

Exploring the relationship between network competence, network capability and firm performance: A resource-based perspective in an emerging economy

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ABSTRACT

Growing interest in business-to-business networks and the demonstrated linkage between firm performance and collaborative efforts within these networks fuels the continued search for a greater understanding of what is needed to manage firms in complex business constellations. Key components of managing in networks, and the focus of this study, are the competencies and capabilities required at the firm level in order to engage in meaningful network relationships to enhance performance. Adopting the resource-based view (RBV) of a firm, an attempt is made to validate measures of network competence and network capability under South African conditions. Secondly, this study considers the relationship between network competence, network capability and subjective measures of firm performance. The analysis is based on data collected using a multi-informant mail survey of 219 business managers in South Africa. Factor analysis and structural equation modelling were utilised to test a conceptual model based on contemporary literature. Our results suggest significant relationships between network competence and network capability, and between network capabilities and firm performance, but not between network competence and firm performance. In addition to providing greater clarity on the relationships depicted in the model, the study also contributes to the rich debate on network management challenges.

INTRODUCTION

Attention to networks is powered by the notion that firms cannot survive and prosper solely through their individual efforts, and that each firm's performance depends upon the activities and performance of others. Hence, the nature and quality of the direct and indirect relationships that a firm develops with its counterparts (Batt and Purchase, 2004) is fundamental to managing in complex networks. Within the network context the question may then be posed: What is it that any firm needs to do well, or needs to be capable of doing, in order to derive benefits from networked relationships? We argue that researchers should be able to contribute to this debate by considering the relationship between network competence, network capability and firm performance. In addition, this idea should be extended to emerging markets, as various authors (Parkhe, Wasserman and Ralston, 2006; Ritter, 1999) concede that network thinking is a key factor in shaping global business architecture. This rationale implies that the objective of the study is to observe the role of both constructs separately and together, as well as their relation to firm performance.

The concept of network competencies and capabilities is derived in part from the resource-based view (RBV) of a firm, a major pillar in the strategic management literature. This study employs resource-based theory (RBT) to construct a development path for network competencies and network capabilities. Such theorisation emphasises the difficulty in bridging the gap between strategic planning and network theories, as suggested by Baraldi, Brennan, Harrison, Tunisini and Zolkiewski (2007) and Ford and

Håkansson (2006). Finally, we test the usefulness of existing constructs to investigate the relationship between network competencies, network capabilities and firm performance in an emerging market setting. Our study shows that although these measures may be considered valid and reliable, the strength of their relationship with firm performance is varied.

RESOURCE-BASED VIEW AND BUSINESS NETWORKS

Despite criticism (Baraldi *et al.*, 2007), analysing firm resources and capabilities in order to select strategies that are most likely to offer good returns seems to remain a key focus in management literature. The idea of resources and capabilities is grounded in the RBV of a firm and has received considerable attention during the last decade. Hooley, Greenley, Fahy and Cadogan (2001) argue that the resource-based perspective emerged to counter the excessive determinism of the Porterian view of competition, and that RBV emphasises the importance of key resources in achieving a competitive advantage (Fahy, Hooley, Greenley and Cadogan, 2005; Teck-Yong, 2005; Fahy and Smithee, 1999). Researchers such as Camelo-Ordaz, Martin-Alcazar and Valle-Cabera (2003), however, note that a firm's achievement of a sustainable competitive advantage depends not only on resources and capabilities in its competitive architecture, or on the consistency of these with its strategy, but also on the degree of fit between its resources and the set of critical strategic industrial factors. Some key ideas behind RBT, however, appear to present scholars with problems.

According to Baraldi *et al.* (2007), the resource-based view of competitive advantage is based on the assumptions that firms are heterogeneous in terms of their control of important strategic resources, and that resources are not perfectly mobile between firms. They argue that these ideas present a relaxation of the assumption that firms do not differ in their control of strategic resources. In terms of competitive advantage, it is noted that the RBV would argue that a firm has sustained competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitors. Also, other firms should be unable to duplicate the benefits of this strategy. In short, for a resource (physical or human) to be a potential source of sustained competitive advantage, it must be valuable, rare, inimitable, and non-substitutable. In comparing these views with key perspectives from network scholars, Baraldi *et al.* (2007) noted some potential difficulties with the RBV in a network context.

Assuming that relationships and networks are considered to be resources themselves, then the relationship and network approach to strategy has something in common with the RBV, in that the current resources of the firm are considered to be the key factor in determining the firm's strategic behaviour. While the RBV focuses on three principal categories of resources, the relationship and network approach identifies the firm's portfolio of relationships and its network of positional resources as the key factors in strategy formulation (Ford and Håkansson, 2006; Foss, 1999). Network literature seems to include a significantly broader view of resources and of the context within which they are considered.

Another area of debate relates to the ability of a firm to act independently – a key assumption in RBT. Under this assumption the firm is viewed as being independent of other actors, and can therefore seek to manipulate resources optimally in the search for competitive advantage. This is referred to as the “myth of independence” by Ford and Håkansson (2006), who argue that true independence in a network is not possible, as firms have a restricted view of the surrounding network. Thus, firms are limited in their freedom to act independently because the outcomes of their actions are dependent upon the actions of other firms within the network. This interdependence suggests that no matter how strategically capable the firm may be, its own performance is linked to the performance of others in the network. Arguably, a firm's performance is, therefore, largely dependent on those with whom it interacts.

Competence-based theory

Competence-based theory (Hunt and Lambe, 2000) is also an "internal factors" theory, and it complements RBT because it explains how firms develop strategies to exploit resources in their quest for competitive advantage. In fact, it is argued that competence-based theory (CBT) is a logical extension of RBT. Numerous theoretical and empirical studies (Atuahene-Gima, 2005; Harmsen and Jensen, 2004; Ritter and Gemünden, 2004; Sanchez and Heene, 2004; Ritter and Gemünden, 2003; Ritter, Wilkinson and Johnston, 2002; Savolainen, 2002; Awauh, 2001; Bush, Rose, Gilbert and Ingram, 2001; Harland and Knight, 2001; Ritter, 1999; Hamel and Heene, 1994; Meyer, 1991; Prahalad and Hamel, 1990; Winter, 1988; Snow and Hrebiniak, 1980;) have been developing CBT, and the idea of core (also referred to as “distinctive”) competencies by Teece and Pisano (1994) and Prahalad and Hamel (1990) has received specific attention. Core competencies:

- provide access to a wide variety of markets;
- make a significant contribution to customers' perceptions of benefits, and
- are difficult for rivals to imitate.

In addition, a firm must manage its competence(s) as a system, and avoid excessive focus of managerial attention on developing and managing a “single competence” judged by some criteria to be “core”. Hunt and Lambe (2000) also suggest that CBT employs assets and capabilities in the description of competencies – further blurring the borders between these concepts.

Although Baraldi *et al.*'s (2007) analysis points at the limitations of RBT and CBT to complement network approaches, it simultaneously recognises the validity of employing these theories in a network context. If network-mobilising incorporates the network competences and capabilities required for processes of internally-generated change, researchers should attempt to establish what tools, technologies and skills are necessary to better understand how firms are managed in networks. They (Baraldi *et al.*, 2007) conclude that little attention has been paid to the question of whether more successful firms have better mechanisms for managing their external relationships and networks than less successful companies. Researchers need to know whether firms that do achieve consistently above-average economic success have better internal resources and competences or capabilities for handling external relationships in the surrounding network than their rivals. This study attempts to contribute towards bridging this gap.

COMPETENCIES AND CAPABILITIES

According to Heene and Sanchez (1996), a competence is defined as an ability to sustain the coordinated “deployment of assets in a way that helps a firm achieve its goals”. Defined in this manner, it is viewed as a resource, even though it is in practice an “intangible entity” that allows a firm to compete more effectively. According to Hunt and Lambe (2000), one may view a competence as being a higher-order resource that is a distinct combination of more basic resources.

In turn, the definition of capabilities appears to have followed a similar path, which originates with the notion of “marketing assets” (Hooley *et al.*, 2001; Hooley *et al.*, 2005; Hooley and Greenley, 2005) and includes customer-based assets, distribution or supply-chain-based assets, internal assets and alliance-based assets. Notably present in this collection are a number of “marketing assets” that relate strongly to networks and the firm's ability to operate

in network environments. Furthermore, marketing assets are distinguished from “marketing capabilities” – which are referred to as the “glue” that binds marketing competencies together and facilitates their effective deployment in the marketplace. The varied way in which the concepts of competencies and capabilities are used in the literature is demonstrated when these authors (Hooley *et al.*, 2001) employ the seminal work of Day (1994) to classify capabilities as *outside-in* (those skills and competencies of the firm that help it to understand changes taking place in its markets together with those that enable the firm to operate more effectively in the market place), *inside-out processes* (these focus on the firm's internal resources and capabilities such as financial management, cost control, technology development and integrated logistics), and *spanning capabilities* (those skills and competencies that serve to integrate inside-out and outside-in capabilities. They typically require both an understanding of market requirements and internal competencies to fulfil them). In providing further support for the idea of network capabilities, as in the context of this study, Day (1994) also refers to a set of capabilities for the purpose of competing, and specific reference is made to “networking capabilities”, also suggested by Cravens and Piercy (1994).

The studies cited above refer to attempts to consider the relationship between resources (including competencies and capabilities) and firm performance. Moreover, in their consideration of performance, a distinction is made between financial performance and market performance. This separation appears useful to our consideration of firm performance. Hooley *et al.*'s (2005) research demonstrates how marketing resources impact on performance outcomes, with both direct and indirect relationships being found. Although these linkages may appear to be useful in investigating the relationship between marketing resources and firm performance, no specific mention of network competence and network capabilities was made.

NETWORK COMPETENCIES AND CAPABILITIES

Research by Golfetto and Gibbert (2006) note that existing work on the role of competencies in industrial marketing firstly focuses on established approaches to deal with competencies as inputs to firm processes and the consequent attempts to establish how marketing competencies such as customer relationship management, channel design, etc., lead to superior financial returns. Secondly, it also focuses on the marketing of competencies as a source of customer value. Similar to views by Baraldi *et al.* (2007), it is acknowledged that the resource-based

view has become influential in explaining the origin of competitive advantage and differences in profitability, but has emphasised resources and competencies as highly specific internal factors.

Based on the reasoning of Barney and Airikan (2000) Golfetto and Gibbert (2006) suggest that an integration of RBV and marketing may lead to viewing certain marketing processes as a special kind of competence. It then follows that the extent to which marketing competencies comply with the criteria of the RBV (value, rarity, immobility on factor markets and non-substitutability) will correlate with how they are expected to be a key ingredient of a competitive advantage that may lead to superior performance. We concur with this view and argue that it may be extended to business networks. Our adoption of this approach appears to be well supported in the literature. Firstly, according to Berghman, Matthyssens and Vandenbempt (2006), business marketers seeking to excel in value-creation must display their new value-creation potential and track record to stimulate network partners to cooperate. Secondly, Blois and Ramirez (2006) point out that there are significant opportunities for firms to establish unique and potentially profitable positions by recognising that some of the capabilities that they utilise in the creation of their products may themselves be marketable products. Thirdly, Ritter (2006) contributes to the notion of competence-based marketing and suggests a model of firm capabilities, and also indicates when to use competence-based communication approaches. Finally, according to Golfetto and Gibbert (2006), this work (the resource linkage to firm performance) is commendable since a firm's ability to exploit external knowledge may be considered a critical component of performance, and they (Golfetto and Gibbert) accept that a prime source of such external knowledge resides in the supply network.

Although grounded in RBT, the literature suggests that competencies and capabilities are often used interchangeably. For the purposes of this study a competence is viewed as an ability to sustain the coordinated deployment of an asset (Heene and Sanchez, 1996). In the case of capabilities we relax the definition of a capability as an asset (Hooley *et al.*, 2001) to that of a higher-order resource (Walter, Auer and Ritter, 2006; Teece, Pisano and Shuen, 1997) that can be either tangible or abstract. We also suggest that capabilities and competencies are inherently interconnected. This distinction is made to isolate the underlying constructs, and facilitate independent analysis. Extending this argument to network competencies and network capabilities, our first hypothesis is:

H¹: There is a significant positive relationship between network competence and network capability

Network competence

Network competence is considered to be a firm-specific ability to handle, use and exploit inter-firm relationships (Ritter and Gemünden 2003; Ritter, Wilkinson and Johnston, 2002). This approach recognises that firms are embedded in networks of cooperative and competitive relations with other firms (Achrol and Kotler, 1999; Ford *et al.*, 1998; Anderson, Fornell and Lehmann, 1994). Within these networks the inter-organisational relationships are long-term arrangements, maintained for some overall functional purpose. According to Ritter, Wilkinson and Johnston (2002), there appear to be substantial differences in the ability of firms to deal with networks.

Ritter, Wilkinson and Johnston (2002) note that the term "competence" is used to describe resources and preconditions such as qualifications, skills, or knowledge, necessary to perform certain tasks without considering the actual execution of the task itself. But they also recognise competence as a process, and incorporate both aspects in their conceptualisation of network competence. Hence, their definition seeks to include both having the necessary knowledge, skills and qualifications, and using them effectively. They further distinguish between the tasks that need to be performed in order to manage a firm's technological network and, on the other hand, the qualifications, skills, and knowledge that are needed in order to perform these tasks. The latter are referred to as "qualifications". Network competence is described (Ritter, Wilkinson and Johnston, 2002) as an embedded firm construct, and the ability to manage in networks is inseparable from the firm itself. Ritter, Wilkinson and Johnston (2002) extend their argument further by noting that networking is a firm-wide responsibility, limited and supported by the firm's characteristics. Such a responsibility demands that the whole firm be network-orientated.

The work of several authors (Hakansson and Ford, 2002; Wilkinson and Young, 2002; Möller and Halinen, 1999) suggests that a distinction between tasks which are relevant to managing a single relationship and tasks which are necessary to manage a portfolio of relationships (a network as a whole) is useful. Three different types of *relationship-specific tasks* (initiation of a relationship, exchanging products and services and coordinating dyadic relationships) is supplemented with "adaptations" from both sides of the dyad to contribute to that specific relationship. This approach seems to be supported in recent research (Fang, Palmatier, Sheer and Li, 2008; Palmatier, Dant and Grewal, 2007). For *Cross-relational tasks* Ritter, Wilkinson and Johnston (2002) draw on the widely recognised managerial tasks of planning, organising,

staffing and controlling described in general management literature (Lichtenstein and Dade, 2007; Witzel, 2002; Wernerfelt, 1989; Carroll and Gillen, 1987; Fottler, 1981).

For *network management qualifications*, Ritter, Wilkinson and Johnston (2002) make a distinction between specialist qualifications and social qualifications. *Specialist qualifications* deal with the “technical side of the relationship” and include political, legal and economic specialities, as well as knowledge about other actors. In turn, these “technical aspects” include information about the operations of network partners, their staff and resources. *Social qualifications* refer to how people behave in a social setting. These qualifications include dimensions such as communication ability, extraversion, conflict management skills, empathy, emotional stability, self-reflectiveness, sense of justice, and cooperativeness. Ritter, Wilkinson and Johnston (2002) note that these are of special interest as the interpersonal interactions and relationships in business relations are very important.

Ritter, Wilkinson and Johnston (2002) demonstrate a significant positive relationship between network competence and three performance-related measures, namely “technological interweavement, innovation success and market orientation”. Although the relationship between innovation orientation (Berthon, Mac Hulbert and Pitt, 2004) and firm performance, as well as that between market orientation (Harris, 2001; Deshpandé and Farley, 1998; Jaworski, Stathakopoulos and Cadogan, 1993; Narver and Slater, 1990) and firm performance has been demonstrated in the literature, Ritter, Wilkinson and Johnston’s (2002) theory does not seek to measure the direct relationship between network competence and firm performance. However, they specifically note the need for robust measures and tests in order to understand the impact of network competence on firm performance (Ritter, Wilkinson and Johnston, 2002). We therefore construct our second hypothesis as follows:

H²: There is a significant positive relationship between network competence and firm performance

Network capability

The idea of firms’ capabilities in a network context is considered by Walter, Auer and Ritter (2006), who conceptualise network capability as a higher-order construct and define it as a firm’s ability to develop and utilise inter-organisational relationships. Based on competence-based theory, they claim to consider networking ability rather than only the existence of a network. By considering the relationship between network

capability (NCA) and performance of university spin-off firms, they observe that NCA strengthens the relationship between entrepreneurial orientation and spin-off performance, and it (NCA) moderates the relationship between entrepreneurial orientation and organisational performance. These findings lead Walter, Auer and Ritter (2006) to conclude that firms develop their network capability and their networks as a means of improving performance, and that NCA is an organisation-wide characteristic.

The development of the network capability construct is based on the contributions to “alliance capability” (Kale, Dyer and Singh, 2002), “relational capability” (Lorenzoni and Lipparini, 1999) and “network capability” (Anand and Khanna, 2000). Walter, Auer and Ritter (2006) specifically acknowledge the contribution of RBT in the network capability debate, and propose that the NCA construct consists of four latent dimensions: coordination, relational skills, market knowledge and internal communication. They therefore treat NCA as a composite construct that requires a formative measure because it is regarded as a higher-order “resource” that increases in magnitude as each of the four components increases. *Coordination* between collaborating firms is a boundary-spanning activity, and connects the firm to other firms in order to effect mutually supportive interactions. *Relational skills* are viewed as important to the management of relationships because business relationships are often inter-personal. Such skills may include communication ability, extraversion, conflict management skills, empathy, emotional stability, self-reflection, sense of justice and cooperativeness. These factors are similar to the cited social qualifications in the NCO construct. *Partner knowledge* enables “situation-specific management” and includes the reduction of transaction costs and solution-oriented conflict management, and it stabilises a firm’s position, where necessary, within a network. It is argued (Walter, Auer and Ritter, 2006) that this knowledge is a prerequisite for effective coordination between parties, and contributes to the enhancement of internal communication. True to common belief, *internal communication* is central to a relational perspective. It deals with assimilating and disseminating up-to-date information about partners and their resources, as well as agreements with them, in order to avoid redundant processes and miscommunication, while improving the detection of synergies.

Walter, Auer and Ritter (2006) observe that NCA has a key influence on a wide variety of performance measures. Specifically, the authors suggest that this relationship should be considered “more seriously”, as NCA’s relation

to firm performance appears to be significant. In an effort to gauge this relationship more specifically, we construct our final hypothesis:

H³: There is a significant positive relationship between network capability and firm performance

The development, maintenance and growth of firm-level competencies and capabilities can only make sense if they contribute to competitive advantage (a primary position in RBT) and ultimately contribute to firm performance. Our treatment of firm performance is based largely on the work by Hooley *et al.*, (2005), Krohmer and Workman (2004), and Fynes and Voss (2002), who support the use of perceptual measures of firm performance. In addition, we followed a qualitative process, where experience interviews were conducted with senior executives in business-to-business firms. From these interviews it emerged that sales growth, customer retention, market share and return on investment (ROI) are the “top-of-mind” measures that managers consider when evaluating firm performance. These results are consistent with the

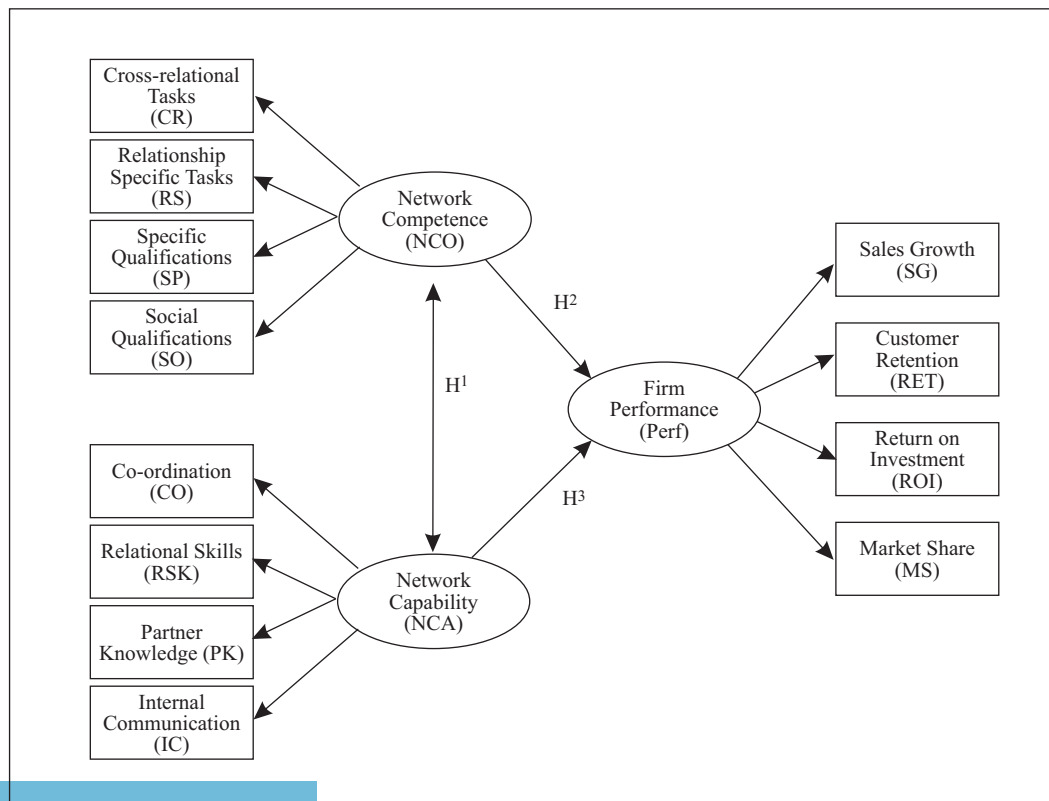
literature (Palmatier, Dant and Grewel, 2007; Hart and Banbury, 1994; Naman and Slevin, 1993; Venkatraman and Ramanujam, 1987; Dess and Robinson, 1984) which confirms that perceptual performance measures have been shown to have a high correlation with objective financial performance measures.

Against this background, a conceptual model was constructed (Figure 1) where network competence (a composite construct consisting of four dimensions) and network capability (also a composite construct consisting of four dimensions), are related to a composite measure of firm performance (consisting of four perceptual measures).

METHOD

In the qualitative phase of the study, eight in-depth interviews were conducted with managers from the manufacturing, financial services and property development sectors. The interviews attempted to obtain the following:

FIGURE 1
CONCEPTUAL MODEL RELATING NCO, NCA AND FIRM PERFORMANCE



- the managers' opinion of the scales to be used in the survey;
- their views on performance measurement, and
- their views regarding the construction of the questionnaire and the data collection method.

Based on these results, a structured survey was distributed via fieldworkers, using a multi-informant approach.

Sample

The population was defined as managers in a South African business-to-business setting. The non-probability convenience sample drawn included 288 managers from 100 firms in the Johannesburg, Cape Town and Durban metropolitan areas. This sample yielded 227 (79%) responses, from which eight (4%) of the cases were considered not useful, leaving 219 (76%) questionnaires for analysis.

Data collection

The questionnaire contained the following: A 22-item scale, measuring four latent variables related to network competence (NCO) based on Ritter, Wilkinson and Johnston (2002); a 19-item network capability (NCA) scale also measuring 4 latent variables based on Walter *et al.*, (2006); and four measures of perceived firm performance (sales growth, customer retention, ROI and market share) which were based on work by Hooley *et al.*, (2005), Homburg, Krohmer and Workman (2004), and Fynes and Voss (2002).

The questionnaire also contained demographic information about the respondents (managerial discipline, managerial position, age, gender, citizenship and ethnicity) and about the firms (ownership, industry classification, number of employees, annual turnover and sales origin) that they represented. For the NCO, NCA and performance measures, a unidirectional 7-point Likert-type scale was used. In the case of the NCO and NCA scales, (a score of "1" equals "*strongly disagree*" and a score of "7" equals "*strongly agree*") was used. For the performance measures, the scales were anchored at "*Worse than our strongest competitor*" (1) and "*Better than our strongest competitor*" (7).

Characteristics of the sample

The majority (85%) of the firms in the sample generated their business from local markets, and 76% viewed themselves as purely business-to-business firms. Manufacturing (21.5%), construction (11.4%), wholesale

trade (19.2%) and financial intermediation (26%) represented the largest industry categories in the sample.

As expected, the majority (31%) of the respondents were from marketing and sales departments, and 21% indicated that they were general managers with multi-disciplinary responsibilities. Another 13% claimed to be from operations management, and together these functional areas constituted 65% of the respondents. The average age of respondents was between 36 and 40 years; 50% of the respondents indicated that they were from top management, while 36% claimed to be from middle management, with only 18% from junior management. As much as 55% of the sample consisted of whites, and encouragingly, the sample contained 31% females, which was expected to be much lower as men still largely dominate many areas of the South African economy.

Data analysis

The analysis first considered the reliability and validity of the NCO and NCA scales separately. As is customary for scale refinement, reliability was primarily considered through the calculation of Cronbach alpha coefficients, while discriminant validity was considered by way of exploratory factor analysis (EFA). Once we were satisfied with the reliability and validity for the two network scales, confirmatory factor analysis (CFA) and structural equation modelling (SEM) were employed to gauge the hypothesised relationships. Structural equation modelling not only allows the researcher the opportunity to consider multiple observed variables, but also explicitly takes measurement error into account, and gives greater recognition to measurement constructs. Hence, through the use of SEM, a particular relationship can be observed in the presence of other relationships. In addition, SEM provides an indication of how well the data fit the hypothesised model.

RESULTS

Reliability and validity

Both the network competence (NCO) and network capability scales were subjected to reliability and validity testing through exploratory factor analysis (EFA) using SPSS and confirmatory factor analysis (CFA) using LISREL 8.80 (Jöreskog and Sörbom, 1999; Jöreskog and Sörbom, 1993). In the case of network competence, the original 22-item scale (Ritter, *et al.*, 2002) was refined to 15 items by eliminating items that either cross-loaded or had a loading of less than 0.3 (Palant, 2007). The overall Cronbach alpha coefficient (α) for the refined scale was

0.776, indicating good reliability. In addition, the reliability for each underlying dimension of the NCO scale was also satisfactory, as cross-relational tasks ($\alpha = 0.702$) relationship specific tasks ($\alpha = 0.708$) special qualifications ($\alpha = 0.716$) and social qualifications ($\alpha = 0.748$) all yielded Cronbach alpha coefficients above 0.7. In considering discriminant validity, the exploratory factor analysis (EFA) indicated that only two items yielded insignificant (< 0.3) factor loadings, and these were thus eliminated. The remainder of the items loaded as expected, and are depicted in the theoretical model. In addition, the KMO measure of sampling adequacy was above 0.6 (0.702), while the Bartlett's test of sphericity was also satisfactory ($\chi^2 = 932.401$; $df = 78$; $\rho = 0.000$). This initial analysis suggests that the data generated by the scale are suitable for factor analysis and that 64.5% of the variance was explained by the four factors, namely cross-relational tasks (CR), relationship-specific tasks (RS), special qualifications (SP) and social qualifications (SO). In considering the measurement model by using the robust maximum likelihood estimation method, the confirmatory factor analysis yielded a reasonably good fit ($\chi^2 = 108.11$; $df = 59$; $\rho = 0.000$; $RMSEA = 0.062$).

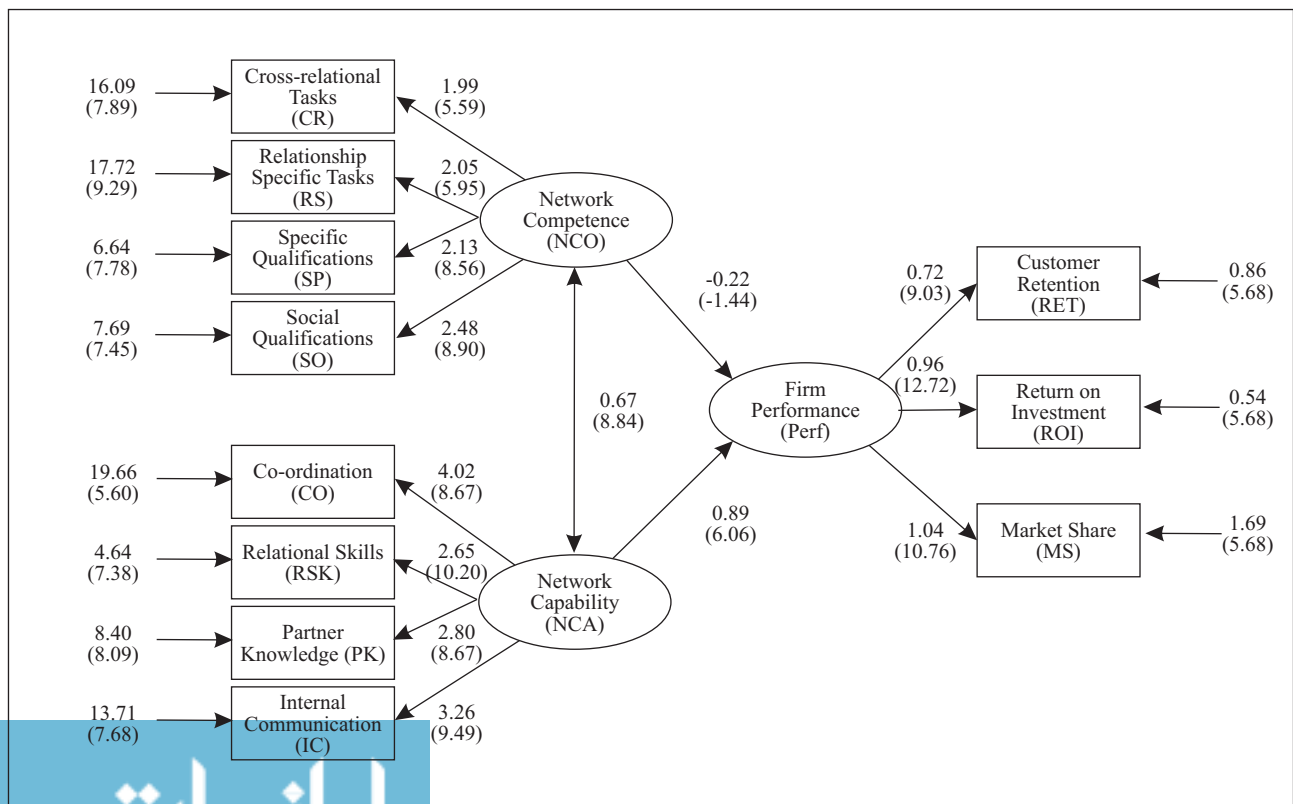
In the case of the network capability (NCA) scale, the underlying dimensions, namely coordination ($\alpha = 0.819$),

relational skills ($\alpha = 0.758$), partner knowledge ($\alpha = 0.811$) and internal communication ($\alpha = 0.713$) all demonstrated good ($\alpha > 0.7$) reliability, and the overall scale ($\alpha = 0.886$) was considered to be reliable. Similar to NCO, the validity of the NCA was also considered through exploratory factor analysis and confirmatory factor analysis. The EFA indicated that one item returned an insignificant factor loading (< 0.3), and it was removed from the scale. For NCA, the KMO measure of sampling adequacy was above 0.6 (0.832), and the Bartlett's test of sphericity was also satisfactory ($\chi^2 = 1589.42$; $df = 153$; $\rho = 0.000$). The CFA (also using the robust maximum likelihood estimation method) suggested good construct validity as the 18 items (derived from the original 19-item scale) loaded as expected, with no loading lower than 0.3. In addition, the factor structure suggested a reasonable fit ($\chi^2 = 266.62$; $df = 113$; $\rho = 0.000$; $RMSEA = 0.079$).

Structural equation modelling

The results of the SEM analysis (Figure 2) revealed that no significant effect for sales growth (indicated by SG as a performance measure in the Y model) could be observed. This led to the elimination of the sales growth variable in the model. All the other paths were retained, and could be interpreted.

**FIGURE 2
EMPIRICAL MODEL***



* t-values in parenthesis

Firstly, the analysis shows a significant positive relationship ($\beta = 0.68$; $t = 8.86$) between network competence (NCO) and network capability (NCA), confirming support for H1. Secondly, a weak and insignificant effect ($\beta = -0.22$; $t = -1.44$) between network competence (NCO) and the composite measure of firm performance (Perf) was observed. This leads to the rejection of H². Finally, in support of H³, a robust effect ($\beta = 0.89$; $t = 6.06$) of network capability (NCA) on firm performance (Perf) was observed. In summary, these results suggest that while network competence and network capability are interrelated, network capability appears to have a significant impact on performance. Figure 2 also shows that the model achieved a fairly poor fit ($\chi^2 = 124.86$; $df = 51$; $p = 0.00000$; $RMSEA = 0.082$). Despite this slightly poor fit the findings discussed here provide insight into the hypothesised paths between constructs associated with a firm's ability to manage in networked environments. Table 1 summarises these results.

DISCUSSION

The results of this study indicate that the data support the underlying dimensions of both the network competence scale and the network capability scale, as proposed in the literature. Moreover, both scales exhibit significant reliability and construct validity, suggesting their usefulness for measuring the unobserved construct. Although the notion of competence-based competition, and specifically the idea of distinctive competencies, is well documented and supported by the RBT literature, research support for network competence appears limited, also Network competence seems to be joined at the hip with network capabilities. This was evident when latent variables were freed to cross-load in the model. More specifically, it appears that the dimension named "social qualifications" in the network competence scale and the "relational skills" dimension in the network capability scale share conceptualisation. Although the exploratory factor analysis in this study suggests that these dimensions exhibit discriminate validity, we concede that more robust analyses, such as those suggested by Fornell and Larcker (1981) and Anderson and Gerbing (1988), and using a

random sample, should yield better insights. Such analyses are warranted, as the social dimension of networks is well recognised and documented (Moller and Rajala, 2007; Teck-Yong, 2005). Both the network competence and network capability scale may benefit from such a refinement.

The data did not exhibit a strong effect for "sales growth", and this variable was removed from the model. As mentioned in the literature review, sales growth is often used as a performance measure in similar studies and, as such, this result was surprising. In a study by Palmatier, Dant and Grewal (2007), a significant positive relationship ($\beta = 0.21$, $t = 2.95$) between a buyer's relationship quality with a particular salesperson and sales growth was observed, but a negative and insignificant relationship ($\beta = -0.07$, $t = -1.04$) was observed between a buyer's relationship quality with the selling firm and sales growth. The latter finding supports our exclusion of this variable, and suggests differences between a firm-level versus a relationship-level analysis of sales growth. However, testing these variances is beyond the scope of this study.

Importantly, network competence was observed to have a weak and insignificant correlation with firm performance. In both the studies by Ritter, Wilkinson and Johnston (2002) and Ritter and Gemünden (2003), network competence is claimed to have a significant positive effect on performance. In both these studies, performance is considered in terms of measures relating to innovation success and technological interweavement, with no direct reference to the type of performance measures employed in this study. Clearly, understanding the relationship between network competence and performance needs to be the subject of a more rigorous study, supported by a random sample. It can be argued that increased networking competence may enhance relational performance, ultimately leading to growing sales through customer retention.

The positive and significant relationship between network capabilities and firm performance supports the results obtained from studies in other parts of the world (Walter, Auer and Ritter, 2006). Our result in this regard strongly

TABLE 1
SUMMARY OF RESULTS

Number	Hypothesised relationship	Estimate	t-value	Result
H ¹	NCO \longleftrightarrow NCA	0.67	8.84	Accept
H ²	NCO \longrightarrow Perf	-0.22	-1.44	Reject
H ³	NCA \longrightarrow Perf	0.89	6.06	Accept

suggests that network capabilities need to be the focus of managerial attention if a firm seeks to enhance its ability to manage in complex networks. The advantage that may be derived from increased network capability is bound to have a positive effect on performance. Various authors (Walter, Auer and Ritter, 2006; Kale, Dyer and Singh, 2002; Han, Kim and Srivastava, 1998) support this by noting that NCA, as a firm-level concept that promotes network-oriented behaviour, can support superior performance by disseminating information throughout the firm and within the supplier network. In addition, high-NCA firms may be better able to anticipate new preferences, are more aware of competitors' actions, and can develop new value propositions more rapidly. In particular, the potential benefits of network capability to enhance time-to-market processes for new innovations (Walter, Auer and Ritter, 2006) seem very attractive.

LIMITATIONS, FUTURE RESEARCH AND MANAGERIAL IMPLICATIONS

Although our study demonstrates the usefulness of the network competence and network capability constructs in emerging economy environments, its ability to draw conclusions regarding the business-to-business population in these markets is limited by its exploratory nature. In particular, this study is based on a cross-sectional research design in an attempt to observe the behaviour of the network competence and network capability scales, and possibly to enhance generalisation of the results. It remains a snapshot which limits its ability to consider causality, and therefore no causality is claimed. A longitudinal design might provide future researchers with better insights, as such designs are generally more powerful (Cooper and Schindler, 2006) in testing for causal relationships. Another notable limitation of the study relates to the non-probability sample. Although considered appropriate for observing the initial performance of the two constructs in question, it implies that the hypothesised relationship cannot be generalised to all business-to-business firms in South Africa. Future studies may seek to ensure random sampling. In addition, although much has been done to consider discriminate validity, the manner in which both scales were used suggests that an inference error because of multi-collinearity may be problematic. According to Grewal, Cote and Baumgartner (2004), multi-collinearity is unlikely if Fornell and Larcker's criterion is satisfied. Thus, it is recommended that this approach be considered in future studies. A final limitation of the study is associated with the use of perceived measures of firm performance, which may result in common method bias in the responses. Future studies may overcome this problem

by using objective measures of performance, and should follow the Lindell and Whitney (2001) procedure to test for it.

Future research should seek to construct a more robust model for considering the causal relationship between network capabilities and organisational performance. Specifically, the drivers of relationship quality in a network context should contribute to our understanding of the linkages between network relationships and network performance. This focus may also bring the ideas associated with network value and/or relationship value under investigation.

Based on our results, we recommend that firms may improve their performance in a business network context through enhanced managerial attention towards

- better coordination between actors in the network;
- the development of relational skills among actors in the network;
- increased partner knowledge across firms in the network, and
- increased quality of inter-firm communications.

These dimensions were positively correlated with perceived measures of firm performance, and should yield returns on managerial investment. In addition, network competence and network capability were tested, and both exhibited good reliability and construct validity. These scales may be used as the basis for initiatives to measure a firm's ability to manage in complex business networks. Moreover, we recommend that firms adopt a critical view of their ability to manage and operate in increasingly collaborative network environments.

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