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THE MULTIDIMENSIONALITY OF THE PHYSICAL TRANSACTION SPECIFIC ASSET CONSTRUCT

by

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Abstract

Transaction cost economics has been applied to a wide range of research areas ; however, the definition of transaction specific asset (TSA) has been overlooked. Content analysis of previous research suggests seven dimensions (specificity, magnitude, durability, utility, importance, risk, and visibility) and six types (site, human, physical, dedicated, brand name, and temporal assets) of TSAs. An empirical examination (using confirmatory factor analysis) performed on the data from a sample of 361 manufacturers in SIC 367 (from U. S. A.) confirms the multidimensionality of the TSA construct.

Key Words

transaction cost economics, transaction specific asset, asset specificity, physical asset, multidimensionality, magnitude, durability, risk, utility, visibility.

Introduction

In the past 10 years, there has been a lot of research in marketing, strategy, economics, and law that has been based on the principles of transaction

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cost economics (TCE). Transaction cost economics (Williamson 1975, 1985), is the dominant theoretical framework employed in the literature to model variations in governance structures. Transactions can be managed using alternative governance structures. If the firm performs the transaction within its boundaries through bureaucratic control and coordination, the governance structure being utilized is a "hierarchy". If the transaction is performed outside the firm through market coordination and outsourcing, the governance structure being utilized is a "market". If the transaction is performed jointly by economic units within the boundaries of and economic units outside the firm, the governance structure being utilized is a "hybrid". TCE advocates the selection of the governance mode that minimizes the sum of the cost of performing the transaction within the boundaries of the firm (i. e., production costs) and the cost of managing the transaction if it was performed outside the firm's boundaries (i. e., transaction costs).

A key characteristic that affects transaction and production costs is the presence of a transaction specific asset (TSA). A TSA is an asset (either tangible or intangible), that has been tailored for a particular transaction and cannot be easily transferred. TSA is a critical construct in the TCE framework. According to Williamson, transaction specific assets, the frequency of contracting, and environmental uncertainty are the three main factors that differentiate one transaction from another. However, "...the first is the most important and most distinguishes transaction cost economics from other treatments of economic organization..." (Williamson, 1985, p. 52).

The numerous applications of the TCE framework attest to its significance and generalizability. The marketing applications of TCE include vertical integration decisions (Monteverde and Teece 1982), sales organization decisions (Anderson 1985 ; John and Weitz 1989), the structuring of distribution channels and purchasing decisions (Dwyer and Oh 1988 ; Heide and John 1988, 1990 ; Noordewier, John, and Nevin 1990), market entry decisions (Anderson and Coughlan 1987 ; Klein, Frazier, and Roth 1990), decisions involving the organization of marketing activities (Ruekert, Walker, and Roering 1985), the impact of the environment on the political economy of channels (Achrol, Reve, and Stern 1983), and the study of long-term relationships (Jackson 1985 ; Ganesan 1994).

Despite its widespread use, however, there are several problems with research involving TCE. A key problem is the absence of a commonly accepted operationalization of transaction specific assets—a fundamental construct on which the propositions of TCE are based. Williamson alludes to the "de-

gree of asset specificity," i. e., the extent to which assets are highly specific, mixed, or nonspecific, as the primary dimension of a TSA. However, the literature reveals other dimensions that, though not explicitly recognized, have been used.

It is time to synthesize previous research and refine the TSA construct. The purpose of this research is to help develop a scale for the TSA construct and show its multidimensionality. "**Theoretically**, this improved understanding of the dimensions underlying TSA will help develop a better conceptual definition and thereby help validate the TSA construct. Such construct validation and accurate measurement of associated variables will contribute towards theory development and testing (Peter 1981 ; Churchill 1979) and, thereby advance our use of TCE" (Lohtia, Brooks, and Krapfel 1994). This research is also **managerially** significant. A seller who is interested in investing in a TSA will be able to use the additional dimensions of a TSA to signal commitment to a buyer. A seller can identify the dimensions of a TSA that are most critical to the buyer and use the appropriate dimension or dimensions to strongly signal commitment to the buyer.

The paper begins with a brief discussion of the research objectives. This is followed by the research methodology used in this research to develop and validate a multidimensional scale for the transaction specific asset construct. Finally, a discussion of the research results and research implications are presented.

Research Objectives

One difficulty in applying transaction cost economics that appears to have been overlooked in the literature is the definition of the focal construct, transaction specific assets. Different researchers have operationalized the construct in different ways. This paper focuses on addressing this drawback.

In his work, Williamson (1985, 1988, 1991) suggests that asset specificity can be of six **types** : (1) **site specificity** which refers to situations in which successive production facilities are located close to each other ; (2) **physical asset specificity** or investments in specialized equipment ; (3) **human asset specificity** that arises because individuals acquire specific skills by working for an organization ; (4) **dedicated asset specificity** which refers to an investment in reputation ; (5) **brand name capital** which refers to an investment in reputation ; and (6) **temporal specificity** which has been described as a type of site specificity where timely responses from on-site human assets

is critical.

In his definition of TSAs, Williamson also implies that each of these types of assets may be characterized by two **dimensions**: the degree of asset specificity and the magnitude of the asset. On the degree of asset specificity dimension assets could be classified as highly specific, mixed, or nonspecific. However, Williamson does not elaborate on the magnitude of the TSA construct. Furthermore, he provides insufficient direction on how to actually measure TSAs.

Even though Williamson refers only to the degree of asset specificity and magnitude in discussing TSAs, research suggests that there are other dimensions that have intentionally or unintentionally been included by researchers in their conceptualizations and operationalizations of the construct. For example, Heide and John (1988) operationalize a TSA by the time and effort agency sales people spend to learn about the principal's organization and thus use a "large vs. small" connotation in addition to the degree of specificity. Ganesan (1994) also alludes to magnitude and specificity in his retailer and vendor TSA scales. Gatignon and Anderson (1988) introduce an element of risk in their operationalization of the TSA construct.

Joskow (1987) operationalizes a TSA as the "importance" of the investment. Anderson and Coughlan (1987) allude to the "value" of the unique knowledge and working relationships accumulated over time as being an important determinant of a firm's channel choice. Thus in addition to the degree of asset specificity, magnitude, risk, importance, and value may only be some of the other dimensions of the TSA construct.

Based on the content analysis of research in marketing, strategy, law and economics, Lohtia, Brooks, and Krapfel's (1994) work suggests that the TSA construct is multidimensional. The seven dimensions of transaction specific assets identified by them were specificity of the investment, magnitude of the investment, durability of the investment, importance of the investment, utility of the investment to the other party, visibility of the investment, and risk assumed by the investing firm.

Lohtia, Brooks, and Krapfel's analysis of the empirical and conceptual operationalizations clearly suggested that six of the seven dimensions identified in the content analysis have been recognized in prior work. Specificity and magnitude have both received considerable research attention; importance, utility, durability, and risk have also received the attention of researchers, but to a lesser degree. Although visibility was identified in the development of the coding scheme, the incidence rate of visibility was ex-

tremely low and there was no convergence among judges on cases of this dimension. Empirical operationalizations have addressed three of the six dimensions of TSAs which have been considered conceptually. Specificity has been measured most often, but magnitude and risk have also been addressed.

The primary purpose of this research is to test for the multidimensionality of the TSA construct. The research focuses on one type of TSA—physical assets, common in the component manufacturing industry. In the next section we present the methodology used in this research. This is followed by a discussion of the research results and research implications.

Methodology

Sample

Data were collected from manufacturers of electronic components, parts, and accessories (SIC 367) located in U.S.A.. This SIC code was selected because of the frequency with which prior researchers have collected data on TCE variables from respondents in this category (Heide and John 1990, 1992 ; Weiss and Anderson 1992). Furthermore, data collection was limited to one SIC code in order to limit extraneous variation. However, manufacturers in this SIC category produce a variety of products. A mailing list with 2100 manufacturers representing organizations nationwide in SIC category 367 was purchased from Dun and Bradstreet.

Questionnaire Development and Administration

The research focused on developing and testing measures for a physical TSA. The decision to focus on this type of TSA was based on its popularity in research conducted in TCE over the past 10 years (Lohtia, Brooks, and Krapfel). Furthermore, interviews with the industry members revealed that this was the most commonly found TSA in the components, parts, and accessories industry.

The questionnaire items were drawn from three sources. Items were drawn from previous research in the area (based on the content analysis performed by Lohtia, Brooks, and Krapfel) and with interviews with members in industry. Additional items were generated by the researchers. Once a large pool of items had been generated a group of 15 marketing professors and 10 Ph.D. students who were familiar with transaction cost economics separated the items into categories based on the seven proposed dimensions. They also helped to clarify the meaning of the items. Items which were misclassified by a majority of the researchers were dropped from the study. A questionnaire

was developed using the remaining items. Based on discussions with these researchers, it was concluded that the importance of the investment was not conceptually distinct from utility. Items related to these two dimensions were therefore combined. This resulted in hypothesizing and testing a six dimension model—specificity, magnitude, risk, utility, durability, and visibility.

The interviews with industry personnel revealed that the individual best able to provide information on investments made in physical assets by the manufacturer would be the sales manager. The questionnaire was then pretested with three groups of 100 sales managers each. The sales managers were requested to focus on a relationship in which their firm had made an investment in physical assets for customers, and they completed the questionnaire with respect to dimensions of the TSA. They also were requested to provide information about their firm and the industry. The pretests were conducted so that the wordings of the items could be refined and so that problem items could be identified. Items which were commonly misunderstood or were frequently skipped were removed from the questionnaire.

The final questionnaire was sent to a random sample of 1800 sales managers. A follow-up letter was mailed one week after the initial mailing. 380 responses were received for a response rate of 21 percent. Of these 361 were sufficiently complete and were included in the analysis.

Data Analysis

The multidimensionality of the TSA constructs was assessed using the confirmatory factor analysis procedure in LISREL 7 (Jöreskog and Sörbom 1989). Confirmatory factor analysis allows researchers to specify a formal model and provides unique estimates of the factors and loadings. It also provides tests to check for the adequacy of the hypothesized model.

The covariance matrix of the physical asset specificity items was used as input to the program. Maximum likelihood method was used to estimate the model. To evaluate the fit of the six dimension model, three models were estimated. These included the hypothesized six dimension model, a one dimension model based on traditional research in the TCE area, and a null model. The chi-square goodness of fit test, and the goodness of fit indices were used to determine the fit of the hypothesized model. Chi-square difference tests were used to compare the hypothesized model to the one dimension model and the null model.

Results

Data analysis indicates that specificity, magnitude, durability, risk, utility, and visibility are all empirically different dimensions of the TSA construct. For the physical asset construct, the chi-square value for the six dimension model with 89 degrees of freedom was 110.82 with a p-value greater than 0.05. This chi-square value was small indicating a good fit of the data to the model. The chi-square/df value was 1.25, which further indicated that the fit of the data to the model was good. Wheaton et al. (1977) suggest that a value of five or less for this ratio indicates a reasonably good fit. Thus the six dimension model was significant. The goodness of fit index (GFI) was 0.94 and the adjusted goodness of fit index (AGFI) was 0.91 further suggesting a good fit of the data to the model. The items that were significant indicators of the six dimensions (as indicated by their t-values) are provided in Table 1.

For the physical asset construct, comparing the hypothesized model to the null model (a null model assumes complete independence among the variables in the observed data) indicated that the hypothesized model explained the relationships in the observed data better than the null model. Also, the hypothesized model represented a significant improvement in fit over the traditional one dimension model.

To test the nomological validity of the scale, we tested the hypothesis that there is a positive causal relationship between the TSA construct and the manufacturer's commitment to the relationship (Anderson and Weitz 1992). Anderson and Weitz reason that it is not in the interest of a manufacturer who has made idiosyncratic investments to engage in opportunistic behavior and risk the dissolution of the relationship. Making idiosyncratic investments significantly increases the investor's commitment. The commitment scale used in this research was made up of a subset of the items used by them. Results from the second order factor analysis suggests that the fit of the data to the model is good and that there is a significant ($t\text{-value}=2.43$) positive relationship between the manufacturer's investment in a transaction specific asset and the manufacturer's commitment to the relationship.

Discussion and Conclusions

The purpose of this research was to illustrate the multidimensionality of the TSA construct. The results suggest that specificity, magnitude, durability,

risk, utility, and visibility are six distinct dimensions of the TSA construct. To date, researchers have treated TSA as a unidimensional construct. Most researchers have included items related to multiple types of TSAs and multiple dimensions—all in one scale (see Ganesan 1994). From a research perspective, these results are significant because they broaden our understanding of the dimensionality of the transaction specific asset construct. Future empirical operationalizations of the construct should include the different dimensions of a TSA.

Theoretical Implications

Future research should focus on the theoretical ramifications of each of the dimensions and types of transaction specific assets. It is possible that research results based on TCE will depend on the specific type or dimension of the transaction specific asset used in the research setting. Also, transaction costs incurred to safeguard an investment that is highly specific may be quite different from the costs incurred to safeguard a transaction specific investments that is high in any other dimensions. If the transaction costs incurred are very different, the choice of governance structure could depend not only on how specific the investment is but also on the other dimensions of the TSA. Future research needs to examine if the only dimension of a TSA that impacts transaction costs and therefore has implications for the choice of governance structure is specificity or other dimensions identified above.

Managerial Implications

Though this research has addressed the presence of the different dimensions, empirical research confirming the relative significance of the dimensions would be appropriate. Similarly, research confirming the appropriateness of different types of TSAs for different context needs to be established. The relative significance of the different dimensions across types of TSAs also need to be addressed.

Managerially, this research is significant because it provides sellers with a list of the different dimensions of a TSA which may be used to signal commitment to the buyer. Before making an investment, the seller is advised to identify which dimensions of the TSA the buyer considers to be relevant and plan the TSA and signal to the buyer accordingly. Failure to do so may cause the investing seller unnecessary anguish. For example, it may be that a seller focusing on the “magnitude” of the investment may not successfully signal commitment because for that buyer the nature of the investment itself has low utility. That is, for the seller, the significance of the asset may be reflected by the magnitude (assessed in cost terms), while for the buyer the signifi-

cance of the asset may be reflected by the utility relating to the investment.

A broadened perspective on a transaction specific asset opens up avenues for sellers who are interested in signalling commitment but have so far not been able to make either a "substantial" or a "highly specific" investment. If other dimensions identified above are viewed favorably by a buyer, a seller may be able to signal commitment by making an investment that has the other characteristics without having to make a "substantial" or "highly specific" investment. Electronic data interchange systems (EDIs) such as those between General Motors (GM) and its parts suppliers are an example of such a TSI. EDIs offer both parties several benefits including reduced paper work and greater accuracy of information transferred. Compared to the cost of collecting sales information, the cost of dedicated computer facilities required to share such information is not substantial. Further, even though such assets are purchased for a particular purpose, they may be transferable, in part, to other applications. However, the utility of the information that GM and its suppliers are able to gain by virtue of their EDI investments make these investments important. Even though the TSA is not substantial or highly specific, it has high utility and serves as a signal of commitment.

It is possible that the appropriateness of the different TSAs might be dependent on the context in which the TSA is considered as well on the type of TSA examined. For example, in a sales organization, human assets may be more germane than physical assets, while in a manufacturing situation, physical or site specific assets may be more appropriate. Future research also needs to examine whether all types of TSAs are characterized by the six dimensions.

To conclude, this research confirms the multidimensionality of the TSA construct. Future research in TCE should incorporate the different dimensions of a TSA when constructing a scale for a TSA.

References

- Achrol, Ravi S., Torger Reve, and Louis W. Stern (1983), "The Environment of Marketing Channel Dyads : A Framework of Comparative Analysis," *Journal of Marketing*, 47 (Fall), 55-67.
- Anderson, Erin (1985), "The Salesperson as Outside Agent or Employee : A Transaction Cost Analysis," *Marketing Science*, 4 (Summer), 234-254.
- Anderson, Erin and Anne T. Coughlan (1987), "International Market Entry and the Expansion via Independent or Integrated Channels of Distribution,"

- Journal of Marketing*, 51 (January), 71-82.
-, and Barton Weitz (1992), "The Use of Pledges to Build and Sustain Commitment in Distribution Channels," *Journal of Marketing Research*, 29, (February), 18-34.
- Churchill, Jr., Gilbert A. (1979), "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research*, XVI (February), 64-73.
- Dwyer, F. Robert and Sejo Oh (1988), "A Transaction Cost Perspective on Vertical Contractual Structure and Interchannel Competitive Strategies," *Journal of Marketing*, 52 (April), 21-34.
- Ganesan, Shankar (1994), "Determinants of Long-Term Orientation in Buyer-Seller Relationships," *Journal of Marketing*, 58 (April), 1-19.
- Gatignon, Hubert and Erin Anderson (1988), "The Multinational Corporation's Degree of Control over Foreign Subsidiaries : An Empirical Test of a Transaction Cost Explanation," *Journal of Law, Economics, and Organization*, 4, No. 2 (Fall), 305-35.
- Heide, Jan B. and George John (1992), "Do Norms Matter in Marketing Relationships?" *Journal of Marketing*, 54, (April) 32-44.
- and (1990), "Alliances in Industrial Purchasing of Joint Action in Buyer-Supplier Relationships," *Journal of Marketing Research*, XXVII (February), 24-36.
- and (1988), "The Role of Dependence Balancing in Safeguarding Transaction-Specific Assets in Conventional Channels," *Journal of Marketing*, Vol. 52 (January), 20-35.
- Jackson, Barbara Bund (1985), *Winning and Keeping Industrial Customers*, Lexington Books, Lexington, MA.
- John, George. and Barton A. Weitz (1989), "Salesforce Compensation : An Empirical Investigation of Factors Related to Use of Salary Versus Incentive Compensation," *Journal of Marketing Research*, XXVII, (February) 337-355.
- Jöreskog, Karl G. and Dag Sörbom (1989), *LISREL 7 : A Guide to the Program and Applications*, SPSS Inc., Chicago.
- Joskow, Paul L. (1987), "Contract Duration and Relationship-Specific Investments : Empirical Evidence from Coal Mines," *American Economic Review*, Vol. 77, No. 1, 168-85.
- Klein, Saul, Gary L. Frazier, and Victor J. Roth (1990), "A Transaction Cost Analysis Model of Channel Integration in International Markets," *Journal of Marketing Research*, Vol. XXVII (May), 196-208.

- Lohtia, Ritu, Charles M. Brooks, and Robert E. Krapfel (1994), "What Constitutes a Transaction Specific Asset? An Examination of the Dimensions and Types," *Journal of Business Research*, 30 (July), 261-270.
- Monteverde, Kirk and David J. Teece (1982), "Appropriate Rents and Quasi-Vertical Integration," *Journal of Law and Economics*, XXV (October), 321-28.
- Noordewier, Thomas G., George John, and John R. Nevin (1990), "Performance Outcomes of Purchasing Agreements in Industrial Buyer-Vendor Relationships," *Journal of Marketing*, 54 (October), 80-93.
- Peter, J. Paul (1981), "Construct Validity: A Review of Basis Issues and Marketing Practices," *Journal of Marketing Research*, XVIII (May), 133-145.
- Ruekert, Robert W., Orville C. Walker, and Kenneth J. Roering (1985), "The Organization of Marketing Activities: A Contingency Theory of Structure and Performance," *Journal of Marketing*, Vol. 49 (Winter), 13-25.
- Walker, Gordon and David Weber (1987), "Supplier Competition, Uncertainty, and Make-Or-Buy Decisions," *Academy of Management Journal*, 30 (3), 589-596.
- Weiss, Alen M. and Erin Anderson (1992), "Converting from Independent to Employee Salesforces: The Role of Perceived Switching Costs," *Journal of Marketing Research*, 29 (February), 101-115.
- Wheaton, B., B. Muthén, D. R. Alwin, and G. F. Summers (1977), "Assessing Reliability and Stability in Panel Models," in *Sociological Methodology*, D. R. Heise (ed.), Jossey-Bass, San Francisco, 84-136.
- Williamson, Oliver E. (1991), "Comparative Economic Organization: The Analysis of Discrete Structural Alternatives," *Administrative Science Quarterly*, 36, 269-296.
- (1988), "The Logic of Economic Organization," *Journal of Law, Economics, and Organization*, IV : 1, 65-93.
- (1985), *The Economic Institutions of Capitalism*, The Free Press, New York.
- (1975), *Markets and Hierarchies: Analysis and Antitrust Implications*, New York: The Free Press.

Table 1

TSA Scale Items With Confirmatory Factor Analysis t-values

Durability

The investment we have made in order to do business with this customer will not last as long as other physical assets we own. (t-value=7.684)

The investment we have made in order to do business with this customer should have a relatively long life. (t-value=5.531)

The investment we have made in order to do business with this customer could easily become outdated. (t-value=3.566)

Specificity

The investment we have made in order to do business with this customer is tailored to the specific needs of this customer. (t-value=10.787)

The investment we have made in order to do business with this customer could be sold to recover a large part of our investment. (t-value=4.238)

The investment we have made in order to do business with this customer has been customized to satisfy their requirements. (t-value=10.080)

Magnitude

The investment we have made in order to do business with this customer is tailored to the specific needs of this customer. (t-value=7.102)

The investment we have made in order to do business with this customer is relatively small compared to what other suppliers spend on specialized assets. (t-value=5.489)

The investment we have made in order to do business with this customer is relatively large compared to what other suppliers spend on specialized assets. (t-value=4.169)

Visibility

The investment we have made in order to do business with this customer may not be obvious to this customer. (t-value=6.301)

The investment we have made in order to do business with this customer is visible to their firm. (t-value=4.768)

Risk

The investment we have made in order to do business with this customer is not guaranteed to be recovered over the course of this relationship. (t-value=7.014)

The investment we have made in order to do business with this customer

does not guarantee that this customer will continue to purchase from us. (t-value=6.490)

Utility

Our investment in this customer has enabled them to reduce their costs. (t-value=12.784)

Our investment in this customer has enabled them to be more competitive in their markets. (t-value=14.842)

Our investment in this customer has enabled them to become more profitable. (t-value=14.192)