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Dependency on suppliers as a peril in the acquisition of innovations? The role of buyer attractiveness in mitigating potential negative dependency effects in buyer–supplier relations

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ABSTRACT

New product development occurs nowadays mostly in joint buyer–supplier projects, which require closer ties between the partners in order to mobilize their resources. One issue arising from this collaborative model is that the buyer tends to become more dependent on the supplier. Multiple cases of supplier obstructionism have been reported. To mitigate this dilemma, this paper analyzes the relevance of customer attractiveness as an enabler of collaboration. Testing this hypothesis on a sample of 218 buyer–supplier relationships, we show that dependency as such is not the issue in the presence of close ties. Buyers who are a preferred customer of their suppliers can accept the risk of becoming dependent on them. The managerial implications of this finding is that firms should apply a reverse marketing approach and thus attempt to become the preferred customers of their important suppliers. From a conceptual perspective, our findings indicate the need to consider dependency not as an isolated variable, but in conjunction with attractiveness.

CHINESE ABSTRACT

当今涌现的新产品大多数是出现在买方和供应商的联合项目中，而这就需要合作伙伴之间更紧密的联系，以调动他们的资源。这个合作模式所带来的一个问题是，买方往往会变得更加依赖于供应商。供应商蓄意阻挠的案例时有报道。为了缓解这一困境，本论文分析了将客户吸引力作为双方合作的推动者的相关性。通过在218例买方和供应商关系的抽样中对这个假设进行测试，结果表明，如果双方存在紧密联系，那么这种依赖性将不会成为一个问题。如果买方是其供应商的首选客户，那么该买方就可以接受成为依赖者所带来的风险。这一发现在管理领域中的含义是，企业应该采取一个反向的营销方式，从而试图成为其重要供应商的首选客户。从概念上讲，我们的研究结果表明，对依赖的考虑并非一个孤立的可变量，而是要与吸引力结合起来。

1. Introduction: challenges in handling dependency in close buyer–supplier relations

Actively managing access to the resources of key suppliers has emerged as a new topic on the agenda of industrial marketing and purchasing scholars and practitioners alike (Ellram et al., 2013; Pulles et al., 2014; Schiele et al., 2012). In order to achieve competitive advantage within a supply network, a buying firm needs to get better access to the industry's core suppliers than its competitors. Hence, competition for supplier resources deserves increasing managerial attention in business-to-business markets. Dependency issues become even more relevant. Supplier resources can consist, among others, of production resources, i.e. production capacity allocated to the buyer at hand, as well as innovation resources, such as personnel dedicated to new product development projects (Steinle and Schiele, 2008). In particular, the latter aspect has gained relevance in recent years due to a fundamental change in the process of innovation. Until the last decade of the twentieth century, most firms conducted virtually all new product development (NPD) activities in-house (Huizingh, 2011, p. 1255; West and Bogers, 2014). However, this no longer seems to be the standard case. For instance, a longitudinal panel study covering the top European and American firms, responsible for three-quarters of the total corporate research and development budget, showed that their percentage of in-house NPD had fallen from 78% at the beginning of the 1990s to only 15% at the end of that decade (Roberts, 2001). Similarly, the level of outsourced development spending by US firms more than doubled in this period (Carson, 2007). The literature has reflected this trend by introducing the notion of network innovations (Freeman and

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Soete, 1997), and exploring the open innovation paradigm (Chesbrough, 2003, 2006).

In NPD vendors, rather than offering a finished product, sell their ability to identify an innovative solution (Golfetto and Gibbert, 2006). NPD relationships differ from typical channel relationships in areas such as material supply or distribution, because they require a creative contribution on the part of the external suppliers; a very different type of resource mobilization (Carson, 2007). To deliver their innovative contribution, external suppliers have to be integrated early on in collaborative NPD processes, with the consequence of forging substantially closer ties between buyer and seller (Clark, 1989; Handfield et al., 1999; Hartley et al., 1997; Lau, 2014; Primo and Amundson, 2002; Ragatz et al., 1997; Tracey, 2004; Wasti and Liker, 1997). Because such close ties require considerable resources, they cannot be established with a large number of suppliers, so firms tend to reduce their supply base. Often, the core supplier captures up to three-quarters of the buyer's business in a particular category (Ulaga and Eggert, 2006).

Being dependent on only one, or very few, suppliers increases risk for the buyer. Supplier obstructionism has become a frequently reported problem (Flynn et al., 2000; Hartley et al., 1997; Hibbard et al., 2001; Khoja et al., 2011; Petroni and Panciroli, 2002; Primo and Amundson, 2002; Zsidisin and Smith, 2005). A possible cause of obstructionism has been identified in the form of dependency on a supplier, in the sense of a "negative one-sided relationship" (Cousins and Crone, 2003, p. 1467). The worst-case scenario for a firm would be to be dependent on a supplier's resources for their innovation process, but being denied access.

Due to the growing reliance on collaborative NPD, among other reasons, there is a growing need for close buyer–supplier ties. Considering the challenge arising from the buyer becoming dependent on a supplier by integrating the supplier into its own processes and relying on the supplier's ability to innovate, our research question is:

> *How can the apparent trade-off between closer ties in the buyer–supplier relationship on the one hand and the danger of dependency – and consequent supplier opportunism – on the other hand be addressed? Are there conditions under which the buyer does not need to be afraid of becoming dependent upon a particular supplier?*

The potential solution to this dilemma, which will be elaborated subsequently, is the discussion of the concept of "customer attractiveness". The idea is simple; if the buyer is sufficiently attractive to the supplier, the latter will not abuse its power and instead provide privileged resource access. While past research on customer attractiveness has primarily been conceptual and case based (Benton and Maloni, 2005; Christiansen and Maltz, 2002; Ellegaard et al., 2003), the present study adds new empirical insights to the recent stream of quantitative research on customer attractiveness (Baxter, 2008, 2012a, 2012b; Hüttinger et al., 2014; La Rocca et al., 2012; Tóth et al., 2015). Our analysis of a large sample of buyer–supplier relationships provides evidence that it is not dependency as such that is the problem in the presence of close ties, but rather the coincidence of low attractiveness to the partner and a high degree of dependency on that same partner. This means that firms can accept dependency, provided that they are sufficiently attractive to the partner. This finding has substantial implications for both management and research.

With respect to management, the finding urges firms to reverse their marketing approach, not only by directing marketing towards their customers and attempting to become their preferred supplier (Ulaga and Eggert, 2006) but also to become a preferred customer of their most important suppliers (Baxter, 2012b; Schiele et al., 2011). The importance of being a preferred customer may extend beyond the extreme case of collaborative development and also apply to other situations, such as the buyer receiving preferential treatment in event of production shortages and innovation sharing (Schiele et al., 2011). Generally, the buying firm may have to adopt marketing approaches that are typically dedicated to the downstream part of the value chain and apply them to the upstream part of the chain (Koppelmann, 2000). Regarding our theoretical contribution, our findings suggest that the popular measure of dependency should be considered in conjunction with attractiveness, rather than alone.

In Section 2 we will elaborate on the relationship among dependency on a supplier, preferred customer status and the supplier's contribution to innovation, which lead to three testable hypotheses. We then present our model, the data and the results of the analysis, which are discussed in Section 5.

2. Theory and hypotheses: the triangle of dependency, preferred customer status and supplier's contribution to innovation

The theoretical issue of buyer–supplier dependency has appeared in many scholarly discussions. For example, transaction cost economics theory defines dependency in light of transaction-specific assets, which are assumed to influence the exchange behavior of transaction partners (Fink et al., 2011; Poppo and Zenger, 2002). Resource dependency theory argues that dependency creates vulnerability, which should thus be avoided (Cool and Henderson, 1998; Pfeffer and Salancik, 1978; Provan and Skinner, 1989). Additionally, principal-agent theory offers a conceptual explanation for this issue. The power relation shifts after the contract has been signed, creating a situation of post contractual lock-in. Increasing power on the part of the supplier could lead to opportunistic behavior (Lonsdale, 2001).

This situation may become increasingly commonplace due to the reduction in the number of suppliers and closer relationships with them (Ellis et al., 2012; Horn et al., 2013). As a consequence, intensive competition for suppliers' resource allocation takes place (Pulles et al., 2014). Moreover, firms often appear to lack particular competencies for supplier integration (Lakemond et al., 2006). During innovation processes, power may shift in favor of the supplier. A supplier that has been entrusted with development tasks increases its knowledge on the subject. The seller, by contrast, having delegated the task, faces the risk of gradually losing its competence and, potentially, its absorptive capacity to fully understand the progress that the supplier has made in solving the problem at hand (Cohen and Levinthal, 1990; Corsten and Felde, 2005). Thus, over the course of the relationship, the supplier is constantly expanding the competence gap. In this way, the buyer must increasingly rely on the supplier's resources to achieve its own goals; that is, the supplier becomes more dependent (Fink et al., 2011). Arguably, there is a correspondence between the balance of power in a relationship and dependency (Buchanan, 1992; Emerson, 1962; Provan and Skinner, 1989), meaning that the supplier could be tempted to exploit its increasingly strong position, which may lead to conflicts (Heide and John, 1988; Kumar et al., 1995). In the particular case of NPD, the increasingly strong position of suppliers could translate into suppliers withholding resources from the development project or not making the project a priority. Innovative projects are associated with a high degree of risk due to the uncertainty of the outcome (Keizer and Halman, 2007), which may not make them a supplier's preferred choice. Therefore, we postulate:

H1. *As the buyer becomes more dependent on the supplier, the supplier will be more reluctant to collaborate in NPD processes.*

Business relationships can be assessed in terms of benefits and costs. This means that the relationship continues as long as the

partner is sufficiently attractive and adds value to the relationship (Buchanan, 1992; Hogan and Armstrong, 2001; Walter et al., 2001). The value of a business relationship has been discussed extensively, and such studies were often stimulated by Reichheld's work on customer value (Reichheld, 1992). Conceptually, the value of a relationship can be understood as the perceived trade-off between the benefits and sacrifices gained and lost through it (Walter et al., 2001). The value of a business relationship has been operationalized as relational asset value, defined as the net worth of benefits perceived over the future of a relationship (Hogan and Armstrong, 2001); partnership advantages, which compare the advantages secured through a particular relationship to those that would be obtained through relationships with alternative partners (Sethuraman et al., 1988); or value equations, these being the differences between benefits and life-cycle costs (Blois, 2004). The essence of all of these attempts to define the value of a relationship lies in the observation that certain partners are more attractive than others because they deliver a higher value to their partners.

Initial attempts have been made to study customer attractiveness. Christiansen and Maltz, for example, conducted case studies with small Danish firms attempting to become interesting customers of their large international suppliers (Christiansen and Maltz, 2002). Through a case study on new product development, Wynstra et al. concluded that the buyer should present itself to its supplier in a way that makes it interesting to the supplier (Wynstra et al., 2003). On a more conceptual level, Koppelmann urged procurement marketing (Koppelmann, 2000), while Leenders and Blenkhorn cited the need to motivate a supplier to satisfy novel demands, which they termed reverse marketing (Leenders and Blenkhorn, 1988). Ellegaard et al., again drawing on a case study, highlighted the importance of customer attractiveness in industrial buyer–supplier relationships (Ellegaard et al., 2003). From a different perspective, but concerning the same phenomenon, Zolkiewski et al. analyzed suppliers' willingness to discontinue serving unattractive customers (Zolkiewski et al., 2006), while Essig and Amann developed an index to assess supplier satisfaction – with satisfaction presumably preventing the supplier from terminating the relationship (Essig and Amann, 2009).

A special form of customer attractiveness is preferred customer status. Preferred customer status is defined as a situation in which the supplier offers the customer a preferential resource allocation (Steinle and Schiele, 2008). The decision of whether to confer this status is influenced by the attractiveness of the buyer (Hüttinger et al., 2012) and stems from the reasoning that the supplier has the choice to assign its customer either regular or preferred status (Baxter, 2012b). After awarding preferred status, the perceived relationship quality often increases which, in turn, motivates the supplier to offer additional functions to the customer and further commits itself to the relationship (Baxter, 2012a; Ellegaard et al., 2003; Schiele et al., 2011; Walter et al., 2003). Therefore, being an "interesting" customer is presumed to ensure the loyalty of the supplier and facilitate open innovation (Christiansen and Maltz, 2002). Several researchers have obtained initial support for this assumption. In particular, the recent empirical studies by Ellis et al. (2012) and Schiele et al. (2011) in the automotive sector, including analyses of 233 and 166 supplier–buyer relationships respectively, showed that preferred customer status has a positive influence on supplier innovativeness and the supplier's willingness to share these innovations. Correspondingly, it is expected that the attractiveness of a partner, manifested in the form of the seller awarding it preferred status, has a positive impact on supplier's contribution to collaborative NPD. Therefore, we postulate:

H2. *The greater the supplier's preference for the buyer, the more pronounced the supplier's contribution to collaborative NPD will be.*

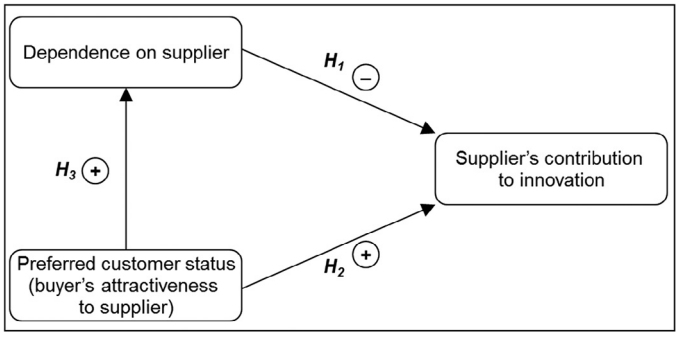

Fig. 1. The research model.

Having elaborated on the potentially detrimental effects of dependency on suppliers on the one hand and the expected beneficial effects of customer attractiveness on the other hand, this raises an interesting question: are these two states mutually exclusive? Does dependency exclude attractiveness; does the buyer become less attractive when they decline in importance to the seller?

Interdependency has been found to lead to an increased level of commitment in wholesaler–distributor relationships. Additionally, the hypothesis that the more powerful party is less likely to contribute to a relationship was not supported in an initial empirical analysis (Lusch and Brown, 1996). It is possible that this finding could be transferred to a NPD situation. It could be the case that the two states are mutually reinforcing; that is, that the buyer accepts dependency once it perceives that it has achieved preferred customer status with the supplier. Dwyer et al. used the metaphor of a marriage to illustrate the possibility of combining high dependency with a high level of commitment (Dwyer et al., 1987). Based on this view, it can be assumed that dependency and preferred customer status are not mutually exclusive. Thus, we postulate:

H3. *A buyer will often be dependent on a supplier that awards the buyer with preferred customer status.*

Corresponding to the three hypotheses, the overall research model is presented in Fig. 1, summarizes our conceptual model and the assumed relationships and expected signs of the paths, which are subsequently operationalized to test the model. Section 3 continues with an explanation of the procedures and statistical methods employed in this study.

3. Method: administrating a large-scale survey with buyers in high tech industries

3.1. Reflective measurement items and questionnaire implementation requesting information of purchasers on two buyer–supplier relations per firm

We designed a quantitative study to address the issues raised earlier. To this end, a survey was administered to purchasing managers in Germany and Austria. The survey design was guided by the principle of employing proven measures whenever possible. Thus we dedicated considerable effort to identifying measures in the literature for the three factors of dependency, preferred customer and supplier collaboration.

The dependency measure was taken from studies by Corsten and Felde (Corsten and Felde, 2005; Felde, 2004). Among the multitude of dependency measures available, this measure was chosen not only because of its good statistical properties documented in previous studies but also because it was already available in both English and German. The other two instruments had only been tested in English. They were translated into German by a translation agency

and then translated back again to ensure that the original meaning has been captured. The English version of the complete set of items can be found in the Appendix, although the questionnaire was administered in German.

The measure of a buyer's attractiveness to the supplier, assessing whether the supplier had awarded preferred customer status to the buyer, was taken from another published study (Ganesan, 1994). The independent variable, satisfaction with the supplier's contribution to NPD, was adopted from a study by Krause et al. (2001). The questionnaire uses a five-point Likert scale (1 = "strongly disagree" and 5 = "strongly agree"). All constructs were reflective in nature.

One common problem with surveys assessing relationship issues in a buyer–supplier environment is the frequent incidence of non-normally distributed data. This causes problems in statistical analysis and makes it difficult to reveal significant differences. For instance, asking firms to assess their most important customer or their largest supplier does not typically allow for clear differentiation. Firms that do not have good or very good relationships with these important partners may find it difficult to persist in the market. Accordingly, to obtain meaningful data, we adopted the idea of comparing two suppliers (Ulaga and Eggert, 2006). Therefore, respondents were asked to identify a supplier with excellent NPD performance and another of their suppliers that had disappointing performance; that is, a supplier that they had expected to deliver a valuable contribution but ultimately failed to do so. Respondents were asked to write down the names of these two firms on a separate sheet of paper and then answer the same questions twice, once for the good and once for the bad supplier.

Subsequently, the instrument was intensively pre-tested using a sample of five academics knowledgeable in the field of buyer–supplier relations and seven practitioners. Minor changes were introduced.

3.2. A sample reflecting Central European high tech industry

We collected data through a survey administered by the German and the Austrian associations of materials management, purchasing and logistics, BME and BMÖ, respectively. Members received an invitation to participate via e-mail and via a newsletter, which contained the link to a homepage with the questionnaire. Because we did not have direct access to the database, it was not possible to contact non-respondents. In addition to the association members, a list of contact persons from the supply management consulting firm H&Z was also included. No significant difference between these groups of respondents could be identified, and there was also no significant difference between early and late respondents.

The homepage containing the questionnaire was opened 440 times. It resulted in 121 completed questionnaires (27%), which should have contained 242 assessed suppliers. However, we applied case-wise replacement, such that only fully completed questionnaires were used for analysis. This resulted in a final sample of 218 cases for analysis.

Most respondents came from the typical industries that are highly developed in the German-speaking countries: 24% mechanical engineering/machine building, 21% electrical/electronic engineering, 11% chemical, 9% vehicles and 35% other industries, including 13% services. No difference across the branches or between industry and services were identified. Respondent firms were of notable size, averaging 2988 employees and 840 million Euros in turnover. The sample can be considered a high-tech sample, as the average research and development expenditure represented 7.9% of turnover. Of the respondents, 45% were purchasing managers, 39% were purchasers and 16% were from other functions, including senior management.

Table 1
Results of the analysis of latent factor loadings.

	CL	CL^2	t_{CL}	MFL	MFL^2	t_{MFL}
CO1	0.663	0.439	5.129	0.125	0.016	0.923
CO2	0.888	0.789	12.354	0.062	0.004	0.185
CO3	0.995	0.990	14.188	–0.120	0.014	1.606
CO4	0.919	0.845	13.604	–0.061	0.004	0.380
CO5	0.822	0.676	10.460	0.081	0.007	0.911
DB3	0.888	0.788	34.468	0.033	0.001	0.512
DB4	0.869	0.755	25.432	–0.040	0.002	0.499
DB5	0.844	0.712	17.102	0.047	0.002	0.051
IS1	0.969	0.938	12.060	–0.099	0.010	1.156
IS2	0.961	0.924	12.062	–0.094	0.009	1.011
IS3	0.768	0.590	6.723	0.105	0.011	0.628
IS4	0.799	0.638	9.277	0.113	0.013	1.337
IS5	0.883	0.780	9.580	0.078	0.006	0.061
Mean	0.867	0.759	14.034	0.018	0.008	0.712

Notes: CL = construct loading; MFL = method factor loading; t > 1.96 = significant path at the p < .05 level (two-sided).

4. Data analysis: robust measures and strong paths

4.1. Measurement model: satisfying measurement quality criteria and no detection of common method bias issues

Concerning the measurement model, we subjected the sample to exploratory factor analysis to test the constructs. As expected, based on the conceptual framework, three factors emerged on the basis of the Kaiser criterion. The first factor is that concerning the supplier's contribution to innovation in NPD processes (27.8% of variance explained). Furthermore, the five items associated with the preferred customer construct load on a single factor (24.8% of variance explained). Dependency emerges as the third factor (16.2% of variance explained). The KMO criterion has a value of 0.929, which can be considered very high indeed. We then calculated the Bartlett-test for sphericity, which is significant at $p < 0.000$ (Mayer, 2004). No cross-loadings could be identified.

In our study, we used the same informants to measure the dependent and independent variables. Thus, we applied two approaches to control for common method bias: Harman's single-factor approach (Harman, 1967) and the analysis of latent factor loadings (Liang et al., 2007; Perols et al., 2013; Podsakoff et al., 2003). First, regarding Harman's single-factor test, the previously explained exploratory factor analysis already revealed that more than one factor with an eigenvalue greater than 1 can be identified in the data. Additionally, no single factor accounted for the majority of covariance in the variables, ranging from 27.8% to 17.2% variance explained, which is a prerequisite for conformity to the Harman (1967) single-factor test. Second, we applied the unmeasured latent methods factor test (Podsakoff et al., 2003) as used by Liang et al. (2007) and Perols et al. (2013). As a first step, we generated a latent "common factor" on which all survey items loaded. Then, this common factor was linked to all survey items underlying our constructs. Finally, we applied a PLS analysis to assess the strength of path coefficients and their significance values. As shown in Table 1, the squared method factor loadings were all below 0.01 and the mean of squared construct loadings was above 0.76. The ratio of substantive variance to method variance was very high (95:1), and none of the common method path coefficients appeared significant, all having a t-value <1.96. Overall, both Harman's single factor approach and the unmeasured latent methods factor test indicate that it is unlikely that common method bias is a critical concern in this dataset (Perols et al., 2013; Podsakoff et al., 2003).

As a next step, we then assessed convergent and discriminant validity (Table 2). Factor loadings, Average Variance Extracted (AVE) and Composite Reliability (C.R.) are indicative of a high level of convergent validity. All values exceeded the recommended thresholds

Table 2
Overview of constructs and quality criteria.

Construct	Source	Type of variable	Composite reliability	Average variance extracted
Dependence on supplier	Felde (2004), Corsten and Felde (2005)	Reflective	0.896	0.742
Preferred customer status (buyer's attractiveness to the supplier)	Ganesan (1994)	Reflective	0.933	0.769
Supplier's contribution to innovation	Krause et al. (2001)	Reflective	0.943	0.737

of 0.5 for AVE and 0.7 for C.R. (Bagozzi and Yi, 1988; Fornell and Larcker, 1981; Henseler et al., 2009; Nunnally, 1978). Moreover, we assessed the reliability of the variables with Cronbach's α (Cronbach, 1951). All indicators of the reflective variables had an $\alpha > 0.83$, which is considered very satisfactory.

We assessed discriminant validity using the Fornell and Larcker criterion (Fornell and Larcker, 1981). As presented in Table 3, the smallest square root of the AVE exceeds the correlation between each pair of factors. This indicates a satisfactory level of discriminant validity.

4.2. Hypothesis testing: PLS analysis reveals strong paths

We report the results of our partial least squares (PLS) analysis in Fig. 2. The data were computed using SmartPLS software (Ringle et al., 2005). We chose PLS because of its lack of distributional assumptions. In contrast, co-variance-based structural equation modeling approaches, such as those used by AMOS or Lisrel software, require normally distributed data (Reinartz et al., 2009). Despite our approach of asking respondents to assess two contrasting suppliers, the variable "preferred customer" was right skewed and slightly leptokurtic. Under a co-variance based approach, only the ADF algorithm could be used for such data. However, this algorithm produces badly misleading results except for very large sample sizes (Boomsma and Hoogland, 2001; Hoogland and Boomsma, 1998).

As depicted in Fig. 2 the model has a very satisfactory R^2 of 0.56. Additionally, we used bootstrapping to test the significance of the paths. All relationships are highly significant ($p < 0.001$).

Table 3
Cross-correlations of constructs.

Constructs		1	2	3
1	Dependence on supplier	**0.861**		
2	Preferred customer status	0.396	**0.877**	
3	Supplier's contribution to innovation	0.504	0.732	**0.858**

Note: **Bold** = Fornell and Larcker (1981) criterion.

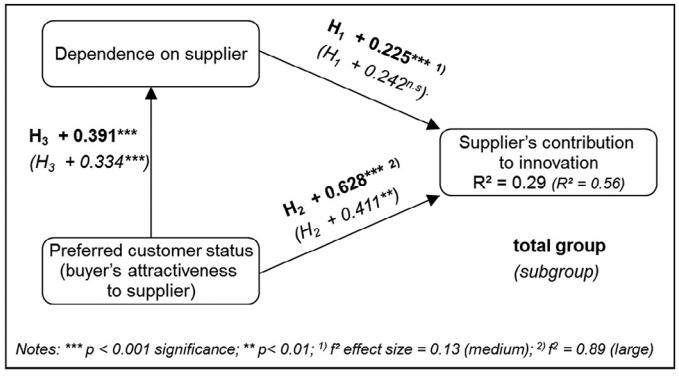

Fig. 2. Results of PLS analysis and FIMIX subgroup testing.

To assess the effect size, we used Cohen's effect size test (Cohen, 1988). The path dependency → supplier contribution has an f^2 of 0.13, which indicates a medium effect size. The path preferred customer status → supplier contribution has an f^2 of 0.89, which indicates a very high effect size. As indicated earlier, Hypothesis 2, which predicts a beneficial effect of customer attractiveness, and Hypothesis 3, which predicts that preferred customer status and dependence on the supplier are correlated, are fully supported by the findings. Hypothesis 1 postulating that dependence leads to a lower supplier contribution, however, is significant, but instead of the expected negative had a positive sign.

As a final analysis, we subjected our data to a FIMIX test. This algorithm tests for unobserved heterogeneity in the data (Hahn and Kaufmann, 2002; Ringle et al., 2010). Could there be unexpected subgroups in the sample that exhibit significantly different patterns of relationships? A FIMIX analysis has two steps: first, the FIMIX algorithm identifies potential subgroups in the sample. Second, an ex-post interpretation must be conducted to check whether the significantly different groups display any logical grouping factors.

Applying the FIMIX algorithm to our sample, a small subgroup containing 28 cases was separated. Most of the paths remained roughly the same (see Fig. 2), except for the path dependency → supplier contribution, which became non-significant. In the second step, we then used a t-test to identify differences between the main group and this statistically identified subgroup. The subgroup significantly differs from the main group in three respects: the suppliers assessed in this subgroup are more export oriented, have made joint investments with the buying company and, more often than in the main group, the buyer and seller belong to the same group of companies. However, the subgroup should not be separated from the main group because the entropy value of 0.37 is below the threshold of 0.5 recommended for group separation (Ringle et al., 2010). This means that our complete sample of 218 cases can be analyzed jointly. Nevertheless, the FIMIX analysis – despite confirming the homogeneity of the sample – also provides an initial suggestion that it may be sensible to analyze intra-group relationships and not only inter-group buyer–supplier relations.

5. Discussion and implications: mitigation of dependency problems by achieving preferred customer status

5.1. Discussion: positive relationship between dependency and innovation and strong explanatory power of the preferred customer construct

Against the background of a changing pattern of NPD – which increasingly requires buyer–seller collaboration and close ties between the partners – with the consequence of the buyer becoming increasingly dependent on its supplier, this study has analyzed whether the attractiveness of the buyer can overcome a possible negative effect challenging supplier resource access and resulting from this new situation of dependency.

The first remarkable result is that the relationship between dependency and supplier contribution (Hypothesis 1) is not negative, as was hypothesized, but positive. In our sample the suppliers on which the buyer was highly dependent were exactly those

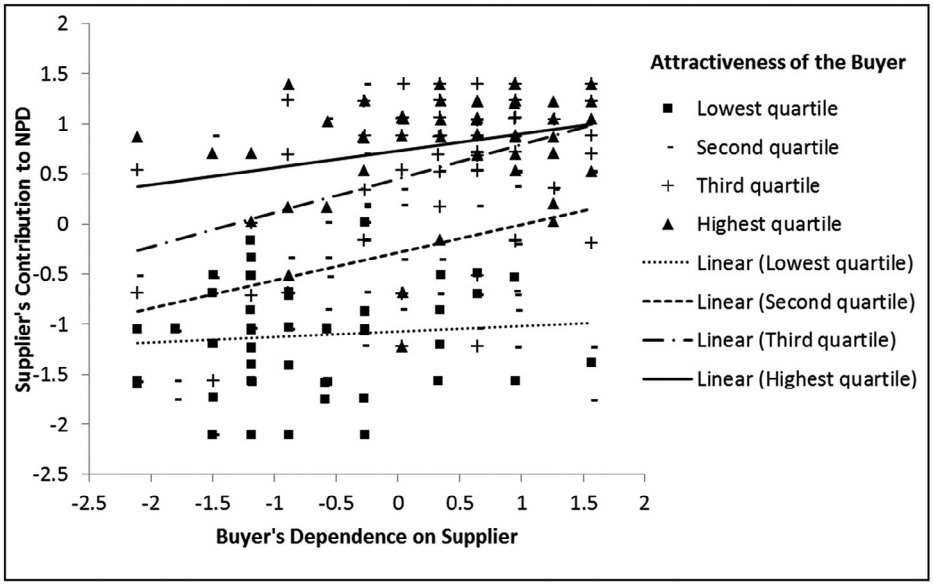

Fig. 3. The effects of the buyer's dependency and attractiveness on a supplier's NPD collaboration.

suppliers exhibiting the best NPD performance. As opposed to the recommendations derived from resource dependency theory, and in the context of principal-agent considerations, our data suggest that a state of dependency is acceptable for firms, provided that their aim is to increase the supplier's contribution to innovation. This finding supports the results of Corsten and Felde, who identified a similar relationship (Corsten and Felde, 2005).

Our research further contributes to the NPD literature by integrating the concept of preferred customer status. In line with the findings of Ellis et al., we showed that the more a firm enjoys preferred customer status with a supplier, the more the vendor will be willing to engage in joint projects, in our case collaborative NPD (Ellis et al., 2012). As shown in Fig. 3, the supplier's contribution to NPD is to a large extent influenced by the degree to which the buyer has a preferred status. This is also indicated by the remarkable f^2 of 0.89 (Fig. 2). Both Fig. 3 and Fig. 2 show that the size of the effect of buyer attractiveness is very large.

Moreover, a firm being dependent on a supplier while simultaneously enjoying preferred customer status with this supplier seems to be a common phenomenon. Hence, preferred status and buyer dependence often coincide. The path between these two factors has a positive sign and is highly significant. As a conclusion, the results can be summarized as follows: *Dependency as such is not the problem in collaborative NPD; instead only the combination of low buyer attractiveness and a high degree of dependence on a supplier is problematic*. This finding has important implications both for management and theory development.

5.2. Management implications: trying to become an attractive customer in order to access key suppliers' resources by applying a reverse marketing approach

Our data suggest that collaboration is feasible and can generate benefits, such as resource access. This lends further support to the idea of supply base reduction. There is ample evidence of the value of a streamlined supply base (Chen and Paulraj, 2004; Paulraj and Chen, 2005; Talluri and Narasimhan, 2005). Our findings stress the importance of supply base reduction by adding an additional argument. Firms may not only achieve better prices by offering larger volumes to few selected suppliers. Closely collaborating with a limited set of suppliers may be a viable way to ensure their contribution to innovation in the context of NPD.

A firm that attempts to avoid becoming dependent on individual suppliers by distributing its purchasing volume across many similar vendors may find it difficult to integrate all of them in NPD. Comparable companies that continue to rely on the traditional in-house NPD process – thus bearing all costs and risks alone and having to maintain all required competencies in-house – may thus have a disadvantage in NPD relative to their competitors that have already shifted to the open innovation model. If one follows these notions, such firms may find it more difficult to become a preferred customer of any of their exchangeable suppliers and encounter difficulties in collaborating even if they wish to do so.

Not being the preferred customer of any of the leading suppliers in an industry may even have strategic consequences, as it reduces the capacity for innovation and thus the long-term sustainability of a firm. One relevant example is the American automotive industry in the years from 2004 to 2008, where the formerly "big 3" US automakers, GM, Ford and Chrysler, found it difficult to quickly adapt to new consumer and launch new models (Holweg, 2008; Train and Winston, 2007). One reason for this development is that suppliers evaluated the quality of their relations with the buyer and drew consequences from this. Specifically, the big three scored between 114 and 218 points in the annual supplier working relations index, while Honda and Toyota reached 359 and 415 points on this index, respectively (Henke, 2013). Empirical results have indicated that there is a positive and significant relationship between the quality of the relationship as expressed by the supplier working relations index on the one hand and cost efficiency, innovation, inventory reduction and quality improvement on the other (Milas, 2006). Hence, automotive suppliers in the US attempted to reduce their exposure to the big three, due to their low satisfaction with those three OEMs. Correspondingly, studies at that time indicated that the suppliers shifted their research capacities away from the big three US OEMs and primarily developed innovations in collaboration with Japanese firms, which may explain some of the difficulties the big three experienced in responding to the market and NPD (Verespej, 2005).

Buyers may need to accept dependency on some of their key suppliers. As a consequence, they may need to change their relational

approach to these firms and actively attempt to become a preferred customer of these suppliers, i.e. by applying a reverse marketing perspective (buyers trying to become attractive to suppliers, rather than only the other way round). Buyers need to increase their attractiveness to their suppliers. As Baxter summarizes it: "The findings show how important it is for managers to attend to relationship management in order to gain preferential investments of resources in the relationship from their suppliers. If they want suppliers to allocate resources to them, they need to manage suppliers' perceptions" (Baxter, 2012b, Baxter, 2012b, p.1255). There is still a long way to go in order to develop a managerial toolset allowing to operationalize this request, but as a first step antecedents of customer attractiveness and supplier satisfaction have been identified (Hüttinger et al., 2014).

5.3. Theory implications: request to measure dependency always in conjunction with partner attractiveness

Dependency is an oft-discussed construct, particularly in channel studies and supplier portfolio analysis, for example elaborations based on the Kraljic matrix (Kraljic, 1983), and in more theory-driven assessments of buyer–supplier relationships, for example those based on resource dependency theory and the transaction cost economics perspective (Fink et al., 2006, 2011). We have expanded this list by exploring on the resource allocation issue. As our analysis has shown, on the one hand, the buyer's dependent status is an important factor influencing the supplier's contribution to NPD. On the other hand, we found that it may be sensible to include an additional variable, which is attractiveness of the buyer. The main implication from our results is that when analyzing dependency situations – whether buyer–supplier relations or another business situation – it may be sensible to include a variable for the attractiveness of the exchange partner. A problematic situation is presumed to occur when high dependency on a partner coincides with low attractiveness to that partner because this could lead to increased supplier opportunism. Based on our findings, we may conclude that research on dependency considering this variable alone without at the same time analyzing partner attractiveness may leave out a key context variable and may as such be considered as too narrow.

5.4. Limitations and suggestions: discussing mutual dependency in a dyadic setting

This research, of course, has several limitations that should be taken into account. Although the Harman factor test and the analysis of latent factor loadings did not give any indications that it was a concern, from a methodological perspective, common method bias cannot fully be excluded because we used a single informant per firm (Podsakoff and Organ, 1986). It would also be sensible to extend the study to also include the supplier's opinion. Our study solely relied on the buyer's assessment of the relationship, and a dyadic or network perspective could provide additional insights into the phenomenon at hand. Moreover, as Woodside and Baxter (2013) argued, in business-to-business relationships research, additional qualitative analyses can add valuable details and the necessary accuracy to understand, describe, and forecast business-to-business processes. Accordingly, additional insights could be gained by combining quantitative and qualitative methods in future studies.

Dependency can be conceived as a one-sided, asymmetric dependency – as our definition does – or as a status of interdependency; that is, mutual dependency (Emerson, 1962; Fink et al., 2011; Gulati and Sytch, 2007). It might be interesting to extend the attractiveness concept to include the interdependency of cases. Although interdependency and attractiveness are two different concepts, mutual dependency might precede attractiveness, at least to a certain extent.

The final limitation of this study is that it used only the supplier's contribution to NPD as a dependent variable. It would be interesting to expand the analysis to include other variables, such as the quality, responsiveness and reliability of the supplier. In so doing, we would learn more about the interwoven effects of dependency and attractiveness on various performance outcomes of the buyer–supplier relationship.

Appendix A: Overview over the questionnaire

		no				yes
	Supplier contribution to New Product Development	**1**	**2**	**3**	**4**	**5**
IS1	This supplier is able to design new products or make changes to existing products	☐	☐	☐	☐	☐
IS2	The level of technological capability the supplier possesses and is willing to use for our products is high	☐	☐	☐	☐	☐
IS3	The supplier is willing to share key technological information	☐	☐	☐	☐	☐
IS4	This supplier is capable of supporting collaborative processes in product development and process improvement	☐	☐	☐	☐	☐
IS5	This supplier is frequently proactive in approaching us with innovations	☐	☐	☐	☐	☐
	Dependency from supplier	**1**	**2**	**3**	**4**	**5**
DB3	It would be difficult to replace this supplier quickly	☐	☐	☐	☐	☐
DB4	A lot of our sources depends on the supplier's success	☐	☐	☐	☐	☐
DB5	The supplier commands resources that we would have difficulties obtaining somewhere else	☐	☐	☐	☐	☐
	Preferred customer status	**1**	**2**	**3**	**4**	**5**
C01	This supplier has made sacrifices for us in the past	☐	☐	☐	☐	☐
C02	This supplier cares for us	☐	☐	☐	☐	☐
C03	In case of shortages, this supplier has gone out on limb for us	☐	☐	☐	☐	☐
C04	We feel this supplier is on our side	☐	☐	☐	☐	☐
C05	The best resources of this supplier work for us	☐	☐	☐	☐	☐

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