *locational, relational and firm level resources* (Brown et al., 2010). Building on the original concept, we specify and extend the relational and locational resources. The focus of the following elaboration first lies on coming to a better understanding of different ties between actors in a cluster. Second, we elaborate the relevance of knowledge as a valuable inter-organisational resource in cluster contexts. Finally, we specify locational resources as independent variables.

We assume that value is created jointly when focal actors exchange, integrate and apply resources with others (Gretzinger & Leick, 2017; Jaakkola & Hakanen, 2013;

Vargo & Lusch, 2011). As rent creation in VAWs requires access to resources (including knowledge packages) that are associated with different kinds of actors, teams or coalitions, the development of trustful relationships is important for deducing and managing capabilities (Gretzinger & Leick, 2017; Coleman, 1990; Håkansson et al., 2009).

A further assumption is that beyond the specification being a horizontal, vertical or lateral actor, the relationships can be characterised as consisting of weak or of strong ties. Next to strong ties (characterised as dense relationships with frequent exchange and/or close interaction) weak ties are assumed as well to be an important base for creating value and rents. Weak ties are understood as loose connections that bond actors, who infrequently exchange information and/or resources (Coleman, 1990; Burt, 2005). Gaps between connected, unconnected and/or loosely connected actors can offer opportunities in terms of information advantages in matters of strategic deployment (Zaheer & Soda, 2009; Burt, 2005; Ahuja, 2000). In addition, building on our fundament, we regard the ties between cluster actors as getting stronger with an increasing interdependency among them.

In a cluster context, resources such as knowledge may be even more valuable than in isolation. Relationships in a particular location may be used in a beneficial way in order to exchange and share knowledge. “Specifically, firms located inside a cluster will collectively become more innovative than the sum of individual firms had those firms been geographically scattered to the extent that knowledge exchanges take place between cluster firms, and cluster firms effectively amplify knowledge from other cluster firms through their knowledge spirals” (Arikan, 2009: 660). Easterby-Smith et al. (2008) in that line suggest that “[...] there may be idiosyncratic features of inter-organizational knowledge transfers within a cluster that are not shared by firms outside the cluster” (Easterby-Smith et al. 2008: 686). According to Bathelt et al. (2004) “[o]verall, the shared knowledge basis enables cluster firms to continuously combine and re-combine similar and nonsimilar resources to produce new knowledge and innovations” (Bathelt et al., 2004: 37).

However, Bathelt et al. (2004: 48–9) warn not to overestimate the relevance of local networking and thereby miss that exchange with actors outside the cluster may be also highly important for cluster members in order to generate new knowledge and innovations. García Villaverde et al. (2018) have compared companies embedded in a cluster with those outside clusters and found related to their empirical example that clustered actors do not just benefit from being embedded in dense cluster structures. Apparently, one characteristic of industry clusters is that firms are used to exchange information and knowledge preferentially within fostered relationships inside the cluster instead of acquiring new ideas from less bonded actors. In García Villaverde et al.’s (2018) example, companies which mainly interact inside the cluster can be affected by lock-in obstacles (Grabher, 1993; Cho & Hassink, 2009),

whereas companies located outside the clusters were better able to acquire valuable knowledge.

Even though concentrating on knowledge exchange inside a cluster may lead to missed opportunities of knowledge sharing across cluster boundaries, the necessary sharing and combining of knowledge resources inside a cluster is regarded as “[o]ne of the most important reasons for industrial networks” (Johnson et al., 2002: 251).

Building on Rohde et al. (2018) we suggest that locational resources and inter-organisational resources have “certain interfaces” (p. 19). Specifically, the institutional resources in terms of social, cultural and legal specificities on the locational level embed the interactions between the actors in a cluster. Thus, the institutional context is taken into account regarding the formal and informal actor relations in our reasoning (Brown et al., 2007), for instance in the form of knowledge sharing mechanisms with positive effects on cluster actors’ absorptive capacity (Mitchell et al., 2014). Absorptive capacity is reconceptualised “as a dynamic capability pertaining to knowledge creation and utilization that enhances a firm’s ability to gain and sustain competitive advantage” (Zahra & George, 2002: 185).

### Mediating Variables

When it is accepted that cluster actors do have an impact on resource and capability constellations in a VAW it becomes relevant to also think about how structural and behavioural difficulties may be overcome. Mediating variables are included into our VAW framework so to implement mechanisms aiming at internalising negative externalities (Gretzinger & Royer, 2018: 61). Following Gretzinger and Leick (2017) we here include bridging, bonding, protecting and balancing as social capital-related mediator variables in our framework. These also reflect the clarification of the underlying behavioural assumptions.

Linked into the reasoning regarding the relational level, we include social capital-related considerations into the VAW framework. Inkpen and Tsang (2005) suggest that “[f]or effective and efficient knowledge transfer to occur, firms may have to manage and build social capital proactively” (Inkpen & Tsang, 2005: 160). Regarding the network level, therefore *social capital* has been included into the VAW concept in previous research (Gretzinger & Royer, 2014, 2018; Neale, 2017). Social capital here is understood as a combination of actual and potential resources and capabilities (Burt, 1997; Gulati, 1999; Gnyawali & Madhavan, 2001). Duschek (2004: 62) contends “Within the scope of the relational view, social capital as a bundle of resources inheres primarily in the social network of inter-firm relations”.

When taking into account social capital, it is realistic and therefore useful for our reasoning to clarify that “social capital is not a universally beneficial resource” (Nahapiet & Ghoshal, 1998: 245). This broader understanding of social capital has implications for the management of social capital in VAW contexts. Negative external-

ities (e.g., a negative attitude towards new ideas) may result from a failure in balancing-out strong and weak ties between actors in VAWs. Negative effects on rent creation may result.

Bounded rationality posits that VAW actors may have different opportunities to get access to knowledge exchanges and new knowledge combinations. Depending on their motivation as well as their abilities to share knowledge, the resulting rents may differ. Further, a relationship between VAW actors can be characterised by trust and a long history of cooperation leading to a motivation to use resources jointly, which however is decreasing when negative relationship characteristics dominate. This illustration indicates that mediation may have the potential here to increase the rent creation in a VAW.

We therefore include four social capital-related activities in our reasoning as mediating variables: bridging, bonding, protecting and balancing. Bridging refers to tying initiatives among formerly unconnected or just loosely connected actors in order to complement each other's businesses (Burt, 2005: 9; Adler & Kwon, 2002: 19–22). Bonding refers to initiatives to increase trust in already existing relationships (Coleman, 1990; Adler & Kwon, 2002: 19–22). Protecting refers to initiatives started in order to sustain the exclusivity of resource bundles (Gretzinger & Leick, 2017: 357). Finally, balancing refers to initiatives aiming at counterbalancing negative externalities. In relation to an Australian wine cluster, Mitchell et al. (2014) illustrate that: "Technical specialists utilize their own bridging and bonding social capital to identify and assimilate knowledge, and use their bonding capital within the cluster to disseminate knowledge to recipient organizations" (Mitchell et al., 2014: 2204).

## Dependent Variables

Building on the original concept as well as the outlined extensions, we regard the following rent concepts as our dependent variables: The resources on different VAW levels may lead to different types of rents as described above. Thus, regarding the set of dependent variables, competitive advantage generation on different levels of the VAW is central (see also Brown et al., 2010; Gretzinger & Royer, 2018). In this context, we understand competitive advantage as a construct that may occur on different levels that may be conceptualised by different types of rents, i.e., Ricardian, Schumpeterian, quasi, in- and outbound spillover rents as well as relational and contextual rents.

By including spillover rents, we acknowledge potential negative implications of exploiting resources in cluster contexts. We want to develop a finer-grained picture of the advantages as well as disadvantages of being embedded into a VAW. This focus is also reflected in the potential of certain resource constellations to destroy value from the perspective of single actors that goes beyond one-sided gains on the basis of non-shared resources. It may also include the destruction of relational rents.



**Table 1: Resulting propositions**

Proposition	
# 1a	<i>Unique resources of focal VAW actors</i> lead to <b>Ricardian rents</b> in stable environments.
# 1b	<i>Valuable dynamic capabilities of focal VAW actors</i> lead to <b>Schumpeterian rents</b> in dynamic environments.
# 2a	<i>Unique resources of focal VAW actors</i> lead to <b>outbound spillover rents</b> in the case of VAW partners not living up to their promises (due to opportunism or other reasons).
# 2b	When the focal VAW actor does not live up to its promises towards another VAW actor, <b>inbound spillover rents</b> can result from <i>unique resources of the VAW partner</i> .
# 3a	<i>Relationship-specific investments of VAW actors</i> lead to <b>quasi rents</b> .
# 3b	<i>Valuable inter-organisational resources of VAW partners</i> may lead to appropriated <b>relational rents</b> .
# 4a	Social capital-related mechanisms, i.e. <u>bridging, bonding, protecting and balancing</u> may have positive implications on the generation of <b>relational and contextual rents</b> .
# 4b	A lack of social capital-related mechanisms, i.e. <u>bridging, bonding, protecting and balancing</u> may lead to the destruction of potential <b>relational and contextual rents</b> .
# 5a	<i>Systemic locational resources</i> (accessible for all VAW actors) may lead to <b>contextual rents</b> .
# 5b	<i>Restricted-access resources</i> (exclusive to certain VAW actors) may lead to additional <b>contextual rents</b> for a certain group of VAW actors.
# 5c	Being too focused on the exploitation of <i>locational resources</i> may lead to locational lock-in preventing rents resulting from activities outside the VAW and thus the destruction of <b>contextual rents</b> .

*Independent variables*; mediating variables; **dependent variables**

## Conclusions: Discussion and Outlook

A comprehensive theoretical framework taking into account the developments of the value adding web concept from different research contributions is the core result of this paper bringing together several propositions.

Clarifying behavioural assumptions for a resource-based perspective makes the VAW framework more specific regarding the issues in focus as well as ways to come to organisational structures best dealing with these issues. We conceptualise VAW actors as bounded in their rationality and reliability. This assumption opens the perspective for the inclusion of behaviours other than just opportunism in the classical sense of Williamson (1981). Actors in our conceptualisation may change their minds over time and therefore may not live up to the promises they made in the past. We can also put forward that our actors just cannot live up to their promises due to a lack of capabilities or resources. This situation is not just more realistic to assume than purely opportunistically behaving actors, it also opens the space for a different set of recommendations to deal with potentially unreliable behaviour since organisational mechanisms designed to prevent opportunistic behaviour may not work in constellations that Kano and Verbeke, (2015: 98) call “identity-based discordance” of actors.

By reducing complexity here the fundament of the VAW concept is specified. Further, we do not reduce the complexity too much in terms of relying on the assumption of opportunism, but extend it to bounded reliability so to avoid recommendations that are too narrow-minded or, in the worst case foster opportunism instead of preventing it.

Resources on the firm, network and context level are investigated with regard to their contribution to value creation in VAWs. Their contributions to value creation are reflected in Ricardian and Schumpeterian rents that may be gained on the firm level. In addition, rents stemming from relationships between networked actors are taken into account: While (appropriated) relational rents reflect the cooperative behaviour of partners in VAWs and accrue from shared resources of both partners, spillover rents result from opportunistic behaviour or unreliability of involved actors. Inbound spillover rents are generated by a focal VAW actor due to its unreliability or opportunism. Outbound spillover rents are generated by a partner of the focal VAW actor on the cost of the focal actor. The reason again lies in the unreliability or the opportunism of the actor who appropriated the rent. These rents are relevant from the perspective of a single actor embedded into a VAW that accrue rents/resources on the organisational level as well as the dyadic level, i.e., in the relationships with other horizontal, vertical and lateral actors in the VAW. Contextual rents may result from locational assets that may be exploited by all cluster members (i.e., in the case of systemic locational resources) or that are exclusive to a certain group of them (i.e., in the case of restricted access resources on this level).

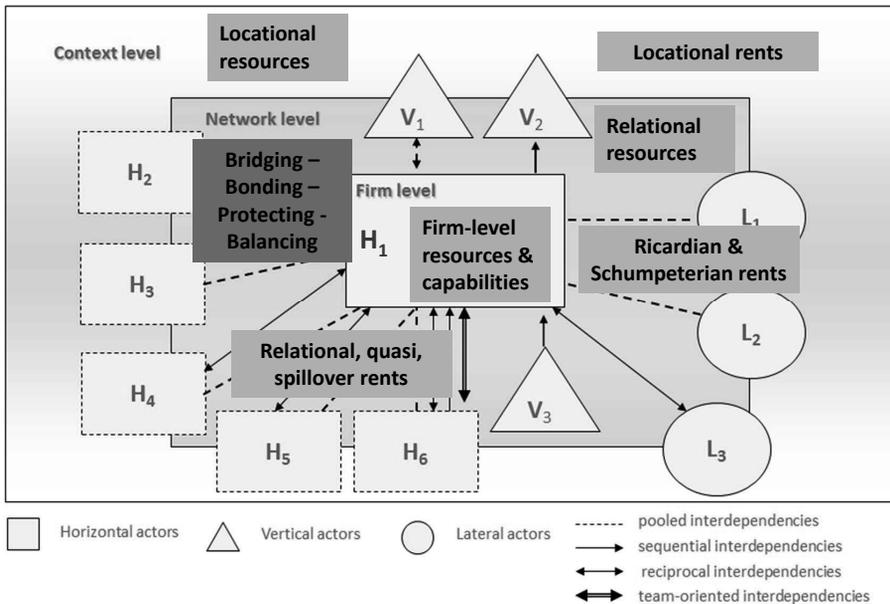
Building on Gretzinger and Leick (2017) and Gretzinger and Royer (2018) we suggest the relationship between the resources on different VAW levels are mediated by bridging, bonding, protecting and balancing activities. Bridging activities in VAWs may help to overcome and/or to prevent structural barriers. Bonding activities in VAWs are regarded as useful in order to improve the atmosphere of the interaction as well as support more effective communication. The latter may be also facilitated by protecting activities – a specific form of bonding – which increase the awareness of joint valuable resource bundles. Finally, balancing activities, in the form of combining complementing strong ties with weak ties or vice versa, especially help to overcome structural imbalances (e.g., by investing equally in relationship-specific assets). These recommendations reflect a differentiation between structural, cognitive and relational dimensions of social capital as in Nahapiet and Ghoshal (1998).

Regarding the mediating variables, the impact of the underlying behavioural assumptions becomes clear – by focusing on the issues of bounded rationality and bounded reliability, useful ways of overcoming the related problems regarding exploiting different level resources in a cluster context can be specified. For example, bonding activities make it possible to overcome opportunistic behaviour as well as to be better able to differentiate between the different reasons for unreliability. It

helps to overcome problems of asymmetric information by establishing better communication possibilities.

Pragmatic implications are founded on the basis of the extended VAW concept. In this context, we further develop a (mapping) tool to investigate interactions among actors, adaptation of (cluster-related) resources and capabilities as well as the emergence of resources, capabilities and resource ties and resulting rents.

Figure 4 sketches such a template that may be adapted to an investigated cluster case. The template can be filled with resources and capabilities of actors on different levels according to the VAW approach. It is important here to recognise that next to potential rents to be generated the potential negative outcomes are also included. These are first of all, one-sided spillover rents. Further, it includes the destruction of potential relational rents as well as missing out on VAW external rent creation possibilities due to a lock-in into the locational and relational resources in the respective cluster.



**Figure 4: Ideal-typical VAW map around horizontal actor H1**

Coming to a more holistic and balanced understanding of the advantages as well as disadvantages of a particular cluster context makes finer grained facilitation from the perspective of a cluster manager possible. The perspective is also useful for single firms embedded in VAWs to understand the potential as well as the drawbacks of a geographical location. A more in-depth understanding of clusters with bridging, bonding, protecting and balancing mechanisms is developed, along with providing,

cluster actors with a sound fundament for pragmatic recommendations to change an unfavourable rent situation.

Theoretically this paper indicates that the creation of rents related to clusters is complex by nature and that public policy managers who want to support the development of e.g. regional clusters, need not just to think in terms of single firm capabilities and resources, but network level-based resource pools and relationships and finally local resources and limitations. The propositions formulated in table 1 provide first implications for actors in charge of managing local clusters and/or companies embedded in clusters.

The Value Adding Web (VAW) concept of clusters, as it is formulated in this contribution, remains on a level of high generality. Follow up research in the area of exploring specific clusters is warranted. Furthermore, related to specific context constellations reflection on the drafted propositions will be possible. Finally, empirical findings in specific cluster cases will assist to reflect the VAW model and to develop it further.

As with any theoretical frame, this model has its limitations. For exploring the dynamics inherent in specific clusters, it will be necessary to undertake further empirical investigations. However, the development of a general framework with a clear descriptive fundament including explicit behavioural assumptions and a limited number of interacting variables also is a good basis for empirical studies and is applicable to many cases of clusters across industries and countries. We provide a systematic base to be adapted to the specific cluster case in order to come to a better understanding of value creation potential on different levels as well as ways to generate further competitive advantage.

The high generality of our concept is a strength on the one hand side since we present a conceptual framework that can be applied to various clusters in different industry and country contexts. However, on the other hand side, the generality of the concept also leads to a high need for adaptations and specifications for the cases investigated.

Future research has to further investigate the usefulness of the underlying behavioural assumptions of bounded rationality and bounded reliability in the context of coming to a better understanding of how to generate competitive advantage on different cluster levels.

So to come up with a good basis for further empirical studies and pragmatic recommendations we tried to keep the extended VAW concept as simple (and general) as possible. However, adapting the conceptualisation to practical cases of actors embedded in clusters may hold challenges. For strategists in clustered firms it may for example be a difficult exercise to identify and define the resources and capabilities on different levels in an appropriate and useful way and gain knowledge how to exploit them. The operationalisation of the different rent concepts that reflect differ-

ent types of competitive advantage and disadvantage also is a rather complex task. Here further research regarding “operationalisation guidelines” may be fruitful.

The aim of this contribution – i.e., to develop a general conceptual framework that argues for certain theoretical relationships between relevant strategic variables and that bases on a fundament of behavioural assumptions and an explicit elaboration of the used terminology – has been reached, but also has to be further developed and specified for different cases.

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