

Prerequisites for performance measurement supporting purchaser–supplier collaboration

Aki Jääskeläinen*

Otto Thitz

Industrial and Information Management

Tampere University of Technology, Finland

* Corresponding author at: Tampere University of Technology, Korkeakoulunkatu 8, P.O. Box 541, 33101 Tampere, Finland. Tel.:+358 50 326 1113, E-mail address: aki.jaaskelainen@tut.fi

Structured abstract

Purpose – This paper clarifies the prerequisites for performance measurement supporting purchaser-supplier relationships and value co-creation. It also explains the causes for limited use of collaborative measurement.

Design/methodology/approach – Four case companies representing different contextual settings are studied. The primary source of empirical material is an interview study addressed to 24 interviewees. The empirical data is analyzed according to constructs created as a result of the literature review.

Findings – The results reveal that prevailing performance measurement practices represent a more transactional than relationship-oriented approach to purchaser-supplier collaboration. The technical prerequisites for collaborative performance measurement are mostly not fulfilled, inhibiting the use of performance measurement in a collaborative manner. It is proposed that the differentiation between project and process production types has implications on the importance of collaborative performance measurement.

Research implications – The paper illustrates the desirable characteristics of performance measurement supporting collaboration. It also presents an application of collaborative performance measurement in a single case context. The research reveals the need to develop non-financial performance measures further in order to facilitate the more proactive use of performance measurement supporting true value co-creation between purchaser and supplier companies.

Originality/value – The empirical research on the topic of performance measurement in purchasing and supply management (PSM) is often limited to intra-organizational measurement and highlights transactional approach to collaboration between parties, although PSM research has otherwise acknowledged the importance of value creation and relationships between organizations.

Keywords: antecedent, performance measurement, purchaser-supplier relationship, purchasing, supply chain management, value co-creation

Article classification: Research paper

1. Introduction

Benchmarking includes systematic identification of best practices, innovative ideas, and effective operating procedures (Bogan and Callahan, 2001). It supports performance improvements through learning between companies and organizational units. Supply chain benchmarking can include the comparison of operations between suppliers aiming at best possible transactional value (e.g. fit for existing production process). It can also mean inter-organizational product/service development leading to new business opportunities. The latter approach reflects relationship value (Lindgreen *et al.*, 2012). Less attention has been paid on benchmarking supporting supply chain collaboration at the inter-organizational level (Choy *et al.* 2007).

Current business environment requires means to improve the effectiveness of inter-organizational relationships. Performance measurement is one potential tool facilitating inter-organizational collaboration between supply chain members. It can ease communication and sharpen the understanding of joint targets (Busi and Bititci, 2006). Studies have shown that performance measurement systems (PMS) have a positive impact on supply chain performance (Cousins *et al.*, 2008). However, the role of PMS in supporting purchaser-supplier collaboration is unclear. Earlier research has identified challenges, such as the short-term focus of measurement highlighting cost savings (Cousins *et al.*, 2008; Morgan, 2007; Pohl and Förstl, 2011) and a lack of balance between financial and non-financial measures (Chan and Qi, 2003). Complexity of supplier relationships has not been properly captured by the measures used (Hald and Ellegaard, 2011). There is a need to understand better the causes of challenges and the conditions realizing the potential of performance measurement (Balfaqih *et al.*, 2016).

Much of the earlier performance measurement literature focuses on internal performance rather than on inter-organizational relationships (Cousins *et al.*, 2008). However, performance measurement in purchasing and supply management (PSM) has gained a lot of attention in the literature in recent decades (Andre *et al.*, 2015). A number of conceptual frameworks have been developed (e.g., Gunasekaran *et al.*, 2004) and generic metrics to be used have been listed (e.g., Axelsson *et al.*, 2002; Caniato *et al.*, 2014). Many existing performance measurement studies reflect the traditional transaction-based thinking (cf. Axelsson *et al.*, 2002) to the supply chain. While performance measurement in collaborative networks and extended enterprises has gained increasing interest (Busi and Bititci, 2006; Morgan, 2007), empirical research has remained limited (Verdecho *et al.*, 2009). There is clearly a need to update the prevailing understanding, offer more recent explanations for observations in the extant literature and suggest areas for further academic research.

Performance measurement can be examined from the lifecycle perspective including design, implementation, use and review (Bourne *et al.*, 2000). Many studies highlight the measurement design variables, most notably the aspects that should be measured (Cho *et al.*, 2012). This study contributes by providing insights on the prevailing usage of supplier performance measurement and the prerequisites for performance measurement supportive to strategic purchasing aiming at value co-creation between purchaser and supplier companies. While earlier research gives understanding on the generic challenges of collaborative performance measurement (Busi and Bititci, 2006; Morgan, 2007), more specific performance measurement criteria required (i.e. prerequisites) in the endeavor for inter-organizational collaboration have remained implicit. This study has two research questions:

1. How do companies use performance measurement in purchaser-supplier collaboration?

2. What are the prerequisites of collaborative performance measurement and how are they fulfilled?

The unit of analysis of this study is a purchaser company applying supplier performance measurement. Hence the dyadic relationship between purchaser and supplier companies is perceived from the purchaser viewpoint. The paper is based on four case studies and interviews are the main source of empirical data. The rest of the paper is structured as follows. Section 2 reports the findings of the literature review and presents the research framework for the empirical study. Section 3 describes the methodology used. Section 4 presents the empirical results. Section 5 discusses the findings in relation to the earlier literature. Finally, concluding remarks are presented in Section 6.

2. Literature on performance measurement supporting purchaser-supplier collaboration

2.1. Overview of the literature on supplier performance measurement

Typical purposes of PSM performance measurement include control and monitoring of purchasing costs and internal communication indicating the 'internal customer' logic (Caniato *et al.*, 2014). The excessive emphasis on issues internal to an organization limits the potential benefits of performance measurement (Morgan and Dewhurst, 2007; Papakiriakopoulos and Pramadari, 2010). It has been argued that performance measurement should be augmented through the evaluation of relationships between organizations (Gunasekaran *et al.*, 2004). While supplier performance measurement has been studied for a long time (Chan and Qi, 2003; Gunasekaran *et al.*, 2004), there is also an increasing interest in collaborative performance measurement (Busi and Bitici, 2006; Giannakis, 2007). However, literature on the measurement of value co-creation opportunities and on supplier performance measurement going beyond adherence to contractual agreements is still limited (Nudurupati *et al.*, 2015; Ramanathan *et al.*, 2011).

Suppliers are typically measured in terms of quality and price (Caniato *et al.*, 2014). Price has traditionally been considered as the single most important criterion when assessing suppliers (Chia *et al.*, 2009; Cousins *et al.*, 2006) while there is also an extensive body of literature on managing and measuring supplier quality (Chin *et al.*, 2006; Noshad and Awasthi, 2015). Cousins *et al.* (2008) differentiate two types of supplier performance measures. Operational measures monitor how suppliers deliver materials, components or products to the purchaser company on time and of sufficient quality.

Complementary to operational measures, supplier communication performance measures are expected to increase interaction between purchaser and supplier companies. Cousins *et al.* (2008) argue that communication measures are of increased importance when working in a close collaborative relationship and may include aspects such as the effectiveness of communication, information exchange, information quality and timeliness, and the level of feedback from the supplier. The communication of a buying company does not necessarily influence supplier performance unless collaborative communication is used (Cousins *et al.*, 2008; Prahinski and Benton, 2004). The use of supplier performance measurement as a communicational tool is crucial since naturally the information has no value without appropriate practices for communicating the results and transferring the numbers into action. Simply making the performance data available is not enough (Morgan and Dewhurst, 2007).

Contradictory views on the technical characteristics of supplier performance measurement have been presented. Caniato *et al.* (2014) found that performance measures are often similar across different purchasing categories and suppliers, although sometimes specific targets for measures are differentiated

according to the category. In turn, Andre *et al.* (2015) studied the use of performance measurement in various supplier roles (input suppliers, producers, distributors, retailers) and found that customer satisfaction is the only common measure which is used across the contexts. There is an apparent trade-off between accuracy and the standardization of measurement. A common set of supplier measures makes measurement less time-consuming and supports supply chain benchmarking (Choy *et al.*, 2007). However, the definition of a set of measures applicable to multiple companies across the supply chain is a very challenging task (Andre *et al.*, 2015; Bruno *et al.*, 2012). Industry-specific features affect the implementation of supply chain performance measurement (Balfaqih *et al.*, 2016). The varying characteristics and information requirements of specific purchasing categories increase the variation and case-specific nature of the required measures (Pohl and Förstl, 2011). It appears that close relationships are best supported by jointly defined performance measures (Forslund and Jonsson, 2009).

2.2. Prerequisites for collaborative performance measurement

Spekman (1988) defines collaboration as “the process by which partners adopt a high level of purposeful cooperation to maintain a trading relationship over time”. In turn, Mentzer (2001) defines supply chain collaboration as “a means by which all companies in the supply chain are actively working together towards common objectives”. This entails sharing of information, knowledge, risk and profits. PMS can be used to manage collaboration through supporting the definition and collection of relevant information (Verdecho *et al.*, 2009). In this study, *collaborative performance measurement* is defined as a tool to support information requirements of dyadic collaboration between supplier and purchaser companies aiming at common targets.

The other important concept in this study is the *prerequisite for collaborative performance measurement* which is used to refer to specific maturity criteria for performance measurement. Maturity of performance measurement has gained increasing attention in the literature over the last ten years and it can be related to the level of sophistication and managerial usefulness of measures (e.g. Evans, 2004). However, criteria in supply chain performance measurement have received less attention (Balfaqih *et al.*, 2016). Two prerequisites related to the design of collaborative performance measurement are chosen for the basis of this research: the non-financial perspective of measurement and the non-standard nature of measurement. These prerequisites appear as potential for supporting inter-organizational collaboration in light of the previous literature.

Non-financial measurement

Balance between financial and non-financial performance measures is a widely used characteristic for contemporary PMSs and it has been found to have a positive effect on organizational performance (Cocca and Alberti, 2010; Van der Stede *et al.*, 2006). Soft dimensions of management are critical in supplier relationships (Giannakis, 2007) and value co-creation in supplier-purchaser relationships is often multi-dimensional in nature (Möller and Törrönen, 2003). It is widely accepted that financial measures do not ensure the long-term sustainability of a firm or a relationship (Chia *et al.*, 2009). There is a consensus in the literature that performance measurement supporting inter-organizational collaboration requires both financial and non-financial measures (Cousins *et al.*, 2006; Dossi and Patelli, 2010; Giannakis, 2007; Nudurupati *et al.*, 2015; Papakiriakopoulos and Pramatar, 2010).

According to Nudurupati *et al.* (2015), both monetary and non-monetary benefits, risks and sacrifices should be included in the assessment of value in the supplier–purchaser relationship. Cousins *et al.* (2006)

state that both tangible and intangible measures should be used in supplier performance measurement. They link the tangible dimension to operational performance, as the intangible dimension is connected to the status of the relationship between the companies, and stress the importance of the latter perspective. Similarly, it has been proposed that more balanced objects of measurement including aspects of quality could afford support in the pursuit of overall success of integrated value-chains (Barber, 2008; Batson and McGough, 2006).

Using non-financial measures together with financial measures has been found to improve the communicative use of performance measurement (Dossi and Patelli, 2010) potentially supporting the collaborative work between suppliers and purchaser companies. Papakiriakopoulos and Pramataris (2010) argue that measures dedicated to collaboration are typically non-financial, since financial measures more often cause more conflicts of interest leading to difficulties with definitions.

It is noteworthy that non-financial performance measures comprise a wide variety of measures. As an example, they may be related to the creation of transactional and relationship value between supplier and purchaser companies (Lindgreen *et al.*, 2012). The non-financial measures supporting transactional value creation can include measures related to the content and quality of the purchased product or service, whereas non-financial measures supporting relationship value creation might include aspects such as responsiveness of suppliers and rate of new innovations. It can be conjectured that non-financial measures supporting relationship value creation best reflect the idea of collaborative performance measurement.

Non-standard nature of measurement

Standardization of PSM is a widely shared objective. For example, Bruno *et al.* (2012) argue that the lack of widely accepted cross industry performance measurement systems makes it difficult to measure the performance of entire supply chains and their members. In practice, PSM performance measurement often searches for a balance between contextual tailoring and standardization. Sometimes a rather stable set of measures with differentiating weights and targets according to purchasing category and strategic level of hierarchy are applied (Caniato *et al.*, 2014).

Manufacturing in particular has a long history of supplier quality management with a process focused perspective, meaning that the internal quality standards have been extended to the supplier network (Morgan and Dewhurst, 2007). This reflects the idea of extended process measures (i.e., how the extended process performs) (Busi and Bititci, 2006). The majority of suppliers in the study by Purdy and Safayeni (2000) felt that their effectiveness was not accurately reflected in measurement resembling an extended process approach. More specifically, this approach was perceived to evaluate the identification of suppliers with the purchaser companies.

Performance measurement of supplier-purchaser collaboration can be difficult due to the challenges in defining the unit of analysis (i.e., company level, unit level, purchasing category level etc.) (cf. Busi and Bititci, 2006; Morgan, 2007) and to the dynamic and complex nature of supplier relationships and their outcomes (Giannakis, 2007). Strategic purchasing tends to be non-repetitive and complex in nature (Nudurupati *et al.*, 2015) and its practices require tailoring to specific projects between purchaser and supplier companies (Eriksson and Westerberg, 2011). The outcomes of collaboration are easier to measure when pre-set targets of collaboration are identifiable (Giannakis, 2007; Gunasekaran, 2001).

It has been argued that relationship measures should be at least partly tailored to each business relationship (Heimbürger and Dietrich, 2012; Ramanathan *et al.*, 2011). Earlier research has also indicated that non-standard performance measurement does not necessarily hinder supply chain integration if measures are standardized in a specific supplier relationship (Forslund and Jonsson, 2009). These observations from the earlier literature can be interpreted as a requirement to approach collaborative performance measurement at the level of single key suppliers with supplier-specific objectives and measures (i.e., non-standard measures).

2.3. Summarizing the literature

While inter-organizational relationships have attracted increasing attention in the literature, there has been limited research on performance measures supporting collaboration in relationships (Cousins *et al.*, 2008) and especially empirical research is lacking (Papakiriakopoulos and Pramataris, 2010). As a summary of this section, Table 1 provides research constructs in relation to the research questions of this study. According to the literature, communicative use of performance measurement should include bilateral performance information change. Two prerequisites for the design of collaborative performance measurement were identified from the literature. These include availability of non-financial measures and non-standard measures depending on the characteristics of individual suppliers. If these criteria are met, it is proposed that measurement is more likely to support inter-organizational collaboration.

Table 1 Constructs for the empirical part

Use of collaborative performance measurement (RQ1)	Sources
Communicative use of performance measurement	Cousins <i>et al.</i> , 2008; Prahinski and Benton, 2004; Morgan and Dewhurst, 2007
Prerequisites for collaborative performance measurement (RQ2)	Sources
Use of non-financial performance measures	Cousins <i>et al.</i> , 2006; Dossi and Patelli, 2010; Nudurupati <i>et al.</i> , 2015
Non-standard measures	Eriksson and Westerberg, 2011; Giannakis, 2007

3. Methodology

A qualitative study for exploring the applicability and manifestation of constructs presented in the literature was carried out (cf. Patton, 1989). The data collection method in this study was interviewing. Secondary empirical method included observations during a development project of collaborative performance measurement in a single case setting. Selection of studied companies followed the idea of maximum variation (Flick, 2002) in order to justify the findings in several contextual settings. The four companies studied are large (annual revenue over 1 billion euros; over 10,000 employees in 2014) Finnish companies operating internationally and mainly in business-to-business markets. They represent the views of the purchaser. Two of the companies operate in service industries (ServA and ServB) and the other two (ManufA and ManufB) in manufacturing industries. In addition, two of the companies (ServA and ManufB) have continuous process-like production, homogenous products and large production volumes. By contrast, two companies (ServB and ManufA) have a more project-oriented production with at least a moderate level of tailoring of services and products for each customer. A summary of the companies studied and the interviewees appears in Table 2.

Table 2 Illustration of case companies

Company	ServA	ServB	ManufA	ManufB
Industry	Services (logistics)	Services (ICT)	Manufacturing (machinery)	Manufacturing (forest industry)
Type of production	Process	Project	Project	Process
Proportion of purchasing spend over all the costs	~50%	~50%	~65 %	~55 %
Supplier count	14,000	7,000	10,000	20,000
Ratio of purchased materials/services	10 % materials, 90 % services	30 % materials, 70 % services	80 % materials, 20 % services	60 % materials, 40 % services
No. of interviewees in different positions	2 purchasing directors 3 category managers 1 operations manager	2 purchasing directors 1 category manager 1 operations director 1 ICT director 1 finance manager	2 purchasing directors 1 purchasing manager 1 category manager 1 operations director 1 R&D director	2 purchasing directors 2 category managers 1 finance director 1 operations director

Table 3 specifies the empirical research methods applied in this study. The choice of respondents in the case companies with each of the empirical studies followed the idea of theoretical sampling since the choice was driven by the anticipated high level of knowledge in light of the research questions (Flick, 2002). An interview study addressed to 24 managers of four companies was carried out during the period May–June 2015. Sixteen of the respondents represented the purchasing function and eight respondents represented other functions, including R&D, finance, ICT, logistics, and engineering. Thirteen of the respondents represented top management (later referred to as directors) and 11 middle management (later referred to as managers). The interviews were audio-recorded, transcribed verbatim and the extracts utilized were translated from Finnish to English. The interviews were flexible and open-ended theme interviews with some more precisely defined points to be addressed. The discussion was typically initiated without restricting the respondent too much and later on more detailed questions on the theme were posed.

Table 3 Summary of the empirical research methods of the study

Empirical research method	Description
Interview study (M1)	24 interviews
Observation of a performance measurement development project (M2)	Three discursive workshops

Observation of a performance measurement development project investigating the benefits of supplier partnerships was utilized in order to gain more profound insights into the applicability of ideas on collaborative performance measurement from the perspective of practitioners. This also served as a way to challenge the propositions of the prerequisites for collaborative performance measurement derived from the literature. This part of the research was carried out at ServA, where a development project was launched during this research. New measures for analyzing the benefits of the partnership model were defined during three workshop events, each lasting for three hours. Workshops were attended by three managers and directors representing the purchasing function and two directors representing two major

business lines. Two researchers attended the workshops by giving overall discussion topics and directing the discussions. The researchers documented the workshops by taking notes. The notes were discussed and summarized by the authors after the events and further reviewed and accepted by the participants of the case organization.

Table 4 illustrates how the empirical data was gathered and analyzed with each of the research methods in relation to the research questions of this study. Deductive analysis of the interview data (M1) was used to gain more understanding on how the constructs derived from the literature (see Section 2.3.) manifested in practice. This included the analysis of the causes supporting earlier literature as well as identification of opposite observations in light of the research constructs. The qualitative data analysis started with within-case analysis and was followed by cross-case analysis (Miles and Huberman, 1994). Within-case analysis was mainly done by highlighting observations recurring in several interviews in order to provide a reliable understanding of the prevailing practice. In some cases, single responses were stressed if they included an important message from the point of view of the research questions and constructs.

Table 4 Research questions, data gathering, and analysis

Research method	Research question	More specific questions studied	Codes for cross-case analysis
Interview study	RQ1	How does performance measurement support purchaser-supplier communication?	<ul style="list-style-type: none"> • extent of using performance measurement in bilateral communication with suppliers (utilized vs. not utilized) and intention to develop such usage (intended vs. not-intended)
	RQ2	How is supplier performance measurement is carried out in terms of: <ul style="list-style-type: none"> • balance between financial and non-financial measures • variance of measures and measurement practices? 	<ul style="list-style-type: none"> • availability of non-financial supplier performance measures (not perceptible, transactional non-financial measures, relationship-oriented non-financial measures) • systematic characteristics (i.e. standard vs. non-standard measures) of supplier performance measurement and intention to develop such measures (intended vs. not intended)
Observation of a development project at ServA	RQ1	What kind of approach to the measurement of supplier partnerships is desired by company representatives?	N.A.
	RQ2	Can financial measures be used in the measurement of partnerships? What kind of balance between standard and non-standard measures is desired in the measurement of partnerships?	N.A.

The contextual characteristics of each case were also used in the analysis by investigating the differences between the service and manufacturing contexts as well as the project and continuous process production contexts. Both authors were involved in the analysis. The first analysis round was done separately and then the results were compared and reviewed in order to reach consensus. The results were also communicated to the companies studied in order to ensure they reflected the actual practice.

Analysis of observations (M2) was done by raising the most notable decisions or comments having a clear impact on the direction of performance measurement development. The rationales for the contrasting findings in light of the constructs from the existing literature were also sought.

4. Empirical results

4.1. Usage of performance measurement in purchaser-supplier collaboration

Overall, it was perceived that measurement information was quite frequently utilized in the evaluation of suppliers when making purchasing decisions. Some of the companies utilized TCO (total cost of ownership) for analyzing the envisaged benefits of major investments or other strategic purchases. However, the use of TCO was often linked to the activity of suppliers. This is how one of the interviewees described the issue:

"A machinery supplier can provide a certain estimate [...] We should obtain information from the suppliers but the information provided by the suppliers is not binding them in any way." – an operations director, ManufB

Generally, there appeared to be a room for improvement in communicating measurement results (see Table 5). Most of the respondents regarded that the communication of measurement results to the supplier side was not systematic and that it was carried out on an ad-hoc basis. Usually the most obvious deviations in observed results were communicated, for example in a dedicated feedback session. Most of the interviewees stated that there was still room for improvement in supplier communication practices in general, even though different kinds of practices such as supplier meetings and events were increasingly organized.

Table 5 Communication of supplier performance measurement results in the four companies

Company			
ServA	ServB	ManufA	ManufB
Classification of the interview response			
Communicative performance measurement not used*	Communicative performance measurement not used	Communicative performance measurement not used	Communicative performance measurement not used
Description of the interview response			
Communication of measurement results to the supplier side was presented on an ad-hoc basis. There was no indication of communication from the supplier direction, either. * ServA had identified this as a challenge and concurrently initiated a development project (see end of this section).	Suppliers are asked to perform their own measurements as a part of service level agreements (SLAs). Feedback sessions were organized when critical deviations in supplier performance were identified.	Most respondents described their supplier communication without performance measures and only few respondents mentioned recurring discussion regarding deviations and trends in supplier key performance indicators (KPIs) (quality, delivery, price).	Communication with suppliers is mostly carried out without performance measures. Quality deviations are communicated to suppliers.

Measures communicated to suppliers included quality deviations, delivery performance and price trends. However, the information on supplier performance appeared mostly as internal to the purchaser company. Transparency of measurement results between the parties was somewhat limited since bilateral communication on performance measurement results seemed to be almost totally lacking. As an exception, ServB had asked their suppliers to carry out performance measurement and communicate their results as a part of service level agreements (SLAs).

A purchasing director of ServB commented that there was no sense in supplier performance measurement if information was not shared between the parties concerned. The comment was linked to the opportunities of utilizing information possessed by a supplier in improving operations in the purchaser company. ServA had also acknowledged the need to improve their supplier performance measurement. In the development project at ServA it was found that a genuine collaborative performance measurement should begin at the level of individual suppliers. This approach highlighting individual relationships was proposed by a single participant and agreed on by all the participants in the development workshops. The widely shared conception was that supplier-specific measurement would provide in-depth understanding of the success of a partnership and factors affecting that success. This could also be a good way to understand the cause-and-effect chains between joint processes and their benefits since individual partnerships are easier to perceive and evaluate. The variance in partnerships and their evaluation criteria also supported the choice of measurement highlighting individual relationships.

The participants felt that the evaluation of expectations of the partnerships on the part of those concerned was useful and that it could be carried throughout the partnership's life-cycle. According to a purchasing manager of ServA, a key difference in the measurement of partnerships in comparison to the normal supplier evaluations should be that the examination period would be longer, preferably more than a single contractual period. Joint targets could be evaluated regularly and updated if deemed necessary. The examination period of different targets might also vary, which should be accounted for in implementing the measurement approach. Another differentiating factor on which all the participants of the development workshops agreed was that the definition of measures and their targets should be done jointly by the purchaser and supplier companies.

While most of the interviewees in the companies studied perceived a need to develop supplier performance measurement, criticism was also voiced on the importance of measures in supplier communication. A financial director of ManufB stated that formal measurement systems are often too slow since information should be transferred by different and instant means:

“A supplier receives instant feedback [in case of deviations in delivery performance]. We do not do much with historical measurement. We do not wait for some reports [but instantly inform suppliers]. I do not see any added value in investing in such measurements.”

This response gives a good picture of the context-specific requirements of supplier communication and reflects the situation in a business where success is largely determined through the performance of supplier deliveries. A purchasing director of the same company elaborated the same observation by explaining that there are only a limited number of supplier partnerships in which joint targets or measures could be defined. He continued that in maintenance services there can be similar targets with both supplier and their company in relation to the reliability and utilization rates of machinery.

4.2. Status of prerequisites for collaborative performance measurement

4.2.1. Use of non-financial measures

Table 6 summarizes the key observations in each of the companies studied regarding the use of non-financial measures. Overall, there appears to be a room for improvement in balancing the measures used. Most respondents started their description of measures with financial numbers, which were often related to the supply savings achieved as a result of the activities of the purchasing function. ServA appeared to place the lowest reliance on non-financial measures (50 % of the respondents reported their usage) whereas the respondents at ManufB were seemingly more often of the opinion that non-financial measures are available (80 % reported their usage).

Table 6 Usage of financial and non-financial measures in the four companies

Company			
ServA	ServB	ManufA	ManufB
Classification of the interview response			
Some transactional non-financial performance measures utilized	Some transactional non-financial performance measures utilized	Some transactional non-financial performance measures utilized	Some transactional non-financial performance measures utilized
Description of the interview response			
The performance measures presented include a very limited number of non-financial measures, mostly related to service quality. Several respondents expressed a need to improve the situation.	SLAs include measures for the achievement of standards related to supplier quality and service content. A need for measures capturing the competencies of suppliers was mentioned.	Purchasing costs in a dominant role. Non-financial measures typically address failures to meet set targets in quality and delivery performance.	Supplier price development in an important role. Presented examples of non-financial performance measures were complaints per supplier, deviations in quality standards and safety performance. A need to develop non-financial measurement was mentioned, especially in manufacturing support services.

The presented non-financial measures reflected mostly transactions between companies. This means that non-financial measures related almost exclusively to the content of the product/service (e.g. standards defined in SLAs), and deviations in delivery performance and product/service quality. Here is an example of how an ICT director of ServB explained the situation:

“Our standard subcontractors are measured very simply through qualitative criteria such as bugs in software code.”

At ManufB results indicated relatively higher reliance on non-financial measures which was apparently related to measures of delivery performance and supplier quality. Intangible or more qualitative aspects in supplier collaboration were regarded as more challenging to measure. This is how one of the respondents described the issue:

“Of course we try to take account of [intangible aspects] but it is more like based on your intuition or gut feeling. If we have two suppliers which are comparable in monetary terms, we buy from the one which otherwise feels better or more reliable” – a purchasing director, ManufB

The importance of relevant non-financial measures was acknowledged. Much of the criticism and development objects identified in the interviews were related to excessive emphasis on financial measures. A category manager of ManufB linked the role of qualitative measures to a specific message communicated to the personnel and suppliers. This message relates to culture change and change in the way of working, meaning that suppliers can be evaluated on the basis of many different criteria, also qualitative ones. Here would therefore be potential for future development work on purchasing performance measurement. An interesting response regarding the balance between financial and non-financial measures was presented by a category manager in ServA:

“When establishing a purchasing function, there are lots of low hanging fruits which can be picked. But the better, the more systematic and efficient the purchasing function becomes, [...] all the other work [than improvement of cost-efficiency] carried out by the purchasing function becomes more important and there are not many good measures for that. In the beginning there should be quantitative hardcore measures, but when the real value is considered, matters other than savings should be looked at.”

This response is clearly related to the maturity of the purchasing function and how its success should be measured in the longer term. Another perspective on non-financial measures related to whether inputs (monetary resources) or outputs/outcomes were examined. An operations director at ServB stated that purchase price reductions were widely measured, but it was difficult to know the benefits of purchased resources. Measurement information on the competencies of suppliers could be extremely valuable in increasing this understanding. Another representative of the same company explained how it was perhaps not wise to simply compare the prices of purchased services to certain standard benchmark prices. It was more important to understand the outcomes and the value to the company of the services purchased.

It became evident that contextual characteristics and differences between suppliers affect the desired content of measurement. A financial director of ServB pointed out that the requirements for measurement depend on the role of a supplier:

“We have two types of suppliers [having either standard or specific competencies] which require different kinds of measures. If a supplier were to be [independently] responsible for larger [service] offerings requiring specific competencies, more complex measures could be defined.”

Quality-related evaluation was emphasized in connection to service purchases:

“Especially in service purchases which have more long-term impacts, qualitative aspects are important, as well as in large investments. [...] In service purchases service level agreements (SLA) are utilized and aspects related to managing services and co-operating are evaluated.” – a purchasing director, ManufB

Hence it appears that there are suppliers which can be perfectly managed with transactional measures while a selected group of suppliers would require more attention.

During the development of partnership measurement at ServA, many of the workshop participants stressed, somewhat surprisingly, the importance of financial measures. However, several attendees opposed the revealing of absolute monetary values (e.g. sales margins) since it might disclose confidential information to supplier partners. Hence, a relative examination of measurement results in comparison to previous ones was deemed a more neutral way of approaching the issue.

4.2.2. Non-standard nature of measurement

Table 7 presents a summary of the results on the systematics vs. non-standard nature of performance measurement in the studied companies. The results reveal that a difference between the companies representing continuous production (ServA, ManufB) and projects (ServB, ManufA) is identifiable. At ServB and ManufA practices for measuring suppliers were notably non-standard and the respondents did not clearly present a need to seek for more systematic solutions. A prevailing practice of all companies appeared to be that there was no systematic or company-wide PMS for suppliers but various measures depending on purchasing categories and suppliers. However, ServA and ManufB wanted to achieve a more systematic approach and this appeared as a goal in measurement development.

Table 7 Perceptions of performance measurement systematics in the four companies

Company			
ServA	ServB	ManufA	ManufB
Classification of the interview response			
Systematic approach to supplier performance measurement is desired	Non-systematic approach to supplier performance measurement	Non-systematic approach to supplier performance measurement	Systematic approach to supplier performance measurement had recently been developed
Description of the interview response			
A need for a systematic supplier PMS in the form of the Balanced Scorecard was mentioned	Measurement practices varied in the case of different suppliers. Supplier performance measurement was often linked to SLAs including the criteria for service content and quality	Supplier performance measurement practices vary in different purchasing categories. Some measures (e.g. delivery performance) are similar.	A PMS for PSM resembles the Balanced Scorecard, which is complemented by a supplier perspective. The same measures are used at the levels of purchasing function, category and supplier.

In ServB and ManufA it was deemed important that category managers themselves consider which aspects were relevant to be measured. Only a few (typically financial) measures at the whole company level should be systematically in use in each category. At ServB, supplier collaboration was described as a category-specific question and the measures were mostly defined at the category level depending on the object of purchasing. SLAs clearly had a major role in the content of supplier performance measurement. The content of these agreements appeared to vary depending on the suppliers. This is how one of the interviewees representing ServB rationalized their varying measurement practices from the point of view of tailoring their service purchases:

“There is no coherent measurement system but individual measures for each supplier. And we have no system, tools or processes to combine that information. And at the moment I do not think that there is much need to do that either because there are very few suppliers with which we recurrently measure something” – a purchasing director

The recent development work at ManufB arrived at a more systematic way of measuring suppliers. The interviewees were satisfied with the opportunities to compare suppliers with the improved PMS. At ServA there was a pre-designed structure of criteria for evaluating suppliers when making purchasing decisions. A clear need for a systematic approach to measuring supplier performance was also expressed and a purchasing director already described the content of such a measurement and labeled it as “Supplier Balanced Scorecard”:

“Unfortunately we do not have a systematic supplier PMS at the moment. We have discussed the development of Supplier Balanced Scorecard [...] which could include delivery performance, service quality, responsiveness to feedback, validity of billing [...] and we could also conduct subjective supplier evaluation in those categories collaborating with specific suppliers.”

While the overall perception of the interview results at ServA seemed to be in favor of standard supplier measures, it should be noted here that the supplier partnership measurement development project had already chosen an approach highlighting individual supplier partners with their specific objectives. This choice was driven by the difficulty to otherwise understand in-depth the content of a relationship with partner suppliers. However, the representatives of ServA also deemed it important that partners representing the same purchasing category could be compared. Hence the accounting practices were defined in such a way (e.g. average deviance/difference from set targets, trend in agreed performance criteria) that it enabled comparisons despite variance in partnership-specific criteria and targets.

5. Discussion

Many earlier studies have highlighted similar purposes for performance measurement in PSM as in any managerial functions: objectives setting, determining future actions (Gunasekaran *et al.*, 2004), strategic alignment and financial contribution (Pohl and Förstl, 2011), identification of deviations from standards (Cousins *et al.*, 2008) and benchmarking (Giannakis, 2007). This study intended to shed light on a less studied aspect: how performance measurement supports collaboration with suppliers. The key result regarding the first research question is that the companies apply supplier performance measurement widely but mostly in formal control mode. This means that deviations identified in product quality and delivery performance are communicated to suppliers when they occur, but in a non-systematic way. Communication appears one-directional, from purchaser to supplier and even the one-directional communication is limited. This can pose challenges since suppliers easily become demotivated if a purchaser company does not communicate performance evaluation results and link them to other similar suppliers (Sundtoft and Ellegaard, 2011). In addition, this does not embody the idea of collaborative performance measurement where bilateral communication should be facilitated (Noshad and Awasthi, 2015; Prahinski and Benton, 2004). This observation also reflects the lack of communicational structures alongside with performance measurement which has been found to hinder the integration of supply chain (Forslund and Jonsson, 2009).

There can be many different reasons for limited communicative use of performance measurement. One explanation could be that performance measurement, as an intrinsically formal control, is possibly not perceived as an appropriate tool for collaboration. Forslund and Jonsson (2009) proposed that obstacles in supply chain performance measurement can be caused by both relationship-related and operational, measurement tool-related challenges. Cousins *et al.* (2008) concluded that it is not the performance measurement system, but rather the purchaser-supplier socialization mechanisms that are critical to purchaser-supplier relationships. Indeed, all the companies studied had several formal and informal means to communicate with their companies, although the interviewees quite widely presented a need to improve communication in general. While the requirement for functional socialization mechanisms is justifiable, this study sought for explanations for the limited use of collaborative performance measurement from the technical characteristics of performance measurement. If measures are technically inappropriate, they cannot be even considered to support collaboration. The second research question of this study examined two criteria for collaborative performance measurement. Table 8 summarizes the key observations which are explained in more detail below.

Table 8 Overview of the results regarding the pre-requisites for collaborative performance measurement

Studied pre-requisite	Observed status in collaborative performance measurement
Non-financial performance measurement	Non-financial measures are used by all the companies but almost solely regarding past transactions, not bilateral relationships Respondents commonly acknowledged the need to improve non-financial performance measurement
Non-standard nature of measurement	All companies have rather non-standard characteristics in their supplier performance measures In companies with continuous production a more systematic approach to supplier performance measurement was desired

Non-financial measures have been proposed to support the use of performance measurement in inter-organizational collaboration. The observation of the partnership performance measurement development at ServA ended up with a contradictory finding with existing literature. Financial measures were regarded as beneficial but specific attention to the presentation of potentially confidential financial measurement results should be paid.

The non-financial supplier measures identified in this study resemble those reported elsewhere, for example delivery performance, product/service quality and environmental and safety aspects (Chia *et al.*, 2009). Balancing of measurement was an issue where almost all the respondents clearly saw a room for improvement. One of the respondents even linked the issue more widely to the level of maturity of the purchasing function. The earlier literature often discusses non-financial measures as a coherent group of measures although they may contain a very diverse set of measures. Most of the non-financial measures used by the case companies of this study relate to historical transactions. The presented measures can be used as a part of an extended process transcending organizational boundaries (cf. Busi and Bititci, 2006), resembling the practices of buying company and indicating reactive behavior, but not as a genuine means for collaboration. The literature on relationship value (Chatain, 2011; Ulaga and Eggert, 2006) provides some ideas on the aspects (e.g. responsiveness, competencies and time to market) that should be measured when highlighting the true value of purchaser-supplier collaboration. Measures for supplier capabilities were requested by the interviewees of ServB. This is a good example of a measure which could support the creation of relationship value and acting in a proactive, not reactive manner.

Standard definitions for performance measures at different organizational levels and units have often been called for in the literature (Choy *et al.*, 2007; Forslund and Jonsson, 2009). Standard practices enable supplier comparisons and facilitate the aggregation of measurement information. They can support the integration of performance measurement along the supply chain (Forslund and Jonsson, 2009). However, it has been proposed that the use of performance measurement supporting inter-organizational collaboration requires tailoring to specific relationships (Eriksson and Westerberg, 2011). In ServB and ManufA there was a clear variance in the supplier measures applied and this was deemed as a mostly satisfying characteristic of measurement. In ManufB and ServA the prevailing situation was similar but a desire for more standard ways of measuring suppliers was expressed. It should be noted that ServB and ManufA are more project-oriented companies, which may explain their satisfaction with more variable measurement practices. The fact that practices vary is in line with the findings of earlier empirical studies (Andre *et al.*, 2015; Pohl and Förstl, 2011; Forslund and Jonsson, 2009) but the present study also makes the clear observation that a systematic approach is not even desired in specific types of business contexts.

The use of varying performance measures was often justified by stating that in that way the genuinely important aspects can be measured and that the purchasing category-level personnel know these aspects best. Hence, at the company level PSM performance measurement is non-standard. However, this study supports the proposition that standardization of performance measurement at the level of specific supplier relationships is desirable (cf. Forslund and Jonsson, 2009). As illustrated by the Case of ServA, collaborative performance measurement can include similar set of criteria, even though the actual measures vary depending on the characteristics and objectives of a specific relationship. This can still enable the comparison between different suppliers, e.g. by the measurement of goal attainment. It is also notable that the practices of using and communicating measurement results can be similar regardless the specific measures applied.

Finally, the results of this study demonstrate that the importance of collaborative use of performance measurement varies in different contexts and even within the operations of single large companies. Some (and often most) of the suppliers provide standard deliveries and require no specific attention in performance measurement. However, some suppliers are regarded as strategic partners and tailored measurement tools supporting collaboration can actually be designed as the observed development project at ServA demonstrates. Most of the differences between the companies were identified concerning companies with project orientation and continuous production. There is an indication in the findings that collaborative performance measurement is perceived to be more important in project business and it was most evident at ServB, representing knowledge-intensive services. The interviewees of ServB identified the need for more proactive supplier information and had already defined measures together with their suppliers. This suggests that project companies seem to be better prepared for collaborative performance measurement. On the other hand, the findings at ManufB indicate that when the supplier relationship consists of standard transactions, it is not meaningful to consider more complex measurement solutions supporting supplier communication.

6. Conclusions

This study contributes to the literature of performance measurement in PSM by extending the empirical knowledge on collaborative performance measurement and performance measurement in extended enterprises and networks. The objective of this paper was not to provide a framework for collaborative performance measurement but to present and evaluate prerequisites for measurement supporting

collaboration. The empirical examination demonstrates that prevailing performance measurement practices represent a more transactional than relationship-oriented approach to collaboration between purchaser and supplier companies. Communication of measurement information between purchaser and supplier remains limited, and measurement mostly follows the logic where the purchaser company monitors its suppliers in a very similar manner (i.e., identification of deviations from agreed specifications/standards) to what it does in its own operations (cf. extended process measurement). Use of performance measurement in bilateral communication is mostly lacking.

The existing literature points out that the way of using performance measurement needs to be changed in order to facilitate more bilateral communication. The empirical examination of two measurement characteristics (non-financial measurement, non-standard nature) in this study reveals that the proposed technical prerequisites for collaborative performance measurement are not fulfilled. Hence much remains to be done in order to bring to fruition some of the ideas proposed in earlier conceptual papers. As a result of this research, the following proposals for further research are put forward:

- Non-financial performance measurement should not be treated as a single coherent group characterizing the scope of measurement. Cousins *et al.* (2008) already distinguish operational and communicative measures. In this study, differentiation between non-financial measures supporting transactional trading or relationship-oriented collaboration is presented. This difference is significant since the latter measures examining joint processes and results are proposed as more suitable for inter-organizational collaboration.
- Collaborative performance measurement should be applied with careful consideration. It is essentially build upon joint targets between the parties. The greatest potential is realized by concentrating solely on suppliers considered as strategic key partners. This study identifies project business as a potential context to applying collaborative performance measurement since it requires more negotiation and communication during the provision of the deliveries and the role of transactional supplies is often smaller.

This study also has implications for practice. First, the study evaluates the idea of collaborative performance measurement, presents an application of it in one case context and discusses its applicability and potential in different contexts. Second, the paper gives ideas on the desirable characteristics of supplier performance measurement in different contexts to support companies developing their performance measurement practices. Third, the research reveals the need to develop non-financial performance measures further in order to facilitate more proactive use supporting the creation of genuine purchaser-supplier relationship value. Such measures could be linked to supplier competencies, joint processes, new initiatives and relationship characteristics.

This study has limitations, as indeed have most qualitative studies. Only four case settings were studied. The external validity of the findings should be improved by further empirical research. This study investigated the issue solely from the perspective of the purchaser company; the perspective of suppliers could have extended the findings and provided some further explanations for the observations. The study examined large organizations and their PSM measurement as a whole and more specific examination of business-lines and key suppliers should be done in a future study. This could further clarify the content and use of collaborative purchaser-supplier performance measurement.

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