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Interorganizational Resource Interfaces and the use of Customer Accounting

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Abstract

The role of the customer has received increased attention in the management accounting and control literature recently. Understanding and tracing the revenues and costs of customers has always been of outmost importance for firms. In business markets which often are concentrated in terms of numbers of buyers and sellers, it is even more important to know in what extent a customer contributes to the firm's profitability. Instead of looking at internally formulated strategies or the competitive conditions in a generalized environment, we argue that the way a firm measures a customer can be explained by the idiosyncratic interfaces and relationships with customers a firm have developed over time. In these relationships the character of the firm's *organizational* and *technical interfaces* to its customers are instrumental. The technical interfaces can differ in terms of how adapted products and production facilities are to each other. Some technical items are highly standardized while others are adapted to a specific counterpart. The organizational interfaces a firm has differ in terms of direct commercial commitment (e.g. amount and frequency). While some relationships affect the firm to a large extent commercially, others are only marginal to the supplier. The variation in interfaces creates heterogeneous customer relationships and just as heterogeneous customers must be managed taking the heterogeneity into account, so must also the control of the firm's customers take into account this variety of customer interfaces. We illustrate with example from the telecom company Ericsson and the forest company Holmen how the character of the technical and commercial interfaces can explain what type of customer accounting technique a firm has applied as well as the level of sophistication that is needed to measure its customers. We suggest a typology of relationships, based on the combinations of technical and commercial interfaces a firm has.

Kewords: Customer accounting, resources, interfaces, relationships

Introduction

The role of the customer has received increased attention in the management control literature recently (Vaivio 1999, Guidling & McManus, 2001). From a practitioner's point of view, understanding and tracing the revenues and costs of customers has always been of outmost importance for firms. It is essential for any firm to know if a customer contributes to its profit bottom line or not. In business markets which are concentrated in terms of numbers of buyers and sellers it is even more important to know to what extent a customer contributes to the firm's profitability.

A growing number of articles in the field of customer accounting has been presented lately (e.g. Foster and Gupta, 1994; Foster and Young, 1997; Kaplan & Narayanan 2001; Pfefier, Haskins & Conroy, 2004; Reinartz & Kumar, 2003; Guilding and McManus, 2002). Possible factors that might affect a firm's propensity to use customer accounting (e.g. customer profitability measurement techniques) was examined by Guilding and McManus (2002) who found a positive relationship between a firm's market orientation and its use of customer accounting. They also found a weak positive relationship between the perceived intensity of competition and the use of customer accounting.

In the literature on customer accounting, different techniques and their benefits and pitfalls are discussed. Examples of customer accounting techniques include the use of activity based-costing in the analysis of customer profitability (Cooper and Kaplan, 1991; Kaplan and Narayanan, 2001), profitability analysis of customer segments (Libai, Narayandas & Humby 2002), customer valuation (Boyce, 2000) and customer life time profitability (Reinartz and Kumar, 2000, Pfeifer, Haskins and Conroy, 2004). However, little effort has so far been devoted to examining under what conditions a certain customer accounting technique is used. In this paper we will examine what factors that affects the use of various customer accounting techniques in a business-to-business setting.

Instead of looking at internally formulated strategies or the competitive conditions in a generalized environment, we argue that the way a firm measures a customer can be explained in the idiosyncratic interfaces and relationships with customers a firm have developed over time. In these relationships the character of the firm's *organizational* and *technical interfaces* are instrumental. The organizational interfaces a firm has developed differ in terms of direct commercial commitment (e.g. amount and frequency). While some relationships affect the firm to a large extent commercially, others are only marginal. The technical interfaces can differ in terms of how adapted products and production facilities are to each other. Some technical items are highly standardized while others are adapted to a specific counterpart. The possible variation in interfaces creates heterogeneous customer relationships and just as heterogeneous customers must be managed taking the heterogeneity into account (e.g Ford et al 1998), the control of the firm's customers should take into account this variety of customer interfaces. We suggest a typology of relationships, based on the distinction and combinations of various technical and commercial interfaces a firm has. Using case illustrations from the telecom company Ericsson and the forest company Holmen we also show how the character of the technical and organizational interfaces can explain what type of customer accounting technique a firm has applied.

This paper draws on work conducted within the IMP Group (e.g. Håkansson, 1982; Axelsson and Easton, 1992; Håkansson and Snehota, 1995; Ford et al, 1998; Arujo et al, 1999; Håkansson & Waluszewski, 2002). The remainder of the paper is organized as follows. First we will examine four different customer accounting techniques as they are presented within the management accounting field. Second we discuss types of resource interfaces as they are presented by IMP researchers. Next, we will present two case illustrations where the relational contexts in Ericsson's and Holmen's use of the four customer accounting techniques are examined. In the next section we develop a framework which explain the choice of customer accounting technique. We end the paper with a discussion and some concluding remark where suggestions for further research are presented.

Customer accounting

Accounting for customers has become a key topic both in practice as well as in the research community. The importance of knowing which customers that contributes to the firm's profit has been discussed by several scholars. The reason is that not every unit of revenue contributes equally to the bottom line profit; some customers are just more profitable than others for the supplier (Kaplan &

Narayanan 2001, Reinerz & Kumar 2004). Or as Boyce (2000, p 678) expresses it: “Not all customers are created equal”.

Both marketing and accounting scholars have looked into different types of customer accounting techniques (e.g. Kaplan & Narayanan, 2001, Pfefier, Haskins & Conroy, 2004). The way customer accounting is conducted by firms can broadly be divided in four different categories: (i) customer profitability analysis (ii) customer segment profitability analysis (iii) lifetime customer profitability analysis and (iv) valuation of customers as assets. We do not claim that this is an exhaustive list. However, this is also the list of that Guilding and McManus came up with in their study on customer accounting and it seems to capture the most commonly used customer accounting techniques.[1]

(i) Customer profitability analysis
Customer profitability analysis measures a customer’s contribution to a firm’s profits as the difference between the revenues and costs (accrual based) that can be traced to a specific customer during a given period of time e.g. on an annual basis or a quarter of a year (Pfeifer, Haskins & Conroy 2004). This type of analysis can be more or less sophisticated (Malmi et al 2004). Most often the basis of the analysis is some type of full costing product analysis where the amount of products purchased by a customer and hence the costs associated with these products are allocated to a customer. More sophisticated analyses include for example activity based costing (ABC). ABC is considered to be a step in making customer accounting more accurate by also allocate overhead costs to specific customers based on their behavior and hence how much resources they are forcing the supplier to consume. (Kaplan & Cooper 1998, Kaplan & Narayanan, 2001).

(ii) Customer segment profitability analysis
In this type of analysis the object of measurement is a group or segment of customers. The segmentation can be based on variables such as purchasing behavior, geographic location, demographic variables or something that makes them stand out from the rest of a firm’s customers. This regards customer groups, that there is no meaning of treating on an individual basis and hence the information that is needed is grouped into segments. It is certainly possible to trace overhead costs to segments of customers. However, customers are always seen and indirectly also treated as aggregated groups and never on an individual basis.

(iii) Life time customer profitability analysis
When a firm uses lifetime customer profitability analysis the time horizon is extended to include also future years. The focus of the analysis is on customer profitability, as in *accounting* profitability and account for the future revenues and costs that can be associated to a specific customer on accrual principles (Pfeifer, Haskins & Conroy 2004). The revenues and costs that can be associated to a specific customer are simply added together and the firm uses a time horizon that extends the normal annual measurement.

(iv) Customer valuation
Customer valuation implies looking at customers as assets and that customers are important resources that the firm will be able to receive revenues from today and in the future. This asset is important as the firm can use it also in other relationships, e.g. as a learning device. The economic value is related to the customer life time value and account for the present value of future cash flows that can be related to a specific customer relationship (Pfeifer, Haskins & Conroy 2004). Then there is a question of customer lifetime *value* (CLV) and accordingly not accounting based profits as discussed above. (ibid). Adding up the “customer equity”, the firm’s equity is also given, as customers are those that will generate cash flow in the future and the cash flow determines the value of the firm.[2]

[1] The development of customer accounting (including customer profitability measurement techniques) have certainly been changed by the progress in the IT field. The development of IT has made it easier and more convenient to track costs to certain customers or customer groups, which facilitate measuring customer profitability (e.g. Searcy 2004). Still, IT does not solve all problems; the firm has the choice to make on what type of customer accounting technique that will be used and IT tools such as ERP-systems does not solve this problem.

[2] The focus on customer value, customer equity etc, is therefore, according to Boyce (2000) just an extension of the development of the shareholder value focus (see Rappaport 1986, 1998).

The four different customer accounting techniques differ with regard to the object of measurement. The object can be a single customer or a group of customers. A second difference refers to the time period with a variety between annual (or quarter of a year) or several years (a lifetime). All the four ways of measuring customers are aiming at the financial dimension.

In terms of explaining why a firm uses a certain way of measuring a customer or a group of customer there have been few contributions. One exception is as mentioned in the introduction, Guilding & McManus (2002) study that identified two main variables that explained the use of customers accounting: the competition within the industry where a firm resides and a firm's market orientation. In the following section we will focus on another perspective that can increase the understanding for a firm's choice of customer accounting technique, namely the firm's position in an industrial network context in general and more specific its technical and organizational interfaces to its customers.

Interorganizational Resource Interfaces

In business markets, where both buyers and sellers are firms or professional organizations firms develop resources and invest in new ones. One such resource is the relationships which firms develop over time. Resources have different characteristics and qualities (Håkansson & Waluszewski 2002) depending on how they are used and by whom. There are basically two types of resources, technical such as products and production facilities, and organizational resources such as organizational units and organizational relationships (Håkansson & Waluszewsksi 2002, Wedin 2001, Baraldi 2003, Gressetvold 2004). Interfaces in general are concerned with the interdependencies that arise and exist between objects (technical or organizational). This happens when the resource base of a supplier gets connected to the one of a buyer (Araujo, Dubois & Gadde 1999). The interfaces are managed by the firms involved in the exchange activities and concern two levels, a technical level and an organizational level.

According to Håkansson & Waluszewski (2002) *products* are part of both a buyer as well as a seller system and have features that are used and shaped in the interaction between a seller and a buyer. Further, a product can be more or less adapted to the buyer's need or be more standardized. *Production facilities* tie the production and utilization of resources together. In business markets facilities are often systematically related to specific counterparts in order to fit a certain input, but perhaps more often to fit a certain user or user group. The third basic resource, *organizational units*, involves aspects like a unit's capabilities and ability to cooperate with other units. When a unit grows; it becomes more important financially for a supplier or a customer, which most likely results in a long term relationship. The fourth resource is thus *organizational relationships*. Relationships are connected and form network structures. The connected relationships can be used in order to reach goals for the firm. For example, relationship can be used to mobilize resources that otherwise not would be available. Getting into a network of connected relationships is not easy however and demands in most cases that time and efforts are invested.

A firm's organizational interfaces with its environment are related to how it interacts with other units, the relationships it forms, the type of exchange that can be found etc. Another important factor in this context is, of course, the concentration of its revenue streams the amount of a product a customer purchases and the frequency of purchases. Moreover, the organizational interface also depend on whether the customer purchases a single product, or several (cross buying) or even a system of products and production facilities, including the knowledge of a supplier. Companies within business networks often operate closely with a few important counterparts. It means that there are some firms that are more important from an financial viewpoint than others. Other customers might be more important than others from an innovation perspective while other customers are functioning as a bridge to a market or a specific group of customers or even individual customers (Håkansson & Snehota 1995, Ford et al, 1998)..

Another aspect of business relationships is the technical interfaces a firm has to handle. Products developed and produced by a firm are combined with other products and components and are used and further processed in the customer's production facilities (Håkansson and Waluszewski, 2002, Wedin 2001, Baraldi 2003, Gressetvold 2004). This makes the use and production of products systemic and the interfaces between products and production facilities are not always easy to break apart since long time might have passed and costly adaptation might have occurred to get them in

place. The technological content of relationships makes firms to look at relationships as important investments that have to be governed and controlled (Johanson & Mattsson 1985). If a supplier is aware of the technical interfaces that exist in relation to a customer, it will be prompted to start collecting information about the customer and the relationship. If the relationship is an important one commercially, this will be even more important.

When a relationship has reached a certain level or volume, a supplier must be able to gain information about the customer in order to asses whether the costs related to the account is greater than the revenues. However, a relationship might be important even if the relationship is not financially important today. For example, from a technical development perspective, there will also be customers that have specific and sophisticated user needs that are important to understand. These relationships will render the supplier knowledge that is crucial both in the direct relationship, but perhaps more important the knowledge developed will be possible to use in connected relationships. Further, these relationships can supply the firm with knowledge about future needs of the customer group.

Through the different mixes of technical and commercial interfaces, every customer is unique in one way or another and must therefore be managed uniquely (Håkansson and Snehota, 1995; Ford et al, 1998)[3]. A company's customer relationship will differ between each other in several aspects such as commercial commitment, history, size, technology, organization and culture (Ford et al, 1998). It means that a company's interface to a particular customer is a unique combination of the organizational-technical interfaces that exists, a combination which will not be found within another customer interface. The relationship is, therefore, important for the productivity and profitability of the individual firms. Costs and revenues for a firm depend on the relationships that it engages in. By being active in the relationship, the costs and revenues are not once and for all given, but just variables that the firm can influence. Information about these heterogeneous customer relationships will be necessary in order to be able to change and strengthen behavior in relation to a certain customer.
Just as the relationships are handled as unique entities, firms also account for different business relationships in different ways, depending on the interfaces between the supplier and customer.

Illustrations from Ericsson and Holmen

We are using two case studies to identify patterns in the use of customer accounting. The two case companies, Ericsson and Holmen, represent two firms with two different technologies, pace of development and different ways of doing business. Still, we believe that the two cases complement each other, just by being different; they show different aspects of how firms organize business relationship on a organizational and technical level, and accordingly how they use different customer accounting techniques. We have searched for the unique in each case and the particularity in how they handle relationships with customers. This has increased our understanding in how the different layers of a business relationship affect how they are measured formally or informally. Interviews were conducted with a large number of individuals within each organization. In the Holmen case, over 100 interviews were conducted. In the Ericsson case both authors have conducted research where the focus was on interorganizational control issues. Both authors had access to offices assigned at Ericsson and had also right to use to the firm's intranet. The interviews focused on interorganizational relationships in general where issues such as relationship length, interaction pattern, technical content, development (both commercially and technically) and conflicts were discussed. Questions about of how customers were measured, financially and non-financially was a part of the interviews and was discussed sometimes explicitly in other interviews more implicitly. The linkages between how a customer was measured and the relational context were also covered by the above more general questions about how a relationship with a customer evolved. As for questions about more peripheral or less important customers, these were covered by questions that dealt with adaptive behavior in terms of technical resources or administrative routines. Customers that were considered of less interest received standard treatment, while more important customers were treated differently, had a history of being a "good" customer in various aspects.

[3] The opposite situation is of course when the customers are homogeneous, no customer is then more important than another and the revenues are equally distributed among the customers and the technical content of the different exchanges is all the same. This situation is less likely to occur.

The two companies are both Swedish companies operating on business to business markets. The telecom company Ericsson and Holmen, a forest product company, have both applied customer accounting to be able to trace the customer profitability. Holmen manufactures and sales printing paper which is produced in capital intensive production facilities. Ericsson is one of the dominating actors within the telecom industry and sales complex technical systems which are used by its customers over a long period of time.

In the following we will examine under what relational contexts the two firms are using the four different customer accounting techniques discussed above.

The use of Customer Profitability analysis at Holmen and Ericsson

Holmen, produces and sells printing paper which is produced in capital intensive production facilities. Holmen's accounting system makes it possible to identify what different customers have purchased in terms of product, volume and the price paid per ton. Different types of costs such as production and distribution costs are allocated down on product level can further be traced to a particular customer. Thus, the customer related costs are in fact product costs. When there is a shortage of available capacity available and Holmen is offered to sell to several customers, Holmen evaluates customer bids by measuring the contribution per hour on a specific paper machine that a customer will generate. Thus, it is for example possible to follow up the customer profitability for a specific customer such as Svenska Tryckcentralen (STC), a civil printing house based in Stockholm, Sweden. STC purchases mainly improved newsprint which is produced on some of the smaller paper machines in one of Holmen's paper mills. Even if these are more value added products, they are considered to be more or less standardized products.

Ericsson work on a market with relatively few customers as the total numbers of customers are about 400 in total and are decreasing as consolidation in telecom industry is underway. Ericsson uses revenues and market contribution measures that can be traced within specific customer relationships to different objects such as customer projects, software features, hardware components and support services. It means that Ericsson measures costs and revenues associated with particular projects and customer orders on a continuous basis and over time (as we shall se more about below). These are customers that buy a standardized system, but that still account for a significant volume. However, these customers might not purchase as many number of features that is possible in the system that Ericsson has provided. These operators might for example not demand advanced features by Ericsson in the mobile system, because of the population in the country have less need for advanced mobile services (such as in developing countries). Within these relationships, it is important that the technical demands and requirements are compatible with the ones of other customers. Otherwise, other types of profitability measurements would be used.

The use of Customer Segment Profitablity analysis at Holmen and Ericsson

The forest company, Holmen divides some of its customers into segments, depending on the volume that they buy on an annual basis and whether the relationships are characterized as strategic or not. Thus, the less voluminous or strategic relationships are grouped into segments, either on a product or a geographical basis. In these relationships the organizational and commercial interface to the customers is less developed as there are no adaptations in terms of ordering systems or other administrative routines. On the technical side, these customers are also more of "spot customers". Holmen finds that there is less need to measure and control these customers on an individual basis. Instead this is done more on a segment level.

Ericsson on the other hand has few customers which they don't follow and monitor on an individual basis. Even if there are customers that are insignificant both from a organizational and commercial perspective as well as from a technical one, Ericsson still measure and control individual customers. However, there are many customers that not are assigned a special Key Account Management organization, such as is the case for the true important and global telecom operators.

The use of Customer Life Time Profitability analysis at Holmen and Ericsson

As the technical adaptations are substantial and the commercial content also is significant, are these types of relationships of great importance for a supplier. We saw a pattern where the two firms measured customer profitability by taking in future revenues. In Ericsson's case the amount of years were quite many, while in the Holmen case the future revenues were more implicitly accounted for when the firm made investments in production facilities.

For Holmen, it is of outmost importance to know what type of profit large customers contribute with. Springer Verlag in Germany one of the largest customers in terms of both revenue, but is also important technology wise. The profitability that large paper customers render is monitored on an annual basis, but also implicitly over time. The reason is that a large customer often buys a product, adapted to the technical facilities it uses, in terms of type of printing press and the type of ink it uses. These adaptations must in the end pay off for Holmen. For really large customers the products are often adapted in terms of different features (such as brightness, or color).

For Ericsson which sales complex technical systems which are used by its customers over a long period of time, it is essential to be able to trace the profitability of a customer over a mobile system's life cycle. As the technical interdependence that Ericssson faces is considerable, the customer profitability is measured over a project's life cycle. In the Ericsson case more than 50% of its revenues are concentrated to the firm's ten largest customers. These customer relationships are characterized by being long term and Ericsson has had a relationship with some of them for more than 50 years. Vodafone and Ericsson have for example had a relationship since 1983, when Vodafone was founded. Ericsson and its important customers have adapted their resources and activities to each other as much of its R&D activities are directed towards some of the larger telecom operators. Ericsson collaborates closely with its important customers. Ericsson has projects concerning specific software releases together with some of the more significant customers. As mentioned above, the technical interface between these two firms is thus significant as Ericsson sales technical systems with a long technical life time. The possibility to "move in" with a customer comes every 5-10 years, when a customer is about to upgrade its system. To be able to become a supplier is very important as the amount of complementary purchases that are made is considerable.

Customer Valuation analysis at Holmen and Ericsson

The use of customer valuation can be found in both the Holmen case as well as in the Ericsson case. Holmen´s customers thus differ from each other in some critical ways as some customers account for a large share of the firm's revenues and that technical ties exist with some specific firms. There is further a variety in the type of printing technology that customers use. Further, some larger customers are very sophisticated when it comes to evaluate the paper in terms of chemistry, but also in terms of setting up measurement systems for how a supplier's paper function in terms of runability and printability, while others, smaller printing houses, have fewer resources for these types of activities. The customers that demand high quality are important since they have sophisticated user demands that later on can be transferred and used on other customers. One such customer is the small but closely located newspaper, Norrtelje Tidning, which for a long time has worked together with Holmen in its development new paper grades. Financially, Norrtelje Tidning is not a particularly important customer, but since it is in the forefront of using new printing technologies and work systematically with all the different inputs in the printing process, Holmen still finds it worthwhile to work closely together with this customer.

In the Ericsson case, the customers differ in aspects such as necessary support of the ongoing cellular system, demands on new software features to the cellular system, and demands on the next generation of the cellular system. One customer that has played an important role historically is the Swedish operator Telia. Telia certainly imposes other demands on a cellular system than a new operator in China would do. However, the demands that Telia requires and the technical solutions that is worked out in joint development work, Ericsson can use in other relationships, such as the one with China Mobile. Therefore, a customer like Telia must be valued for other reasons than purely the financial outcome, but also as a learning partner, whose knowledge can be taken further into more financially important relationships.

Interorganizational Resource Interfaces and the use of Customer accounting

The case illustrations show that the use of the different customer accounting techniques takes place in different relational contexts. In what types of relational contexts are these techniques used? To address this question we found it useful to emphasize the implicit logics of the different customer accounting techniques.

> (i) customer profitability analysis implicate that there is a relationship between a supplier and customer that is rather well developed and that has organizational and technical interfaces that must be governed and controlled for, even if the technical interfaces are specially adapted for this particular customer.
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> (ii) customer segment profitability analysis on the other hand, is associated with more arm's length or loose relationships where there are few direct investments in technical products or facilities. At the same time this type of analysis is made when there are no meaning of measuring individual customers, since the revenue stream within this group is evenly distributed.
>
> (iii) lifetime customer profitability analysis is used when the technical interfaces imply large investments and the organizational interface at the same time, is associated with high commitment from both sides, which mean that revenues are likely to be concentrated and substantial.
>
> (iv) valuation of customers as assets is a technique that is used when there are technical investments that are specific for a customer, but the organizational interfaces are less developed in terms of revenues and commercial commitment. This is also a technique that implicitly is used for customers that function as a "learning object" as the knowledge and the technology developed can be used in other customer relationships.

Figure 1 shows the analytical dimensions that we have used in order to sort the different accounting techniques. The first dimension regards the degree of technical adaptation that occurs in an interface towards a customer. The adaptation occurs either when the product the firm sells to the customer is adapted for the customer's purposes, its production processes or in relation to other inputs or resources. Alternatively, the firm's production facilities technically are adapted in relation to the customer for example in order to increase the yield of critical resources or to make physical flows more efficient. The other dimension in the matrix deals with the organizational interface of the relationship. This regards both the financial flows and thus the amount and frequency of the exchange, (Kelley & Thibaut 1978), but also more indirect benefits that a firm can gain from having a relationship to a specific counterpart. These benefits can regard other contacts with customers, or knowledge that is essential for the firm to have. If a customer accounts for a significant share of sales and at the same time there is a contact pattern (frequency) that is long term and is developing, the relationship interface can be seen as organizationally well developed. If the relationship interface is organizationally developed, the information flow between a customer and a supplier can be assumed to extensive and involving both short term as long term planning and coordination.

		Degree of developed Organizational interface to customers	
		High	Low
Technical level in Interface to customers	High	(3) Customer Life Cycle Profitability analysis	(4) Customer Valuation
	Low	(1) Customer Profitability analysis	(2) Customer Segment accounting

Figure 1. A framework that conceptualizes how customer accounting techniques are related to the interorganizational interfaces of a firm.

This type of typology increases our understanding on why a firm applies a certain type of customer accounting technique. Given the type of heterogeneous customer relationship that the combination of

a techno-organizational interface will create the firm will seek to monitor and control the relationship differently, with a different customer accounting technique (explicitly or implicitly). Basically, a company with a heterogeneous set of interfaces to its customers will also use a heterogeneous set of customer accounting techniques compared to a company working with customers with less developed commercial interfaces and standardized technical interfaces. Different accounting information is needed in different relationships.

In the following we will discuss the use of different customer accounting techniques in relation to the interorganizational resource interfaces that were identified in the case illustrations from Holmen and Ericsson.

Discussion

Square 1: *High* degree of developed organizational interface/ *Low* technical level in customer interface: Customer profitability analsysis

In the cases where Holmen and Ericsson measure customer profitability on an accrual basis and on an individual level, the organizational interfaces to the customers are developed in terms of volume and frequency. There is likely therefore that the relationship has evolved over some time, often over several years. As for the adaptations in the technical interfaces to these customers there are mainly standardized products, at least in relative terms with more specialized and tailor made products. However, one can in some cases see that production facilities are related in a rather systematical way to each other in this situation. This is at least the case for Holmen paper, whose paper machines are adapted towards groups of newspaper companies using a similar technology. Thus, a group of customers may be very important and technical facilities can be designed and manufactured in order to fit these customers' needs. Within these customer groups there are often one or two really large customers that push the supplier's problem solving activities in a certain direction. Still, there are no investments directed to an individual and specific customer as paper making is a capital intensive technology that seldom permits this.

Square 2: *Low* degree of developed organizational interface/ *Low* technical level in customer interface: Customer Segment Analysis

Some customers for Holmen and Ericsson are just not important enough to measure and monitor on an individual basis. Instead, these customers are often grouped together into segments. Marketers have segmented groups of customers in all times, into geographical, demographical or life style segments. The whole idea is that the customer groups should be homogenous within the segment, but heterogeneous between segments. The characteristics of these interfaces are rather straight forward. In the technical dimension, there is no adaptation towards individual customers, even if some production facilities might be directed towards a specific segment. In this aspect, the technical interfaces between the types of customers that are measured on an individual basis are similar.

Square 3: *High* degree of developed organizational interface/ *High* technical level in customer interface: Customer life cycle Profitability analysis

For Holmen and Ericsson as well as for most other firms it is not possible to have well developed commercial interfaces to all its customers, instead these will refer to a few large customers that are very crucial for the firm's profitability. It will therefore be important to know these individual customers' contribution to the firm's bottom line profit. As simple as it may seem, a firm cannot afford to be engaged in resource demanding customer relationships which cost more than they contribute. If this happens, there is a need for an information system that captures this so that actions can be taken to change unprofitable customers into profitable ones. The content of a business relationship often changes just gradually and it will therefore take time for the company to change an unprofitable customer relationship to become a profitable one.

A firm is likely to measure customer profitability over the relationship's life time with customers that it is having a organizational interface to that is deep not only in financial terms as in the amount a customer purchases the supplier products and the frequency it does so, but also in terms of information sharing and knowledge development. The technical level or adaptations often demand a close interaction pattern. The financial content of the relationship is complex and involves large upfront

investments in production facilities or knowledge development projects. In terms of technical interfaces to customers, the degree of technical adaptation in the interface to the customer is high. This means that there have been co-developed products or the facilities needed to produce the products are likely to have been adapted to each other or the service content might be significant. Another, possibility is that components and products that are used together with the "focal" product in the exchange, must be fitted together which might be a time consuming process. For firms, this means that there is need to know what contribution this type of customer will render over a number of years, not only on annual basis. Therefore when theses conditions are present, the firms will in many cases use a sort of life cycle measurement on the customers' profitability.

Square 4: *Low* degree of developed organizational interface/ *High* technical level in customer interface: Customer valuation analysis

Most firms have a portfolio of customers which are measured and monitored in different ways, explicitly or implicitly. The techno-organizational interface in this case looks a bit different from the others that we discuss. For customers where a firm has committed rather a large pool of technical resources and co-developed solutions, one can speak of a technical interface that is characterized with a rather high degree of adaptation. On the other hand, there is hardly any commercial interface what so ever, at least not at this stage. The reason might be that the customer is a start-up and is still working to design and develop its products (in collaboration with the supplier). Another possibility is that the customer is a part of a mature firm that is moving in a new direction, but still the sales of the customer is very limited and therefore is also the commercial interface to the supplier rather limited. However, the firm as a supplier has committed, invested, in this customer for a reason: that the customer some time in the future will be profitable for the firm. Or that the firm will serve as an important source of knowledge that can be leveraged in other relationships. This is often the case with lead users (von Hippel 1988) as they posses knowledge about future needs that later on will become more common among other firms. If this is the case the "valuation" of this customer is done in the light that the firm will make money on other firms, whose needs are compatible with the lead user. In fact, sometimes, a firm will allow a customer to not be profitable at all. A customer relationship might have other values than strict financial ones. A customer relationship can for example work as a bridge to another relationship, which in turn is a profitable for the firm.

Both Holmen and Ericsson look at these types of customer relationships as assets that one will make money from in the future even if this is not the case today. Firms make in these cases a "valuation" of these customer relationships. Is there any chance that the firm will get a return on the investments in the technical adaptations in products and production facilities that has been conducted, direct in the relationship or indirect through the connected relationships? The non-financial information that a supplier collects regarding these relationships is related to financial returns and the search for indicators that speaks for a possible translation of the technical requirements or demands that the customer has. A translation is necessary in order to the knowledge gained in the relationship will be possible to use in other relationships. Information about the demands that come from a lead user and value these demands in relation to other customer in the future can be willing to purchase and demand in terms of technical solutions.

Concluding remarks

In this paper we have offered a framework that conceptualizes how customer accounting techniques are related to the interorganizational interfaces of a firm. Previous research on customer accounting has acknowledged that different techniques are more or less valuable for firm. However, less effort has been given to when a certain technique is used. What this article shows is that firms need different type of accounting information in different relationships, depending on the interface with the customer.

We showed that the firm's interface to its environment and more specifically the firm's technical-organizational interfaces to customers are important in order to understand the use of specific customer accounting technique. Our framework which is based on the IMP literature (Håkansson & Snehota 1995, Håkansson & Waluszewski 2002) allows us to describe and analyze relationships between firms on business markets and the technical and organizational interfaces that always are present there. We argued that a company with a heterogeneous network of customer relationships will also use a heterogeneous set of customer accounting techniques. Heterogeneous relationships are to

a large extent a result from the interfaces that exist in the commercial and technical dimensions or layers in a relationship.

We used case illustrations from Ericsson and Holmen. These firms use varying customer accounting techniques and measure customer profitability with different levels of sophistication depending on the interfaces to its customers. Holmen as well as Ericsson traced costs and revenues to specific customers (and also groups of customers in Holmen's case), albeit in different ways depending on the types of technical and commercial interfaces the firms have to their customers. As there are variations in the commercial and technical interfaces and thus the customer heterogeneity, there will also be a variation in the use of customer accounting technique applied.

More research on this topic is clearly needed. The framework presented here is only a first step and must be further developed. More in-depth case studies is needed in order to further find variations in the technical-commerical interfaces between organizations and how they affect the way firms measure and control customer relationships. In addition, the behavioral aspect of measuring customer relationships is also a field that should be further examined in order to better grasp the management of customer relationships.

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