

Transaction Cost Theory Refined – Theoretical and Empirical Evidence from a Business-to-Business Marketing Perspective

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Transaction Cost Theory Refined –

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Recently, integrating Transaction Cost Economic (TCE) and Resource Based View (RBV) arguments has become one of the most prominent theoretical approaches in research on business relationships. We question this dominance and strengthen an exclusive TCE perspective by recalling two of the core TCE constructs in order to achieve full exploitation of TCE reasoning. We discuss the transaction attributes “asset specificity” and “uncertainty” and identify conceptual gaps that lead to ambiguous results regarding the test of TCE guided hypotheses in prior relationship marketing and management research. To overcome these problems, we redefine both concepts and show that they are interconnected in more complex ways than past empirical research has accounted for. Hypotheses are derived and tested empirically in a cross-sectional online-survey setting by using means of structural equation modelling.

Keywords: new institutional economics, risk, uncertainty, asset specificity

1. Introduction

From 1985 until today Transaction Cost Economic (TCE) reasoning has been widely successfully applied to research in marketing (e.g. Heide & John, 1992; Joshi & Stump, 1999; Brown, Dev, & Lee, 2000) – especially relationship marketing – and all other areas of social sciences (for an overview see for example Macher & Richman, 2008). Nevertheless on second sight the picture becomes blurred as vote-counting (David & Han, 2004; König, 2009) or meta-analysis studies (Geyskens et al., 2006) show: Two of the three core TCE concepts, namely uncertainty and specificity, have been tested in many different but partially inconsistent or incomplete ways (David & Han, 2004; König, 2009). The overarching results that core TCE constructs have been neglected or ambiguously operationalized and potential causal relationships have not been considered in prior empirical research hint at problems concerning the general measurability and comparability of the constructs. As a consequence this leads to the problem of identifying potential interdependencies between the constructs.

Also the question has been raised whether Transaction Cost Economics (TCE) sufficiently illuminates the sources of firm heterogeneity in general and the sources of different recognition and treatment of property rights management in particular (e.g. Foss & Foss 2004). In management and marketing research this question has been answered within the last years by explicitly combining TCE and Resource Based View (RBV) perspectives (Mellewigt, Madhok, & Weibel, 2007; Argyres, Bercovitz & Mayer, 2007) or integrating TCE within RBV perspectives in research on inter-firm relationships (Ghosh & John, 2005; Palmatier, Dant & Grewal, 2007). These findings however, in addition to the problems identified above, also raise the question whether empirical research that is primarily based on TCE assumptions is obsolete. In our opinion TCE has the power to generate valuable insights on its own. To prove this argument the contribution of our paper is twofold:

- First we will theoretically structure the consistency and ambiguity issues of TCE construct operationalization by theoretically refining the concepts of specificity and uncertainty.
- Second we will deduct hypotheses from the refined framework and statistically test them in a business-to-business context via an online survey setting.

As we will show the exploration of interdependent effects between the constructs specificity and uncertainty has the potential to make TCE a more powerful tool for the research on governance forms in general and business relationships especially.

Accordingly the paper will continue in the following manner. Section two starts with an overview about the TCE framework, especially focusing on the definition of a transaction and TCE's self-conception as a theory of contracts. We then discuss the concept of asset specificity and show that it is not only the degree of specificity but also the magnitude dimension of specific investments that is important. The concept of uncertainty is theoretically analyzed and differentiated into different interdependent dimensions in the following section. It is shown that the notion of uncertainty is a complex phenomenon that has to be explicitly accounted for in a more sophisticated way. In the last section of chapter two we connect the concepts of specificity and the different kinds of uncertainty and deduct six hypotheses. Chapter three encompasses our empirical study in which we test the hypotheses empirically and interpret our results with respect to the refined theoretical framework as well as managerial relevance. The paper ends with a conclusion in which we also discuss limitations of our approach and avenues for further research.

2. Transaction Cost Economics

According to Williamson (1985, p. 1) a transaction "occurs when a good or service is transferred across a technologically separable interface". This rather broad definition of the transaction can be refined by sticking closer to the basic definition of a transaction by Commons (1959, p. 4) who understood the transaction as the "ultimate unit of economic investigation, a unit of transfer of legal control." Williamson (2005, p. 3) concludes that "...a coherent theory of organization for implementing these novel ideas nevertheless eluded Commons and his followers, possibly because the concept of transaction costs had yet to surface...". Though Williamson also states that Commons' later works "...resulted in an elaborate taxonomy, but a predictive theory of contract and organization and a follow-on empirical research agenda did not materialize." (Williamson, 2005, p. 3 Fn. 5), he also argues for Commons' (1931) characterization of the transaction by means of the terms "conflict," "order," and "mutuality" as a basis for his idea of governance thus agreeing on the transaction as the smallest unit of economic organization. In addition the explicit combination of TCE assumptions and

Property Rights Economics (Foss & Foss 2005) accentuates the nowadays prevailing perspective of a property rights based transaction definition within TCE.

In other words it can be stated that the actors involved in transactions interact with each other in order to accomplish their respective goals. Their interests are not completely harmonious with each other and are directed at the configuration and accomplishment of action opportunities (Haase, Chatrath, & Saab, 2008). Commons differentiates between three kinds of transactions: “*Bargaining transactions* transfer ownership of wealth by voluntary agreements between legal equals. *Managerial transactions* create wealth by commands of legal superiors. *Rationing transactions* apportion the burdens and benefits of wealth creation by the dictation of legal superiors.” (Commons, 1934, p. 68). From a marketing perspective bargaining transactions predominantly take place in buyer-supplier dyads. Therefore a transaction always takes place in a manner where bundles of property rights over people, physical objects, money and/or information are somehow concentrated and/or attenuated temporarily during the transaction process and durable in the transaction outcome(s) (Kleinaltenkamp & Jacob, 2002). Here fore contracts of purchase, hiring or leasing contracts, contracts of employment or contracts for work and labour or on service are concluded between the supplier and the customer of a product/service offering (Haase & Kleinaltenkamp, 2011). Accordingly we follow Haase et al. (2008) and define a transaction “...as a form of social interaction between economic actors (individuals as well as organizations) in markets (bargaining transactions) and within organizations (managerial transactions) that results in an exchange of property rights.” (Haase et al. 2008, p. 11). Following this definition, business relationships can be defined as a series of market transactions between a customer and a supplier that is established not by accident (Kleinaltenkamp & Ehret, 2006) but for economic reasons.

The governance mode which is chosen is directly linked to the transaction dimensions in TCE reasoning. If one considers pure market transactions and hierarchy as extreme poles on a governance mode continuum every governance mode in between can be considered a hybrid organization of exchange. Ménard (2004, p. 359/360) names three major problems for the governance of hybrid organizations in general: “...adaptation, in order to maintain the flexibility to adjust, must combine with control, in order to reduce discrepancies among inputs, outputs, or quality in the process itself,

while developing safeguards, in order to prevent opportunistic behavior that uncertainties make difficult to detect.”. From a contractual perspective the three types of contract law (MacNeil, 1978), namely classical, neoclassical and relational contracts, are applied simultaneously to at least a minimum extent in every transaction since the extreme poles of the continuum are somewhat ideal types (Dwyer, Schurr & Oh, 1987). Determinants of contractual arrangements from a TCE point of view thus have to be rooted within the core TCE concepts. Geyskens et al. (2006) respectively argue that “...in future empirical work researchers should attempt to gain insight into the underlying mechanisms driving governance decisions, by measuring the motivations mediating the relationships between transaction dimensions and governance mode chosen.” (Geyskens et al. 2006, p. 532). In sequence we will therefore examine the concepts of specificity and uncertainty regarding their denotation and connotation.

2.1 Magnitude of a specific investment and specificity degree - Two different dimensions of asset specificity

A first detailed discussion of different asset specificity dimensions and according operationalizations can be found in Lohtia, Brooks & Krapfel (1994). They refer to Williamson’s six forms of asset specificity which each have the two dimensions of specificity degree and magnitude of the investment. Williamson (1985, 1991) considers both dimensions but ascribes the most importance to the specificity degree dimension. Accordingly Lohtia et al. (1994) have found these two dimensions to account for most of the efforts to define and operationalize the concept of asset specificity. In their quantitative content analysis the specificity degree dimension was found to have been considered three times more often than the magnitude dimension. The six specificity forms site specificity, physical asset specificity, human asset specificity, dedicated asset specificity, brand name capital and temporal specificity are more of a connotative character whilst the magnitude and the specificity degree are more of a denotative character of asset specificity.

Both, the specificity degree as well as the magnitude of the specific investment have to be considered explicitly and simultaneously though. The magnitude of the conducted specific investments will then necessarily have a different influence on the type of risk perceived by the investing party than the specificity degree in both cases. The latter dimension is determined by the magnitude of the quasi-rent

and is more of a dynamic character because amortization horizons for the respective investments are critical.

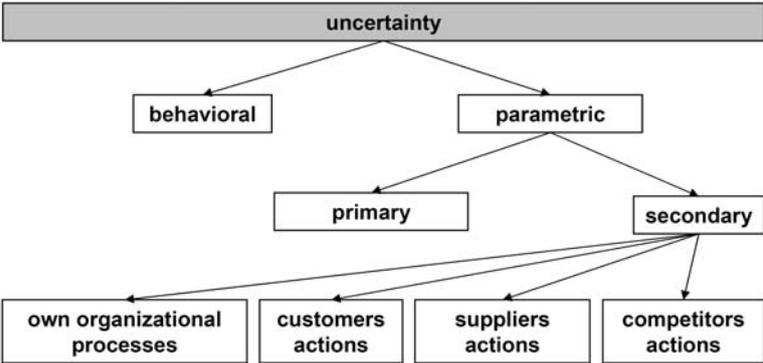
Thus different specificity constellations will have different implications with regard to the kinds of risks perceived by either transaction party. How the magnitude dimension of specific investments affects uncertainty perceptions will be shown after the concept of uncertainty has been discussed in general terms.

2.2 From uncertainty to different forms of uncertainty

The concept of uncertainty has received almost as much attention in empirical TCE literature as the concept of specificity (Macher & Richman, 2008) but has been operationalized in more ambiguous ways (David & Han, 2004; Geyskens et al., 2006; König, 2009). Therefore we will start our discussion by going back to the original framework of Williamson (1985, 1991).

Williamson differentiates between parametric and behavioural uncertainty. The latter one is closely linked to opportunistic behaviour and can be considered a strategic kind of uncertainty. The concept of parametric uncertainty is further differentiated into primary and secondary uncertainty following Koopmans (1957). Figure 1 summarizes Williamson’s uncertainty approach.

Figure 1: Types of Uncertainty with reference to Williamson 1985



While he refers to primary uncertainty as states of nature external to the firm and the market arena he characterizes secondary uncertainty as caused by “innocent” and “non strategic” (Williamson, 1985, p. 59) behaviour of other market participants that among others result from a lack of

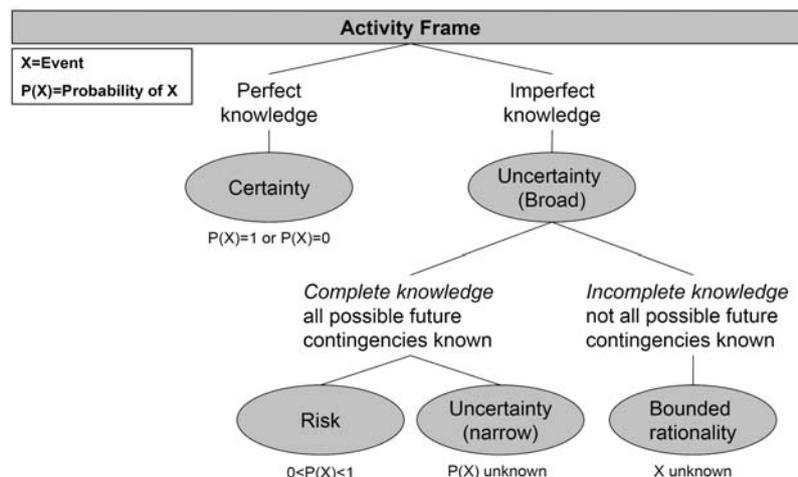
communication between market participants. However note that we added “own organizational processes” which will be important in sequence.¹

König (2009, p. 119) in her review of empirical uncertainty studies concludes an “...equal empirical presence of the two external uncertainty branches...” environmental change and ambiguity but detects an underrepresentation of the concept of behavioural uncertainty as a distinct mediator variable that is contingent on the interaction effect between external uncertainty and specificity.² Therefore what Williamson (1985) meant originally seems partly neglected by empirical research related to this topic.

Furthermore the terms “risk” and “uncertainty” need to be differentiated. While actors facing risk assign objective probabilities to future contingencies actors facing uncertainty cannot (Knight, 1921).

Figure 2 summarizes this systematization.

Figure 2: Conceptual definition of certainty, risk, uncertainty, and bounded rationality. Translated from Backhaus, Aufderheide & Späth (1994) with reference to Knight (1921)



The concept of uncertainty can take different forms. The question is whether all possible future states of nature are known or not. If they are known one can speak of (narrow) uncertainty. If they are not known the concept of bounded rationality applies. For the latter all assessments about the quality and

¹ We consider this modification as unproblematic because of the TCE presumption of methodological individualism.

² Also note that our understanding of ambiguity in the context of this paper is much tighter than in most of literature. We observe ambiguity during the process of a transaction resulting from the more or less complicated interaction process between buyer and supplier. Speaking in terms of figure 1, the ambiguity results from the interaction between a particular customer’s processes and supplier processes. The traditional ambiguity concept is by far more generic (for a detailed discussion see for example König, 2009).

consequentially the probabilities of future states of nature are subjective and incomplete. Only by chance the concept of bounded rationality and (narrow) uncertainty can be the same.

2.3 *Connecting the concepts of specificity and the different kinds of uncertainty*

Often the terms risk and uncertainty are used interchangeably. For example Ménard concludes that „...it is the combination of opportunism, or the risk of opportunism, and of miscoordination, or the risk of miscoordination, that determines the governance characterizing hybrid organizations.“ (Ménard, 2004, p. 360). Das & Teng (1996) similarly differentiate between relational risks and performance risks. The concept of relational risks “...addresses the possibility and the consequence that the partners in inter-firm alliances do not fully commit themselves to joint efforts.” (Das & Teng 1996, p. 831). Performance risks on the other hand are used “...to account for the possibility and the consequences that the objectives of inter-firm alliances are not successfully achieved, although all partners co-operate fully.” (Das & Teng 1996, p.833). For Das & Teng the term performance risk embraces all kinds of hazards, except those related to co-operation. An important modification regarding this assumption has to be made if one considers the transaction as a more or less complex transfer of property rights with according customer integration. This modification combines Williamson’s differentiation between behavioral, primary parametric and secondary parametric uncertainty as depicted in figure 2 with the concepts of relational and performance risk. This means that behavioral uncertainty can be regarded synonymous to the concept of relational risks while secondary parametric uncertainty can be regarded equivalent to performance risks. Also the quality dimension differs around the two risk types. While relational risks are more of a risk, thus imperfect but complete knowledge character, performance risks, though potentially influenceable by coordinated actions, are more of incomplete knowledge or even bounded rationality character. The different complexity levels concerning the arrangement of temporary property rights in the transaction process are thus unique determinants of different risk types. They lead to different perceived risk types which in turn may lead to different contractual regimes installed by the parties to reduce the risks accordingly. A procedural understanding will be necessary to connect both lines of thought. Specific investments are only conducted if the net value (acquired value minus acquisition costs, transaction costs and production costs) is the biggest among all other alternatives. Therefore the long-term

strategic calculus determines the – in marketing terms – “evoked set of alternatives” in a broad sense while the mid-range strategic calculus consists of an assessment of these alternatives and their suitability for the respective situation.

The combination of asset specificity and uncertainty thus leads to two general propositions regarding the magnitude and the degree of specificity. First, it seems obvious that the magnitude of specific investments implies that at least imperfect knowledge is existent with regards to the success of a transaction. Because of the complexity degree that is inherent in every market transaction this argument holds even under the absence of possible behavioral uncertainties. Thus performance risks are more likely to be of at least narrow uncertainty or even bounded rationality character if the transaction is complex. This leads to hypothesis H_1 :

H₁ The higher the magnitude of partner specific investments by the supplier the higher are the performance risks perceived by both parties.

Second, the degree of behavioral risks is influenced by different specificity degree constellations. The notion of bounded rationality in that case is not critical because potential opportunistic behavior by either party is common knowledge in a game theoretic sense. Thus it seems more likely that relational risks are ceteris paribus more of a risk or at most narrow uncertainty character. Nevertheless relational risks will be perceived in every transaction and we can deduct H_2 as follows:

H₂ The higher the magnitude of partner specific investments conducted the higher are the relational risks perceived by the investing party.

Perceived relational risks result from different degrees of asset specificity and/or different amortization horizons for the respective relevant parties' investments. The risk or narrow uncertainty character of relational risks demands for a written form anticipation of as many as possible contingencies potentially leading to opportunistic behavior. Also all possible opportunistic actions by the contracting parties have to be anticipated as well. This also implies that external uncertainty, understood as primary parametric uncertainty in Williamson's terms, and performance risks are antecedents of relational risks in general. The rationale behind this argument is simply probabilistic

because more possible contingencies lead to smaller probabilities even under complete imperfect knowledge conditions. This leads to hypotheses H₃ and H₄:

H₃ Performance risks drive perceived relational risks.

H₄ Environmental uncertainty drives perceived relational risks.

Whereas the preceding hypotheses regarded relational risks as a variable that is dependent on two variables (magnitude of specific investments and environmental uncertainty) we only identified one independent variable (magnitude of specific Investment) for performance risks so far. While the argument for H₄ is theoretically deducted we also want to control for the influence of environmental uncertainty on perceived performance risks. Thus hypothesis H₅ is formulated as follows:

H₅ Environmental uncertainty increases perceived performance risks.

Considering that specific investments are conducted to transact or prepare to transact resources that are critical for the company's success one can also conclude that specific investments also have a risk reducing component per se. This means that specific investments are also conducted in order to reduce the influence of parametric primary uncertainties on parametric secondary uncertainties as for example performance risks. This leads to hypothesis H₆:

H₆ The interaction between the magnitude of specific investments and environmental uncertainty lowers perceived performance risks.

3. Empirical study

To test these hypotheses we apply a structural equation modeling approach to cross sectional survey data using an online survey which addressed managers engaged in business-to-business marketing/sales. We personally contacted 4500 Sales Managers via an online business network and retrieved 642 usable questionnaires. This equals a response rate of 14.3%, which we consider quite good.³ To assure randomization of the researched business relationship we asked managers to answer the questions exclusively in connection with the last deal closed before participating in the survey.

³ In the Online Business Network only 50 Managers per day can be contacted. For a three month period we contacted 50 Managers per day. We were thus only able to contact each manager once within this period. Therefore a control of non response bias was not possible.

They were reminded on each page of the online survey to answer all questions only in relation with that particular deal.

3.1 Construct measurement

Concerning the independent variable *magnitude of specific investments* we adapted scales used by Cannon et al. (2000) and Rokkan, Heide & Wathne (2003) to our research context.⁴ We defined the concept of *relational risks* as the perceived risk that the other party may behave opportunistic. Again we adapted the opportunism scales used by Rokkan et al. (2003) to our context. For the concept of *performance risk* – from our theoretical perspective – the operationalization was a little more complicated. We do not challenge the fact that there are many already well established scales concerning constructs as task interdependence (Gulati, Lawrence & Puranam, 2005) or performance ambiguity (for an overview see for example David & Han, 2004).

However, coming from a business-to-business and a service marketing perspective we needed to take a more intangible transaction process perspective to account for the property rights based definition of a transaction. The Service Dominant Logic's (Vargo & Lusch, 2004) success as an innovative perspective on markets and society also accentuates this process aspect of value creation in general. We found a promising operationalization in the "gap model" of service quality by Zeithaml, Berry & Parasuraman (1988). This quite complex scale had to be simplified and adapted to our questionnaire. We used single indicators for the perceived risk by the supplier that gaps 1 and/or 2 might become critical. Additionally we included one new item asking if the supplier perceived the risk, that the customer would communicate different expectations than he really had. We asked the same three questions regarding the perceived risk by the customer in the respondent's estimation. *Environmental uncertainty* was measured as a higher order formative construct. We operationalized *environmental uncertainty* in the context of the environmental dynamism construct by Achrol & Stern (1988, p. 37) who define their construct as "...the perceived frequency of change and turnover in marketing forces". They differentiate between the sub-dimensions dynamism own marketing practices, dynamism in competitor's marketing practices and customer dynamism. We consequently adapted their scales to our general business-to-business research context and, considering the index based

⁴ Please see the appendix for the detailed information on the scales and items used.

operationalization by Achrol & Stern (1988), operationalized them as the formative first order constructs *environmental uncertainty supplier*, *environmental uncertainty competitors* and *environmental uncertainty customers*. Together they make up the overall degree of *environmental uncertainty* which was additionally measured with a single indicator.

Using the studies of Rakkona et al. (2003) and Cannon et al. (2000) as a reference, control variables accounted for in this study were the concept of *relational norms*, *size of the customer in comparison to the supplier* and the *magnitude of the investment conducted by the customer* in the opinion of the supplier. For the concept of *relational norms* four items were taken from Cannon et al. (2000) because of their reliability as well as their manageable number. The relative size was measured with a single item. *Specific investments by the customer* were measured analogous to the measure for magnitude of *specific investments by the supplier*.

When it comes to analyzing relations between constructs (latent variables), Structural Equation Modeling (SEM) represents a standard method in marketing and management research (see for example Steenkamp & Baumgartner, 2000 or Henseler, Ringle & Sinkowics, 2009). The two matching statistical techniques for estimating such models are the covariance-based structural equation modeling and partial least squares (PLS) path modeling approach. Whereas covariance-based structural equation modeling has long been the predominant approach for analyzing latent variable models, PLS path modeling has recently gained increasing recognition, especially in the field of marketing research. In general the prediction oriented PLS path modeling and covariance-based SEM, which has its focus on confirmatory modeling need to be seen as complementary approaches. A soft-modeling approach like PLS path modeling does not rest on any distributional assumptions. Due to the fact that the underlying algorithm estimates OLS regressions for parts (blocks) of the model separately, the complexity of the model does not strongly influence sample size requirements (Henseler et al., 2009). Therefore the approach can be applied to estimate relationships between constructs when sample size is rather small and/or when formative constructs cause potential identification problems in covariance based SEM. (Chin & Newsted, 1999, Tennenhaus et al. 2005). For a more detailed comparison of the two modeling approaches please see for example Schneeweiß (1991) or Tenenhaus et al. (2005). The more predictive and exploratory nature of the approach and the

fact that we have three formative constructs in our model, led to the decision to use PLS path modeling in our empirical study. Our analysis is conducted with the software solution SmartPLS, Version 2.0b (Ringle, Wende & Will 2005).

The structural equation modeling (SEM) was undertaken in two stages (Anderson & Gerbing 1988) starting with the evaluation of the measurement model estimating the structural model. Based on the conceptual underpinnings presented above, all constructs except the sub-dimensions of the environmental uncertainty construct are modeled with reflective scales. The interaction effect of asset specificity and environmental uncertainty (global) is incorporated by a multiple product indicator approach (Chin et al. 2003). All constructs were assessed in terms of internal and external consistency (Anderson et al. 1987; Gerbing and Anderson 1988).

Reflective Scales: All standardized factor loadings were significant and higher than the required minimum level of 0.708, 0.716 being the lowest loading. Thus no refinements on the measurement models were needed. Respectively the average variance extracted (AVE) for each construct exceeded the desirable level of 0.50 (Bagozzi and Yi 1988). Furthermore, the composite reliability of each construct exceeded the 0.70 level (Nunnally 1978), the lowest value being 0.86 for the *relational norms* construct. As the distributional properties of estimates are not known in the partial least squares approach, the assessment of significance needs to be carried out with the help of resampling methods. We used a bootstrap procedure with 1000 re-samples.

Table 1: Construct Reliability measures for reflective operationalizations

	AVE	Composite Reliability	R Square	Cronbachs Alpha
environmental uncertainty	1.000	1.000	0.529	1.000
environmental uncertainty * specific investments supplier	0.745	0.921	0.000	0.905
performance risk	0.615	0.905	0.136	0.875
relational norms	0.599	0.856	0.000	0.777
relational risk supplier	0.718	0.927	0.396	0.902
specific investments customer	0.812	0.945	0.000	0.922
specific investments supplier	0.763	0.928	0.000	0.897

We assessed common method bias using Harman's single-factor analysis. A varimax rotated factor analysis extracted five factors for the multiple item constructs that had an initial eigenvalue above 1

that accounted for 65.3% of the explained variance, the first factor accounting for 26% of the variance. The fact that no single factor accounted for more than 50% of the variance in the data gives an indication that common method bias is not critical (Podsakoff & Organ 1986). We were also able to assure convergent validity with the factor analysis since assessing the cross loadings did not show any item that loaded higher on a different than the intended to measure construct. Discriminant validity between the constructs was assessed using the criterion of Fornell and Larcker (1981) by comparing the respective construct's square root of the AVE to its correlations with every other construct. We could assure sufficient differences between the constructs.

Formative Constructs: To assess the formative higher order construct we evaluated each sub-dimension in terms of potential multicollinearity and therefore calculated the Variance Inflation Factors (VIF) for each sub-dimension with multiple linear regressions. The highest value for VIF was 2.14. Thus we can assume that multicollinearity is not an issue on the first order construct level. Also all factor weights except one for item 4 for the *external uncertainty competitor* dimension were significant on a five percent level.

With an R^2 of 0.53 we can assume a sufficient influence of the sub-dimensions on the second order construct. Also the sub-dimensions *environmental uncertainty supplier* (0.58) and *environmental uncertainty customers* (0.11) have path coefficients that are significant on a 0.01 level. Only the path coefficient for *environmental uncertainty competitors* (0.08) is marginally significant on a 0.1 level for a two-tailed test. For theoretical reasons it is nevertheless retained in the analysis.

3.2 Results of the structural model

Table 2 shows the results of the structural (inner) model. In the second column the path coefficients of the proposed relationships (first column) are documented. As already stated, the assessment of significance is generated with a bootstrap approach. The relevant sample means and calculated standard errors are given in columns three and four. The last column of the table contains information on the effect sizes calculated for significant relationships. According to the literature, values below 0.15 are to be seen as weak, whereas values above 0.35 are strong effect sizes and in between one can assume a moderate effect on the dependent variable (Chin 1998). As one can see, although most of the hypothesized path coefficients are significant on a .01 α -level, the effect sizes vary a lot and are quite

small in many instances. The predictive relevance of the model can be evaluated with the Stone-Geisser criterion (Q^2). According to Fornell & Cha (1994) predictive relevance is given for $Q^2 > 0$. We hypothesized *relational risks* perceived by the supplier and *performance risks* as dependent variables. Values for Q^2 were 0.08 for *performance risk* and 0.27 for *relational risk*. We thus can assume sufficient predictive relevance.

Table 2: Path coefficients, Standard Error and Effect Size Report

Relationships	Coefficient	Sample Mean	Standard Error	Effect Size
Specific investments supplier → performance risk	0.247	0.244	0.045	0.06
Specific investments supplier → relational risk supplier	0.251	0.249	0.040	0.08
Performance risk → relational risk supplier	0.225	0.225	0.034	0.08
Environmental uncertainty → relational risk supplier	0.055	0.056	0.029	0,01
Environmental uncertainty → performance risk	0.108	0.109	0.040	0.01
Environmental uncertainty * specific investments supplier → performance risk	0.050	0.070	0.037	
Relational norms → performance risk	-0.175	-0.179	0.040	0.03
Relational norms → relational risk supplier	-0.447	-0.449	0.033	0.27
Size_supplier_versus_customer → performance risk	0.011	0.033	0.025	
Size_supplier_versus_customer → relational risk supplier	0.029	0.035	0.025	
Specific investments customer → performance risk	0.104	0.105	0.045	0.01
Specific investments customer → relational risk supplier	-0.026	-0.031	0.023	

Performance risks are mainly driven by the *magnitude of specific investments*. Like assumed in hypothesis 1, the more specific investments are made, the more performance risks are perceived.⁵ Specific investments significantly increase perceived relational risks for the investing party, supporting hypothesis 2.

Also hypothesis 3 is supported. As proposed in hypothesis 5, *environmental uncertainty* has an effect on *performance risk* on its own. But opposed to hypothesis 6 no significant interaction effect with the *magnitude of specific investments* can be observed. *Environmental uncertainty* only has .05 α -level

⁵ Due to the fact that we interviewed sales managers we could only ask for the perceived risk by the customer in estimation of the supplier. Nevertheless the factor reliability scores show satisfactory results.

significant effect on *relational risk* and therefore only exerts a marginal influence. Thus hypothesis 4 is only partly supported.

Concerning the control variables *relational risk* is strongly affected by *relational norms*. In a way that the more *relational norms* are involved, the smaller is the *relational risk* perceived by the supplier. In contrast to that the *difference in company size* did not exert a significant influence on the dependent variables. The *magnitude of the specific investments* conducted by the customer also had no significant effect on *relational risk* and a marginal effect on *performance risk*.

The following table summarizes the results regarding our hypotheses.

Table 3: Summary of hypotheses

Hypotheses		
H ₁	The higher the magnitude of partner specific investments conducted by the supplier the higher are the perceived performance risks	✓
H ₂	The higher the magnitude of partner specific investments conducted by the supplier the higher are the relational risks perceived by the supplier.	✓
H ₃	Performance risks drive perceived relational risks.	✓
H ₄	Environmental uncertainty drives perceived relational risks.	(✓)
H ₅	Environmental uncertainty increases perceived performance risks.	✓
H ₆	The interaction between the magnitude of specific investments and degree of environmental uncertainty lowers perceived performance risks.	x

3.3 Review of empirical findings

We were able to confirm five out of the six hypotheses we have deducted. Although the effect sizes have to be regarded as small, we were able to account for an R² of .396 for the *relational risk* construct and an R² of .136 for our newly developed *performance risk* construct. According to Chin (1998) this can be regarded as satisfactory for the former and small for the latter.

Due to the fact that the scale for performance risk was adopted and significantly reduced from a Service Marketing setting to our TCE based research context we nevertheless consider our results as satisfactory in general. We were able to confirm interdependencies between different uncertainty concepts in a large cross sectional setting. We find support for our framework of discriminant yet interdependent TCE dimensions magnitude of specific investments, relational risk and performance risk. Especially the interdependence between performance risk and relational risk can be proven from

a purely TCE based perspective. Therefore it can be concluded that research that is based exclusively on TCE reasoning is not obsolete and can still yield valuable insights concerning interfirm cooperation.

The managerial relevance is to be seen primarily in the analytic differentiation between performance risk and relational risk. Relational risks have to be accounted for and reduced by means of contractual safeguards and the creation of relational norms in terms of establishing a trustful business relationship. Performance risks, on the other hand, have to be reduced by successfully establishing transaction process coordination mechanisms. The former is connected to the dyad: The latter has to be designed by each party itself but has to be constantly improved and adopted to the ongoing or future transaction(s) by permanently considering lessons learned from past transactions.

Transferred to the area of relationship marketing the according tools may also vary according to the risk type. Relational risks can be easier anticipated, the concept of performance risks, in contrast, has to be seen more complex because of the existing interdependencies between the knowledge base of the transaction parties. Thus only joint efforts by both parties have a risk reducing impact especially the reduction of performance risks seems to be the real challenge for relationship marketers.

4. Conclusion

The combination of the arguments above resulted in a refinement of TCE thinking concerning the transaction itself as well as in a better understanding of interdependencies between uncertainty and specificity on a theoretical level. We precised the TCE based grasp of vertical business-to-business relationships by explicitly accounting for different perceived risks and their supposed respective determinants in terms of specific investment dimensions. By this explicit inclusion of different forms of uncertainty and risks we replied to Ménards (2004, p. 368/369) request for incorporating uncertainty in a more sophisticated manner since "...it is clearly a distinct variable that would deserve to be explored in more detail and introduced more explicitly in order to better understand which form of hybrid organization is chosen."

From a theoretical perspective the explicit consideration of property rights theory in combination with transactions and business relationships as defined in this paper helps to further overcome the gap

between the efficiency and the effectiveness dichotomy that evidently lead to the combination of TCE and RBV approaches within the last years. Because it seems possible to describe the distribution of property rights in the transaction process as well as in the transaction outcome (Kleinaltenkamp & Jacob 2002), an abstraction from product, firm and other categories becomes possible. Relationships similar to hierarchic governance are connected to high transaction costs, severe uncertainties and incomplete contracts while dyads closer to pure market arrangements are linked to low transaction costs, minimal risks and standardized complete often implicit contracts. The accumulation of critical resources will mostly be connected with the former. Further research on transactions and relationships in business-to-business marketing will thus hopefully help to integrate efficiency (transaction cost optimizing calculus) and effectiveness (accumulation of capabilities and strategic resources). Additionally the plural form thesis (e.g. Cannon, Achrol, & Grundlach, 2000; Bradach, 1997)⁶ as well as the findings of the Contemporary Marketing Practices Group suggest that "...within a customer/product type, firms choose to compete in different ways." (Coviello, Brodie, Danaher, & Johnston 2002, p. 42) and succeed independently of the governance type in place still need further explanation. To further investigate these issues dynamic theoretical approaches have to be used in combination with the refined governance branch of TCE in future empirical research as well. Research on property rights attenuation versus concentration possibly in combination with path dependence theory and market process theory within different business-to-business marketing regimes might be applicable here (Haase & Kleinaltenkamp 2011).

With regards to operationalization and empirical issues our approach can be understood as a starting point. We were able to confirm most of our deducted hypotheses. Nevertheless the relative low effect sizes and the rejection of two of our proposed hypotheses leave certain questions unanswered and raise new ones. E.g. the question remains whether the relationships between the constructs are linear. Also other potential antecedents for the distinct risk types will have to be identified in future research. For example the dynamic nature of the quasi rent concept seems to be one potential antecedent of the relational risk concept that needs further exploration. Furthermore more

⁶ Note that the term "plural forms" is understood in different ways within the extant literature (Heide 2003, Fn. 1). We follow Cannon et al. (2000) who apply the term to an inter-organizational relationship perspective.

sophisticated and complete uncertainty scales will have to be applied to the different uncertainty dimensions.

The connection to governance outcomes is necessary to test whether the distinct risk concepts play a mediating role between governance forms and transaction dimensions. Last but not least we were only able to use monadic data. Though we tried to account for common method variance dyadic data, especially in the area of research in relationship marketing, seem to be more promising. A future research agenda thus may contain different and, more importantly, interdisciplinary research areas, empirically as well as theoretically.

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Appendix:

Measures	Extant Literature
<p>Magnitude of specific investment by supplier: <i>reflective</i> (strongly disagree – strongly agree)</p> <ul style="list-style-type: none"> All in all we have invested quite a bit specifically for the last closed deal with this particular customer. All in all we have conducted quite a few adjustments specifically for that last closed deal with this particular customer. We have undertaken significant investments specifically for that last closed deal with this particular customer. The specific investment in terms of time and money was quite high for the last deal with this customer. 	<p>New items</p>
<p>Magnitude of specific investment by supplier: <i>formative</i> (not at all – to a high degree)</p> <ul style="list-style-type: none"> Specifically for the last deal with this customer assigned certain personnel. Specifically for the last deal with this customer we expanded our production and/or inventory. Specifically for the last deal with this customer we have invested in capital assets. Specifically for the last deal with this customer we have invested in specific Know-How (e.g. certain trainings) in terms of time and money. Specifically for the last deal with this customer we have conducted significant site specific investments like location decisions or –investments. 	<p>Rokkan/Heide/ Wathne 2003 Cannon/Achrol/ Grundlach 2000</p>
<p>Magnitude of specific investment by customer: <i>reflective</i> (strongly disagree – strongly agree)</p> <ul style="list-style-type: none"> All in all the customer has invested quite a bit specifically for the last closed deal with us. All in all the customer conducted quite a few adjustments specifically for that last closed deal with us. The customer has undertaken significant investments specifically for that last closed deal with us. The specific investment by the customer in terms of time and money was quite high for the last deal with us. 	<p>New items</p>
<p>Magnitude of specific investment by supplier: <i>formative</i> (not at all – to a high degree)</p> <ul style="list-style-type: none"> Specifically for the last deal with us the customer assigned certain personnel. Specifically for the last deal with us this customer expanded its production and/or inventory. Specifically for the last deal with us the customer has invested in capital assets. Specifically for the last deal with us the customer has invested in specific Know-How (e.g. certain trainings) in terms of time and money. Specifically for the last deal with us this customer has conducted significant site specific investments like location decisions or –investments. 	<p>Rokkan/Heide/ Wathne 2003 Cannon/Achrol/ Grundlach 2000</p>
<p>Amortization horizon (variable for grouping purposes only) (yes – no)</p> <ul style="list-style-type: none"> Has the sum of the specific investments amortized within the course of the last transaction with this customer? Will the sum of the specific investments be amortized after the transaction with this customer has been successfully finished? Has the sum of the specific investments conducted by the customer amortized for him within the course of the last transaction with you? Will the sum of the specific investments by the customer be amortized for the customer after the transaction with you has been successfully finished? 	<p>New items</p>

<p>(very few – quite many)</p> <ul style="list-style-type: none"> • How many transactions will probably be needed to amortize the specific investments for your company? • How many transactions will probably be needed to amortize the specific investments for your customer? 	<p>New items</p>
<p>Relational risk (very low – very high) We consider</p> <ul style="list-style-type: none"> • the risk that one party does not always act in accordance with the contract(s) as... • the risk that one party promises things without actually doing them later as... • the risk that one party will try to take advantage of “holes” in contracts to further their own interests as... • the risk that one party will lie about certain things as... • the risk that the one party will use unexpected events to extract concessions as... 	<p>Rokkan/Heide/ Wathne 2003</p>
<p>Performance risk (very low – very high): (3 items each party) We consider/the customer considers</p> <ul style="list-style-type: none"> • the risk that we do not perceive the customer’s expectations in the right way because of the complexity of the transaction as... • the risk that we do not specify the perceived customer expectations in the right way because of the complexity of the transaction as... • the risk that the customer will communicate another expected product than he really needs as... <p>Relational norms (very inaccurate description – very accurate description)</p> <ul style="list-style-type: none"> • Both sides are willing to make cooperative changes. • One party will not take advantage of a strong bargaining position. • We do not mind owing each other favours. • No matter who is at fault, problems are joint responsibilities. <p>External uncertainty global (monthly – more seldom than every 4 years): reflective single indicator</p> <ul style="list-style-type: none"> • How often are changes in the marketing strategy of your business unit necessary? <p>External uncertainty (monthly – more seldom than every 4 years): formative</p> <ul style="list-style-type: none"> • How often are changes in the following parts of your business unit’s marketing strategy necessary? <ul style="list-style-type: none"> - product - place - promotion - price 	<p>Zeithaml/Berry/ Parasuraman, 1988</p> <p>New Item</p> <p>Cannon/Achrol/ Grundlach 2000</p> <p>Achrol/Stern 1988</p>

<p>External uncertainty competitor (monthly – more seldom than every 4 years): formative</p> <ul style="list-style-type: none"> • How often are changes in the following parts of your competitor’s marketing strategy necessary? <ul style="list-style-type: none"> - product - place - promotion - price <p>External uncertainty customers (monthly – more seldom than every 4 years): formative</p> <ul style="list-style-type: none"> • How often do your customer’s preferences change concerning the following issues? <ul style="list-style-type: none"> - product - particular suppliers - price 	<p>Achrol/Stern 1988</p>
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