

**Obtaining supplier commitment:
antecedents and performance outcomes**

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Obtaining supplier commitment: antecedents and performance outcomes

Abstract

Effective management of the supply network is essential to assure market success for modern supply chains. On these premises, the paper aims to shed light on the dynamics of buyer-supplier industrial relationships by exploring the antecedents of supplier commitment – a requisite to improve performance obtained from suppliers. The paper develops a theoretical framework, grounded on Transaction Cost Economics and Social Exchange Theory, which is tested using survey data from 305 international companies and applying a Structural Equation Modelling approach. Results show that goal alignment, buyer commitment and supplier collaboration initiatives are all drivers of supplier commitment, which, in turn, positively affects innovation performance ensured by suppliers. These findings confirm the relevant role of buyer-side initiatives in driving supplier commitment, giving managers focus points to look at when the objective is to gain a preferred customer status.

Keywords: Supplier commitment; Collaboration; Supply Chain relationships

1. Introduction

Commitment is a key condition for buyer-supplier relationships' success (Kim and Choi, 2015). In particular, a number of studies have identified the positive effects of commitment showing that committed suppliers benefit the buying firm by expanding its know-how (Yoon and Moon, 2019), improving products (Mazzola et al., 2015), and enhancing the new product development processes (Tsai, 2009).

However, limited empirical evidence exists regarding how the buying firm – which we will refer to as the buyer – can actively promote supplier commitment. Due to the limited availability of high-skilled, innovation-oriented suppliers, the latter might decide to prioritize specific buyers (Schiele et al., 2013). Besides, engaging into collaborative relationship with suppliers is not easy and might lead mixed results (Krause et al., 1999). Thus, previous studies have emphasized the importance of buyers increasing their attractiveness for critical suppliers for securing their commitment and, consequently, satisfactory supplier performance (e.g., Hovmøller Mortensen et al., 2008; Schiele et al., 2012; Pulles et al., 2016).

Previous studies have mainly explored the consequences of supplier commitment for long-term buyer-supplier relationships (e.g., Tanskanen and Aminoff, 2015; Huttinger et al., 2014), while the antecedents of supplier commitment still lack a solid empirical evidence. The literature about buyer-supplier relationships explores both a transactional and relational posture for relationship management (Kim and Choi, 2015), but not explicitly related these perspectives to supplier commitment. In fact, commitment in a buyer-supplier relationship is mostly researched by industrial marketing literature from the supplier's point of view (Stanko et al., 2007), while the supply management literature usually adopts the buyer's point of view (Schmitz et al., 2016). In this study, we would like to bridge these two streams of literature and provide an evidenced-based explanation about the buyer's strategies to ensure supplier commitment. In simple terms, we pose the following research question:

With the objective to obtain better performance, how can a buyer enhance supplier commitment?

To answer this question, the present study combines insights from social exchange theory (SET) and transaction cost economics (TCE) to build the conceptual basis for interpreting supplier commitment antecedents and outcomes. On the one hand, industrial marketing literature based the investigation of supplier commitment on the premises of SET, which prescribes that the one party's attractiveness determines the other's party commitment in the relationship, and that attractiveness not only depends on transaction's characteristics but also on the social value embedded in the buyer-supplier relationship (Liu et al., 2009; 2017). On the other hand, previous supply management studies widely grounded on TCE to explore how buyer-supplier relationships are managed, building on the central argument that the costs of transactions will orient the parties in the continuum between arm's length, collaborative and vertically-integrated relationships (Narayanan et al., 2015; Chen et al., 2017). By using insights from both theories, this research attempts to conceptually underpin the identification of buyer's antecedents for supplier commitment as well as to link the effects of supplier commitment to performance.

The remainder of this manuscript is structured as follows. In *Section 2* we summarize main literature and in *Section 3* theoretical background about commitment in buyer-supplier relationships. *Section 4* presents the research framework and theories, and elaborates the research hypotheses. *Section 5* outlines the methodology and explains how data collection was conducted. *Section 6* presents the statistical results, which are discussed in *Section 7*. Finally, *Section 8* draws the main conclusions and summarizes the limitations of the present study and outlines the areas for further research.

2. Commitment in buyer-supplier relationships

Morgan and Hunt (1994, p.23) define relationship commitment as “*an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it*”. Subsequent studies confirmed the relevance of relationship commitment and provided a broad nuance of definitions (Shahzad et al., 2018). In the context of buyer-supplier relationships, commitment is generally defined as the degree to which a supplier feels obligated to continue business with a particular buyer and is considered as a prerequisite to any enduring business relationship (Tanskanen and Aminoff, 2015). Authors also relate commitment as a basic requirement for successful supply chain initiatives (e.g., Yenyurt et al., 2014) and emphasize the importance of commitment in situations of interdependence between supply chain actors (Khalid and Ali, 2017; Shen et al., 2017; Liu et al., 2017).

Emanating mostly from the industrial marketing literature, previous studies about commitment usually adopt the supplier’s perspective and investigate how companies decide to commit to their customers (e.g., Adobor and Mc Mullen, 2014; Shahzad et al., 2018). However, in line with the previous definitions of commitment, it seems relevant to adopt also the buyer’s perspective and ask how to secure the commitment of strategic suppliers. Extant supply management studies emphasize the importance of collaborative buyer-supplier relationships: Especially in presence of turbulent environments and increased supply market complexity, buying firms often have to struggle to be the customer of choice and secure the commitment of skilled suppliers (Schiele et al., 2013). As a consequence, the first gap we intend to fill is addressing the buyer’s perspective regarding supplier commitment.

Regarding the potential antecedents of commitment, previous studies suggest that commitment may be driven by the adoption of process-oriented practices, such as information sharing and operational integration (e.g., Lockstrom et al., 2010; Kim et al., 2011; Baxter, 2012), or by relational specific investments such as joint investments in dedicated machineries or facilities

(Lyu et al., 2009; Ellis et al., 2012). Furthermore, various intangible antecedents of commitment are explored, including motivation (Nollet et al., 2012), satisfaction (De Ruyter et al., 2001; Tanskanen and Aminoff, 2015), justice (Liu et al., 2012), attraction (Schiele et al., 2012; Huttinger et al., 2012), and trust (Jain et al., 2014). The resulting picture is still inconclusive and leaves room to further examine potentially relevant factors that the buyer should take into account when the goal is to drive supplier commitment. Therefore, the second research gap we are addressing in this study is the analysis of specific buyer practices as antecedents of supplier commitment.

Finally, given the paucity of studies exploring buyers' practices conducive of supplier commitment, we also have limited evidence available regarding the potential outcomes of supplier commitment for the buyer. In general, previous studies suggest that a committed supplier is likely meeting or even exceeding the buying firm needs (Carey et al., 2011). Some authors have assessed the impact of supplier commitment on strategic and financial performance (Jain et al., 2014) or new product performance (Tsai et al., 2009), but there is no univocal evidence regarding the extent to which supplier's commitment actually enhances operational performance obtained by the buying firm (Nyaga et al., 2010). Thus, we plan to explore different types of performance outcomes that the buyer can target as a result of supplier commitment.

3. Theoretical background: theories explaining supplier commitment

In order to investigate the aforementioned research gaps, we ground on two theoretical perspectives that complement each other (Huttinger et al., 2014; Shahzad et al., 2018), i.e. SET and TCE, in line with previous works addressing relationship commitment (e.g., Kwon and Suh, 2004; Prajogo and Olhager, 2012; Moon and Tikoo, 2013).

SET focuses on the study of social exchanges among actors, which can be defined as ‘*voluntary actions of individuals that are motivated by the returns they are expected to bring and typically do in fact bring from others*’ (Blau, 1964). Several authors argue that SET provides a relevant and fruitful perspective that can be applied when studying buyer-supplier relationships as it explains the potential value that each party sees in the relationship (e.g. Corsten and Felde, 2005; Hald et al., 2009; Chae et al., 2017).

According to the definition of social exchange, commitment is a voluntary action, motivated by potential (social) returns. In other words, one party is ready to commit only when it is attracted by the potential value deriving from the relationship with the other party. Previous studies explore the concept of attraction in the context of buyer-supplier relationships (e.g. Liu et al., 2009, 2017; Patrucco et al., 2018). Given our research goal, we explore a set of factors that the buyer should look after as they can potentially increase the supplier’s perceived social return and therefore favour its commitment.

To this end, we account for some of the key concepts TCE addresses. The premise of TCE is that firms choose specific institutional modes to govern the exchanges in a marketplace as a function of transaction costs, which can be defined as ‘*the costs that attend completing transactions by one institutional mode rather than another*’ (Williamson, 1981). Besides the two classic “polar modes” (i.e. market and hierarchy) Williamson (1991, p. 280) introduces also “hybrid modes” that reflect collaborative buyer-supplier relationships supported for example through long-term contracts. Supplier commitment, which is the focus of this study, can happen in presence of this kind of collaborative relationship. In line with the definition of commitment and the premises of SET, supplier commitment can be conceived and an informal (social) control mechanism that matches the specificity of hybrid modes. As a matter of fact, Williamson (1991) postulates that hybrid modes have a specific form of administrative control in place, which is different from the type of administrative control in markets or hierarchies.

We do not expect commitment to arise in a spot market, as there are no enduring relationships; while it is not applicable to a hierarchy mode, as there is only one company managing tasks. This raises the question of when and how commitment might arise. TCE offers a series of factors that influence the level of transaction costs and that characterize the different institutional mode. For example, findings report that behavioral uncertainty and a lack of frequent interactions reduces commitment (Prahinski and Benton, 2004; Choi and Krause, 2006). Similarly, the existence of reciprocal specific asset investment in a buyer-supplier relationship increases commitment and the expectations of relationship continuity (Kwon and Suh, 2005). Since we are analysing situations when interactions are expected to be frequent and the two parties have a minimum level of trust (as they are engaged in a collaborative relationship), we focus in particular on the level of relational-specific assets as representative of commitment.

In summary, while SET provides the main theoretical underpinning of commitment as a consequence of perceived social value (i.e. future returns) in a relationship; TCE confirms that commitment can be an appropriate control mechanisms for hybrid modes and provides a theoretically sound way to assess such commitment as a function of relational assets. Merging both theoretical perspectives, we make our study more comprehensive and theoretically robust, and we provide further empirical evidence about SET and TCE potential complementarity (Shazad et al., 2018).

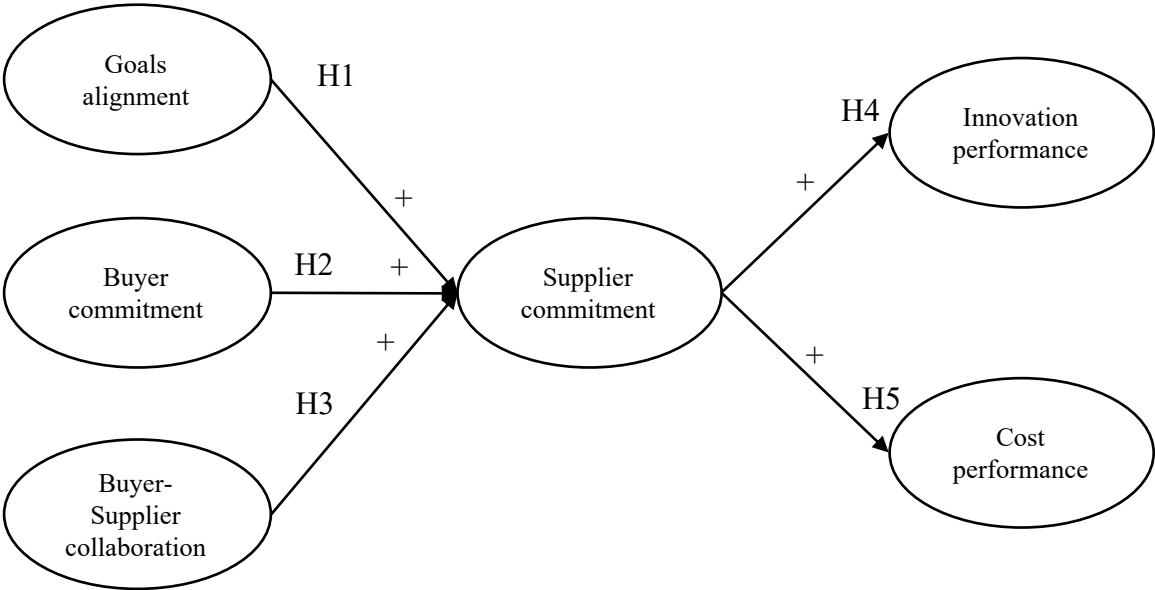
4. Research model and hypotheses

As explained, for enduring long-term relationships, the commitment of both parties is required. In the context of buyer – supplier interaction, particularly, it is interesting to understand which are the levers buying company can exploit to obtain this commitment, and the benefits which may arise from it. Given this background, the article wants to contribute by testing a model

exploring both supplier commitment input (i.e. its antecedents) and output (i.e. its effects), in the perspective of the buyer (Chae et al., 2017), in contrast with past studies who instead mainly consider the supplier's point of view (e.g., Schiele et al., 2015; Shahzad et al., 2018).

The research model is represented in *Figure 1*. On one side, it is grounded on TCE in that supplier commitment is a form of hybrid collaboration mode. On the other, the model is also grounded on SET in that it considers sociological governance mechanisms, implying that the supplier increases its commitment if specific (social) investments by the buyer are provided. The combination of the two theories help overcoming the partial perspective of current literature, also providing a complete view of supplier commitment implications, from the antecedents to the impact on performance.

Figure 1. Research model



4.1 The antecedents of supplier commitment

Relationship commitment is related to the need to develop and maintain a stable relationship with partners (Solinger et al., 2008). Literature has strongly debated on the main antecedents of supplier commitment (e.g. Krause, 1999; Kwon and Suh, 2004, 2005; Krause et al., 2007).

One aspect is the alignment between the relationship parties, as defined by e.g., Caceres and Paparoidamis (2007) in terms of business objectives, trust, loyalty and values. These aspects are also debated by other authors e.g., Krause et al. (2007), who include "shared values" as a key variable to explain buyer-supplier relationship efforts. This variable, as antecedent of commitment, is supported by the TCE theory, considering overlapping goals as a necessary element in relational – hybrid – governance modes (Maestrini et al., 2018). From a SET perspective, alignment of objectives can be a factor that increases expected returns and so justify the effort in commitment. Thus, among different buyers, suppliers are more willing to be committed to those buyers that are able to establish a level of return expectation – or in other words reduce behavioural return uncertainty – through goals alignment among parties (Kwon and Suh, 2004).

In light of this, we can postulate the following hypothesis:

H1: Increased goals alignment between buyer and supplier increases supplier commitment

Second, several authors also reported the importance of formal and evident buyers' commitment as an antecedent of supplier commitment for years, because the latter is the social return for own commitment (e.g., Anderson and Weitz, 1992; Maloni and Benton, 2000; Prahinski and Benton, 2004; Krause et al., 2007; Schiele, 2012; Moon and Tikoo, 2013). In fact, one actor might be committed to another, while the other might be not committed at all; to avoid this risk, suppliers seek mutual commitment (Nagati and Rebolledo, 2013).

As a measure of the commitment, literature often mentions the importance of '*relationship dependence*' as a key aspect and is defined as the degree to which either a buyer or a supplier needs to maintain the relationship with a supplier or a buyer in order to achieve desired goals (Barratt, 2004). Several authors have further linked dependence and influence in buyer-supplier

dyadic relationships (e.g., Nagati and Rebolledo, 2013; Yenyurt et al., 2014), all supporting the concept that suppliers that perceive higher dependence from a buyer are likely increasing their commitment (Schmitz et al., 2016). Buyer commitment needs formal recognition, and should be measured through tangible indicators, such as relationship-specific investments made by customers (Wathne and Heide, 2004), which are positively related to expectations of continuity of the supply chain link (Simchi-Levi et al., 2015). When buyers' assets are specific for a relationship, this is likely to strengthen the long-term perspective of the relationship itself (Yoon and Moon, 2019), and this view is strictly consistent with the TCE theory, particularly for what concerns buyer asset specificity. On the one hand, asset specificity reduces possible uncertainty related to the counterpart's behaviour, thereby increasing suppliers' willingness to commit to the relationship (Kwon and Suh, 2004; Chen et al., 2017). On the other hand, asset specificity reduces the possibility for the buyer to easily change suppliers, because of higher switching costs; therefore, buyers are more interested in maintaining a good long-term relationship (Jayaram et al., 2010; Handley and Benton, 2012). In light of this, we can postulate the following hypothesis:

H2: A greater buyer commitment fosters supplier commitment

Finally, commitment is an issue of hybrid modes (as promoted by TCE), what includes long-term collaboration between firms. Supplier commitment in a market mode makes no sense, but there is the need to have some forms of collaboration in place *before* supplier commitment can arise. Thus, buyer-supplier collaboration, specifically, could concern two areas. On one side, we have technological collaboration, related to the development of a partnership oriented to the development of a new product i.e., the extent to which buyers tend to actively involve suppliers

in new product development (e.g., Van Echtelt et al., 2008; Zhao et al., 2014; Yan and Nair, 2016; Laursen and Andersen, 2016).

On the other, we have operational collaboration, related to the extent to which a firm is strategically interconnected and aligned with its supply chain partners, both in terms of information sharing and process improvement (e.g., Das et al., 2006; Jayaram et al., 2010; Prajogo and Olhager, 2012; Prajogo et al., 2016). The final purpose of this partnership is to better manage the flow of products through the supply chain, giving access of resources and capabilities to other supply chain partners - which otherwise may be too expensive to be developed internally (Thomas, 2013).

Therefore, it appears reasonable to assume that suppliers will commit to buyers that invest in involving suppliers. That invest could be improving the level of process visibility and integration, as this will be perceived as an opportunity to increase the value for them, in terms of both their own knowledge (Saenz et al., 2014; Patrucco et al., 2017), and a reduction of transaction costs (Krause et al., 2007).

These considerations are not only aligned with the TCE statement regarding the role of information sharing and collaboration in reducing transaction costs, but also with the SET perception of sharing of critical data to increase the value for both parties.

In conclusion, the deeper or the better that collaboration is established, the more supplier commitment can develop, and the need to consider buyer efforts into the collaboration relationship as antecedents for supplier commitment is explained according to specific investments (potential social returns) and the existence of collaboration practices (potentially reducing transaction costs). In light of this, we can postulate the following hypothesis:

*H3: A greater dedication on the part of the buyer to collaboration fosters supplier
commitment*

4.2 The impacts of supplier commitment

To justify efforts into business-to-business relationships, managers need also an understanding of how these relationships create value for the firm (Wagner, 2012). As such, consistent with the indications of the SET, expected value needs to be considered to understand how to manage suppliers and devote resources to increase supplier commitment. Despite the fact that several studies address supplier's commitment and its dynamics, only a few provides a clear perspective on corresponding performance outcomes (e.g. Jain et al., 2014). An examination of the literature reveals that there are two crucial areas of mutual goals that are related to commitment. First, commitment plays a pivotal role in improving outcomes of specific projects, such as development and commercialization of new products and services (Mazzola et al., 2015; Wang et al., 2017; Patrucco et al., 2018); secondly, commitment may lead to identification of process improvement areas, thereby resulting in higher efficiency and cost savings (Jokela and Soderman, 2017).

When suppliers are committed, buyers can count on broader knowledge-sharing in the supply network (Schiele, 2012). This supplier expertise is of great relevance, particularly when the aim is to achieve technological innovation and improve product design (Rosell and Lakemond, 2012), as it helps to expand the product range, the level of innovation in existing products, and/or the introduction of new ones. Consequently, commitment may have a positive impact on the NPD process (Zhao et al., 2014). Given that, supplier commitment becomes crucial to achieve innovation (Ellis et al., 2012 Schiele et al., 2013; Luzzini et al., 2015), and “innovation performance” can be seen as an indication how intense knowledge in the relationship has been shared. In light of this, we can postulate the following hypothesis:

H4: Greater supplier commitment positively impacts innovation performance secured to the buyer

Besides innovation, firms that are able to obtain the necessary supplier commitment are expected to be successful also on the efficiency side (Jokela and Soderman, 2017), as they are able to reduce transaction costs. Supplier cost must be evaluated from a comprehensive perspective, with proactive aspects such as the total cost of ownership (e.g., Caniato et al., 2015); thus, such evaluation would include resource productivity, process cost, inventory level, and purchasing price (Pettersson and Segerstedt, 2013). In light of this, we can postulate the following hypothesis:

H5: Greater supplier commitment positively impacts cost performance secured to the buyer

5. Methodology

5.1 Sample

Research hypotheses are tested through a cross-sectional, multi-country survey. To investigate the research model, we use the data collected in the second round of the International Purchasing Survey project (Knoppen et al., 2015). Data were collected in Finland, Germany, Ireland, and Italy during 2015 by a group of researchers from these countries. The goal was to investigate linkages among purchasing strategies, practices, organizational contexts, and purchasing performance. The questionnaire collects data pertaining to four areas. The first two focus on general data regarding the organization and respondent, as well as the characteristics of the purchasing function. The other two focus on a major purchase category managed by the respondent, and contain questions on category strategies, practices, characteristics, and performance. The survey was originally developed in English, as were the institutional item

scales. It was then translated to local languages using the TRAPD-approach: translation, review, adjudication, pre-testing, and documentation (Harkness et al., 2004). Piloting was conducted in each country, using both the local language and, in certain cases, the English version survey as well.

The survey group decided on the range of industries to be included in the survey (manufacturing and service industries, based on ISIC codes), and a random sample of companies in these industries was drawn from each country level database (Fonecta in Finland, Dun and Bradstreet in Germany, the Bill Moss Partnership in Ireland, and AIDA in Italy). Only companies with at least 50 employees were included in the sample. All countries followed the same data collection procedures to ensure consistency. After the random sampling, a suitable respondent was identified in each organization through the company website, LinkedIn, or direct company contact. Each respondent was approached via phone first, and the electronic survey was only sent to those who agreed to participate. The databases across the four countries included a total 20,515 companies that fit our sampling criteria. Of these 3,068 were selected through random sampling. 3,059 were directly contacted (some companies did not fit the criteria after sampling, for example, had moved abroad or were not part of the specified industry any more). 1,105 were reached via phone (for those not reached, either a suitable respondent was never located in the company or the suitable respondent never answered our calls despite a minimum of three attempts made). A total of 656 companies agreed to participate and out of these, 305 usable responses were received, thus yielding a 10% response rate of the total sample and a 46% response rate of those who agreed to respond. *Table 1* reports the main data characteristics.

Table 1. Sample descriptive

Descriptive	Freq.	%	Descriptive	Freq.	%
<i>Country</i>			<i>Industry Sector</i>		
Italy	99	32.5	Manufacturing	234	76.7
Germany	70	23	Information and comm.	23	7.6
Finland	84	27.5	Finance and insurance	19	6.2
Ireland	52	17	Professional, scientific, and technical activities	29	9.5
<i>Purchasing categories</i>			<i>Respondent position</i>		
Raw materials	125	41	Purchasing director	53	17.4
Components and supplies	90	29.5	Purchasing manager	153	50.2
IT services	28	9.2	Senior, Project buyer	34	11.1
Logistics services	16	5.2	Buyer, Purchasing agent	28	9.2
Office equipment and supplies	19	6.2	Other	32	10.5
Maintenance and cleaning	27	8.9	Missing	5	1.6
<i>Employees</i>					
Medium (50–249)	152	49.8			
Large (250–1,000)	78	25.6			
Very large (> 1,000)	75	24.6			
Total	305	100		305	100

5.2 Survey items and constructs measurement

In order to operationalize the constructs, the questionnaire used measures and items consolidated in past literature.

In line with the approach proposed by Jap and Anderson (2003; 2007) and Yan and Doley (2014), ‘*Goals alignment*’ reflects the concept of relationship safeguard, and it is grounded in the agency theory. In particular, it measures the extent to which firms perceive the possibility of achieving compatible (if not identical) objectives for a given purchasing category. Operationalization follows Jokela and Soderman (2017), so goals alignment can be interpreted as a multi-items construct measuring how much buyer and supplier 1) shared the same goals; 2) share compatible goals; 3) wish to support each other.

In line with previous measures suggested by literature (e.g., Cousins, 2005; Narayanan et al. 2015; Patrucco et al., 2018) ‘*Buyer-supplier collaboration*’ reflects the multiple forms of joint collaboration between a focal firm and its suppliers in managing cross-firm business processes,

including both the operational (i.e., information visibility and process integration) and technological (i.e., joint product development) levels. It measures the extent of the collaborative interactions occurring between a firm and its major suppliers. Measurement follows the operationalization used by prior studies assessing this construct (i.e., Flynn et al., 2010; Zacharia et al., 2011), so buyer-supplier-collaboration can be interpreted as a multi-items construct measuring how much buyer and supplier 1) share confidential data such as cost; 2) focus on cost/quality improvement as performance incentive; 3) collaborate on early involvement in NPD activities.

In line with the approaches of Krause et al. (2007), Reuer and Arino (2007) and Huttinger et al. (2014), '*Buyer commitment*' and '*Supplier commitment*' reflect instead the idiosyncratic and specific investments necessary to enter into and manage a channel relationship; these investments are difficult to be redeployed for another relationship and, therefore, they lose substantial value unless the relationship continues. In a buyer-supplier relationship, they can be present on both sides, thereby realizing the so called 'asset specificity' for a purchasing category (Artz, 1999). Following the operationalization used by Moller et al. (2017), '*buyer commitment*' can be interpreted as a multi-items construct measuring 1) the cost, for the buyer, in switching a supplier; and 2) the extent to which non-recoverable investments are in place for a given category. Similarly, for what concerns '*supplier commitment*', the operationalization is made through multi-items measuring 1) the cost, for the supplier, in abandoning a buying company; and 2) the extent to which non-recoverable investments are in place for a given category (Krause et al., 2007).

Finally, in line with consolidated operationalization proposed in the past (e.g. Terpend and Krause, 2015; Luzzini et al., 2015), '*Cost performance*' and '*Innovation performance*' reflect the traditional dimension to measure purchasing efficiency (i.e. internal and external) and supplier contribution to innovation (i.e. product/service innovation and variety) at the category

level. In particular, “*innovation performance*” can be interpreted as a multi-items construct measuring 1) the level of product/service range secured by supplier; 2) the capability to provide product customization; and 3) the rate of introduction of new products. “*Cost performance*”, instead, can be interpreted as a multi-items construct measuring 1) the level of purchasing resources productivity; 2) the level of purchasing costs; and 3) the inventory level.

Table 2 summarizes the main questions included in the survey, and how they have been used to operationalize the constructs.

Table 2. Operationalization of constructs

Construct	Definition	Survey items	Label	Scale
<i>Goals alignment</i>	The extent to which firms perceive the possibility of achieving compatible (if not identical) objectives for a given purchasing category	Buyer and supplier share the same goals in this category	GA1	1 = "Totally agree" 6 = "Totally disagree"
		Buyer and supplier support each other's goals in this category	GA2	
		Buyer-supplier compatibility of goals in this category	GA3	
<i>Buyer – Supplier collaboration</i>	The level of collaboration between the buyer and its suppliers	We share our cost information with our major suppliers of this category	COLL1	
		We require major suppliers in this category to contribute to cost/quality improvement	COLL2	
		We emphasize early major supplier involvement in product/service design in this category	COLL3	
<i>Buyer commitment</i>	The level of asset specificity, i.e., the specific investments buyer and supplier need to make to enter into and manage the relationship	Investment in dedicated personnel for suppliers of this category	BC1	1 = "Very Low" 6 = "Very High"
		Investment in dedicated facilities and/or systems for suppliers of this category	BC2	
		Difficulty in resource redeployment in case of change of suppliers of this category	BC3	
		Non-recoverable investments in case of change of suppliers of this category	BC4	
<i>Supplier commitment</i>	The level of asset specificity, i.e., the specific investments buyer and supplier need to make to enter into and manage the relationship	Investment in dedicated personnel for the buyer	SC1	1 = "Very Low" 6 = "Very High"
		Investment in dedicated facilities and/or systems for the buyer	SC2	
		Difficulty in resource redeployment in case the buyer abandon the supplier	SC3	
		Non-recoverable investments in case the buyer abandon the supplier	SC4	
<i>Innovation performance</i>	The level of supplier contribution to innovation at the category level	Supplier capability to widening the range of product/service versions, options and features offered	IP1	1 = "Far below expectations" 6 = "Far above expectations"
		Supplier capability to introduce (customized) changes in products/services	IP2	
		Supplier rate of introduction of new products (updated and leading products)	IP3	
<i>Cost performance</i>	The level of supplier contribution to purchasing efficiency at the category level	Level of productivity of purchasing resources	CP1	1 = "Far below expectations" 6 = "Far above expectations"
		Level of cost (purchasing price and transportation)	CP2	
		Level of inventory	CP3	

5.3 Bias control

Potential biases were considered in survey and protocol design and in the data analysis. Several approaches (i.e. direct contact by phone, multiple mailings, and the assurance to share results) were used to ensure a high response rate and avoid non-response bias (Frohlich, 2002). To estimate non-response bias, we compared the descriptive statistics of samples in each country, and we ran non-parametric tests in each of these to compare the valid respondent group to the sample in the country (Froehle and Roth, 2004). These tests confirmed that no significant differences existed in the distribution of company size (number of employees) and in the distribution of industries (ISIC code).

Further, social desirability in the entire survey bias was reduced through assurance of confidentiality and through questions pertaining to the behaviour of the organization and its members in general rather than about direct personal behaviours. The institutional items themselves do not relate to personal behaviours or performance and are thus less likely to be affected by a social desirability bias.

Finally, the common latent factor technique was applied to address common method bias (Podsakoff et al., 2003). Through this analysis, we found that the common latent variable has a linear estimate of 0.623. This value indicates a variance of 0.388, which is below the threshold of 0.50.

5.4 Statistical approach for model testing

Since the objective of our research is theory testing and confirmation, the presented hypotheses were tested using covariance-based structural equation modelling (CB-SEM), a common method employed for this type of research (Hair et al., 2011; Perols et al., 2013).

The model was tested using the maximum likelihood (ML) estimation method (White, 1982), being ML able to provide more realistic indexes of overall fit and less biased parameter values

for paths that overlap with the true model as compared to other methods such as generalized least squares and weighted least squares (Olsson et al., 1999). The ML estimation assumes that the variables in the model are (conditionally) multivariate normal, which is true for our dataset according to the Doornik-Hansen test ($\chi^2 = 316.53$; $p > \chi^2 = 0.000$).

Two possible ways of evaluating model fit are the use of the chi-square goodness-of-fit statistic and the use of other absolute or relative fit indices (Hu and Bentler, 1999). For what concerns the chi-square, there is the need to check for the ratio between chi-square value and degrees of freedom in the model, where cut-off values range from <3 to <5 , depending on the type of study (exploratory or explanatory SEM; Hair et al., 2017). For what concerns fit indices, they can range from 0 to 1, with values closer to 1 indicating a good fit. Some authors suggest some indices presentation strategy including, among others, the comparative fit index (CFI), the Tucker Lewis index (TLI) and Gamma hat or root mean square error of approximation (RMSEA). A satisfactory threshold for CFI and TLI is >0.90 (with a value >0.95 showing excellent fit), whereas RMSEA is supposed to be < 0.05 (Hooper et al., 2008).

Stata 15.0 was used to estimate both the measurement and structural models.

6. Data analysis and results

6.1 Confirmatory factor analysis

Table 3 presents the results of the confirmatory factor analysis (CFA). All of the measurement model fit indicators show a sufficient fit ($\chi^2/\text{d.f.} = 2.565$; CFI = 0.952; TLI = 0.947; RMSEA = 0.039;). Additionally, convergent validity was assessed through significant loadings from all scale items on the hypothesized constructs as well as through the average variance extracted (AVE), Composite Reliability (CR) and Cronbach Alpha (CA). AVE ranges between 55% and 76% (higher than the 0.5 threshold), and both CR and CA are higher than 0.7 for all the constructs.

Table 3. Confirmatory Factor Analysis (CR = Composite Reliability; AVE = Average Variance Explained; CA = Cronbach's Alpha)

Construct	Label	Loading	CR	AVE	CA
<i>Goals alignment</i>	GA1	0.878	0.901	75.3%	0.847
	GA2	0.901			
	GA3	0.854			
<i>Buyer-Supplier collaboration</i>	COLL1	0.821	0.865	68.2%	0.758
	COLL2	0.811			
	COLL3	0.845			
<i>Buyer commitment</i>	BC1	0.633	0.861	61.3%	0.697
	BC2	0.618			
	BC3	0.821			
	BC4	0.799			
<i>Supplier commitment</i>	SC1	0.844	0.908	71.2%	0.895
	SC2	0.777			
	SC3	0.826			
	SC4	0.855			
<i>Innovation performance</i>	IP1	0.798	0.892	73.4%	0.835
	IP2	0.812			
	IP3	0.834			
<i>Cost performance</i>	CP1	0.731	0.797	56.8%	0.709
	CP2	0.702			
	CP3	0.615			

As an additional test for discriminant validity, in *Table 4* we report the squared correlation between two latent constructs to their AVE estimates (Fornell and Larcker, 1981). According to this test, the AVE for each construct should be higher than the correlation between each pair of constructs - a condition which is valid for all the constructs.

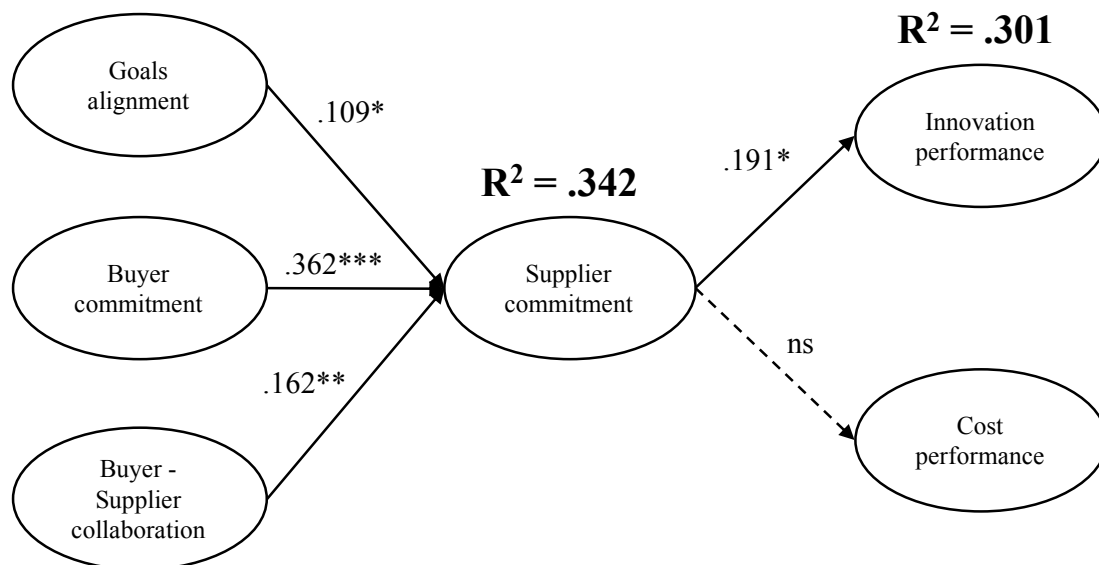
Table 4. Correlation matrix (***p < 0.001, **p<0.01, *p< 0.05)

Variables	Average	St.Dev.	1	2	3	4	5	6
1. Goals alignment	3.92	1.04	1					
2. Buyer commitment	2.87	1.07	0.434**	1				
3. Buyer – Supplier collaboration	3.96	1.17	0.173***	0.395***	1			
4. Supplier commitment	3.12	1.32	0.335***	0.382***	0.272***	1		
5. Innovation performance	3.39	1.23	0.116**	0.081	0.168**	0.122**	1	
6. Cost performance	4.14	1.02	0.046	0.317**	0.001	0.081*	0.147*	1

6.2 Model testing

The postulated path model produced a sufficient fit to the data ($\chi^2/d.f. = 2.928$; CFI = 0.939; TLI = 0.927 RMSEA = 0.047). *Figure 2* reports the results of the hypotheses testing. The structural model shows a highly positive and significant relationship between goals alignment, buyer commitment, buyer-supplier collaboration and supplier commitment, thus failing to reject H1, H2, and H3. In turn, supplier commitment reveals having an impact on innovation performance - thus failing to reject H5 – while no statistical significance is found for cost performance – thereby rejecting H6.

Figure 2. Resultant structural model



***p < 0.001, **p<0.01, *p< 0.05

7. Discussion of results

The testing of the model provides two relevant contributions: one enriches the debate about supplier commitment antecedents, while the other better explains the nature of benefits coming from this commitment.

7.1 Which are the antecedents?

First of all, our analysis confirms the relevance of the three hypothesized antecedents, as all goals alignment, supplier commitment and supplier collaboration represent drivers of supplier commitment.

When suppliers perceive that there is a sharing of business goals with the buying company, and both parties are willing to work to achieve these objectives (e.g. decreasing cost and purchasing price, improving quality and level of integration of the components in the final product, and proposing a new technology innovation to the market), it is likely that more focus and more efforts will be invested for a successful outcome of this relationship. In today's market, where supply chain success depends on multiple and complex activities, a misalignment of objectives among supply chain actors is one of the first causes of failure (Barrat, 2004). Whenever an overlapping of goals can be identified, it is not surprising that the two sides will attempt to leverage on this aspect in order to build a collaborative relationship (Maestrini et al., 2018), thereby increasing the value for both parties and bringing benefits in the long-term. From a buyer-supplier perspective, this pushes buyers to make the most to identify an area of common benefits (and the mutual role for achieving them) as a basis for establishing a collaborative relationship; on the other hand, suppliers need to be opened to invest some resources in order to demonstrate their commitment (Kim and Choi, 2015; Yoon and Moon, 2019).

Further, it emerges that actual investments in collaboration practices, at the technological (i.e. innovation) and operational (e.g. quality improvement) levels, as well as towards more visibility

and integration (e.g. information sharing) are very welcome by suppliers and are consequently a good strategy to secure supplier's commitment. As a matter of fact, buyer's efforts towards different forms and level of collaboration with suppliers do attract their attention (Schiele, 2012; Huttinger et al., 2012), as suppliers are seeking customers willing to invest in the relationship – particularly in the long term – thereby demonstrating a wish to invest in the relationship too. Finally, a fundamental role is played by buyer commitment, which represents the most relevant antecedent (at least from a statistical perspective, with a standardized coefficient of 0.382).

If the buyer is able to put in place initiatives that prove their intention to invest in the relationship (i.e. share of personnel or facilities; assignment of a preferred status to the supplier), they will be likely to generate commitment from the other side based on the same dimensions (Stanko et al., 2007; Tanskanen and Aminoff, 2015). This provides the basis for long-term interactions.

7.2 Which are the effects?

On the other side, results show that investing for obtaining commitment from suppliers does give returns in terms of performance at the category level.

In particular, once commitment has been generated (driven by establishment of shared goals, collaboration initiatives, and buyer investment in the relationship), supplier are likely to put in place buyer-dedicated investments as well. This, in turn, is able to provide better innovation performance at the category level – in terms of a wider range of product/service versions, higher rate of introduction of new products/services, and introduction of new functionalities (Wagner, 2012; Yenyurt et al., 2014). This result is in line with several previous studies demonstrating the existence of a positive connection between establishment of strategic buyer-supplier relationship and supplier contribution to firm innovation efforts (e.g., Luzzini et al., 2015; Patrucco et al., 2017).

Unfortunately, according to our evidence, such commitment apparently does not contribute to an improvement of cost performance (as a matter of fact, H6 is not verified). Even though not totally expected and not totally aligned with literature, the possible interpretations of this are threefold.

As discussed, in order to obtain commitment, investments from both parties are required, as well as execution of new and different type of activities (compared to the case of traditional relationships). Often, what is ‘new’ is also more resource-consuming, which can imply, at least in the medium term, less efficiency (Narayanan et al., 2015). Therefore, when considering specific category cost aspects (e.g. the inventory level or the productivity of people in managing the purchasing process for the category), it is not unusual to see an initial deterioration of these performance. This is mainly due to the higher coordination efforts needed to set-up the collaboration as well as the operational parameters of the relationship (like inventory – Corsten and Felde, 2005; Wang et al., 2017).

Further, when suppliers display commitment by dedicating resources and investing in the relationship, it is likely that they will ask buyers for higher prices, thereby worsening category cost performance, from a spending perspective. However, this may represent a criticality only at first sight: buyers are increasingly looking at total costs rather than simple purchasing prices, and committed suppliers might slightly increase unit prices while, at the same time, working to design efficient processes to reduce buyer’s total cost of ownership (Choi and Krause, 2006; Yan and Nair, 2015).

Finally, when buyers and suppliers invest in the relationship it is more likely they are doing this mainly with a matter of innovation, willing to improve either their products or services. Improvements of costs is more perceived as routine activities and so not the main focus of a stronger commitment (Ellis et al., 2012 Schiele et al., 2013; Luzzini et al., 2015).

8. Contributions and future developments

The previously discussed results concerning supplier commitment antecedents and outcomes are able to provide contributions to both theory and practice as well as open up opportunities for future developments, which are summarized in the following.

8.1 Theoretical implications

From a theoretical perspective, the validity of the three antecedents in explaining the supplier commitment contribute to the stream of literature calling for SET and TCE as valid theories to analyse this relational dynamic (e.g. Kwon and Suh, 2004; Prajogo and Olhager, 2012; Moon and Tikoo, 2013; Huttinger et al., 2014; Shahzad et al., 2018). This study is one of the first blending together these two theories, to explain supplier commitment.

In line with other pioneering studies on supplier relationship management which demonstrates that customers with common objectives are preferred (e.g., Kannan et al., 2006; Huttinger et al., 2014), "*Goals alignment*", as antecedent, indicates that buyers and suppliers need to share a common view on what will be the 'value' coming from their relationship. This pushes them to find ways to create and share that value (Zhao et al., 2014). Moreover, evident and shared goals and investments smooth, since the beginning, the risk of opportunistic behaviour during the relationship lifecycle (Steinle et al., 2014). This conclusion is of course in line with SET, but also consistent with the TCE theory: sharing goals and supporting each other are cognitive means to reduce uncertainty regarding behaviours of supply chain partners, thereby increasing the perception of long-term attention and the commitment devoted to a buyer (Kown and Suh, 2004; Yan and Dooley, 2013; Maestrini et al., 2018). Further, this result also enriches the pool of factors usually considered as giving a customer an attractive status from the supplier's perspective. Previous literature has mainly promoted output aspects as antecedents, such as the buyer's company reputation or its financial and operational performance (De Ruyter et al.,

2001; Huttinger et al., 2014; Jack and Powers, 2015), instead of input relational variables (i.e. business objectives), only considered by few scholars (e.g., Krause et al., 2007; Jokela and Soderman, 2017). With this study, we can conclude that, besides e.g., profit, market brand, and ability to manage processes efficiently and effectively, the possibility of working toward the achievement of common targets is also a motivational factor for putting in place mutual investments.

The role of "*Supplier collaboration*", instead, supports all the previous studies discussing how higher formalization of collaboration processes contribute to increase expected value, dependence, and specific assets, thereby resulting in greater supplier's commitment (Hoegl and Wagner, 2005; Hald et al., 2009; Brito et al., 2017). So, our results confirm that buyer-supplier relationships are not just based on flows of money and goods but also on reciprocal commitment, which is reflected in more collaborative relationships (Kwon and Suh, 2004).

This conclusion, again, is strictly consistent with both the SET and the TCE theory. For the former, collaboration might increase both expected value and dependence, thereby leading to greater supplier's commitment (e.g. Caceres and Papparoidamis, 2007). For the latter, collaboration is an asset that is specific to the buyer-supplier transaction, and so a strategic orientation of the buyer causes the supplier to perceive a lower transaction cost (Krause et al., 2007; Saenz et al., 2014; Patrucco et al., 2018).

Finally, the validity of "*Buyer commitment*", not only supports several previous conceptual and empirical works promoting the idea of buyer commitment being antecedent of supplier commitment (e.g., Krause et al., 2007; Chae et al., 2017), but specifically ascribes buying companies with asset specificity the role of main driver of this commitment. By putting in place asset investment to support the relationship, buying companies are be able to obtain commitment from the other part based on the same dimensions, completely in line with indications of the TCE theory (Stanko et al., 2007; Narayanan et al., 2015; Chen et al., 2017).

Overall, we are able to operationalize supplier commitment through the concept of asset specificity for a buyer-supplier relationship (assessing its direct measure and validity using a large-scale international survey).

These antecedents contribute to literature about supplier commitment also in terms of perspective: previous literature has mainly focused on the supplier point of view, with less attention devoted to the buyer's one.

Further, our results contribute also to the discussion about the benefits of investing in the design in strategic supplier relationships. In particular, results show that supplier commitment has a significant effect on category innovation performance ensured to the customer – a point of analysis not considered in previous studies - despite having possible short-term drawbacks in terms of efficiency – as the collaborative relationship arising from double commitment can generate process complexity and a higher price request.

Investing to obtain supplier commitment gives the buying company a benefit. The benefit manifests first in terms of category innovation performance, supporting those scholars who, in the past, have largely explored, tested and debated how buyer-supplier strategic relationships (which is where commitment arises) is the ideal setting to obtain better innovation from the suppliers (Ellis et al., 2012 Schiele et al., 2013; Zhao et al., 2014; Luzzini et al., 2015). Unfortunately, commitment does not lead to efficiency in the traditional manner (i.e. process efficiency and purchasing price), but this result can support the argument that collaboration can lead to more long-run improvement in the total cost of ownership for that category (Prajogo and Olhager, 2012).

8.2 Managerial implications

These results are also relevant for practitioners, being collaboration and development of long-term supplier relationships at the top of management agendas in all sectors.

First, our results support managers in focusing their attention on specific variables to become more attractive for their suppliers and acquire the status of preferred customer, highlighting the importance of clearly showing the commonalities in strategic choices and strategic objectives to their partner, as well as in the design of collaboration initiatives at different levels. Most importantly, the key message is that there is "*no commitment, without investment*": if the buying company does not make the first move, showing that the supplier is willing to invest in the relationship (through dedicated supplier resources or status), it is unlikely that the supplier will do that anyway. The study illustrates also the management relevance to clearly show to suppliers the value potentially achievable through the collaboration, to commit them; anyhow, this study extends the concept of value not only considering achievable outputs – as previous studies presented – but illustrating also the importance to guarantee an alignment at the strategic levels, in terms of common goals and buyer commitment.

Further, we provide managers evidence of the payback that comes from this investment: having commitment from the supplier first gives a return to company in terms of better innovation outcomes, while no evident benefits can be gained in the short term on the cost side. This evidence is particularly relevant to make managers aware of the real benefits achievable and to identify how a proper commitment of the suppliers is necessary to find a way to improve innovation also at the category level.

8.3 Limitations and future developments

This research also has certain limitations, both conceptual and methodological, which provide opportunities for further developments. From a methodological perspective, the survey has been developed with the intention to assume the buyer perspective. Future studies could examine the same problems using the dyad as unit of analysis, to compare buyer and supplier's point of view.

From a conceptual perspective, further research is also necessary to deepen the relationship between buyers' performance and supplier commitment: our model merely considers innovation performance and cost performance, but further aspects can be included (e.g. flexibility and process quality).

Finally, our model excludes contextual factors; for example; future studies could investigate possible internal and external variables that might influence supplier commitment e.g., exploring how these relationships vary in different countries and/or in the context of companies of different size.

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