A Relational View of Accounting Information Sharing

Lorraine Lee
Wilmington, Wilmington, NC, United States., leel@uncw.edu

Dutch Fayard
University of North Texas, Denton, TX, United States., dutch.fayard@unt.edu

Robert Leitch
University of South Carolina, Columbia, SC, United States., leitch@moore.sc.edu

William Kettinger
Management Information Systems, University of Memphis, Memphis, TN, United States., bill.kettinger@memphis.edu

Americas Conference on Information Systems
AMCIS2012 Seattle

A Relational View of Accounting Information Sharing

Lorraine S. Lee
UNC Wilmington
leel@uncw.edu

Dutch Fayard
University of North Texas
Dutch.Fayard@unt.edu

Robert A. Leitch
University of South Carolina
leitch@moore.sc.edu

William J. Kettinger
University of Memphis
wjkttngr@memphis.edu

ABSTRACT

Today's organizations are characterized by a network of relationships with various customers and suppliers. As such, the critical resources leading to competitive advantage may no longer reside within a firm's own boundaries and instead be a part of the network of relationships. This perspective, known as the relational view of the firm, suggests that a firm's critical resources may be embedded in the routines and processes associated with inter-firm relationships. One such inter-firm process is the sharing of accounting information. Using the relational view of the firm, this study develops a research model with three antecedent factors of accounting information-sharing (electronic integration systems, trust, and knowledge-sharing routines) which can lead to benefits associated with inter-organizational competitive advantage. We find that the factors of trust and knowledge-sharing have direct effects on accounting information-sharing, while the factor of electronic integration has an indirect effect through the enabling of knowledge-sharing routines.

Keywords

information-sharing; inter-organizational systems; trust.

INTRODUCTION

Firms today are characterized by close relationships and/or partnerships with customers and suppliers. In this type of organizational structure, a firm's critical resources may no longer solely reside within its own boundaries. Instead, the critical resources leading to competitive advantage might also be found in the network of relationships in which the firm is involved. This relational view of the firm suggests that a firm's critical resources may cross firm boundaries and may actually be embedded in the routines and processes associated with inter-firm relationships (Dyer and Singh, 1998).

One such process associated with inter-firm interactions is the sharing of accounting information between partner firms. This inter-organizational information sharing often has the objective of reducing costs through collaborative efforts (Cooper and Slagmulder, 2004). While there have been several case studies and theoretical work describing inter-organizational cost management (e.g. Mouritsen, Hansen, and Hansen, 2001; Cooper and Slagumulder 2004; Coad and Cullen 2006), there have been fewer empirical studies focused on the variables that facilitate the sharing of accounting information.

This study answers the call by Caglio and Ditillo (2010) for additional empirical research focused on the factors influencing or enabling inter-organizational accounting information flow. Based on the theoretical perspective of the relational view of the firm (Dyer and Singh, 1998), we develop several hypotheses that form our theoretical model. We theorize that the following are antecedent factors of accounting information sharing (electronic integration systems, trust, and knowledge-sharing routines), which then leads to benefits associated with inter-organizational competitive advantage. With the support

and cooperation of the Institute of Management Accountants, we surveyed a group of management accountants who work for firms participating in a supply chain. The data are analyzed using structural equation modeling to test the theoretical model.

Our results suggest that the factors of electronic integration, trust, and knowledge-sharing routines are all important enablers in the sharing of accounting information for competitive advantage. The results are of particular interest to practitioners in that the model depicts a combination of factors that firms can nurture to enhance the overall value of their internal accounting information by bringing it to the realm of inter-organizational information.

This paper is organized as follows. First, we examine the literature on accounting information sharing and the relational view of the firm, developing hypotheses about the various determinants of accounting information sharing. Second, we describe the operationalization of the factors through a scale development process. Third, we describe the collection of the data and the analysis of the data using structural equation modeling. Finally, we conclude with a discussion of the results, the limitations of the study, and implications for research and practice.

BACKGROUND, THEORY, AND HYPOTHESIS DEVELOPMENT

Relational View of the Firm

The relational view of the firm (Dyer and Singh, 1998, p. 660) suggests that "a firm's critical resources may span firm boundaries and may be embedded in inter-firm resources and routines." The relational view is an extension of the resource-based view of the firm (Barney, 1991). Whereas the resource-based view (RBV) has a within-firm perspective and positions competitive advantage as a result of firm-specific differences in acquiring resources that are rare, valuable, non-substitutable, and difficult to imitate, the relational view builds upon RBV and focuses on resources that may extend beyond firm boundaries (Dyer and Singh, 1998).

The relational view suggests that competitive advantage can result when firms move away from market-based, arm's length transactions to relationships characterized by partnerships and/or alliances (Dyer and Singh, 1998). Dyer and Singh (1998) identify 4 determinants of inter-organizational competitive advantage – 1) relation-specific assets; 2) knowledge-sharing routines; 3) complementary resources and capabilities; and 4) effective governance.

In the accounting literature, there have been limited studies specifically grounded in the relational view of the firm. Most notably, Cooper and Slagmulder (2004) draw from the work of Dyer and Singh (1998) in their analysis of different relational contexts associated with inter-organizational cost management (IOCM). In their case study of 3 large Japanese manufacturing firms, Cooper and Slagmulder (2004) identify 5 specific relational contexts of inter-organizational relationships, ranging from a pure market perspective to a pure hierarchy perspective to hybrid forms of relational contexts that were neither market- nor hierarchy-based. Following this stream of research, Dekker (2004) analyze the network (or relational) mode of governance in relation to hierarchy and market modes.

Despite the limited number of accounting studies specifically using the relational view of the firm, there has been recent interest in the role of accounting as an integrative mechanism for inter-organizational relations. For example, accounting controls have been positioned as the self-regulating and orchestrating mechanisms necessary for inter-organizational relations (Mouritsen and Thrane, 2006). Management control has also been positioned in integrated planning and supply chain relationships (e.g. Cullen, Berry, Seal, Dunlop, Ahmed, and Marson, 1999; Seal, Cullen, Dunlop, Berry, and Mirghani, 1999; Mouritsen and Thrane, 2006).

A key distinction of the relational view of the firm versus the resource-based view is the emphasis by the relational view on the mechanics of value creation through jointly-developed resources. One example of resources that extend beyond a firm's boundaries is a network resource. A network resource is an external resource embedded in a firm's alliance network that provides strategic opportunities and affects firm behavior and value (Gulati, 1999; Lavie, 2006). One such possible network resource is the sharing of accounting information with the objective of reducing costs through partnership and collaboration.

Accounting Information Sharing

The interchange of information has been recognized as the basis of all organizational activity, whether intra- or inter-organizational (Barret and Konsynski, 1982). From an inter-organizational perspective, cost reduction opportunities may arise through the exchange of accounting information with inter-organizational partners such as suppliers or customers. For

example, Seal et al. (1999) describe the possibility of cost reductions associated with open book accounting practices in a supply chain. Similarly, Mouritsen et al. (2001) describe cost savings projects at two companies resulting from the exchange of accounting information, one related to open book accounting and the other to target cost management.

The definition of accounting information sharing can vary. One type of accounting information sharing is open book accounting, which is defined by Hoffjan and Kruse (2006, p. 40) as the "systematic disclosure of cost information between legally independent business partners beyond corporate borders." Mouritsen et al. (2001, p. 221) identify open book accounting as an effective inter-organizational management control to "create new possibilities for management intervention." These new possibilities extend the reach of a firm's management beyond the boundaries of their own firm and extend outward to control a partner firm's activities. Mouritsen et al. (2001) demonstrate these new possibilities through case analysis where they document the benefits of one firm's experience with open book accounting. In the case study, open book accounting not only improved efficiencies in the firm's production system, but also impacted the strategic direction by transforming the firm's core competencies and competitive strategy via the insights gained from access to the supplier's production processes (Mouritsen et al., 2001).

Less formal than open book accounting is the idea of cost transparency or openness, which is defined by Lamming (1993, p. 214) as the "sharing of cost information between customer and supplier including data which would traditionally be kept secret by each party…The purpose of this is to make possible for customer and supplier to work together to reduce costs." By increasing information transparency between partners, open book accounting can improve the effectiveness of other IOCM techniques, such as enabling more in-depth target costing and kaizen costing.

A common thread between techniques such as open book accounting and cost transparency is the sharing of accounting information among suppliers and customers. Although cost information related to core products and services are some of the more common information that can be shared among partners, other types of information could also be shared, such as information related to logistics, shipping, production, market demand, and forecasting. For example, the new product development process can be enhanced by integrating input from both customer and supplier in the process (e.g. Petersen, Handfield, and Ragatz, 2005; Primo and Amundson, 2002). Another example of information sharing enabling collaboration is the placement of guest engineers in joint development projects, which is specifically identified by Cooper and Slagumulder (2004) as an example of an inter-organizational cost management practice that facilitates information sharing. Other specific forms of information sharing have been identified as salient in inter-organizational relations, including the sharing of real-time information about material flow and the sharing of real-time documents, collaborative forecasting and planning processes, and the automation of processes such as order entry, shipping, and billing (Marquez et al., 2004). Furthermore, Malhotra, Gosain, and El Sawy (2005) identify the breadth of information exchange as having an impact on leveraging inter-organizational partnerships and specifically identify information related to market demand and forecasts, demand shifts and changes in customer preferences, and the sharing of future plans such as long-term production plans and capital investments.

The common thread among the above examples is the positioning of the sharing of information in realizing the benefits. Therefore, in this study, we position accounting information sharing as a jointly-developed, network resource. Drawing from the relational view of the firm, we hypothesize that this network resource is valuable, rare, inimitable, and non-substitutable, thereby providing a source of competitive advantage. Specifically, we hypothesize:

H1: The sharing of accounting information is associated with competitive advantage

Determinants of Accounting Information Sharing

The relational view of the firm (Dyer and Singh, 2008) identifies 4 potential sources of competitive advantage: 1) relation-specific assets; 2) knowledge-sharing routines; 3) complementary resources / capabilities and 4) effective governance mechanisms (trust). However, the Dyer and Singh conceptualization does not specify a particular order of these determinants. In this study, the information sharing of accounting information is positioned as a network-based, complementary resource driving competitive advantage (H1). The other 3 resources (relation-specific assets, knowledge-sharing routines, and effective governance) are positioned in the research model as driving information sharing (Figure 1).

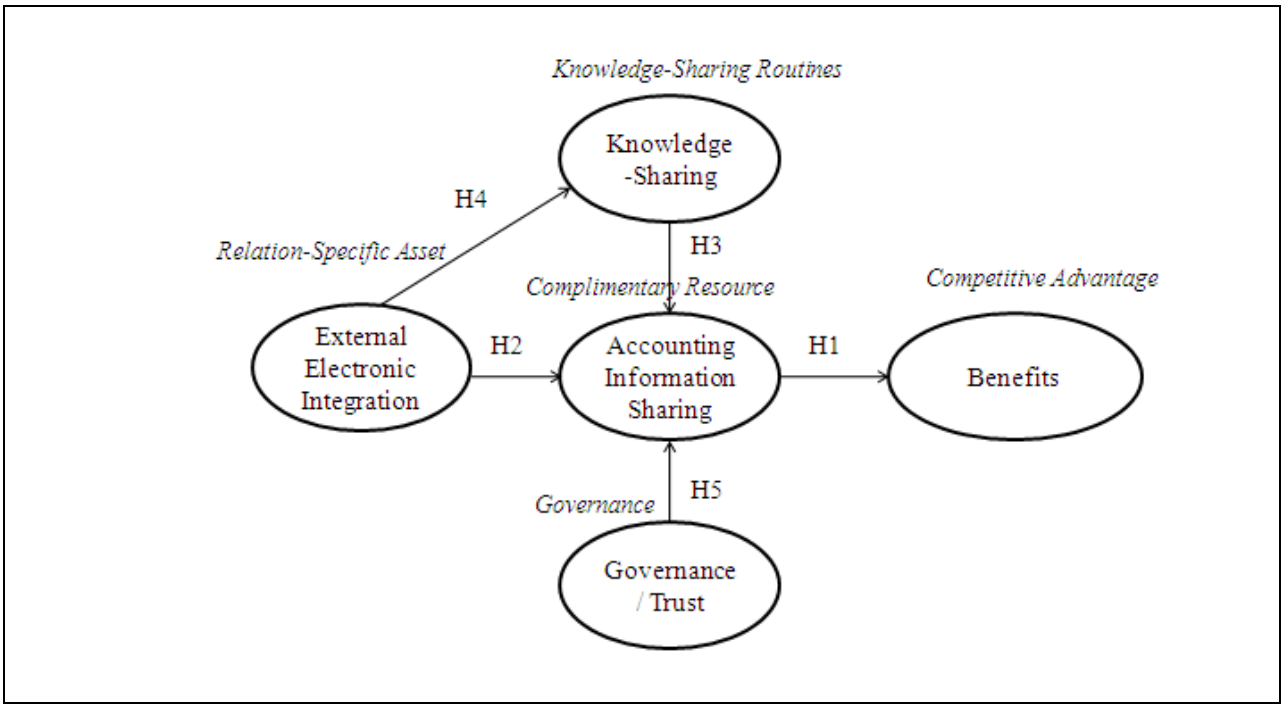


Figure 1. Research Model

Relation-Specific Assets (Electronic Integration)

According to Amit and Schoemaker (1993), the specialization of assets is a necessary condition for developing a competitive advantage. Asset specificity refers to the extent to which a resource (or asset) used in support of a particular purpose has a higher value than if the resource were redeployed for a different purpose. Information systems (IS) as a resource enabling competitive advantage has been extensively explored in the IS literature (e.g. Mata, Fuerst, and Barney,1995; Bharadwaj, Sambamurthy, and Zmud,1998; Wade and Hulland, 2004). Previous studies have recognized the IS resource as enabling market responsiveness (Ross, Beath, and Goodhue, 1996), as well as facilitating external relationships with both suppliers and customers (Bharadwaj et al., 1998; Bharadwaj 2000). In our research model, the conceptual construct of a relation-specific asset is operationalized as electronic integration.

External electronic integration refers to the extent that the information systems of a company support the interchange of information between that company and its partners. Many inter-organizational activities require an external information systems to control operations, coordinate activities, provide data, and to facilitate and enable communications with partners (Hopwood 1996; Anderson 2007). For example, Ellram and Zsidisin (2002) identify the role of an integrated IS in facilitating cost analysis between supply chain partners. From a management control perspective, the collaborative effects of integrated information exchange have been documented, such as using EDI to improve the efficiency of accounting transactions between partners (Anderson and Lanen, 2002) or the role of information systems and information reliability in facilitating partner relationships (Kulp 2002).

Drawing from the resource-based view of the firm, previous studies such as Powell and Dent-Micallef (1997) have positioned the IS resource as valuable, rare, inimitable, and non-substitutable. In their typology of IS resources, Wade and Hulland (2004) characterize the IS resource as having a specific role in facilitating external relationships. When the IS resource is specifically designed to facilitate relations with a specific partner, the IS resource falls into the realm of a network resource also. As such, based on the relational view of the firm and previous IS research, we hypothesize:

> *H2: The extent of a firm's external electronic integration systems will impact the firm's accounting information-sharing capability.*

Knowledge-Sharing

In the relational view of the firm, inter-firm knowledge-sharing routines refer to a regular pattern of inter-firm interactions that facilitate or enable the transfer, recombination, or creation of specialized knowledge (Grant, 1996; Dyer and Singh, 1998). The scanning or seeking of knowledge is an outward-looking exploration and search for new ideas and information that can enable a firm to respond to changing market conditions (March 1991; Teece, Pisano, and Shuen, 1997).

The knowledge-sharing ability of a firm to capitalize on inter-organizational relations is identified by Dyer and Singh (1998) as partner-specific absorptive capacity. With partner-specific absorptive capacity, a firm can recognize, discern, and assimilate the knowledge resulting from a partnership alliance (Dyer and Singh, 1998). In the accounting literature, Elbashir, Collier, and Sutton (2011, p. 155) position organizational absorptive capacity, defined as the ability to "gather, absorb, and strategically leverage new external information," as a precursor to the strategic use of business intelligence.

The knowledge-sharing capability of a firm is closely related to organizational learning Dyer and Singh (1998) propose that the greater a firm's investment in knowledge-sharing routines, the greater the potential for competitive advantage resulting from that knowledge integration. Based on the tenets of the relational view of the firm, knowledge-sharing between partners is positioned as a key enabler of information sharing. We hypothesize:

H3: Knowledge-sharing routines between firms will impact the sharing of accounting information.

The knowledge-sharing routines between partner firms can also be facilitated by the level of electronic integration between the firms. Specifically, communication and its frequency between partners can be facilitated by inter-organizational information systems. Through more frequent communications, information and data sharing will increase (Kumar, 1996; Cooper and Slagmulder, 2004; Hakannson and Lind, 2007), as well as reduce the amount of information asymmetry between partners (Vickery, Jayaram, Droge, and Calatone, 2003). As such, we hypothesize:

H4: The extent of electronic integration between firms will impact the knowledge-sharing routines.

Governance (Trust)

In the relational view of the firm, the final determinant of inter-organizational competitive advantage is effective governance (Dyer and Singh, 1998). A network, relational organizational structure (as distinct from the traditional markets and hierarchies) can serve as an alternative governance structure, characterized by a high level of inter-organizational trust (Zaheer and Venkatraman, 1995). In the relational view, effective governance is evidenced by informal, self-enforcement governance mechanisms and can rely on trust relations as a governance mechanism (Dyer and Singh, 1998). In fact, trust is identified as a necessary condition for relational governance (Macneil, 1980; Granovetter, 1985; Zaheer and Venkatraman, 1995).

Prior studies consistently point out the importance of trust between partner firms before engaging in inter-organizational collaboration (e.g., Handfield and Nichols, 1999; Hoyt and Huq, 2000; Tomkins, 2001; Mouritsen et al., 2001). Trust among partner firms is a precursor to inter-organizational relationships and alliances (Tomkins, 2001; Mentzer, Min, and Zacharia, 2000). For example, a "climate of openness" can facilitate organizational learning (Nevis, DiBella, and Gould, 1995; Liedtka, 1996) and can enable supply chain partners to share proprietary information (e.g. cost, demand, and planning information) with each other, and can facilitate collaboration and cooperation on product development and design (Mentzer et al., 2000). Lengnick-Hall (1998) argues that trust developed through effective communication is an important resource that can lead to a competitive advantage for both partners in an inter-organizational relationship. Likewise, Mouritsen et al. (2001) identify a highly developed sense of trust between partners as one of two important prerequisites for open book accounting.

From the literature above, trust has been identified as a precursor to competitive advantage in the relational view of the firm. We therefore hypothesize:

H5: There is a positive relationship between trust and accounting information sharing

RESEARCH METHODOLOGY

Based on the relational view of the firm, this study empirically examines the determinants of competitive advantage in the context of accounting information sharing. The constructs of interest in this study are measured through a survey methodology that includes five scales of interest.

Scale Development

Following the guidelines of Netemeyer, Bearden, and Sharma (2003), we developed five scales to measure the constructs in Figure 1. We first began the process by conceptually determining whether each construct should be modeled as reflective or formative. Next, we selected and/or developed a set of question items designed to measure each variable construct. Where possible and applicable, we used items from previously validated instruments. When our review of the literature indicated no previously developed measurement scale, we defined and developed new items based on the literature. Table 1 provides an overview of each of the constructs and the categorization as either formative or reflective. The survey items for the data collection are presented in Appendix A.

Construct	Formative or Reflective	Definition
Electronic Integration	Reflective	A firm's external information technology systems capability that allows a firm to integrate its various IT systems in order to provide visibility to customer and supplier data and to allow online information sharing across the value chain (Vickery et al., 2003; Barua et al., 2004).
Trust	Reflective	Trust as reflected by an open communications environment (Tu et al., 2006); a willingness to share accounting information with partners (Vosselman and van der Meer-Kooistra 2009); and a willingness to deal fairly with partners (Dyer 1977).
Knowledge-Sharing Routines	Reflective	The regular pattern of inter-firm interactions that facilitate the transfer, recombination, or creation of specialized knowledge (Grant 1996; Dyer and Singh 1998).
Accounting Information-Sharing	Formative	A resource consisting of one or more forms of information associated with the accounting discipline.
Benefits	Formative	Indicators of competitive advantage, including increased market share growth, financial performance, and new business opportunities (Saraf et al., 2007; Marchand et al., 2001).

Table 1. Construct Description

Pilot Study

We conducted a pilot study of our instrument by surveying a regional chapter of the Institute of Management Accountants who work for organizations that are a part of the supply chain. Forty-nine IMA members completed the survey, and the feedback was used to further refine the measurement items.

Construct Measures

Electronic Integration

The items used to measure electronic integration are originate from the "system integration" construct defined by Barua, Konana, and Whinston (2004, p. 593) as "the extent to which a firm integrates its various IT systems to provide visibility to customer and supplier data and to allow online information sharing and transaction execution across the value chain." We supplemented the Barua items with items from Vickery et al. (2003) that reflect the resources needed to support inter-organizational information exchange and data sharing. As noted in Table 1, the electronic integration construct is expected to

be reflective. The validity tests of the pilot data confirm the reflective nature of the construct and the appropriateness of the final items measuring electronic integration.

Knowledge-Sharing

The items used to measure knowledge-sharing are derived from Tu, Vonderembse, Ragu-Nathan, and Sharkey (2006) and focus on the mechanisms that enable firms to identify and capture relevant external and internal knowledge and technology. As noted in Appendix A, the construct is reflective and focuses primarily on the seeking of knowledge related to accounting information and the organizational learning associated with assimilating the information.

Trust

The trust construct is also modeled as reflective. An aspect of trust is an open communications environment (Tu et al., 2006), as well as a willingness to share accounting information with partners (Vosselman and van der Meer-Kooistra, 2009). In a trust relationship, partner firms are willing to accept new ideas from each other (Vickery et al., 2003), as well as deal fairly with each other (Dyer, 1997). All of these aspects of trust are in incorporated into the trust construct (Appendix A).

Accounting Information Sharing

The construct of accounting information sharing refers to specific types of information that can be shared between partners. This information includes sales or order-entry information, logistic and shipping data, product cost information, production data, market demand and forecasts, product design information, etc. In general, the items were developed from generally accepted managerial accounting textbooks (e.g. Brewer, Garrison, and Noreen, 2007). Since these items each represent a unique type of accounting information, this construct is modeled as formative.

Benefits

The "Benefits" construct is an operationalization of competitive advantage. According to Dyer and Singh (1998), competitive advantage is indicated by firms experiencing above-normal returns. In our benefits construct, we focus on benefits associated with cost reductions (Anderson and Lanen, 2002), reducing uncertainty about markets (Marquez, Bianchi, and Gupta, 2004), decreasing response times to market changes (Marchand, Kettinger, and Rollins, 2001), increasing new business opportunities (Marchand et al., 2001), increasing market share growth (Marchand et al., 2001, Saraf, Langdon,a nd Gosain, 2007), increasing financial performance (Marchand et al., 2001; Saraf et al., 2007), and improving the level of innovation (Marchand et al., 2001). Because these items each represent a specific benefit attributable to information sharing, the construct is modeled as formative.

Data Collection

With the assistance of the Institute of Management Accountants (IMA), the data for the main study was collected at three IMA-sponsored events: 1) a national meeting; 2) a Lean Accounting Conference; and 3) a regional IMA conference. Target respondents were IMA members who work in an organization that is a part of a supply chain. A total of 77 respondents completed the survey. Not all respondents completed the demographic information, but over half had graduate degrees, slightly more than half were male, and more than 70 percent were over 40. A summary of the demographic information is presented in Table 2.

Panel A *Position of Respondents*	**Number**	**% of Total**
Controller/ Area Controller	**31**	*40%*
CFO	**13**	*17%*
Various Management	**10**	*13%*
Cost Accountant/ Supervisor	**9**	*12%*
Various Accounting Positions	**8**	*10%*
Various Finance	**3**	*4%*
VP of Finance	**3**	*4%*
Panel B *Annual overall firm sales in dollars*		
Less than $1 million	**1**	*1%*
$1 million to $10 million	**4**	*5%*
$10 million to $100 million	**34**	*45%*
$100 million to $500 million	**12**	*16%*
$500 million to $1 billion	**5**	*7%*
More than $1 billion	**20**	*26%*
Panel C *Nature of Company**		
Manufacturing	**47**	*49%*
Service	**14**	*15%*
Materials/Parts supply	**10**	*10%*
Distribution	**8**	*8%*
Retail	**5**	*5%*
Wholesale	**4**	*4%*
Other	**8**	*8%*

* Total is greater than the sample size because respondents were allowed to select more than 1 response

Table 2. Respondent Demographics

Results

The hypotheses were tested using Partial Least Squares (PLS), a structural equation modeling technique. As illustrated in Figure 1, we hypothesized a comprehensive set of relationships among the various constructs based on the relational view of the firm.

Measurement Model

With PLS, the measurement model can be tested simultaneously with the structural model. The first step in the PLS analysis is the assessment of the measurement model by examining construct validity, which tests how well the indicators are measuring the construct. We assess construct reliability for both the reflective and formative constructs.

Reflective Constructs

In our research model, three constructs (Electronic Integration, Trust, and Knowledge-Sharing) are modeled as reflective constructs. Reliability measures such as Cronbach's alpha and composite reliability are used to assess the internal consistency of a reflective latent construct. As shown in Table 3, the Cronbach's alpha and composite reliability for Electronic Integration, Trust, and Knowledge-Sharing are all above the adequate level of .70 as recommended by Nunnally (1978).

	AVE	Composite Reliability	Cronbach's Alpha
Electronic Integration	0.894801	0.971443	0.96084
Trust	0.699998	0.920724	0.894049
Knowledge-Sharing Routines	0.742549	0.920184	0.884348

Table 3. Reflective Constructs Reliability Measures

To test for discriminant validity, we are verifying that the items measuring the construct are more closely associated with the intended construct than with the other constructs in the model. Discriminant validity is assessed by verifying that the squared root of the average variance extracted (AVE) for each construct is higher than the correlation between it and the other constructs. Table 4 displays the correlations, with the diagonal element representing the square root of the AVE.

	Electronic Integration	Trust	Knowledge-Sharing
Electronic Integration	0.945939		
Trust	0.377153	.836659	
Knowledge-Sharing	0.418925	0.384979	.861713

Table 4. Correlation Among Reflect Constructs*

* The square root of the AVE is on the diagonals

We further tested for discriminant validity by following the Chin (1998) cross-loading analysis, which validates that each item loads more highly on its assigned construct than on other constructs (Table 5). In addition, each item loading is greater than .707, implying that there is more shared variance between the construct and its item than error variance.

	EEI	Trust	Knowledge-sharing
EEI1	0.948432	0.389778	0.412825
EEI2	0.961653	0.353389	0.41026
EEI3	0.944189	0.33016	0.39892
EEI4	0.929198	0.352405	0.358703
TRUST1	0.323963	0.846907	0.268656
TRUST2	0.394191	0.861487	0.298183
TRUST3	0.320352	0.872737	0.483336
TRUST4	0.324018	0.86866	0.305252
TRUST5	0.175675	0.724112	0.167422
KS1	0.343085	0.293212	0.853639
KS2	0.344286	0.337889	0.897602
KS3	0.349321	0.374584	0.83455
KS4	0.40753	0.328601	0.859846

Table 5. Discriminant Validity Loadings and Cross-Loadings

Formative Constructs

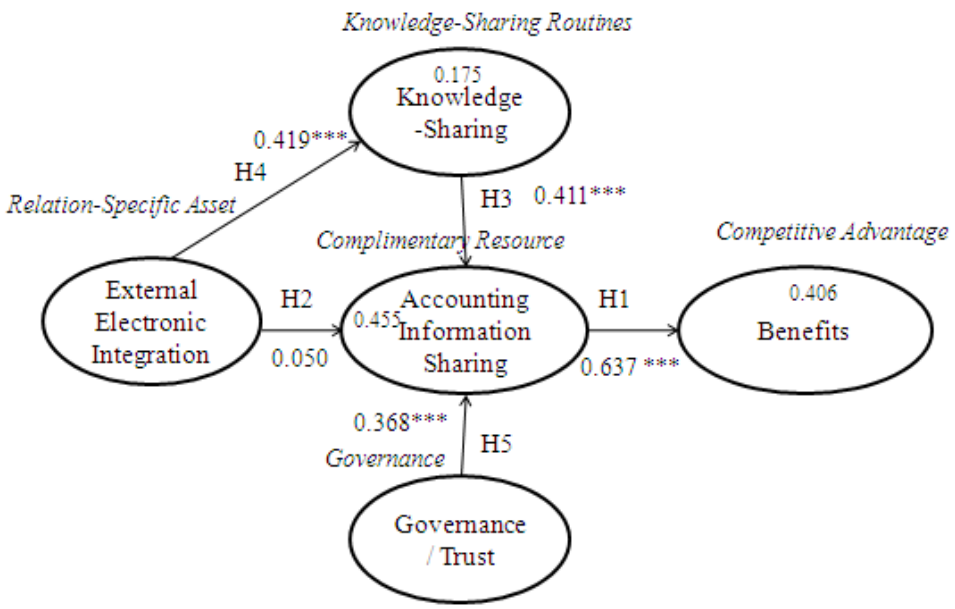
To assess the validity of the formative constructs, we followed the guidelines of Petter, Straub, and Rai (2007). Because the formative measurement model is based on multiple regression, the stability of the coefficients (i.e. multicollinearity among formative constructs) is sensitive to sample size and the strength of the item correlations (Diamantopoulos and Winklhofer, 2001). Following the guideline from Petter et al. (2007) that a Variance Inflation Factor (VIF) in excess of 3.3 is an indicator of multicollinearity and may be unduly influencing parameter estimates, we computed the VIF for the formative items. All of the items had a VIF less than the 3.3 cutoff.

Structural Model

The hypotheses were tested using SmartPLS 2.0 software (Ringle, Wende, and Will, 2005). Similar to other accounting studies (e.g. Pennington, Kelton, and DeVries, 2006; Hall, 2008; Chapman and Kihn, 2009) and as recommended by Chin (1998), bootstrapping (with 500 subsamples) was performed to test the statistical significance of each path coefficients using t-tests.

Overall, the results of the structural model were positive. Every path coefficient but one is statistically significant at the 0.05 level. The results also reveal that 40.6% of the Benefits construct variance, 45.5% of the Information Sharing variance, and 17.5% of the Knowledge-Sharing variance are explained by the model.

The estimates for the PLS path coefficients are used to test the direct effects of the hypothesized relations between constructs. Figure 2 reveals statistically support for H1, H3, H4, and H5, with H2 the only proposed relation not supported as a direct effect.



	Link	Path coefficients	p-value	PLS Analysis Support
H1	Information-Sharing to Benefits	0.637	***	YES
H2	Electronic Integration to Information-Sharing	0.050	.3703	**NO**
H3	Knowledge-Sharing to Information Sharing	0.411	***	YES
H4	Electronic Integration to Knowledge-Sharing	0.419	***	YES
H5	Trust to Information-Sharing	0. 368	***	YES
*** p < .001				

Figure 2. PLS Results

DISCUSSION, CONTRIBUTIONS AND CONCLUSION

From the results of the PLS analysis, we see a strong relation between the sharing of accounting information and tangible firm benefits (0.637; $p < 0.001$). Similarly, we see strong support for the role of trust enabling information sharing (0.368; $p < 0.001$) and knowledge-sharing routines enabling the sharing of accounting information (0.411; $p < 0.001$). Surprisingly, electronic integration did not have a direct effect on information sharing (0.050; $p= 0.3703$). Instead, electronic integration appears to have an indirect effect, with electronic integration impacting the knowledge-sharing routines (0.419, $p < 0.001$), which then has a subsequent effect on information sharing.

This study contributes to the relational view of the firm by empirically testing the determinants of competitive advantage as theorized by Dyer and Singh, (1998). Whereas Dyer and Singh (1998) put forth general propositions related to the potential determinants of competitive advantage, this study extends Dyer and Singh (1998) by 1) proposing a theory-based order to the constructs and 2) empirically testing the relational view of the firm in a specific accounting context. Our study suggests that accounting information sharing can be considered a complementary, network resource in which the within-firm information can be combined with partner-specific information. The result is a network-based, information resource that is rare, valuable, non-substitutable, and difficult to imitate, which can then form the basis of competitive advantage.

The research model also highlights the role of other determinants of competitive advantage. Interestingly, in our results, electronic integration by itself does not directly enable accounting information sharing. Instead, electronic integration first enabled knowledge-sharing routines. And in addition to knowledge-sharing routines, trust must also be present for accounting information sharing to occur.

This study has limitations which may lead to future studies. The first limitation is that our research instrument inquired about a dyadic relationship or partnership between a focal firm and its partner firm. However, we only measured the relationship from the focal firm's perspective. Future studies might take a dyadic perspective and explore both sides of the relationship. The second limitation is that this represents a cross-sectional snapshot of organizations from which the temporal order of the model is inferred. Future studies could more fully test the hypothesized order of the relationships. A final limitation in this study is the operationalization of governance mechanisms with the trust construct. Future studies could provide more fully explore the role of trust and incorporate control and other governance mechanisms into the research model.

Despite these limitations, this study contributes to the growing literature on how accounting, control, and trust facilitate inter-organizational relationships. From a theory perspective, this paper empirically tests the relational view of the firm in an accounting context, providing a foundation for future studies. From a more practical perspective, the research model provides specific guidance on integrating systems with knowledge-sharing routines and trust in order to benefit from accounting information-sharing. Overall, the result is an improved understanding of how accounting information can create value to organizations.

REFERENCES

1. Amit, R., and Schoemaker, P. (1993) Strategic assets and organizational rent, *Strategic Management Journal,* 14, 33-46.
2. Anderson, S. W. (2007) Managing costs and cost structure throughout the value chain: Research on strategic cost management. In C. S. Chapman, A. G. Hopwood and M. D. Shields (eds.), *Handbook of Management Accounting Research*. Oxford: Elsevier Ltd.
3. Anderson, S. W. and Lanen, W. N. (2002) Using electronic data interchange (EDI) to improve the efficiency of accounting transactions, *The Accounting Review,* 77, 703-729.
4. Barua, A., Konana, P., and Whinston, A. (2004) An empirical investigation of net-enabled business value, *MIS Quarterly,* 28, 585-620.
5. Bharadwaj, A. S. (2000) A resource-based perspective on information technology capability and firm performance: An empirical investigation, *MIS Quarterly,* 24, 1, 169-196.
6. Bharadwaj, A. S., Sambamurthy, V., and Zmud, R. W. (1998) IT capabilities: Theoretical perspectives and empirical operationalization, in *Proceedings of the 19th International Conference on Information Systems*, R. Hirschheim, M. Newman, and J. I. DeGross (eds.), Helsinki, Finland: 378-385.
7. Barney, J. B. (1991) Firm resources and sustained competitive advantage, *Journal of Management,* 17, 99-120.
8. Barrett, S., and Konsynski, B. (1982) Inter-Organization Information Sharing Systems, *MIS Quarterly,* 6, 93-105.
9. Brewer, P., Garrison, R., & Noreen, E. (2007). *Introduction to Managerial Accounting*, New York: McGraw-Hill Irwin.
10. Caglio, A., and Ditillo, A. (2010) Interdependence and accounting information exchanges in inter-firm relationships. *Journal of Management and Governance* , DOI: 10.1007/s10997-010-9136-3.
11. Chapman, C.S. and Kihn, L.A. (2009) Information system integration, enabling control and performance, *Accounting, Organizations and Society,* 34, 151-169.
12. Chin, W. (1998) The partial least squares approach to structural equation modeling. In G. A. Marcoulides (ed.), *Modern Business Research Methods*, Mahwah, NJ: Lawrence Erlbaum Associates.
13. Coad, A. F., and Cullen, J. (2006) Inter-organizational cost management: Towards an evolutionary perspective, *Management Accounting Research,* 17, 342-369.
14. Cooper, R. and Slagmulder, R. (2004). Inter-organizational cost management and relational context, *Accounting, Organizations, and Society,* 29, 1-26.
15. Cullen, J., Berry, A.J., Seal, W., Dunlop, A., Ahmed, M., and Marson, J. (1999) Interfirm Supply Chains: the contribution of management accounting, *Management Accounting*, June, 30-32.
16. Dekker, H.C. (2004) Control of inter-organizational relationships, evidence on appropriation concerns and coordination requirements, *Accounting, Organizations and Society,* 29, 27-49.
17. Diamantopoulos, A., & Winklhofer, H.M. (2001) Index construction with formative indicators: An alternative to scale development, *Journal of Marketing Research,* 38, 269-277.
18. Dyer, J. (1997) Effective interfirm collaboration: How firm's minimize transaction costs and maximize transaction value, *Strategic Management Journal,* 18, 7, 535-556.
19. Dyer, J.H. and Singh, H. (1998) The relational view: Cooperative strategy and sources of inter-organizational competitive advantage, *Academy Management Review*, 23, 4, 660-679.
20. Elbashir, M., Collier, P., and Sutton, S. (2011) The role of organizational absorptive capacity in strategic use of business intelligence to support integrated management control systems, *The Accounting Review,* 86, 1, 155-184.
21. Ellram, L, and Zsidisin, G. (2002) Factors that drive purchasing and supply management's use of information technology, *IEEE Transactions on Engineering Management,* 49, 3, 269-281.
22. Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology,* 91, 481-510.

23. Grant, R. (1996) Prospering in dynamically-competitive environments: Organizational capability as knowledge integration, *Organization Science,* 7, 375-387.
24. Gulati, R. (1999) Network location and learning: The influence of network resources and firm capabilities on alliance formation, *Strategic Management Journal,* 20, 397-420.
25. Hakansson, H. and Lind, J. (2007) Accounting in an inter-organizational setting. In C. S. Chapman, A. G. Hopwood and M. D. Shields (eds), *Handbook of Management Accounting Research.* Oxford: Elsevier Ltd.
26. Hall, M. (2008) The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance, *Accounting, Organizations and Society*, 33, 141-163.
27. Handfield, R.B., & Nichols, E.L. (1999) *Introduction to Supply Chain Management*. Upper Saddle River, NJ: Prentice-Hall.
28. Hoffjan, A., and H. Kruse. (2006) Open book accounting in supply chains—when and how is it used in practice? *Cost Management,* November/December, 40–47.
29. Hopwood, A. (1996) Looking across rather than up and down, on the need to explore the lateral processing of information, *Accounting, Organizations and Society,* 21, 589-590.
30. Hoyt, J. and F. Huq. (2000) From arms-length to collaborative relationships in the supply chain: An evolutionary process, *International Journal of Physical Distribution & Logistics*, 30, 9, 750-764.
31. Kulp, S. (2002) The effect of information precision and information reliability on manufacturer- retailer relationships, *The Accounting Review,* 77, 653-677.
32. Kumar, N. (1996) The power of trust in manufacturer-retailer relationships, *Harvard Business Review,* 74, 92-106.
33. Lamming, R. (1993) *Beyond partnership. Strategies for innovation and lean supply*. New York: Prentice Hall.
34. Lavie, D. (2006) The competitive advantage of interconnected firms: An extension of the resource-based view, *Academy of Management Review,* 31, 3, 638-658.
35. Lengnick-Hall, C.A. (1998) Customer contributions to quality: A different view of the customer-oriented firm, *Academy of Management Review,* 21, 3, 791-824.
36. Liedtka, J. (1996). Collaborating across lines of business for competitive advantage, *Academy of Management Executive*, 10, 2, 20-37.
37. Macneil, I.R. (1978) Contracts: Adjustment of long-term economic relationship under classical, neo-classical, and relational contract law, *Northwestern University Law Review,* 72, 854-906.
38. Malhotra, A., Gosain, S., and El Sawy, O.A. (2005) Absorptive capacity configurations in supply chains: Gearing for partner-enabled market knowledge creation, *MIS Quarterly*, 29, 1, 145-187.
39. March, J.G. (1991) Exploration and exploitation in organizational learning, *Organization Science,* 2, 71-87.
40. Marchand, D., Kettinger, W., and Rollins, J. (2001) *Information Orientation: The Link to Business Performance.* Oxford University Press: Oxford.
41. Marquez, A.C., Bianchi, C., and Gupta, J.N.D. (2004) Operational and financial effectiveness of e-collaboration tools in supply chain integration, *European Journal of Operational Research,* 159: 348-363.
42. Mata, F., Fuerst, W., and Barney, J. (1995) Information technology and sustained competitive advantage: A resource-based analysis, *MIS Quarterly,* 19, 4, 487-505.
43. Mentzer, J. T., Min, S. and Zacharia, Z. G. (2000) The nature of interfirm partnering in supply chain management, *Journal of Retailing,* 76, 549-568.
44. Mouritsen, J., A. Hansen, and C. Hansen. (2001) Inter-organizational controls and organizational competencies: Episodes around target cost management/functional analysis and open book accounting, *Management Accounting Research,* 12, 221-244.
45. Mouritsen, J., and S. Thrane. (2006) Accounting, network complementarities and the development of inter-organisational relations, *Accounting, Organizations and Society,* 31, 241-275.

46. Netemeyer, R., Bearden, W. and Sharma, S. (2003) *Scaling Procedures*. Thousand Oaks, CA: Sage Publications.
47. Nunnally, J.C. (1978) *Psychometric Theory*. New York, NY: McGraw-Hill.
48. Nevis, E.C., DiBella, A.J. ,and Gould, J.M. (1995) Understanding organizations as learning systems, *Sloan Management Review*, Winter, 73-84.
49. Pennington, R., Kelton, A. and DeVries, D. (2006) The effects of qualitative overload on technology acceptance, *Journal of Information Systems*, 20, 2, 25-36.
50. Peterson, K.J., Handfield, R.B., and Ragatz, G.L. (2005) Supplier integration into new product development: coordinating product, process, and supply chain design, *Journal of Operations Management,* 23, 371-388.
51. Petter, S., Straub, D., & Rai, A. (2007) Specifying formative constructs in information systems research, *MIS Quarterly,* 31, 623-656.
52. Powell, T. C., and Dent-Micallef A. (1997) Information technology as competitive advantage: The role of human, business, and technology resources, *Strategic Management Journal,* 18, 5, 375-405.
53. Primo, M. and Amundson, S. (2002) An exploratory study of the effects of supplier relationships on new product development outcomes, *Journal of Operations Management*, 20, 1, 33-52.
54. Ramos, M. (2004) Interaction between management accounting and supply chain management, *Supply Chain Management: An International Journal*, 9, 134-138.
55. Ringle, C.M., Wende, S., and Will, S. (2005) SmartPLS 2.0 (M3) Beta, Hamburg http://www.smartpls.de.
56. Ross, J. W., Beath, C. M., and Goodhue, D. L. (1996) Develop long-term competitiveness through IT assets, *Sloan Management Review,* 38, 1, 31-42.
57. Saraf, N., Langdon, C. S., and Gosain, S. (2007) IS application capabilities and relational value in interfirm partnerships, *Information Systems Research*, 18, 320-339.
58. Seal, W., Cullen, J., Dunlop, A., Berry, A., and Mirghani, A. (1999) Enacting a European supply chain: The role of management accounting, *Management Accounting Research*, 10, 303-322.
59. Teece, D., Pisano, G., and Shuen, A. (1997) Dynamic capabilities and strategic management, *Strategic Management Journal,* 18, 509-533.
60. Tomkins, C. (2001) Interdependencies, trust and information in relationships, alliances and networks*, Accounting, Organizations and Society,* 26, 161-191.
61. Tu, Q., Vonderembse, M.A. ,Ragu-Nathan, T.S. , and Sharkey, T.W. (2006) Absorptive capacity: Enhancing the assimilation of time-based manufacturing practices, *Journal of Operations Management,* 24, 5, 692-710.
62. Vickery, S. K., Jayaram, J., Droge, C. ,& Calatone, R. (2003) The effects of an integrative supply chain strategy on customer service and financial performance: An analysis of direct versus indirect relationships, *Journal of Operations Management,* 21, 523-539.
63. Vosselman, E. andVan der Meer-Kooistra, J. (2009) Accounting for control and trust building in interfirm transactional relationships, *Accounting, Organizations and Society,* 34, 267–283.
64. Wade, M., & Hulland, J. (2004) Review: The resource-based view and information systems research: Review, extension, and suggestions for future research, *MIS Quarterly,* 28, 1, 107-142.
65. Zaheer, A., and Venkatraman, N. (1995) Relational governance as an interorganizational strategy: An empirical test of the role of trust in economic exchange, *Strategic Management Journal,* 16, 373-392.

APPENDIX A: MEASUREMENT ITEMS

		Source
	External Electronic Integration of Information Systems	
EEI -1	Our firm and our partner firm have information systems that facilitate information exchange across firm boundaries.	Vickery et al. (2003)
EEI -2	Our firm and our partner firm have interorganizational information systems that support the easy exchange of information.	Vickery et al. (2003)
EEI -3	Our firm's information systems are connected to our partner firm's systems, allowing data to be shared easily between firms.	Vickery et al. (2003)
EEI -4	Our firms systems can easily transmit, integrate, and process data with our partner firm.	Barua et al. 2004
	Trust	
TRUST-1	The employees both in our firm and in our partner firm trust each other.	Tu et al. 2006
TRUST-2	Both our firm and our partner firm have a very open communications environment.	Tu et al. 2006
TRUST-3	The employees in both our firm and our partner firm are willing to share ideas about cost management with each other.	Tu et al. 2006
TRUST-4	The employees in both our firm and our partner firm are willing to accept new ideas from each other.	Vickery et al. (2003)
TRUST-5	The employees in both our firm and our partner firm deal with each other fairly.	Dyer, 1997
	Knowledge-Sharing	
KS-1	Employees within both our firm and our partner firm actively seek knowledge about costs information associated with our firm's products and/or services.	Tu et al. 2006
KS-2	Employees within both our firm and our partner firm actively seek to learn from cost information to improve our business activities.	Tu et al. 2006
KS-3	Employees within both our firm and our partner search for the best cost management practices in our industry to apply to our firms.	Tu et al. 2006
KS-4	Employees within both our firm and our partner firm actively seek to learn from the cost information provided by both firms.	Tu et al. 2006

		Source
	Accounting Information-Sharing	
	When working with our partner firm to manage or control interorganizational costs, our firm openly shares and uses the following types of information:	
AIS-1	Sales or order entry information	Brewer et al. 2007
AIS-2	Logistic and shipping information	Brewer et al. 2007
AIS-3	Billing and payment information such as EFT (electronic funds transfer)	Brewer et al. 2007
AIS-4	Product cost information	Brewer et al. 2007
AIS-5	Information related to future production and/or customer service plans	Brewer et al. 2007
AIS-6	Information related to future capacity changes and capital investments plans	Brewer et al. 2007
AIS-7	Information on market demand and forecasts	Brewer et al. 2007
AIS-8	Costs related to business process activities	Brewer et al. 2007
AIS-9	Proprietary and/or confidential information regarding product design	Brewer et al. 2007
AIS-10	Proprietary and/or confidential information regarding production and/or inventory information	Brewer et al. 2007
AIS-11	Quality cost information	Brewer et al. 2007
	Benefits	
BEN -1	... our firm has been able to reduce costs associated with day-to-day purchasing or sales transactions.	Anderson and Lanen 2002
BEN -2	... our firm has been able to reduce costs through the streamlining of inter-firm processes.	Ramos 2004: Kulp 2002
BEN -3	... our firm has been able to reduce costs through reducing uncertainty about market information.	Barua et al. 2004; Marquez et al. 2004 Marchand et al. 2001
BEN -4	... our firm has been able to decrease response time to market changes.	Marchand et al. 2001
BEN -5	... our firm has been able to identify new business opportunities.	Marchand et al. 2001
BEN -6	... our firm's market share growth has increased.	Marchand et al. 2001, Saraf et al. 2007
BEN -7	... our firm's financial performance has increased.	Marchand et al. 2001 Saraf et al. 2007
BEN -8	... our firm has improved our level of product and service innovation.	Marchand et al. 2001