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# Tangible and intangible resource inequity in customer-supplier relationships

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## Abstract

**Purpose** – This study aims to investigate the effects of perceived tangible and intangible resource inequity and the moderating effect of long-term orientation on future collaboration.

**Design/methodology/approach** – Outcome and moderating measures were developed using structural equation modeling. Data were collected at the project level of customer-supplier relationships via survey among German and Swiss firms. The results were generated with regression and subgroup analyses.

**Findings** – The higher the negative tangible inequity or intangible inequity, the lower the customers' willingness to collaborate on future projects with suppliers. However, negative intangible inequity showed a stronger negative effect than negative tangible inequity. When long-term orientation is in the model, the effects of inequity are stronger in short-term relationships.

**Research limitations/implications** – The study extends equity theory and provides a fruitful basis for future research at the project level of the customer-supplier relationships. Specifically, since the effects of negative intangible inequity are stronger than the effects of negative tangible inequity, intangible resources may be more important than tangible resources to the future of customer-supplier relationships. Since prior research does not delineate between tangible and intangible inequity, this is a unique finding and an important contribution to the application of equity theory in business. Cultural homogeneity is a limitation of the study. Furthermore, a longitudinal study could add insight.

**Originality/value** – This research offers a distinction between the effects of tangible and intangible resource inequity; it disaggregates the concepts of tangible and intangible resource inequity and tests the effects of either "positive inequity" (i.e. receiving more than deserved) or "negative inequity" (i.e. receiving less than deserved); and it separates short-term from long-term oriented companies to allow for a more discrete analysis, than prior approaches, of the effects of inequity on the propensity for future collaboration.

**Keywords** Buyer-seller relationships, Exchange, Germany, Switzerland, Resources, Suppliers, Resource allocation, Supplier relations

**Paper type** Research paper

An executive summary for managers and executive readers can be found at the end of the article.

## 1. Introduction

The mutual benefits of value co-creation and value sharing in collaborative customer-supplier relationships are increasingly considered the *raison d'être* (Anderson, 1995, p. 348). However, while "much attention has been given to how organizations 'expand the pie' of benefits between them" (Jap, 2001, p. 86), little attention is devoted to understanding the relational impact of tangible and intangible elements of pie sharing. The importance of investing both tangible and intangible resources to co-create value in key customer-supplier relationships renders vast opportunities to better understand the relative impact of the concepts in customer-

supplier relationships (Ulaga and Eggert, 2006). Specifically, an understudied area is the effects of relationship-specific intangible versus tangible inputs and shared outcomes on the propensity for future customer-supplier collaboration.

Equity theory is the fundamental framework for studying the consequences of shared resources in a wide range of personal (Walster *et al.*, 1978b) and business (Jap, 2001; Scheer *et al.*, 2003; Wagner and Lindemann, 2008; Wagner *et al.*, 2010a) exchange relationships. Despite the importance of these studies, Scheer *et al.* (2003) state that prior studies only scratch "the surface of the fertile research opportunities associated with outcome distribution norms in interorganizational relationships" (p. 312). Furthermore, there is virtually no work that tests the application of equity theory in the context of tangible and intangible inputs and outcomes on the propensity for future collaboration in customer-supplier relationships.

The purpose of this research is to better understand the effects of tangible and intangible inputs and outcome distribution for theory and practice. Specifically, we apply

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equity theory to empirically evaluate the effects of tangible and intangible resource inequity perceptions on future collaboration. The study is conducted in the context of recently completed projects embedded in ongoing customer-supplier relationships. We extend prior customer-supplier collaboration studies and contribute to theory and practice first by delineating the inequity effects of tangible and intangible relationship-specific invested resources (i.e. inputs) and the related outcomes. After delineating the tangible and intangible inequity differences, we disaggregate the inequity concept into either “positive” (i.e. receiving more than deserved) or “negative” (i.e. receiving less than deserved). Disaggregation allows for an even more discrete analysis.

Tangible costs and benefits can be measured in monetary terms. However, intangible costs and benefit elements “may be very difficult to evaluate in monetary terms” (Blois, 2004, p. 251). Therefore, understanding the leverage potential of often neglected intangible resources should be of interest to both supplier- and customer-firm managers that co-create value in business-to-business relationships. While the effects of intangible stand alone firm-assets, such as brand and brand equity, are well studied (Kim and Cavusgil, 2007) more focus is needed on the effects of intangible assets that are more closely related to inter-firm relationships, such as supplier know-how.

In addition, several scholars that recognize the importance of better understanding the influence of intangibles are integrating disciplines to:

- explore the integration of tangible goods and intangible services (e.g. Cann, 1998) or a “service dominant logic” (Vargo and Lusch, 2004);
- offer theory concerning tangible “must have” resources and intangible resources towards explaining the “key-supplier” concept (e.g. Eggert *et al.*, 2009; Ulaga and Eggert, 2006); and
- offer dialogue towards metrics that could eventually assess the impact of intangible resources on firm value (e.g. Srinivasan and Hanssens, 2009).

This interest, which is primarily theoretical, explains the relevance of the present empirical study.

Finally, the study considers the moderating effects of relationship intentions on inequity in project collaborations. Relationship intention is operationalized as long-term orientation. Long-term orientated relationships are strategic rather than short-term or “arm’s length” (Dyer and Singh, 1998; Eggert *et al.*, 2009).

First we review the fundamental concepts from equity theory and integrate them with the concepts of tangible and intangible resources to develop the hypotheses. Second, the methodology and empirical results are presented. Finally, managerial and theoretical implications as well as conclusions are offered.

## 2. Literature review, theoretical framework, and hypotheses

### 2.1 Equity theory and equity measures

With Festinger’s (1957) cognitive dissonance theory and aspects of Homans’ (1961) theory of distributive justice at its foundation, Adams’ (1963, 1965) equity theory is seminal in the field of social exchange. Equity theory is considered the most explicit and most rigorously developed of all theories

that evaluate exchange relationships (e.g. Mowday, 1979). Equity theory can be applied to study any relationship in which partners expect a fair exchange (Adams, 1963). For example, in customer-supplier exchange relationships, customers expect that “the actual price charged by the supplier as the core relationship driver ... [will be an] ‘average,’ ‘fair’ or ‘reasonable’ market price” (Ulaga and Eggert, 2006, p. 123). Considerable interest among scholars in various fields supports the importance of equity theory in interorganizational contexts (Austin and Walster, 1975; Jap, 2001; Ring and Van De Ven, 1994; Scheer *et al.*, 2003; Wagner and Lindemann, 2008). Some scholars claim that using equity theory to test effects in business-to-business relationships leads to the most reliable assumptions and to more systematic empirical support than similar social exchange concepts (Cosier and Dalton, 1983; Goodman and Friedman, 1971).

In any exchange relationship, partners evaluate perceived equity or inequity by assessing and comparing relationship inputs and received outcomes (Adams, 1963). Because evaluations are made from individual judgments, the measurement of inputs and outcomes is “perceived” and equity is therefore “in the eye of the beholder” (e.g. Adams, 1963, p. 423; Donnerstein and Hatfield, 1982, p. 310).

Generally, exchanges are considered equitable when the input-outcome ratios are perceived as equal. Inequity judgments arise both when a party perceives to receive more (i.e. positive inequity) or less (i.e. negative inequity) value than believed to be deserved. The distinction between equitable and inequitable exchange relationships is not discrete because equity is “not an all-or-none phenomenon” (Adams, 1963, p. 426). Given that equity is not discrete, binary coded measures are not used to capture equity theory in empirical research (i.e. equity versus inequity); but instead, equity indices measure the degree of inequity (Walster *et al.*, 1978a).

Inequity evaluations compare an informant’s input-outcome ratio perceptions about both exchange partners. To obtain these ratios, prior empirical equity research typically asked informants (e.g. employees, company managers) to answer questions about the inputs and outcomes of the exchange relationship using the premise: “All things considered...” (Cate *et al.*, 1982; Scheer *et al.*, 2003). This “all things considered” data collection procedure safeguards against possible exclusionary bias created when indicating specific factors to consider. However, an obvious shortcoming of the “all things considered” approach is the inability to differentiate between the types of relationship-relevant inputs and outcomes. Differentiation allows for a more insightful evaluation.

### 2.2 Characteristics of inputs and outcomes in the exchange

Corporations in customer-supplier relationships collaborate for reward purposes or with the expectation of rewards (Griffith *et al.*, 2006). Furthermore, a major premise when investigating the effects of equity or inequity is that exchange partners recognize the inputs and outcomes of the collaboration and consider them relevant to the relationship (Adams, 1963). In evaluating this basic concept while investigating pay inequities, Adams (1963) considered inputs such as on-the-job employee effort, education, intelligence, or experience; and outcomes as received

payments or status symbols such as the closest parking space to the entrance of the office or a walnut, instead of a metal desk. Linking Adams' theory to customer-supplier relationships, invested human resources, direct costs, and applied general know-how are examples of inputs. Examples of outcomes include joint cost reductions, increased sales or improved knowledge. These relationship-specific inputs and outcomes are situational (Adams, 1963). Variables such as country, geography, culture, and perceptions of long-term orientation could affect input-outcome perceptions in the exchange relationship (Ganesan, 1994; Scheer *et al.*, 2003). Given this, specific exchange settings or relationship-specific situations should be considered.

### 2.3 Tangible versus intangible resources and outcomes

According to Barney (1991), "firm resources include all assets, capabilities, organizational processes, information and knowledge, etc. controlled by a firm that enable the firm to implement strategies" towards sustaining a competitive advantage (p. 101). A firm's resources are either tangible or intangible or a combination of both (Baxter and Matear, 2004; Cann, 1998; Vargo and Lusch, 2004; Wagner *et al.*, 2011). Therefore, to investigate perceived inequity in customer-supplier project collaborations, relationship-specific inputs and outcomes are grouped as either tangible or intangible resources. This delineation extends the application of equity theory within customer-supplier relationships domain and allows for:

- investigation of possible differences in the perceptions of equity and inequity by the type of relationship-specific resource investment and outcome;
- new application of the theory; and
- future research directions.

Companies' relationship-specific tangible inputs in customer-supplier project collaborations are financial inputs and those related to personnel and infrastructure resources, such as salaries and expenses or the costs of capital equipment. Tangible outcomes are the measurable financial benefits received from the collaboration, such as price reductions for procured parts or inventory reductions. In competitive business markets, most tangible resources are "must-haves," while intangible resources can be leveraged towards a competitive advantage (Barney, 1991) and preferred supplier status (Ulaga and Eggert, 2006).

Relationship-specific intangible inputs include employees' knowledge, such as specific insights about the product or process best practices and companies' specific know-how and their patents (e.g. product or manufacturing technology patents). Examples of relationship-specific intangible outcomes are enhanced knowledge and new patents that extend to benefit other collaborations.

Although some scholars acknowledge the theoretical importance of distinguishing between tangible and intangible resources invested in customer-supplier relationships (Baxter and Matear, 2004; Fang *et al.*, 2008; Ulaga and Eggert, 2006; Vargo and Lusch, 2004), many of these studies have not explicitly captured the effects of this distinction in their empirical models. This study disaggregates the concept of equity to explicitly investigate the influence of positive and negative tangible and intangible resource inequity.

### 2.4 Hypotheses

Customer-supplier exchange partners generally expect that tangible financial outcomes from project collaborations will balance their financial and personnel inputs. Partners that receive more or less tangible outcome rewards than they perceive to deserve could consider the tangible resources to be less fair. If considered to be less fair, this partner would likely be less willing to extend the collaboration to future projects. Companies should also want equitable intangible outcomes in return for their invested intangible inputs. Therefore, we expect similar effects with relationship-specific intangible resource-inputs such as knowledge and patents.

The theoretical framework (Figure 1) investigates the effects of perceptions of receiving less tangible (intangible) output than deserved (i.e. negative inequity: *H1* and *H2*) or more tangible (intangible) output than deserved (i.e. positive inequity: *H3* and *H4*) on the companies' intention to collaborate on future projects; as well as the moderating effect of long-term orientation (*H5*).

#### *Effects of negative tangible and intangible inequity*

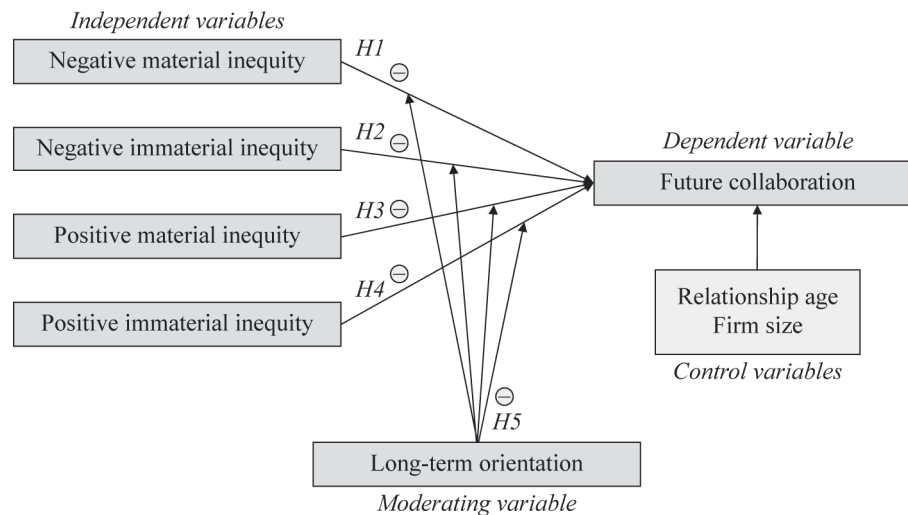
Homans (1961), evaluating clerks and cashiers, was among the first to investigate the effects of negative inequity. In his study, a clerk position was considered a higher-level job, suggesting more responsibility (i.e. higher input) than a cashier. However, they received the same salary (i.e. equal outcomes). The clerks' response to this negative inequity was to form a labor union to increase salaries (i.e. increase their outcomes), thereby reducing negative inequity. More recently, Scheer *et al.* (2003) showed that customer-supplier relationship stability, defined as mutual trust and relationship continuity, was negatively related to negative inequity. They also showed that negative inequity enhances hostility between exchange partners.

Prior empirical studies combine (i.e. aggregate) tangible and intangible resources when evaluating equity of invested inputs and received outcomes. However, disaggregating tangible and intangible equity inputs and outcomes may show unique effects. We hypothesize that:

- H1.* Perceptions of receiving negative tangible inequity from recent project collaborations relates negatively to the company's willingness to collaborate on future projects.
- H2.* Perceptions of receiving negative intangible inequity from recent project collaborations relates negatively to the company's willingness to collaborate on future projects.

#### *Effects of positive tangible and intangible inequity*

Based on findings from Adams (1963) and Scheer *et al.* (2003), companies perceiving to receive a greater share of relationship-specific outcomes than deserved, will perceive the exchange to be unfair. This perception of unfairness could cause feelings of guilt (Adams, 1963). This counterintuitive effect of positive inequity has some theoretical as well as empirical support within a single organization. For example, Arrowood (1961) showed that overpaid workers (i.e. higher outcome) in a factory increased their own productivity (i.e. increased input) to reduce inequity. Adams and Rosenbaum (1962) and Goodman and Friedman (1971) empirically validated these results in different experimental settings. Several decades later, Scheer *et al.* (2003) showed that participants from Dutch companies also reacted negatively to

**Figure 1** Conceptual framework

perceptions of positive inequity in their customer-supplier relationship study. Considering these results from prior business-to-business scholars, we believe that both positive tangible and positive intangible inequity should show a negative effect on the company's intention to collaborate on future projects.

- H3. Perceptions of receiving positive tangible inequity from recent project collaborations relates negatively to the company's willingness to collaborate on future projects.
- H4. Perceptions of receiving positive intangible inequity from recent project collaborations relates negatively to the company's willingness to collaborate on future projects.

#### *The moderating role of long-term orientation*

Generally, prior equity studies did not test for moderating effects of contextual factors. Scheer *et al.* (2003) were among the first scholars to empirically address moderation. Their study compares the moderating effects of culture among managers in the United States (US) and the Netherlands. The effects of negative inequity were similar in both countries. However, positive inequity had negative effects in Dutch relationships, while there were no significant effects of positive inequity among US participants. Scheer *et al.* (2003) attributed this difference to a "masculinity" dimension in the US culture.

In addition to disintegrating equity into tangible and intangible and positive and negative inequity, another contribution of the present study is an investigation into the moderating effect of long-term orientation on perceptions of inequity in customer-supplier relationships. Long-term orientation includes the companies' alignment of strategic goals, expectation of relationship continuity and long-term relationship profitability (Ganesan, 1994). Long-term oriented relationships provide the opportunity for companies to share relationship-specific assets more openly than is possible in short-term or "arm's length" relationships (Dyer and Singh, 1998). In long-term oriented relationships, any inequity in the current project collaboration could possibly even out over time. However, this evening out effect is not expected in short-term oriented relationships. Therefore,

- H5. Perceptions of inequity received from recent project work in short-term oriented relationship collaborations have a more negative effect on the company's willingness to collaborate on future projects than the effect in long-term oriented relationships.

### 3. Research methodology

#### 3.1 Data collection and sample

A large-scale survey was conducted targeting 1,846 purchasing managers drawn from a reliable list of industrial firms in Germany and Switzerland (Wagner *et al.*, 2010a). The units of analysis in this study are customer-supplier relationships in the context of a recently completed project. These projects had a clearly defined timeframe (within the last 12 months), clearly define type project goals (cost reduction, quality improvement or innovation in processes or products (i.e. the joint creation of value)) and resource boundaries.

Invitations to participate in the online survey were conveyed via emails that contained a link to the questionnaire. The incentive for participation was a summary of the results and a practitioners' purchasing book. Three email follow-ups and a reminder phone call yielded 186 completed questionnaires (10.1 percent response rate). Three questionnaires were omitted from the sample due to informants' limited knowledge about respective projects, resulting in 183 usable questionnaires.

It is important to note that 40 potential key informants (2.1 percent) replied to indicate that their company had not been involved in a customer-supplier project during the past 12 months. This suggested that other potential informants may have had the same limitation. Consequently, 100 non-respondents were randomly selected and contacted by telephone to determine whether or not they met the study specifications of recently conducted projects with their suppliers. Overall, 45 percent reported that they did not conduct projects within the required timeframe. Therefore, the response rate garnered seems reasonable given this information and the study's framework.

Appendix 1 (Table AI) shows the industry profile of the 183 companies included in the sample. They had sales averaging



\$3.09 billion (range was \$6.6 million to \$138.4 billion) and had on average 7,350 employees.

The majority of informants were head of purchasing or CPO (45.9 percent), purchasing manager (17.5 percent) and CEO, owner, or plant manager (11.5 percent). The remainder claimed positions as head of logistics, supply chain or operations (8.7 percent), head of supplier management/development (2.7 percent) and other managers (6.0 percent). The average time in their respective positions was 7.8 years and time with the particular firm was 11.4 years. These informants were most likely to have a boundary-spanning view of their company's supplier activities.

To ensure the informants' ability to answer the questionnaire, two questions were asked concerning knowledge about the:

- 1 specific project; and
- 2 relationship to the respective supplier (Wagner *et al.*, 2010b).

On average, the informants' knowledge about the project and the specific supplier relationship were high ((4.4 and 4.6 respectively); (five-point Likert scale)). Most informants confirmed a high (i.e. 4) or even very high (i.e. 5) knowledge about the project (92 percent) and the relationship (96 percent). These values promised knowledgeable informants.

Comparisons of the early (initial email) and late (second and third reminder) informant responses show no statistically significant mean differences in all items used in the model ( $p > 0.05$ ). Comparing the sample of informants to 100 randomly selected non-respondent companies (from the initial sample) in terms of annual sales and number of employees in 2006 (drawn from an independent industry database) found no significant difference in terms of average means for both measures ( $p > 0.05$ ). Therefore, these two tests indicate the absence of a non-response bias (Wagner and Kemmerling, 2010).

### 3.2 Survey instrument

The survey instrument and measures were developed in three stages. The first stage was a literature review and insights from case study interviews with purchasing professionals in eight industrial companies in Germany. This stage was the basis for the draft of a questionnaire. The second stage included comments about the proposed questionnaire items from several academics with diverse research backgrounds and a small number of practitioners. The third stage was a pre-test of the survey instrument through interviews with purchasing executives from a small number of firms in Germany. To ensure clarity, half of the informants in this phase were interviewed while they were answering the questionnaire and the other half were interviewed after completing the questionnaire. The final version of the survey instrument incorporated the relevant comments.

### 3.3 Measures

#### Inequity

The "Global Measure of Equity" developed by Walster *et al.* (1978a) captures the inequity concept. The measure is frequently used in its original form (Cate *et al.*, 1982; Corsten and Kumar, 2005; Hegtvedt, 1990; Scheer *et al.*, 2003), which calculates the degree of inequity based on aggregated (i.e. combined) inputs and outcomes. However, in the present study tangible and intangible inequity are two separate

measures. Therefore, four inequity variables, identified as negative tangible inequity; negative intangible inequity; positive tangible inequity; and positive intangible inequity, result from calculating the equations.

Equation 1: Measure of tangible equity

$$\frac{\text{Tangible outcome customer}}{\text{Tangible input customer}} - \frac{\text{Tangible outcome supplier}}{\text{Tangible input supplier}}$$

< 0 negative tangible inequity

= 0 tangible equity

> 0 positive tangible inequity

Equation 2: Measure of intangible equity

$$\frac{\text{Intangible outcome customer}}{\text{Intangible input customer}} - \frac{\text{Intangible outcome supplier}}{\text{Intangible input supplier}}$$

< 0 negative intangible inequity

= 0 intangible equity

> 0 positive intangible inequity

When negative tangible (intangible) inequity exists, the appropriate variable is less than zero. When positive tangible (intangible) inequity exists, the appropriate variable is greater than zero. The calculations use the absolute values for the inequity measures, which means, that high positive values represent high degrees of both positive inequity and negative inequity. Negative tangible inequity rules out positive tangible inequity and negative intangible inequity rules out positive intangible inequity (and vice versa). In the case of perfect equity all four variables equal zero.

#### Long-term orientation: dimensionality, reliability, and validity

The concept of long-term orientation in the relationship employs a seven-item measure developed by Ganesan (1994), who applied this measure to investigate "supplier-retailer" relationships. Long-term orientation includes the customers' belief that the relationship with the supplier has mutual long-term viability and profitability; and strategic importance for the customer-company's future success. The measures were retested using structural equation modeling (SEM) and confirmatory factor analysis (CFA) via LISREL 8.80. CFA supported that four of the seven items capture the respective underlying construct. This finding indicated that three original construct items appear to not be "tapping ... [the] underlying construct as are the other four items in the [scale]. In practice, the measurement model would be re-specified by eliminating these [three] items" (Gerbing and Anderson, 1988, p. 189). A four-item measurement model resulted after respecification. Both Cronbach's  $\alpha$  reliability coefficient (0.80) and the composite reliability index (0.82) confirmed good reliability for the four-item long-term orientation measurement scale (Nunnally and Bernstein, 1994). CFA confirmed that the behavior-relevant traits chosen to measure long-term orientation captured the proposed underlying construct. Specifically, the LISREL estimates for the items of long-term orientation (0.69, 0.56, 0.94, and 0.78) are all significant ( $p < 0.05$ ). All items tested are shown in Appendix 2 (Table AII). Final items for the construct with factor loadings,  $t$ -values, and reliabilities are reported in Table I. The long-term orientation measurement model fit statistics are  $\chi^2 = 0.17$ ;  $p = 0.92$ ,  $df = 2$ ;  $\chi^2/df = 0.09$ ; RMSEA = 0.0; 90% CI = (0.0; 0.97); ECVI = 0.10; NFI = 1.00; CN = 10,198; RMR = 0.01; GFI = 1.00, AGFI = 1.00.

Table I Items, factor loadings, and reliabilities for continuous variables

Construct name/items	Factor loading	t-value	Coefficient $\alpha$	Composite reliability
<b>Long-term orientation</b>			0.80	0.82
Long-term orientation 1	0.69	9.95		
Long-term orientation 2	0.56	7.76		
Long-term orientation 3	0.94	14.85		
Long-term orientation 6	0.78	9.76		
<b>Future collaboration</b>			0.96	0.97
Future collaboration 1	0.93	16.48		
Future collaboration 2	0.96	17.50		
Future collaboration 3	0.94	16.81		

*Future collaboration: dimensionality, reliability, and validity*

The future collaboration construct was a 3-item measure developed by Jap (2001), who investigated the effects of different “value pie sharing rules” (i.e. equality and equity) in complex collaboration contexts on the future of relationships (Wagner *et al.*, 2010a). The construct displays the customers’ willingness and desire to collaborate on future projects with their respective suppliers. The measure was retested in the present study, using structural equation modeling (SEM) to develop and test the measurement model (LISREL 8.80). Both Cronbach’s  $\alpha$  reliability coefficient (0.96) and the composite reliability index (0.96) confirm very good reliability for the three-item future collaboration measurement scale (Nunnally and Bernstein, 1994). CFA confirmed that the behavior-relevant traits chosen to measure future collaboration captured the proposed underlying construct. Specifically, the LISREL estimates for the items of the construct are excellent (0.93, 0.96, and 0.94;  $p < 0.05$ ). Fit statistics could not be determined because the model is saturated, and therefore designated as a “perfect fit.” Factor loadings,  $t$ -values and reliabilities are shown in Table I.

*Discriminant validity test*

After both continuous measures (i.e. long-term orientation and future collaboration) were finalized, they were entered into a structural model to test for discriminant validity. In this test, the items for each construct loaded on the designated factor without cross loading. The squared structural multiple correlation of the structural link between the constructs (0.21) is less than 0.50 and less than the squared structural links of each item in the measurement model for the paired measures (future collaboration:  $0.21 < 0.87, 0.94, 0.89$ ; long-term orientation  $0.21 < 0.51, 0.32, 0.83, 0.49$ ) (MacKenzie *et al.*, 2005). Additionally, the average variance extracted for each construct in the model pair is greater than 0.50 and greater than the squared structural multicorrelation between the construct pair ( $0.90 > 0.21, 0.53 > 0.21$ , respectively), which further supported discriminant validity between the factors (Fornell and Larcker, 1981). As a final examination of discriminant validity, the covariance matrices for the construct pairs were examined and showed intercorrelations less than 0.70 for each item. In every case, the item’s intercorrelation with the non-designated construct was below the correlation of the designated construct (MacKenzie *et al.*, 2005). Combining results support that the two measurement scales are reliable and valid.

*Controls*

To eliminate undesirable sources of variance, the analysis included two control variables, relationship age (e.g. Tangpong and Ro, 2009) and firm size (e.g. Huang *et al.*, 2008), that could influence and confound the hypothesized relationships. Relationship age was measured in years of project collaboration involvement. Firm size was measured as total number of employees working for the company. It was chosen because it is a structural variable with the relative potential to impact many areas of an organization (Blau and Schoenherr, 1971; Redondo and Fierro, 2007). The correlation matrix of all study variables is shown in Table II.

#### 4. Analysis and results

Before testing the hypotheses, the dependent variable, willingness to collaborate on future projects was regressed on the two control variables, relationship age and firm size. In all three models (full model, short-term and long-term; Models 1, 2, and 3, respectively) the inspection of the standard estimates for the control variables of relationship age and firm size revealed a lack of statistical significance (Model 1:  $\beta_5 = -0.03, p = 0.68$  and  $\beta_6 = -0.04, p = 0.61$ ; Model 2:  $\beta_5 = 0.04, p = 0.73$  and  $\beta_6 = -0.08, p = 0.44$ ; Model 3:  $\beta_5 = -0.14, p = 0.28$  and  $\beta_6 = 0.05, p = 0.66$ ). This indicated that the effects were not significantly caused by control variables. Second, the parameters were estimated to determine the effects of each type of inequity (i.e. negative tangible, negative intangible, positive tangible, positive intangible) on the future collaboration construct.

Subgroup analysis helped to explore the hypothesized moderating effect of long-term orientation. This method of analysis is widely used in management and organizational research (e.g. Fynes *et al.*, 2004; González-Benito, 2007; Terwiesch and Loch, 1999). The test split two groups from the sample based on the long-term orientation of the relationships. One group, which was below the average mean score (4.03) of long-term orientation in all relationships, represented the relatively short-term oriented relationships. The other, above the average mean, represented the strategic, long-term oriented relationships group.

Model 1 includes all 183 investigated relationships. Model 2 represents the 106 short-term relationships and Model 3 represents the 77 long-term relationships. The general regression model structure of each model tested follows and results are reported in Table III.

Table II Correlation matrix and descriptive statistics

	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Negative tangible inequity	0.10	0.45	1.00						
(2) Negative intangible inequity	0.13	0.55	0.08	1.00					
(3) Positive tangible inequity	0.56	0.88	−0.15 *	−0.06	1.00				
(4) Positive intangible inequity	0.46	0.78	−0.09	−0.14	0.42 **	1.00			
(5) Long-term orientation	4.03	0.67	−0.13	−0.32 **	−0.07	0.02	1.00		
(6) Future collaboration	4.21	0.91	−0.20 **	−0.23 **	0.12	0.08	0.44 **	1.00	
(7) Relationship age	10.48	9.92	0.00	−0.09	−0.01	−0.01	0.11	−0.01	1.00
(8) Firm size	7,350	37,342	−0.02	0.01	−0.04	−0.07	−0.02	−0.04	0.17 *

Notes: \* $p < 0.05$  (two-tailed); \*\* $p < 0.01$  (two-tailed)

Table III Regression results with future collaboration as dependent variable

	Model 1	Model 2 (short-term) <sup>a</sup>	Model 3 (long-term) <sup>b</sup>
Relationship age	−0.03	0.04	−0.14
Firm size	−0.04	−0.08	0.05
Negative tangible inequity	−0.17 *	−0.25 *	0.00
Negative intangible inequity	−0.23 **	−0.24 *	0.02
Positive tangible inequity	0.06	0.08	0.16
Positive intangible inequity	0.03	−0.01	0.04
F value of model	3.17 **	2.89 *	0.60
R <sup>2</sup>	0.103	0.156	0.053

Notes: \* $p \leq 0.05$  (two-tailed); <sup>a</sup> $n = 106$  (Long-term orientation < 4.03);

\*\* $p \leq 0.01$  (two-tailed); <sup>b</sup> $n = 77$  (Long-term orientation > 4.03)

$$Y_i = \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i}$$

where:

$X_1$  = negative tangible inequity.

$X_2$  = negative intangible inequity.

$X_3$  = positive tangible inequity.

$X_4$  = positive intangible inequity.

$X_5$  = relationship age.

$X_6$  = firm size.

Multicollinearity tests for all three models indicated that the tolerance and the variance inflation factor (VIF) both meet the common thresholds (i.e. > 0.10 and < 10 respectively), supporting the absence of multicollinearity (Hair *et al.*, 2010).

#### Test of H1 and H2 – effects of negative tangible and negative intangible inequity

The standardized regression coefficients for negative tangible and negative intangible inequity were statistically significant with standardized parameter estimates of  $\beta_1 = -0.17$  ( $p < 0.05$ ) and  $\beta_2 = -0.23$  ( $p < 0.01$ ), respectively. Specifically, our findings indicated the higher the negative tangible inequity or negative intangible inequity the lower the willingness of customers to collaborate on future projects with their respective suppliers. These findings support hypotheses H1 and H2. Our findings further suggested that negative tangible inequity and negative intangible inequity explain unique variance. This indicates that the two constructs have unique effects on a company's willingness to collaborate on future

projects. Furthermore, negative intangible inequity showed a stronger negative effect on the companies' willingness to collaborate on future projects than negative tangible inequity. Since prior research does not delineate between tangible and intangible inequity, this is a unique finding and an important contribution to equity theory. We explain this finding considering Ulaga and Eggert (2006), who found in their qualitative work that tangible resources are must haves, while intangibles are added-value resources associated with long-term relationships seeking key-supplier status. Therefore, intangible resources, such as supplier know-how, make the difference towards future relationship status.

#### Test of H3 and H4 – effects of positive tangible and positive intangible inequity

The coefficients for measures of both positive tangible inequity and positive intangible inequity were not statistically significant ( $\beta_3 = 0.06$ ,  $p = 0.46$ ;  $\beta_4 = 0.03$ ,  $p = 0.76$ ), thus the data does not support H3 and H4. Contrary to prior studies and our hypotheses, positive inequity (i.e. receiving more than deserved) does not appear to have a negative effect on the customers' willingness to collaborate on future projects. This finding could be culture-specific since in an earlier study Scheer *et al.* (2003) reported a non-significant effect of positive inequity among US firms, while Dutch reacted negatively to receiving more than deserved. The findings in our study might suggest that companies simply interpret positive inequity (i.e. receiving more than deserved) as "good fortune" (Adams, 1963, p. 426). An alternate explanation could be related to the long-term orientation construct and feelings that this good fortune balances out over the course of the relationship.

#### Test of H5 – the moderating effect of long-term orientation

After separating the two groups, the Chow-test procedure (Chow, 1960) confirmed the existence of two separate regression models (Model 2: short-term oriented relationships; Model 3: long-term oriented relationships). This finding supports the moderating role of long-term orientation posited in H5.

Another indicator of three separate regression models was the different levels of explained variance of the outcome variable ( $R^2$ ). Model 1 (all relationships) explains 10.3 percent of the overall variance of the outcome variable. This means that the perceptions of equity (inequity) in the current project collaboration determine 10.3 percent of the customers' future collaboration intention. In short-term



relationships (Model 2), a higher level of the variance of the outcome variable (15.6 percent) was explained. This indicated that the effects of equity (inequity) were stronger on the future of the collaboration in short-term relationships (versus Model 1). The rather low level of explained variance (5.3 percent) in Model 3 indicated that equity (inequity) in current project collaborations had only minor effects on future collaboration intentions.

Comparisons of parameter estimates and the significance levels among the models further supported hypothesis *H5*. First, the analysis considered the effects of negative tangible inequity and negative intangible inequity on future collaboration within the short-term oriented relationships (Model 2). The standardized parameter estimates of negative tangible and negative intangible inequity are  $\beta_1 = -0.25$  ( $p < 0.05$ ) and  $\beta_2 = -0.24$  ( $p < 0.05$ ), respectively. These results indicated that both variables have a stronger negative effect on the outcome variable, willingness to collaborate on future projects, than in the base Model 1 (for all relationships) when investigated in short-term oriented relationships. On the other hand, when investigated in long-term oriented relationships (Model 3) the standardized parameter estimates of negative tangible and intangible inequity were not significant ( $\beta_1 = 0.00$ ,  $p = 0.99$ ;  $\beta_2 = 0.02$ ,  $p = 0.89$ ). Contrary to Model 1 (all relationships) and Model 2 (short-term oriented relationships), the perceptions of negative (tangible and intangible) inequity in the current project collaboration appeared to have no effect among the companies on future collaboration intentions in long-term oriented relationships.

Next, the effects of positive tangible and positive intangible inequity in the two subgroups were evaluated. The results were not significant in short-term (Model 2:  $\beta_3 = 0.08$ ,  $p = 0.45$ ;  $\beta_4 = -0.01$ ,  $p = 0.92$ ) and long-term relationships (Model 3:  $\beta_3 = 0.16$ ,  $p = 0.26$ ;  $\beta_4 = 0.04$ ,  $p = 0.75$ ), respectively. Receiving a greater share than deserved from the collaboration outcomes appeared to have no effect on the intention for future collaboration among the companies in this study, independent of the strategic orientation (long-term versus short-term) of the relationship.

The results of the Chow-test and the differences in standardized coefficients, significance levels and explained variance in the three models suggested that long-term orientation moderated the effects on equity (inequity) on the customers' future collaboration intention. Overall, hypothesis *H5*, that the effects of perceptions of inequity in current projects are stronger in short-term relationships was supported.

## 5. Discussion

### 5.1 Managerial implications

In contrast to prior empirical studies and as extension of equity theory, Adams' (1963) framework is used to show the effects of tangible and intangible inequity in sharing the benefits of customer-supplier project collaboration. The assumption that exchange partners do not just aim for equity as a total outcome, as suggested in prior studies (Corsten and Kumar, 2005; Jap, 2001; Scheer *et al.*, 2003), was supported. Our findings indicated that the customers' perceptions of inequity of outcomes from both tangible and intangible inputs affect future collaboration intentions. Therefore, if suppliers want to conduct future business with current customer partners they should consider the influence and consequences of both tangible and intangible resource-inequity in project collaborations.

Specifically, disaggregating tangible and intangible project-specific resources offers managers a more detailed analysis of the effects of inequity. Specifically, we show the effects of negative intangible inequity on the customers' future collaboration intention are stronger than the effects of negative tangible inequity. Therefore, intangible resources may be more important to managers in companies that desire relationship continuity than tangible resources. This might suggest that these managers accumulate and leverage intangible resources, such as capabilities, knowledge, and patents because intangible resources are associated with future market success and firm performance (e.g. Dyer and Singh, 1998). In addition, these findings suggest that managers should aim toward securing relationship-specific intangible resources in customer-supplier project collaborations. Furthermore, managers that place importance on future collaboration, should pay specific attention to ensuring equity in sharing of intangible resources.

The study also provided evidence that a long-term orientation moderates the effects of inequity. In suggesting future research, Scheer *et al.* (2003) assumed that close customer-supplier relationships are less dependent on equity than less intense relationships. However, close relationships might rather rely on sharing principles like equality (Deutsch, 1975). The present study supports that customers who believe that a relationship with a supplier is long-term, did not show a negative effect as to negative inequity on future collaboration intentions. In long-term relationships strategic goals and long-term profitability perceptions from the current project collaboration seemed to be less negative. This less negative effect could be attributed to the belief that tangible inequities will even out over the course of the relationship. Also, intangible value such as knowledge should be more secure in the long-term relationship. While results suggests that firms in long-term project collaborations relationships do not need to be overly concerned with equitable sharing of relationship-specific outcomes, equitable sharing is a major criterion in rather short-term relationship collaborations.

### 5.2 Research implications

While the data supports the hypotheses concerning the effects of negative inequity, we did not find support for the hypothesized negative effects of positive inequity on the future of relationships. The negative effect for positive inequity was expected because it was seen in prior studies conducted among European firms in the Netherlands but not in US firms (Scheer *et al.*, 2003). Several explanations are possible for the lack of a negative effect for positive inequity in the present study among European firms in Germany and Switzerland. First, some scholars argue that overpayment does not necessarily lead to feelings of unfairness; and secondly, some exchange partners do not necessarily react negatively to positive inequity (Cosier and Dalton, 1983; Hegtvædt, 1990). Third, some may simply interpret positive inequity as "good fortune" (Adams, 1963, p. 426). Fourth, companies perceiving positive inequity could develop feelings of guilt (Scheer *et al.*, 2003), but guilty feelings do not necessarily force them to oppose future project collaborations. Future research might continue to address the effects of positive inequity by investigating the effects of tangible and intangible inequity on additional outcome variables (e.g. guilt) and moderating variables (e.g. morals, ethics, the self-concept). Finally, as stated earlier the cultural background of the investigated companies might be another plausible explanation for the

findings (Scheer *et al.*, 2003). The impact of culture and “global space” should continue to be considered in equity theory research. In the present study, German and Swiss firms reacted differently from Dutch firms in prior studies towards positive inequity. Therefore, a more discreet analysis of the effects of regional cultures would be interesting.

## 6. Conclusion

While the variables included in this analysis explained a portion of the outcome variable's variance, obviously companies' future collaboration intentions are determined by factors other than equitable or inequitable sharing of resources. For example, factors like the overall project success in terms of value creation or the partners' satisfaction with the collaboration in general are likely factors that could affect future collaboration intentions. In short-term relationships inequity seems to have a more important impact on the company's future collaboration intention. When a relationship is perceived to be short-term, supplier managers may want to intentionally take steps to avoid inequity perceptions in negotiations. Such steps could include:

- transparency about cost and profit requirements;
- providing information about training on each employee assigned to the project; and
- access to top level managers' perspective towards ensuring value of received outcomes from the relationships.

The differentiation of inputs and outcomes into positive and negative tangible and intangible resources, as investigated in this study, is a very suitable method for evaluating the effects of perceptions of inequity during customer-supplier project collaboration. Future equity research might consider this disaggregated approach as a valuable extension to the traditional method of equity analysis.

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## Appendix 1

**Table A1** Industry breakdown of participating companies (number of firms and percentage of sample)

	<i>n</i>	Percentage
Industrial machinery	37	20.2
Electronics and optics	35	19.1
Automotive and transport equipment	24	13.1
Metals and metal working	17	9.3
Chemicals and pharmaceuticals	14	7.7
Construction	6	3.3
Food and consumer goods	5	2.7
Rubber and plastic products	4	2.2
Textiles and clothing	3	1.6
Other	38	20.8
<b>Total</b>	<b>183</b>	<b>100.0</b>



## Appendix 2

**Table All** Measures and items

<b>Tangible inputs and outcomes<sup>a</sup></b>	
Tangible input customer	Our company's tangible (financial and personnel) contributions to the project
Tangible input supplier	Supplier X's tangible (financial and personnel) contributions to the project
Tangible outcome customer	The tangible (financial) outcomes we received from the project
Tangible outcome supplier	The tangible (financial) outcomes Supplier X received from the project
<b>Intangible inputs and outcomes<sup>a</sup></b>	
Intangible input customer	Our company's intangible (know-how and patents) contributions to the project
Intangible input supplier	Supplier X's intangible (know-how and patents) contributions to the project
Intangible outcome customer	The intangible (know-how and patents) outcomes we received from the project
Intangible outcome supplier	The intangible (know-how and patents) outcomes Supplier X received from the project
<b>Future collaboration<sup>b</sup></b>	
Future collaboration 1	We would welcome the possibility of collaboration with Supplier X in additional projects in the future
Future collaboration 2	We would be willing to work with Supplier X in projects in the future
Future collaboration 3	We would be willing to collaborate with Supplier X in projects, should the opportunity arise
<b>Long-term orientation<sup>b</sup></b>	
Long-term orientation 1	We believed that over the long run our relationship with Supplier X would be profitable
Long-term orientation 2	Maintaining a long-term relationship with Supplier X was important to us
Long-term orientation 3	We focused on long-term goals in this relationship
Long-term orientation 4	We were willing to make sacrifices to help Supplier X from time to time <sup>c</sup>
Long-term orientation 5	We were only concerned with our outcomes in this relationship. (R) <sup>c</sup>
Long-term orientation 6	We expected Supplier X to be working with us for a long time
Long-term orientation 7	Any concessions we made to help out Supplier X would even out in the long run <sup>c</sup>
<b>Relationship age</b>	
For how many years had your company been working with Supplier X at the beginning of the project (in full years)?	
<b>Firm size</b>	
How many employees worked for your company in 2006?	

**Notes:** <sup>a</sup>All items were measured on a five-point Likert scale (1 = low, 5 = high); <sup>b</sup>All items were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree); <sup>c</sup>Item dropped in final measurement model

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## Executive summary and implications for managers and executives

*This summary has been provided to allow managers and executives a rapid appreciation of the content of the article. Those with a particular interest in the topic covered may then read the article in toto to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefit of the material present.*

The comment in that legendary novel *Animal Farm* that all animals are equal but some animals are more equal than others has been quoted and misquoted on a regular basis ever since George Orwell wrote it more than 60 years ago. And



why not? The irony can be applied to all manner of situations. Take customer-supplier relationships. There are mutual benefits of value creation and value sharing in such collaboration but how about equality of benefit? Does a partner who perceives his organization is not getting a fair share of the benefits become less willing to collaborate in future projects? And what about the partner who reckons they are getting the best out of the deal? Do they suffer from guilt and try to make up for it in other ways, or accept the situation as just their good fortune? It seems all customer-supplier relationships are equal but some are more equal than others.

Weighing up the equality of a relationship is even more difficult to grasp when both tangible (which can be measured in monetary terms) and intangible (which cannot) inputs are in the mix. Therefore, understanding the leverage potential of often neglected intangible resources should be of interest to both supplier- and customer-firm managers who co-create value in business-to-business relationships. While the effects of intangible, stand-alone firm-assets, such as brand and brand equity, are well studied more focus is needed on the effects of intangible assets that are more closely related to inter-firm relationships, such as supplier know-how.

In “Tangible and intangible resource inequity in customer-supplier relationships” Linda Silver Coley *et al.* take such a focus and find that customers’ perceptions of inequity of outcomes from both tangible and intangible inputs affect future collaboration intentions. Therefore, if suppliers want to conduct future business with current customer partners they should consider the influence and consequences of both tangible and intangible resource-inequity in project collaborations.

Generally, exchanges are considered equitable when the input-outcome ratios are perceived as equal. Inequity judgments arise both when a party perceives to receive more (i.e. positive inequity) or less (i.e. negative inequity) value than is believed to be deserved.

Companies’ relationship-specific tangible inputs are financial and those related to personnel and infrastructure resources, such as salaries and expenses or the costs of capital equipment. Tangible outcomes are the measurable financial benefits received from the collaboration, such as price reductions for procured parts or inventory reductions. In competitive business markets, most tangible resources are “must-haves,” while intangible resources can be leveraged towards a competitive advantage. Relationship-specific intangible inputs include employees’ knowledge, such as specific insights about the product or process best practices and companies’ specific know-how and their patents (e.g. product or manufacturing technology patents). Examples of relationship-specific intangible outcomes are enhanced

knowledge and new patents that extend to benefit other collaborations.

Disaggregating tangible and intangible project-specific resources offers managers a more detailed analysis of the effects of inequity. Specifically, this study shows that the effects of negative intangible inequity on the customers’ future collaboration intention are stronger than the effects of negative tangible inequity. Therefore, intangible resources may be more important to managers in companies, which want relationship continuity than tangible resources. This might suggest that these managers accumulate and leverage intangible resources, such as capabilities, knowledge, and patents because intangible resources are associated with future market success and firm performance. Managers should aim to secure relationship-specific intangible resources in customer-supplier project collaborations. Furthermore, managers who place importance on future collaboration should pay specific attention to ensuring equity in sharing of intangible resources.

There is evidence that a long-term orientation moderates the effects of inequity. In previous research it had been assumed that close customer-supplier relationships are less dependent on equity than in less intense relationships. This study demonstrates that customers who believe that a relationship with a supplier is long-term do not show a negative effect as to negative inequity on future collaboration intentions. In long-term relationships strategic goals and long-term profitability perceptions from the current project collaboration seemed to be less negative.

This less negative effect could be attributed to the belief that tangible inequities will even out over the course of the relationship. Also, intangible value such as knowledge should be more secure in the long-term relationship. While results suggests that firms in long-term project collaborations relationships do not need to be overly concerned with equitable sharing of relationship-specific outcomes, equitable sharing is a major criterion in the more short-term relationship collaborations.

When a relationship is perceived to be short-term, supplier managers may want to take steps to avoid inequity perceptions. They could include: transparency about cost and profit requirements; providing information about training on each employee assigned to the project; and access to top level managers’ perspective towards ensuring value of received outcomes from the relationships.

*(A précis of the article “Tangible and intangible resource inequity in customer-supplier relationships”. Supplied by Marketing Consultants for Emerald.)*