

Stockholm School of Economics

Institute of Accounting and Financial Management

Master thesis

Spring 2010

SIGNED, SEALED, DELIVERED – AND BEYOND

A case study of how different supplier relationships are evaluated

Abstract

Supplier accounting is an area within management control that has been subject to research during the past years. This thesis develops a framework to explain what supplier accounting techniques are used in different relationships based on their supplier resource interfaces.

Four different supplier relationships have been identified each with its own supplier accounting technique. Transactional supplier relationships with low technical and organizational interfaces are associated with supplier segment cost analysis. Facilitative supplier relationships with low technical and high organizational interfaces are associated with total cost of exchange analysis. Integrative supplier relationships with high technical and organizational interfaces are associated with total cost of ownership analysis. Connective supplier relationships with high technical and low organizational interfaces are associated with total connective cost of ownership analysis.

An explorative case study of the automotive restraint company Autoliv has been conducted which supports the framework developed. However, the empirical results are not without ambiguity and provide a more complex picture of how supplier accounting techniques are related to a company's resource interfaces. Empirical data has been gathered through qualitative interviews with managers responsible for different supplier relationships, and internal documents on supplier management. The conclusion is that different accounting techniques are used depending on the relationship however more variables are important determinants of the supplier-accounting technique used. With this thesis we aim to bring a deeper understanding of what different supplier accounting techniques are used in this particular case.

Keywords: Supplier accounting techniques, Supplier evaluation, Supplier measurement, Supplier profitability, Resource interfaces, Buyer-supplier relationships

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Presentation: June 3rd 2010

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1. INTRODUCTION

In a world with immediate information at your fingertips, the strain on the management of inter-organizational relationships is put to the test. How to sort out what information is relevant in the context of a relationship is a common issue, as well as the task of choosing an analytical tool to process the information and evaluate the importance and value of the relationship at hand.

Within the area of Management control, the supply side of companies has become increasingly important over the last few decades.¹ One reason is, as years of lean production has forced companies to put tight cost controls on their own production systems, many have now emptied their profitable cost cutting opportunities and have had to turn upstream, to their suppliers, in order to find new ways to increase efficiency.²

The value of a supplier relationship is not absolute and depends on how it is managed. Some suppliers are considered more important than others because of their immediate effect on the bottom line result, in other words, their ability to directly affect the financial performance of a company. Other suppliers have benefits that are discovered and realized only over time. In order to be able to successfully compete, the buyer-supplier relationships have to be monitored in the best possible manner. Thus, it is highly important that the most proper supplier evaluation technique is used in different supplier relationships. However, limited knowledge exists as to what supplier accounting technique is the most suitable in each type of buyer-supplier relationship as well as what supplier accounting techniques in reality are used in these relationships. This thesis takes a first step towards answering the first question by addressing the latter, in a business-to-business setting.

1.1 Purpose and Research Question

Companies in business-to-business markets engage in a mixture of supplier relationships, which develop over time. Arm's-length relationships might grow close, and close ones may dissolve. The resource interfaces between companies can be divided into two types; technical and organizational.³ Variation in these interfaces creates heterogeneous buyer-supplier

¹ Dubois (2003)

² Kato (1993)

³ Håkansson and Waluszewski (2002a) p.35, Lind & Strömsten (2006)

relationships and, just as heterogeneous customers should be accounted for by taking heterogeneity into consideration⁴, accounting for a firm's suppliers should take the variety of supplier resource interfaces into account. Thus, a company ought to apply different supplier accounting techniques according to their supplier interfaces.

The aim of this thesis is to develop a framework, founded on prior theory, to explain a company's choice of supplier accounting technique based on its supplier resource interfaces. An explorative case study of the automotive restraint company Autoliv has aided the study by determining the frameworks' practical applicability. This leads us to the following research question:

What supplier accounting techniques are used when evaluating different types of supplier relationships?

The types of supplier relationships will be based on the technical and organizational interfaces towards these suppliers, and thus the relationships considered will be limited to four archetypes, namely: transactional, facilitative, integrative and connective supplier relationships.

1.2 Disposition

In chapter 2, the theoretical framework is presented, and in chapter 3 the methodological approach is described. Chapter 4, empirics I, provides an introduction to Autoliv and its purchasing organization while, in chapter 5, empirics II, the research findings regarding the supplier accounting techniques at Autoliv are presented. In chapter 6, the empirical material is analytically related to the theoretical framework and discussed. In chapter 7, the conclusions of the thesis are presented. Finally, in chapter 8 strengths and weaknesses regarding the study are assessed as well as opportunities for future research is suggested. The disposition of the thesis is illustrated by the following outline:



⁴ IBID

2. THEORETICAL FRAMEWORK



In the theoretical framework we will provide a background on purchasing theory. Thereafter, we will describe the four different buyer-supplier relationships on which we base our framework. This is followed by a discussion of supplier accounting techniques and their implications for our framework. Finally, the developed framework is presented where the four relationships have been matched against their corresponding accounting techniques.

2.1 The Evolution of Purchasing Theory

During the last decade, suppliers as well as the financial and non-financial measurement of suppliers have received increased attention in the management accounting literature. While earlier research argues that competitive advantage stems from internal capabilities, more recent research aims at matching external resources with the buyer's needs. These scholars represent a more transactional-based perspective on purchasing behavior.⁵

The transactional-based perspective focuses on transactions in isolation and on firms buying products and services. It has a strong price focus, and every transaction can be viewed as a new business deal, hence no supplier should benefit from past performance. Short-term business partners should be kept at arm's-length distance, enhance flexibility, and effectiveness should stem from choosing the most efficient trading partner at each point in time.⁶

In the late 1990's, a new line of scholars criticized the transactional-based perspective in various ways, and argued that it was too narrow.⁷ This new view on purchasing was relationship oriented, where focus instead was on determining the level of involvement needed in different relationships. Companies were seen to balance a portfolio of different types of relationships rather than relying on one single type.⁸ However, due to scarcity of resources in companies, a firm can only be highly involved with a limited number of

⁵ Krajlic (1983)

⁶ Axelsson, Laage-Hellman & Nilsson, (2002), p.54

⁷ Olsen and Ellram (1997b), Bensaou (1999), Gadde & Snehota (2000)

⁸ Bensaou (1999)

suppliers. Hence, firms need a variety of relationships with different requirements and benefits, and the capacity to deal with different types of relationships in the most appropriate way.⁹

2.2 Buyer-Supplier Relationships

In 2006, Lind and Strömsten published their article “*When do firms use different types of customer accounting*”. Here, they presented a relationship-based framework on buyer-supplier relationships in a network context, which they applied when classifying customer relationships from the supplier’s perspective. They classify the relationships based on the levels of technical and organizational interfaces towards the counterpart. The resource interfaces are “concerned with the technical [and organizational] interdependencies that arise when the resource bases of buyer and supplier are connected through exchange activities”.¹⁰ A relationship between a customer and a supplier exists from both perspectives, although the counterparts may perceive and classify the relationship differently.

Framework Implications

Given the above, we argue that the framework should also be applicable from the opposite perspective; from the customer towards the supplier. Since the supplier has a resource interface towards the customer, the customer will correspondingly have an interface towards the supplier. These interfaces will have various characteristics depending on the counterpart it aims to serve, and it will thereby give rise to different types of relationships.

⁹ Gadde & Snehota (2000)

¹⁰ Lind & Strömsten (2006)

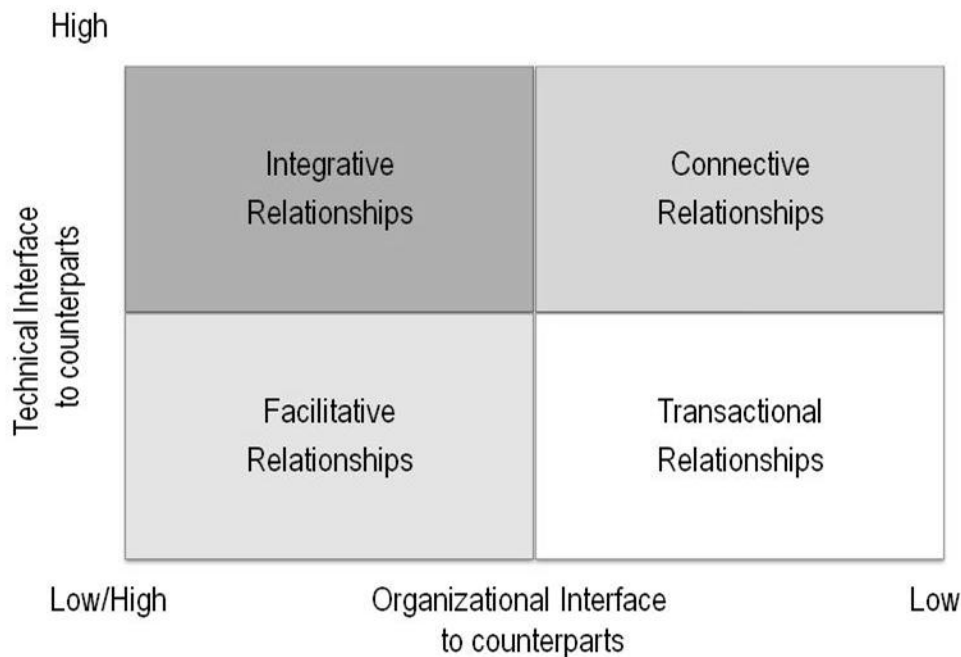


Figure 1 – Resource-based interface framework on buyer-supplier relationships¹¹

The model acknowledges the relationships between buyers and suppliers embedded in larger networks although the main focus is on dyadic relationships. In the framework, two types of resource interfaces can be identified; technical and organizational.¹²

2.2.1 The Technical Interface to Suppliers

The technical interface includes technical resources, such as products, equipment and production facilities. Traditionally, the production and utilization facilities are not seen as being involved in an exchange process, but from an interactive perspective, production and utilization companies are struggling to find ways to save money or time by connecting facilities to each other. The interaction processes taking place thus includes the facilities and the development of their features.¹³

In an interactive or network perspective, the features of a product are the result of the interaction between the buyer and seller. Thus the product is adapted to the needs of the buying firm, the end user and/or to fit the requirements of the supplier. The product is in other words part of both a “selling” and “using” system, and methods for handling product features can thereby affect their use and consequently their value.¹⁴

¹¹ Lind & Strömsten (2006)

¹² Håkansson & Waluszewski (2002a) p.35

¹³ IBID

¹⁴ IBID

Hereby a supplier, which affects the buyers' product base, their value offering to the end customer, their production facilities and processes etc. has a higher level of technical interface than one that does not.

Framework Implications

We have defined the level of technical interface to suppliers as the variation from the standard technical interface to suppliers. The standard will vary depending on the technical requirements of the industry and should hence be determined by each individual user. The buyer's technical interface to a supplier will be marked as zero on the axis when the buyer has no adaptation, and will increase as adaptations move towards total customization.

2.2.2 The Organizational Interface to Suppliers

Social resources such as business units are just as important in the buyer-seller process as the physical, and the characteristics of a business unit reach beyond being a combination of products and facilities. Important features of a business unit include its motivation and ability to co-operate. The ability to co-operate will affect what can be carried out in technical terms with products and facilities and is thereby important in any development process.¹⁵

Another important ingredient in the interactive perspective is the time dimension, including not only memories of what has taken place, but also expectations of future activities. Relationships are a way to connect situations over time, which implies that they will give both opportunities and restrictions to the actors involved.¹⁶

Given the above, a supplier to whom the buyer devotes for example an increased number of units, teams and personnel will have a higher level of organizational interface.

Framework Implications

We have defined the level of organizational interface to suppliers as the variation from the standard organizational interface to suppliers. The standard will vary depending on the organizational requirements of the industry and should hence be determined by each individual user. The buyer's organizational interface to a supplier will be marked as zero on the axis when the buyer has no adaptation, and will increase as the buyer dedicates more human capital to the relationship.

¹⁵ Håkansson & Waluszewski (2002a) p.36

¹⁶ IBID p.37

2.2.3 Transactional Relationships

These relationships are associated with low technical and organizational interfaces.¹⁷ They involve no integration between the supplier and the customer, and the supplier's offering is undifferentiated from those of others. This lack of integration is common when the physical product involved is a commodity, and it also means that other aspects of the offer are undifferentiated. This might be because the customer sees no benefit in integration with any one supplier, since it can make savings from small price reductions.¹⁸ The contacts between the companies are infrequent and lack depth. These relationships are of minor importance for the company financially, thus transactional relationships are classical arm's-length ones.¹⁹

2.2.4 Facilitative Relationships

These relationships are characterized by a low technical interface and high organizational interface.²⁰ Similar to the transactional relationships, the customer in facilitative relationships also wants to acquire undifferentiated products and services at lowest possible cost.²¹ However, in these relationships, both parties are willing to invest in activity links and resource ties, such as integrated delivery systems, to increase the cost benefits of the relationship rather than bargain over price.²² A supplier facing a requirement for a facilitative relationship will aim to differentiate itself by improving the process of purchase and delivery of a product or service, rather than trying to differentiate characteristics of the product itself. This implies that the customer is likely to concentrate a large part of its purchases on one supplier.²³ Since the contacts between the companies are frequent, the company will often dedicate organizational units to handle the relationship.²⁴

2.2.5 Integrative Relationships

Integrative relationships are characterized by high technical and organizational interfaces.²⁵ These relationships develop from both parties' willingness to invest in evolving and adapting their resources and activities to fit each other's requirements. The customer expects benefits beyond those of lower costs of acquisition and use of products. For the supplier, the integrative relationships provide the advantage of higher volumes and the opportunity to be responsible for a greater part of the customer's value added. However, both the supplier and

¹⁷ Lind & Strömsten (2006)

¹⁸ Ford et al. (1998) p.166

¹⁹ Lind & Strömsten (2006)

²⁰ IBID

²¹ Ford et al. (1998) p.167

²² IBID, and Gadde & Snehota (2000) p.5

²³ Ford et al. (1998) p.167

²⁴ Lind & Strömsten (2006)

²⁵ IBID

the customer can benefit from the transfer of technology and mutual learning between them. Integrative relationships tend to develop over time as the scope of the relationship is extended.²⁶ Consequently, integrative relationships are important for a company's short and long-term profitability, and the company thus employs dedicated organizational units to work with its prioritized customers.²⁷ Conversely, as such relationships are important to the customer as well, the customer also devotes more human capital to its prioritized suppliers.

2.2.6 Connective Relationships

Connective relationships are associated with high technical and low organizational interfaces. The products are adapted to the customers' individual needs why the supplier invests a lot in the customer in terms of technical resources over a long period of time. Thus, the products and/or production facilities are customized. Compared to integrative relationships, the revenues are low which put pressure on the company because the connective relationships still create high direct costs. As a result, the connective relationships must contribute indirectly to other customer relationships by for example acting as a bridge to other relationships.²⁸ We argue that a connective relationship from the customer's perspective also is associated with high costs and low initial revenues as the customer in turn sells or uses the product. This means that compared to the other relationships, the motive behind a connective relationship is not as clear but must then be considered to contribute indirectly to other relationships.

The relationships described above and under the previous sections are under continuous development, and thus they move within the framework as they evolve over time. In other words this means that, for example, a facilitative or a connective supplier may become an integrative supplier as the resource interfaces between the counterparts change.

2.3 Supplier Accounting Techniques

Lind and Strömsten defined the buyer-supplier relationships discussed above, and by applying logic they argued for what type of customer accounting technique that ought to be used in each type of relationship.²⁹ Conversely, established supplier accounting techniques that we

²⁶ Ford et al. (1998) p.168

²⁷ Lind & Strömsten (2006)

²⁸ IBID

²⁹ IBID

argue should logically be applied when evaluating different types of buyer-supplier relationships from the customer's perspective are discussed below.

Supplier evaluation helps the business organization to control the costs of supply. As a consequence from studies of strategic purchasing as well as the movement from a transactional-based to a relationship-based perspective on purchasing, supplier evaluation techniques have evolved. Supplier evaluation can thus be divided into two approaches that are complementary rather than mutually exclusive, namely transactional-based techniques and relationship-based techniques.³⁰

2.3.1 Transactional-based Techniques

When applying a transactional approach every deal is seen as a new business deal, and no supplier should thus profit from historical performance. Customers exploit the potential of short-term based competition and choose the most efficient supplier on each occasion. The focus here is on the product and a strong price-orientation is kept.³¹

Measures found to be used in prior studies are: price, quality, on-time delivery and cost of keeping a purchasing department.³²

Framework Implications

As Lind and Strömsten suggest segment profitability analysis for evaluating transactional customer relationships³³, we have deemed it logical that a large industrial company ought to analyze the transactional-suppliers by segment and not individually. The segmentation can be based on multiple variables such as geographic location or product delivered. The logic behind this approach is that transactional-supplier groups are more important as overhead costs are traceable to supplier segments rather than to individual suppliers. This evaluation should be based on transactional measures mentioned above such as price and quality. We have called this accounting technique Supplier Segment Cost analysis (SSC).

2.3.2 Relationship-based Techniques

In the view of transaction-based purchasing behavior it becomes evident that the methods listed above are not sufficient to incorporate the costs of closer relationships. More integrative

³⁰ Axelsson et al (2002)

³¹ IBID

³² Axelsson & Laage-Hellman (1991)

³³ Lind & Strömsten (2006)

relationships are instead in need of measures that capture external as well as internal costs. These are called relationship-oriented measures.³⁴

It is important to bear in mind that the following described techniques all have strong inter-organizational features and that they do not have clearly defined boundaries; they overlap and have features in common.³⁵ Among the most important mutual feature is that they are based on the transactional costs listed above and it is only the way of applying them that varies.³⁶

2.3.2.1 Total Cost of Exchange

Total Cost of Exchange (TCE) deals with how costs can be managed, when both the buyer and supplier are involved, across the boundaries of firms.³⁷

TCE highlights the importance of including the indirect costs of doing business with a particular supplier for a particular item. This technique considers, among others, the indirect costs of investigating and qualifying suppliers as well as costs within the transaction, such as placing and receiving the order, receiving and paying the invoice and keeping stock. Through the identification of cost drivers, through the application of for example ABC-costing, such as number of suppliers and number of deliveries, as well as implementation of appropriate procedures, the operational performance is improved.³⁸

Prior studies on the application of TCE in companies have observed that a goal of reducing the supplier base has been a result, as the number of suppliers has been found to be an important driver of costs.³⁹

When applying TCE the customer furthermore considers each transaction as one in a series of similar transactions. Instead of striving for the lowest price, the customer implements measures to reduce long-term costs of doing business with one supplier. Mutual, continuous learning about the counterparts enable constant redefinitions of what cost drivers that are to be included in the analysis of the costs of the exchange.⁴⁰ When applying this technique, the total cost is measured for a period of one quarter to a year, based on accrual accounting data.⁴¹

³⁴ Axelsson et al (2002)

³⁵ IBID

³⁶ Ellram & Siferd (1998)

³⁷ Dubois & Gadde (2002)

³⁸ IBID

³⁹ IBID

⁴⁰ IBID

⁴¹ Lind & Strömsten (2006)

Framework Implications

We have considered this technique to be logically applicable when evaluating facilitative-supplier relations as these relationships are more important financially than transactional and thus ought to derive profit from additional attention.

2.3.2.2 Total Cost of Ownership

Total Cost of Ownership (TCO), is a purchasing tool as well as a philosophy aimed at understanding the most relevant costs of buying a particular product or service from a particular supplier. In other words, TCO incorporates the cost of doing business with a certain supplier over the life of the items purchased.⁴² The concept involves identifying cost elements incurred before, during and after a transaction is made, by for example the application of open book accounting and activity-based costing. The cost of for example purchasing for order placement, research and qualification of suppliers, transportation, receiving, inspection, rejection, storage, and disposal are among those considered.⁴³ This implies that TCO goes beyond the price, quality and cost of delivering the product or service and incorporates all aspects of a supplier's performance as well as the costs incurred internally due to the purchase.⁴⁴

TCO can further be disassembled into the dollar-based approach and the value-based approach. The former solely relies on gathering cost information much like activity based costing, while the latter incorporates qualitative data that is more difficult to quantify or "dollarize". Moreover, TCO-models have been further divided into standard and unique models. The standard model has been found useful when analyzing repetitive purchases or where the issues of concern were the same across all purchases. The unique model on the other hand has been found useful when there are large variations in purchases and where no set of factors can capture critical issues across all purchases.⁴⁵

Framework Implications

Lind and Strömsten suggest that a lifetime profitability analysis is appropriate to use for integrative customer relationships, which is done by discounting the revenues and costs associated with a specific customer beyond the normal annual measurement.⁴⁶ We argue that the same logic should be applied when evaluating the integrative supplier, since these

⁴² IBID

⁴³ Ellram & Siferd (1998)

⁴⁴ Ellram (1995)

⁴⁵ Ellram (1995)

⁴⁶ Lind & Strömsten (2006)

suppliers can be profitable in the long-term even though their short-term performance may give evidence for the opposite. However, here only the cash outflows should be discounted. This is in line with the TCO approach described above; as it incorporates the costs incurred during the life of the items purchased by extending the time horizon to include the years before and after the transaction is made. We have thus considered this method the most logical choice when evaluating integrative-supplier relations as these relationships are strategically important for the company and thus a more long-term technique should be motivated.

2.3.2.3 Total Connective Cost of Ownership

As customers find themselves in a relationship with a supplier where the technical adaption is high while the organizational interface is low, the need for a unique evaluation method is at hand. The large investments made are not associated with immediate revenues, and the revenues that can be grasped are often several years into the future as are the streams of out-flowing costs associated with such a relationship. Not only may the profitability of such a relationship be distant, it may even be non-existing if analyzed from a dyadic perspective. These relationships are often, as with connective customer relationships⁴⁷, an important knowledge source that can be leveraged in other relationships, most often with customers. The depth and time dimensions of such a relationship are within the range of TCO, mentioned above. However, this relationship also calls for a broadened scope in terms, not only of other relationships, but also in terms of future products. These relationships are thus of strategic importance and should therefore be evaluated individually.⁴⁸

Framework Implications

Given the above, a connective relationship ought to be evaluated on measures incorporating estimated costs for future products created within that relationship as well as within other relationships leveraging the knowledge from that relationship. In line with Lind & Strömsten's suggestion for evaluating a connective customer relationship⁴⁹, we suggest that the economic value of a connective supplier relationship should be measured as the present value of the presumed future cash outflows derived directly as well as indirectly from the relationship with that supplier. We have chosen to call this method Total Connective Cost of Ownership (TCCO), as it is an expansion of TCO.

⁴⁷ Lind & Strömsten (2006)

⁴⁸ IBID

⁴⁹ IBID

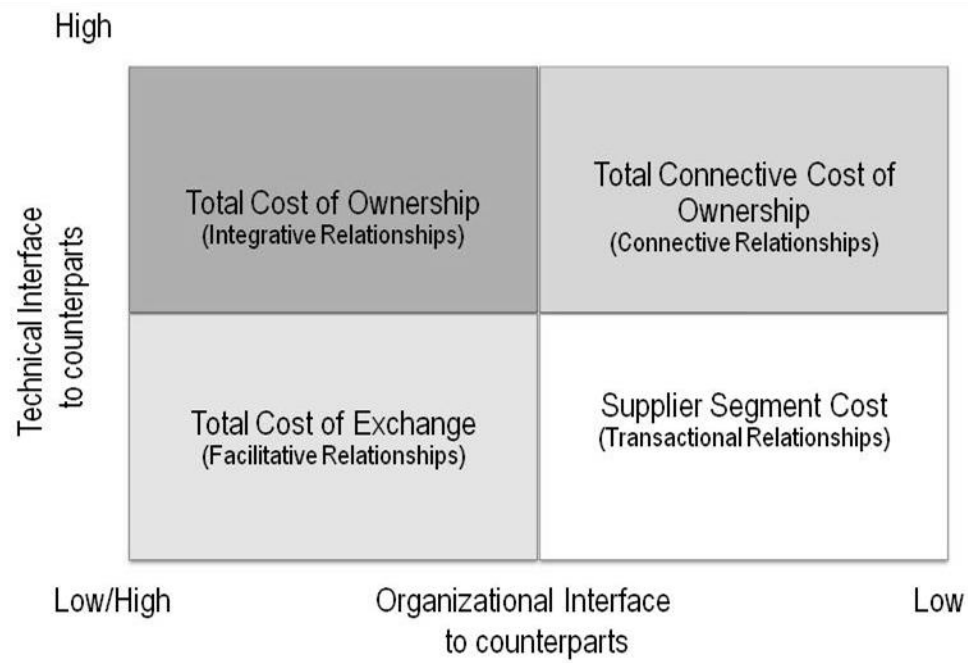


Figure 2 – A framework on how supplier accounting techniques are related to the inter-organizational interfaces of a firm

3. METHODOLOGY



In this section, the used research methodology is explained and supported. The section includes methodological approach, the choice of case company, data collection, and quality of the study in terms of validity and reliability and delimitations.

3.1 Methodological Approach

There are three types of case studies: descriptive, explanatory and exploratory.⁵⁰ As we aim to conclude: “*What supplier-accounting techniques are used when evaluating different types of supplier relationships?*” the research question of this study is of a descriptive nature. However, as we want to provide insights into and comprehension of this issue as well as research the practical applicability of our developed framework our study takes an exploratory form.⁵¹ We have thus found it appropriate to perform an explorative case study. A case study enables in-depth learning of a defined problem over a limited time period, since it allows for inclusion of varying empirics such as interviews and internal documents.⁵² Due to the ambiguity residing in the interpretation of many accounting techniques brought up in the theoretical framework, we have considered a qualitative approach best suited to handle the multifaceted image we anticipated to find in the empirical material. A qualitative approach allows the user to compare and contrast empirics to theoretical frameworks at their own discretion, which is often required to interpret and understand management control issues.⁵³ However, one also needs to consider the inevitable drawback that this type of research is limited by subjective interpretations.⁵⁴

When relating method and theory, there are three theoretical approaches: inductive, deductive, and abductive. The inductive method uses several cases and the conclusions can be

⁵⁰ Yin (1994) p.13

⁵¹ Merriam (1994) p.42

⁵² Bell (2000)

⁵³ Samuelsson (1999)

⁵⁴ Merriam (1994) p.44

generalized, while the deductive method emanates from general theories that are applied to a real case. The abductive method on the other hand is a combination of the above mentioned methods. It uses empirical data but is based on a theoretical framework.⁵⁵ The abductive method is often considered acceptable in case studies and we have chosen this method to be able to include general theories as well as practical examples.

3.1.1 Design and Selection

Upon having chosen our methodological approach we needed to consider whether conducting a single or a multiple case study was preferable. In this choice lies a trade-off between depth and generalization.⁵⁶ There are arguments for either choice, where the main reason for choosing a single case company is to enable a deeper and more complete understanding of the supplier evaluation techniques used in different supplier relationships. Considering the limited scope of the thesis, we believe that a multiple case study would not allow for such a thorough analysis that a single case study could enable. This stance is supported by Eisenhardt and Dyer & Wilkins who state that the key issue is not the number of cases but how much is known, how much new information is likely to be learned, understood and described in an intelligible manner that may generate theory in relation to that context.⁵⁷ In other words it is the content and explanatory value of the case study that matters.

3.2 Choice of Case Company

The choice of case company is very important when using a case study based research approach, since conclusions and the relating of theories will be based on this one case company.⁵⁸ We have chosen to study what types of evaluation techniques that are used in industrial supplier relationships. We believe that in order to find more elaborate techniques that go beyond price of a sole purchase we needed to observe an established company. This company should preferably be large enough to incorporate all four types of supplier relationships found in a business-to-business setting.

⁵⁵ Alvesson & Sköldbberg (1994) p.42

⁵⁶ Yin (1994) p.52

⁵⁷ Eisenhardt (1991) and Dyer & Wilkins (1991)

⁵⁸ Eisenhardt (1989)

Autoliv, the world's largest supplier of automobile safety systems, was chosen as our case company since it fulfills the above mentioned criteria, has multicultural supplier relationships and agreed to give us access to the required information for this study.

3.3 Data Collection

The methods for data collection in a case study can be divided into six different categories: documentation, archival records, interviews, direct observation, participant observation, and physical artifacts.⁵⁹ Although these methods are not mutually exclusive but rather complementary, conducting interviews is the most apparent method used for data collection in a qualitative study.⁶⁰ The methods for data collection in a case study are flexible before and throughout the actual research, and thus pose a challenge for researchers choosing this approach.⁶¹ One of the inherited caveats is for example the challenge of pedagogic; the necessity of gaining the respondents' understanding of the questions asked as well as comprehend the answers given. In order to minimize any misinterpretations, several data sources have been used to be able to crosscheck the information received. We have thus chosen to base our analysis mainly on interviews but also on external and internal documents we have found of importance such as annual reports and supplier evaluation manuals.

3.3.1 Interviews

The selection of respondents in a qualitative case study is of the utmost importance in order to find the best and most relevant information.⁶² We started by establishing contact with Autoliv's Chief Purchasing Officer (CPO) with whom we discussed the scope of the study, as well as our goals and intents. With the help of the CPO's knowledge about Autoliv we were able to determine the most suitable respondents for further inquiries. As the purpose of our study was to find what supplier accounting techniques are used to evaluate different types of supplier relationships, the respondents mainly consisted of purchasing managers as they are responsible for Autoliv's supplier relationships.

From here on we chose to construct interviews of a semi-structured nature where a standardized set of key questions were formulated beforehand and sent to the respondent a

⁵⁹ Yin (1994) p.85

⁶⁰ Langemar (2005) p.23

⁶¹ Taylor & Bogdan (1998) p.25

⁶² IBID

few days prior to the interview. These questions were standardized and the same for all interviews but formulated in an open manner to permit varying answers as we believe this approach may have lead to answers that allowed for a deeper understanding of the situation at hand.⁶³ As we wanted the respondents to be prepared for the interview a short description of the purpose and basis of the study was also sent. We found this to be a good way to be able to get a more in-depth picture of the reality observed given the time at our disposal. Although our key questions were standardized we never stuck to them in a literal sense but rather let them be a guide that enabled us to contemplate and ask more thorough questions at places of interest but also move forward when a subject not related to the study emerged.

Eight interviews were carried out from 2010-02-01 to 2010-05-11, where of three interviews were held with the CPO. All interviews lasted from 60-120 minutes each and some of them were carried out by telephone as a result of geographical distances. Both researchers were present at all interviews, which were, after receiving permission from the respondent in question, recorded and transcribed. A set of standardized interview questions is provided in the appendix.

3.3.2 Secondary Data

The interviews were preceded by the compilation, mapping and studying of literature and theories regarding buyer-supplier relationships and supplier evaluation techniques, as well as studies on the same subject directed towards customers. Both printed and electronic sources have been used. Additionally, annual reports and internal documents received from Autoliv were studied. One should be cautious for the potential pitfall of considering these documents as the absolute truth.⁶⁴ However, we have chosen to disregard any such risk for several reasons, one of which being the lack of motive for Autoliv to supply us with any faulty information, as we do not believe our study to pose any threat towards the company. The internal documents received consist of written descriptions of the organizational structure, task descriptions, sourcing strategy as well as the formal supplier evaluation techniques used. The main purpose for gathering this information was to confirm data and analyze the formal and written version.

⁶³ Kvale (1997) p.82 and Trost (1997)

⁶⁴ Yin (1994) p.86

3.4 Quality of the Study

The accuracy and applicability of a study are important measures of a study's quality. These are most often referred to as validity and reliability where validity generally concerns the study's ability to measure or illustrate what was intended. Reliability, on the other hand, concerns whether the research, if conducted once more, would reach a similar or identical result.⁶⁵

3.4.1 Validity

Validity can be divided into three sub-categories: construct validity, internal validity, and external validity.⁶⁶ Construct validity refers to the integrated subjectivity of the study.⁶⁷ A researcher's goal is to maximize the construct validity in order for a study's results to not be obscured with subjectivity. As already mentioned, both researchers were present at all interviews and all respondents were informed about the purpose and foundation of the study prior to the interviews. The interviewees were further supplied with a list of key questions that were to be discussed during the interview. We believe that the above enabled respondents to ponder their answers which added to the clarity of the same, once answered, and thus ought to have minimized any misinterpretations and by relation, the subjectivity. The subjectivity was further diminished by the number of interviews conducted as well as the inclusion of internal documents, as this allowed for crosschecking of information. At length our empirical material was sent to the respondents that allowed for a final confirmation of our information.

The internal validity concerns the accuracy of the study's interpretation of reality.⁶⁸ In other words, high internal validity implies that a study's results have been caused by the variables suggested by the study and not by anything else. The optional anonymity mentioned above added to the internal validity of this study as this provides protection for the respondents that may encourage truthful answers. The multiple interviews and crosschecking, have further added to the internal validity.

Finally, external validity determines whether the findings of the study can be generalized and thus applied in other situations.⁶⁹ A case study is generally thought to limit the applicability of generalization. However, Yin states that by comparing empirical material to a theoretical

⁶⁵ Malterud (1998), and Merriam (1994)

⁶⁶ Yin (1994) p.40

⁶⁷ IBID p.40-42

⁶⁸ IBID

⁶⁹ Merriam (1994)

framework, the external validity can be improved.⁷⁰ In line with Yin, we also argue this to be true, since if a theory based on logic is applicable in one well-conducted case study then the probability that the theory would hold in several other cases is far from implausible. Further, the depth provided by a case study may also give an explanation as to why a theory does or does not work as anticipated.

3.4.2 Reliability

As stated above, reliability ensures that the same conclusions would have been reached if the study had been conducted by another researcher. Reliability thus reduces preconceptions and errors in the research.⁷¹ In order to ensure the reliability of the study, the same key questions have been used for all interviews, although, other questions were also posed during the interviews. Furthermore, both authors have been present during all interviews, which have been recorded in order to reduce the risk of misunderstandings. All respondents have agreed to the publishing of their names, which adds transparency to the study, and the appendices covering more details regarding interviews and references further adds to the duplicability of the study.

3.5 Delimitations

We have designed a theoretical framework based on earlier research which we consider to be logically applicable, and then applied this on our empirical findings. However, as reality diverges from theory, a complete alternative design for the framework is not presented. This would be beside the purpose and scope of the thesis and would require a study over a longer period of time with multiple case studies. The scope of our study is focused on developing theory and relating this theory to reality and thus new theory solely based on the empirical findings is not presented. Our study has furthermore only been concerned with financial or quantifiable supplier evaluation techniques found in a business to business setting within an industrial company. As theoretical approaches for analyzing suppliers are multiple and often overlap we have limited the number of techniques to four, which we consider capture several scholars' view on supplier accounting techniques. We have further limited our definition of a buyer-supplier relationship in terms of a two dimensional framework based solely on invested resources.

⁷⁰ Yin (1994) p.44

⁷¹ IBID p.45

4. EMPIRICS I – THE ORGANIZATION



In this section an introduction to Autoliv's industry, Autoliv and its business is provided.

4.1 Industry

The global automotive occupant restraint market is characterized by intense competition, increasing raw material prices and severe customer pressure to decrease the prices by two percent per year. The customer base of this market is small and mainly consists of the worlds around a dozen largest car manufacturers while the supplier base is well over the thousand.⁷² The market was estimated a worth of USD 16 billion in 2004 and USD 18.5 billion in 2009.⁷³ The competitors are multiple but the market is dominated by Autoliv, TRW and Takata that for some time have been in a situation resembling a oligopoly but are now facing increasing competition from small suppliers with close ties to the automotive industry in Japan, Korea and China.⁷⁴

4.2 Autoliv

Autoliv as it is known today was founded in 1997 as a result of Europe's leading automotive safety company, Autoliv AB of Sweden, merging with the leading airbag manufacturer in North America and Asia, Morton ASP.⁷⁵ Today Autoliv is the global leader with 30 percent of the world market within the automotive occupant restraint industry. They are operating all over the world with a turnover of approximately USD six billion a year. Autoliv, whose production mainly consists of assembling has, in comparison with the market, a diversified customer base and supply safety system to all large car manufacturers.⁷⁶ Their supplier base consists of more than ten thousand suppliers spread all over the world.⁷⁷

⁷²Interview with Chief Purchasing Officer, 2010-02-10

⁷³ www.researchandmarkets.com/ and www.autoliv.com

⁷⁴ Autoliv Annual Report 2009

⁷⁵ www.autoliv.com

⁷⁶ Autoliv Annual Report 2009

⁷⁷ Interview with Chief Purchasing Officer, 2010-02-10

4.3 Autoliv's Purchasing Organizational Structure

In order to manage Autoliv's large amount of suppliers, Autoliv's purchasing organization is structured around commodities ranging from Electronics to Textiles that deliver to Autoliv's product development teams, as can be seen in figure three. There is one development team assigned to each customer working with the customer in their development of a new car.

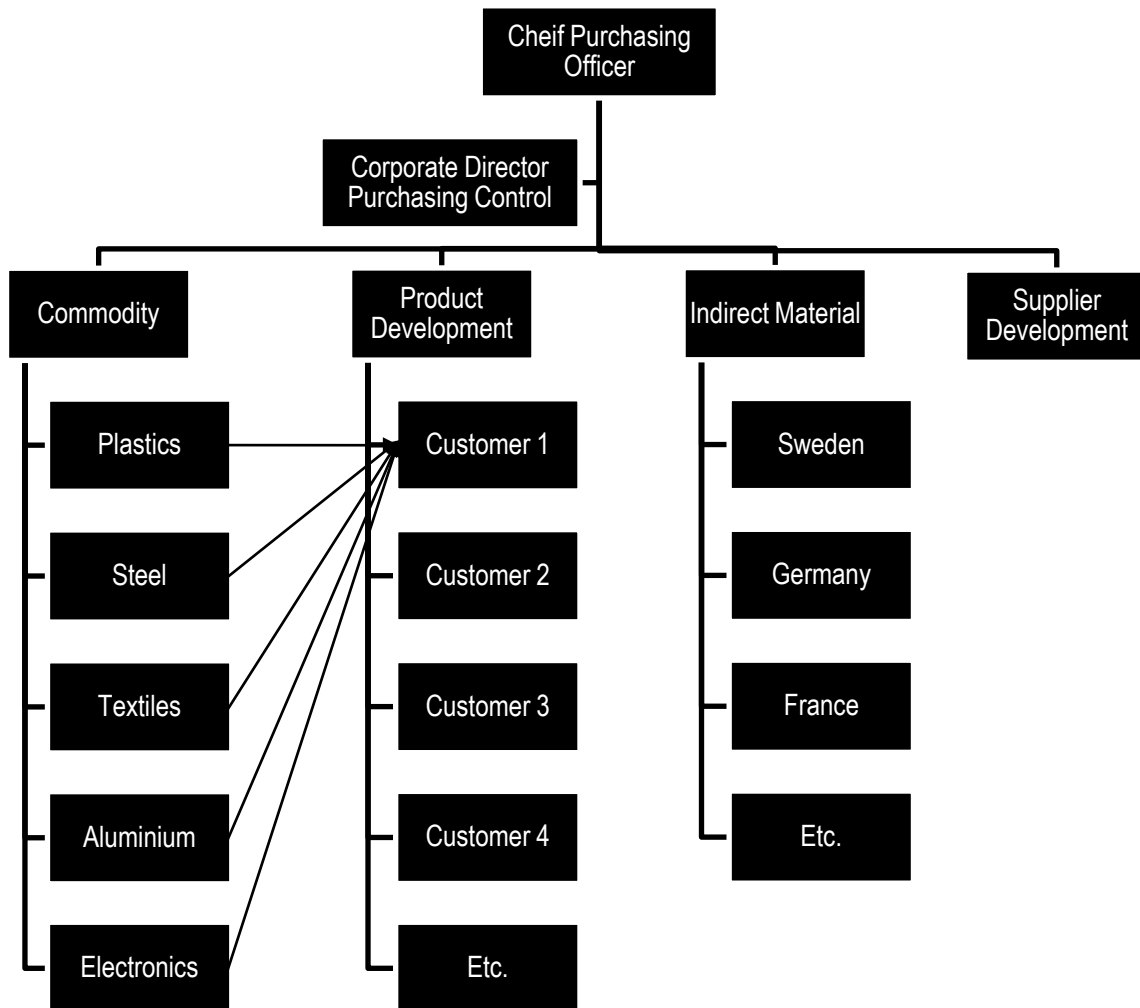


Figure 3 – Autoliv's Purchasing Organizational Structure

We have carried out interviews with; the Chief Purchasing Officer, the Corporate Director Purchasing Control, the Global Purchasing Director of Electronics, the Global Commodity Manager of Textiles, a Commodity Purchasing Manager within Steel and the Swedish Purchasing Manager of Indirect Material.

5. EMPIRICS II - RESEARCH FINDINGS



The first section describes how Autoliv divides its suppliers into different segments. Then one of these two segments is described in terms of relationship characteristics and evaluation technique. Thereafter the remaining segment is decomposed into three archetypes of suppliers that are described in the same manner.

5.1 Supplier Segmentation

Autoliv sorts their suppliers into groups of direct and indirect suppliers depending on the type of product or service being delivered. The direct suppliers deliver material or products that will constitute a part of the final product. Examples of direct supply are airbags, gas generators, and other components like screw nuts that are included in the final products delivered to the customer. Suppliers that are currently developing new products not yet part of the production are also defined as direct suppliers. Indirect suppliers do, on the other hand, supply services or products not part of the final product. Examples of indirect supply are support functions such as food, cleaning, working clothes as well as machines for the production of final products.⁷⁸

5.2 Indirect Material Suppliers

Autoliv currently has around ten thousand suppliers of indirect material and service worldwide which constitute approximately 25 percent of Autoliv's total supply purchases. Meanwhile less than 10 percent of Autoliv's purchasers are involved with these suppliers. The indirect suppliers are contracted for no more than a year and thereafter Autoliv makes the decision whether to continue with the supplier or contract a new one. Presently, there is one person in Sweden, responsible for the purchases from the around a thousand indirect suppliers in Sweden.⁷⁹

⁷⁸ IBID

⁷⁹ Interview with Purchasing Manager Indirect Materials, 2010-03-29

When Autoliv is about to contract an indirect supplier, research on the different alternatives is carried out by the Purchasing Manager for Indirect Materials (the Indirect Purchasing Manager) in the country concerned. Autoliv then chooses the supplier that can produce “the right quality for the right price in the right time”. By “right quality” means quality suited for its purpose. Suppliers operating on a global level are preferred since Autoliv is striving to have the same suppliers worldwide if possible. The reason behind this endeavor is that if more of Autoliv’s factories can use the same supplier, Autoliv may increase their bargaining power and prices can thus be pressured as a result of the larger volumes demanded.⁸⁰

A few years ago the Indirect Purchasing Manager started to reduce the number of suppliers of cleaning and maintenance, in order to decrease the total cost within this area. The chosen company, ISS operated on an international level. Many offices and factories were reluctant towards this transition since they had had the same suppliers for many years, and it was an enduring process to convince them all to change. To convey the local facilities, management allowed local suppliers to stay if the same price was offered. However, almost none were able to compete with ISS and the number of suppliers was thus reduced to one.⁸¹

When an indirect supplier has been contracted by Autoliv, the Indirect Purchasing Manager has sporadic contact with the supplier since it is only deemed necessary when new contracts have to be discussed. The evaluation process, where supplier prices are compared among competitors, is performed annually, and the best offer receives a one-year contract with Autoliv. In addition evaluations are made on an ad-hoc basis when new contracts are made. The Indirect Purchasing Manager reports the indirect material costs according to a pre-defined document where the indirect material suppliers are sorted into 96 categories such as office equipment, travel fares and external laboratories. The indirect suppliers are then evaluated according to these categories at a group level where cost targets for each category are set.⁸²

Another type of supplier of indirect material is Atlas Copco that provides expensive machines used in Autoliv’s production systems. These types of suppliers constitute the major part of Autoliv’s purchases of indirect material and are evaluated on the estimated costs of their product over the life of that item. This evaluation incorporates everything from the price paid, to the electricity required, to estimated future cost of repairs. The evaluation process considers the supplier’s products past performance and is made on a group level or within a customer

⁸⁰ Interview with Purchasing Manager Indirect Materials, 2010-03-29

⁸¹ IBID

⁸² IBID

development team. However, the people making this decision have no more contact with this type of supplier than the Indirect Purchasing Manager has with any other supplier of indirect material. Autoliv does furthermore not consider these suppliers to in any way affect their business, products or facilities as Autoliv's demand for such equipment is readily found on the market.⁸³

5.3 Direct Material Suppliers

The direct suppliers deliver material or products that will constitute a part of the final product. Suppliers that currently are developing new products not yet part of production are considered part of this group. One of Autoliv's corporate targets is to reduce the direct supplier base.⁸⁴ Once a direct supplier is part of Autoliv's supplier base, the evaluation process among all producing direct suppliers is practically the same. However, on the road of becoming a producing direct supplier, the evaluation can vary depending on the purpose of the supplier relationship.

5.3.1 Autoliv Supplier Manual

In order to effectively co-operate with the direct material suppliers, Autoliv has a Supplier Manual (ASM), which consists of four main areas; Autoliv Supplier Requirements, Autoliv Supplier Development Program, The Product Life Cycle with Autoliv, and finally Autoliv Supplier Status Review.⁸⁵

5.3.1.1 Autoliv Supplier Requirements

Autoliv Supplier Requirements are considered in the introductory phase of a co-operation between Autoliv and a direct supplier. First, potential suppliers are screened on quality, project management, manufacturing system, logistics, and environment on a very basic level. Then only the most promising suppliers are put through a pre-qualification process where the purpose is to evaluate potential new suppliers' capability to meet Autoliv's supplier requirements. The first selection is made due to the cost of putting a supplier through the pre-qualification process. Here, in the pre-qualification process, a more thorough screening process involving the above-mentioned criteria takes place.⁸⁶

⁸³ Interview with Chief Purchasing Officer 2010-03-15

⁸⁴ Autoliv Annual Report 2009 p.20

⁸⁵ Interview with Chief Purchasing Officer 2010-02-10

⁸⁶ Interview with Corporate Director Purchasing Control 2010-04-20, and Supplier Pre-Qualification Process

Suppliers fulfilling the pre-qualification process requirements are allowed to make quotations in up-coming projects and are considered part of Autoliv's supplier base. Once a supplier is part of Autoliv's supplier base the pre-qualification process is never done again in full.⁸⁷

5.3.1.2 Autoliv Supplier Development Programme

Suppliers that Autoliv considers to be strategically important but lack in some area of their operations compared to Autoliv's standards may at this point enter into the Autoliv Supplier Development Programme. An existing supplier may also enter into this program if it is later found to be of strategic importance. This program is developed for each occasion and is customized to suit that individual supplier.⁸⁸ This program is further discussed below under "The Developing Direct Supplier".

5.3.1.3 Autoliv Product Life Cycle

Once a customer project is initiated, suppliers within Autoliv's supplier base are allowed to continue into Autoliv Product Life Cycle, which consists of four phases. The supplier is chosen for the project already in the first phase, which consists of project support and pre-quotes on request, where the suppliers are asked to provide quotations on demand. These quotations include a breakdown of yearly costs based on estimated quantities provided by Autoliv. The decomposition of costs considers among others direct labor, direct material, machine time and depreciation on machines used. Then a feasibility study is conducted which is a more technical evaluation where the suppliers' capability to handle deliveries is tested. At this point one supplier is selected for the project based on their results in the first phase, and continues through to the production process.⁸⁹

5.3.1.4 Autoliv Supplier Status Review

When a direct supplier has been chosen for a project they are part of a continuous evaluation process that is illustratively captured by what is called the "Flag Panel". Here the suppliers are monthly given a color mathematically based on their short-term and long-term performance.

The short-term status is based on capacity, cost performance, overall risk status, quality and service. The purpose of the short-term status is to provide an overview of the supplier's free capacity; their pricing situation compared to competitors; as well as their financial performance with regard to for example solidity and solvency. For the evaluation of quality and service Autoliv has a standard document called AS 51. Here the business units check the

⁸⁷ Interview with Corporate Director Purchasing Control 2010-04-20

⁸⁸ IBID

⁸⁹ Autoliv Supplier Manual

quality in terms of supplier PPM, which measures quality in terms of broken products per million, supplier demerits (DMT), which measures the severity of the deficiency, and on time delivery according to the individual purchasing agreement as on time parts index (OTP). The service level is measured on whether the supplier performs well in reaction to problems, continuous support, communication and customer orientation. All the above-mentioned parameters are given weights in accordance to the anticipated cost they incur, which are based on accounting estimates generated by Autoliv. If the short-term status is satisfying, the suppliers may provide quotations in up-coming projects.⁹⁰

The long-term status of the supplier is an estimation of the future costs of doing business with this supplier, which is based on the aggregated results from the short-term status as well as a strategic decision made by each Commodity Purchasing Manager. This status constitutes the basis for Autoliv's annual decision; to continue to make new business with the supplier, or to phase-out the relationship. If the supplier reaches a total score below 60 percent, it is colored red which indicates phase-out. If the total score is between 60 percent and 85 percent, it is colored yellow which indicates monitor or develop/improve. Finally, if the supplier is given a total score between 85 and 100 percent, it is colored green which indicates "grow business".⁹¹ This evaluation process is the same for all producing direct suppliers who have access to the panel through the Internet, where it is up-dated monthly.⁹²

Autoliv further has Supplier Status Review Meetings, at least once a year. At these meetings, the suppliers' financial status, cost competitiveness, and, for chosen suppliers, technology and new product development is discussed. The Flag Panel serves as the main basis for discussion for most direct suppliers. Here Autoliv sets new targets in concurrence with the supplier and give them feedback on their performance during the year.⁹³

5.3.2 The Basic Direct Supplier

Most direct suppliers are suppliers of commodity products and have become part of Autoliv's supplier base by going through the Autoliv Requirements Process and the Autoliv Product Life Cycle Process. In other words, these suppliers have not gone through the Autoliv

⁹⁰ Interview with Chief Purchasing Officer 2010-02-10 and Autoliv Supplier Rating AS 51

⁹¹ Interview with Chief Purchasing Officer 2010-02-10

⁹² IBID

⁹³ Interview with Corporate Director Purchasing Control 2010-04-20 and Autoliv Supplier Status Review – Process Standard

Supplier Development Programme, and thus technology and new product development is not discussed during the annual review meetings.⁹⁴

An example of a basic direct supplier is Gnotec, a provider of sheet metal components focusing on safety products for the automotive industry. Autoliv has at least weekly contact with Gnotec, and there are around twenty people from Autoliv's organization working with them.⁹⁵

“One of the most important tasks for a purchasing manager working with a supplier is to lower the price.”

Louise Johansson, Commodity Purchasing Manager, Steel

Furthermore, Autoliv has a logistics department working with basic direct suppliers to coordinate the deliveries from all suppliers in each project. These suppliers are evaluated according to the Flag Panel where the accrued costs are estimated for a period of one year, based on accounting data. If a supplier like Gnotec cannot reach Autoliv's required scores in the Flag Panel, they are on the supplier review meetings decided to be phased-out of Autoliv's supplier base and another supplier, most often one that is already part of Autoliv's supplier base, is contracted instead. This means that basic direct suppliers are replaced if their performance is not satisfying. This is possible since they deliver commodity components produced by several other suppliers.⁹⁶

5.3.3 The Innovative Direct Supplier

The spirit and philosophy of Autoliv is a common answer to why Autoliv does what they do. Autoliv invests large amounts in research dedicated to analyze traffic accidents all over the world. On the basis of this information Autoliv's research teams review the data and try to discover how Autoliv can save the most lives.⁹⁷

One example of such a discovery was that 60 percent of the traffic accidents occur by night. This led Autoliv to do a micro investigation where it was found that the reason for the high number of accidents was mainly the dampened visibility at night. Autoliv then searched for solutions, not one but several since a function can be solved in many ways. They typically search within other industries where the same problem could be found and thus the possibility

⁹⁴ Interview with Corporate Director Purchasing Control 2010-04-20

⁹⁵ Interview with Commodity Purchasing Manager, Steel, 2010-03-29

⁹⁶ IBID

⁹⁷ Interview with Global Purchasing Director Electronics, 2010-03-26

that a solution has already been developed in that industry. In the case of night vision, Autoliv concluded that the best solution would be a bolometer or infrared as it is more commonly known as.⁹⁸

In their search for the right supplier of the function demanded, Autoliv reviews potential suppliers on the basis of their; know-how, in terms of their products and applications incorporating the function sought, and their capability, in terms of quality and capacity. Autoliv also reviews the potential supplier in question's reputation on the market through informal discussions with for example former customers. Finally, they make a supplier fact profile where they review the business plan as well as ask for the supplier's five most important suppliers and customers. They look both up-stream and down-stream to get a sense of the supplier's environment and to better be able to predict future developments and consequences of that environment.⁹⁹ On the basis of these inquiries Autoliv, in co-operation with the suppliers, makes estimates on the time and costs required in each stage from thereon to deliver the project. These costs are then discounted in order to get a present value estimate which serves as an evaluation tool when comparing the potential suppliers. This is done because of the strategic nature of the desired relationship. As Autoliv strives to be in the forefront within new technology to attract and keep customers, they invest large amounts into these types of relationships and continue to do so for a considerable time-period even though the prospect of future cash inflows is distant and highly uncertain. Therefore, these projects are almost never profitable when considered in isolation but contribute to Autoliv's total sales of other products.¹⁰⁰

“We do not develop these technologies to gain a profit on them. We develop them to save lives. // Of course they contribute to our reputation as an innovational company.”

Peter Kellerhals, Global Purchasing Director, Electronics

In the case of the infrared, after thorough searches, meetings and reviews, Autoliv came down to the choice between three companies that all full-filled Autoliv's requirements. Autoliv then chose the most renowned company, Flir.¹⁰¹ Flir is a global leader in infrared cameras and thermal imaging systems and has been supplying infrared to the military.¹⁰² Since the project

⁹⁸ IBID

⁹⁹ IBID

¹⁰⁰ Interview with Corporate Director Purchasing Control, 2010-04-20

¹⁰¹ Interview with Global Purchasing Director Electronics, 2010-03-26

¹⁰² www.flir.com

required such advanced technology Autoliv wanted to learn from this relationship and had already in the early stages of the relationship ideas for further potential applications for the technology.¹⁰³

“Although we considered the benefits such technology might bring, that we can use in other relationships, and we give them rather a heavy weight in the decision whether to continue the project or not, we never make any calculations, formally, on the amount. There would be no point. // We make educated guesses”

Peter Kellerhals, Global Purchasing Director, Electronics

Once the project and the solution-process have begun, physical, quarterly meetings are held where progress and cost-targets are checked against predefined toll-gates and cost-roadmaps. These cost-targets are based on the estimates regarding the costs required to finalize the project mentioned above. As soon as the idea is conceptualized, the function is put into production, however not often by the company with whom Autoliv developed the solution. At this point the pre-qualification process, mentioned under “Autoliv Supplier Requirements” above, is put into place. If the company with whom they developed the solution is not adaptable to Autoliv’s production requirements, where the cost of producing is one of the crucial determinants, Autoliv purchases the patent or license to produce the solution with another supplier.¹⁰⁴

While innovation generation is carried out all the time by Autoliv’s research teams, this type of conceptualization and industrialization of an idea is done perhaps once every three to five years. Due to Autoliv’s criteria and the innovational aspects of these orders there are often few suppliers to choose from. During a process such as this, Autoliv has about six people working with, or even knowing about, the project partly due to confidentiality issues but also due to coordination issues.¹⁰⁵

5.3.4 The Developing Direct Supplier

A third type of direct material suppliers discussed in our interviews were suppliers that in a few cases had been either an innovational type of supplier, or a more general one, that then developed into a more integrative supplier. These types of suppliers are few, of strategic

¹⁰³ IBID

¹⁰⁴ Interview with Chief Purchasing Officer 2010-02-10

¹⁰⁵ Interview with Global Purchasing Director Electronics, 2010-03-26

importance and develop new technologies and products in co-operation with Autoliv. They share know-how, human resources as well as capital resources.

One example of this type of supplier is Millican, an American producer of airbags. Due to “Millican’s geographically unmatched know-how, and ability to produce large volumes”, as well as Autoliv’s good experience with the supplier, Autoliv asked Millican to enter into Autoliv’s Supplier Development Programme.¹⁰⁶

Some suppliers chosen for this type of joint efforts have already passed the pre-qualification process and are part of Autoliv’s supplier base. They are chosen on an ad-hoc and circumstantial basis where Autoliv’s experience of the supplier in question is the crucial determinant if a development agreement should be considered. When the decision if a development agreement should be entered into, such as the one made with Millican, Autoliv considers the commercial profitability of the company in question and their engineering capability where their technology and know-how is reviewed. The future profitability of the potential relationship is estimated in terms of, for example, future estimated cost savings and product improvements based on the parameters described above.¹⁰⁷

Once a development agreement is signed, Autoliv and the supplier open up their books in order to facilitate the process of identifying the most relevant costs and their origin in order to reduce them. This also facilitates the implementation of new production systems should the product development require such a change.¹⁰⁸

“We know what we need to know about our partners, and more”

Stefan Denz, Global Commodity Manager, Textiles

The projects are mutually developed and each development project is assigned a team consisting of employees from both counterparts. Every project is then evaluated on its own merits. A profitability analysis is performed for each project where the value of the future costs is estimated and then the most profitable projects are further funded.¹⁰⁹

In the case of Millican, the Purchasing Manager responsible has weekly contacts with the supplier while the technicians have contact at least three to four times a week. In total four to

¹⁰⁶ Interview with Global Commodity Manager Textiles, 2010-04-06

¹⁰⁷ IBID

¹⁰⁸ IBID

¹⁰⁹ IBID

five employees from; the purchasing department, the marketing department, engineering and several others are in regular contact with Millican.¹¹⁰

Besides the regular communications, reviews are performed quarterly where progress is measured, in terms of, for example, cost reductions made, and problems are discussed. These projects are given a fixed amount of money to be invested and during the follow-ups it is discussed whether more money is necessary and motivated by the future benefits expected.¹¹¹ Furthermore, as some developing suppliers already are part of Autoliv's supplier base they are thereby subject to Autoliv's general evaluation process, the Flag Panel, which is described in the section "Autoliv Supplier Status Review".

Most suppliers that enter into Autoliv's Development Programme are located in low-cost countries and not part of Autoliv's supplier base. However, they are also considered strategically important as they provide the opportunity for future cost reductions. On the basis of future estimated cost reductions, Autoliv for a limited period of time adjust their operations/facilities to fit these types of new relationships. Meanwhile the supplier in co-operation with Autoliv's consultants adjusts their facilities and processes to fulfill Autoliv's standards. Once the adjustments are made, Autoliv no longer adapt to the requests of such a supplier.

¹¹⁰ Interview with Global Commodity Manager Textiles, 2010-04-06

¹¹¹ IBID

6. ANALYSIS



In this section the empirical material presented in previous sections is analyzed in order to fulfill the aim of this thesis and answer the research question. The research findings are discussed and compared to the theoretical framework, and differences and similarities are highlighted.

6.1 Transactional Relationships

Most suppliers of indirect material and service do not, according to our empirical findings, affect Autoliv's product base or their value offering to the end customer as is characteristically for high technical interfaces. Presently, only one Indirect Purchasing Manager per country is responsible for these relationships that add up to around thousand per country and hence both the technical and the organizational interfaces are to be considered low.¹¹² Furthermore, there is little or no integration between the Indirect Purchasing Manager and the indirect suppliers as contacts are distant and sporadic, which is a characteristic of a transactional relationship.¹¹³ The products and services in question are commodities in their nature and hence the relationships with the indirect suppliers are of minor importance for the company financially. This is in line with Ford et al.'s definition of a transactional relationship,¹¹⁴ which implies that the indirect suppliers should be located in the transactional area of our framework.

A customer that uses a transactional evaluation technique should consider every new deal with a supplier as a new business deal where the suppliers should not benefit from past performance.¹¹⁵ This is in line with our empirical findings on how the indirect suppliers every year are evaluated on their price, quality and time for delivery. The supplier with the best offer according to these parameters receives a one-year contract with Autoliv.¹¹⁶ Furthermore, the Indirect Purchasing Manager, by doing the above, exploits the potential of short-term based competition between individual suppliers in order to choose the most efficient supplier

¹¹² Håkansson & Waluszewski (2002a) p.35

¹¹³ Lind & Strömsten (2006)

¹¹⁴ Ford et al. (1998) p.166

¹¹⁵ Axelsson et al (2002)

¹¹⁶ Axelsson et al (2002) and Interview with Purchasing Manager Indirect Materials 2010-03-29

on each occasion which coincides with the writings of Axelsson et al.¹¹⁷ With regard to our choice of a SSC-analysis for evaluating transactional suppliers, we find support when looking towards the higher levels of Autoliv's organization. Here, the costs of such relationships are analyzed in the terms of 96 segments, and thus no individual evaluation of the suppliers is conducted.

The above supports the truth of our framework and the applicability of the same. However, as Autoliv strives to reduce the number of indirect suppliers one could argue that this is a deviation from the typical transactional relationship. Logically the supplier should gain in importance, as it becomes the sole supplier of a particular product or service in such a large company. A technique which captures a wider scope of the relationship in terms of other relationships could perhaps then be appropriate since this could enable synergies such as cost reductions within deliveries and inventory. This is for example argued by Dubois et al. who are of the opinion that TCE is applicable for indirect suppliers. However, we find no support in our empirical findings for such a usage of TCE in these relationships.

Furthermore, it has become evident by the empirical findings that even though the present relationship to the indirect suppliers is in line with our framework; the situation has changed over time. A few years ago Autoliv's factories had contracts longer than a year with indirect suppliers that they for some reason valued based on factors beyond price, as with the example concerning cleaning and maintenance suppliers. These findings show that even though our framework within this area is applicable deviations are to be expected.

The perhaps most interesting relationships we have found within Autoliv's suppliers of indirect material are the relationships with suppliers such as Atlas Copco. These suppliers deliver expensive manufacturing equipment to Autoliv and are considered important enough for the decision on from where and from what supplier to source the purchase to be delegated to a customer team or a global manager. The reason for this is that the purchases of this type of equipment constitutes the major part of the purchases of indirect material and are thus important for Autoliv financially. This is not consistent with a transactional relationship. Meanwhile, Autoliv does not keep any regular contacts with the supplier and even though a group of people makes the decision on from where to source, this decision is not an important part of their job description and thus the integration between Autoliv and the supplier is low. This implies a rather low organizational interface. Furthermore Autoliv does not consider

¹¹⁷ IBID

themselves to in anyway adapt to this type of supplier and neither do they consider them to affect their products, which is consistent with a low technical interface. These findings suggest that suppliers like Atlas Copco should be considered transactional. However, when making these decisions the historical performance of the supplier's products bares weight which is in line with a facilitative relationship. Based on our framework we would expect Autoliv to evaluate, for example, Atlas Copco together with other suppliers of manufacturing equipment on the basis of transactional measures of cost like price or by evaluating them individually by applying TCE. However, we find that a more extensive valuation of the costs of buying the equipment over the life of the same is made, consistent with the application of TCO which our framework suggests for integrative relationships.

We consider this finding to convincingly convey a shortcoming of our framework. We believe this shortage to be a result of the fact that the framework only suggests a technique based on the buyer-supplier relationship and does not consider the nature of the product or service being bought. A supplier that provides a machine that is bought to last several years and costs millions can hardly be expected to face the same evaluation as a supplier of consumables. Given the above, we argue that the frameworks technical interface should be adjusted to incorporate the nature of the supply purchased. We argue this as we believe this finding not to be exclusively found in our case company although we are aware that further research is preferable. It should perhaps be noted that Autoliv's technical interface towards these types of suppliers may be considered low due to the fact that Autoliv's production mainly consists of assembly and thus the technical requirements of the machines purchased might be lower than many other industrial companies. If the technical requirements required more customization the technical interface would have been higher and our framework would have been applicable.

6.2 Facilitative Relationships

Most direct suppliers, such as Gnotec, are not essential for Autoliv's final products and neither to Autoliv's facilities or production processes since they are easily replaceable. Meanwhile, there are numerous employees in continuous contact with Gnotec, hence the technical interface is low while the organizational is high. A facilitative relationship is characterized by, from the customer's perspective; a large part of purchases concentrated on one supplier, a willingness to acquire undifferentiated products at lowest cost and invest in

activity links such as integrated delivery systems.¹¹⁸ This definition has been found to be true in Autoliv's relation to most direct suppliers, which we have called the basic direct suppliers. Autoliv sources the area of purchase within each project from one supplier and while Autoliv strives to find the lowest price within the range of quality for these commodities, they also have a logistics department working with the direct suppliers to co-ordinate the deliveries from all suppliers in each project. Given the above, the relationship with the basic direct material supplier can be defined as a facilitative relationship and thereby be located in the lower left corner of our framework.

The TCE approach considers each transaction as one in a series of transactions, which is in contrast to the transactional approach where each transaction is seen in isolation.¹¹⁹ The basic direct supplier at Autoliv first has to pass Autoliv's pre-qualification process and then they become part of Autoliv's supplier base where their past performance is crucial for their future relationship with Autoliv. Furthermore, the chosen supplier in each production project is evaluated on the basis of their quotations and capacity. The quotations consist of the suppliers' annual costs decomposed into cost drivers such as direct material, direct labor, number of machine hours etc. These costs are added to additional cost drivers such as quality and service within the Flag Panel where they are under continuous evaluation throughout the contract period. The result of these parameters within the Flag Panel is captured by the short-term status, which determines if the supplier may provide quotations in up-coming projects. At the annual status review meetings the Flag Panel, problems and solutions as well as the prospect of future business are discussed. The above findings are in line with the TCE evaluation technique where the implementation of both direct and indirect cost drivers is part of the analysis.¹²⁰ As the accrued costs are measured for a period of one year, based on accounting data, the empirical findings support the applicability of TCE for a facilitative relationship. Moreover, Autoliv has set a corporate target to reduce the number of direct suppliers which coincides with the findings made by prior scholars in companies applying TCE.

However, the fact that the basic direct material suppliers are also evaluated on their long-term status within the Flag Panel implies that Autoliv goes beyond TCE in this respect. This is because the Flag Panel also incorporates the suggested future of the relationship based on estimated future costs, and not only the costs involved in the annual exchange. One can argue

¹¹⁸ Ford et al. (1998) p.167

¹¹⁹ Dubois & Gadde (2002)

¹²⁰ IBID

that the usage of the long-term status is more in line with the TCO approach as it considers the costs before, during and after the transaction for a time period extended beyond the typical, annual, measurement.¹²¹

Our empirical findings support the usage of TCE within facilitative relationships as yearly indirect costs related to the transaction, such as placing and receiving the order, are considered when doing business with a supplier. Furthermore, the accrued costs are measured for a period of one year, which implies a TCE approach rather than usage of the TCO method. However, we also find the usage of TCO within these relationships since some of the measures in the Flag Panel also incorporate an estimation of future costs.

6.3 Integrative Relationships

A few direct suppliers that we have called developing suppliers, are by Autoliv considered strategically important and are thus asked whether they would consider entering into Autoliv's Supplier Development Programme. Once a development agreement is signed, Autoliv and the supplier invest in the relationship in terms of both human capital and technical resources. Hence the technical and organizational interfaces are high. These direct suppliers develop products in co-operation with Autoliv and benefits beyond those of lower costs are obtained from the transfer of technology and mutual learning as the relationship develops over time. This type of mutual agreement to co-operate is captured by the definition of an integrative relationship.¹²² On the basis of the above, the developing supplier relationship may be considered integrative and is hence located in the upper left corner of our framework.

When Autoliv is about to enter into a development agreement with a strategic supplier, the decision is based on both estimated future cost reductions and the ability to improve existing products or services. In other words, Autoliv within these relationships recognizes the benefits of considering future costs, which is in line with the TCO philosophy. In comparison with the facilitative relationship, the method used for co-operation involves total transparency between the counterparts and thus the most relevant costs are identified due to joint efforts. Furthermore, the process involves evaluating costs incurred over the lifetime of the

¹²¹ IBID

¹²² Ford et al. (1998) p.168

relationship and thus the practice used is consistent with the TCO approach where the costs of doing business with a particular supplier over the life of the items purchased are measured.¹²³

Although the evaluation technique used for facilitative relationships has features relating to TCO, which our framework has suggested to be used in integrative relationships, we still find support for the general idea that integrative relationships are evaluated on the basis of measures taking a longer time perspective into consideration. In the facilitative relationships only one long-term measure is used which bears little weight in comparison to the short-term or annual measures used for the daily business, as the short-term status determines if the supplier's quotations in a new project are to be considered or not. In the integrative relationships the long-term analysis, where future costs are discounted to present values, determines whether there will be such a relationship at all. Additionally, we have found the measures used to be on a more decomposed and relevant level due to the integration of both counterparts accounting data, which is a common feature when applying TCO.¹²⁴ These findings support the usage of TCO for integrative relationships.

We consider the above findings to be of interest for the development of our framework, as this suggests the use of a standard TCO model in facilitative relationships and the use of a unique TCO model in integrative relationships. Furthermore, the majority of the measures used in the standard model found in the Flag Panel are more easily quantifiable while most unique models seem to incorporate measures based on parameters that are most often hard to quantify such as know-how. This is in line with prior scholars' findings of a dollarized and value-based technique for the TCO approach.¹²⁵

In situations where Autoliv enters into a development program with suppliers in low cost countries, we discover another interesting empirical finding as the relationship from Autoliv's perspective is not as characteristic for an integrative supplier. Although the technical and organizational interfaces to begin with are high, the reasons for the relationship and the benefits from it are only cost related. However, these relationships, that constitute the majority of Autoliv's integrative suppliers, are still entered into on the basis of a discounted cash flow analysis considering the life of the relationship. Nevertheless, once the supplier has fulfilled Autoliv's supplier requirements the relationship is solely evaluated through the Flag Panel just as other facilitative relationships. We thus consider these relationships to bare

¹²³ Dubois & Gadde (2002)

¹²⁴ Ellram (1995)

¹²⁵ Ellram (1995)

trades of both types of relationships over an over-seeable time-period where they enter as integrative- but are destined to become facilitative-relationships. This finding supports the changed usage of one supplier accounting technique for another as the relationship, in terms of technical and organizational interfaces, change. However, this finding also sheds light on yet another shortcoming. The framework provides, like a photograph, a static illustration of the relationships and their accounting techniques. But relationships are dynamic and change over time and this is not captured by the framework.

6.4 Connective Relationships

The innovational supplier has a strong influence on the development of Autoliv's product base, which suggests a high technical interface. Moreover, the number of people involved with an innovational supplier is always kept low, partly due to confidentiality purposes, in line with a low organizational interface. As is characteristically for connective relationships, the products are adapted to Autoliv's purposes where Autoliv supplies high and prolonged investments while expecting low initial revenues.¹²⁶ The high investments are further not expected to earn a payback immediately and perhaps not at all if only considering one relationship; therefore, Autoliv expects these relationships to contribute to other relationships. In the case of Flir, for example, Autoliv did not expect night vision to be profitable in the short-term. However, they anticipated that the technology of night vision might become applicable in other areas and even in other supplier relationships. Another finding that is in line with this reasoning is the fact that Autoliv commonly, after the research and development has been carried out by an innovational supplier, buys the license or patent and signs a producing contract with another supplier that can produce at lower cost. In some cases found, the technology generated by an innovational supplier might never breakeven by itself even though produced by another supplier. Nevertheless, Autoliv has deemed these relationships profitable by considering the draw such innovations have on customers, that then buy Autoliv's other products. Consequently, these innovations may at length be profitable when incorporating the relationships of other suppliers delivering other products, generating a profit. Given the above, we consider this type of relationship to be connective and situated in the upper right corner of our relationship.

¹²⁶ Lind & Strömsten (2006)

When a new safety or process function is thought of, Autoliv makes a thorough search for a supplier they believe may find a solution for the intended function. Once alternative suppliers are found they are evaluated on their capability, know-how and capacity. From these results Autoliv, in co-operation with the potential suppliers makes estimates on what the project will cost as well as the time it will take. This is in line with the TCO approach since the total cost of the project is estimated over the life of the same. However, although no formal process of discounting future costs relating to, for example, future related sales generated from the relationship exists, when the choice was between equals as in the case of Flir, the most renowned was chosen. We believe that this choice was partly made in order to create legitimacy among potential customers that in length would thus be enticed to place their other safety purchases at Autoliv. This notion, that the draw of the innovation may turn a profit when incorporating the sales of other supplier products generated by the relationship is considered when evaluating the relationship is further emphasized by the Global Purchasing Director of Electronics. He stated that even though Autoliv does not make any formal calculations on the profitability of an innovational project it is in line with their philosophy and their strategy to keep and gain market shares. We consider these findings to support a technique which incorporates more than the dyadic relationship.

Furthermore, although the formal process of evaluating a supplier, once the agreement is signed, is made on progress in relation to costs incurred and the estimated future costs to finalize and deliver the project, it is common that Autoliv buys the patent and uses this in other products and/or with other suppliers. The costs incurred in these related relationships are also considered once the solution is near a producible state.

We believe that the above coincides with the application of combining the total costs of more than one product in more than one relationship, as is the definition of TCCO. However, one could argue that since the application of TCCO is not formalized, the real use of TCCO is highly subjective and could possibly gain from formalization. Nevertheless, since the formal application of TCCO is highly demanding from a supplier accounting view and since every connective relationship is unique; the formalization might be too costly compared to the potential benefits it may bring. This conclusion is supported by the Global Purchasing Director of the Electronics division who stated that even though the expected benefits of the relationship, in terms of other relationships, are important in the decision-making process they are never formally calculated. This is because the decisions are based on educated guesses and

experience that is hard to further decompose. We consider these finding to support the use of an informal TCCO analysis and avoid any opinion regarding if a more formal usage should be considered suitable.

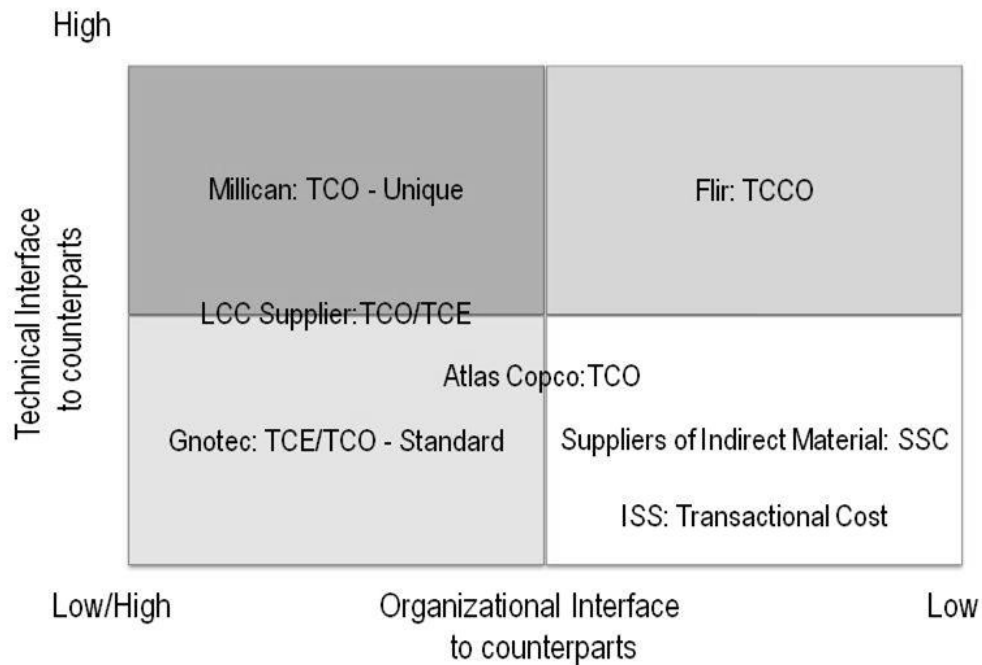


Figure 4 – The results of our case study illustrated in a framework based on inter-organizational resource interfaces
(LLC = Low Cost Country)

7. CONCLUSIONS



The purpose of this thesis has been to develop a framework, founded on prior theory, to explain an industrial company's choice of supplier accounting technique based on its supplier resource interfaces.

We have conducted an explorative case study to aid this purpose. However, since we have chosen to conduct a single case study it is hazardous to generalize the findings from this case. Nevertheless, we aim to bring a deeper understanding of what evaluation techniques are used in different types of relationships in this case. The thesis thus aims to answer the following question:

What supplier accounting techniques are used when evaluating different types of supplier relationships?

The answer to our research question may be summarized as follows:

Transactional relationships within Autoliv are evaluated on transactional measures such as price, quality and time for delivery whereby the best offers receive a one-year contract. This is done on an individual basis however the usage of a SSC method has been found on a group level where they are evaluated in terms of 96 segments.

We have found evidence for the usage of TCE in the facilitative relationships where Autoliv measures the accrued costs from a supplier, based on cost-driver accounting data, for a period of one year. However, the usage of a standardized TCO approach has also been found within these relationships. We have thus concluded that facilitative relationships may be found to be evaluated using more elaborate techniques than our framework has suggested.

Autoliv's integrative relationships are entered into on the basis of a unique TCO evaluation as the present value of future cash outflows, related directly and indirectly through the use of

cost drivers and estimates, is calculated. However, most integrative relationships, are transient and the method is then only carried out once in the beginning of the relationship.

Connective relationships are, within Autoliv, formally evaluated using a TCO approach where the present value of future costs relating to the purchase is estimated. However, when the decisions regarding such a relationship are made other aspects, such as the benefits the relationship brings to other relationships, carry a high weight. Thus an informal application of TCCO is used for evaluating connective relationships.

Within the relationships Autoliv has with suppliers in low-cost countries we found evidence for the applicability of our framework. These relationships change in terms of Autoliv's technical interface towards the supplier and with this change the supplier accounting technique used to evaluate these relationships is also changed in accordance with our framework.

Finally, we have discovered that in some of Autoliv's supplier relationships the relationship itself is not the determinant factor of what type of supplier accounting technique is used. Instead, the nature of the item purchased is the determinant factor. In order to not render the framework less useful in these situations we suggest a redefinition of the technical interface to incorporate the nature of the item purchased.

8. DISCUSSION



8.1 Strengths and Weaknesses

Much has been written about suppliers and different accounting techniques. However, limited knowledge exists as to when a particular supplier accounting technique is suitable. This thesis has begun to address this question in a business-to-business setting since before one can know what is suitable one has to know what technique is used. No previous study has, as far as we know, related different supplier evaluation techniques to different buyer-supplier relationships depending on their technical and organizational interfaces. Our case study on Autoliv is thus the only case study that has been carried out on the subject. Since suppliers provide the input for a company the evaluation of the same is crucial. Therefore, we found it interesting to create a framework describing the supplier accounting techniques used in a company's different relationships. We hope that this study will bring a deeper understanding of how the different supplier accounting techniques are used in an industrial company.

We have conducted a single case study, which implies that it is not appropriate to generalize the research findings. In order to generalize, it would have been necessary to perform case studies on additional companies, which is beyond the format of this thesis.

Furthermore, we could have conducted more interviews. We believe that it could have been interesting to conduct interviews with, for example, additional managers responsible for other supplier relationships. This could perhaps have provided an all-encompassing picture of Autoliv's purchasing organization. We are however of the opinion that, given the limited time and format of the thesis, the study has benefited from the limited scope our interviews have provided as this has afforded the study a more in-depth picture of the relationships observed and the supplier-accounting techniques used.

8.2 Further Research

During the research process we have found several interesting issues extending beyond the scope of our study. We present some suggestions for further research below:

- In order to be able to generalize the applicability of our framework, additional case studies need to be carried out with other industrial companies. Quantitative studies on the subject could preferably also be conducted, serving as a complement and adding to the possibility of generalization.
- Case studies regarding business-to-business relationships within other industries could further provide an understanding of how wide the applicability of our framework is.
- This study has gone beyond the dyadic relationship in terms of TCCO; however a study where our framework is combined with that of Lind and Strömsten's would provide a much wider scope. Such a study could incorporate the link between the customers' and suppliers' relationship perspectives and provide the field with an illustration on how different accounting techniques are used in a network perspective. Such a study may also add further insight as to why some relationships are evaluated as they are.
- Our study has been concerned with what supplier accounting techniques are used in different buyer-supplier relationships. We have based the accounting techniques used in our framework on theory and logic. However, the field of management control could gain from research conducted on what supplier accounting technique is the most suitable within a particular buyer-supplier relationship as this would provide a useful practical platform for companies to apply.

9. REFERENCES

9.1 Theoretical Sources

- Alvesson, M. & Sköldbberg, K. (1994), *Tolkning och reflektion; Vetenskapsfilosofi och kvalitativ metod*. London: Studentlitteratur.
- Axelsson, B. & Laage-Hellman, J. & Nilsson, U. (2002), Modern management accounting for modern purchasing, *European Journal of Purchasing & Supply Management*, 8(1), 53-62.
- Axelsson, B. & Laage-Hellman, J. (1991), *Purchasing a management issue*. Stockholm: Mekanförbundets förlag.
- Bensaou, M. (1999), Portfolios of Buyer-Supplier Relationships, *Sloan Management Review*, Summer 1999, 40(4), 35-44.
- Bell, Judith. (2000), *Introduktion till forskningsmetodik*. 3rd edition. Lund: Studentlitteratur.
- Dubois A. and Gadde L.E. (2002), Cost management across firm boundaries - A case study of MRO-procurement, Chalmers University of technology.
- Dubois A. (2003), Strategic cost management across boundaries of firms, *Industrial Marketing Management* 32(2003), 365-374.
- Dyer, G. & Wilkins, A. (1991), Better Stories, Not Better Constructs, to Generate Better Theory: A Rejoinder to Eisenhardt, *Academy of Management Review*, 16(3), 613-619.
- Eisenhardt, K. (1989), Building theories from case study research, *Academy of Management Review*, 14(4), 532-550.
- Eisenhardt, K. (1991), Building Stories and Better Constructs: The Case For Rigor and Comparative Logic, *Academy of Management Review*, 16(3), 620-627.
- Ellram, L.M. (1995), Total cost of ownership. An analysis approach for purchasing, *International Journal of Physical Distribution & Logistics*, 25(8), 4-23.
- Ellram, L.M. & Olsen, R.F. (1997b), Buyer-supplier relationships: alternative research approaches, *European Journal of Purchasing & Supply Management*, 3(4) 221-23.
- Ellram, L.M. & Siferd S.P. (1998), Total cost of ownership: A key concept in strategic cost management decisions, *Journal of Business Logistics*, 19(1), 55-84.
- Ford D, Gadde L-E, Håkansson H, Lundgren A, Snehota I, Turnbull P, et al. (1998), *Managing business relationships*. Chichester: Wiley.
- Gadde, L-E. & Snehota, I. (2000), Making the Most of Supplier Relationships, *Industrial Marketing Management*, 29, 305-316.
- Håkansson H and Waluszewski.A. (2002a), *Managing technological development. IKEA, the environment and technology*. London: Routledge.
- Kato, Y. (1993), Target costing support systems: lessons from leading Japanese companies, *Management Accounting Research*, 4(1), 33-47.
- Kraljic, P. (1983), Purchasing Must Become Supply Management, *Harvard Business Review*, September-October 1983, 107-117.

- Kvale, S. (1997), *Den kvalitativa forskningsintervjun*. Lund: Studentlitteratur
- Langemar, P. (2005), *Att låta en värld öppna sig – Introduktion till kvalitativ metod i psykologi*. Stockholms Universitet, Psykologiska institutionen.
- Lind, J. & Strömsten, T. (2006), When do firms use different types of customer accounting? *Journal of Business Research*, 59, 1257-1266.
- Malterud, K. (1998), Validitet. *Kvalitativa metoder i medicinsk forskning*. Lund: Studentlitteratur.
- Merriam, S.B. (1994), *Fallstudie som forskningsmetod*. Lund: Studentlitteratur.
- Samuelson, L. (1999), *Några vetenskapsteoretiska aspekter på forskning om Ekonomistyrning*.
- SSE/EFI Working Paper Series in Business Administration, Nr. 1999:5.
- Taylor, S. & Bogdan, R. (1998), *Introduction to qualitative research methods: A guidebook and resource*. 3rd edition. Hoboken: John Wiley & Sons Inc.
- Trost, J. (1997), *Kvalitativa intervjuer*. 2nd edition. Studentlitteratur, Lund.
- Yin, R. (1994), *Case study research: Design and methods*. 2nd edition. Beverly Hills: Sage Publishing.

9.2 Annual Report

Autoliv Annual Report 2009

9.3 Internal Documents

Autoliv Supplier Rating AS 51

ASM – Autoliv Supplier Manual

Flag Panel

Supplier Pre-Qualification Process – Guideline- Version 2: released May 2005

Supplier Quality Review Process

9.4 Internet Sources

www.autoliv.com [2010-05-16]

www.flir.com [2010-05-16]

www.gnotec.com [2010-05-16]

www.researchandmarkets.com/reports/296308 [2010-05-10]

www.autoliv.com/wps/wcm/connect/autoliv/Home/Who+We+Are/Ourpercent20Market [2010-05-10]

9.5 Interviews

Halvar Jonzon, Chief Purchasing Officer, 2010-02-10, 2010-03-15, 2010-05-11

Louise Johansson, Commodity Purchasing Manager, Steel, 2010-03-29

Jan Sjöström, Purchasing Manager Indirect Materials, Sweden, 2010-03-29

Johan Lagerstedt, Corporate Director Purchasing Control, 2010-04-20

Peter Kellerhals, Global Purchasing Director, Electronics, 2010-03-26

Stefan Denz, Global Commodity Manager, Textiles, 2010-04-06

10. APPENDIX

10.1 Interview Questions

1. Please, tell us a little bit about yourself?
2. For how long have you been working at Autoliv, and what are your main responsibilities?
3. To whom do you report?
4. How many suppliers are you responsible for?
5. How would you divide those suppliers into different segments?
 - a. Do you usually treat those segments differently? In what way?
6. Please choose one important supplier, and one less important:
 - a. How did Autoliv begin to contract this supplier?
 - b. How many people are working/is involved with this supplier?
 - c. How often do you or anyone from Autoliv have contact with this supplier?
 - d. Do you/Autoliv have the ability to affect the products the suppliers deliver to you? To what extent?
 - e. Does Autoliv in turn adapt to this supplier and/or its services and products?
 - f. Do you share any facilities, machines, logistics etc. with the supplier?
 - g. Does the supplier affect your products?
 - h. If you did not have access to this supplier would your product/service be different? In what way?
7. How do you evaluate this supplier?
 - a. How often is this evaluation carried out?
 - b. What happens if a supplier is performing non-satisfactory?
8. Do you think that the current evaluating system is good?
 - a. How can it be improved?
 - b. How are the evaluations followed up?
9. Do the suppliers know how you evaluate them?
10. What do you think is the main difference when evaluating the important and the less important supplier?