Competitive Paper submitted to 17th IMP Conference, 9th - 11th September 2001

at Norwegian School of Management BI

Core Competencies, Vertical Integration and Governance Costs in Buyer-Supplier Relationships

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January, 2001

ABSTRACT

Current inter-organizational research applies various approaches to the study of inter-firm governance and business strategy. This study applies the lenses of governance and competence to the study of vertical integration and governance performance in business-to-business relationships. Building on transaction cost economics (TCE) and the competence perspective (CP), the authors examine significant antecedents of governance costs within buying firms and ex post transaction costs in on-going buyer-supplier relationships. The study focuses in particular on governance performance of inter-firm organization by investigating the association between vertical integration on governance costs.

In accordance with TCE-reasoning, the empirical findings demonstrate that employment of specific assets in the buying firms is associated with substantial ex post transaction costs and intention of vertical integration. Further, high core competence in the buying firm actually reduces internal governance difficulties and enforces the intention of vertical integration. Accordingly, the study demonstrates both the theoretical foundation and empirical support for that TCE and CP are complementary explanations of vertical integration.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Closeness to Core Competence, Governance Costs and In-House Production

Evolutionary economics (EE) (Nelson & Winter, 1982) holds that when firms grow by vertical integration they grow in a direction of something closely related. Resource based theory (RBT) and the core competence approach argue that firms will expand in those areas where their existing competence is the foundation for a firm's value creating process. These two sources are the theoretical departure for the expected relation between buyer's CCC and vertical integration. While EE gives the basic foundation for the understanding of economic actors' limited capacity to perform new and different tasks, RBT gives an understanding of those competencies most likely to generate rents. Some of the barriers and problems that impede effective competence accumulation for the buyer in buyer-vendor relations will be overcome if the buyer has CCC regarding the activity in question. When CCC is high, the buyer can use his existing competence as a guide in learning processes and in imitating relevant competence from the vendor. The coding problem (available knowledge from the vendor must be decoded by the buyer), the available problem (the vendor refuses to share his coded knowledge with the vendor), and the tacit problem (not all knowledge embedded in the vendor's routines is articulated in written documents), will through internal learning and imitating processes be reduced if the buyer has CCC. When CCC is low, in contrast, it will take considerable time and spending of resources before the buyer will be able to absorb and learn the relevant knowledge necessary to effectively perform the activity. As previously argued by scholars in the competence perspective, if an integration of a new activity is not linked to the firms' existing competence base they will face high production costs. A relatedness will provide gains from the redeployment of existing competence (Penrose, 1959) as well as give the opportunity to economize on intraknowledge and information transfer. Thus, we propose the following hypothesis:

H_1: The buying firm's closeness to the core competencies of a specific supplier firm is positively related to the buying firm's intention to vertical integration.

By using the existing competencies and routines, firms are able to economize on what we call *internal governance costs* in addition to production costs. Scholars in the competence perspective have previously emphasized the latter (cf H1), while the former has not been an issue so far[1]. Using Hennart (1982) as the connecting bridge, however, both TCE and CP may acknowledge the prospect of opportunistic behavior, even though the explanations of what prevents or hampers opportunistic behavior differ across these theoretical frameworks. Both theories state that intrafirm conditions can prevent opportunistic behavior. However, while Williamson argues that opportunistic behavior is hampered by the use of fiat, Hennart emphasizes that the intrafirm common codes act as a condition that produces trust and decreases the degree of opportunistic behavior. If the activities to be performed fit the code, the acquiring and transmitting of information are efficient (Arrow, 1974). If new activities do not fit existing codes, a deficiency in using them will arise, and such conditions increase the potential of opportunistic behavior inside firm boundaries (Hennart, 1982). This is an important distinction, because the TCE-view implies that increasing potential for opportunistic behavior only can be hampered by increasing costs of safeguarding, which "are likely to adversely affect [the firm's] performance" (Ghoshal & Moran, 1996:16).

By the development of common codes within the firm, the opportunistic behavior is hampered without using the organizational mechanism of fiat (Hennart, 1982), or, the parties' 'deep knowledge' makes firms able to efficiently utilize the power of fiat. This latter issue is not theorized by TCE. In sum, Hennart's theory is complementary to TCE. The theory specifies the mechanisms through which the costs of hampering opportunistic behavior may be reduced. The theory is also complementary to the competence perspective as it highlights that existing common codes or routines as a part of a firm's competence base, are the main mechanism that reduces the employees possibilities to cheat.

Following Hennart (1982), when introducing completely different undertakings, the degree of opportunistic behavior may increase, because the parties in-house lack the main mechanisms to codify the accomplishment of the new activity. One aspect of common codes is to know who knows what and how different activities should be organized (Kogut & Zander, 1992). If completely new techniques and routines have to be developed in order for a firm to perform

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[1] *The competence perspective does not consider the exchange costs involved in the evaluation of integrating av new activity (Winter, 1988; Collis, 1991). The view is strictly based on the assumption that it would be more efficient to produce something where the firm already has some degree of relevant knowledge. compared with producing something not related to current competence. Foss (1996a), however, sketches some of the same arguments as in his paper. He states that firm will be confronted with increasing agency costs when moving away from its core competence, "as increasingly unfamiliar activities produce more severe moral hazard and adverse selection problems" (p. 474.).*

an activity, firms will surely lack this knowledge. This will impair the ability to detect cheating, and the management will miss 'the detailed continuous information' regarding the employees. In such situations firms will be exposed to many of the same problems as in markets. This argument may also explain why Nelson & Winter (1982) assert that firms' existing routines are the stabilizing forces in firms and represent a "truce" in hampering intraorganizational conflicts. Introducing new undertakings that cannot be supported by existing routines, however, would require introduction of quite new routines. In such situations selfish motives are relevant, because the management's ability to detect cheating will be reduced (Hennart, 1982).

Performing completely different undertakings is expected to increase the transaction costs because the prospect of opportunistic behavior of actors inside the firm will increase if the management lacks the common codes necessary to detect cheating (Hennart, 1982). Similarly, if the existing codes and routines support the performance of a new activity substantially, there are less opportunities for moral hazards and easier to coordinate in-house production. Thus, increasing CCC will reduce internal transaction costs or governance costs, while internal governance costs is expected to affect the intention of in-house production negatively. Based on this reasoning, we propose the following two hypotheses:

H_2: The buying firm's closeness to the core competencies of a specific supplier firm is negatively related to the governance costs associated to vertical integration.

H_3: The governance costs associated to in-house production are negatively related to the buying firm's intention to vertical integration.

Asset Specificity, Ex-Post transaction Costs and the Intention of In-House Production

Investments in specific assets will create a safeguarding problem because of the vulnerability due to the potential opportunistic behavior of the other actor. Transaction specific investments will thus increase the potential for opportunistic behavior and thereby increase the costs of safeguarding (Williamson, 1985), i.e., increasing transaction costs. Consequently, *ex-post* transaction costs occur because of actors' opportunistic behavior and bounded rationality, combined with high asset specificity situations. Following Williamson's (1985) underlying proposition, we state the following:

H$_4$: The buying firm's transaction specific investments are positively related to transaction costs associated with the specific supplier firm.

Transaction costs are supposed to create a lock-in effect caused by a fundamental transformation ex-post (Williamson, 1985). The lock-in effect will shape a condition where autonomous trading conditions *ex-ante* will be supplanted by unified ownership (Williamson, 1985). The underlying TCE argument for this proposition is that with increasing degrees of transaction cost, the point will be reached where the transaction costs loss will exceed the extra production costs that are supposed to exist internally. Based on Williamson (1979, 1981, 1985), we propose the following hypothesis:

H$_5$: Transaction costs associated with the specific supplier firm are positively related to the buying firm's intention to vertical integration

The five hypotheses form the model shown in Figure 1.

METHOD

Context

The chosen industry is the Norwegian hydroelectric power production industry. Up to 1991 the industry was organized as a natural monopoly, but is today one of the most competitive power markets in the world. A major and central part of the power stations' activities concerns the maintenance activities of the stations. The governance of mechanical maintenance activities is the focus of this study. This part of the industry has never been regulated, as the case was for distribution of electric power.

This study examine attributes of the economic exchanges between buyers and suppliers in the power station industry and regards buyer's make or buy decision of the maintenance activity in question. To acquire variation in the independent variables the selection of transactions (i.e., activities) for the power station was based upon a choice of the maintenance activity that most recently has been completed by an external supplier.

Measures

The measurement items used in this research are presented in the Appendix. All items were presented with seven point scales. *Vertical integration* is measured by four questions adapted from the hypothetical choices approach developed by Whyte (1994), where the unit is asked to consider to which extent it will continue to purchase the goods from the vendor or if he will perform the activity in-house. According to Whyte, hypothetical measures are a reasonably valid indicator of the vertical integration decision.

Core competencies are very difficult to measure directly on a consistent basis across different industries (Verdin & Williamson, 1994). The measures of buyer's *closeness to core competence* in this study reflect this, and may not be appropriate indicators across different industries. Closeness to core competence is operationally defined as the buyer's perceived degree of closeness to the vendor's competence. Three items were developed to reflect different kinds of closeness to core competence.

The *buyer's transaction specific investments* scale describes the extent to which the buyer has made specific investments tailored to the specific relation. Thus, a high amount of specificity represents sunk costs that have little value outside of a particular exchange relationship. Williamson (1985) identifies four types of specificities, of which one (human asset specificity) is of most relevance in the power maintenance industry. Human asset specificity is also the one most commonly assessed in empirical studies (Rindfleisch & Heide, 1997). Human assets specificity refers to specialized investments in human competence tailored to the specific transaction. The scale is adapted from previous empirical research by Stump & Heide (1995), Haugland (1994) and Buvik (1995).

Buyer's transaction costs are measured by using the scale developed by Buvik (1995). The scale approaches to which extent the transaction costs exceed the expectations of the transaction, accounting for that different kinds of activities have different levels of government costs. Six questions measure transaction costs. Similarly, three measures are developed for the *expected internal transaction costs* if the activity was to be done in-house. The three items are selected from the scale of the buyer's transaction costs and adapted to fit the expected transaction costs that may occur in the organization when an activity is vertically integrated.

Sampling Procedures

118 companies and accompanying 411 business units (i.e., power stations) that produce electric power in Norway, were identified, and these units represent the sampling frame. Data were collected from the buyer side of the dyad. Each of the business units was informed to select the last activity carried out by a vendor in whom the informant was well informed. The data were collected using a questionnaire. 116 responses from 75 companies were obtained resulting in a response rate of 64% for the companies and 28% for the power stations.

RESULTS

The data analysis was done using structural equation modeling (Lisrel 8.30). The approach allows the simultaneous investigation of the measures and the hypothesized model.

Measurement Model

The initial measurement model was evaluated using the guidelines provided by Anderson and Gerbing (1988). To meet the requirements of unidimentional measures some items were deleted from the analysis. These items are indicated in the Appendix. After removing those items, the measurement model had a good fit. The chi square value for the model was 68.11 with 80 degrees of freedom and a p-value of .83. The other goodness of fit indices were represented by a CFI of 1.0, NNFI of 1.02, and a RMSEA of .00 with a p-value for close fit of 1.0. The fit indices indeed meet the requirements for a well fitting model (Hu and Bentler 1999; Browne and Cudeck, 1993).

The reliability information is presented in Table 1 using standardized coefficients. The composite reliability varied from .76 to .91 indicating a satisfactory level of reliability (Bagozzi and Yi, 1988). The resulting variance covariance matrix for the test of the structural model is presented in Table 2.

Test of Structural Model

The hypothesized model in Figure 1 had a satisfactory ability to explain the observed variance covariance matrix. The chi-square for 84 degrees of freedom was 81.05 (p=.57), the RMSEA was .00 and a p-value for close fit of .98, the NNFI was 1.00 and the CFI was 1.00. The fit indexes are above the cutoffs for good fit (Hu and Bentler 1999. All of the hypothesized direct effects were supported (please see Table 2) and found significant at the 1% level. No additional paths were suggested in the modification indices information, and thus, add additional support to the structure of the hypothesized model. Moreover, the indirect effects of the exogenous variables on vertical integration were significant at 5% level for buyer's TSI and at 1% level for buyer's CCC.

DISCUSSION

In a review of transaction costs economics, Rindfleisch & Heide (1997) summarize the research needs within the transaction costs framework. *First*, further research is needed to clarify the role of production costs vs. transaction costs in determining appropriate governance structures. *Second*, research is needed to assess the costs of internal organization, i.e., to what degree transaction costs may exist within firms. *Third*, they ask for studies that address the implications of deviations from opportunistic behavior. Additionally, Shelanski & Klein (1995) criticize empirical studies for not testing alternate hypotheses that may also fit the data as well as the TCE-variables. Thus, they argue that there is a need for studies that explicitly compare TCE derived hypotheses with hypotheses derived from other perspectives. From a competence-based point of view, Barney (1996) asks for studies that integrate a competence-based view with transaction cost economics. This paper, thus, attempts to accomplish the research needs addressed from TCE and the competence perspective. Consequently, the study may be seen as an extension of both the competence perspective as well as TCE.

The main contribution of the study lies in the theoretical arguments and the empirical test of the synthesis of the two addressed perspectives. Few studies have empirically examined the TCE-proposition that investments in asset specificity increase transaction costs (Rindfleisch & Heide, 1997). To our knowledge, no studies have tested the association between *ex-post* transaction costs and vertical integration. Additionally, no studies have theoretically

elaborated nor tested the propositions that closeness to current competencies decrease internal governance costs, or the association between internal governance costs and vertical integration.

We have shown how important insight from the competence perspective can be incorporated into a model intended to explain vertical integration. The competence perspective, like TCE, assumes actors to be bounded rationally. This is explicitly discussed by Nelson & Winter's (1982). Moreover, the assumptions underlying the resource-based perspective are that firms are heterogeneous with respect to the resources they control, and that resources are not perfectly mobile across firms (Barney, 1991). If the actors were perfectly rational, resources would be mobile and competitive advantage, because of heterogeneity (out of equilibrium), would only be temporary. Accordingly, the industry would in a short-term perspective be brought back to equilibrium. What we have done in this paper is to incorporate and emphasize the issue that firms have production constraints as well as contractual constraints. This argument clearly deviates from TCE, as it sees firms as existing only because of their ability to attenuate opportunism (Conner, 1991; Ghoshal & Moran, 1996). Accordingly, we have emphasized the issue that firms are repositories of knowledge and skills, which in some circumstances provide firm advantages over autonomous market exchange with respect to efficiency and adaptation.

Moreover, we have shown that in order to throw light on the actual costs firms are exposed to, the assumptions of opportunism must also be addressed in order to predict the most efficient governance form. In two respects, our assumption of opportunism deviates from TCE. First, we distinguish between opportunism as an attitude (assumed present), and opportunism as a kind of manifest behavior (opportunistic behavior). This distinction is absent in Williamson's formal theorizing (Ghoshal & Moran, 1996). Second, we are able to specify the mechanisms (i.e. the use of common codes) through which internal opportunistic behavior is reduced. Accordingly, our assumption of opportunism also rests on arguments from the competence perspective.

As shown above, we have used extensive arguments from both perspectives when outlining the synthesis. Consequently, we do not view the theoretical arguments and the model developed in this study as a modification of the TCE-program, but rather as a synthesis of the competence perspective and TCE. According to Knudsen (1996:1), "it is probably not feasible at this point to describe the competence-perspective as a coherent research program, or

paradigm, characterized by a common hard-core and positive heuristics." However, by connecting arguments that are inherent in the competence perspective and combining these with TCE-arguments, we have also contributed to showing how further progress in outlining the behavioral assumptions of the competence perspective can be done.
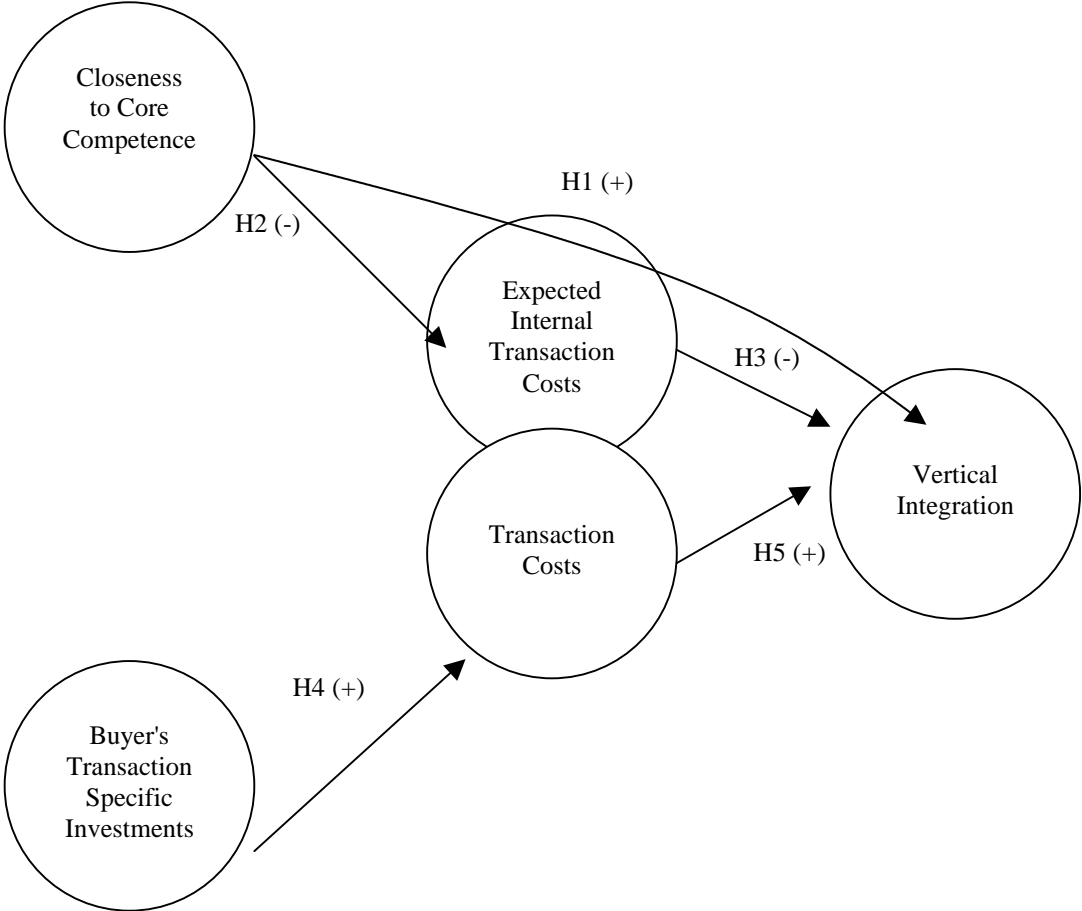
FIGURE 1:
THE MODEL

TABLE 1

Reliability information for the measurement model

Item[a]	Factor loading[b]		T-value	Error term[b]		T-value	Item reliability	Average variance extracted	Composite reliability
Vertical Integration								0.78	0.91
Item 1	$\lambda_{1,1}$	0.84	10.87	$\theta_{1,1}$	0.29	5.99	0.71		
Item 3	$\lambda_{2,1}$	0.89	11.80	$\theta_{2,2}$	0.21	5.12	0.79		
Item 4	$\lambda_{3,1}$	0.91	12.38	$\theta_{3,3}$	0.16	4.31	0.84		
Closeness to Core Competences								0.74	0.89
Item 1	$\lambda_{4,2}$	0.69	8.28	$\theta_{4,4}$	0.52	7.08	0.48		
Item 2	$\lambda_{5,2}$	0.89	11.88	$\theta_{5,5}$	0.20	4.78	0.80		
Item 3	$\lambda_{6,2}$	0.96	13.48	$\theta_{6,6}$	0.07	1.83	0.93		
Buyer TSI								0.54	0.76
Item 1	$\lambda_{7,3}$	0.43	4.47	$\theta_{7,7}$	0.82	7.28	0.18		
Item 2	$\lambda_{8,3}$	0.98	9.99	$\theta_{8,8}$	0.03	0.24	0.97		
Item 3	$\lambda_{9,3}$	0.69	7.18	$\theta_{9,9}$	0.52	5.30	0.48		
Expected Internal Transaction Costs								0.63	0.84
Item 1	$\lambda_{10,4}$	0.78	9.12	$\theta_{10,10}$	0.40	5.39	0.60		
Item 2	$\lambda_{11,4}$	0.77	9.04	$\theta_{11,11}$	0.40	5.46	0.60		
Item 3	$\lambda_{12,4}$	0.83	9.89	$\theta_{12,12}$	0.32	4.54	0.68		
Transaction Costs								0.63	0.84
Item 1	$\lambda_{13,5}$	0.82	9.58	$\theta_{13,13}$	0.33	4.37	0.67		
Item 2	$\lambda_{14,5}$	0.85	10.07	$\theta_{14,14}$	0.27	3.61	0.73		
Item 3	$\lambda_{15,5}$	0.71	8.04	$\theta_{15,15}$	0.50	6.12	0.50		

Note. [a] : The item abbreviation refers to the item list in Appendix; [b] : Standardized coefficients

Table 2

STRUCTURAL MODEL ESTIMATION RESULTS

Hypothesis	Path	Estimate
	Direct Effects	
H1	Closeness to Core Competencies → Vertical Integration	0.51*
H2	Closeness to Core Competencies → Expected Internal Transaction Costs	-0.57*
H3	Expected Internal Transaction Costs → Vertical Integration	-0.28*
H4	Buyer TSI → Transaction Costs	0.28*
H5	Transaction Costs → Vertical Integration	0.23*
	Squared Multiple Correlations	
	Vertical Integration	0.57
	Expected Internal Transaction Costs	0.33
	Transaction Costs	0.08

χ^2 (84) = 81.05 (P = 0.57)   RMSEA = 0.0 (P(close fit) = 0.98)   NNFI = 1.00   CFI = 1.00

*$p < 0.01$; n = 114

Appendix

SCALE ITEMS

Vertical integration (adapted from Whyte, 1994)
In the longer term, the principal responsibility for carrying out the maintenance activity will be executed by our own organization.
If the need for maintenance should arise unexpectedly, the activity will next time be carried out internally in our own organization.
If the need for maintenance can be foreseen, the activity will next time be carried out by our own organization.
It is very likely that the activity next time will be carried out by our own staff. *

Buyer's closeness to core competence (new scale)
Our unit's knowledge can be compared with the knowledge our supplier's employees possess in carrying out the activity
Our unit's skills are suitable for carrying out the activity, compared with our supplier's skills.
Our routines and procedures are suitable to accomplish the activity approximately as well as our supplier

Buyer's human transaction specific investments (adapted from Stump & Heide, 1995; Haugland, 1994; Buvik, 1995)

We have spent significant resources in reorganizing the power production in connection with this particular co-operation
Employees working together with our supplier were given spesialized training*
During the collaboration we brought into notice significant aspects of our supplier's operations.
We have spent significant time to acquire knowledge about our supplier's technical standards

Transaction costs (adapted from Buvik, 1995)
We used too much time controlling the supplies of this supplier*
It was time-consuming and difficult to get necessary verification of production performance and costs from this supplier
The co-ordination and governing of the relationship with this supplier was very costly
Our firm did not manage to utilize the skills and production resources of this supplier very well*
It was difficult to agree with this supplier about specifications of products and services
Negotiations about price and payment terms with this supplier proved time-consuming*

Expected transaction costs if integrating the transaction (adapted from Buvik 1995)
We will use a lot of time to control and monitor our own employees when they carry out the activity
It may prove difficult and time-consuming to make agreement with our employees about specifications and procedures for performing the activity
The co-ordination and governing of the employees will be very costly

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* indicates that the item has been deleted in the measurement validation procedure.