

Social Capital as a Microlevel Origin of Organizational Capabilities*

Jan Kemper, Oliver Schilke, and Malte Brettel

The microlevel concept of social capital has received significant attention in management and sociological research but has not yet been empirically associated with the development of organizational capabilities. The major purpose of this paper is to investigate the relationship of social capital with marketing and research and development (R&D) capability and to explore how the environmental context moderates the social capital–organizational capability link. It is suggested that top management’s social capital provides a firm with important information and control benefits that facilitate effective access to the knowledge and resources necessary for building superior organizational capabilities. In addition, we identify the role of two important environmental factors influencing the social capital–organizational capability link: technological turbulence and competitive intensity. The strength of the relationship between social capital and organizational capabilities is proposed to vary depending on the level of these two environmental characteristics. This study conceptualizes and operationalizes social capital as a multidimensional construct reflected by the structural dimension of tie strength, the relational dimension of trust, and the cognitive dimension of solidarity. Survey and archival data on 280 firms from various industries are analyzed using structural equation modeling. Empirical support for the proposed three-dimensional structure of social capital is found. Results further indicate that social capital is a significant antecedent to both marketing and R&D capability, which in turn significantly affect firm performance. While a positive relationship between social capital and organizational capabilities is supported in general, the strength of this relationship depends on the environmental context the firm is embedded in. The positive effect of social capital on marketing capability increases in environments with high technological turbulence and competitive intensity; the opposite holds for R&D capability. This research contributes to the resource-based view by introducing social capital as an important microlevel factor promoting the development of organizational capabilities. By identifying and evaluating two important environmental contingencies, our study also decreases some of the ambiguity surrounding the effectiveness of antecedents to organizational capabilities. The findings further help practitioners decide under what circumstances investing in top-managers’ social capital provides an effective means for achieving superior performance through enhanced organizational capabilities. This should have an important bearing on issues such as management training and incentives as well as on hiring policies.

Introduction

The resource-based view (RBV) identifies organizational capabilities as a major source of sustainable competitive advantage. Organizational capabilities are socially complex routines that determine a firm’s effectiveness in transforming inputs into outputs (Collis, 1994), and researchers have theorized that firms with superior capabilities can achieve a sustainable

competitive advantage by better leveraging their resources (Barney, 1991). However, as Zollo and Winter (1999) note, the RBV lacks a solid account of how organizational capabilities come into existence (also see Danneels, 2008; Newbert, 2007). Despite their importance for firm prosperity, organizational capabilities remain underspecified (Kraatz and Zajac, 2001), and empirical work on antecedents to capabilities is relatively rare. Therefore, further investigation of what ultimately leads to one organization being capable in some area of business activity while another is not remains important. In particular, individual-level processes may play an important role in the origins of organizational capabilities (Felin and Foss, 2005). We thus agree with Gavetti (2005, p. 599), who states that “research on capabilities needs

Address correspondence to: Oliver Schilke, Department of Sociology, University of California, Los Angeles, 264 Haines Hall, Los Angeles, CA 90095-1551, USA. E-mail: schilke@ucla.edu. Tel: +1 310 825-1313.

* We would like to thank Andreas Engelen for his valuable support throughout the research reported here.

microfoundations,” as it is still unclear how organizational capabilities emerge from individual action and interaction (Abell, Felin, and Foss, 2008).

This study specifically explores the role of social capital as a microlevel origin of organizational capabilities. We posit that senior management’s social interaction within their external network offers an important basis of organizational capabilities development. By focusing on the individual-level foundation of social capital, our aim is to explore a new “basic element” (Lippman and Rumelt, 2003, p. 903) that drives differences in the capability endowment of firms.

Beyond investigating direct links, Gavetti (2005) and Zollo and Winter (2002) called for further research on the environmental conditions under which specific antecedents lead to enhanced organizational capabilities, with certain contingencies fostering and others reducing the effects of these antecedents. An additional contribution of this paper, therefore, is to empirically test a set of environmental factors moderating the social capital–organizational capabilities link in order to improve current knowledge of the contextual settings in which social capital as a key antecedent of organizational capabilities is relatively most relevant.

BIOGRAPHICAL SKETCHES

Jan Kemper received his doctoral degree from RWTH Aachen University, Germany. He has worked for two leading international investment banks and is currently the Chief Financial Officer of Zalando GmbH, one of Europe’s fastest growing e-commerce companies. His areas of research include international management and marketing as well as entrepreneurial finance. He has published his research in academic journals such as *Journal of International Marketing* and *Zeitschrift für betriebswirtschaftliche Forschung*, and presented at leading international conferences.

Oliver Schilke is a doctoral candidate in sociology at the University of California, Los Angeles. His research focuses on trust, cooperation, identity, and organizational capabilities. His publications have appeared or are forthcoming in academic journals such as *Entrepreneurship Theory and Practice*, *Journal of Management*, *Journal of Marketing Research*, *Strategic Management Journal*, *Strategic Organization*, and *Long Range Planning*, among others.

Malte Brettel is Professor of Business Administration for Engineers and Natural Scientists and Director of the Center for Entrepreneurship at RWTH Aachen University, Germany. He received his doctoral degree and his postdoctoral lecturing qualification from WHU Otto Beisheim School of Management, Germany. He has worked as a management consultant and was cofounder of JustBooks (today ABEBooks). His research interests include entrepreneurial management and development, entrepreneurial marketing, entrepreneurial finance, and innovation management. He has authored several books and published in various academic journals, and presented his research at leading international conferences.

Conceptual Background

Social Capital

Social capital can be understood as “the goodwill available to individuals or groups. Its source lies in the structure and content of the actor’s social relations” (Adler and Kwon, 2002, p. 23). Various authors expanded on the concept of social capital and, in doing so, derived slightly different conceptualizations, with two opposing positions emerging (cf. Adler and Kwon, 2002). The first camp of researchers describe social capital as a public good (e.g., Coleman, Winship, and Rosen, 1988; Kostova and Roth, 2003), thus regarding it as an attribute of a social unit. According to this view, social capital is available to, and benefits, both its creators and group members at large. Other scholars describe social capital as a private good (e.g., Belliveau, O’Reilly, and Wade, 1996; Burt, 1992, 1997). These researchers focus explicitly on the individual’s accrued social assets such as prestige, educational credentials, and social clubs. Nahapiet and Ghoshal (1998) aimed to integrate both the private and the public good perspectives of social capital into one coherent framework. We follow their lead and formally define social capital as the sum of the actual and potential benefits embedded in, available through, and derived from an individual’s or social unit’s network or relationships. Given the complex nature of the concept, social capital may be thought of as a higher order factor that is reflected by several dimensions: structural, relational, and cognitive (Nahapiet and Ghoshal, 1998).

Structural dimension. The structural dimension of social capital refers to the embeddedness of actors in a social system. A strongly embedded individual often possesses unique advantages in accessing certain resources or information, as strong embeddedness implies a high position in a status hierarchy. For the purpose of operationalization, we focus on tie strength as a proxy for the structural dimension of social capital, following Li, Poppo, and Zhou (2008), and Peng and Luo (2000). Strong ties promote and enhance both reciprocity and long-term perspectives (Larson, 1992), and a positive relationship exists between the strength of ties and the degree of learning (Kale, Singh, and Perlmutter, 2000).

Relational dimension. The relational dimension of social capital characterizes the types of relationships actors develop with each other. In contrast with the structural dimension, the relational dimension does not refer to the structure of the relationships or connections between

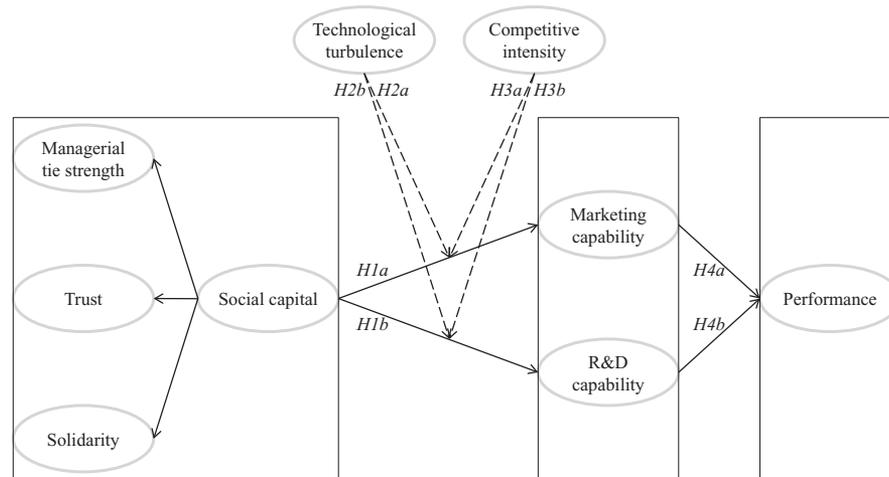


Figure 1. Conceptual Framework

actors but to the underlying basis of the relations (Inkpen and Tsang, 2005). This study follows prior research and focuses on trust as a key relational aspect in most forms of economic relationships (Cook and Schilke, 2010; Nahapiet and Ghoshal, 1998). Trust can be viewed as the basic active ingredient of social capital, the condition that allows an actor to reliably expect to obtain and use the information and resources made available through contacts (Nahapiet and Ghoshal, 1998).

Cognitive dimension. The cognitive dimension refers to those benefits providing shared representations, interpretations, and systems of meaning among parties (Nahapiet and Ghoshal, 1998). It diminishes misunderstandings, opens discussion, and promotes frequent communication among network members (Tsai and Ghoshal, 1998). Thus, a shared vision can be viewed as a bonding mechanism that helps different parts of a network integrate knowledge (Inkpen and Tsang, 2005). An important representation of this form of social capital is solidarity, which is used here as a proxy for capturing the cognitive dimension of social capital, following the lead of Atuahene-Gima and Murray (2007). Solidarity denotes the degree to which parties in a relationship subordinate their personal needs to the goals or objectives of the relationship (Adler and Kwon, 2002). Solidarity thus emphasizes the benefits of collective goal attainment and cooperation rather than individual achievements in a network or dyadic relationship. By emphasizing the salience of common goals, solidarity fosters information sharing and resource exchange (Atuahene-Gima and Murray, 2007).

While separating the structural, relational, and cognitive dimensions is useful analytically, interrelations

among the dimensions are high (Nahapiet and Ghoshal, 1998), and we suggest that the three social capital dimensions are elements of a reflective higher order construct, as shown in Figure 1.

Organizational Capabilities

Organizational capabilities are “the socially complex routines that determine the efficiency (and effectiveness) with which firms physically transform inputs into outputs” (Collis, 1994, p. 145). This definition stresses that organizational capabilities are embedded in firms’ routines—learned, stable pattern of collective activity (Schilke, forthcoming; Zollo and Winter, 2002). Distinct capabilities exist in different areas of business activities that allow firms to generate competitive advantage (Eisenhardt and Martin, 2000; Schilke and Goerzen, 2010). Therefore, to empirically examine organizational capabilities in particularly relevant domains and to reduce conceptual ambiguity, we concentrate on two key capabilities: marketing, and research and development (R&D). These capabilities are consistently mentioned among the key facets of new product development processes (e.g., Griffin and Hauser, 1996). In addition, previous empirical work has confirmed the central importance of these two capabilities in explaining differential firm outcomes (Jayachandran, Hewett, and Kaufman, 2004; Vorhies and Morgan, 2005). *Marketing capability* refers to the “organizational competence that supports market sensing and customer linking” (Krasnikov and Jayachandran, 2008, p. 2) and allows the organization to compete by detecting market changes, anticipating shifts in the market environment, creating and retaining durable links with customers, and creating strong bonds with

external stakeholders (Danneels, 2008). *R&D capability* pertains to the processes that enable firms to generate new knowledge by recombining existing knowledge (Marsh and Stock, 2006). Therefore, R&D capability manifests in organizational routines that help a firm develop new technical knowledge, combine it with existing technology, and ultimately design superior products and services (Lee, Lee, and Pennings, 2001).

Hypotheses

Social Capital and Organizational Capabilities

Turning to the source of organizational capabilities, it has been suggested that capabilities can be formed by leveraging individuals' experience (Sundbo, 2001) and that a company's key personnel (i.e., senior management) plays a crucial role in accumulating and strengthening organizational capabilities (Paladino, 2007). Hence, although generally considered supra-individual, organizational capabilities are highly dependent on individual-level actions (Abell et al., 2008). As argued by Elster (1989), the explanation of firm-level (macro) phenomena must ultimately be grounded in explanatory mechanisms that involve individual (micro) action and interaction.

More specifically, we propose a positive link between senior managers' social capital and organizational capabilities. Based on the work of Burt (1992, 1997) and others (Coleman et al., 1988; Larson, 1992), we posit that two key benefits of managers' social capital for the organization explain this link: (1) *information benefits*: unique, timely access to information at comparatively low cost; and (2) *resource benefits*: greater control over and access to resources. As such, organizational capabilities benefit from managers' social capital, as it determines the degree to which these managers can contribute to information and resource accumulation required for capability development in marketing and R&D.

First, the information and resource benefits associated with social capital should significantly enhance an organization's marketing capability. Senior managers' ability to gain quick access to diverse information sources at low costs will enable the firm to effectively assess the potential of new markets and become aware of relevant new competitors and customers. Similarly, firms' acquisition of resources necessary for relationship building and distribution channel development will be facilitated by the resource benefits inherent to managers' social capital.

H1a: A positive relationship exists between social capital and marketing capability.

Further, social capital also enhances R&D capability through its information and resource benefits. For example, through their managers' strong ties, organizations will be better informed about new technologies as well as about highly qualified job candidates that could augment the firm's technical expertise (Kleinschmidt, de Brentani, and Salomo, 2007). Further, resource benefits stemming from managers' social capital will enhance the firm's ability to effectively set up new manufacturing facilities and production processes.

H1b: A positive relationship exists between social capital and R&D capability.

Scholars have called for further research investigating relevant contingencies affecting the link between organizational capabilities and their antecedents (Gavetti, 2005; Zollo and Winter, 2002). This study contributes to this line of research by investigating a set of contingencies influencing the social capital–organizational capabilities link, improving current knowledge of the conditions under which social capital is comparatively more relevant. As a cautionary note, specifying contingencies does not necessarily indicate that social capital is only important to capability development in one condition and unimportant in the other condition. Rather, our arguments focus on *relative importance*, and it can very well be that social capital is a significant driver of organizational capability in both conditions that are contrasted (even though the contrast itself is significant).

The specific contingencies investigated in this study are (1) technological turbulence and (2) competitive intensity. These two “structure-loosening” factors (Wellman, 1988) characterize important conditions under which social capital is proposed to vary in value, as elaborated subsequently.

Technological turbulence. Technological turbulence can be defined as the rate of technological change in an industry (Kohli and Jaworski, 1990). Technological change reallocates opportunities, shifts industrial standing, and redistributes power in the industry and among members in a network (Wellman, 1988). It is hypothesized that social capital exerts a comparatively stronger effect on marketing capability when technological turbulence is high rather than low. In technologically turbulent markets, the ongoing change of the competitive landscape and the persistent fragmentation of consumer preferences makes it very challenging for firms to obtain information that helps them accurately predict market growth, customer demand and preferences, and/or competitor positions and reactions (Tatikonda and

Montoya-Weiss, 2001). In turbulent environments, social capital, with its information and resource benefits, should therefore be a particularly relevant mechanism for acquiring the information and resources required to overcome these difficulties, thereby enhancing the firm's marketing capability.

H2a: Technological turbulence moderates the positive relationship between social capital and marketing capability; the relationship strengthens as technological turbulence increases.

With regard to R&D capability, we also postulate a stronger effect of social capital when technological turbulence is high rather than low. In cases where an industry's turbulence in technology is high, product and process life cycles are typically highly compressed, and technological change is rapid (Fredericks, 2005). Having an above-average R&D capability in such dynamic environments requires possessing a wide array of strategic options and having access to a variety of diverse resources (Bowman and Hurry, 1993). Social capital, with its information and resource benefits, is a key facilitator in fulfilling these requirements.

H2b: Technological turbulence moderates the positive relationship between social capital and R&D capability; the relationship strengthens as technological turbulence increases.

Competitive intensity. Competitive intensity refers to the degree of competition that a firm faces in its industry (Kohli and Jaworski, 1990). As the number of players in the market increases, so does competitive intensity (Porter, 1985). We postulate a stronger effect of social capital on marketing capability when competitive intensity is high rather than low. In markets characterized by intense competition, customers have many alternatives to choose from (Kohli and Jaworski, 1990). As marketing differentiation is hard to achieve when many firms target the same customer base, strong marketing capabilities in highly competitive environments need to be based on a comprehensive understanding of customer needs (Reimann, Schilke, and Thomas, 2010). As such, it can be argued that when competitive intensity is high, social capital's information benefits will be particularly vital to enhancing firms' understanding of customer needs, which enables them to build a strong marketing capability that provide customers with unique benefits. These vigorously competing firms need to leverage all available information sources in order to understand customer needs in greatest possible detail.

H3a: Competitive intensity moderates the positive relationship between social capital and marketing capability; the relationship strengthens as competitive intensity increases.

Similarly, we postulate a comparatively stronger effect of social capital on R&D capability when competitive intensity is high rather than low. Research on unknown unknowns (or "unk unks") has argued that with greater complexity of the competitive environment, R&D projects become increasingly ambiguous and unpredictable, rendering traditional planning techniques obsolete (Loch, De Meyer, and Pich 2006). Instead, a different logic of managing R&D is needed—a logic that is strongly based on instantaneous learning and selecting among various alternatives (Loch, Solt, and Bailey, 2008). Following this line of argumentation, competitive intensity increases the ambiguity associated with firms' R&D activities. In markets with high competitive intensity, it becomes very difficult to foresee interactions among own R&D projects and actions of competitors. Hence, a strong R&D capability in such environments needs to be rooted in mechanisms that enable the firm to learn continuously and to choose from a variety of different alternatives. An important such mechanism is social capital. As argued previously, social capital allows gaining access to a variety of different information sources as well as gaining access to relevant resources. As such, social capital will be a particularly strong driver of R&D capability when competitive intensity is high.

H3b: Competitive intensity moderates the positive relationship between social capital and R&D capability; the relationship strengthens as competitive intensity increases.

Organizational Capabilities and Performance

Researchers have long suggested a positive relationship between organizational capabilities and firm performance (Day, 1994). Capabilities enable a firm to effectively perform value-creating tasks and reside in organizational routines that are difficult to replicate. This creates barriers to imitation, enabling firms to enjoy a sustainable advantage over their rivals (Barney, 1991).

A firm with a strong organizational capability in marketing is able to detect changes in the market environment before competitors, adapt its strategy earlier, and compete more effectively. In line with Vorhies and Morgan (2005) and Jayachandran et al. (2004), firms with strong marketing capability should therefore attain higher performance.

H4a: A positive relationship exists between marketing capability and firm performance.

Moreover, we expect a positive relationship between R&D capability and firm performance. First, R&D capability allows firms to achieve higher efficiency in their operations by improving production processes (Day, 1994; Slater and Narver, 1999). Second, a firm with superior product design routines gains advantage by effectively differentiating its products from competitors (Reimann and Schilke, 2010), increasing firm performance.

H4b: A positive relationship exists between R&D capability and firm performance.

Figure 1 summarizes the conceptual model implied by our hypotheses.

Methodology

Sampling Frame and Data Collection Procedure

We collected survey and archival data on firms headquartered in Germany. The 5834 firms in the initial list obtained from the German Chamber of Commerce were affiliated with the following industries: chemicals/health care, electronics, engineering, infrastructure, information technology/media, professional services, and retailing. Members of top management (i.e., managing directors, senior managers) were chosen as relevant key informants for our survey because they have an overview of the entire organization (Kumar, Stern, and Anderson, 1993) and top managers' social capital has been proposed to be of particular relevance to organizational processes (Tsai and Ghoshal, 1998).

For 2191 of the firms in the initial list, a personal e-mail address of a top manager was available. Of the 2191 e-mails sent to these firms, 616 were nondeliverable, yielding a sampling frame of 1575 firms. The total number of responses received was 347, resulting in a response rate of 22.0%, which is in line with comparable studies using top managers as key informants (e.g., Lee et al., 2001; Subramaniam and Youndt, 2005). Of the 347 responses, 67 cases were dropped from further analysis because of missing or incomplete responses, leaving 280 complete responses in the final sample. Table 1 provides descriptive information on the sample composition.

Tests for Potential Biases

Following the recommendations of Armstrong and Overton (1977), we assessed nonresponse bias by com-

Table 1. Composition of Sample

	%
Industry	
Chemicals/health care	12
Electronics	9
Engineering	21
Infrastructure	11
Information technology/media	23
Professional services	16
Retail	8
Firm age (years since incorporation)	
<5	20
6–10	17
11–15	14
16–20	11
21–50	19
>50	20
Firm size (number of employees)	
<10	28
10–50	31
51–100	13
101–250	12
251–500	5
501–1000	4
>1000	9
Position of respondents	
Managing director	74
Senior management	19
Other	6

paring the responses of early and late respondents. The results of the *t*-tests indicated no significant differences, suggesting that nonresponse bias is not a problem in our data. Two analyses aimed at controlling for common method bias (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). First, we investigated the effect of an unmeasured latent methods factor added to the structural model. All items were double-loaded onto their substantive latent variable and the method variable. As the paths found to be significant remained significant in this altered model, the estimates' robustness to common method effects was supported. Second, following the recommendations by Homburg, Klarmann, Reimann, and Schilke (2012), archival data were used to triangulate subjective performance information with secondary archival data. Using the AMADEUS database, objective performance information was available for a subset of 66 firms in our sample. We determined the average sales growth rate, Earnings before interest and tax (EBIT) margin, and employee growth rate over the last three years. The archival data were highly correlated with the corresponding information provided by the managers (sales growth: $r = .64$, $p \leq .01$; EBIT margin: $r = .48$, $p \leq .01$;

employee growth: $r = .88$, $p \leq .01$). The results of both tests suggest that the managerial performance evaluations are valid and not influenced by other questions in the survey, as would be the case if common method bias were an issue.

Measures

The measures used in this survey were based on those used in prior studies. We applied seven-point Likert answer scales, with the exception of firm size, firm age, and industry, and used two types of measurement models: reflective and formative (MacCallum and Browne, 1993). A complete list of items and constructs appears in Table 2.

Social capital. We conceptualized social capital as a reflective higher-order construct with the dimensions of managerial tie strength, trust, and solidarity. We followed Li et al. (2008) in treating managerial ties as a two-dimensional factor reflected by the following constructs: (1) business ties and (2) political ties. By averaging the items forming each dimension, two factor scores were obtained and then used as reflective items of the managerial tie strength construct. To capture trust, we adapted measures from Levin and Cross (2004). Further, we measured solidarity using three items adapted from the work of Atuahene-Gima and Murray (2007).

Marketing/R&D capability. For both capability constructs, we adapted measures recently introduced by Danneels (2008).

Firm performance. Following Slater and Olson (2000), our measurement of firm performance focuses on market performance, profitability, and growth.

Control variables. In line with Danneels (2008) and Li et al. (2008), we include firm size, firm age, and industry as control variables. Firm size was measured by a single item representing the number of employees (seven answer categories were provided: <10, 10–50, 51–100, 101–250, 251–500, 501–1000, >1000). We measured firm age in terms of the natural logarithm of the number of years since the formation or incorporation of the firm. Additionally, respondents were asked to classify their firm's industry.

Moderating variables. The scales for both competitive intensity and technological turbulence were adapted from the work of Jaworski and Kohli (1993).

Results

We applied structural equation modeling using AMOS 16.0 software and followed a two-stage data analysis approach, first assessing the measurement model and subsequently the structural model (Anderson and Gerbing, 1988).

Measure Validation

The overall measurement model fits the data satisfactorily ($\chi^2 = 645.35$, d.f. = 349, $\chi^2/\text{d.f.} = 1.85$, comparative fit index [CFI] = .93, Tucker–Lewis Index [TLI] = .92, root mean square error of approximation [RMSEA] = .06, standardized root mean square residual [SRMR] = .06). We assessed the reflective multi-item measures individually by analyzing the estimated factor loadings, Cronbach's alphas, composite reliabilities, and average variance extracted (AVE). All factor loadings are positive and significant, supporting unidimensionality of the measures. Cronbach's alphas and composite reliabilities range from .74 to .91 and .75 to .90, respectively (see Table 2), exceeding the common cut-off value of .7. Finally, AVE exceeds the required threshold of .5 in all but one case. These findings indicate sufficient reliability and validity of the proposed measures.

Given the formative character of the tie strength dimensions, we analyzed the variance inflation factors associated with the items measuring the business and political tie strength variables. All values were below the common threshold of 10, indicating that multicollinearity is not a problem.

Next, discriminant validity was assessed on the basis of the procedure proposed by Fornell and Larcker (1981). The square root of the AVE by the measure of each factor was larger than the correlation of that factor with all other factors in the model (see Table 3) in support of satisfactory discriminant validity.

Subsequently, the postulated higher order structure of the social capital construct was tested by means of second-order confirmatory factor analysis (Bagozzi, 1994). The loadings of the second-order construct on the three dimensions are .48, .58, and .55 ($p \leq .01$), respectively. The global fit criteria indicate a good overall model fit ($\chi^2 = 40.92$, d.f. = 24, $\chi^2/\text{d.f.} = 1.71$; CFI = .98, TLI = .97, RMSEA = .05, SRMR = .04). The target coefficient index (T) clearly exceeds the required minimum value of 90% and demonstrates that a large portion of the variance within the first-order factors can be explained through the second-order construct (Marsh and Hocevar, 1985).

Table 2. Measurement Scales

				Item Loading
Managerial tie strength				
(reflective, 7 point Likert answer scale: (1) very little—(7) very extensive)				
<i>During the past three years, you and other top managers at your company have heavily utilized personal ties, networks, and connections with . . .</i>				
Business tie strengths				
<i>(formative)</i>				
1a . . . top managers at buyer firms.		VIF = 1.35		.74
1b . . . top managers at supplier firms.		VIF = 1.33		
1c . . . top managers at competitor firms.		VIF = 1.20		
Political tie strengths				
<i>(formative)</i>				
2a . . . political leaders in various levels of the government.		VIF = 2.32		.60
2b . . . officials in industrial bureaus.		VIF = 2.54		
2c . . . officials in regulatory and supporting organizations such as tax bureaus, state banks, commercial administration bureaus, and the like.		VIF = 2.48		
Trust				
(reflective, 7 point Likert answer scale: (1) strongly disagree—(7) strongly agree)				
$\alpha = .88$ CR = .88 AVE = .66				
<i>Prior to seeking information/advice from a key contact in my business network . . .</i>				
3a . . . I assumed that he or she would always look out for my interests.				.78
3b . . . I assumed that he or she would go out of his or her way to make sure I was not adversely affected.				.89
3c . . . I felt like he or she cared what happened to me.				.79
3d . . . I believed that this person approached his or her job with professionalism and dedication.				.77
Solidarity				
(reflective, 7 point Likert answer scale: (1) strongly disagree—(7) strongly agree)				
$\alpha = .74$ CR = .75 AVE = .50				
<i>To what extent do you agree with the following statements?</i>				
4a Members of my business network believe that the needs of the whole network should take priority over personal needs.				.69
4b Members of this business network accept decisions taken within the network even when they have different opinions.				.79
4c Problem solving by many members of a business network give better results than those by individuals.				.62
Marketing capability				
(reflective, 7 point Likert answer scale, (1) much worse—(7) much better than competitors)				
$\alpha = .84$ CR = .84 AVE = .58				
<i>Please rate your company relative to your major competitors in terms of its capabilities in the following areas:</i>				
5a Assessing the potential of new markets.				.74
5b Building relationships in new markets.				.90
5c Setting up new distribution channels.				.76
5d Researching new competitors and new customers.				.61
R&D capability				
(reflective, 7 point Likert answer scale, (1) much worse—(7) much better than competitors)				
$\alpha = .86$ CR = .88 AVE = .59				
<i>Please rate your company relative to your major competitors in terms of its capabilities in the following areas:</i>				
6a Setting up new types of manufacturing facilities and operations.				.73
6b Assessing the feasibility of new technologies.				.78
6c Recruiting engineers in technical areas it is not familiar with.				.73
6d Identifying promising new technologies.				.84
6e Implementing new types of production processes.				.77
Performance				
(reflective, 7 point Likert answer scale: (1) strongly disagree—(7) strongly agree)				
$\alpha = .86$ CR = .87 AVE = .69				
<i>To what extent do you agree with the following statements?</i>				
7a We are satisfied with our company's development compared with our main competitors.				.92
7b We are satisfied with our company's growth compared with our main competitors.				.91
7c We are satisfied with our company's operating income projections for the next years.				.67
Technology turbulence				
(reflective, 7 point Likert answer scale: (1) strongly disagree—(7) strongly agree)				
$\alpha = .91$ CR = .90 AVE = .70				
<i>To what extent do you agree with the following statements?</i>				
8a The technology in our industry is changing rapidly.				.89
8b Technological changes provide big opportunities in our industry.				.90
8c A large number of new product ideas have been made possible through technological breakthroughs in our industry.				.87
8d Technological developments in our industry are rather minor.*				.72
Competitive intensity				
(reflective, 7 point Likert answer scale: (1) very little—(7) very much)				
$\alpha = .75$ CR = .77 AVE = .47				
<i>Please comment on the characteristics of the industry you are active in:</i>				
9a Extent of promotion wars.				.63
9b Extent of competitive intensity.				.92
9c Similarity in competitors' product offerings.				.52
9d Extent of price-based competition.				.51

* Reverse scaled item.

AVE, average variance extracted; CR, composite reliability; VIF, variance inflation factor.

Table 3. Correlations and Discriminant Validity

Factor	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Managerial tie strength	3.94	1.73	n.a.															
2 Trust	5.47	1.22	.19	.81														
3 Solidarity	4.25	1.58	.19	.28	.71													
4 Marketing capability	4.49	1.29	.32	.18	.05	.76												
5 R&D capability	4.60	1.31	.19	.17	.19	.38	.77											
6 Performance	4.66	1.51	.20	.10	.07	.47	.41	.83										
7 Technology turbulence	4.89	1.77	.01	.21	.15	.11	.24	.06	.84									
8 Competitive intensity	4.93	1.68	.19	.16	.11	.06	.02	-.08	.10	.69								
9 Firm age	2.81	1.14	.10	.13	.02	.01	.01	-.05	-.19	.06	n.a.							
10 Firm size	2.80	1.85	.26	.08	.08	.19	.16	.07	-.03	.16	.55	n.a.						
11 Industry dummy 1 (infrastructure)	.11	.31	-.02	-.07	-.02	.00	-.10	-.15	-.19	-.06	.03	-.05	n.a.					
12 Industry dummy 2 (chemicals/health care)	.12	.42	.03	.07	.02	-.01	.14	-.01	.05	.00	.01	.09	-.13	n.a.				
13 Industry dummy 3 (IT/media)	.23	.37	-.14	-.02	.02	-.06	.06	-.01	.33	.00	-.21	-.17	-.19	-.20	n.a.			
14 Industry dummy 4 (professional services)	.16	.37	.05	.06	-.05	.16	-.04	.13	-.12	.14	.00	.12	-.15	-.16	-.24	n.a.		
15 Industry dummy 5 (engineering)	.21	.41	.06	.09	-.02	-.09	.00	.05	-.12	-.04	.20	.11	-.18	-.19	-.28	-.22	n.a.	
16 Industry dummy 6 (retailing)	.08	.28	.02	-.16	.01	-.04	-.11	-.05	-.05	-.03	-.04	-.07	-.11	-.11	-.16	-.13	-.15	n.a.

Notes: Bold numbers on the diagonal show the square root of AVE, numbers below the diagonal the correlations. Correlations > |.151| are significant at 1% level, > |.121| at the 5% level. AVE, average variance extracted; IT, information technology; n.a., not applicable; SD, standard deviation.

Structural Model

Next, we examined the structural model simultaneously relating social capital to organizational capabilities and organizational capabilities to firm performance. The goodness-of-fit measures showed satisfactory values ($\chi^2 = 337.42$; d.f. = 182; $\chi^2/d.f. = 1.85$; CFI = .94, TLI = .94; RMSEA = .06; SRMR = .07).

The first two hypotheses suggested that social capital is positively related to marketing and R&D capability (H1a and H1b). As predicted, the social capital–marketing capability link is both positive and statistically significant ($\beta = .64, p \leq .01$), in support of H1a. The same is true for the social capital–R&D capability link; the path coefficient is positive and statistically significant ($\beta = .55, p \leq .01$), supporting H1b. In H4a, marketing capability was proposed to be positively related to firm performance.

Table 4 shows that marketing capability is indeed strongly linked to firm performance ($\beta = .37, p \leq .01$), in support of H4a. H4b suggested a positive relationship between R&D capability and firm performance. The estimate for the path coefficient between the two constructs indicates such a positive relationship ($\beta = .29; p \leq .01$). Thus, empirical support for H4b was found.

The structural model also considered firm size, firm age, and industry type as control variables that could be related to organizational capabilities and firm performance. Table 5 summarizes the respective path estimates.

Moderation Analysis

Applying multigroup structural equation modeling (Hair, Black, Babin, Anderson, and Tatham, 2006), we divided the sample into two subsamples along the median of each

Table 4. Structural Relationships

Hypothesis	Relationship	Path Coefficient (Standardized)	Probability
H1a	Social capital → Marketing capability	$\beta = .64$	$p \leq .01$
H1b	Social capital → R&D capability	$\beta = .55$	$p \leq .01$
H4a	Marketing capability → Firm performance	$\beta = .37$	$p \leq .01$
H4b	R&D capability → Firm performance	$\beta = .29$	$p \leq .01$

R&D, research and development.

Table 5. Effects of Control Variables

Variables	Marketing capability		R&D capability		Performance	
	Path coefficient	Probability	Path coefficient	Probability	Path coefficient	Probability
Firm size	$\beta = .20$	$p \leq .01$	$\beta = .14$	$p \leq .10$	$\beta = -.01$	$p > .10$
Firm age	$\beta = -.16$	$p \leq .05$	$\beta = -.10$	$p > .10$	$\beta = -.04$	$p > .10$
Industry dummy 1 (infrastructure)	$\beta = -.02$	$p > .10$	$\beta = -.10$	$p > .10$	$\beta = -.16$	$p \leq .05$
Industry dummy 2 (chemicals/health care)	$\beta = -.08$	$p > .10$	$\beta = .08$	$p > .10$	$\beta = -.08$	$p > .10$
Industry dummy 3 (IT/media)	$\beta = -.09$	$p > .10$	$\beta = .04$	$p > .10$	$\beta = -.04$	$p > .10$
Industry dummy 4 (professional services)	$\beta = .06$	$p > .10$	$\beta = -.11$	$p > .10$	$\beta = .07$	$p > .10$
Industry dummy 5 (engineering)	$\beta = -.16$	$p \leq .10$	$\beta = -.06$	$p > .10$	$\beta = .07$	$p > .10$
Industry dummy 6 (retailing)	$\beta = -.04$	$p > .10$	$\beta = -.11$	$p > .10$	$\beta = -.02$	$p > .10$

IT, information technology.

moderating variable. The influence of a moderating variable was tested using a chi-square difference test between pairs of nested models. One model restricts the relevant path coefficient to be equal across the subsamples, while the more general model allows this parameter to vary. Because these are nested models, the chi-square value is always lower for the general model than for the restricted model. A significant increase in the chi-square suggests a moderating effect. Before interpreting the structural estimates for the subsamples, we tested for measurement invariance by equating the factor loadings in the two subgroups (Williams, Edwards, and Vandenberg, 2003). This constraint did not lead to a significant decrease in model fit for any of the multigroup analyses, which supported measurement equivalence.

The results for the multigroup analyses are summarized in Table 6. H2a and H2b stated that the positive relations between social capital and marketing/R&D capability are stronger in markets characterized by high rather than low technological turbulence. Our results reveal that technological turbulence indeed plays a significant role in the social capital–organizational capabilities relationship ($\chi^2_{\text{diff}} = 10.36$, $p \leq .01$; and $\chi^2_{\text{diff}} = 3.52$, $p \leq .10$, respectively). For firms operating in markets

with high technological turbulence, social capital has a significantly stronger link with marketing capability ($\beta_2 = .86$) than for firms in markets with few technological changes ($\beta_1 = .47$). Thus, H2a is supported. Contrary to H2b, however, the link between social capital and R&D capability was stronger for firms in markets with low technological turbulence ($\beta_1 = .63$) than for firms in highly turbulent markets ($\beta_2 = .47$). Thus, H2b is rejected. H3a and H3b predicted a stronger positive relationship between social capital and marketing/R&D capability in markets with high competitive intensity. In line with H3a, we find a significant difference in the effect of social capital on marketing capability between markets with high and low competitive intensity ($\chi^2_{\text{diff}} = 8.68$, $p \leq .01$, $\beta_1 = .52$, $\beta_2 = .77$). Thus, H3a is supported. Contrary to H3b, however, we found the strength of the relationship between social capital and R&D capability to be significantly weaker ($\chi^2_{\text{diff}} = 4.86$, $p \leq .05$) when competitive intensity is high ($\beta_2 = .59$) rather than low ($\beta_1 = .62$). Therefore, H3b is rejected. Note, however, that despite being statistically significant, the magnitude of the difference between standardized coefficients in the two subgroups is very small. Thus, the interpretation of this result should be treated with caution.

Table 6. Results of Multigroup Moderation Analyses

Hypothesis	Relationship	Moderator Variable	Low Value of Moderator (Standardized Coefficient)	High Value of Moderator (Standardized Coefficient)	χ^2 Difference ($\Delta d.f. = 1$)
H _{2a}	Social capital → Marketing capability	Technological turbulence	$\beta_1 = .47$	$\beta_2 = .86$	$\chi^2_{\text{diff}} = 10.36$ ($p \leq .01$)
H _{2b}	Social capital → R&D capability	Technological turbulence	$\beta_1 = .63$	$\beta_2 = .47$	$\chi^2_{\text{diff}} = 3.52$ ($p \leq .10$)
H _{3a}	Social capital → Marketing capability	Competitive intensity	$\beta_1 = .52$	$\beta_2 = .77$	$\chi^2_{\text{diff}} = 8.68$ ($p \leq .01$)
H _{3b}	Social capital → R&D capability	Competitive intensity	$\beta_1 = .62$	$\beta_2 = .59$	$\chi^2_{\text{diff}} = 4.86$ ($p \leq .05$)

Post-hoc Analyses

A supplementary test for mediation assessed the significance of the two indirect effects: social capital→marketing capability→performance and social capital→R&D capability→performance (MacKinnon, Lockwood, Hoffman, West, and Sheets, 2002). Estimating a single model, including both the hypothesized indirect paths and a direct path (social capital→performance), we find that the indirect associations are significant (indirect effect via marketing capability: $\beta_{\text{indirect}} = .30$; $p \leq .01$; indirect effect via R&D capability: $\beta_{\text{indirect}} = .24$; $p \leq .01$), whereas the direct association is insignificant ($\beta_{\text{direct}} = .12$; $p > .10$). Thus, marketing and R&D capability fully mediate the link between social capital and performance, supporting the proposed structure of our model.

A source of potential concern pertains to the possibility that a third variable omitted in the research model is causal for both social capital and organizational capabilities, thus leading to biased parameter estimates for the social capital-capabilities link. In particular, it could be argued that a developmental culture, with its emphasis on resource development and external orientation (Iivari and Huisman, 2007), may lead a firm to both develop strong organizational capabilities and impress upon managers the importance of forming bonds.¹ Therefore, two additional analyses were conducted where we included developmental culture (measured with three items based on Iivari and Huisman [2007]) as an antecedent to (1) social capital and marketing capabilities, and (2) social capital and R&D capabilities. First, developmental culture has a significant relationship with social capital ($\beta = .69$, $p \leq .01$) but not with marketing capabilities ($\beta = -.18$, $p > .10$), while the social capital→marketing capabilities path remains significant ($\beta = .74$, $p \leq .01$). Second, developmental culture is significantly associated with social capital ($\beta = .46$, $p \leq .01$) and R&D capabilities ($\beta = .33$, $p \leq .01$), while the social capital→R&D capabilities link again remains significant ($\beta = .41$, $p \leq .01$). These results suggest that the relationship between social capital and organizational capabilities is not solely due to the previously omitted third variable, in support for the robustness of our results.

Discussion

A crucial insight that we glean from our empirical results is that firms whose managers have built strong social

capital also possess superior marketing and R&D capabilities. This study augments previous work on the role of social capital, such as Adler and Kwon (2002), and Nahapiet and Ghoshal (1998), by investigating the relationship between social capital and key organizational capabilities. In addition, we identified and empirically tested the role of two important environmental factors in influencing the social capital–organizational capability link: technological turbulence and competitive intensity. To the authors' knowledge, this study is the first to investigate the contextualized relationship between social capital and firms' capabilities.

As predicted, the social capital–marketing capability link is stronger when technological turbulence is high. This is in line with our argument that social capital is an effective instrument for accessing marketing-related information and resources required to cope with constant technological change. Regarding the social capital–R&D capability link, we predicted a stronger relationship in environments with high technological turbulence than in contexts with low turbulence. Again, social capital's information and resource benefits were expected to help firms cope with rapid technological change. However, the empirical results reveal the opposite pattern, with social capital having a stronger effect on R&D capability in *less* turbulent environments. Although counterintuitive, a possible explanation for this finding may lie in the greater propensity of firms to manifest their technological inventions in patents when environmental turbulence is high—for example, in an effort to secure royalty income before the technology becomes obsolete (Levin, Klevorick, Nelson, and Winter, 1987). While patents provide the inventor firm with a certain degree of protection from imitation, they also involve disclosure of codified knowledge. Therefore, identifying new technologies and assessing their potential (two key facets of R&D capabilities) becomes more straightforward for competing firms. As innovations are highly visible, information transferred through social capital may become redundant, potentially zeroing out social capital's information benefits (Burt, 1997). In other words, as information on new technologies becomes widely visible in markets with high technological turbulence, a firm's dependence on managers' social capital declines. On the other hand, in comparatively less turbulent environments, in which public disclosure of technological information is less common, social capital's information benefits may prove more relevant. Clearly, as this explanation for our unexpected finding is provided *ex post*, future research is needed to further elucidate the contingent role of the environment in the social capital–R&D capability relationship.

¹ We would like to thank an anonymous reviewer for pointing this out.

Similarly, our results regarding the moderating effect of competitive intensity on the social capital–organizational capability link are mixed. While social capital is more strongly linked to marketing capability when competitive intensity is high (in line with H3a), the opposite is true for its link to R&D capability, which leads us to reject H3b. Similar to our discussion in the previous paragraph, the weaker effect of social capital on R&D capability in environments with high competitive intensity may result from the codified nature of the underlying technologies. As organizations in highly competitive segments seek protection from imitation through patenting, information relevant to R&D becomes more codified, and the focal firm's dependence on managers' relations to social capital partners thus declines.

In sum, we find that while a positive relationship between social capital and organizational capabilities is supported in general, the strength of this relationship depends on the environmental context the firm is embedded in. Finally, our results provide additional support for the positive link between organizational capabilities and firm performance, corroborating prior evidence (Danneels, 2008; Jayachandran et al., 2004; Vorhies and Morgan, 2005). Thus, our research suggests that social capital is important not only because it is linked to organizational capabilities but also because of its link to superior performance, although indirectly through organizational capabilities (as shown in our mediation analysis).

Limitations and Directions for Future Research

While this study provides unique insights into the relationship between social capital and organizational capabilities, its conceptual focus and the empirical setting employed impose limitations. First, our rationale for proposing a relationship between social capital and organizational capabilities rested on the assumption that social capital will lead to information and resource benefits and that those information and resource benefits will facilitate capability development. Future empirical research may examine the mediating role of information and resource benefits in greater detail, thus improving empirical knowledge on the mechanisms underlying the social capital–organizational capabilities link. Second, additional microlevel antecedents should be addressed in future empirical studies. Felin and Foss (2005) emphasize the need to also scrutinize the effect of individual endowments, characteristics, motivation, and choice of behavior. The research approach used in our study could

be used as a reference point for future micro-macro studies of the RBV. Third, while this study focuses on the key organizational functions of R&D and marketing, we recognize that research on alternative capabilities might offer interesting possibilities for future researchers. Krasnikov and Jayachandran (2008), for instance, identified operations capability as yet another core capability. Other scholars have emphasized the importance of capabilities in alliance management, and mergers and acquisitions (Eisenhardt and Martin, 2000). In sum, research on the relationship between social capital and alternative organizational capabilities represents a promising area for future research. Finally, we acknowledge that our claims about effects of social capital have been tested based on data from a survey study. Such inferences are problematic for reasons that are among the common threats to validity in nonexperimental designs. We realize that the nature of our data does not allow us to establish the proposed direction of causality with absolute certainty. Therefore, alternative research designs—in particular experiments—need to be applied in the future to gain definite evidence of the causal effect of social capital on the development of organizational capabilities.

Academic Contribution

Despite these limitations, the current study makes several academic contributions. First, this research contributes to the RBV by conceptualizing social capital as an important factor promoting the development of organizational capabilities. Our finding of a significant social capital–organizational capabilities link is of particular importance given the limited amount of research on microlevel origins of organizational capabilities (Felin and Foss, 2005; Zollo and Winter, 2002), especially research of empirical nature (cf. Danneels, 2008; Newbert, 2007). Our study suggests that individuals' social capital enables firms to actively build and enhance specific organizational capabilities by focusing on managerial ties, trust, and solidarity. In sum, this empirical study is among the first to broaden the RBV's unit of analysis and integrate individual-level considerations in the predominantly organizational level concept. This contribution is important as the individuals (and their underlying characteristics, skills, and motivations) who compose the organization are a key to understanding strategy processes on the organizational level (Felin and Foss, 2005).

By identifying and evaluating two important environmental moderators, our study also decreases some of the ambiguity surrounding the effectiveness of antecedents to

organizational capabilities. As noted by Subramaniam and Youndt (2005), Gavetti (2005), and Zollo and Winter (2002), previous studies have largely neglected this important research area. We followed these scholars' calls for further research and made our second contribution by investigating the role of two environmental contingencies in the social capital–organizational capability link. Our results show that technological turbulence and competitive intensity are relevant moderators that determine the strength of the relationship between social capital and organizational capabilities.

Third, our findings lend support to the multidimensional view of social capital. While Nahapiet and Ghoshal (1998) suggested social capital as a multidimensional concept reflected by three facets, we are the first to empirically measure social capital as a second-order factor. On the basis of our data and the results of the confirmative factor analysis, we establish reliability and validity of our measure. Increased confidence regarding the availability of appropriate survey measures should pave the way for more quantitative work on social capital and its nomological network.

Managerial Implications

While previous studies have established the importance of organizational capabilities for firms in that these capabilities may lead to a competitive advantage, our research is especially useful for practitioners because it analyzes an important source of these capabilities. More specifically, we hypothesized that top managers and their interactions with members from their network have an important effect on organizational capabilities. Thus, the consistent message of our research is that building organizational capabilities is greatly dependent on the existence of management's strong social capital.

Managers should therefore seek to cultivate relationships with a wide array of external stakeholders to ensure access to crucial information and resources. They should further promote the importance of trust and solidarity among network members by providing opportunities for social interactions and by striving for a shared vision. A firm's training activities should focus not only on extending their employees' functional or specific technological knowledge and skills but also on developing their abilities to network, collaborate, and share information and knowledge.

Furthermore, our research suggests that managers should give thoughtful consideration to the market environment their firm operates in. With respect to a firm acting in a market with high technological turbulence

or competitive intensity, our analysis suggests that managers' social capital is very strongly associated with enhanced marketing capability. Conversely, in markets with low technological turbulence or competitive intensity, social capital's relationship with R&D capability is particularly strong.

Overall, firms need to appreciate the relevance of senior managers' ties for the development of organizational capabilities. This should have an important bearing not only on issues such as management training and incentives but also on hiring policies.

References

- Abell, P., T. Felin, and N. Foss. 2008. Building micro-foundations for the routines, capabilities, and performance links. *Managerial and Decision Economics* 29: 489–502.
- Adler, P. S., and S.-W. Kwon. 2002. Social capital: Prospects for a new concept. *Academy of Management Review* 27 (1): 17–40.
- Anderson, J. C., and D. W. Gerbing. 1988. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin* 103 (3): 411–23.
- Armstrong, J. S., and T. S. Overton. 1977. Estimating nonresponse bias in mail surveys. *Journal of Marketing Research* 14 (3): 396–402.
- Atuahene-Gima, K., and J. Y. Murray. 2007. Exploratory and exploitative learning in new product development: A social capital perspective on new technology ventures in China. *Journal of International Marketing* 15 (2): 1–29.
- Bagozzi, R. P. 1994. *Structural equation models in marketing research: Basic principles*. Cambridge, MA: Basil Blackwell.
- Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17 (1): 99–120.
- Belliveau, M. A., C. A. O'Reilly III, and J. B. Wade. 1996. Social capital at the top: Effects of social similarity and status on CEO compensation. *Academy of Management Journal* 39 (6): 1568–93.
- Bowman, E. H., and D. Hurry. 1993. Strategy through the options lens: An integrated view of resource investments and the incremental choice process. *Academy of Management Review* 18 (4): 760–82.
- Burt, R. S. 1992. *Structural holes—The social structure of competition*. Cambridge, MA: Harvard University Press.
- Burt, R. S. 1997. The contingent value of social capital. *Administrative Science Quarterly* 42 (2): 339–65.
- Coleman, J. S., C. Winship, and S. Rosen. 1988. Social capital in the creation of human capital. *American Journal of Sociology* 94 (Supplement: Organizations and institutions: Sociological and economic approaches to the analysis of social structure): 95–120.
- Collis, D. J. 1994. Research note: How valuable are organizational capabilities? *Strategic Management Journal* 15: 143–52.
- Cook, K. S., and O. Schilke. 2010. The role of public, relational and organizational trust in economic affairs. *Corporate Reputation Review* 13 (2): 98–109.
- Danneels, E. 2008. Organizational antecedents of second-order competences. *Strategic Management Journal* 29 (5): 519–43.
- Day, G. S. 1994. The capabilities of market-driven organizations. *Journal of Marketing* 58 (4): 37–52.
- Eisenhardt, K. M., and J. A. Martin. 2000. Dynamic capabilities: What are they? *Strategic Management Journal* 21 (10/11): 1105–21.
- Elster, J. 1989. *Nuts and bolts for the social sciences*. Cambridge, MA: Cambridge University Press.

- Felin, T., and N. J. Foss. 2005. Strategic organization: A field in search of micro-foundations. *Strategic Organization* 3 (4): 441–55.
- Fornell, C., and D. F. Larcker. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 18 (1): 39–50.
- Fredericks, E. 2005. Using flexibility into business-to-business firms: A contingency theory and resource-based view perspective and practical implications. *Industrial Marketing Management* 34 (6): 555–65.
- Gavetti, G. 2005. Cognition and hierarchy: Rethinking the microfoundations of capabilities' development. *Organization Science* 16 (6): 599–617.
- Griffin, A., and J. R. Hauser. 1996. Integrating R&D and marketing: A review and analysis of the literature. *Journal of Product Innovation Management* 13 (3): 191–215.
- Hair, J. F., W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham. 2006. *Multivariate data analysis*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Homburg, C., M. Klarmann, M. Reimann, and O. Schilke. 2012. What drives key informant accuracy? *Journal of Marketing Research* 49 (4): 594–608.
- Iivari, J., and M. Huisman. 2007. The relationship between organizational culture and the deployment of systems development methodologies. *MIS Quarterly* 31 (1): 35–58.
- Inkpen, A. C., and E. W. K. Tsang. 2005. Social capital, networks, and knowledge transfer. *Academy of Management Review* 30 (1): 146–65.
- Jaworski, B. J., and A. K. Kohli. 1993. Market orientation: Antecedents and consequences. *Journal of Marketing* 57 (3): 53–70.
- Jayachandran, S., K. Hewett, and P. Kaufman. 2004. Customer response capability in a sense-and-respond era: The role of customer knowledge process. *Journal of the Academy of Marketing Science* 32 (3): 219–33.
- Kale, P., H. Singh, and H. Perlmutter. 2000. Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strategic Management Journal* 21 (3): 217–37.
- Kleinschmidt, E. J., U. de Brentani, and S. Á. Salomo. 2007. Performance of global new product development programs: A resource-based view. *Journal of Product Innovation Management* 24 (5): 419–41.
- Kohli, A. K., and B. J. Jaworski. 1990. Market orientation: The construct, research propositions, and managerial implications. *Journal of Marketing* 54 (2): 1–18.
- Kostova, T., and K. Roth. 2003. Social capital in multinational corporations and a micro-macro model of its formation. *Academy of Management Review* 28 (2): 297–317.
- Kraatz, M. S., and E. J. Zajac. 2001. How organizational resources affect strategic change and performance in turbulent environments: Theory and evidence. *Organization Science* 12 (5): 632–57.
- Krasnikov, A., and S. Jayachandran. 2008. The relative impact of marketing, research-and-development, and operations capabilities on firm performance. *Journal of Marketing* 72 (4): 1–11.
- Kumar, N., L. W. Stern, and J. C. Anderson. 1993. Conducting interorganizational research using key informants. *Academy of Management Journal* 36 (6): 1633–51.
- Larson, A. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly* 37 (1): 76–104.
- Lee, C., K. Lee, and J. M. Pennings. 2001. Internal capabilities, external networks, and performance: A study on technology-based ventures. *Strategic Management Journal* 22 (6/7): 615–40.
- Levin, D. Z., and R. Cross. 2004. The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science* 50 (11): 1477–90.
- Levin, R. C., A. K. Klevorick, R. R. Nelson, and S. G. Winter. 1987. Appropriating the returns from industrial research and development. *Brookings Papers on Economic Activity* 3: 783–820.
- Li, J. J., L. Poppo, and K. Z. Zhou. 2008. Do managerial ties in China always produce value? Competition, uncertainty, and domestic vs. foreign firms. *Strategic Management Journal* 29 (4): 383–400.
- Lippman, S. A., and R. P. Rumelt. 2003. The payments perspective: Micro-foundations of resource analysis. *Strategic Management Journal* 24 (10): 903–27.
- Loch, C. H., A. De Meyer, and M. T. Pich. 2006. *Managing the unknown: A new approach to managing high uncertainty and risk in projects*. Hoboken, NJ: Wiley.
- Loch, C. H., M. E. Solt, and E. M. Bailey. 2008. Diagnosing unforeseeable uncertainty in a new venture. *Journal of Product Innovation Management* 25 (1): 28–46.
- MacCallum, R. C., and M. W. Browne. 1993. The use of causal indicators in covariance structure models: Some practical issues. *Psychological Bulletin* 114 (3): 533–41.
- MacKinnon, D. P., C. M. Lockwood, J. M. Hoffman, S. G. West, and V. Sheets. 2002. A comparison of methods to test mediated and other intervening variable effects. *Psychological Methods* 7 (1): 83–104.
- Marsh, H. W., and D. Hocevar. 1985. Application of confirmatory factor analysis to the study of self-concept: First- and higher order factor models and their invariance across groups. *Psychological Bulletin* 97 (3): 562–82.
- Marsh, S. J., and G. N. Stock. 2006. Creating dynamic capability: The role of intertemporal integration, knowledge retention, and interpretation. *Journal of Product Innovation Management* 23 (5): 422–36.
- Nahapiet, J., and S. Ghoshal. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review* 23 (2): 242–66.
- Newbert, S. L. 2007. Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. *Strategic Management Journal* 28 (2): 121–46.
- Paladino, A. 2007. Investigating the drivers of innovation and new product success: A comparison of strategic orientations. *Journal of Product Innovation Management* 24 (6): 534–53.
- Peng, M. W., and Y. Luo. 2000. Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal* 43 (3): 486–501.
- Podsakoff, P. M., S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology* 88: 879–903.
- Porter, M. E. 1985. *Competitive advantage*. New York: The Free Press.
- Reimann, M., and O. Schilke. 2010. Product differentiation by aesthetic and creative design. In *Design thinking: Understand, improve, apply*, ed. H. Plattner, C. Meinel, and L. Leifer, 45–58. Berlin: Springer.
- Reimann, M., O. Schilke, and J. S. Thomas. 2010. Customer relationship management and firm performance: The mediating role of business strategy. *Journal of the Academy of Marketing Science* 38 (3): 326–46.
- Schilke, O. forthcoming. On the contingent value of dynamic capabilities for competitive advantage: The nonlinear moderating effect of environmental dynamism. To appear in *Strategic Management Journal*.
- Schilke, O., and A. Goerzen. 2010. Alliance management capability: An investigation of the construct and its measurement. *Journal of Management* 36 (5): 1192–219.
- Slater, S. F., and J. C. Narver. 1999. Market-oriented is more than being customer-led. *Strategic Management Journal* 20 (12): 1165–68.
- Slater, S. F., and E. M. Olson. 2000. Strategy type and performance: The influence of sales force management. *Strategic Management Journal* 21 (8): 813–29.
- Subramaniam, M., and M. A. Youndt. 2005. The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal* 48 (3): 450–63.

- Sundbo, J. 2001. *The strategic management of innovation. A sociological and economic theory*. Cheltenham, UK: Edward Elgar.
- Tatikonda, M. V., and M. M. Montoya-Weiss. 2001. Integrating operations and marketing perspectives of product innovation: The influence of organizational process factors and capabilities on development performance. *Management Science* 47 (1): 151–72.
- Tsai, W., and S. Ghoshal. 1998. Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal* 41 (4): 464–76.
- Vorhies, D. W., and N. A. Morgan. 2005. Benchmarking marketing capabilities for sustainable competitive advantage. *Journal of Marketing* 69 (1): 80–94.
- Wellman, B. 1988. Structural analysis: From method and metaphor to theory and substance. In *Social structures: A network approach*, ed. B. Wellman and S. D. Berkowitz, 19–61. Cambridge, UK: Cambridge University Press.
- Williams, L. J., J. R. Edwards, and R. J. Vandenberg. 2003. Recent advances in causal modeling methods for organizational and management research. *Journal of Management* 29 (6): 903–36.
- Zollo, M., and S. G. Winter. 1999. From organizational routines to dynamic capabilities. In *Working paper of the Reginald H. Jones Center*, The Wharton School, University of Pennsylvania.
- Zollo, M., and S. G. Winter. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science* 13 (3): 339–51.