Social capital and usefulness of external knowledge: 
The moderating role of group affiliation

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Abstract  
Knowledge is the most important firm asset and studies show that social capital facilitates access to internal and external knowledge and in turn increases business value. In that respect, studies show that companies sharing some similarities such as organizational values and practices may benefit more than companies differing in various aspects. In particular, group affiliations have been shown to influence performance in specific contexts but results are mixed at best. In addition, the question of how the influence of social capital on transferring useful external knowledge might be moderated by closer affiliations between companies is virtually not addressed. Employing a survey among manufacturing companies, this paper contributes to extant research by demonstrating a moderating effect of group affiliations on the relationship between social capital and useful external knowledge.

1. Introduction  
Knowledge is the most important firm asset [28], shown to be key to achieving and sustaining competitive advantage, in particular in turbulent environments [56], and an important resource for innovations [53]. In this respect, the last decades of empirical research demonstrate that companies foster innovation success when leveraging company-internal knowledge (or briefly: internal knowledge) but also knowledge that is available in a company’s network with other companies and institutions (briefly called external knowledge). Research highlights that new knowledge has to be acquired and assimilated to come up with new solutions [35] which is particularly the case for transferring external knowledge [58].

Transferring external knowledge requires inter-organizational ties on which valuable knowledge can flow. This, in turn, enables companies connected with these ties to learn from one another [19] which is particularly important for coming up with innovations. Thus value from company’s inter-organizational ties accrues by providing resources to achieve and sustain competitive advantage. This value accrues mainly from the transfer of knowledge as the most important resource. Knowledge transfer can be investigated along four dimensions: Comprehension, usefulness, speed, and cost of knowledge transfer [48]. This paper focusses on the dimension of usefulness of received knowledge defined as the relevance and salience of transferred knowledge for the organizational success [48].

The inter-organizational knowledge transfer relate to the notion of social capital that is defined “as the sum of the actual and potential resources [e.g., knowledge] embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” [45]. Research consistently shows that social capital fosters, e.g., knowledge transfer [32], knowledge creation [42], and value creation [57]. Consequently, social capital theory advances that social capital increases knowledge creation through facilitating the access to resources and thus fosters exchange and combination of internal as well as external knowledge [42, 45]. Accordingly, a company’s network creates value for the respective company through access to useful external knowledge which has been investigated by several studies [24, 44, 54].

Thus literature shows the importance of organizational relationships’ characteristics for knowledge transfer. However, literature also indicate that different organizational values and practices between organizations inhibit collaboration and learning [6] which, in turn, would lower the value accruing from a company’s network. Hence, the context of organizational values and practices between organizations might influence value creation. In that respect, the context of group affiliations referring to “firms tied together in various formal and informal ways” but are legally independent [7, p. 437] may play a role. Group-affiliated companies share some commonalities such
as innovation systems that are institutionally embedded in specific contexts [23]. This in turn might enhance collaboration and learning. Accordingly, social capital might exert a stronger influence if organizations are affiliated and thus share some similarities.

Although research investigated group affiliations and their influence on performance in specific contexts [e.g., 7, 36, 41], there is virtually no research in the innovation context. In particular, the question of how the influence of social capital might be moderated by closer affiliations between companies is not addressed. We therefore formulate the following research question:

How are group affiliations related to social capital’s influence on useful external knowledge?

We address this question by applying social capital theory on the value chain of a company, i.e., on the relationship between a focal firm and its customers and suppliers. Using survey data from manufacturing companies, we contribute to extant research by demonstrating a moderating effect of group affiliations (or briefly affiliations) on the relationship between social capital and useful external knowledge.

This paper is structured as follows. First, the research model is developed using arguments from the social capital theory. Second, the methodology used is introduced. Third, the results are presented. Finally, conclusions and limitations are discussed.

2. Research Model

Our research model deals with social capital between the focal firm and external partners, e.g., customers and suppliers, and its influence on the usefulness of knowledge received from these external partners. This relationship is moderated by the affiliation of the external partners with the focal firm. Figure 1 depicts these relationships which will be explained in detail below.

![Research Model Diagram](image)

**Figure 1. Research model**

2.1. The Role of Social Capital for Usefulness of Received Knowledge

External partners, in particular, suppliers and customers, have been in focus of prior research [9, 14, 20, 38]. These external partners are knowledge sources and may contribute to a firm’s knowledge stock. We model the relationships between the focal firm and its partners as social capital and investigate the effect on the usefulness of the knowledge received [45].

According to Nahapiet and Ghoshal [45] social capital comprises three dimensions which affects the usefulness of received knowledge for the following three reasons.

First, the structural dimension of social capital refers to ties between partners and affect the usefulness of received knowledge by providing conduits for knowledge transfer [30] and facilitates the access to knowledge [59].

Second, the relational dimension of social capital refers to mutual respect and trust. The relational dimension enhances the efficiency and effectiveness of knowledge transfer [1, 39] by increasing the willingness to exchange knowledge [e.g., 5, 22, 30, 45] and in particular willingness to transfer tacit knowledge [e.g., 4, 15] which is of central importance for organizational success.

Finally, the cognitive dimension refers to shared vocabulary and interpretations [28, 35] and improves knowledge transfer by developing a greater understanding through common languages and symbols [22] and by creating a common frame of reference [46]. This, in turn, allows to assess the usefulness of knowledge due to the ability to interpret ambiguous knowledge [58].

Therefore, we hypothesize H1: Higher levels of social capital in its structural, relational, and cognitive dimension increases the usefulness of knowledge received from external partners.

2.2. The Moderating Role of Group Affiliation

Companies are often affiliated with other companies in groups or multicorporate enterprises. Within these groups multiple business relationships exist where one company is customer or supplier of another company within that group. Such group may exhibit similar values, culture, and organizational practices as the group exhibits common administrative control. Lane et al. [37] argue that familiarity and community membership lead to an increasing absorptive capacity that relates to a
The company’s ability to acquire and to absorb new external knowledge. In a similar vein, Gilsing et al. [25] find that similarity, e.g. with regard to knowledge and cognition, eases inter-organizational learning. Van Wijk et al. [58] argue that intra-organizational knowledge transfer has a stronger influence on performance than inter-organizational knowledge transfer, partly because of “more opportunities to eventually understand the ambiguous knowledge”. Thus, we can expect that group affiliations strengthen the effect of social capital on the usefulness of knowledge received from external partners.

Therefore, we hypothesize H2: Group affiliation positively moderates the relationship between social capital and the usefulness of knowledge received from external partners.

3. Methodology

3.1. Data Collection

To test the hypotheses we applied survey data collected among the 2,500 largest German manufacturing companies (SIC-Codes 3011-3999) according to their revenue. Further, we focused only on the most important product division of these companies instead of the company as a whole to avoid aggregation problems.

The data collection process consists of three steps. In the first step we contacted each company by phone to identify the right survey participant within the company which in most cases was the product division’s manager or if such a position existed, the innovation manager. According to managers preference the questionnaire was sent out by fax (4 times), by email (581 times), or by paper (1,915 times) in the second step. After a four weeks period a friendly reminder was sent out if the manager had not answered. In the final step of the data collection the managers who had not answered to the first questionnaire or the reminder were called again and a second reminder was issued. This procedure resulted in 229 completed received questionnaires whereof 196 could be applied for this analysis due to no missing values regarding the items used.

Since we tracked when a respondent answered we are able to cluster the received questionnaires into two groups [2]: early respondent who answered after the initial dispatch (n=91) and late respondent who answered after the first (n=91) or the second reminder (n=37). Eleven questionnaires were completed anonymously. Using the Mann-Whitney test for comparing these two groups we found no significant differences except for the third item measuring the usefulness of received knowledge from suppliers. Further, we elaborate if any difference exists between the respondent and non-respondent companies regarding the demographic data of the revenue and number of employees. Again using the Mann-Whitney test no differences could be detected concluding that non-response bias is a not a major issue in our data.

3.2. Measurement

The questionnaire was developed by four experienced researchers who reviewed 97 related journal articles regarding knowledge transfer and social capital research. On this basis the measurement model was developed by extracting the relevant measurement items out of these articles. Each dimension of social capital as well as the usefulness of the received knowledge comprises a set of three items each measured on a 7-point-Likert-scale ranging from totally disagree (-3) to totally agree (+3). The group affiliation of a company was measured by a single item on a 7-point-Likert-scale ranging from “external partners” (-3) to “other companies of the same group” (+3). Table 3 lists the final items and provides references to related research using these items previously. Understandability and comprehensiveness of each construct was ensured by conducting pretests upfront the survey with business managers or innovation managers of eight different companies resulting in only slight modifications of the wording of few items.

Since the survey was conducted at the level of a product division we included the importance of the product division for the respective company as a control variable in the analysis. Further, the set of control variables is expanded by the overall size of the company in terms of the revenue measured by secondary data as well as by the strategy of the company measured by a single item from Droge et al. [17]. The latter one exhibits a scale ranging from ‘focusing on optimization of processes’ to ‘focusing on innovation leadership’. Beside these control variables two more were considered on an individual level in terms of the experience of the respondent regarding the years of experience in the current position in the company as well as the years the person is holding this position, regardless of its current employer.
3.3. Analysis

For analyzing the hypotheses we applied the product-term approach running regressions with the product of the sums [27] using IBM SPSS Statistics. We have chosen this approach instead of the product-term-approach running Partial Least Squares with product indicators since Goodhue et al. [27] shows that the former approach has more statistical power and thus is superior. This is line with Frazier et al. [21] who state that regression analysis is the mostly applied method for scrutinizing moderation effects. According to the research model the usefulness of the received knowledge from external partners represents the dependent variable, the social capital to the external partner the predictor variable and group affiliation of the partner the moderator variable. The product of predictor and moderator variable denotes the interaction term. Since we distinguish between customers and suppliers the analysis was done for each type of external partner separately resulting in a model A for customers and a model B for suppliers (compare Table 4).

In the first step all nine items measuring the social capital of one type of external partners were aggregated by calculating the mean of the scores. The mean instead of the sum is similarly considered by the product of the sums approach [27]. This was also done for the three items measuring the usefulness of received knowledge from customers, or suppliers, respectively. Since the predictor and the moderator variables were measured with the same scale we standardized them to reduce the problem of multicollinearity [10]. The resulting standardized scores were then used to build the two interaction terms for customers and suppliers by calculating the product [21].

In the second step the regression analysis was run. Model 1 only comprises the control variables whereas model 2 additionally includes the social capital to customers, or suppliers, respectively (predictor variable) as well as the group affiliation of customers, or suppliers, respectively (moderator variable). Finally, model 3 takes into account the corresponding interaction term.

4. Results

4.1 Descriptive results

Table 1 and Table 2 provide the descriptive results for our latent variables for customers and suppliers showing that organizations mainly work together with external customers and suppliers (as mentioned before the 7-point-Likert-scale ranges from “external partners” (-3) to “other companies of the same group” (+3). Further, the results show that social capital inherent in the relationships to customers is higher rated in all three dimensions compared to social capital inherent in relationships to suppliers.

The three social capital dimensions as well as the usefulness of received knowledge are correlated for customers as well as for suppliers. Further, in case of customers, the variable group affiliation is correlated with the structural dimension of social capital. This means that organizations perceive relationship with affiliated customers as more interactive while this relationship is not characterized by more respect or a higher cognitive level. In case of suppliers no correlation between group affiliation and social capital can be detected meaning that it does not matter whether the supplier is affiliated or not with respect to the level of social capital.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Stand. Dev.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) SC structural</td>
<td>1.40</td>
<td>0.82</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) SC relational</td>
<td>1.34</td>
<td>0.96</td>
<td>0.366**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) SC cognitive</td>
<td>0.91</td>
<td>0.88</td>
<td>0.387**</td>
<td>0.548**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>(4) Usefulness of received knowledge</td>
<td>1.22</td>
<td>0.90</td>
<td>0.275**</td>
<td>0.442**</td>
<td>.413**</td>
<td>-</td>
</tr>
<tr>
<td>(5) Group affiliation</td>
<td>-2.06</td>
<td>1.71</td>
<td>0.150*</td>
<td>-0.065</td>
<td>0.033</td>
<td>-0.026</td>
</tr>
</tbody>
</table>
Table 2. Means, standard deviations, and correlations for suppliers (**: p<.01)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Stand. Dev.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) SC structural</td>
<td>0.87</td>
<td>0.93</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) SC relational</td>
<td>1.02</td>
<td>1.05</td>
<td>0.458**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) SC cognitive</td>
<td>0.63</td>
<td>0.98</td>
<td>0.433**</td>
<td>0.690**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>(4) Usefulness of received knowledge</td>
<td>1.12</td>
<td>1.02</td>
<td>0.527**</td>
<td>0.459**</td>
<td>0.567**</td>
<td>-</td>
</tr>
<tr>
<td>(5) Group affiliation</td>
<td>-1.80</td>
<td>1.60</td>
<td>-0.050</td>
<td>-0.016</td>
<td>0.020</td>
<td>0.036</td>
</tr>
</tbody>
</table>

Table 3. Measurement model and item loadings (C=customers, S=suppliers)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>Loading</th>
<th>Cronbach’s α</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social capital (customer; supplier) (structural)</td>
<td>The exchange with our most important (customers; suppliers) is very intensive.</td>
<td>C: 0.873</td>
<td>S: 0.873</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We exchange a lot of information with our most important (customers; suppliers).</td>
<td>C: 0.848</td>
<td>S: 0.892</td>
<td>[11, 18, 26]</td>
</tr>
<tr>
<td></td>
<td>Compared to the industry average we interact ... frequently with our most important (customers; suppliers). (Scale: “Considerably less”, “less”, “rather less”, “just as much”, “rather more”, “more”, “considerably more”)</td>
<td>C: 0.669</td>
<td>S: 0.667</td>
<td></td>
</tr>
<tr>
<td>Social capital (customer; supplier) (relational)</td>
<td>The chemistry between us and our most important (customers; suppliers) is right.</td>
<td>C: 0.832</td>
<td>S: 0.873</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We and our most important (customers; suppliers) is absolutely trustworthy.</td>
<td>C: 0.877</td>
<td>S: 0.910</td>
<td>[51, 55]</td>
</tr>
<tr>
<td></td>
<td>The relationship to our most important (customers; suppliers) is characterized by mutual respect.</td>
<td>C: 0.889</td>
<td>S: 0.887</td>
<td></td>
</tr>
<tr>
<td>Social capital (customer; supplier) (cognitive)</td>
<td>We and our most important (customers; suppliers) always agree concerning innovative topics.</td>
<td>C: 0.821</td>
<td>S: 0.840</td>
<td>[34]</td>
</tr>
<tr>
<td></td>
<td>The communication with our most important (customers; suppliers) about content wise topics is outstandingly.</td>
<td>C: 0.812</td>
<td>S: 0.855</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our most important (customers; suppliers) and we always have a common language to deal with technical issues.</td>
<td>C: 0.721</td>
<td>S: 0.805</td>
<td></td>
</tr>
<tr>
<td>Usefulness of received knowledge</td>
<td>The received knowledge from our most important (customers; suppliers) is very useful for us.</td>
<td>C: 0.848</td>
<td>S: 0.895</td>
<td>[43]*</td>
</tr>
<tr>
<td></td>
<td>The received knowledge from our most important (customers; suppliers) is always economically exploitable.</td>
<td>C: 0.740</td>
<td>S: 0.877</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The relationships to our most important (customers; suppliers) provide very interesting information.</td>
<td>C: 0.846</td>
<td>S: 0.898</td>
<td></td>
</tr>
<tr>
<td>Group affiliation</td>
<td>Our most important (customers; suppliers) are predominantly ... (Scale: external (customers; suppliers) vs. other companies of the same group)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

All items were originally in German and have been measured by a 7-Point-Likert-Scale ranging from -3 (totally disagree) to +3 (totally agree) and were adopted and adapted to our research domain.

* Items were developed based on concepts from the respective source.

4.2. Measurement Model

For checking indicator reliability, confirmatory factor analysis (principal component analysis) was applied since we derived the items from literature. All items show loadings higher than 0.7 as recommended by Hulland [31]. Only one item of the structural dimension of social capital missed this strict threshold but its loading is still above 0.6 as suggested by Bagozzi and Yi [3]. To check for construct reliability we calculated Cronbach’s Alpha. Values above 0.7 indicate sufficient construct reliability [29]. Only the cognitive dimension of social capital regarding customer missed this threshold marginally while all other constructs fulfill this requirement (see Table 3).
4.3. Regression Results

As mentioned before we run different models: One only with control variables (Model 1), another one with control variables plus predictor and moderator variable (Model 2), and a third one containing the interaction term in addition to the variables named in the second mode (Model 3). These models are calculated for customers (indicated by the letter “a”) and for suppliers (indicated by the letter “b”). Table 4 lists all standardized regression coefficients of all models. For each of the models we first calculate the variance inflation factors (VIF) which is far below the recommended threshold of 3.33 \[16\] demonstrating that multicollinearity is not a serious problem.

Regarding the control variables the results indicate that only company size affects the usefulness of knowledge received from customers (compare model 1a to 3a). All other controls show no impact. For the model variants for customer as well as for suppliers, social capital positively impacts the usefulness of received knowledge confirming hypothesis 1 (compare model 2a/3a and 2b/3b). In that respect, the regression coefficient of social capital to suppliers is significantly higher than the coefficient regarding customers (p<0.01, parametric test according to Keil et al. \[33\]). Following Carte and Russell’s \[8\] advice we considered the significance of the \(\Delta F\) associated with the resulting changes in R\(^2\) to examine the moderating effect of group affiliation. Model 3a indicates a moderating effect of group affiliation of customers while model 3b shows no such effect for suppliers. Hence, hypothesis 2 is only partially confirmed. The regression coefficient of the interaction term in case of customers can be interpreted with regard to the scale used for the measurement of group affiliation. As mentioned in the previous section, group affiliation was measured on a 7-piont-Likert-scale ranging from “external partners” (-3) to “other companies of the same group” (+3). Accordingly, the regression coefficient means that the more the partner is part of the same company group the more the company can benefit from the relation to the customers in terms of receiving useful knowledge. To illustrate this moderating effect we performed a simple slope analysis \[12, 47\]. This analysis allows for understanding the relationship between the usefulness of received knowledge and the social capital to customers, or suppliers, respectively at different levels of group affiliation of customers, or suppliers, respectively.

Figure 2 shows that group affiliations in case of customers positively moderate the relationship between usefulness of received knowledge and social capital (the two lines intersect) while such an effect cannot be detected for suppliers (the two lines develop parallel and do not intersect).
4.4. Validity of the Results

One limitation of a single respondent survey is always that it raises common method bias concerns. Accordingly, we applied post statistical tests to scrutinize if common method bias is a serious problem. In a first step we used the Single-Factor Harman test [49] indicating that the largest identified component accounts for 27.29% of the variance. In a second step we built a marker construct of unrelated marker items which were included in the questionnaire [40] and took this construct as an additional predictor variable into account [50]. Since the marker construct shows no significant effect on our dependent variable and since the comparison of the regression results without the marker construct (Table 4) and including the marker construct (not reported) shows no difference, we conclude that common method bias is not a serious thread in this analysis.

5. Discussion and Conclusion

The objective of the study was to investigate the role of group affiliations on the relationship of social capital between partners and the usefulness of received knowledge.

Before discussing the results of the study, the main limitation should be considered to allow interpreting the results. Common method bias could be an issue because we used a single person to capture both the dependent and independent variables. As pre-hoc measure we addressed this issue by developing three different versions of the questionnaire with varying order of questions. In addition, post-hoc statistical analyses have been applied as mentioned in the section before which showed no indication of common method bias. A second limitation is that we only include group affiliation as moderator. Further research could consider other organizational aspects as moderators such as the absorptive capacity of a focal firm [13].

Our research question was: How are group affiliations related to social capital’s influence on useful external knowledge?

The answer we found indicates that group affiliations of customers positively moderate the relationship between the social capital among companies and the usefulness of external knowledge received. Interestingly, for suppliers we could not find such effect. One possible explanation lies in the notion of certain usefulness of knowledge which
relates to the known potential of knowledge for future business making it attractive to consider [52]. In that respect, it is reasonable to assume that customers provide more certain knowledge about future uses of products offered, hints for future product developments, and help assess market chances than that is the case for suppliers. Suppliers might provide knowledge about specific components or material which is valuable but how to transform it to useful knowledge for the marketplace is probably more uncertain than explicit inputs from customers. Accordingly, the focal firm learns about sales potential and ways to cater their product’s to customer needs which may represent more certain knowledge and is thus deemed more useful than knowledge acquired from suppliers.

We also found low levels of social capital with respect to external customers as better sources of information than affiliated customers (compare Figure 2 left). A potential explanation could be that expectations to get valuable knowledge from customers in general are high. However, there might be expectations to get even more valuable knowledge from customers that are not affiliated because a less amount of redundant knowledge is expected. Future research could address this topic.

Furthermore, we found that the effect of social capital to suppliers on usefulness of received knowledge is stronger compared to the effect regarding customers. A potential explanation relates to supply chain integration. The most important suppliers that are in focus of our study are typically tightly coupled in the focal firm’s supply chain. A focal firm can only deliver high-quality products and ensure delivery times if their suppliers deliver premium quality at the right time. Collaboration with suppliers ranges from close interaction through to interlinked supply chain processes and information systems (e.g., as in the automotive industry). This also includes joint problem handling because problems at a supplier affect the focal firm in similar ways than problems in the focal firm itself. Thus, it can be expected that social capital between the focal firm and its most important suppliers is rather strong.

As an overall conclusion we can summarize that closer affiliation to customers strengthens the influence of social capital between a focal company and its customers on the usefulness of received knowledge from these customers. This is not the case for suppliers. Thus, our research extends previous work on inter-organizational knowledge transfer by investigating how affiliations moderate social capital’s effect on useful external knowledge as one dimension of knowledge transfer.

6. References


