SHARED MANAGEMENT INFORMATION IN BUYER/SUPPLIER RELATIONSHIPS: ITS USEFULNESS AND ITS INFLUENCE ON CONTINUITY EXPECTATIONS

UTILIDAD DE LA INFORMACIÓN DE GESTIÓN COMPARTIDA EN LAS RELACIONES COMPRADOR-PROVEEDOR: INFLUENCIA SOBRE LAS EXPECTATIVAS DE CONTINUIDAD

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ABSTRACT

This paper is focused on the effect that the exchange of management information has on client and/or supplier relationships. Moreover, this study extends the concept of the usefulness of management control information to inter-organizational relationships, analysing how the scope of such information affects continuity expectations, and how these in turn influence opportunistic behaviour and the mutual adaptation of production systems. The data was gathered from 104 purchasing and 90 sales managers of equipment manufacturers on the nature of their respective relationships with their suppliers/ clients. The results confirm that the use of broad-scope management control information sharing in buyer-supplier relationships increases continuity expectations and reduces opportunistic behaviour.

KEY WORDS: Management accounting, management control information sharing, buyer-supplier relationships, continuity expectations, opportunistic behaviours.
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RESUMEN

El objetivo de este trabajo es analizar el efecto que ejerce el intercambio de información de gestión sobre las relaciones con clientes y/o proveedores. Para ello, se extiende el concepto de la utilidad de información de control de gestión a las relaciones ínter-organizativas, analizando cómo su contenido afecta a las expectativas de continuidad y éstas a su vez influyen en el comportamiento oportunista y en la adaptación mutua de sistemas de producción. Los datos analizados se han obtenido de las relaciones entre 104 directores de compras y 90 directores de ventas de empresas industriales con sus proveedores y clientes. Los resultados confirman que utilizar información compartida de control de gestión con un contenido más amplio en las relaciones compredor/proveedor favorece la creación de expectativas de continuidad y reduce comportamientos oportunistas.

PALABRAS CLAVE: Contabilidad de gestión, información compartida de control de gestión, relaciones comprador-proveedor, expectativas de continuidad, comportamientos oportunistas.

1 INTRODUCTION

Interorganizational relationships involve a nascent form of cooperation between firms in order to obtain mutual competitive advantages, such as access to new resources or markets. Different facets of these relationships have been studied in fields such as business organization (Dyer, 1996), marketing (Wuyts and Geykens, 2005), or management accounting (Van der Meer-Kooistra and Vosselman, 2006). Within this latter field, studies have looked at the role of management control systems in supply chain management, where buyers and suppliers use management information to improve coordination, reduce opportunistic behaviours and supply times and/or transaction costs (Van der Meer-Kooistra and Vosselman, 2006).

Management control literature considers management control information sharing to be an important tool to coordinate and control joint activities between companies (Tomkins, 2001; Dekker, 2004). Thus, Van der Meer-Koistra and Vosselman (2000) found that information flow is a crucial element for the development of cooperative relationships between companies, especially in the supply chain between buyers and suppliers (Dekker, 2004). However, the characteristics that shared information in an interorganizational relationship should have in order to improve coordination and establish relationships that are long-lasting and beneficial for both parties are still unknown. Management control literature on interorganizational relationships has studied many cases to describe management control techniques and systems within the supply chain, but has paid little attention to the content of the information that these systems should provide in the buyer-supplier relationships (Dekker, 2004); in addition, these studies do not allow for generalization and comparison of the results (Frances and Garnsey, 1996; Dekker, 2004; Chua and Mahama, 2007).

This paper analyzes the content of shared management control information in buyer-supplier relationships. It proposes a model that examines how broader content of management control information affects continuity expectations. In addition, it analyzes how these expectations influence opportunistic behaviours and production systems. By doing so, the work attempts to enlarge on our understanding of the usefulness of management control information beyond intra-organizational relationships, by considering relationships between companies (e.g. customer and supplier). At the same time, it enlarges on the effect of continuity expectations by analyzing the mediatory role that they play in the relationship's stability. All of this will allow more solid evidence to be contributed on the role of shared management control information in buyer-supplier relationships, thus allowing generalization and comparability of the results.

The empirical study focused on the collaborative relationships that manufacturers of consumer goods have with their industrial customers and suppliers. A questionnaire was

sent to purchasing and sales managers, in which the purchasing managers answered questions on their relationship with a supplier with whom they collaborate and the sales managers on their relationship with an industrial client. This allowed us to analyse the perceptions from the two standpoints, assessing both similarities and differences (Anderson and Narus, 1990). The results suggest that both purchasing managers and sales managers consider that, in order to generate continuity expectations, it is very useful for management control systems to supply information on future events, which are external to the firm and of a long-term nature. The results also show that continuity expectations reduce opportunistic behaviours in buyer-supplier relationships.

The remainder of the paper is structured as follows: the following section describes the theoretical model and formulates the hypotheses. The third section presents the research methodology. The fourth section shows the results and, finally, the fifth section covers the discussion and the conclusions arising from the work, as well as its limitations and possible future lines of research.

2 THEORETICAL FRAMEWORK

The study of the role played by control and coordination in interorganizational relationships has produced a range of reviews concerning management control issues (Binberg, 1998; Speklé, 2001), analyzed through qualitative (Langfield-Smith and Smith, 2003; Dekker, 2004) as well as quantitative studies (Munday, 1992; Kulp, 2002; Mahama, 2006). In addition, these works have used different theoretical approaches, such as the transaction costs theory (Gietzmann, 1996; Anderson and Dekker, 2005), the agent/network theory (Mouritsen, Hansen and Hansen, 2001) or the agency theory (Sánchez, Vélez and Ramón, 2006). Such approaches show the enormous relevance of interorganizational relationships in the supply chain in general (Kulp, 2002), and between buyers and suppliers in particular (Frances and Garnsey, 1996; Anderson and Dekker, 2005).

Typically, the relationship between a buying company and its supplier is characterized by the use of price as the only coordination mechanism (Kulp, 2002). However, as the complexity or the importance of supply increases, the tendency is for a more cooperative strategy (Munday, 1992; Van der Meer-Kooistra and Vosselman, 2000). Information from management control systems supports the development of a stable cooperative relationship between companies and their suppliers and clients (Sánchez, Vélez and Ramón, 2006), especially when oriented towards long-term relationships, where there is a continuity expectation from the parties (Speklé, 2001; Langfield-Smith and Smith, 2003). This management control information sharing enables firms to obtain lower cost products, to control their joint productive processes better (Frances and Garnsey, 1996), to reduce lead times, and to function more efficiently (Tomkins, 2001).

Increased competitiveness and the need for company innovation have made the search for efficiency a top priority in the strategy developed by the parties involved in a collaborative relationship (Anderson and Dekker, 2005). Both parties realize that the relationship's success depends on the other party and on a suitable flow of information due to the need to coordinate activities and efforts in the most efficient way possible (Chua and Mahama, 2007). In this sense, the exchange of management information with broader content facilitates the coordination of tasks as well as efforts between departments (Chenhall and Morris, 1986; Chenhall, 2003). Broad-scope management information features more sophisticated information, which encompasses information oriented geared towards the future, that is external to the company, and that goes beyond the information typically supplied by management control systems (e.g. financial information oriented towards the past that is internal to the organization). Broader management information provides a greater range of solutions for businesses to consider when making decisions (Bouwens and Abernethy, 2000; Naranjo-Gil, 2004).

The exchange of useful management control information affects the strategy developed by the companies participating in the relationship (Mouritsen, Hansen and Hansen, 2001). Naranjo-Gil and Hartmann (2007) found that the availability of a broader set of information facilitates a change towards more cooperative and proactive strategies and stimulates interdepartmental planning and the coordination of operations (Bouwens and Abernethy, 2000; Naranjo-Gil and Hartmann, 2007). Along these lines, Bouwens and Abernethy (2000) stated that in order to achieve effective decentralization and coordination of operations, management needs more sophisticated management information with a greater content range enabling it to face uncertainty and to optimize performance (Chua and Mahama, 2007). Abernethy and Guthrie (1994) found that broad scope, as opposed to reduced scope management information makes it possible to increase the performance of business units that follow more prospective strategies, such as cooperation between clients and suppliers (Naranjo-Gil and Hartmann, 2007). Furthermore, it is the department managers on the frontline, such as purchasing and sales managers, who are aware of the usefulness of broad content information and its greater impact on performance and future continuity of the company (Gul and Chia, 1994; Mia and Chenhall, 1994).

Broad-scope management information not only improves performance but it also facilitates planning joint activities in the organizations (Abernethy and Lillis, 1995; Bouwens and Abernethy, 2000), helps implements flexible and decentralized strategies (Naranjo-Gil and Hartmann, 2007), and increases interdependence between business operations (Abernethy and Lillis, 1995; Perera, Harrison and Poole, 1997). It likewise enables managers immersed in the management of an inter-organizational relationship to gain a better understanding of the processes and activities developed by each of the parties (Abernethy and Guthrie, 1994; Van der Meer-Koistraa and Vosselman, 2000). Furthermore, this type of information means companies face complex and highly dynamic

and uncertain situations such as those that arise in interorganizational relationships (Munday, 1992; Mahama, 2006), reducing the risk of a break in the relationship. For that reason, it may be expected that broad scope management information will increase the continuity expectations that the purchasing and sales managers have of interorganizational relationships. Thus, we set out our first hypothesis:

> **H1:** Sharing broad scope management control information will increase the continuity expectations of the purchasing and sales managers in collaborative relationships.

Strong continuity expectations increase the level of joint action (Heide and John, 1990), which affects the behaviours developed by the parties involved in the relationship. One party may act in its own interests, thereby harming the other through its actions (Birnberg, 1998). This behaviour may be apparent in price increases, a reduction in the quality of the products exchanged or delivery delays (Stump and Heide, 1996; Wuyts and Geyskens, 2005).

Due to the relationships not always being equally beneficial for both parties, one of them may break the agreements they had by reducing the quality of products supplied, falsifying reports on costs or performance, increasing prices or delaying deliveries for their own benefit (Stump and Heide, 1996). These opportunistic behaviours temporarily favour the party that carries them out, and are detrimental to the one that bears them (Wuyts and Geyskens, 2005). However, if both parties feel that the relationship will last over time, the continuity expectation will increase, thereby increasing each party's capacity to respond (Frances and Garnsey, 1996; Stump and Heide, 1996) and reducing the reduction of incentives for opportunistic behaviour. Thus, it may be expected that greater belief in continuity will lead to a reduction in opportunistic behaviours in the relationship, as both parties will act correctly so that the relationship will be successful. Taking this idea into consideration, the following hypothesis is formulated:

> **H2:** Greater continuity expectations entail less opportunistic behaviour on the part of the purchasing and sales managers.

Continuity expectations arise from the need to safeguard the assets involved and to manage the uncertainty stemming from the relationship (Heide and John, 1990). The longer the relationship lasts overtime, the greater the value of the investment in the assets adapted to the other party (Heide and Stump, 1995), whether they are tangible assets such as production systems or distribution channels (Sánchez, Vélez and Ramón, 2006) or whether they are intangible assets such as employee training (Heide and Stump, 1995). Furthermore, long-term relationships normally require investments in specific assets and production systems for the relationship to work and continue over time (Gietzmann, 1996). Heide and John (1990) analyzed the collaborative relationship from the buyer's perspective and they noted that the increase in the continuity expectation entails increases

investment in specific assets, which leads to investment in a more efficient production process as expectations are thought to exist that cooperation will last and future transactions will take place (Noordewier, John and Nevin, 1990). Considering these ideas, we formulated the following hypothesis:

H3: The greater the continuity expectations, the greater the influence wielded by one party over the other party's production systems.

Based on the previous hypotheses, a theoretical model was drawn up (Figure 1) to analyze each of the relationships from the perspectives of the purchasing manager as well as the sales manager.

FIGURE 1.- THEORETICAL MODEL

3 | METHODOLOGY

Data collection and description

The previous hypotheses were contrasted with data obtained from questionnaires sent to purchasing and sales managers at 1,380[1] Spanish manufacturing companies listed in the SIC[2] under numbers 35, 36, and 37 according to the 2004 version of the DUNS 50000 database. The grounds for this selection are that the sectors must be industrial, in which both buyer and supplier are organizations (Dyer, 1996). It is a question of original equipment manufacturers, whose buyers are other wholesale or retailmanufacturers. Management control information is crucial and relevant when suppliers deliver products that are specific and important to each buyer. The supplier and the buyer have at least to invest in specific assets, while cooperation and control are necessary to establish and maintain the relationship (Dekker, 2004).

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[1] From among the 1,380 companies in the sample, those companies with less than 20 employees were excluded (as calls were made to 10% of companies with less than 20 employees from the sample during the pilot study and it was confirmed that they employed the same staff for both the purchasing and the sales functions, which could detract from the validity of their responses), as were those companies that would have ceased to do business or that had delegated the role of purchasing or sales to another company.
[2] Standard industrial classification. These codes refer to companies that manufacture consumer goods: 35 for general machinery, 36 for electronic machinery, and 37 for transportation equipment.

The questionnaire was developed following Dillman's method (2000) that has been demonstrated as perfectly acceptable in accounting and management control studies (see Naranjo-Gil, 2006). Thus, our research was structured in three stages. Firstly, interviews were held prior to sending out the questionnaire (a total of 4 sales department managers were interviewed between the months of January and March, 2006), in which the topic's relevance and the relationship between the variables were confirmed. Secondly, a first draft of the questionnaire was drawn up by means of a careful translation of the original measurement instrument taken from the review of the literature. This draft was submitted for a first evaluation by eight researchers in the field of organization and management control, who suggested various changes to the survey's design and wording and the organization of its questions. Lastly, the questionnaire's draft was pre-contrasted with six sales managers (2 purchasing managers, 3 sales managers, and one technical manager familiar with the supplies. The questionnaire was discussed with each of them in a personal interview of approximately one hour in length, in which they were asked for an opinion on their understanding of the individual items and the measurement instruments. On the basis of their suggestions, the questions, and certain captions and headings were rephrased in the questionnaire to facilitate understanding (Naranjo-Gil, 2006).

The questionnaire was directed at purchasing and sales managers because, as is considered in the literature (Cannon and Perreault, 1999), even though there are other people within the company who might have ample knowledge of the client or the supplier, the sales department managers are the ones who pool more information and whose knowledge covers the majority of points asked about in the survey[3]. In addition, so that their response would relate to a specific relationship, an explanation was inserted at the beginning of the questionnaire which pointed out that: *"The following questions attempt to analyze aspects of your company and its relationship with the supplier (client) with whom it has a certain degree of* **collaboration**, *the latter being understood as that which is brought about when* **your company and your supplier (client) work as if they were a team**, *allowing both companies to reach their objectives and increase the profitability of their business."*

The questionnaires were sent out by post on September 15, 2006, as well as by email over the months of November and December, 2006 and January, 2007, and the process ended in February, 2007 with the receipt of a total of 198 questionnaires, of which 194 were useful (97.9%)[4], 104 were from purchasing managers and 90 were from sales

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(3) Examples of people who responded to this survey and their responsibilities are: "global purchasing manager", "sales manager", "sales & marketing director", purchasing managers and sales managers.
(4) It should be noted that a non-answer could become a serious problem if it were to show systematic differences between those that respond and those that do not respond, and if such differences affected the results. In order to resolve this problem, tests were carried out to demonstrate that there were no systematic differences; a comparison of the answers for the first and the last people surveyed among the purchasing executives and sales executives using the Chi-square Test for the total population based on the SIC code from the original list and the response to the survey and the Chi-s quare Test for the SIC Code indicated that neither the response from the purchasing executives nor from the sales executives differed between each other, which shows that there is no systematic skew due to non-answers (Naranjo-Gil, 2006).

managers, making the size of the sample comparable to previous studies (Kulp, 2002; Mahama, 2006)[5].

Measurement of variables

Three criteria were identified in order to select the scale that would measure the variables. Firstly, whenever possible, it should have been used in previous studies or other accounting studies (Chenhall and Morris, 1986) or in the context of survey-based interorganizational relationships (Heide and John, 1990; Heide and Stump, 1995; Wuyts and Geykens, 2005). Secondly, it should have shown reliability and validity in the latter studies. Lastly, its length should be as limited as possible (Naranjo-Gil, 2006). Although the chosen scales were validated in intra-organizational environments (e.g. Chenhall and Morris, 1986), we considered it advisable to transfer them to the interorganizational context. In this sense, and according to Langfield-Smith and Smith (2003), an appropriate departure point for the study of management control systems in new interorganizational scenarios is to consider them as either intra-organizational management control systems or as belonging to one sole business,.

Usefulness of the scope of management control information sharing

The usefulness of management control information is defined as its importance and relevance as perceived by the person who should take a particular decision (Chenhall and Morris, 1986). Such information may be considered useful whenever managers see that it can help them control areas under their responsibility (Bouwens and Abernethy, 2000). The *scope* reflects the content of the management control information. This content is divided in three aspects: range (if it contains information that is internal or external to the organization), quantification (monetary or non-monetary character of the information) and timeframe (allows decision-making in the short run or long run, or includes past events or future predictions) (Chenhall and Morris, 1986). A continuum is considered to be between a "narrow scope" (only includes information about the organization, strictly monetary in character, outdated and oriented towards the short term) and a "broad scope" (also includes information about the organization's environment, not monetary, far-sighted and oriented to the long term). This variable was evaluated on the basis of four questions that were analyzed using the scales proposed by Chenhall and Morris (1986) (Table 1) which have been widely tested in later works (e.g. Bouwens and Abernethy, 2000; Naranjo-Gil and Hartmann, 2007).

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(5) We must emphasize the difficulty of accessing the specific professionals, either because of the high number of questionnaires to which, from different sectors, they are asked to respond or because of the reticence to provide information about the management of their company. This low response makes for a lower participation in management control research (Gul and Chia, 1994; Bouwens and Abernethy, 2000).

TABLE 1.- QUESTIONS SELECTED TO MEASURE THE USEFULNESS
OF THE BROAD SCOPE OF MCIS[1]

Adapted Item	Original Item	Item No.[2]
Evaluate the degree of **usefulness to the relationship** with this supplier/customer that may be given to the **management information that** you receive from **the supplier/customer or that your company provides to this supplier/customer,** considering the following characteristics[3]:		
Compared with information about **past events,** you think that information about **future events** is	Information which relates to possible future events (if historical information is most suitable for your needs, mark the lower end of the scale)	AM1
Compared with **internal** information, you think that information that is **external to the relationship** is	Information on broad factors external to your organization, such as economic conditions, population growth, technological developments, etc	AM2
Compared with information that is **financial or monetary** in nature, you think that information that is by nature **non- financial or non- monetary** is	Non-economic information, such as customer preferences, employee attitudes, labour relations, attitudes of government and consumer bodies, competitive treats, etc	AM3
Compared with **short-term** information, you think that **long-term** information is	Information on the effect of events on particular time periods (e. g. monthly/ quarterly/ annual summaries, trends, comparisons, etc.)	AM4

(1) Management control information sharing (MCIS).
(2) In the original questionnaire, the items were not numbered.
(3) Supplier/customer will be used in order not to duplicate the tables, considering that "supplier" appeared in the questionnaire sent to the purchasing managers, and "client" in the questionnaires sent to the sales managers.

Continuity Expectations

This is defined as the perception of a bilateral expectation of a future interaction involving interpersonal connections, as well as an expectation of continued exchange (Heide and John, 1990). The scale is adapted from the work of Heide and John (1990) and describes the purchasing executive's or the sales manager's perceptions of continuity in the future relationship, the actions taken by their companies, as well as those taken by the other party (see Table 2).

Opportunistic behaviour

Opportunistic behaviour occurs when one of the parties repeatedly exaggerates its needs to get what is desired or hides relevant information (Wuyts and Geykens, 2005), frequently alters what has been agreed in order to obtain its objectives, or promises to do things even though it has no real intention of doing them (Wuyts and Geykens, 2005). This variable's scale describes the degree to which one party shrewdly pursues its own interest, providing erroneous or incomplete information, breaking promises, or exaggerating its needs in order to obtain what is desired (see Table 2). The four items have been adapted from the work of Wuyts and Geykens (2005).

Received Influence

Received influence is defined as the capacity that one party has to intervene in the set-up of the other's production system (Heide and Stump, 1995). This is because the companies involved in cooperative processes normally invest in assets that lead to changes in the production processes (Gietzmann, 1996). In this case, the scale, which was adapted from the work of Heide and Stump (1995), describes the influence that the other party has on the specificity of the productive process and focuses on the items that describe the influence on the productive system (see Table 2).

TABLE 2.- QUESTIONS SELECTED TO MEASURE CONTINUITY EXPECTATION, OPPORTUNISTIC BEHAVIOUR AND RECEIVED INFLUENCE

Adapted Item	Original Item	Item No.
Now we will ask you about the characteristics of your relationship with this supplier/customer:		
Your company expects that the relationship will continue over time	The parties expect this relationship to last a long time (Heide and John, 1990; p. 30).	EC1
You believe that your supplier/customer expects the relationship to continue over time	The parties expect this relationship to last a long time (Heide and John, 1990; p. 30).	EC2
Your company makes plans based on continuance	The parties make plans not only for the terms of the individual purchase, but also for the continuance of the relationship (Heide and John, 1990; p. 30)	EC3
The supplier/customer makes plans based on continuance	The parties make plans not only for the terms of the individual purchase, but also for the continuance of the relationship (Heide and John, 1990; p. 30).	EC4
This supplier/customer often exaggerates its needs to obtain what it desires	This supplier often exaggerates its needs to get what it desires (Wuyts and Geykens, 2005, p.114).	CO1
This supplier/customer often alters what has been agreed upon to obtain what it wishes	This supplier often alters the facts to get what it wants (Wuyts and Geykens, 2005).	CO2
This supplier/customer often promises to do things that it does not do later on	This supplier often promises to do things, even though it actually had no intention of following through (Wuyts and Geykens, 2005).	CO3
You believe that the supplier/customer hides important information	We have reason to believe that this supplier hides important information from us (Wuyts and Geykens, 2005).	CO4
Your production system is adapted to the supplier	Our production system has been tailored to using the particular items bought from this supplier (Heide and Stump, 1995).	IR1
A specific production system was imposed on you/This client imposed a specific production system	Our production system has been tailored to using the particular items bought from this supplier (Heide and Stump, 1995).	IR2

4 | EMPIRICAL ANALYSIS

Validity and reliability of the measurements. Metric invariance assessment

This reseach project uses latent factors that have been measured with Likert 1-7 scales. This makes it essential to accept the existence of measurement errors in the indicators for which reason the use of Structural Equation Models is an appropriate tool for validating the scales (using confirmatory factor analysis) as well as to test the proposed causal relationships.

A priori, both samples collected come from two different sources (purchasing managers and sales managers). In both samples, the variables have been measured in the same way since the purpose of the research is to know whether both parties to the relationship behave in a consistent manner. Even though in this case the relationship has not been examined as a dyad, which is to say, by gathering data from both parties involved in the same relationship, studying the variables for the population of purchasing managers as well as for the population of sales managers allows us to see whether the behaviours are consistent in both contexts. This approximation has been considered valid in previous studies of interorganizational relationships (Anderson and Narus, 1990; Doney and Cannon, 1997).

The use of samples from different populations leads us to consider that both samples are perhaps not completely equal, such that it would be appropriate to set out a multiple structural model instead of a single model that considers the data as an aggregate (Bentler, 2006). However, before considering the assumption that both samples are equivalent as valid, we should examine whether the populations are completely different as far as the observed variables are concerned. It is therefore to be expected that the covariance matrices of both samples will be different, and in this case the structural models that generate both variance and covariance matrices are probably completely different. Thus, there would be no reason to use multi-group analysis, but rather the correct approach would be to propose a different model for each sample.

However, if the populations are completely equal as regards the observed variables, both sample variance and covariance matrices should be identical, in which case there would therefore only be one model in which all sample parameters would be equal in both populations. Nevertheless, in reality these two situations can be considered extremes of the same continuum. The likelihood is that the populations in which similar behaviours are expected *a priori* (as is the case) and in which the population parameters may therefore be considered equal, will show differences when these parameters are estimated due to the error that is produced by using sample data instead of observing the whole population. Multi-group analysis therefore enables both samples to be simultaneously analysed which makes it possible to verify the model when it is identical for both populations, by

approximating the demographic parameters through an estimation of the sample parameters that takes account of the error that is introduced when observing a sample instead of the whole population (Bentler, 2006).

Multi-group analysis appears to be the most appropriate approximation for the case under study. EQS 6.1 software for Windows was used and the models were estimated using maximum likelihood. As the conditions that take account of the normalized value of Mardia's coefficient for multivariate normality were not met, the results of the robust statistics are presented (Mardia, 1970).

The first step is to evaluate whether both samples (i.e. purchasing managers as well as sales managers) should be considered separately or on the contrary whether a single variance and covariance matrix exists and one vector of averages that describes both populations. In order to do this, we used the method proposed by Steemkamp and Baumgartner (1998) that was developed for validating scales in different countries and is applicable to any multi-sample analysis (Bentler, 2006). The starting point of this method is to confirm whether the variance and covariance matrices and the mean vectors are equal in both groups. As shown in Table 3, the chi-square test of the model that considers equality of means and of covariance in both groups is significant (p-value <.05), because of which it is not possible to accept equality in both samples. The same happens for the model that only considers equality of variance and covariance matrices and in the mean equality model. In addition, having seen the results it can be concluded that the differences between the two groups is due to the mean vectors of the indicators since that model presents a worse fit. This means that the data must be considered as two different groups and cannot therefore be aggregated. Consequently, multi-group analysis will be used for validating the scales as well as to test the proposed structural model, taking into account the differences that exist between the two groups.

TABLE 3.- MODEL COMPARISONS ACROSS SAMPLES

Model	Chi-square	Satorra-Bentler Chi-square	Degrees of freedom	RMSEA	CFI	Robust RMSEA	Robust CFI
Equality of Σ and μ	301.460	273.150 (0.000)	119	0.089	0.883	0.082	0.895
Equality of Σ	196.831 (0.000)	166.726 (0.000)	105	0.067	0.895	0.055	0.912
Equality of μ	101.432 (0.000)	-	14	0.180	0.972	-	-
Configuration Invariance	226.930 (0.000)	209.3473 (0.000)	143	0.055	0.976	0.049	0.807
Metric Invariance	163.999 (0.000)	150.4837 (0.00241)	105	0.054	0.983	0.047	0.833

Since it is a question of a multi-group analysis, the need arises to study the equivalence between the measurements of both groups and to guarantee that the results of the structural analysis are consistent in both groups. It is therefore necessary to consider the metric invariance of the items (Steenkamp and Baumgartner, 1998). Metric invariance exists when factor loadings that relate items with each latent factor are equal in both groups.

The ideal situation is not only to have metric invariance but also invariance in the mean of the items, in the variances of the measurement errors and in the factor covariances and variances (Steenkamp and Baumgartner, 1998). However, in some cases these necessary conditions may be relaxed. Thus, it is sufficient that, in addition to the item with a loading fixed at 1 (marker), there be at least some other item with a factor loading that may be considered equal in both groups for the measurements to be equally consistent in both samples. If this happens, it may be said that there is at least partial metric invariance (Steenkamp and Baumgartner, 1998).

The first aspect to take into account in evaluating the metric invariance is to consider whether the items found in the model show the same configurations, that is, if the factor loadings are equally significant in both contexts and the proposed factors may be described in the same way in both samples. This is what is known as *configuration invariance*. Table 4 shows the factor loadings of two measurement models. Model 1 contains all of the proposed items jointly used to measure the latent factors, estimating the correlation that exists between all the factors. It is known as a joint measurement model. Only those items from model 1 that guaranteed the scales' reliability and validity have been kept in model 2, however (Fornell and Larcker, 1981). In order to assure the validity of the scales, two points have been taken into account. In the first place, the factor loadings must be significant and, in second place, the measurement models for each latent factor must present a suitable fit. As may be seen in Table 4, the first condition is met as all the factor loadings showed significant values at 1%.

The second of the requirements involves the performance of a confirmatory factor analysis for each proposed factor and in each group. In the case of the latent factors that contained three or fewer items, it was necessary to validate them along with another factor. This is the case for received influence in model 1, and the scope and continuity expectation in the second model (where in each case, it was necessary to eliminate an item to obtain the validity of the measurement) that were jointly validated with the opportunistic behaviour.

The measurements for goodness of fit that were obtained as a product of the factorial analyses are presented in Table 5 (these analyses were consistent with the results obtained in the exploratory factor analysis previously performed with the help of the SPSS 14

program, in which the parameters were estimated using maximum likelihood and Varimax rotation). As can be seen in Table 5, some of the factors did not initially present convergent validity since the measurements for goodness of fit were not acceptable. Only opportunistic behaviour and received influence present goodness-of-fit measurements that are acceptable with the measurements initially proposed. The rest of the factors were modified in order to obtain convergent validity and therefore, as may be seen from Table 5, the goodness-of-fit measurements in model 2, which is to say the confirmatory factor model for each latent factor with some items eliminated, presented satisfactory goodness-of-fit measurements, when the broad scope and continuity expectations factors were measured with three instead of the four initially proposed items (item AM3 was eliminated in the case of broad scope and EC3 for continuity expectations). Two criteria were used to reduce the number of indicators and thereby modify the measurement models. On the one hand, those items that presented factor loadings below 0.5 in some groups were eliminated. On the other, items were eliminated in an effort to increase the value of the variance extracted (Fornell and Larcker, 1981; p. 46). As can be seen in Table 4, the eliminated items were those that presented lower factor loadings in each factor when the factor analysis was carried out together with all the measurements.

Model 2 in Table 4 was reached by following this procedure where those items were maintained that met the reliability and validity criteria in both groups.

Discriminatory validity is another of the points to take into consideration when accepting invariance with regard to configuration. In the joint measurement model (in which all the correlations between factors are included) the latent factors must be independent, which is the case in both samples given that all the correlations between the squared factors are less than the average variance extracted (AVE) for the factors (Fornell and Larcker, 1981) (see Table 6). In this way, validity is reached in the configuration of the measurements for both samples. (Steenkamp and Baumgartner, 1998)

The joint measurement model (for both samples performed by means of the multi-group analysis and considering all the related factors) that is proposed as valid would include the items proposed in Model 2 of Table 4. This model's fit may not be entirely rejected as the values of CFI and RMSEA were acceptable: (Chi-square: 146.371; p-value: 0.000; degrees of freedom: 97; GFI: 0.895; CFI: 0.986; RMSEA: 0.051; Satorra-Bentler Chi-square: 137.697; p-value: 0.004; Robust CFI: 0.851; Robust RMSEA: 0,047). These results lead us to accept Model 2 as the best approximation of the configuration invariance.

TABLE 4.- METRIC INVARIANCE ASSESSMENT ACROSS GROUPS[1]

Standardized factor loadings					
Factor	Purchasing Manager	Sales Manager	Purchasing Manager	Sales Manager	Metric Invariance
	Model 1		Model 2		
F1- Broad Scope					
AM1	0.605	0.699	0.700	0.692	Marker
AM2	0.744***	0.380***	0.692***	0.418***	Invariant
	(4.829)	(2.599)	(4.641)	(2.822)	
AM3	0.539***	0.455***	-	-	
	(3.265)	(3.09)			
AM4	0.589***	0.712***	0.564***	0.698***	Invariant
	(4.474)	(4.033)	(4.406)	(3.112)	
Reliability	0.715	0.655	0.691	0.637	
AVE	0.389	0.337	0.429	0.380	
F2- Opportunistic behaviour					
CO1	0.586	0.736	0.584	0.735	Marker
CO2	0.748***	0.846***	0.746***	0.846***	Invariant
	(5.045)	(8.311)	(5.037)	(8.323)	
CO3	0.772***	0.880***	0.775***	0.879***	Invariant
	(5.514)	(7.677)	(5.500)	(7.693)	
CO4	0.742***	0.745***	0.740***	0.746***	Invariant
	(5.370)	(6.976)	(5.322)	(6.991)	
Reliability	0.806	0.879	0.806	0.879	
AVE	0.512	0.647	0.511	0.646	
F3- Received Influence					
IR1	0.643***	0.601***	0.614***	0.600***	Invariant
	(2.353)	(6.912)	(2.591)	(6.896)	
IR2	0.495	0.986	0.519	0.986	Marker
Reliability	0.491	0.791	0.487	0.790	
AVE	0.329	0.667	0.323	0.666	
F4- Continuity Expectations					
EC1	0.853	0.729	0.784	0.648	Marker
EC2	0.764***	0.871***	0.831***	0.990***	Invariant
	(7.762)	(6.523)	(4.099)	(4.538)	
EC3	0.537***	0.482***	-	-	
	(6.997)	(3.622)			
EC4	0.7***	0.694***	0.722***	0.660***	Invariant
	(4.75)	(4.488)	(4.099)	(4.011)	
Reliability	0.810	0.794	0.823	0.819	
AVE	0.522	0.501	0.609	0.612	

(1) *** p < .01, ** p < .05, * p < .10. The values presented in the Table correspond to the standardized loadings (t-values appear in parenthesis). AVE = Average Variance Extracted.

TABLE 5.- CONFIRMATORY FACTOR ANALYSIS[1]

Goodness-of-fit Measurements					
Factor		Purchasing Manager	Sales Manager	Purchasing Manager	Sales Manager
		Model 1		Model 2	
Broad Scope	Chi-square	9.575	1.497	20.908	13.950
4 items/ 3	Degrees of freedom	2	2	14	14
items	p-value	0.008	0.473	0.104	0.453
	GFI	0.901	0.992	0.947	0.957
	AGFI	0.805	0.960	0.894	0.914
	Satorra-Bentler Chi- square	7.647	1.631	18.767	14.905
	p-value	0.022	0.442	0.174	0.385
	Robust RMSEA	0.166	0.00	0.057	0.027
Continuity	Chi- square	16.546	25.262	28.295	23.819
Expectations	Degrees of freedom	2	2	14	14
4 items/	p-value	0.000	0.000	0.013	0.048
3 items	GFI	0.930	0.900	0.931	0.934
	AGFI	0.652	0.499	0.861	0.868
	Satorra-Bentler Chi-square	6.672	18.587	22.510	15.874
	p-value	0.036	0.00	0.069	0.3211
	Robust RMSEA	0.151	0.305	0.077	0.039
Received	Chi- square	25.334	20.352	=	=
Influence	Degrees of freedom	9	9	=	=
2 items	p-value	0.003	0.016	=	=
	GFI	0.930	0929	=	=
	AGFI	0.836	0.835	=	=
	Satorra-Bentler Chi- square	19.826	16.241	=	=
	p-value	0.019	0.062	=	=
	Robust RMSEA	0.108	0.095	=	=
Opportunistic	Chi- square	0.891	3.604	=	=
Behaviour	Degrees of freedom	2	2	=	=
4 items	p-value	0.640	0.165	=	=
	GFI	0.996	0.980	=	=
	AGFI	0.979	0.901	=	=
	Satorra-Bentler Chi- square	0.559	3.008	=	=
	p-value	0.756	0.222	=	=
	Robust RMSEA	0.00	0.075	=	=

[1] Recommended values to guarantee fit: Robust RMSEA <0.05, p-value>0.05 GFI>0.9 AGFI>0.9.

TABLE 6.- DISCRIMINANT VALIDITY: PURCHASING MANAGER AND SALES MANAGER[1]

	Purchasing Manager				Sales Manager			
	F1	F2	F3	F4	F1	F2	F3	F4
F1 - Broad Scope	0.429[a]				0.380[a]			
F2 - Continuity Expectations	0.054	0.511[a]			0.005	0.646[a]		
F3 - Received Influence	0.029	0.255	0.323[a]		0.001	0.001	0.666[a]	
F4 - Opportunistic Behaviour	0.165	0.141	0.008	0.609[a]	0.102	0.108	0.021	0.612[a]

(1) Variance extracted is indicated with a "a" (the values of the correlations between factors squared can be found below the diagonal).

The configuration invariance was a step prior to verification of the metric invariance as the joint measurement model previously proposed does not indicate whether the individuals of the two groups understood, and consequently responded to the questions that were put to them in the same way. Following the procedure proposed by Steenkamp and Baumgartner (1998), it becomes necessary to check whether there is metric invariance. In order to accomplish that, the previously accepted configuration invariance model was tested using the chi-square difference statistic corrected by Satorra and Bentler (2001) to establish whether it differs significantly from an alternative model in which all the equal factor loadings in the two groups are considered (metric invariance model in Table 3). The results of this test show that there are no significant differences in the two models (Satorra-Bentler Scaled Difference: 12.461; degrees of freedom: 8; chi-square p-value: 0.132). This shows that the metric invariance is accepted for the proposed items in model 2. Additionally, Lagrange multipliers, also known as LMtest (Bentler, 2006), show that the imposed restrictions are appropriate and as none of them is significant they can be kept in the model, thereby contributing consistency and validity to the measurements in both samples (Steenkamp and Baumgartner, 1998).

Test of hypotheses

In order to evaluate metric invariance it was necessary to use Structural Equation Models and multi-group analysis. The same tools will be used to contrast the proposed hypotheses in this section for the reasons discussed in the previous section concerning the use of the multi-group analysis as an analytical tool for populations with similar behaviours estimated by the sample parameters. The standardized loadings and the level of significance of the proposed relationships appear in Table 7. They also included the direct relationships between the use of the scope of the management control information and the opportunistic behaviour and the received influence, as shown by the arrows with dotted lines in Figure 2 aiming to examine the measurement relationship of the continuity expectations in the model.

TABLE 7.- RESULTS OF THE STRUCTURAL MODEL[1]

Independent Variables	Dependent Variables	Proposed Model		Adjusted Model	
		Purchasing Manager	Sales Manager	Purchasing Manager	Sales Manager
Broad Scope	Continuity Expectations	0.296***	0.319***	0.289***	0.303***
		(2.847)	(2.376)	(2.861)	(2.331)
Broad Scope	Opportunistic Behaviour	-0.169	0.071	-	-
		(-0.791)	(0.243)		
Broad Scope	Received Influence	-0.306	-0.023	-	-
		(-0.914)	(-0.061)		
Continuity Expectations	Opportunistic Behaviour	-0.601**	-0.624***	-0.711***	-0.602***
		(-2.018)	(-2.760)	(-2.709)	(2.977)
Continuity Expectations	Received Influence	-0.055	0.389	-	-
		(-0.140)	(1.239)		
Model Fit					
Chi-Square (p-value)		174.593 (0.000)		94.888 (0.044)	
S-B Chi (p-value)		159.782 (0.001)		84.759 (0.164)	
Degrees of freedom		107		73	
CFI		0.980		0.965	
Robust CFI		0.806		0.977	
GFI		0.877		0.910	
AGFI		0.821		0.864	
RMSEA		0.057		0.040	
Robust RMSEA		0.051		0.029	

(1) *** $p < .01$, ** $p < .05$, * $p < .10$. The values presented in the Table correspond to the standardized loadings (t-values appear in parenthesis). Recommended values to guarantee the fit: Robust RMSEA <0.05, p-value>0.05, CFI>0.9, GFI>0.9 and AGFI>0.9.

FIGURE 2.- RESULTS OF THE EMPIRICAL ANALYSIS
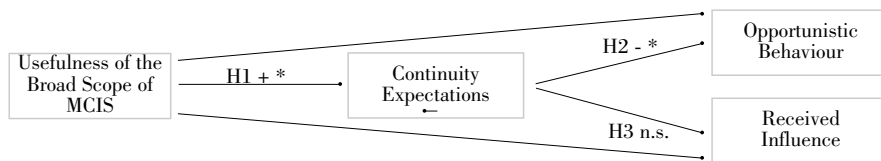
The results of the proposed model show differences between the purchasing executive and the sales manager (Table 7). In the first place, the use of the scope of management control information in the broad sense has a positive and significant[6] effect both for the purchasing managers and for the sales managers (Figure 2). Thus, the companies that develop a collaborative relationship with their clients and suppliers will have to consider that when broadening the content of the management control information, in the case of the businesses that cooperate, the most useful information will be the external, non-financial, long-term, future-oriented information, if they wish to increase the continuity expectations of the relationship. These results lead us to accept hypothesis 1.

As for the proposed relationship in hypothesis 2, which proposed that greater continuity expectations would lead to less opportunistic behaviour, the results of both the purchasing managers and the sales managers samples show a negative and significant relationship (Table 7, Figure 2). Thus, we may also accept hypothesis 2 as it is proposed.

As for hypothesis 3, which proposed that the greater the continuity expectations the greater the influence of one party on the production system of the other, the results are contradictory between the purchasing managers and the sales managers, the former having a negative sign and latter a positive one. However, in no case is it significant (Table 7).

The proposed theoretical model analyzed the continuity expectations as a mediator between the variables of the model. Direct relationships were introduced between the usefulness of the scope of the management control information and opportunistic behaviour and received influence, in order to verify whether the measurement is pure or, if on the contrary, there are also direct effects. The results show that these direct effects are not significant; therefore, we can consider the measurement pure. In addition, given that received influence has no significant relations with the rest of the variables and with the objective of improving the model's fit, we considered the elimination of the non-significant relationships. With these modifications, a new adjusted model was built, in which the same significant relationships as proposed in hypotheses 1 and 2 continue to be upheld, for the purchasing managers as well as the sales managers. In addition, the model's fit improves and begins to display acceptable values (see Table 7).

Lastly, in the annex the variance and covariance matrix is presented, which includes the variables used for measuring the latent factors, in both cases the purchasing manager and the sales manager.

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(6) The symbol of the relationship in Figure 2 is shown with a "+" if the relationship is positive and with a "-" if it is negative. In addition, if the relationship is significant it is marked with a "*".

5 CONCLUSIONS

This paper set out to examine the use of management control information in a buyer-supplier relationship, analyzing how the exchange of information could affect the generation of the parties' expectations and how these would influence desirable behaviour, avoiding opportunist behaviour and increasing mutual influence between the production systems. The results show that broader content of control information allows increasing continuity expectations intervening in the parties' behaviour and reducing opportunistic behaviours. Concretely, it can be seen that management control information on future events, environmental factors and oriented towards the long term, as opposed to information about past events, internal to the relationship and oriented towards the short term, supports the parties' expectations regarding the continuance of the relationship with its suppliers and industrial customers. This allows us to confirm the importance that this broad scope had within the organization (Bouwens and Abernethy, 2000), as a determinant of the coordination of tasks between departments (Chenhall and Morris, 1986), activity planning (Abernethy and Lillis, 1995), and business decentralization or performance (Mia and Chenhall, 1994; Naranjo-Gil, 2004); it is also useful in buyer-supplier relationships, by which the spectrum of the usefulness of management control information can be expanded to interorganizational relationships.

On the other hand, our results show that greater continuity expectation reduces opportunistic behaviour. Thus, purchasing managers and sales managers, given the mediating characteristic these expectations have in our model, can exchange broad scope in management control information in order to stimulate desirable behaviours in the relationship, prevent possible breaks and allow the advantages that stem from the relationship itself to be maintained (Dyer, 1996; Van der Meer-Kooistra and Vosselman, 2000).

As regards the relationship between the continuity expectations and the received influence in the production systems, even though the literature review showed a positive relationship between them, our results were inconclusive. The non-significance of the relationships may be due to aspects such as the development of joint actions (Heide and Stump, 1995) or the coordination of tasks that may have a greater impact on the adaptation of the production systems (Dekker, 2004). In other words, it would be necessary to analyze all the specific assets together, not only the production systems, given the high interrelation of this and other aspects, such as the training of personnel or the geographic location of the production facilities (Dyer, 1996; Anderson and Dekker, 2005).

Lastly, cooperation between businesses, as has been pointed out, generates advantages for the participants. In this study, we have focused our efforts on identifying how broad scope of management control information is useful in collaborative relationships between consumer goods manufacturing companies and their suppliers and clients, even though our

results can be extrapolated to any relationship between companies where there is cooperation and freedom to enter or leave the relationship. Nevertheless, this broad scope could also generate continuity expectations in other types of relationships where the degree of dependence between parties is greater or freedom to leave the relationship is limited. Such is the case with relationships where the supplier has only one industrial client due to the product being very specialized, or the members of a distribution channel that exclusively supplies only one brand or product. A future line of research would be to analyze the use of management control information in non-cooperative relationships.

This research like any empirical research has its limitations; some are related to the data collection method. The survey does not allow the causality of the relationships to be analysed, as the data is collected at a certain point in time. In addition, any generalization of the results should be carried out with caution, as the chosen sectors may contain certain unconsidered idiosyncrasies, though we think the sectors have a common pattern that makes it feasible to generalize the results.

ANNEX.- MATRIX OF PEARSON CORRELATION BETWEEN ITEMS: PURCHASING MANAGER

	Am1	Am2	Am3	Am4	IR1	IR2	EC1	EC2	EC3	EC4	CO1	CO2	CO3	CO4
Am1	1													
Am2	0.486(**)	1												
Am3	0.195(*)	0.423(**)	1											
Am4	0.409(**)	0.374(**)	0.406(**)	1										
IR1	-0.042	0.022	0.106	-0.017	1									
IR2	-0.091	-0.131	0.090	-0.055	0.318(**)	1								
EC1	0.231(*)	0.267(**)	0.200(*)	0.130	-0.057	-0.043	1							
EC2	0.254(**)	0.195(*)	0.151	0.211(*)	-0.127	-0.015	0.658(**)	1						
EC3	0.120	0.231(*)	0.119	0.049	0.019	-0.073	0.547(**)	0.272(**)	1					
EC4	0.137	0.306(**)	0.214(*)	0.162	-0.065	0.011	0.545(**)	0.606(**)	0.365(**)	1				
CO1	-0.089	-0.331(**)	-0.183	-0.153	0.137	0.017	-0.115	-0.126	-0.112	-0.294(**)	1			
CO2	-0.025	-0.101	-0.057	-0.180	0.378(**)	0.251(*)	-0.226(*)	-0.157	-0.089	-0.131	0.409(**)	1		
CO3	0.014	-0.129	-0.052	-0.130	0.250(*)	0.280(**)	-0.272(**)	-0.239(*)	-0.147	-0.335(**)	0.478(**)	0.570(**)	1	
CO4	-0.126	-0.113	-0.123	-0.184	0.180	0.147	-0.320(**)	-0.259(**)	-0.190	-0.254(**)	0.463(**)	0.565(**)	0.556(**)	1

** The correlation is significant at level 0.01 (bilateral).
* The correlation is significant at level 0.05 (bilateral).

ANNEX.- MATRIX OF COMPLETE CORRELATIONS BETWEEN ITEMS: SALES MANAGER

	Am1	Am2	Am3	Am4	IR1	IR2	EC1	EC2	EC3	EC4	CO1	CO2	CO3	CO4
Am1	1													
Am2	0.271(**)	1												
Am3	0.321(**)	0.078	1											
Am4	0.486(**)	0.302(**)	0.350(**)	1										
IR1	0.002	0.282(**)	0.124	0.031	1									
IR2	-0.031	0.136	-0.015	0.014	0.591(**)	1								
EC1	0.262(*)	0.090	0.149	0.245(*)	0.362(**)	0.214(*)	1							
EC2	0.200	0.147	0.082	0.152	0.269(*)	0.071	0.641(**)	1						
EC3	0.163	-0.009	0.157	0.053	0.456(**)	0.293(**)	0.528(**)	0.321(**)	1					
EC4	0.118	0.175	0.066	0.033	0.397(**)	0.224(*)	0.385(**)	0.654(**)	0.390(**)	1				
CO1	-0.061	0.064	-0.086	-0.027	0.072	0.103	-0.045	-0.091	0.128	0.010	1			
CO2	-0.205	0.085	-0.162	-0.098	-0.098	0.141	-0.132	-0.311(**)	0.037	-0.167	0.665(**)	1		
CO3	-0.064	0.065	-0.130	-0.025	-0.159	-0.027	-0.188	-0.292(**)	0.052	-0.229(*)	0.625(**)	0.738(**)	1	
CO4	0.023	0.037	-0.116	-0.032	-0.085	-0.049	-0.156	-0.277(**)	0.069	-0.159	0.547(**)	0.590(**)	0.686(**)	1

** The correlation is significant at level 0.01 (bilateral).
* The correlation is significant at level 0.05 (bilateral).

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