A Relational View of Environmental Performance: What Role do Environmental Collaboration and Cross-Functional Alignment Play?

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Abstract

Despite extensive research into the role played by social capital and relational capability in attaining interorganizational advantage, the way in which these resources matter for environmental performance has received scant attention. We investigate how firms' social capital and relational capability influence their environmental performance, by analyzing the mediating role of environmental collaboration and the moderating role of cross-functional alignment. Based on an analysis of dual responses from 270 Turkish firms, we find that environmental collaboration mediates the impact of social capital and relational capability on environmental performance. We also find that alignment between marketing and supply chain management functions strengthens the effects of relational capability and environmental collaboration on environmental performance. Our study suggests that both environmental collaboration and cross-functional alignment are necessary if the true value of social capital and relational capability for environmental performance is to be realized.

Keywords

Environmental performance; relational view; environmental collaboration; cross-functional alignment; social capital; relational capability

1. Introduction

In today's global economy, firms do not operate in a vacuum. Much of the environmental footprint of contemporary firms is influenced by the network partners that comprise their supply chain (Chan, He, & Wang, 2012; Mariadoss et al., 2016; Zhu & Sarkis, 2004). Controversies over the environmental impact of key suppliers in the electronics and textile/apparel industries, among others, have underscored the realization that in global production and distribution networks, environmental impacts can be felt at various stages in the supply chain (Clarke & Boersma, 2017). By way of illustration, China recently shut down tens of thousands of factories in an unprecedented effort to reduce pollution. This action has caused significant supply chain disruption and has led some companies to move entire supply chains to other countries, such as India or Bangladesh, in an effort to meet their customers' orders (Schmitz, 2017).

Researchers have recognized that if firms are to improve their overall environmental footprint, they must work closely with their partners in a collaborative fashion and efficiently use their capabilities (Chan et al., 2012; Mariadoss et al., 2016; Zhu & Sarkis, 2004). Social capital –relational resources attainable by individual actors through networks of social relationships (Tsai, 2000)– and relational capability –a firm's capability to create, manage, and leverage the overall structure of the relationships in its network over time (Capaldo, 2007)– are considered integral elements of such interorganizational relationships. However, previous research has yielded mixed or conflicting results about the role of social capital (Labianca & Brass, 2006; Villena, Revilla, & Choi, 2011) and relational capability (Kohtamäki et al., 2013; Schillebeeckx et al., 2016) in these relationships. In addition, little is known about the actual impact of social capital and relational capability on environmental performance (Chan et al., 2012). Therefore, our research objective is to unpack the role of firms' inter- and intra-organizational relationships in using social capital and relational capability to achieve improved environmental performance. To fulfill our research objective, we ask the following research question: "*How do social capital and relational capability impact environmental performance?*". Increased knowledge of how firms can utilize social capital and relational capability to reduce their environmental footprint can help firms to leverage their supply chain network better in order to achieve their environmental objectives.

We build our argument on the Relational View (RV) (Dyer & Singh, 1998); and the premise of this paper is that social capital and relational capability help increase the level of environmental collaboration between supply chain partners and that this also has a direct impact on environmental performance. Additionally, to explain the boundary conditions of the nexus of relationships between social capital, relational capability, and environmental performance, we explore the moderating role of cross-functional (i.e., marketing and supply chain management) alignment. The inclusion of cross-functional alignment in our framework enables a better understanding of the conditioning role of the intraorganizational relational dynamics among a firm's key boundary spanners when converting social capital and relational capability into environmental performance. Based on a sample of dual respondents (marketing and supply chain managers) from 270 Turkish firms, we find that environmental collaboration mediates the impact of social capital and relational capability on environmental performance. We also find that cross-functional alignment plays a critical moderating role in the linkages between social capital, relational capability, environmental collaboration, and environmental performance.

We make several noteworthy contributions. First, we augment the growing literature that addresses the relationship between social capital and environmental performance. Recent research has argued that there is no direct relationship between social capital and environmental performance (Grafton & Knowles, 2004; Peiró-Palomino & Picazo-Tadeo, 2018). Our study offers a more comprehensive understanding of this relationship by examining the mediating role of environmental collaboration. In this way, our results complement the extant research by indicating that there is indeed a relationship between the two variables, but that it is partially mediated by environmental collaboration.

Second, we provide a different perspective on the relationship between relational capability and environmental performance. Past research has suggested a direct and positive relationship between these constructs (Parmigiani, Klassen, & Russo, 2011; Paulraj, 2011). However, our results do not provide evidence of a direct relationship, giving instead a more comprehensive perspective and indicating that environmental collaboration fully mediates the relationship between relational capability and environmental performance. In this way, our findings contradict prior studies and highlight the

importance of considering mediating factors in the complex relationship between relational capability and environmental performance.

Third, we make a double contribution to environmental sustainability research and the growing literature on demand and supply integration (Esper et al., 2010; Stank et al., 2012). We integrate these literature streams and stress the intriguing role of cross-functional alignment in helping firms improve their environmental performance. In doing this, we uncover further avenues through which cross-functional alignment can create value, and we augment the research on environmental sustainability by identifying a noteworthy factor (i.e., cross-functional alignment) that shapes how firms' social capital, relational capability, and ensuing environmental collaboration impact their environmental performance. Relevant managerial and policy implications are also derived from our findings.

2. Theoretical background and hypotheses

2.1. The relational view

The Relational View (RV) serves as a useful theoretical lens for evaluating the roles of social capital and relational capability in improving environmental performance. The core premise of RV suggests that firms' critical resources are embedded in interfirm interactions and routines (Dyer & Singh, 1998). For this reason, the relationships in which firms are embedded influence their conduct and performance (Borgatti & Foster, 2003). Through theoretical work at the interface of the network paradigm (e.g., Borgatti & Foster, 2003) and the resource-based perspective (e.g., Russo & Fouts, 1997), RV has gained increasing recognition and use in management and strategy (Acquaah, 2007; Capaldo, 2007; Leischnig, Geigenmueller, & Lohmann, 2014; Zahra, 2010). According to RV, relation-specific assets, knowledge-sharing routines, complementary resources/capabilities, and effective governance constitute critical sources of interorganizational advantage (Dyer & Singh, 1998). These four factors can be viewed as essential relational resources that should be developed and maintained by firms in order to compete successfully across markets. While RV is primarily relevant to the interorganizational context (Dyer & Singh, 1998), it could also help to explain intraorganizational relational phenomena (Bradbury & Lichtenstein, 2000), especially across functions.

Social capital is a central relational resource (Zahra, 2010) that underpins vital knowledge-sharing routines. It could be leveraged for multiple purposes, including gaining access to and sharing knowledge

across organizational boundaries. Likewise, relational capability is an essential capability that underlies the effective governance of interfirm exchanges in relationships (Capaldo, 2007). It activates the potential assets and resources embedded in a firm's network, and enables the firm to make the best use of this unique and inimitable resource base. Accordingly, we delve further into social capital and relational capability as potentially essential ingredients of firms' relational strategy in the pursuit of environmental performance.

2.1.1. Social capital

Social capital refers to the sum of the actual and potential resources embedded within, available through, and derived from the network relationships of a firm (Nahapiet & Ghoshal, 1998). Social capital is reflected in various ways, including through its role in enabling relational rents, providing access to exclusive privileges and tangible and intangible resources embedded in relationships, and facilitating risk-sharing among actors (Zahra, 2010). Social capital is a source of a multitude of crucial outcomes, including innovation (Borgatti & Foster, 2003) and collaborative knowledge transfer (Inkpen & Tsang, 2005). However, it is also laden with liabilities (Labianca & Brass, 2006; Zeng et al., 2017). Social capital is, thus, a vital intangible resource that can underpin relationship-based competitive advantage and help build and cement cohesion in interorganizational relationships, if used in the right way (Dyer & Singh, 1998).

2.1.2. Relational capability

Relational capability is defined as a firm's capability to create, manage, and leverage the overall structure of the relationships in its network over time (Capaldo, 2007). An internally-driven capability that reinforces interorganizational relational strategy and management, relational capability is instrumental in sowing, cultivating, and harvesting relational resources for interorganizational competitive advantage (Kohtamäki et al., 2013). Relational capability is a pivotal capability for the management of a firm's network and the derivation of relational rents from its key network relationships (Capaldo, 2007; Kohtamäki et al., 2013). The micro-foundations of relational capability lie in the distinct capabilities and actions of the firm's boundary-spanning agents, such as purchasing and sales managers (Zhang, Viswanathan, & Henke, 2011), and thus it is highly inimitable.

2.1.3. Environmental collaboration

Collaboration is an indispensable element of interorganizational relationships (Capaldo, 2007; Vachon & Klassen, 2008; Zahra, 2010). Collaboration forms the foundation of economic and civil advancement (Harari, 2014). However, it is highly sophisticated, and replete with behavioral complications, dualities, and contingent outcomes (Harari, 2014). Because it can be decoupled across time and space and even formed on differing grounds of incongruent goals, incentives, and management practices (Caldwell, Roehrich, & George, 2017), its functioning and outcomes are rarely straightforward. It can be a costly endeavor, laden with conflicts and outcomes that are less than what is expected, although, on average, its benefits have the potential to outweigh its costs (Harari, 2014; Vachon & Klassen, 2008).

Environmental collaboration refers to joint environmental goal setting, shared environmental planning, and business partners working together to reduce environmental impacts (Vachon & Klassen, 2008). It is a relational activity across organizational boundaries and can involve partners of different backgrounds and natures. Collaboration supporting the natural environment is an essential part of environmentally sustainable strategies and activities for firms (Vachon & Klassen, 2008).

2.2. Environmental performance

As a strategic outcome underlying the "planet" pillar of the triple bottom line, environmental performance is defined as the extent of the environmental impact of a firm's activities (De Villiers, Naiker, & van Staden, 2011). As socioeconomic demands regarding firms' environmental responsibility increase, environmental performance offers untapped strategic opportunities to firms that invest in it (De Villiers et al., 2011). Firms with a robust environmental performance can utilize the market opportunities created by increased demand for environmentally-friendly products and services (Berrone & Gomez-Mejia, 2009). Thus, it is one of the primary objectives of environmental strategies and has been considered an important concept when studying environmental sustainability in strategic management (Chen et al., 2014; Russo & Fouts, 1997).

Intangible resources play a vital role in environmental performance (Russo & Fouts, 1997). However, it is hard for firms to be sure that they can improve their environmental performance (Zhu & Sarkis, 2004), especially when the business processes they use, and the markets in which they operate, are complex and uncertain. In such conditions, firms often do not know the payoffs of the various options or investment paths they can take (Shevchenko, Lévesque, & Pagell, 2016). Improving environmental

performance requires a firm to discover alternative and subtle means of doing business and to find the best contingent environmental options, without compromising financial performance. Furthermore, sustainable strategies and activities are laden with tensions that occur between different levels, in change processes, and within a temporal and spatial context (Hahn et al., 2015).

Next, we establish the relationship between the constructs of interest and environmental performance.

2.3. The mediated link between social capital, relational capability, and environmental performance

The positive roles of social capital (Inkpen & Tsang, 2005; Zahra, 2010) and relational capability (Schillebeeckx et al., 2016) in interorganizational collaboration have been documented. However, extensive research on the link between social capital and various performance outcomes has produced conflicting findings. For example, Villena et al. (2011) found an inverted-U relationship between social capital in buyer–supplier relationships and buyer performance, such that a moderate degree of social capital improved performance but these benefits were reversed at higher levels of social capital. Similar conflicting findings have been reported for relational capability (Kohtamäki et al., 2013; Schillebeeckx et al., 2016).

In view of the complex and path-dependent nature of the antecedents of environmental performance (Chen et al., 2014) and the multifaceted nature of relational resources (Labianca & Brass, 2006; Zeng et al., 2017), we argue that social capital and relational capability can be vital precedents, but are unlikely to be self-directed enablers, of environmental performance. Thus, we consider the mediating role of environmental collaboration, which has been found to have a positive impact on environmental performance (Vachon & Klassen, 2008).

The *way* in which social capital and relational capability are put to use, rather than merely their existence or application, is more important in explaining their actual influence. Since firms' activities shape the way in which their capabilities are utilized (Chen et al., 2014), we argue that collaboration plays an instrumental role in how social capital and relational capability are put to use. We expect that, while social capital and relational capability can support and facilitate environmental collaboration, environmental collaboration can enable them to be converted into environmental performance.

On the one hand, most resources are operands (that is, they can neither apply themselves to a particular purpose nor define the purposes for which they are applied). Environmental collaboration is needed to employ the resources to address interorganizational environmental issues and to focus on joint processes by which environmentally-sound outcomes might be achieved (Vachon & Klassen, 2006). These coordinating activities of social and work relationships among partners from diverse backgrounds shape environmental-friendly social value creation (Caldwell et al., 2017). Environmental collaboration assists in the realization of environmental goals by orientating and utilizing relational resources and capabilities for environmental causes. Firms utilize interorganizational collaboration to gain access to shared resources offered by their partners (Borgatti & Foster, 2003; Dyer & Singh, 1998; Zahra, 2010). Furthermore, environmental collaboration can give purpose and direction to social capital and relational capability and enable them to be used to achieve environmental performance.

On the other hand, social capital and relational capability facilitate environmental collaboration among diverse partners with competing priorities. The reality of environmental sustainability is that many firms are either incapable of reaching it fully or see only marginal returns in environmental activities that require a fundamental alteration in the way they do business (Shevchenko et al., 2016). The essential elements of social capital include network tie diversity, firms' positions and influences in a network, access to information, and word-of-mouth referrals (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998; Zahra, 2010). It is a central ingredient in sharing resources and alleviating the burdens of both eliminating unsustainable practices and initiating sustainable practices on a larger scale among business partners. As social capital encompasses access to mutual knowledge and goal alignment (Nahapiet & Ghoshal, 1998), it could be a necessary ingredient in the creation of relational coordination for the environment (Caldwell et al., 2017). Similarly, relational capability can play a positive role in the propensity to collaborate and the efficacy of such collaboration (Schillebeeckx et al., 2016). Therefore, social capital and relational capability can be necessary ingredients for successful environmental collaboration.

In summary, we argue that the interplay between social capital, relational capability, and environmental collaboration in relation to environmental performance is synergistic. Social capital and

relational capability are only meaningful to the environment if they are deployed in a specific and purposeful way via environmental collaboration with business partners. Thus, we propose:

H1: *Environmental collaboration mediates the relationship between firms' relational capability and their environmental performance.*

H2: *Environmental collaboration mediates the relationship between firms' social capital and their environmental performance.*

2.4. The moderating role of cross-functional alignment

Cross-functional alignment refers to the extent to which organizational design, strategy, and culture work together across functions to achieve a firm's objectives (Ashenbaum et al., 2009). It is shaped by relational dynamics in an intraorganizational environment, as firms often employ relational principles and emphasize relational strategy within their boundaries to achieve it (Bradbury & Lichtenstein, 2000). Thus, it draws on RV's core principles of reciprocity, coordination, knowledge and resource sharing, relational mechanisms, and harmony (Dyer & Singh, 1998), through which it cultivates a shared view of a firm's value-creating activities (Williams et al., 2013).

In this research, we focus on the cross-functional alignment of marketing and supply chain management (SCM). Marketing and SCM are the primary domains through which firms manage business processes across organizational boundaries (Mentzer & Gundlach, 2009). These two functions are firms' key boundary spanners, and they are the primary conduits for environmental collaboration with supply chain partners. Thus, these functions are complementary and pivotal to a firm's interorganizational strategy and boundary-spanning activities (Mentzer & Gundlach, 2009; Zhang et al., 2011).

Diversity climate research highlights the fact that managers' treatment of external partners depends on how they are treated internally within their firm (Chen, Liu, & Portnoy, 2012). Although functional areas are intended to work well together, in reality, marketing and SCM are not always aligned, as they do not always think alike, hold the same values, or share the same objectives (Jüttner, Christopher, & Baker, 2007). Cross-functional alignment could be used as a tool for internal cooperation, and could help the interorganizational challenges of environmental collaboration to be overcome, as it fosters an inclusive identity and builds a holistic view of a firm's value-creating activities

(Williams et al., 2013). As such, firms with higher levels of cross-functional alignment are better positioned to utilize their external relational capabilities to enhance environmental collaboration with suppliers/customers.

A growing stream of research on demand and supply integration indicates that cross-functional alignment allows firms to maximize the benefits of collaboration (Esper et al., 2010). Environmental issues frequently entail the consideration of both supplier-related (e.g., suppliers' ability to incorporate recycled materials into packaging) and customer-related (e.g., preferences for recycled packaging) elements. While, as described earlier, relational capability allows firms to engage in environmental collaboration, the ability to integrate customer and supplier perspectives effectively can enhance the strength of this relationship. Firms with higher levels of cross-functional alignment are better positioned to explore environmental collaboration opportunities fully, because they have a more comprehensive and integrated understanding of both the supply-related and the demand-related elements of environmental issues. Similarly, this integrated understanding of supply and demand issues can enhance a firm's ability to utilize social capital to engage in environmental collaboration. Thus, we explore the following hypotheses:

H3a: *Cross-functional alignment moderates the effect of relational capability on environmental collaboration, such that the relationship between relational capability and environmental collaboration is stronger when cross-functional alignment is high.*

H3b: *Cross-functional alignment moderates the effect of social capital on environmental collaboration, such that the relationship between social capital and environmental collaboration is stronger when cross-functional alignment is high.*

Cross-functional alignment can also be conducive to interorganizational governance and value appropriation (Ashenbaum et al., 2009). A critical benefit of cross-functional alignment is its enabling role in a smooth firm-wide diffusion of practices and resources from external sources (Jüttner et al., 2007). Without aligned internal processes and structures, the benefits arising from supply chain partners could fail to materialize into environmental outcomes, as there may be internal disconnections and hurdles (Jüttner et al., 2007). Likewise, experiences in handling inherent tensions across value-creating functions (Esper et al., 2010) could be applied in embracing and dealing with potential

interorganizational tensions in sustainability to improve environmental performance (Hahn et al., 2015). We argue that firms can have a better return on environmental collaboration when their internal activities are aligned and offer fertile ground for transcending tensions and diffusing best practices and relational rents across functions. Hence, we posit:

H3c: *Cross-functional alignment moderates the effect of environmental collaboration on environmental performance, such that the relationship between environmental collaboration and environmental performance is stronger when cross-functional alignment is high.*

3. Research methodology

3.1. Survey setting, sampling, and data collection

We employed a structured questionnaire to gather firm-level primary data from firms in Turkey. We chose Turkey as the research context for a number of reasons. First, Turkey is a sizeable yet overlooked country that exhibits comparable features with several other emerging markets. The industrial, institutional, and corporate structures in Turkey resemble those of other sizeable emerging markets, such as Brazil, Mexico, Ukraine, and Romania (Fainshmidt et al., 2016), which may improve the generalizability of the results. Second, Turkish firms inherit a rich, diverse, and contradictory sociocultural and political macro-environment that results in complex organizational dynamics and tensions (Karakas, Sarigollu, & Uygur, 2017). This fact amplifies the importance of understanding cross-functional alignment and the relevance of the chosen context.

Third, the strong emphasis on social relationships and the capital from those relationships (Cetindamar et al., 2012) renders the Turkish context appropriate for investigating interorganizational relational factors. The fundamental position of social relationships in the Turkish business context offers better grounds for examining the role of environmental collaboration, social capital, and relational capability in environmental performance than contexts in which the transactional paradigm of business exchanges prevails. Finally, from the environmental sustainability viewpoint, weak external pressures for environmental practices in Turkey grant firms increased discretion over whether or not to adopt environmental practices voluntarily (Kalamova & Johnstone, 2012). The increased role of discretion in

environmental sustainability can enhance variations in environmental practices and highlight the internal *enablers* of environmental practices beyond the external *drivers* like stakeholder pressure or regulation.

We developed the survey questionnaire in English originally, translated it into Turkish, and then had it re-translated into English by a second party to ensure accuracy in translation. This process of "back translation" is useful in identifying misinterpretations and misunderstandings before a survey is administered. In a further step to ensure the veracity of the translation, two bilingual researchers compared the back-translated English and Turkish versions of the questionnaire and made any necessary changes.

We sampled a range of firms from several product-intensive industries located in Turkey to attain a sound level of external validity and generalizability of the research findings. The sampling frame of the research was based on the website of TOBB (The Union of Chambers and Commodity Exchanges of Turkey, http://www.tobb.org.tr). TOBB offers an industrial database that includes more than 40,000 firms registered within its 93 chambers in Turkey. As a major non-governmental organization in an emerging market where information sources on firms are incomplete, TOBB was a valuable source for the approach we adopted to sampling frame creation (Kriauciunas, Parmigiani, & Rivera-Santos, 2011).

Following the elimination of firms that did not meet the selection criteria, we randomly sampled 1,000 firms from this database. We pre-qualified research participants within each firm by their responsibilities, their holistic understanding of core corporate functions and processes, and their functional expertise, following the criteria suggested by Dillman (2007) and Kerlinger and Lee (2000). We delivered two paper-based mail surveys to each firm, with a covering letter introducing the research project. The letter requested that two executive managers who had a high degree of knowledge about their firms' value-creating functions and interorganizational collaboration should complete the survey. We believe that using dual respondents for each firm improves the accuracy of the data, especially on cross-functional alignment as an important moderating variable, since it captures the perspectives of two respondents rather than just one.

After two waves of data collection and two reminders, 376 firms returned the questionnaires, with 270 of these sets of responses being dual and fully complete (corresponding to an effective response rate of 27.0%). Thus, we included 540 usable questionnaires from 270 participating firms in the later stages

of the data analysis. We checked the consistency of the answers for relevant variables by comparing the answers of the two respondents for each firm. This process yielded high consistency and equivalence concerning the means and properties of the relevant measures across the two respondents within each firm. Consequently, we merged those answers from the two informants for each firm by taking the average of their answers to arrive at a firm-level unit of analysis. The characteristics of the sample firms are summarized in Table 1.

----------Insert Table 1----------

To evaluate non-response bias, we first compared the responses from early and late respondents to our survey and found no statistically significant differences. Second, a comparison of a randomly selected group of 56 non-participant firms and the 270 respondents revealed no significant differences for any demographic indicators (e.g., annual sales, or number of employees). Thus, we concluded that non-response bias does not pose a significant problem in our study.

3.2. Measurement of variables

We measured each variable through the managers' perceptual evaluations. Human behavior in general, and managerial behavior in particular, is more related to the *perception* of states than to actual states (Harari, 2014), and behaviors and capabilities can be captured in a more sophisticated way using primary perceptual data. Thus, we believe that using perceptual measures is an appropriate way to analyze our concepts, which include behavioral and attributive elements. The use of executives' perceptions has been widely adopted in empirical studies and justified by several researchers (Acquaah, 2007; Chen et al., 2012; Williams et al., 2013; Zahra, 2010).

We employed the procedure suggested by Hair et al. (2007) to establish the content validity of the measures used in this study. First, we conducted in-depth exploratory interviews with five CEOs in Turkey who provided us with their views of the issues we were studying, drawing on their first-hand experience. Second, an initial version of the survey was revised through discussions with expert scholars. Finally, 12 senior executives (all excluded from the final sample) completed a pre-test survey that provided final fine-tuning opportunities, eliminated ambiguous and unfamiliar scale items, and confirmed that the survey achieved a satisfactory level of maturity and clarity. All latent variables were measured using the seven-point scale items shown in Table 2.

The methodology for developing measures for *relational capability* (RC) was mainly based on the guidelines provided by Churchill (1979) and DeVellis (2011). Thus, we developed a set of 10 items to measure RC (α=0.89), drawing mainly on the insights gained through a qualitative research process and the extant literature on relational and networking capabilities, in addition to insights from Mitrega et al. (2012). Then, we followed the scale development procedures outlined by DeVellis (2011), and adopted one step q-sort (Petter, Straub, & Rai, 2007) and pilot testing procedures to refine the items and ensure their face validity before moving on to the main survey. The procedures suggested by Churchill (1979) and DeVellis (2011) resulted in the final set of items for RC that were used in the study.

The measurement of *social capital* (SOC) was drawn from Zahra (2010) and Acquaah (2007) and consisted of five measurement items (α=0.84). *Environmental collaboration* (ECOL) was adapted from Vachon and Klassen (2006) and measured by six items (α=0.94). *Cross-functional alignment* (CAL) was drawn from Ashenbaum et al. (2009); Chen, Mattioda, and Daugherty (2007) and included six measurement items (α=0.87). *Environmental performance* (EP) was adapted from Zhu and Sarkis (2004). This scale captures a firm's environmental performance on each of the five essential criteria identified by Zhu and Sarkis (2004) that have frequently been used as measures of environmental performance by researchers (α=0.97). We believe desirability bias is not likely to be a severe threat to the validity of the EP measures, because of the relatively weak local external pressure for environmental sustainability in Turkey (Kalamova & Johnstone, 2012).

3.2.1. Controls

Firm age (AGE) was measured in five categories and identified by the total number of years elapsed since the establishment of the firm. AGE is a common control variable to test whether older firms differ from newer ones regarding the outcome variable, which is environmental performance in this study.

Firm size (SIZE) was measured in five categories and determined by the number of employees, to control for its potential influence. Within these categories, we captured firms whose number of employees ranged from fewer than 250 to more than 5,000.

Industry sector (IND) was created as a dummy variable to control for industry variations. We split the overall sample of firms broadly into two categories: high-polluting and low-polluting industries. We followed and adapted the approach of Berrone and Gomez-Mejia (2009) in defining our high- and low-polluting sectors. High-polluting industries are the textiles, apparel, leather, metal, mining, petroleum, gas, auto, transport and related equipment, electrical, electronics, durables, and chemical industries. Low-polluting industries are the export–import trading, food and beverages, tourism, retail, construction, and logistics industries. We tested whether including high-polluting as opposed to low-polluting firms might weaken or cancel out the relationships of focal interest.

Degree of internationalization (DOI) was measured by the approximate percentage of foreign sales, in an ordinal form, which included six categories. We included this variable to account for the possible influence of serving foreign customers (Yang & Rivers, 2009), since such customers tend to be relatively more environmentally conscious and demanding, especially given that Turkey's major markets are developed European countries.

4. Analysis and results

4.1. Measurement model validation

Table 2 presents the fit statistics for the confirmatory factor analysis (CFA), where the fit indices are well within generally accepted limits [χ^2/d.f.=1.83, CFI=0.95, TLI=0.94, IFI=0.95, RMSEA=0.05] and indicate a good fit to the data. Table 2 reveals that all items are significantly linked to their underlying constructs ($p<0.001$) by having standardized loadings greater than 0.60. Table 2 also provides composite reliability (CR) values to measure the internal consistency of the constructs. All constructs have CR values exceeding 0.90, indicating satisfactory levels of construct reliability (Bagozzi & Yi, 1988).

----------Insert Table 2----------

Table 3 shows the discriminant and convergent validity measures of the model by examining the average variance extracted (AVE) measures and the squared correlations among the constructs. The AVE values reported in Table 3 are higher than 0.50, indicating an acceptable level of convergent validity for our survey instrument (Fornell & Larcker, 1981).

Furthermore, the standardized regression weights of the variables are highly significant ($p<0.001$) attesting to the convergent validity of the constructs (Anderson & Gerbing, 1988). We assessed the

discriminant validity using the method suggested by Fornell and Larcker (1981), where we compared the AVE with the squared correlation between the construct and other constructs in the model. If the AVE for all the constructs is higher than the squared correlation among all other constructs, then discriminant validity is established. The discriminant validity of the constructs in the measurement model is confirmed, as all four constructs meet this requirement.

----------Insert Table 3----------

We also addressed the measurement invariance of our measures, to test whether our factor structure is equivalent across different values of the multi-group moderator, by dividing our sample into two groups according to the level of their cross-functional alignment, for moderation analysis. Measurement invariance indicates that the same construct is being measured across specified groups, and it is tested through configural and metric invariance (Vandenberg & Lance, 2000). We first analyzed the configural invariance through a multi-group nested model, which yielded configural invariance across two levels of cross-functional alignment [χ^2/d.f.=1.73, CFI=0.91, TLI=0.90, IFI=0.91, RMSEA=0.05]. Second, we tested metric invariance through critical ratios for differences between measurement items across participant firms who reported either low or high cross-functional alignment. We found that indicators for each factor across the two groups of low and high cross-functional alignment firms were not significantly different, and that our measurement model satisfied the conditions for metric invariance. Consequently, we concluded that the measurement invariance of our measures was established.

4.1.1. Common-method bias

Since independent and dependent variables of the study were measured using the same source, we addressed the possibility of common-method bias (CMB) to avoid the contamination of measures in the same direction that would distort the results of our study (Podsakoff et al., 2003). There are various types of design-related (e.g., psychological separation, methodological separation, and using multiple sources) and statistical (e.g., Harman's single factor test and common latent factor) remedies to remove or mitigate CMB (Craighead et al., 2011).

We adopted the following design-related steps to minimize potential CMB. First, we pre-qualified the potential respondents to ensure that they had relevant knowledge of the research topic. Second, we

informed all respondents that their information and responses were to be kept anonymous, we avoided asking for sensitive data, and we received the questionnaire in a separate sealed envelope for each participant, which reduces the threat of social-desirability bias (Podsakoff, MacKenzie, & Podsakoff, 2012). Third, we put the independent and dependent variables/constructs far away from each other, and randomized the items within each construct. Finally, and more importantly, two qualified informants from each participating firm completed the survey, which enabled us to ensure that the responses were consistent (Craighead et al., 2011; Podsakoff et al., 2003). Gathering data from two managers from each firm captures potential differences in perceiving focal issues and environmental performance and provides an early remedy for CMB threats. Thus, using data collection through multiple informants contributed to research rigor and enabled distinct and validated insights into the research phenomenon.

We also tested for CMB through two separate statistical analyses. First, Harman's single factor test was used to check whether a single factor can explain the majority of the variance (Podsakoff et al., 2003). To do this, we constrained the number of factors to a single factor. If there is considerable common variance, this single general factor is expected to generate the majority of the covariance among the items. The single factor result did not account for the majority of the variance in the variables of the study. Second, we tested for a common latent factor (CLF) (Williams, Edwards, & Vandenberg, 2003) by using a latent factor to capture the common variance among all the variables in the study. This method was applied in AMOS by creating a latent factor that was connected to all the observed variables in the model. The CLF suggested that there was no significant CMB in these data since the statistical test between the results of the base and the CLF models revealed that the models did not change significantly. There was a slightly better model fit of the theoretical model (χ^2=781.19, d.f.=428) than the CLF model (χ^2=781.16, d.f.=427). These results indicate again that CMB does not generate a serious problem for the inferences and the entire model (Podsakoff et al., 2003; Williams et al., 2003).

4.2. Hypotheses testing

Descriptive statistics and correlations among the variables used in the study are shown in Table 4. The structural relationships in the hypothesized model were tested using a structural equation modeling (SEM) procedure. First, we tested the path relationships in the model, then the mediation effect of ECOL was assessed, and finally, we examined the moderating role of cross-functional alignment. We also

controlled for firm-specific characteristics including firm size, firm age, industry sector, and DOI to improve the rigor of the analyses and the validity of the results.

----------Insert Table 4----------

Fig. 1 presents the parameter estimates for our proposed framework. The fit statistics for the model are well within generally accepted limits [χ^2/d.f.=1.94, CFI=0.95, TLI=0.94, IFI=0.95, RMSEA=0.05], and indicate a good fit to the data. The analysis shown in Fig. 1 assesses the relationships among the constructs without considering the impact of a moderator variable. Mediation analysis is mainly used for providing a more accurate explanation of the chain of causation, by clarifying how, or why, an independent variable affects a dependent variable (Hair et al., 2010). The major findings of this study are summarized as follows.

----------Insert Fig. 1----------

First, ECOL positively and fully mediates the relationship between RC and EP (Sobel test statistics=2.28, $p<0.05$), thus supporting H1. Second, ECOL partially mediates the link between SOC and EP (Sobel test statistics=2.04, $p<0.05$), which provides partial support for H2. We also checked the existence of mediation effects using the bias-corrected bootstrap confidence interval method, in line with Preacher and Hayes (2008). The use of this method has been recommended over the traditional Sobel test and the causal steps approach, since the bootstrapping method has higher power in controlling type I error (Preacher & Hayes, 2008). When running the bias-corrected bootstrapping method, we generated 5,000 resamples, as recommended (Hayes & Preacher, 2014), to calculate whether the indirect effects differed significantly from zero. Our hypotheses regarding the mediating effect of ECOL on RC and EP are fully supported [bootstrapping estimate=0.40, $p<0.001$; 95% CI (0.17, 0.78)], while the link between RC and EP remains insignificant [bootstrapping estimate=0.04, $p=0.99$; 95% CI (-0.60, 0.42)]. On the other hand, the mediating effect of ECO on the link between SOC and EP is partially supported [bootstrapping estimate=0.34, $p<0.01$; 95% CI (0.11, 0.60)]. This is because the link between SOC and EP remains significant [bootstrapping estimate=0.47, $p<0.01$; 95% CI (0.07, 0.87)].

We ran a post hoc analysis through an alternative model to assess the possibility of reverse causality between SOC, RC, and ECOL. Specifically, we placed ECOL as an antecedent to SOC and RC (with the rest of the model remaining unchanged) to test whether this path offers a better fit and

stronger structural relationships. The results indicate that the model fit for the alternative model, where ECOL is treated as endogenous, is significantly worse (χ^2/d.f.=2.9; GFI=0.78; AGFI=0.74; TLI=0.87; IFI=0.88; RMSEA=0.09) than the fit for our original model. Likewise, the potential mediating effect of RC cannot be found in the alternative model, as the direct path between RC and EP remains insignificant. Thus, we conclude that our original model has a better fit and explanatory power than the alternative model that scrutinizes whether ECOL influences SOC and RC more than SOC and RC influence ECOL.

To verify H3a to H3c, regarding the moderating effects of CAL, a multi-group analysis relying on our proposed model, as represented in Fig. 1, was conducted. Concerning CAL, we split the sample as closely as possible to the median to form two groups (the 'low-CAL' group consists of 125 firms, and the 'high-CAL' group consists of 145 firms). A lack of structural invariance would suggest that the path coefficients differ for the high and the low CAL groups. We set equality constraints to test which path coefficients differ between the high and the low CAL groups. If the path coefficients are significantly different for the two groups, it can be concluded that CAL has a moderating effect on these paths. Thus, to assess the moderating impact of CAL on the causal links, as hypothesized in H3a to H3c, we nested a χ^2 test across two broad CAL groupings (i.e., low-CAL and high-CAL firms). Next, we restricted the two groups so that they had equal factor loadings (Byrne, 2013). In the unrestricted model, all the path coefficients across the two groups were allowed to vary, while in the restricted model the path coefficients across the two groups were fixed. The unrestricted path analysis model, shown in Table 5, indicates an acceptable level of fit [χ^2/d.f.=1.66, CFI=0.92, TLI=0.91, IFI=0.93, RMSEA=0.05]. The difference between the unrestricted and the restricted models is significant ($\Delta\chi^2$=51.94, $p<0.01$), supporting the overall moderating impact of CAL. Table 5 shows the coefficients for the theorized paths across the two CAL groups of firms for the unrestricted model. Hence, we found strong support for Hypotheses 3a and 3c. The path coefficients are significantly higher for the causal links between RC and ECOL ($\Delta\chi^2$=31.94, $p<0.01$) and between ECOL and EP ($\Delta\chi^2$=25.85, $p<0.01$) in firms characterized by a high level of CAL than they are for those characterized by a low level of CAL. We found no support for H3b, since the path coefficient for the link between SOC and ECOL remains insignificant ($\Delta\chi^2$=13.80, $p>0.1$) for both CAL levels. This result may be due to the less behavioral nature of SOC in comparison to RC, which could imply a weaker interaction with the behavioral concept of CAL.

----------Insert Table 5----------

The theoretical model, the hypotheses, and the theoretical arguments presented in the paper to justify the hypotheses are essentially reflective of a moderated mediation model. Moderated mediation shows conditional direct effects (Preacher, Rucker, & Hayes, 2007). As Langfred (2004) asserted, when the moderator operates on the relationships between the independent variable (IV) and the mediator and between the mediator and the dependent variable (DV), then the model should be accepted as moderated mediation. Conversely, mediated moderation mainly focuses on explaining whether there is overall moderation between the IV and the DV (Muller, Judd, & Yzerbyt, 2005). In fact, the two models are two sides of a coin, having a different primary focus. For this reason, to investigate the plausible moderated mediation effects, we employed multi-group analysis using the SEM procedure.

Table 5 indicates the moderated mediation effects. The results show that CAL moderates the mediation effect of ECOL in the relationship between RC and EP ($\Delta\chi^2$=45.19; p<0.01). Similarly, CAL also moderates the mediation effect of ECOL in the relationship between SOC and EP ($\Delta\chi^2$=30.01; p<0.01). From the results, the mediating influence of ECOL in the RC–EP and SOC–EP relationships is stronger under higher levels of CAL.

Of the control variables, only DOI was found to have a positive and significant standardized coefficient (β=0.13, p<0.05). This result suggests that firms with higher DOI exhibit higher environmental performance than firms with a lower level of internationalization, possibly because of pressure from environmentally conscious foreign customers and suppliers, which is in line with our justification for including this variable. The variables of firm age, firm size and industry sector did not seem to influence environmental performance.

4.3. Addressing potential endogeneity threat

Since firms may determine their level of RC based on their desired level of collaboration, RC could be considered endogenous. If RC is endogenously affected by ECOL, the results of the study may be inconsistent and biased (Liu et al., 2016; Uribe-Bohorquez, Martínez-Ferrero, & García-Sánchez, 2018). To assess the endogeneity bias, a two-stage least squares (2SLS) regression method was applied with instrumental variables (Bellamy, Ghosh, & Hora, 2014; Uribe-Bohorquez et al., 2018). First, we

needed to identify instrumental variables for RC to conduct the 2SLS regression. Both AGE and DOI were employed as instrumental variables for RC, as these two variables are not significantly related to ECOL (Table 4). We also identified IND and international performance (IP) as instrumental variables, as it was suggested that they are not significantly linked to ECOL but are significantly related to RC, as can be seen in Table 4 and Table 6. We measured IP with items adapted from Hult et al. (2008) and Lu et al. (2009).

----------Insert Table 6----------

Before running the 2SLS regression, RC was regressed on the following selected variables: SOC, SIZE, CAL, and EP. Model 1 in Table 6, with one-stage OLS, demonstrates that the R^2 of this regression is 0.39, significantly higher than the R^2 of the regression model with only the selected variables (ΔR^2=0.10, ΔF-value=22.93 p<0.01). This result shows that IND, AGE, DOI, and IP can be treated as effective instrumental variables for RC in our study. Based on the results of Model 1 in Table 6, the predicted values of the assumed endogenous variable of RC were calculated (Bellamy et al., 2014), to test the relationship between RC and ECOL at the second stage. As seen in Model 2 in Table 6, the link between RC and ECOL is positive and significant (β=0.72, p<0.01).

After performing the 2SLS method using STATA, we conducted the Durbin–Wu–Hausman post-estimation test of endogeneity (Liu et al., 2016). The test results indicate that the endogeneity associated with RC is insignificant, and thus the null hypothesis that RC is exogenous cannot be rejected [the Durbin score was $\chi^2(1)=2.44$; p>0.1 and the Wu–Hausman score was $F(1.265)=2.42$; p>0.1]. Accordingly, we conclude that our results and conclusions are unlikely to be influenced by endogeneity.

5. Discussion and conclusions

Given the magnitude of environmental problems, firms are increasingly compelled to adopt holistic approaches to environmental practices in collaboration with their supply chain partners, instead of seeking incremental isolated solutions (Clarke & Boersma, 2017; Vachon & Klassen, 2006). That said, environmental practices are sophisticated (Chen et al., 2014), and environmental collaboration can be challenging to execute without the right ingredients (Schillebeeckx et al., 2016). Equally, the potential of social capital and relational capability to bring about environmental sustainability may not be realized unless they are actually enacted and channeled through a proper set of interorganizational activities.

This challenge brings out the role of environmental collaboration as a potential mediating means to translate social capital and relational capability into environmental performance, under the boundary conditions of cross-functional alignment, and this paper examines whether such a proposition holds.

5.1. Theoretical contributions

Our paper highlights social capital, relational capability, environmental collaboration, and cross-functional alignment as the relational underpinnings of environmental performance, and makes several theoretical contributions. First, our findings expand on current empirical research arguing that there is no direct relationship between social capital and environmental performance (Grafton & Knowles, 2004; Peiró-Palomino & Picazo-Tadeo, 2018). We shed further light on this relationship by investigating the mediating role of environmental collaboration. We complement extant research by indicating that a relationship between the two variables does exist, but that it is partially mediated by environmental collaboration. We provide evidence that the role of social capital in environmental performance is weak in its own right. Thus, by adding a higher level of detail to this complicated relationship, our findings offer a more comprehensive and precise perspective on the role of social capital in enhancing environmental performance by explaining how environmental collaboration enacts and realizes the potential value of social capital.

Second, our findings contradict extant research that suggests there is a direct and positive link between relational capability and environmental performance (Parmigiani et al., 2011; Paulraj, 2011). Our study did not find evidence of a direct link when we account for the role of environmental collaboration. This evidence is in line with the possibility of firms utilizing relational capability for multiple purposes, including environmentally futile ones. As such, our research provides a nuanced perspective and reveals that environmental collaboration fully mediates the relationship between relational capability and environmental performance, as it enacts and channels relational capability for environmental purposes. Our results also highlight the need for further research to examine this relationship, as our findings contradict past studies.

Third, we contribute both to environmental sustainability research and to the literature on demand and supply integration by uncovering additional avenues through which cross-functional alignment can create value for firms and environmental stakeholders. This contribution complements the extant

literature that argues that there are value creation opportunities presented by demand and supply integration within firms (Esper et al., 2010; Stank et al., 2012). We also augment the research on environmental sustainability by identifying a noteworthy factor (i.e., cross-functional alignment) that shapes the way in which relational capability and environmental collaboration influence firms' environmental performance. This helps to provide a contingent and more comprehensive perspective on the factors that allow firms to improve their environmental performance.

In sum, our findings contribute to management research on environmental sustainability (e.g., Berrone & Gomez-Mejia, 2009; Cronin Jr et al., 2011; Darnall, Henriques, & Sadorsky, 2010; Russo & Fouts, 1997) and cooperative strategy (e.g., Caldwell et al., 2017; Capaldo, 2007; Dyer & Singh, 1998) by uncovering the synergistic relationships between social capital, relational capability, and environmental collaboration that could be utilized for environmental performance. We highlight boundary-spanning agents as pivotal actors in utilizing social capital and relational capability and conducting environmental collaboration with a firm's partners. With our relational approach and emphasis on collaboration and alignment, we also move beyond the frequently tackled question of "why" firms adopt environmental activities and with what outcomes (e.g., Darnall et al., 2010; Yang & Rivers, 2009), and address "how" firms utilize social capital and relational capability through environmental collaboration. Our mediation analysis suggests that the means through which such resources are utilized matters to performance outcomes more than their mere existence.

The second premise of our study pertains to the moderating role of cross-functional alignment in realizing relational capability and leveraging environmental collaboration. We reveal that firms that align their demand and supply activities and are better at aligning their organizational design and strategy are also better at utilizing their pivotal relational capability for environmental collaboration and leveraging the benefits of environmental collaboration for environmental performance. Cross-functional alignment empowers firms' boundary-spanning agents both to manage and to utilize environmental collaboration through the better deployment of relational capability and the leverage of relational rents. It represents the boundary conditions under which the effective utilization of relational capability and environmental collaboration to achieve environmental performance is possible.

Drawing on the result of our control test for DOI, our research also notes that social capital and relational capability may act as a basis for environmental practices in markets where stakeholder pressures are weak and these practices are enforced on an arbitrary or inconsistent basis. The dominant view of environmental sustainability suggests that firms adopt environmental practices as a response to external pressure (for example, institutional or stakeholder pressure) (Berrone & Gomez-Mejia, 2009; Cronin Jr et al., 2011; Darnall et al., 2010; Shevchenko et al., 2016; Yang & Rivers, 2009), but less attention has been paid to how this occurs. Our results show that beyond motives as *drivers*, environmental collaboration and cross-functional alignment work as *enablers* for utilizing social capital and relational capability in the pursuit of environmental performance in countries with a low external pressure for sustainability.

5.2. Managerial and policy implications

Our study offers several managerial and policy implications. First, it speaks to managers who want to make a real difference to environmental sustainability through environmental practices beyond their corporate boundaries. We particularly emphasize environmental collaboration as a means of utilizing social capital and relational capability to make a positive impact on the environment that is much greater than a firm could achieve alone. Managers should pay close attention to the finding that environmental collaboration fully mediates the relationship between relational capability and environmental performance and partially mediates the relationship between social capital and environmental performance. Thus, firms are advised to invest in their social capital and relational capability if they want to achieve greater environmental performance, especially on a larger scale by relying on their relationships. Nonetheless, we find that those resources and capabilities are not sufficient in their own right, and need to be realized by means of environmental collaboration. Hence, beyond having social capital and relational capability at their discretion, firms are advised to be open to collaborative arrangements for the environment and to pay particular attention to how they conduct environmental collaboration with their partners.

Our findings also suggest that firms that are better at aligning their marketing and SCM functions are more likely to reap the benefits of the potential synergy between relational capability and environmental collaboration. Marketing and SCM managers should engage with each other

constructively and synchronize their principal activities. This alignment can be successfully reflected in their relations with their business partners, because they are more likely to be perceived as credible and competent agents of their firm, and they can create better leverage from the relational rents gained from business partners through the smooth diffusion of external knowledge within their firm. We suggest that effective cross-functional alignment could help firms to have more resources for an external focus that will have a significant positive impact on environmental performance.

From a policy perspective, policy makers are advised to recognize that environmental success in the private sector requires, beyond mere pressure and regulation, the collaborative and large-scale adoption of environmental practices. Policymakers should establish and maintain institutional grounds for encouraging firms to undertake environmental collaboration with their business partners, rather than acting alone, to expand successful environmental practices beyond firms' boundaries. Likewise, policymakers are advised to support the building of connections among firms within and across industries to foster industry-wide social capital and facilitate environmental collaboration initiatives within their local context.

5.3. Limitations and future research

Our research provides an empirically tested framework of the relational underpinnings of environmental performance. Nevertheless, it is far from a complete understanding of the issues we address. First, though social capital and relational capability could be fundamental at embodying the core premises of the relational resources discussed in RV, they do not entirely represent all the relational resources and capabilities related to interorganizational relationships. Thus, other concepts relevant to interorganizational relationships, such as absorptive capacity and coordination capability, could be examined as other possible antecedents of environmental collaboration and environmental performance. This pursuit could enrich our model and help develop a fuller understanding of the relational underpinnings of environmental performance.

Second, considering that the relationship between social capital and environmental performance is partially mediated by environmental collaboration, it is plausible that additional mediators could exist in this relationship. Future research should explore this possibility by investigating other potential mediators, such as knowledge sharing and innovation (Borgatti & Foster, 2003; Inkpen & Tsang, 2005).

Given the cost associated with environment-related initiatives, it is possible for environmental performance to increase if firms gain access through their social capital to knowledge and innovations that allow them to lower their environmental footprint cost-effectively.

Third, interorganizational collaboration has been extensively examined and refined regarding its conceptual properties. However, environmental collaboration is a relatively specialist and less commonly examined concept (Vachon & Klassen, 2008) and requires further attention, especially given the intricacy of the collaboration phenomenon (Caldwell et al., 2017). Its conceptual ground should be developed further to establish its conceptual properties and explain the potential variations in its understanding, application, and outcomes across various contexts and situations.

Fourth, we investigated the moderating impact of the firm-level concept of cross-functional alignment on our proposed framework. Future research may include macro-level variables such as those derived from institutional theory, to understand how home or host country institutions could moderate the influence of firm-level relational underpinnings on environmental performance. Interactions between micro- and macro-level variables can provide insights beyond what could be gained by using a single level of analysis.

Lastly, we employed cross-sectional data. Future research should employ longitudinal data to provide additional evidence of causality for the relationships of interest.

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Table 1 Characteristics of sample firms

Characteristics		**Number**	**%**
Industry sector*	Consumer durables, electronics and electrical	29	10.7
	Chemical and pharmaceutical	21	7.8
	Food, beverage and paper	41	15.2
	Construction equipments	27	10.0
	Retail	27	10.0
	Textile, clothing and apparel	48	17.8
	Metal, iron and steel	37	13.7
	Automotive and related	19	7.0
	Other industries	21	7.8
Number of employees	Less than 250	133	49.3
	251–500	43	15.9
	501–1000	30	11.1
	1001–5000	48	17.8
	More than 5000	16	5.9
Degree of internationalization (% of foreign sales)	1–4.9%	25	9.3
	5.0–9.9%	23	8.5
	10–24.9%	53	19.6
	25–49.9%	58	21.5
	50–75%	59	21.9
	More than 75%	52	19.3
Years of operation	Less than 3 years	9	3.3
	3–10 years	33	12.2
	11–20 years	78	28.9
	21–40 years	86	31.9
	More than 40 years	64	23.7
	N	***270***	

*Primary industry is identified and selected when participant firm operates in multiple industries.

Table 2 Confirmatory factor analysis results

Constructs	Items	Standardized loadings[a]	CR[b]
Relational Capability	**RC**		**0.90**
Our firm can easily overcome difficulties in initiating business relationships with potential suppliers and customers.	RC1	0.63	
Our firm is able to easily attract other firms to conduct business with us.	RC2	0.64	
Our firm is good at evaluating and selecting firms before establishing a business relationship.	RC3	0.71	
Our firm can comfortably establish business relationships with potential customers and suppliers.	RC4	0.75	
Our firm can effectively manage diverse set of business relationships in its network.	RC5	0.66	
Our firm can easily overcome potential conflicts and problems when doing business with its supply chain partners.	RC6	0.71	
Our firm is successful in communicating and collaborating with its supply chain partners.	RC7	0.74	
Our firm is always able to acquire the value from its supply chain relationships.	RC8	0.64	
Our firm is successful at leveraging potential benefits from its suppliers and customers.	RC9	0.73	
Our firm often utilizes ideas and inputs from its supply chain partners to become more innovative and successful.	RC10	0.65	
Social Capital	**SOC**		**0.85**
Our firm is well connected to other companies in its industry.	SOC1	0.57	
Our firm is well connected to other companies in other industries.	SOC2	0.61	
Our firm has a good reputation for fair dealings.	SOC3	0.74	
Our firm has access to valuable resources through its business relationships.	SOC4	0.86	
Our firm has possibility to acquire and leverage valuable knowledge from its business relationships.	SOC5	0.86	
Environmental Collaboration	**ECOL**		**0.92**
Our firm cooperates with its suppliers to achieve environmental objectives.	ECOL1	0.76	
Our firm provides its suppliers with design specification that include environmental requirements for purchased items.	ECOL2	0.85	
Our firm encourages its suppliers to develop new source reduction strategies.	ECOL3	0.85	
Our firm cooperates with its suppliers to improve their waste reduction initiatives.	ECOL4	0.78	
Our firm works with its suppliers for cleaner production.	ECOL5	0.84	
Our firm collaborates with its suppliers to acquire materials, parts and/or services that support its environmental goals.	ECOL6	0.83	
Environmental Performance	**EP**		**0.97**
Reduction in air emission.	EP1	0.94	
Reduction in waste (water and/or solid).	EP2	0.95	
Decrease in use of hazardous/harmful/toxic materials.	EP3	0.96	
Decrease in frequency for environmental accidents.	EP4	0.95	
Increase in energy saved due to conservation and efficiency improvements.	EP5	0.86	
Cross-functional Alignment	**CAL**		**0.88**
Our performance evaluations are partly based on integrative objectives for supply chain management and marketing.	CAL1	0.79	
Employees in supply chain and marketing units are rewarded for working together in our firm.	CAL2	0.64	
Employees from marketing and supply chain management are often designated as liaisons to the other function in our firm.	CAL3	0.77	
We, employees, all serve to the overarching goals of our firm rather than those of our units.	CAL4	0.62	
Within our firm, employees from marketing and supply chain management functions are encouraged to share resources.	CAL5	0.78	
Our firm extensively utilizes cross-functional work teams between marketing and SCM functions for managing day-to-day operations.	CAL6	0.85	

[a]All loadings are significant at $p<0.001$; [b]CR=Composite reliability

Table 3 Convergent and discriminant validity of the measurement model[a]

Constructs	**#Items**	**AVE[b]**	**RC**	**SOC**	**ECOL**	**EP**	**CAL**
RC	10	0.51	*0.71*				
SOC	5	0.54	0.29	*0.73*			
ECOL	6	0.67	0.16	0.16	*0.82*		
EP	5	0.87	0.05	0.08	0.11	*0.93*	
CAL	6	0.56	0.27	0.20	0.29	0.04	*0.75*

[a]Italicized values on the diagonal are the square root of the AVE values. [b]Average variance extracted.

Table 4 Descriptive statistics and inter-correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. RC	5.96	0.61	1								
2. SOC	5.92	0.68	0.53**	1							
3. ECOL	5.50	1.14	0.40**	0.43**	1						
4. EP	5.48	1.52	0.23**	0.28**	0.33**	1					
5. CAL	5.50	0.92	0.52**	0.45**	0.54**	0.20**	1				
6. AGE	3.64	1.08	0.03	0.18*	0.05	0.03	-0.09	1			
7. SIZE	3.10	1.75	-0.03	0.15*	0.05	0.01	-0.02	0.38**	1		
8. IND	0.61	0.49	0.17*	-0.13*	-0.07	-0.02	-0.15*	0.20**	0.13*	1	
9. DOI	3.87	1.63	0.09	-0.01	-0.04	0.13*	0.04	-0.04	-0.01	-0.02	1

*p<0.05; **p<0.01

Table 5 Estimated results of the moderation model

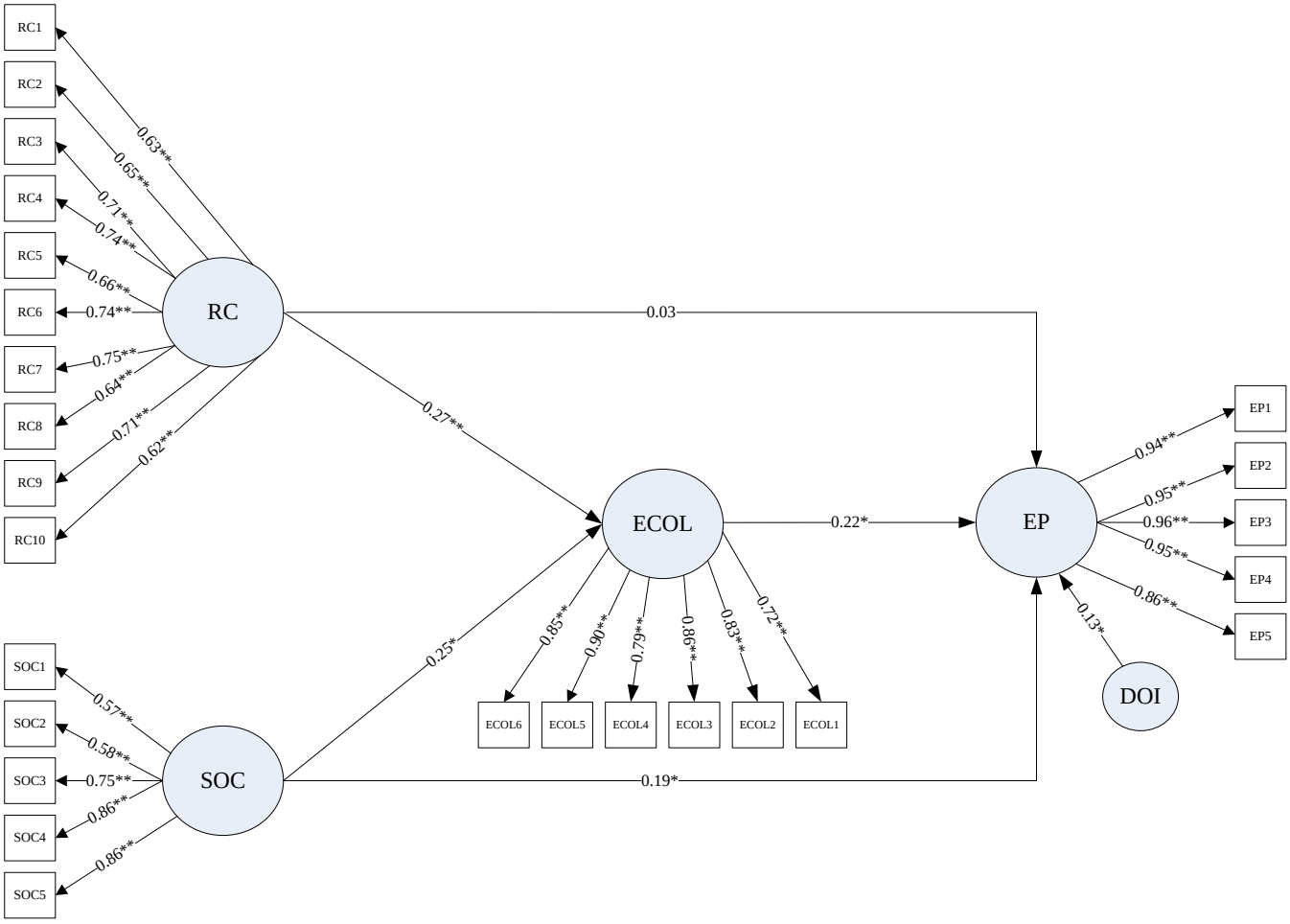
	Path from	Path to	Base model	Cross-functional alignment (CAL)	
				Low-CAL	High-CAL
Standardized regression weights	RC	ECOL	0.27**	0.14	0.21*
	SOC	ECOL	0.25**	0.17	0.16
	ECOL	EP	0.22**	0.14	0.28**
	RC	EP	0.03	0.04	- 0.03
	SOC	EP	0.19*	0.13	0.18*
Goodness of fit index		χ^2/d.f.	1.94	1.65	
		CFI	0.95	0.93	
		TLI	0.94	0.91	
		IFI	0.95	0.93	
		RMSEA	0.05	0.05	
Moderating effects	$\Delta\chi^2$ for hypothesized moderated paths		Overall	51.94**	
			RC–ECOL	31.94**	
			SOC–ECOL	13.80	
			ECOL–EP	25.85**	
			RC–ECOL–EP	45.19**	
			SOC–ECOL–EP	30.01**	

*p<0.05; **p<0.01, N=270.

Table 6 2SLS model for endogeneity

	Model 1 (OLS)	**Model 2 (2SLS)**
Variables	**RC**	**ECOL**
CAL	0.23*****	0.41*****
IND[a]	-0.06	
AGE[a]	0.05	
SIZE	-0.06	0.14
DOI[a]	-0.04	
IP[a]	0.25*****	
RC		0.72*****
R^2	0.39	0.28
F- value	27.55*****	Wald χ^2: 114.8*****

*****p<0.01, [a]Variables used as instruments for the assumed endogenous variable



***p<0.05; ****p<0.01.

Fig. 1. Estimated results of the mediation model