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The effect of supplier development on outsourcing performance: the mediating roles of opportunism and flexibility

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ABSTRACT

In this increasingly competitive business environment, firms utilise outsourcing as a strategic tool to leverage globally dispersed resources so that they may focus on their core competencies and improve efficiency. The more firms rely on outsourcing, the more they depend on their suppliers, and the more important it is to manage and develop suppliers in order to achieve and maximise the benefits of outsourcing. This paper explores the impact of supplier development on outsourcing performance. Structural equation modelling was used to analyse data collected from 213 manufacturing firms in China. The results indicate that supplier development has a strong direct positive impact on outsourcing performance, and that supplier development also leads to enhanced outsourcing performance through reducing outsourcing opportunism risk and improving outsourcing flexibility. In addition to making a contribution to current theories of outsourcing, our findings also provide outsourcing managers with practical understanding and insights about the role of supplier development in enhancing outsourcing performance.

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opportunism risk;
outsourcing flexibility;
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1. Introduction

As the business environment has grown increasingly competitive, there has been an increasing need for firms to outsource non-core products or activities, and to allocate most of their resources and capabilities to their core competencies (Lankford and Parsa 1999; Westphal and Sohal 2013). The primary focus of the early period of outsourcing was to achieve cost reduction goals by taking advantage of cost arbitrage in the global market. This cost arbitrage outsourcing model was prevalent until the end of the 1980s (Hatonen and Eriksson 2009). Beginning in the 1990s, firms increasingly have implemented outsourcing not only as a cost reduction tool, but also as a strategic initiative for accessing core capabilities from the external market (Quinn 2000; Hatonen and Eriksson 2009; Kang et al. 2012). This, in turn, has made firms more dependent on the knowledge and skill of their key suppliers. In our field interview one manager from Samsung electronics operating in Tianjin mentioned: ‘We outsource some of the parts to Chinese manufacturers. At the beginning, those manufacturers’ capabilities couldn’t meet our requirements, and we had to help them to improve their knowledge and skills so that we could achieve our outsourcing purpose.’ The level of suppliers’ capabilities can directly or indirectly impact cost, quality, delivery and technology innovation (Krause and Scannell 2002). Therefore, firms are beginning to give greater attention to supplier development, which aims to continually enhance suppliers’ capability to better serve buying firms’ long-term needs (Krause and Ellram 1997; Krause and Scannell 2002; Liao, Hong, and Rao 2010).

The topic of supplier development has received much research attention during the past few decades (Hahn, Watts, and Kim 1990; Krause, Handfield, and Scannell 1998; Krause, Handfield, and Tyler 2007; Humphreys et al. 2011; Sancha, Longoni, and Gimenez 2015). Previous studies have focused mainly on the drivers of outsourcing, outsourcing processes, supplier selection and evaluation, and outsourcing performance (Jiang and Qureshi 2006; Hatonen and Eriksson 2009). The specific role of supplier development and how it works to improve outsourcing performance in the China context have not yet received as much research attention.

Over the past 30 years, China has experienced dramatic economic growth and has become a manufacturing powerhouse and one of the most attractive outsourcing destinations in the global economy (Wu, Wu, and Zhou 2012). Yet China also has unique characteristics that need to be understood in order to achieve the goal of successful outsourcing. First of all, China is experiencing a transition period in which opportunities and opportunism coexist (Kang et al. 2012). Firms may have higher motivation to behave opportunistically when lots of opportunities are present. Supplier opportunism is recognised as a major type of risk in the buyer–supplier relationship. It has negative impacts on the buyer–supplier relationship and on the focal firm’s performance, and can cause supply chain inefficiency and production disruption (Das 2004; Morgan, Kaleka, and Gooner 2007; Handley and Benton 2012). The fear of opportunism by potential partners may even cause supply chain alliances to fail (McCarter and Northcraft 2007). Thus, it is important to examine the role of opportunism risk in outsourcing and how supplier development

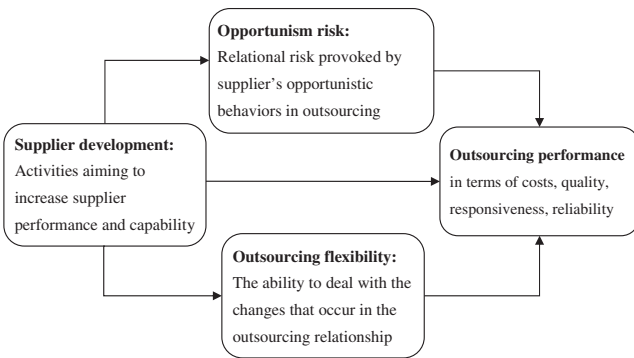


Figure 1. Potential theoretical framework.

can help to mitigate suppliers' opportunistic behaviour. Second, China is regarded as a relational society, where personal relationships or connections have a large influence on both social and business norms (Wiegel and Bamford 2014). In times of crisis, Chinese firms show special favour to firms with which they have good relationships (Chen, Chen, and Xin 2004). Supplier development, which is believed to improve supplier satisfaction and commitment (Ghijsen, Semeijn, and Ernstson 2010), should help to improve the buyer–supplier relationship and facilitate more flexibility, which in turn leads to better outsourcing performance. This relationship has not yet been explored in the literature. In response to the above research gaps, the purpose of this study is to investigate the specific role of supplier development in achieving desired outsourcing performance, and the mediating roles of opportunism risk and outsourcing flexibility.

Figure 1 presents a conceptual research model that illustrates proposed relationships between supplier development, outsourcing risk, outsourcing flexibility and outsourcing performance. Leaving aside all the benefits outsourcing can bring to firms such as cost reduction, focus on core competence and access to more resources (Kang et al. 2012), outsourcing is also accompanied by opportunism risk, which may cause the outsourcing activity to fail to meet firms' expectations or even bring losses and other challenges to the firm. In addition, the dynamic business environment, which is full of uncertainty and changes, requires outsourcing arrangements to be flexible in order to deal with unexpected situations (Colicchia, Dallari, and Melacini 2010; Liao, Hong, and Rao 2010). Thus, outsourcing opportunism risk and outsourcing flexibility are two critical issues that outsourcing firms need to keep in mind as they adopt outsourcing as a strategic tool to gain or maintain their competitive capabilities. Drawing upon empirical evidence combined with literature review, this study explores the important role of supplier development in reducing outsourcing opportunism risk and enhancing outsourcing flexibility in order to achieve desired outsourcing performance. The study focuses on outsourcing practices of manufacturing companies in China and provides practical insights into effective outsourcing practices.

2. Theoretical background and hypothesis development

2.1. Supplier development and outsourcing performance

As the business environment becomes increasingly competitive, firms rely more on their outsourcing suppliers to deliver

the products or services they need. However, each firm has their own way of doing things, and outsourcing suppliers often do not satisfy all the requirements of the buying firms (Krause and Ellram 1997). In the case of unsatisfying suppliers, buying firms can either switch to new suppliers or develop the current suppliers to grow in their capabilities to achieve satisfaction. Switching suppliers requires buying firms to start all over again with supplier selection, which is based on the availability of an alternative supplier in the market, and supplier evaluation. Both are time and resource consuming, yet satisfaction is still not guaranteed (Ghijsen, Semeijn, and Ernstson 2010). Supplier development is also not cost-free, but it can lead to the supplier's continuous improvement and a long-term buyer–supplier relationship, which is beneficial to both buying firms and suppliers, and potentially even to the whole industry (Krause and Ellram 1997).

The concept of supplier development was first proposed by Hahn, Watts, and Kim (1990). It can be defined as buying firms' activities aimed at increasing supplier performance and capability to better serve the buying firms' long-term needs (Hahn, Watts, and Kim 1990; Krause and Ellram 1997; Krause and Scannell 2002; Liao, Hong, and Rao 2010). Supplier development has become an important supply chain management practice across industries as firms continue to outsource non-core activities and accumulate capabilities related to their core competencies (Krause and Scannell 2002). Several empirical studies have suggested that supplier development can be effective in solving problems related to supplier performance and improving buying firm's operational performance (Krause, Handfield, and Scannell 1998; Lu, Lee, and Cheng 2012). Practices employed in supplier development include, but are not limited to: education and training for supplier personnel, supplier performance assessment, supplier recognition, supplier incentives, competitive pressure, direct involvement in improving performance (such as new product development) and placement of engineering and other buyer personnel at the suppliers' premises and direct financial investment by buying firms in the suppliers' capabilities (Krause and Ellram 1997; Krause and Scannell 2002; Krause, Handfield, and Tyler 2007).

When buying firms adopt supplier development as one of their outsourcing strategies, the goal is to continuously improve the supplier's performance and capability to meet the buying firms' requirements, which can be measured in terms of cost, quality, responsiveness or flexibility, and reliability (Prahinski and Benton 2004; Handley and Benton 2009). In this paper, we define outsourcing performance as the degree to which the outsourcing has met or exceeded the buying firm's expectations for total annual costs, quality performance, responsiveness, and reliability.

Nagati and Rebolledo (2013) conducted a literature review on supplier development, and found that among the 18 selected papers, more than half reached the conclusion that supplier development leads to improved performance of buying firms or suppliers. Supplier development requires buying firms to expend significant time, human and financial resources. Thus, firms aiming to develop their suppliers typically plan to leverage their resource investment by building and maintaining long-term relationships with their suppliers so that the suppliers may be able to satisfy their outsourcing goals, and the outsourcing process may enable the firm to gain competitive advantage in the long term. Through the supplier development process, buying firms also build trust relationships with their suppliers, which enables

efficient collaboration and thus improves outsourcing performance. So we posit:

Hypothesis 1. Supplier development is positively related to outsourcing performance.

2.2. Supplier development and outsourcing opportunism risk

Despite all the benefits outsourcing can bring to firms, such as cost reduction, focus on core competence, and access to more resources (Kang et al. 2012), outsourcing also comes with inherent risk which may cause the outsourcing to fail to meet the buying firms' expectations or even bring losses and other challenges. Outsourcing risk refers to the outcome variation or potential loss in the process of outsourcing a product or service from an outside entity (Das and Teng 2001b; Kam, Chen, and Wilding 2011; Kang, Wu, and Park 2012; Lee, Yeung, and Hong 2012). While there are many reasons that may cause different types of outsourcing risk, this study focuses on outsourcing opportunism risk that has great impact on buyer-supplier relationship performance especially in the transient economies such as China (Lai, Tian, and Huo 2011).

Opportunism is a central concept in the transaction cost theory. It refers to 'a variety of self-interest seeking but extends simple self-interest seeking to include self-interest seeking with guilt' (Williamson 1979). This paper defines outsourcing opportunism risks as the outsourcing outcome variation that buying firms may encounter in their outsourcing practices when suppliers choose not to behave according to the agreements.

There are multiple reasons behind suppliers' opportunistic behaviour. Suppliers may behave opportunistically for the purpose of maximising their own benefits when there are conflicts between the interest of buying firms and the interest of the suppliers. It could happen when the suppliers perceive a lack of monitoring mechanisms in the outsourcing process. Also sometimes suppliers would even take the risk of going against an agreement when they see that the benefits of the opportunistic behaviour are higher than the cost they may have to pay for breaking the agreement. This opportunistic behaviour is predicted in transaction cost theory (Williamson 1979). Supplier development pushes buying firms and their suppliers to form a long-term relationship, which incentivises both parties to be long-term oriented, and reduces the suppliers' incentive to act opportunistically. In other words, supplier development increases the suppliers' cost of behaving opportunistically. If the suppliers choose to violate the agreement, they are taking the risk of sacrificing long-term benefits, which could be much greater than the benefit they may receive through not behaving properly in the short run. As a result, suppliers' opportunistic behaviour is discouraged, and outsourcing opportunism risk is reduced. So, we posit:

Hypothesis 2. Supplier development is negatively related to outsourcing opportunism risk.

2.3. Outsourcing opportunism risk and outsourcing performance

Outsourcing opportunism risk refers to the likelihood of suppliers' opportunistic behaviour intended to maximise

suppliers' benefits in the outsourcing process (Das and Teng 2001b; Lehtiranta 2011). Suppliers may not exactly follow buyer's requirements or fully fulfil the terms of a signed contract with respect to product or service quality specifications, work procedures, delivery requirements, or other agreements. Suppliers may also take advantage of any loopholes that exist in the contract. Suppliers' opportunistic behaviour increases the possibility that buying firms will be dissatisfied with the outcomes of the outsourcing arrangement (Lai, Tian, and Huo 2011), whether it be economic performance or strategic performance. Suppliers' opportunistic behaviour also harms the long-term cooperative relationship between buying firms and their suppliers. So, we posit:

Hypothesis 3. Outsourcing opportunism risk is negatively related to outsourcing performance.

'Mediation exists when a predictor affects a dependent variable indirectly through at least one intervening variable, or mediator' (Preacher and Hayes 2008). The impacts of supplier development on outsourcing performance can be direct or indirect (Krause and Scannell 2002; Modi and Mabert 2007; Kaufmann, Carter, and Buhmann 2012; Nagati and Rebolledo 2013). The indirect impact of supplier development on outsourcing performance can occur either through an increase in the supplier's ability to meet the buying firm's needs, or through reduction of negative factors that jeopardise outsourcing performance. While we expect supplier development to positively impact outsourcing performance as hypothesised in Hypothesis 1, part of the benefits of supplier development are realised through reduction in outsourcing opportunism risk. Suppliers' opportunistic behaviours might hurt focal firms' performance and can cause inefficiency and production disruptions (Das 2004; Morgan, Kaleka, and Gooner 2007; Handley and Benton 2012). Supplier development, however, mitigates this negative factor by reducing a supplier's incentive to behave opportunistically. Therefore, supplier development indirectly impacts outsourcing performance by mitigating outsourcing opportunism risk. Taking Hypothesis 2 and Hypothesis 3 together, we posit:

Hypothesis 4. Outsourcing opportunism risk partially mediates the effect of supplier development on outsourcing performance.

2.4. Supplier development and outsourcing flexibility

The business environment is full of uncertainty due to the numerous factors involved in the business process. Often, things do not happen as planned, so flexibility is needed to deal with the unexpected. Flexibility as an important concept has been studied from the perspective of different academic disciplines ranging from manufacturing and strategy to information systems (Tan and Sia 2006). It is defined as the extent of ability to respond and adapt to changes or uncertainties in the environment (Liao, Hong, and Rao 2010). When an unexpected situation happens, firms need to be able to adjust their strategies and practices to overcome the disruption before it leads to a business failure. One of the main reasons firms adopt outsourcing is to enhance their flexibility (Lau and Zhang 2006). Nevertheless, because outsourcing is a long and dynamic process that involves multiple parties and encompasses different tasks, firms inevitably face many uncertainties and changes related to the

outsourcing itself. Because of this, flexibility is potentially an important antecedent to effective outsourcing practices. Tan and Sia (2006) define outsourcing flexibility as 'the ability of an outsourcing relationship to change the extent, nature, or scope of business services delivered', and build upon Bahrami and Evans (2005) to conceptualise four dimensions of outsourcing flexibility as robustness, modifiability, new capability and ease of exit. According to Tan and Sia (2006) and Sia, Koh, and Tan (2008), robustness is the variability of service capacity. It refers to the ability to endure external changes in the outsourcing process by having internal capacity to address uncertainty for varying levels of demand, product mix, and resource availability. Modifiability is the alternation of service attributes. It refers to the ability to make modifications when unexpected situations happen. New capability refers to the ability to be innovative when radical changes occur in the environment that existing practices cannot cope with. Lastly, ease of exit refers to the ability to end the current outsourcing relationship when it cannot meet the buying firms' outsourcing goal, and switch to another supplier that can better serve the outsourcing purpose. This paper builds upon the previous literature to define outsourcing flexibility as the ability to respond and deal with the changes that occur in the outsourcing relationship or outsourcing environment (Tan and Sia 2006; Sia, Koh, and Tan 2008; Liao, Hong, and Rao 2010), including service volume variation, process exceptions, new opportunities, transactional variations and the like.

Suppliers directly impact the flexibility of buying firms (Krause and Scannell 2002). Supplier development helps increase suppliers' capability to better meet buying firms' needs, thus enhancing the overall flexibility of the outsourcing practice. Firms with supplier development as their supplier management strategy aim to maintain and develop long-term collaborative relationship with their suppliers. They see suppliers as an important part of their strategic capability, and involve their suppliers in their long-term strategic plans. The collaborative relationship between buying firms and their suppliers enables both parties to communicate with each other better to cope with the changes they encounter in the outsourcing practice, thus enhancing the outsourcing flexibility (Koufteros, Edwin Cheng, and Lai 2007; Wee, Peng, and Wee 2010). At the same time, flexibility is also one of the criteria buying firms consider when selecting their suppliers (Kannan and Tan 2002; Chen, Lin, and Huang 2006). When firms adopt supplier development as their strategic supplier management goal, they would comprehensively evaluate their supplier candidates on different criteria, including their flexibility in dealing with possible changes in the outsourcing process. So we posit:

Hypothesis 5. Supplier development is positively related to outsourcing flexibility.

2.5. Outsourcing flexibility and outsourcing performance

Firms' capability to learn and adapt to changes in the outsourcing process is important to firms' outsourcing performance (Choy and Lee 2003). The literature shows evidence for a positive relationship between flexibility and firm performance (Anand and Ward 2004; Merschmann and Thonemann 2011; Blome, Schoenherr, and Eckstein 2014). Sia, Koh, and Tan (2008) provide empirical support for Tan and Sia (2006)'s propositions on the

effects of the four dimensions of flexibility on outsourcing performance. Outsourcing performance is evaluated from aspects such as cost, quality, responsiveness and reliability. We predict that suppliers' flexibility in dealing with the changes and new needs in the market and creativeness in solving unexpected problems will lead to improved outsourcing performance in terms of cost, quality, responsiveness and reliability. So, we posit:

Hypothesis 6. Outsourcing flexibility is positively related to outsourcing performance.

In addition to its direct impact on outsourcing performance, outsourcing flexibility also serves as a partial mediator between supplier development and outsourcing performance. This mediation relationship is in accordance with the resources–capabilities–performance relationship (Menor, Kristal, and Rosenzweig 2007; Kristal, Huang, and Roth 2010), which suggests that the benefit of resources is realised in the form of competitive capabilities (Roth 1996). We argue that the benefit of supplier development on outsourcing performance can be realised in the form of outsourcing flexibility. Supplier development enables suppliers to better understand and serve the needs of buying firms, thus improving the buying firms' ability to respond quickly to changes in the market. This, in turn, helps the buying firms to achieve higher outsourcing performance in terms of cost, quality, responsiveness, and reliability. Therefore, supplier development can directly lead to higher outsourcing performance, and it can also indirectly impact focal firms' outsourcing performance through outsourcing flexibility. Taking Hypothesis 5 and Hypothesis 6 together, we posit:

Hypothesis 7. Outsourcing flexibility partially mediates the effect of supplier development on outsourcing performance.

3. Research methodology

3.1. Data and sample

In December 2013 we collected cross-sectional survey data from manufacturing firms operating in China. The unit of analysis of this study is a single outsourcing relationship between an outsourcing firm and one of its major suppliers. Informants were asked to respond to research questionnaires based on the outsourcing relationship that is the most familiar to them. To collect a reliable data-set, we adopted following guidelines: (1) we assessed the credibility of the survey company in terms of its contact profiles, which include a number of reputable organisations such as P&G, Walmart, China Telecom, Lenovo, Alibaba and key Chinese universities; (2) responses that were completed too quickly (i.e. under 200 s) were excluded; (3) in order to avoid heterogeneity that may be caused by various industries and outsourcing types, only R&D outsourcing and manufacturing outsourcing in the manufacturing sector were included; and (4) only members of the top management team and managers engaged in production, R&D, purchasing and quality assurance were included in data collection, as those are the managers who may be expected to be most familiar with R&D and manufacturing outsourcing practices. Based on this procedure, we collected a total 260 survey responses. After removing reckless responses (e.g. responses that which indicated 'strongly disagree' or 'strongly agree' to most of the questions), 213 questionnaires remained in the sample.

Table 1. Demographic data for respondents.

Sample characteristics	Per cent (%)	
Annual sales (Million RMB)	< 5	1.4
	5~30	26.8
	30~300	55.8
	> 300	16.0
Type of outsourcing	Finished goods manufacturing	28.2
	Components manufacturing	54.5
Industry	Research and development	17.3
	Machine industry	24.4
	Electronic and telecommunications	28.6
	Textile	8.0
	Daily supplies	11.7
	Pharmaceuticals and biotechnology	3.8
	Chemicals	6.6
	New materials	11.3
	Food	1.9
	Jewelry	0.9
	Others	2.8
Job position	CEO/Vice CEO	25.8
	Production manager	37.1
	R&D manager	18.8
	Purchasing manager	17.8
	Quality manager	0.5

The respondents came from diverse industry sectors, with 24.4% of the respondents from the Machine industry, 28.6% from Electronics and telecommunications, 8% from Textiles, 11.7% from Daily supplies, 3.8% from Pharmaceuticals and biotechnology, 6.6% from Chemicals, 11.3% from new materials, 0.9% from Jewelry and 2.8% from other industry sectors. In terms of annual sales, 55.8% of the firms had annual sales between 30 and 300 million RMB (on December 31, 2013, 1 USD = 6.04 RMB), 26.8% firms had annual sales between 5 and 30 million RMB, 16% firms had more than 300 million RMB, and 1.4% firms had annual sales less than 5 million RMB Table 1. (Please refer to Table 1 for more details on the respondent profile).

3.2. Measures

To measure supplier development, we adopted the measure from Liao, Hong, and Rao (2010). The items we included in our survey are as follows: (SD1) We have the strategic goal of investing in our major supplier to increase its capabilities. (SD2) We co-locate engineers to our major supplier's facilities to increase its performance or capabilities. (SD3) We assess our supplier's performance regularly through established guidelines and procedures. (SD4) We recognise our supplier's achievements/performance in the form of awards.

For outsourcing opportunism risk, our measure was developed based on the work of Das and Teng (2001a) and Liu et al. (2008). The survey items we included are: (OR1) Our supplier may turn out to be dishonest. (OR2) Our supplier may not carry out its duties if it is not checked up on. (OR3) Our supplier may not always do things that it promises to do. (OR4) Our supplier may act opportunistically. (OR5) We may have conflicts with our supplier in the outsourcing relationship. (OR6) Our supplier may imitate our management experience and operations process and become our competitor.

Measurement scales for outsourcing flexibility were adapted from Sia, Koh, and Tan (2008), Malhotra and Mackelprang (2012)

and Blome, Schoenherr, and Eckstein (2014). The items we included in our survey are: (OF1) Our supplier is usually able to handle variation in service volume with no detrimental effect on process efficiency and quality. (OF2) Our supplier can respond to process exceptions without significant cost escalation. (OF3) The outsourced process can be modified easily as needed in response to new opportunities. (OF4) The outsourced process contains built-in capacity for transactional variation. (OF5) New capabilities can be added to the outsourced process easily as needed in response to new opportunities. (OF6) The supplier can solve problems creatively.

Lastly, the outsourcing performance measures were developed based on Handley and Benton (2009) and Prahinski and Benton (2004). We asked about total annual costs (OP1), quality performance (OP2), responsiveness (OP3) and reliability (OP4). We used a seven-point Likert-scale to measure the degree to which the respondents agreed or disagreed with the statements on the questionnaire, with 7 indicating 'strongly agree' and 1 indicating 'strongly disagree'. Respondents were asked to keep in mind one of their major suppliers as they answered the questions. In addition to the study variables, we included several important control variables (i.e. firm size, industry type, outsourcing type and length of relationship). The natural logarithm of the number of employees was used to indicate firm size. For industry type, we used a dummy variable, coding 0 to indicate a high-technology manufacturing industry (e.g. electronic communications, pharmaceuticals and biotechnology, new materials) and 1 to indicate a traditional manufacturing industry (e.g. machine, textile, chemicals. Etc.). Outsourcing types were also measured by a dummy variable, coding 0 to indicate R&D outsourcing and 1 to indicate manufacturing outsourcing of finished goods or component parts. The length of the relationship was measured by the time period that a firm has been in outsourcing business with its major supplier.

Both a Q-sort and a pilot study were conducted before we collected study data. The questionnaire was first developed in English, translated into Chinese, and then translated back into English by a different translator to ensure the accuracy of the language translation and identical meanings in both languages. To assure the content validity of our constructs, we went through a comprehensive literature review and sent the draft questionnaire to three professors in the Supply Chain Management area (two professors in the USA and one professor in China) and five professionals (two CEOs and three outsourcing managers). They were provided with the definitions of our four constructs and the questionnaire. Before filling out the questionnaire, they were asked to comment on the clarity of the definitions and the questionnaire items. These 8 responses collected through direct interviews were excluded from our analysis.

4. Results

4.1. Reliability and validity

First, a factor analysis was conducted using the 22 items that measure the four main study constructs. Factor loadings above 0.60 are displayed in Table 2. All items measuring supplier development and outsourcing opportunism risk loaded well (mostly above or close to 0.70). One item (OP4) in outsourcing

Table 2. Reliability.

Variable	Item	Factor loadings	Cronbach's α	Composite reliability	AVE
Supplier development (SD)	SD1	0.68	0.786	0.815	0.525
	SD2	0.69			
	SD3	0.71			
	SD4	0.76			
Outsourcing opportunism risk (OR)	OR1	0.86	0.937	0.878	0.642
	OR2	0.88			
	OR3	0.82			
	OR4	0.86			
	OR5	0.82			
	OR6	0.82			
Outsourcing flexibility (OF)	OF1	0.66	0.838	0.896	0.590
	OF2	0.73			
	OF3	0.79			
	OF4	0.65			
	OF5	0.63			
	OF6	0.70			
Outsourcing performance (OP)	OP1	0.72	0.785	0.843	0.546
	OP2	0.73			
	OP3	0.77			

Table 3. Overall model fit.

Model fit criterion	χ^2/df	RMSEA	CFI	TLI	GFI
Suggested value	≤ 2.0	≤ 0.06	≥ 0.90	≥ 0.90	≥ 0.90
Value	1.557	0.051	0.966	0.959	0.904

performance was dropped due to its low loading. The reliabilities of supplier development, outsourcing opportunism risk, outsourcing flexibility and outsourcing performance were assessed with Cronbach's Alpha. Table 2 reports the specific value for each construct and shows that the reliability values for all constructs are greater than 0.70, which is considered the threshold for acceptable reliability.

Overall model fit was assessed with AMOS. Suggested values for each model fit criterion follow Byrne (2016) and Hooper, Coughlan, and Mullen (2008). Values for each of the model fit criteria are provided in Table 3. They indicate that our model has a good overall model fit. Convergent validity was assessed through Confirmatory Factor Analysis (CFA) to assess the degree of agreement between different attempts to measure the same concept with different methods (Campbell and Fiske 1959). Our factor loadings exhibit a high degree of convergent validity with the minimum factor loading of 0.63. Discriminant validity was conducted to examine the uniqueness of each construct measure, making sure that each construct is distinct. According to Fornell and Larcker (1981), discriminant validity can be tested through the average variance extracted (AVE) method by comparing the AVE value with the squared correlation values. Discriminant

Table 4. Descriptive statistics and correlation coefficients.

	Mean	SD	1	2	3	4	5	6	7
Firm size	5.95	1.11							
Industry	0.57	0.49	-0.02						
Outsourcing types	0.81	0.39	-0.17*	0.10					
Length of relationship	6.35	3.17	0.01	-0.07	0.06				
Supplier development	5.85	0.75	0.10	-0.02	0.14*	0.23**			
Opportunism risk	2.64	1.26	0.07	-0.02	-0.18**	-0.23**	-0.30**		
Outsourcing flexibility	5.85	0.59	0.06	-0.08	0.16*	0.26**	0.61**	-0.25**	
Outsourcing performance	5.98	0.69	0.04	0.00	0.21**	0.24**	0.70**	-0.39**	0.68**

Notes: * $p < 0.05$; ** $p < 0.01$.

Table 5. Results of regression tests.

	Opportunism risk	Outsourcing flexibility	Outsourcing performance	
	Model 1	Model 2	Model 3	Model 4
Constant	5.243	2.972	2.112	1.302
Firm size	0.076	0.011	-0.001	0.001
Industry	-0.051	-0.085	0.003	0.035
Outsourcing types	-0.389	0.123	0.188*	0.098
Length of relationship	-0.081**	0.024*	0.015	-0.003
Supplier development	-0.374***	0.446***	0.620***	0.389***
Opportunism risk				-0.094***
Outsourcing flexibility				0.438***
Outsourcing performance				
R^2	0.140	0.402	0.512	0.625
Adjusted R^2	0.118	0.387	0.499	0.612
F	10.656***	97.745***	168.323***	29.875***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; $n = 213$.

validity is adequate if the AVE values for each construct are greater than the values of the squared correlations between that construct and each of the other constructs. As shown in Tables 2 and 4, no squared correlation value is greater than any of the AVE values, indicating adequate discriminant validity (Zhu, Sarkis, and Lai 2012).

4.2. Hypotheses tests

To test the seven hypotheses, we conducted regression and bootstrap analyses using an independent variable (i.e. supplier development), a dependent variable (i.e. outsourcing performance), multiple mediator variables (i.e. opportunism risk and outsourcing flexibility) and several control variables. Tables 5 and 6 present results of the regression analysis and the bootstrap analysis for indirect effects.

Hypothesis 1, which proposed that supplier development would be positively associated with outsourcing performance, was strongly supported (regression coefficient = 0.389, $p < 0.001$ in Model 4). Hypothesis 2 tested the negative relationship between supplier development and outsourcing opportunism risk. It was also strongly supported (regression coefficient = -0.374, $p < 0.001$ in Model 1). Hypothesis 3, which predicted that outsourcing opportunism risk would be negatively associated with outsourcing performance, was also supported (regression coefficient = -0.094, $p < 0.001$ in Model 4). Hypothesis 5 proposed that supplier development would be positively associated with outsourcing flexibility. The results indicate that the relationship between supplier development and outsourcing flexibility is positive and statistically significant (regression coefficient = 0.446, $p < 0.001$ in Model 2). Hypothesis 6 investigated the relationship

Table 6. Bootstrap results for indirect effects.

	Point estimate	Boot	SE	BC 95% CI	
				Lower	Upper
Total	0.2304**	0.2392	0.0527	0.1446	0.3441
Opportunism risk	0.0350***	0.0356	0.0224	0.0052	0.0974
Outsourcing flexibility	0.1954**	0.2036	0.0642	0.0853	0.3274
C1	-0.1605**	-0.1680	0.0804	-0.3122	-0.0045

Notes: Number of bootstrap samples: 5000.

C1: Contrast of the two indirect effects, SE: Standard error.

BC CI: Bias corrected confidence intervals.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

between outsourcing flexibility and outsourcing performance. The results indicate that the relationship between outsourcing flexibility and outsourcing performance is positive and statistically significant, providing support for Hypothesis 6 (regression coefficient = 0.438, $p < 0.001$ in Model 4).

In Table 5 we can see that in model 3, the coefficient for supplier development is significant, meaning there is a positive and significant relationship between supplier development and outsourcing performance. After adding two mediators (opportunism risk and outsourcing flexibility) in model 4, the coefficient for supplier development is still significant, but the value (0.389) decreased compared to the value in model 3 (0.620), meaning the relationship between supplier development and outsourcing performance is influenced after adding two mediators (opportunism risk and outsourcing risk). This shows that opportunism risk and outsourcing flexibility partially mediate the relationship between supplier development and outsourcing performance. In addition, following Preacher and Hayes (2008), we bootstrapped the indirect effect of supplier development on outsourcing performance in order to test the mediating role of opportunism risk and outsourcing flexibility. Table 6 indicates that the true value of total indirect effect is 0.2392 with a 95% confidence interval ranging from 0.1446 to 0.3441. Because zero is outside of this confidence interval, we can conclude that the total indirect effect exists and is statistically significant. The indirect effects through opportunism risk and outsourcing flexibility are 0.0356 and 0.2036, respectively. The 95% confidence intervals for both opportunism risk and outsourcing flexibility also do not include zero, indicating that the specific indirect effects through opportunism risk and outsourcing flexibility exist and are statistically significant. In sum, as presented in Table 6, the relationship between supplier development and outsourcing performance is partially mediated by opportunism risk and outsourcing flexibility, supporting Hypothesis 4 and Hypothesis 7.

5. Discussion and conclusion

The supply chain management literature has explored the importance of supplier management in enhancing supply chain performance and firm performance (Prajogo et al. 2012). As firms increasingly adopt outsourcing as a strategic tool to enhance and maintain their competitiveness in the market, building long-term relationships with their suppliers and developing their suppliers' capabilities in terms of quality, new technology, reduced cost, delivery and other related service to better meet

their strategic goals is a critical part of their outsourcing strategy (Krause, Handfield, and Scannell 1998). Yet despite the importance of supplier development in outsourcing practice, related research is sparse. This study bridges this research gap by empirically investigating the underlying mechanisms linking supplier development to outsourcing performance. Our findings suggest that supplier development can directly lead to improved outsourcing. At the same time, it also indirectly leads to better outsourcing performance through reducing outsourcing opportunism risk and increasing outsourcing flexibility. A detailed discussion is presented in the following two sections.

5.1. Supplier development and outsourcing performance

Supplier development is believed to be an effective way to solve issues of supplier performance because it may cost less than switching to another supplier, and provides significant benefits to both buying firms and their suppliers in the long run (Krause and Ellram 1997). The results of our study show that supplier development is positively related to outsourcing performance, leading to improvements in outsourcing cost, quality, responsiveness and flexibility. This confirms the work of Krause, Handfield, and Tyler (2007), in which the authors draw the conclusion that when buying, firms commit themselves to a long-term collaborative relationship with their suppliers through adopting a supplier development strategy, their suppliers are more willing to cooperate in the outsourcing practice. As a result, buying firms' commitment to a long-term relationship with their suppliers leads to buying firms' performance improvements in terms of cost, quality and flexibility. Similarly, Modi and Mabert (2007) also find empirical support for the direct impact of supplier development on supplier performance, which in turn leads to enhanced outsourcing performance as improved supplier capabilities enable suppliers to better meet buying firms' requirements. In line with previous studies, the results of this study provide evidence that supplier development activities such as buying firms' direct and indirect investments in their suppliers, including financial investment, technological support, personnel training and social relational input, serve to increase suppliers' motivation and capabilities in meeting buying firms' requirements, thus improving outsourcing performance.

5.2. Indirect relationship between supplier development and outsourcing performance

Outsourcing opportunism risk and outsourcing flexibility are two critical issues firms face in their outsourcing practices. Outsourcing opportunism risk in this paper is defined as the likelihood of suppliers' opportunistic behaviours in outsourcing. Outsourcing flexibility is a firm's ability to cope with unexpected changes in internal and external processes and radical changes in the outside environment. This paper investigates how supplier development can improve outsourcing performance through reducing outsourcing opportunism risk, which is negatively related to outsourcing performance, and increasing outsourcing flexibility, which is positively associated with outsourcing performance. The findings of our study provide significant support for our predictions.

First, supplier development reduces outsourcing opportunism risk, thus improving outsourcing performance. One major part of outsourcing opportunism risk is suppliers' opportunistic behaviour intended to maximise their own benefits through not exactly following buying firms' requirements. Such behaviour leads to failure in outsourcing performance. Supplier development reduces outsourcing opportunism risk as it contributes to a long-term collaborative relationship between buying firms and their suppliers, and this collaborative relationship helps reduce suppliers' desire to act opportunistically, which is a main cause of the relational risk (Das and Teng 2001b; Lehtiranta 2011). Through reducing outsourcing opportunism risk, supplier development enables buying firms to suffer less from the possible losses caused by opportunism, and thus achieve improved outsourcing performance.

Second, supplier development improves outsourcing flexibility, which in turn enhances outsourcing performance. In accordance with the work of Liao, Hong, and Rao (2010), the findings of our study indicate that supplier development is positively related to flexibility, and flexibility leads to improved performance. This is also similar to the results in other research papers, such as Sia, Koh, and Tan (2008) and Merschmann and Thonemann (2011). The long-term collaborative relationship between the buying firms and their suppliers, which is an important part of the supplier development strategy, facilitates smoother communication and cooperation between the two parties, and enables them to face challenges as a united entity and with consideration of potential long-term mutual benefits. This increases their capability to cope with unexpected changes in the outsourcing practice. In essence, the long-term collaboration between the buying firms and their suppliers helps improve flexibility in the outsourcing process (Koste, Malhotra, and Sharma 2004). Flexible suppliers are not easily threatened by market changes or new needs; they have the capability to change and respond accordingly in a timely manner and meet customer needs. In this paper, we particularly find support for our prediction that suppliers' flexibility leads to improved outsourcing performance in terms of outsourcing total cost, quality, responsiveness and flexibility.

In sum, this study addresses the role of outsourcing opportunism risk and outsourcing flexibility in influencing outsourcing performance and shows how they may be affected by supplier development.

5.3. Managerial implications

By highlighting the role of opportunism risk and outsourcing flexibility at the interface between supplier development and outsourcing performance, the findings of this study provide important managerial implications for effective outsourcing practices.

First, outsourcing managers should consider the importance of reducing outsourcing opportunism risk in order to secure desired outsourcing performance. China has been chosen as an attractive outsourcing destination for global sourcing because China sourcing provides many benefits such as low cost, market accessibility, availability of skills, manpower, infrastructures and acceptable country risk (Graf and Mudambi 2005). However, China sourcing can also bring risks and challenges, such as loss of control, outsourcing suppliers' opportunistic behaviours and hidden transaction and coordination costs (Lau and Zhang 2006).

Especially in transient economies and highly relationship-oriented societies such as China, where informal personal relationships (Guanxi) can substitute for formal structure and context (Xin and Pearce 1996), outsourcing suppliers may have higher incentive to behave opportunistically when they perceive short-term interests and lack of control mechanisms. This opportunism risk can lead to outsourcing failure. Therefore, outsourcing managers should think about how to decrease suppliers' incentives for opportunistic behaviour, and reduce this risk in order to secure effective outsourcing practices. Supplier development practices offer one way to do so.

Second, outsourcing flexibility is another critical factor that outsourcing managers should keep in mind in their outsourcing practice. In the turbulent market, in which customer needs are constantly changing and product life cycles are becoming increasingly shorter due to the quick pace of technology upgrading, firms cannot rely on themselves to have enough capabilities to respond to the dynamic market demands. They need to strategically manage their upstream supply chain and take advantage of suppliers' capabilities to increase the flexibility of their outsourcing activities (Liao, Hong, and Rao 2010). Unlike insourcing, in which the relationship between the buyer and supplier is more hierarchical, the buyer has more control over the supply and communication is more straightforward, outsourcing requires more coordination and communication effort between buying firms and their outside suppliers in regard to buying firms' expectations and requirements for product mix, volume, specification, packaging, delivery and other details (Malone, Yates, and Benjamin 1987). Therefore, flexibility is even more important yet difficult in an outsourcing relationship. In an environment filled with uncertainty and competition, outsourcing managers need to think about effective ways to improve outsourcing flexibility so that they may achieve better outsourcing performance (Merschmann and Thonemann 2011). Our study suggests that supplier development provides one means of doing so.

Finally, we suggest that outsourcing managers pay close attention to supplier development due to its important role in achieving desired outsourcing performance. Supplier development requires commitment and investment from both the buying firms and suppliers, but it has positive effects on supplier satisfaction and commitment (Matook, Lasch, and Tamaschke 2009), and improves supplier's performance to better meet buying firms' needs (Nagati and Rebolledo 2013). The results of this study provide evidence that supplier development not only directly promotes outsourcing performance, but also indirectly contributes to better outsourcing performance through suppressing supplier's opportunism risk and facilitating outsourcing flexibility. Because the outsourcing environment is full of uncertainties, challenges and supplier opportunism risk, it becomes even more critical and useful for firms to adopt supplier development as a strategic tool to mitigate suppliers' opportunistic behaviour and promote outsourcing flexibility to achieve desired outsourcing performance.

5.4. Limitations and future research directions

While making a theoretical and practical contribution, our study is not free of limitations, which lead to future research possibilities. There are several issues we need to address here:

The first issue is related to the dimensions of outsourcing performance. The literature suggests using multiple perspectives to evaluate outsourcing performance, including the economic perspective, strategic perspective and relational perspective (Lankford and Parsa 1999; Jiang, Belohlav, and Young 2007; Joshi 2009; Lacity, Khan, and Willcocks 2009). Our study simply evaluated outsourcing performance based on four criteria firms emphasise most while selecting and evaluating suppliers (Prahinski and Benton 2004). Future research could be conducted to further investigate the relationship between supplier development and multi-dimensional outsourcing performance, which we believe can add to our understanding of effective outsourcing practices.

The second issue is related to contingency factors. This paper focuses on the key supplier in outsourcing practice. However, in Kraljic purchasing portfolio theory, some purchasing items do not require the building of a close collaborative relationship with suppliers (Kraljic 1983). Thus, our research model may fit with strategic items in a Kraljic portfolio, but may not be applicable to other contexts. We need to further consider contingency variables that can influence the relationship between supplier development and outsourcing performance. For instance, we can consider the outsourcing task complexity, the power relationship between buyer and supplier, the strategic importance of the outsourcing task, the availability of alternative suppliers, and so on. By investigating those contingency factors, we can enhance the effectiveness of supplier development in outsourcing practices in varied outsourcing contexts.

Third, this study focuses on buyers' perspectives on outsourcing practices in Chinese manufacturing sectors. To date China has become one of the largest outsourcing destinations for manufacturing firms (Kang, Wu, and Hong 2009). However, in China's 11th Five-year Plan (2006–2010), the government showed its goal to develop China's service outsourcing capabilities, and many national and local policies have been implemented to support this goal. Instead of relying on manufacturing alone, Chinese firms are shifting into a hybrid outsourcing pattern of developing manufacturing and service outsourcing together. In response to these trends, in future research it would be interesting and also practical to look at supplier development not only from the manufacturing buying firm's perspective, but also from the service firm's and suppliers' perspective, and investigate how buying firms' activities of supplier development influence suppliers' motivation and performance on learning, innovation and their commitment to their outsourcing relationship with their buying firms.

Lastly, we proposed that in the China context, buying firms' investments in supplier development would help to reduce suppliers' opportunism. The reasoning behind this proposal is that supplier development would encourage the buying firms and their suppliers to form long-term relationships, which incentivise both parties to be long-term oriented, thus reducing the supplier's incentive to behave opportunistically. China is a highly relation-based society (Wiegel and Bamford 2014), and the buying firm's investment in supplier development is regarded as a means of improving the mutual relationship between the buyer and supplier, increasing mutual trust and, in turn, reducing the likelihood of the supplier behaving opportunistically. However, according to Transaction Cost Theory (Williamson 2008), buyers' investments in supplier development are relationship-specific investments, which means the investments would have no value or much less

value outside the exchange relationship between the buying firms and their suppliers. As a result, without considering the specific relation-based background, this kind of asset specific investment would tend to increase suppliers' opportunistic behaviours. We think in the future it would be interesting to compare the role of buying firms' investments in supplier development in different cultural contexts to test the difference.

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