Global outsourcing, explorative innovation and firm financial performance: A knowledge-exchange based perspective

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A B S T R A C T

Global outsourcing can be an effective strategy to reduce costs and gain access to worldwide knowledge, however, research reports conflicting results regarding its performance effects. Building on knowledge and relational capital literatures, I submit that firms experience higher cognitive and normative barriers in knowledge exchange in global outsourcing, and this causes explorative innovation to negatively mediate the relationship between global outsourcing and firm financial performance. However, this negative mediation effect can be positively moderated by building relational capital with foreign suppliers. I test the theory using data from 223 manufacturing firms in the Netherlands, and find support for the hypotheses.

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1. Introduction

Global outsourcing is the practice of sourcing from independent suppliers in the global market for goods and services across geopolitical boundaries. As such global outsourcing is part of offshoring, which also includes captive modes of sourcing through the internal organization of the multinational enterprise. Some scholars observed some confusion in the literature regarding the use of these labels (e.g. Bunyaratavej, Hahn, & Doh, 2008; Mol, van Tulder, & Beije, 2005). However, the nature of outsourcing through the market can be fundamentally different from sourcing through internal organization (e.g. Buckley, 2011; Hennart, 2009; Kogut & Zander, 1993). In this study, we focus specifically on global outsourcing defined as the buying by one firm in one country from another independent firm in another country.

Global outsourcing is often considered a critical element of low-cost strategies (Petersen, Prayer, & Scannell, 2000), in gaining access to innovative high-tech inputs (Li, Liu, Li, & Wu, 2008; Linder, 2004), advanced services (Bunyaratavej, Hahn, & Doh, 2007; Kshetri, 2007), global human resources and talent (Lewin, Massini, & Peeters, 2009), and software applications (Verwaal, Commandeur, & Verbeke, 2008). Thus, global outsourcing may be

an effective strategy to reduce costs and gain access to worldwide knowledge (Di Gregorio, Musteen, & Thomas, 2009; Li et al., 2008).

However, research on the relationship between global outsourcing and firm performance is rare and reports conflicting results (e.g. Jiang, Belohlav, & Young, 2007; Lampel and Bhalla, 2011; Mol, van Tulder, & Beije, 2005). Jiang et al. (2007) estimate the impact of global outsourcing on the market value of Japanese firms. They estimated one model for domestic outsourcing and one model for global outsourcing. They find that global outsourcing has a positive and significant effect on market value, whereas domestic outsourcing has a negative effect. Mol et al. (2005) examined the impact of global outsourcing and firm performance measured as a composite measure of return on sales, return on assets, market share and sales growth relative to the largest competitors. They report that global outsourcing for both measures had no significant impact on firm financial performance. Lampel and Bhalla (2011) find that both benefits and risks increase when high value activities are outsourced, and suggest that the degree to which knowledge is codified and embedded in an activity or location constitutes a barrier to the effective global mobility of knowledge. Furthermore, an increasing number of studies report concerns with respect to global outsourcing on quality (Gray, Tomlin, & Roth, 2009; Steven, Dong, & Corsi, 2014), knowledge and intellectual property rights protection (Roy & Sivakumar, 2011), particularly for high-added value products and services (Lampel & Bhalla, 2011). However, few

studies investigated the role of innovation in the relationship between global outsourcing and firm financial performance.

Scholars have argued that companies' choices to engage in international business might positively impact their innovation (e.g. Sapienza, Autio, George, & Zahra, 2006; Siedschlag & Zhang, 2015). Innovation can be directed towards the *exploration* of new knowledge and skills or the *exploitation* of existing knowledge and skills (March, 1991). This distinction is important because explorative innovation depends on a higher level of social interaction (Mesquita, Anand, & Brush, 2008), rich (face-to-face) communication (Espinosa, Slaughter, Kraut, & Herbsleb, 2007; Jean, Sinkovics, & Hiebaum, 2014; Mom, van Neerijnen, Reinmoeller, & Verwaal, 2015), and it is more vulnerable to opportunistic behavior, particularly in the absence of proper institutions that protect knowledge and intellectual property rights (Jean et al., 2014). These conditions are often more difficult to realize in global outsourcing relationships. This raises concerns about the impact of global outsourcing on the explorative capacity of the outsourcing firm, and its capacity to generate financial rents from its knowledge assets (Buckley & Strange, 2011).

One conceivable way to improve the quality of social interaction and communication between buyers and suppliers is to build relational capital (Carmeli & Azeroual, 2009; Cousins, Handfield, Lawson, & Petersen, 2006; Kale, Singh, & Perlmutter, 2000). Relational capital refers to the quality of relationships in terms of the extent to which they are perceived to be close and trustful (Moran, 2005). Relational capital together with the structural configuration of relationships forms social capital (Adler & Kwon, 2002), however, recent studies indicate that relational capital plays a more important role in explorative innovation (Kijkuit & van den Ende, 2010; Mom et al., 2015), and it is closely intertwined with knowledge exchange (Mom et al., 2015). Relational capital with a supplier refers to the extent to which the buying firm operates within close and trustworthy supplier relationships (Cousins et al., 2006). Building relational capital with suppliers is often considered difficult because of differences in organizational cultures and practices (Dyer & Nobeoka, 2000), and building relational capital with foreign suppliers may be even more difficult as firms also need to exchange knowledge that is codified and embedded in a different business environment (Lampel & Bhalla, 2011). However, for firms that succeed to overcome these obstacles, relational capital may have the potential to make knowledge exchange available from a wide variety of suppliers in the global market place (Chang & Gotcher, 2007).

We aim to contribute to the literature on global outsourcing by exploring the role of relational capital in the relationship between global outsourcing, explorative innovation and firm financial performance. As firms differ in their exploration needs and capabilities, the relationship may have different forms for firms introducing explorative innovation to a greater extent. These various degrees of exploration may also lead to different levels of firm financial performance as organizations in global outsourcing relationships are more at vulnerable to the risks of bounded rationality and opportunistic behavior in knowledge exchange, which may dampen the financial returns for outsourcing firms. More precise understanding of this relationship is also important for international business strategies and government policies that underlie innovation policies and international trade agreements. Finally, we contribute to the insights on the relational capital and knowledge-based literatures (Dyer & Singh, 1998; Dyer & Nobeoka, 2000; Fransson, Håkanson, & Liesch, 2011; Håkanson, 2005; Kogut & Zander, 1993, 1996; Mom et al., 2015; Moran, 2005) by deepening our understanding of the effectiveness of relational capital in a global outsourcing context.

We organize the paper as follows. In the next section, I examine previous literature and develop the hypotheses, focusing on the nature of the relationships between global outsourcing, explorative innovation and the role of relational capital with foreign suppliers in the formation of firm performance. I empirically test the proposed theoretical relationships using survey and lagged performance data from manufacturing industries in the Netherlands, home to several innovative manufacturing industries. I present evidence that global outsourcing negatively impacts firm financial performance through reduced explorative innovation of the firm. The model estimates suggest that explorative innovation can be reduced by more than 12% at high levels of global outsourcing. However, I also find that relational capital with foreign suppliers can be an effective way to mitigate this negative effect. I conclude with a discussion of the results, limitations of the study and some managerial and policy implications.

2. Background and hypotheses development

Modern-day industries increasingly operate in global supply chains where firms outsource large parts of their value chain to suppliers across geopolitical borders (Baldwin, 2008; Ethiraj & Levinthal, 2004). Managing such global value chains raises many challenges including quality control (Gray et al., 2009; Steven et al., 2014), knowledge and intellectual property rights protection (Roy & Sivakumar, 2011), and complex coordination (Lampel & Bhalla, 2011). One way to reduce the complexity of these global supply chains is to apply modular production and design (Kedia & Mukherjee, 2009). Modularization of the supply chain reduces coordination costs and increases flexibility (Kedia & Mukherjee, 2009), and reduces the risks of knowledge leakage and violation of intellectual property rights (Henkel, Baldwin, & Shih, 2013; Tiwana, 2008). Thus, modularization may be a successful response to reduce complexity and increase the exploitation efficiency of the global supply chain.

However, reconfiguring or developing a new modular system is more difficult than a comparable interconnected supply chain (Baldwin & Clark, 1997; Ethiraj & Levinthal, 2004; Miozzo & Grimshaw, 2005). For example, design of a new modular system requires more knowledge of the overall process in order to make the modules function effectively as a whole. The module designers need to coordinate, communicate and specify these rules in advance. Problems in modular systems only tend to appear when the modules come together and prove to work poorly. Thus, the benefits of modular global supply chains come at a price as the reconfiguration and adaptation of modules need more advanced communication and coordination between the module partners (Liu, Feils, & Scholnick, 2011). Such advanced communication and coordination may be more difficult to realize if buyers and suppliers work at distant locations and exchange knowledge which is codified and embedded in different business environments (Lampel & Bhalla, 2011).

One perspective that explains the role of knowledge in international business theory is the knowledge-based view (Kogut & Zander, 1993, 1996, 2003). The knowledge-based view assumes that organizational members have a need for identity and social embeddedness and that organizations function as knowledge-based relational networks or epistemic communities in which organizational members acquire and synthesize knowledge and build new applications from recombination of those knowledge resources (Kogut & Zander, 1992). These epistemic communities are better able to handle the exchange of knowledge because their common norms, procedures and practices constrain the risks of bounded rationality and opportunism in knowledge exchange. However, at the same time organizational members can be members of multiple epistemic communities (Håkanson, 2010), such as professional epistemic communities which often operate across different countries (Fransson et al., 2011), and relational

networks between buyers and suppliers (Dyer & Nobeoka, 2000; Dyer & Singh, 1998). Such relational networks can be conceived as a third level of epistemic communities, which is specific for a partnership between one or multiple firms.

The global market offers much more variety in terms of supplier characteristics, however, García and Bounfour (2014) found that when outsourcing firms are confronted with such diversity, they are inclined to select suppliers with similar knowledge assets, leading to more homogeneous supplier networks. This finding is in line with findings from relational capital research at the individual level, which suggests that individuals that have access to a larger network tend to pre-select connections that are more identical in terms of social characteristics (Boase & Wellman, 2006). Firms that outsource to the global market may therefore search for supplier firms that are close to their own epistemic communities and therefore select suppliers with similar knowledge characteristics. Moreover, geographic distance in global supply chains reduces familiarity between the domestic buyer and foreign supplier firm (Espinosa et al., 2007), and leads to more informational uncertainty (Handley & Benton, 2013). Buyer and supplier in the same country may share common knowledge exchange and validation procedures (Lampel & Bhalla, 2011), and therefore they may be more willing to share information (Dyer & Nobeoka, 2000; Leonard-Barton & Sinha, 1993), assist in providing clarification (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004), and fill in the gaps when needed (Uzzi, 1997). Such common ground is conducive to the transfer of complex and fine-grained knowledge required for explorative innovation as it allows for greater clarification, control and motivation (Dhanaraj et al., 2004; Leonard-Barton & Sinha, 1993). Finally intellectual property right protection issues may reduce the willingness to exchange explorative knowledge between the buyer and the foreign supplier (Roy & Sivakumar, 2011).

Thus, global outsourcing is subject to higher risks in knowledge exchange compared to domestic outsourcing. These risks are particularly relevant for explorative innovation where the exchange of knowledge is more ambiguous and difficult to assess (Das & Teng, 2000). For modes of internal organization, the firm-specific epistemic community supported by hierarchy may mitigate the risks of bounded rationality and opportunistic behavior in explorative innovation (Kogut & Zander, 1993, 1996), however, this option is not applicable to global outsourcing.

Epistemic communities are highly effective to mitigate risks of knowledge exchange within their knowledge domain, however, they are ineffective to mitigate these risk with other knowledge domains. Members of different epistemic communities do not share the same cognitive frames and this may reduce the capacity of organizational members to recognizes the value of other epistemic communities in foreign supplier firms. Furthermore, epistemic communities also differ in expectations regarding norms of knowledge sharing and knowledge validation (Arena, Lazaric, & Lorenz, 2006). This raises the question. Why firms outsource globally if this reduces explorative innovation? The main advantage is that exploitative activities within similar epistemic communities provide substantial gains and relatively low risks. That this may be at the expense of the long-term explorative capacity of the organization may not be recognized by the members of the outsourcing firm. Even if the organizational members can overcome the barriers related to different cognitive frames, they also need to develop similar expectations regarding norms of knowledge sharing and validation (Arena et al., 2006).

Thus, the global market offers access to a more diverse pool of suppliers, however, that does not necessarily lead to access to a more diverse knowledge base. Geographic distance between buyers and suppliers and local embeddedness of knowledge may set further constraints on the quality and richness of communication and knowledge transfer, which is particularly important in the reconfiguration of modular global supply chains. Global outsourcing may therefore negatively impact the explorative innovation capacity of outsourcing firms, and subsequently firm financial performance as explorative innovation is an important driver of firm financial performance (Gunday, Ulusoy, Kilic, & Alpkan, 2011; Hashi & Stojčić, 2013; Lööf & Heshmati, 2006). Thus, we posit the following hypothesis:

Hypothesis 1. Explorative innovation negatively mediates the relationship between global outsourcing and firm financial performance.

Relational capital refers to the quality of relations rather than the structure of relations (Moran, 2005). There can be considerable variation in the relational capital that firms have with their suppliers. Relational capital with suppliers may allow firms to deploy selectively and properly interorganizational integration routines (Carmeli & Azeroual, 2009; Cousins et al., 2006; Kale et al., 2000). By building relational capital with foreign suppliers, firms can profit from foreign supplier investments in specific assets and the development of relationship-specific knowledge integration routines (Dyer, 1996; Lau et al., 2010). Thus, supplier relational capital can act like a third layer of a partner-specific epistemic community that mitigates the risks of bounded rationality and opportunism in buyer-supplier relationships (Dyer & Nobeoka, 2000; Dyer, 1996).

Supplier relationships based on trust and mutual understanding may increase the compatibility of knowledge practices, systems and routines between domestic buyer and foreign supplier firms (Chang & Rosenzweig, 2001; Gomez-Mejia & Palich, 1997; Verwaal & Donkers, 2002), and may enhance new product development performance in terms of cost, speed and quality (Lau et al., 2010; Van Echtelt, Wynstra, Van Weele, & Duysters, 2008). Building close and trustful relationships with foreign suppliers may be more difficult (Jiang et al., 2007), however, if a firm succeeds in building a partner-specific epistemic community with suppliers from a different business environment that may offer substantial positive contributions to the explorative innovation capabilities of the firm. Foreign suppliers may be more open to favoring solutions that are different from existing ones, and that may make them more open to develop and exchange novel, emerging and pioneering practices and technologies (Ahuja & Lampert, 2001). Trustful and close supplier relationships facilitate organizational learning and knowledge exchange routines and they improve mutual understanding and communication of buyers and suppliers with knowledge embedded in different business environments (Lampel & Bhalla, 2011). Finally, under conditions of trust and closeness, potential problems with knowledge protection and intellectual property rights (Jean et al., 2014) may be considered less problematic. Supplier relational capital may therefore substantially mitigate the negative effects of global outsourcing on explorative innovation and firm financial performance. Thus, we posit the following hypothesis:

Hypothesis 2. The negative mediation effect of explorative innovation between global outsourcing and firm financial performance is positively moderated by supplier relational capital.

Our conceptual model is summarized in Fig. 1. In Fig. 1, a_1 refers to the slope coefficient of the mediator explorative innovation (M) regressed on global outsourcing (X). The coefficients b_1 and c' represent the conditional effects of the dependent variable firm financial performance (Y) regressed on M and X. The total mediation effect as suggested by hypothesis 1 in this model is $a_1 b_1$. The variable supplier relational capital is the moderator (W)
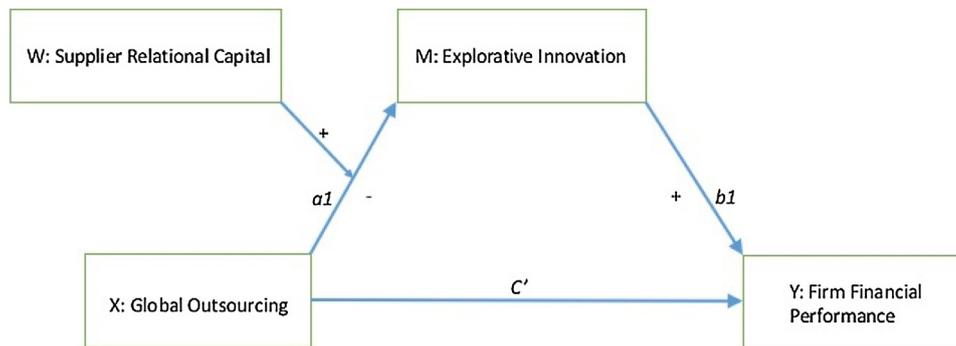
Fig. 1. Conceptual model.

in the model, which according to hypothesis 2 is theorised to moderate the a_1 path.

3. Methods

To test our hypotheses, we collected data from manufacturing industries in the Netherlands. Manufacturing firms in the Netherlands are operating in a highly dynamic, competitive and global environment. The manufacturing industry in the Netherlands is a suitable location for this study for several reasons. First, the manufacturing industry in the Netherlands is a significant sector that represents more than a quarter of added value produced in the Netherlands (CBS, 2015). Second, the Dutch economy is knowledge intensive and advanced technology and innovation are profoundly integrated (WEF, 2015). Third, the Dutch manufacturing industry is characterized by a high value-added and an above average productivity in R&D, expressed in the number of patents obtained (OECD, 2014).

The sample consists of 223 manufacturing firms active in 12 product categories in the manufacturing industry in the Netherlands. The questionnaire was adapted from existing validated scales, with the advice of a small group of senior innovation managers, R&D managers and members of the Board of Directors. Executives, senior innovation, marketing, sourcing and R&D managers and members of the Board of Directors of manufacturing companies with at least one production facility in the Netherlands were contacted and asked to complete an electronic survey. The sample is representative of the manufacturing industry in the Netherlands, however, firms with more that 100 employees are overrepresented in the sample whereas small firms of less than 10 employees are underrepresented. A possible explanation is that large firms have more advanced sourcing capabilities and that this explains why they are more interested in the topic of global outsourcing.

The data were gathered using a pre-tested web-mail survey. Companies were randomly selected using 'Reach', a database from Bureau van Dijk Electronic Publishing, which contains company accounts, ratios, ownership, contact details and management information for 400,000 Dutch companies. Invitations were sent to participate in the electronic survey to 1417 manufacturing companies by e-mail and sent reminders to participate after one week. After checking the e-mail addresses, I found that 158 e-mail addresses were invalid and in total, 1259 companies received an invitation to participate in the online survey. During the specified period, 236 respondents completed the survey, which indicates a response rate of 18.7%. At the same time, 268 companies (21.3%) replied by indicating that they did not want to participate in the survey. These companies were asked for what reason they did not want to participate. The most important reasons given were (1) lack of time; (2) not interested; (3) the right person was not

available. A total of 755 companies (60.0%) did not provide any response. Thirteen respondents (5.6%) were not able to provide information about the sourcing practices of their organizations, because they were not in the right position to answer this question. Because these questions are essential to the study, I decided to remove these responses from the dataset. The total number of responses (n) used in the analyses of this study is therefore 223. To address the possibility that response rates, global outsourcing activities and supplier relational capital might be related, I tested the non-response bias of the sample using the test of (Armstrong & Overton, 1977). The procedure assumes that late respondents are closer to non-respondents than early respondents. When I compared the difference between early and late respondents, I did not find significant differences with respect to global outsourcing and supplier relational capital.

3.1. Dependent and independent variables

3.1.1. Firm financial performance

Consistent with prior studies in management research, we rely on multiple measures of firm financial performance (Bingham, Eisenhardt, & Furr, 2007; Brush & Vanderwerf, 1992). I measured lagged firm financial performance as the return on assets, asset growth and sales growth of the respondent companies over 3 years (2011–2013). It is better to capture the long-term performance effects of innovation by using data over 3 years. To collect this data, I used publicly available financial reports that Dutch companies are legally required to submit annually to the Dutch Chamber of Commerce. I chose these financial figures because they provide a reliable measure of performance and this data was available across the entire sample. Finally, by using multiple sources for our model estimation potential problems with common method bias are reduced (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Using factor analysis, I combined the performance measures. This produced a single factor with an eigenvalue of 3.1. The sums of squared loadings extract 76% of total variance. I used regression as the method for estimating the factor score coefficients. The scores that are produced with this method have a mean of 0 and a variance that is equal to the squared multiple correlation between the estimated factor scores and the true factor values. Combining different measures of firm financial performance produces a more reliable measure (Bingham et al., 2007).

3.1.2. Global outsourcing

Global outsourcing is measured as the expenditure to foreign firms on assembling components, parts, finished products or services divided by the total value of goods and services purchased by the firm (cf. Mol et al., 2005). The electronic survey verified the cumulative total of all reported values from each respondent. I inspected the cumulative frequency chart of global outsourcing of

the respondents in the sample. The graph showed a well-balanced distribution of global outsourcing with outsourcing activities in a wide range of countries in Europe, Asia, Australia, Africa and the Americas.

3.1.3. Explorative innovation

Exploration is defined as creating new knowledge and business practices (cf. March, 1991). To determine explorative innovation, I used the validated measurement scale developed by (Jansen, Van Den Bosch, & Volberda, 2006). This scale measures the explorative dimension of innovation with 7 items (see Table 1).

3.1.4. Supplier relational capital

The supplier relational capital scale was based on the conceptualization of relational capital by (Moran, 2005). Corresponding to this conceptualization of relational capital and the empirical setting of the respondents, this scale assesses the extent to which the respondent perceives his relationships with foreign suppliers as close and trustful. I used 3 items for trust (see Table 1) adapted from Morgan and Hunt (1994) and 4 items for closeness (see Table 1) adapted from (Nielson, 1998). Supplier relational capital is a formative-reflective scale where the average of the 3 items for trust are added to the average of the 4 items of closeness (cf. Mom et al., 2015).

3.2. Control variables

Based on the literature and previous studies, I included several control variables, which are described below.

3.2.1. Firm size

I expect large organizations to outsource relatively more to foreign suppliers than small and medium-sized organizations. I measured firm size with a log-transformed scale of the number of employees working in the firm.

3.2.2. Strategic integration

Strategic integration is defined as the degree to which the outsourcing strategy of the firm is integrated into the overall corporate strategy. To measure the degree of strategic integration, I used the 5 'strategic purchasing' items (see Table 1) of Chen, Paulraj, & Lado (2004). A high level of strategic integration indicates that sourcing is advanced and well-integrated into the strategy of the firm. Integration of global sourcing strategy into the corporate strategy may positively affect the financial performance of the firm (Insinga & Werle, 2000; Trent & Monczka, 2005). Therefore, I included strategic integration in our analysis to control for the quality of the sourcing function.

3.2.3. Product categories

All manufacturing firms that participated in this study were classified into one of 12 different product categories that are manufactured by the firm, based on codes of the Chamber of Commerce in the Netherlands. I used product category as a control variable, as differences between the product categories may account for different levels of firm financial performance. I combined the product categories representing less than 10% of the observations and used this group as the base variable in our analysis.

3.2.4. Multinational

The following question was constructed to control for being multinational: 'Does your organization have foreign offices?'. The variable is measured as a dummy variable with the value 1 if the answer is yes and else is 0.

3.2.5. International experience

The following question was constructed for firms with foreign offices, to control for the number of production plants worldwide: 'In how many countries does your organization have production plants?'. The number of production plants was added as variable to control for the international experience of the outsourcing firm.

Table 1
Items, constructs and measurement model.

Constructs	Item correlation with total score
Supplier Relational Capital	0.74
Trust Cronbach α = 0.741) (Morgan and Hunt, 1994)	
We trust that the decisions of these manufacturers will be beneficial to our business.	0.86
When an agreement is made, we can always rely on the integrity of these manufacturers to fulfill all the requirements.	0.76
These suppliers give us reliable information and advice.	
Closeness Cronbach α = 0.783) (Nielson, 1998)	
We have spent a lot of time working with these suppliers	0.76
We have an extensive relationship with these suppliers	0.79
We have become accustomed to working with these suppliers	0.84
We have developed close working relationships with these manufacturers	0.78
Explorative Innovation (Cronbach α = 0.843) (Jansen et al., 2006)	
Accepting demands that go beyond our present product/service portfolio	0.54
Developing new products and/or services	0.77
Experimenting with new products and/or services in our local market	0.79
Introducing new products/services to the market that are new to our organization	0.76
Benefiting from new chances or possibilities in new markets	0.81
Using new distribution channels	0.67
Searching and approaching new customers in new markets	0.68
Strategic Integration (Cronbach α = 0.90) (adapted from Chen et al., 2004)	
Global sourcing is included in the firm's strategic planning process	0.80
The global sourcing function has a good knowledge of the firm's strategic goals	0.87
Global sourcing performance is measured in terms of its contributions to the firm's success	0.86
Global sourcing' professionals' development focuses on elements of the competitive strategy	0.81
Global sourcing plays an integrative role in the company	0.83

Table 2
Descriptive statistics (n = 223).

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1. Global outsourcing	44.63	31.13	1											
2. Explorative innovation	4.84	1.02	−0.07	1										
3. Supplier relational capital	4.89	0.84	−0.01	0.13	1									
4. Strategic integration	4.67	0.13	0.17*	0.30**	0.34**	0.1								
5. Firm size (Ln)	5.91	1.49	0.26**	−0.05	−0.04	−0.02	1							
6. Food	0.15	0.36	0.04	0.08	0.06	−0.06	0.18	1						
7. Metal	0.17	0.38	−0.24**	−0.13	−0.06	−0.06	−0.10	−0.15	1					
8. Machinery	0.11	0.32	0.10	0.03	−0.06	−0.11	−0.05	−0.13	−0.15*	1				
9. Electronics	0.11	0.32	−0.05	0.01	0.02	0.05	0.12	−0.03	−0.15*	−0.16*	1			
10. Plastics	0.11	0.31	−0.02	0.08	−0.03	0.07	−0.11	0.07	−0.15*	−0.16*	−0.12	1		
11. Multinational	0.65	0.48	0.38***	−0.03	0.01	−0.04	−0.03	−0.47***	0.04	−0.12	−0.11	−0.02	1	
12. International experience	2.58	6.29	0.26**	−0.07	−0.07	−0.04	0.37***	0.06	−0.10	−0.06	0.04	0.11	0.34***	1
13. Firm performance	0	1	−0.01	0.35**	0.27**	0.31**	0.14**	−0.14	0.10	−0.06	0.07	0.08	−0.04	0.10

Note: $^* = p < 0.05$; $^{**} = p < 0.01$; $^{***} = p < 0.001$.

The descriptive statistics of the variables can be found in Table 2.

3.3. Validation

I first analyzed the scale items using exploratory factor analysis to assess their uni-dimensionality and factor structure (DeVellis, 1991). Next, I assessed the reliabilities of the dimensions of each scale by means of the Cronbach alpha coefficient. The alphas are 0.741 (supplier relational capital trust, 3 items), 0.783 (supplier relational capital closeness, 4 items), and 0.843 (explorative innovation, 7 items). Furthermore, composite reliabilities are all above the commonly used threshold value of 0.70, and variance extracted measures exceed the threshold value of 0.50 (Hair, Black, Babin, Anderson, & Tatham, 2010).

I used confirmatory factor analysis with EQS 6.1 to assess the model fit of the measurement model. A satisfactory fit was achieved, $\chi^2 = 184$, df = 74, $p < 0.01$, CFI = 0.96, RSMEA = 0.05. The ratio of χ^2 to degrees of freedom is 2.48; a value less than 3.00 for the ratio indicates good model fit (Carmines & McIver, 1981). Furthermore, the root mean square estimated residual (RSMEA) of 0.05 indicates a good model fit because it does not exceed the critical value of 0.08 (Bentler & Bonett, 1980). I consider the measurement model acceptable, given the supportive indices. The results for our CFA test also indicate that the relationship between each indicator and its respective variable was statistically significant ($p < 0.001$). This supports the posited relationships among indicators and constructs, and thus, convergent validity. I further verified the discriminant validity of the scales by comparing the highest shared variance between any two constructs and the variance extracted from each of the constructs. Finally, the shared variance between two constructs was less than the variance extracted from each of the constructs, supporting the discriminant validity of the measurement model (Fornell & Larcker, 1981). Overall, the statistical indices indicate a high degree of confidence in the validity of the measures.

I tested the robustness and validity of our model specification in several ways. First, I tested for heteroscedasticity with the Breusch-Pagan and the White's tests and inspected the graph of the residuals to look for any patterns. All failed to reject the null hypothesis that the variance of the residuals is homogenous. Second, I inspected the normality of residuals with a kernel density plot, then looked at inter-quartile range and performed the Shapiro-Wilk W test for normality. All were indicating that the residuals are normally distributed. Further, I tested for multi-collinearity among independent variables by calculating variance inflation factors, all of which were well below 3.1 indicating multicollinearity was not a problem. Subsequently, I performed a model specification link test for single-equation models and also a regression specification error test for omitted variables. Results of both of these tests indicate that there may be no impact from omitted variables in our model. Overall, we can conclude that the model specification is robust and valid.

4. Results

To test the hypotheses, we perform statistical mediation and moderated mediation regression analysis. In my conceptual model

Table 3a
Moderated Mediation Regression Results.

Predictor	Mediator Variable Model					
	β	SE	t	p	LLCI (95%)	ULCI(95%)
Constant	4.9644	0.8358	5.9394	0.0000	3.3166	6.6122
Global outsourcing	−3.0774	1.3470	−2.2846	0.0233	−5.7329	−0.4218
Supplier relational capital	−0.1360	0.1427	−0.9534	0.3415	−0.4173	0.1452
Strategic integration	0.2515	0.0551	4.5601	0.0000	0.1428	0.3602
Firm size	−0.2104	0.2088	−1.0079	0.3147	−0.6220	0.2011
Food products	0.2631	0.2024	1.2996	0.1952	−0.1360	0.6621
Metal	−0.2956	0.1960	−1.5062	0.1330	−0.6821	0.0908
Machinery	0.2347	0.2256	1.0404	0.2994	−0.2100	0.6794
Electronics	−0.0186	0.2273	−0.0816	0.9350	−0.4667	0.4296
Plastics	0.4464	0.2284	1.9539	0.0521	−0.0040	0.8967
Multinational	−0.1153	0.1643	−0.7020	0.4835	−0.4392	0.2085
International experience	−0.0019	0.115	−0.1633	0.8705	−0.0246	0.0209
Global outsourcing * Supplier relational capital	0.5224	0.2642	1.9773	0.0493	0.0016	1.0432
$R^2 = 0.1658$	F = 3.4443	N = 222				

in Fig. 1, a_1 refers to the slope coefficient of explorative innovation regressed on global outsourcing, and b_1 refers to the slope coefficient of firm financial performance regressed on explorative innovation. The conditional effect of firm financial performance regressed on explorative innovation is denoted in the figure as c'. The mediation effect in the model is a_1b_1. The most well-known technique to test the significance of the mediation effect a_1b_1 is the Sobel test (Sobel, 1982, 1986). The Sobel test uses the ratio of a_1b_1 to its standard error as a test statistic for testing the null hypothesis that the true mediation effect is 0. To perform the analysis, I use the Process macro version 2.15 which is developed specifically for statistical mediation and moderated mediation regression analysis (Hayes, 2013). The size of the mediation effect a_1b_1 is −0.2574 and the standard error 0.1236. The Z-statistic is −2.0828 and the two-sided p-value is 0.0373, and therefore the mediation effect is significant at a 5% significance level (p < 0.05). The Sobel test assumes normality of the sampling distribution, however, the sampling distribution of mediation effects tends to be asymmetric (Bollen & Stine, 1990). Bootstrapping procedures have the advantage of relaxing the assumption of normality and simulation results have demonstrated that bootstrapping is a more valid and powerful method to test mediation effects (Williams & MacKinnon, 2008). I used the Process macro to estimate the 99% confidence interval of the mediation effect a_1b_1, using 5000 bootstrapping samples. I find that the 99% confidence interval of the mediation effect is expected to be between −0.7891 and −0.0046. Therefore, the null hypothesis that the mediation effect is zero is rejected at a 1% level of significance. Thus, both the Sobel test and the bootstrapping confidence interval support hypothesis 1, albeit at different levels of significance.

Moderated mediation as suggested by hypothesis 2, occurs when the strength of the mediation effect a_1b_1 linearly depends on the level of the moderating variable (Edwards & Lambert, 2007). In Tables 3a, 3b, 3c I present the results of the moderated mediation analyses. In Table 3a, I estimate the mediator variable model, which estimates the moderation effect of supplier relational capital on the mediator variable explorative innovation. Table 3a reveals that in line with expectations, global outsourcing has a substantial negative and significant effect on explorative innovation (β=-3.0774; p < 0.0233). Furthermore, the moderation effect of supplier relational capital on the impact of global outsourcing is positive and significant (β=0.5224; p < 0.0493). Model 3b indicates that the estimate of global outsourcing is not significant in relation to the dependent variable of the model firm financial performance, (β=-0.0965.; ns). This supports the idea that the effect of global outsourcing on firm financial performance is a mediation effect rather than a direct effect.

To explore how the moderator of our study (supplier relational capital) is related to the mediation effect of global outsourcing, I

calculated the conditional mediation effect of explorative innovation for the mean and ±1 SD of the moderator supplier relational capital. In Table 3c, I present the bootstrapping results of our analysis. The results show that the 99% confidence interval of the mediation effect is between −0.8421 and −0.0738. This indicates that at the level of −1SD of the moderator, the mediation effect is negative and significant (p < 0.01). For the mean value of supplier relational capital, the 99% confidence interval is still only in the negative area and therefore the mediation effect is also negative and significant (p < 0.01). However, at +1SD level of supplier relational capital the mediation effect approaches zero and is insignificant. This suggests that at high levels of supplier relational capital, the negative impact of global outsourcing on firm financial performance is unimportant. Evidence of moderated mediation exists if a conditional mediation effect is significantly different from zero at some value(s) of the moderator but not at other values (Preacher, Rucker, & Hayes, 2007). Notably, the results indicate that supplier relational capital has the capacity to mitigate and potentially even neutralize the negative mediation effect of global outsourcing at high levels of supplier relational capital.

To formally test the moderated mediation effect as hypothesized by hypothesis 2, I calculated the Index of moderated mediation (Hayes, 2015). The interval estimate of the index of moderated mediation tests if the mediation effect is linearly moderated by the moderator. As shown in Table 3c, the index of moderated mediation is 0.1676 and the 95% confidence interval of the index based on 5000 bootstrapping samples is between 0.0049 and .0.3843. The 99% confidence interval contains 0. I therefore conclude that hypothesis 2 is supported at a 5% significance level.

To ease interpretation of the results, I plotted in Fig. 2 the effect of global outsourcing on explorative innovation for low medium and high levels of supplier relational capital. At low levels of supplier relational capital, global outsourcing shows a strong negative effect on explorative innovation of more than 12%. However, at a high level of supplier relational capital the line that reflects the impact of global outsourcing on explorative innovation is almost horizontal and not significant. Fig. 2 demonstrates the capacity of supplier relational capital to mitigate and potentially neutralize the negative effects of global outsourcing for the explorative innovation activities of the outsourcing firm.

5. Discussion

Previous studies suggested that global outsourcing may be an effective strategy to reduce costs and gain access to worldwide knowledge (e.g. Di Gregorio, Musteen, & Thomas, 2009; Li et al., 2008), however, the extant literature reported conflicting findings on the relationship between global outsourcing and firm financial performance (e.g. Jiang, Belohlav, & Young, 2007; Lampel & Bhalla,

Table 3b
Dependent Variable Model.

Predictor	β	SE	t	p	LLCI (95%)	ULCI (95%)
Constant	1.4722	.5618	2.6204	0.0094	−0.3646	2.5797
Explorative innovation	0.3209	0.0653	4.9163	0.0000	0.1922	0.4496
Global outsourcing	−0.0965	0.2285	−0.4225	0.6731	−0.5469	0.3539
Strategic integration	0.1889	0.0529	3.5675	0.0004	0.0845	0.2933
Firm size	0.4715	0.1994	2.3647	0.0190	0.0784	0.8645
Food products	−0.4663	0.1928	−2.4192	0.0164	−0.8464	−0.0863
Metal	0.4437	0.1875	2.3658	0.0189	0.0740	0.8134
Machinery	−0.0385	0.2139	−0.1800	0.8573	−0.4602	0.3832
Electronic products	0.2598	0.2166	1.1997	0.2316	−0.1671	0.6867
Plastics	0.2655	0.2177	1.2195	0.2240	−0.1637	0.6947
Multinational	0.0774	0.1565	0.4943	0.6216	−0.2312	0.3859
International experience	0.0171	0.0110	1.5585	0.1206	−0.0045	0.0387
R^2 = 0.2650	F = 6.8498	N = 222				

Table 3c
Conditional mediation effects and the index of moderated mediation.

Moderator Supplier relational capital	Effect (a1b1)	Boot SE	LLCI (95%)	ULCI (95%)	LLCI (99%)	ULCI (99%)
4.0730 (−1SD)	−0.3048	0.1429	−0.6511	−0.0730	−0.8421	−0.0738
4.9000 (Mean)	−0.1661	0.0898	−0.3783	−0.0217	−0.4907	−0.0192
5.7270 (+1SD)	−0.0275	0.0912	−0.2194	0.1432	−0.2708	0.2644
Index of moderated mediation	0.1676	0.0961	0.0049	0.3843	−0.0543	0.4585
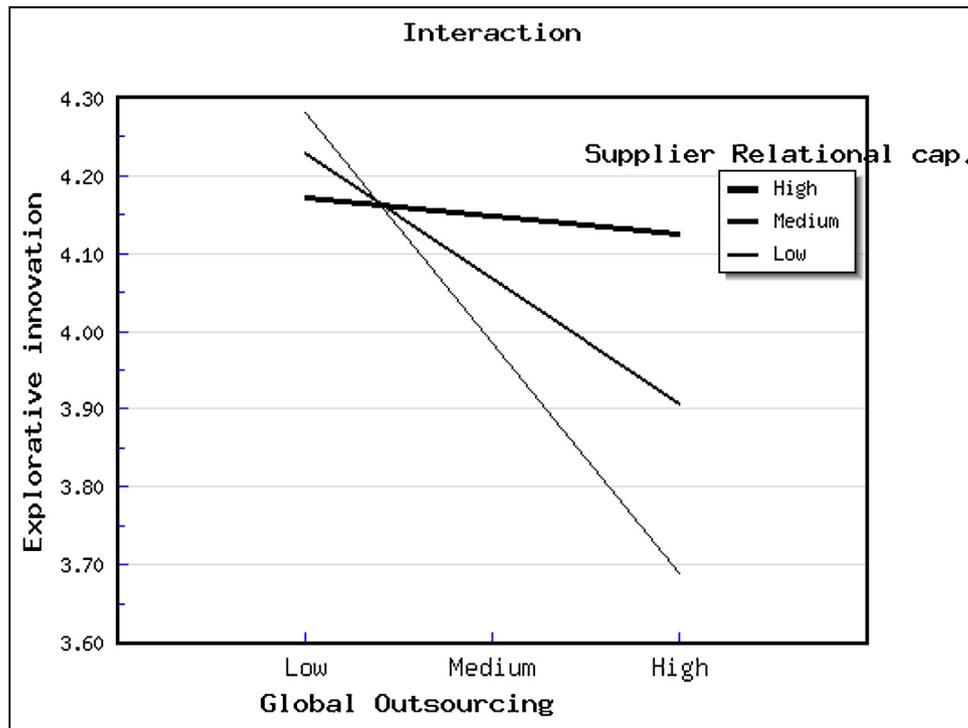
Fig. 2. Moderating effect of supplier relational capital.

2011; Mol et al., 2005). The results of this study reveal that global outsourcing can have a negative impact on firm financial performance through depressing the explorative innovation of the outsourcing firm. Prior research on global outsourcing did not fully acknowledge this potential negative effect of global outsourcing on explorative innovation and firm financial performance. This study is the first to present evidence that outsourcing across geopolitical boundaries may constrain the capacity of firms to realize their explorative innovation potential.

Previous studies suggested that relational capital with suppliers may enhance innovation of outsourcing firms (Lau et al., 2010; Van Echtelt et al., 2008). In this study, I argue that supplier relational capital can be effective in supporting global outsourcing activities. I assessed if supplier relational capital is capable to mitigate this negative mediation effect of explorative innovation in the relationship between global outsourcing and firm financial performance. The evidence presented in this study suggest that supplier relational capital is capable to mitigate and at high levels may even neutralize the negative effect of global outsourcing on firm financial performance. However, I did do not find any indication that this negative mediation effect would be reversed into a positive mediation effect.

This study shows that firms may need to develop supplier relational capital in order to effectively exchange knowledge in global outsourcing relationships. However, this may also apply to global sourcing within a multinational enterprise. As

demonstrated by recent research of Monteiro (2015), headquarters of multinational firms also often fail to appreciate sufficiently the value of novel knowledge in foreign subsidiaries and tend to favor exploitation rather than explorative innovation. Hierarchical relations alone may be insufficient to integrate knowledge across the boundaries of epistemic communities. Multinationals may need to augment these hierarchical relations with subsidiary relational capital in order to successfully integrate knowledge from different regional epistemic communities within the multinational enterprise.

5.1. Limitations and future research

While the present study is a large-scale empirical study, there are a number of limitations and issues that need to be taken into account when interpreting the results. First, the sample of this study was limited to larger firms with manufacturing activities in the Netherlands. Future research may explore boundaries of the theory with different sample selection, focus also on the context of smaller and service firms and thereby augment to the external validity of the results. The quality of the intellectual property right protection in the country of the supplier may also influence the exchange of technology and knowledge to the foreign supplier firm (Lhuillery & Pfister, 2009). The context of global outsourcing for highly developed innovative service industries may also be

different from a context of suppliers in manufacturing and this may change the proposed relationships in the model.

Second, other variables may have affected the relationships reported in this study. The quality of the capability of firms outsourcing globally may be higher, and, hence these firms may produce higher performance. This may cause selection bias in the sample of this study which may influence the results. In the present study, I controlled for the quality of the sourcing capability with the variable "strategic integration". This variable measures how advanced and well-integrated the sourcing capability is within a firm. Including this variable mitigates the risks of selection bias in our study. Although I included relevant control variables and tested several variables for omitted variable specification bias, further extension and specification of this model may allow a more precise estimation of the relationships under examination.

Finally, the study does not address longitudinal effects in global outsourcing strategies beyond the 3-year time lag used in this study. For example, firm financial performance effects of supplier relational capital may take considerably more time than the 3 years. Of particular concern is that in order to neutralize the negative effect of global outsourcing on explorative innovation and firm financial performance, the outsourcing firm needs to develop high levels of supplier relational capital. Previous research suggests that such high levels of relational capital may also be subject to higher risks of opportunistic behavior (Anderson & Jap, 2005). This phenomenon is referred to as the dark-side of relational capital in buyer-supplier relationships (Anderson & Jap, 2005). Even in the absence of opportunism, local suppliers may develop location-specific epistemic communities which are detached from the center as they align their preferences with a different business environment than the outsourcing firm. Thus, supplier relational capital may be a remedy to enhance explorative innovation and firm financial performance in global outsourcing relationships, however, we know very little of the long-term potential negative side effects (Jensen, 2012). Future research could therefore extend our framework by exploring the notion of location-specific epistemic communities and its impact on explorative innovation and firm financial performance beyond the 3 years' time frame of this study.

Future research may also develop more insights into the different roles of epistemic communities in the context of global outsourcing (Fransson et al., 2011; Håkanson, 2005). Building supplier relational capital across regional epistemic communities may give access to resources of firms that are different from the outsourcing firm. For example, building relational capital with an intermediaries or multinational companies operating in different industries and different countries may open access to a variety of knowledge from different industries, technologies and markets. Clearly, such bridging connections could be highly relevant for explorative innovation activities, however, in the absence of bonding such indirect ties may still be ineffective in opening the potential for explorative innovation. Outsourcing firms may also be able to develop supplier selection routines that improve the balance between exploitation and exploration in global outsourcing relationships, and for example include diversity of knowledge of the foreign supplier in the pre-selection criteria. Future research could further develop and empirically test the benefits of such balancing routines in global outsourcing relationships.

5.2. Managerial and policy implications

For managers responsible for global outsourcing this study has several implications. First of all, managers need to be aware of the possible risks that global outsourcing entails for the long term explorative capacity and financial performance of the firm. Fig. 2 shows that without a relational capital response strategy, the explorative innovation of the firm can be reduced with more than 12%. This is a substantial effect that could undermine the future innovation capacity of the firm. Secondly, managers need to assess if high levels of relational capital can be developed with the foreign supplier. Developing relational capital is not a one-sided process. So managers need to make a careful evaluation of the foreign supplier' willingness and capacity to develop relational capital with the buyer. Furthermore, even if such assessment is positive, managers need to assess what could be the risks of the "dark side" of high relational capital in specific global outsourcing relationships (Anderson & Jap, 2005).

To some extent firms may not have a choice than to engage in global outsourcing as intense market competition may simply require firms to realize the cost reductions offered by global markets in order to survive. The public debate on global outsourcing up to now was mainly focused on the loss of jobs and income in the home country. However, for government policies it is important to recognize the potential weakening effect on the explorative innovative capacity of the industry in the home country. To mitigate these negative effects, governments may need to consider more active trade facilitating policies such as supporting R&D, training and education in knowledge areas that are weakened by global outsourcing so they remain competitive and available in the home country. From this study, I conclude that a policy focus on only employment and income effects of global outsourcing is insufficient for an effective long-term international trade policy.

6. Conclusion

In this study, I explored the effect of global outsourcing on explorative innovation and the role of relational capital with foreign suppliers as a critical inter-organizational capability. The findings show that global outsourcing can depress explorative innovation and financial performance of the outsourcing firm, and that relational capital could play an important role in opening-up the potential of global outsourcing in global markets of creative knowledge and new ideas necessary for explorative innovation. Given that trade barriers and tariffs continue to be an important debate in the context of new trade agreements such as the TTIP (Transatlantic Trade and Investment Partnership) and TPP (Trans-Pacific Trade Partnership), research that aims to understand how global outsourcing will influence the innovation and performance of firms is an increasingly relevant and promising research agenda.

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