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Accounting for networks - the consolidated network approach

by Teemu Laine, Jari Paranko, Tommi Lahikainen, Marko Seppanen, Petri Suomala

Abstract: In the network economy, a profitability analysis based on the figures of one company is not sufficient to obtain an insight into the competitiveness of the whole network. In this paper, the basic ideas underlying the consolidated financial statement are analysed to determine its applicability for managing network profitability. The idea of the consolidated network is presented on the basis of a conceptual analysis, derived from research action in two company networks. Despite numerous barriers hindering adoption of a consolidated network, the idea of a consolidated view of business has received much positive feedback. The recognised benefits include value creation, profit calculation and profit-sharing within the network. Using the consolidated network as a metaphor offers one way to communicate within supply chains as well as virtual organisations.

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1 Introduction

1.1 Background

“We cooperate to compete against other networks.” “We apply the win-win principle in our partnership relationships.” Those are well-known phrases in the network economy, in which the performance of one company is said to be dependent on the competitiveness of the network as a whole. In many cases, however, the buzzwords of the networks can be questioned. The main problem with real-life business networks seems to be their inability and unwillingness to see the network as a single entity, as well as a lack of tools to objectively analyze this entity.

In this paper, we broadly define the network as a virtual entity of partner firms with a common goal (and end customer), in line with Ackoff's (1971) idea of the system as a purposeful set of interrelated elements. The partners in networks, because they lack a majority of voting rights, need to trust each other (Tomkins 2001), and therefore should take the potentially opportunistic behaviour of the others into account (Williamson 1985). Similar to a network, a consolidated corporation can be described as an entity which aims at combined economic targets, as long as the right to vote is concentrated to a sufficient degree. Additionally, the objective of the financial statement of a consolidated corporation is to give a true and fair view of the economy of the network entity as a whole. Thus, it would seem relevant to determine whether some lessons could be learned from the consolidated financial statements of consolidated corporations, when analyzing performance in real-life business networks.

The economy of inter-firm network relationships has recently attracted considerable attention in management accounting literature (e.g., Kulmala 2003, Dekker 2003, Mouritsen et al. 2001, Cooper and Slagmulder 1999). During the last decade, companies have concentrated on their core competences and outsourced certain activities. The idea of outsourcing was to improve the cost effectiveness of the company and the whole network (Dekkers 2000). Outsourcing may also provide a tool for increasing value in the supplier network (Vesalainen 2004). Because of this outsourcing, the number of suppliers has often decreased, with certain suppliers becoming system suppliers (Kulmala 2003, p. 30). In addition to outsourcing, the most developed manufacturers have started to look for new opportunities by going downstream (e.g., Mathieu 2001; Wise and Baumgartner 1999). This raises the need to view the network in a new way: within the OEM companies, for instance. The objectives and strategic choices of these companies tend to vary a great deal in the changing business environment.

Traditional transaction cost economics (TCE) has explanatory power, for instance, in describing how many companies there should be, how large the companies should be, and why the companies should have certain products in their offerings (Coase 1937). According to Williamson (1975, p. 148), the transaction costs can be seen as a source of friction within the network structure. In networks with well-working interfaces, transactions should occur smoothly (without friction). In the dynamic network economy, however, such companies simultaneously assume several types of network relationships. To manage their network relationships, companies should always choose between asset specificity (dependence) and flexibility (independence, connectivity), thus stressing the need for new tools to manage the profitability of those network entities and their participants.

1.2 Objective and methodology

The objective of this paper is to analyze the applicability of the basic ideas underlying the consolidated financial statement as a means to manage network profitability. In the network economy, a profitability analysis based on the figures of one company is not sufficient to obtain an insight into the competitiveness of the whole network. In this article, profitability analyses of networks are combined with the principles governing the financial statement of the consolidated corporation.

From a methodological perspective, this study can be considered a conceptual analysis, even though the need for the conceptual analysis was derived from an action research process that was carried out in two company networks. The goal of the action research was to develop the cost management of the company networks to meet the challenges set by the evolving business environment.

2 Consolidated financial statement for networks

2.1 The Consolidated Corporation is a virtual company

A consolidated corporation (i.e., group) does not have any juridical power to act, nor does it have any duty to pay taxes. Therefore, a consolidated corporation does not exist as a juridical actor. What does exist is an agreement that the entity will be designated a consolidated corporation when the right to vote becomes concentrated to a sufficient degree. Thus, in a manner of speaking, the group comes about as a by-product. The reasoning behind the consolidated statement (of a corporation) is the will to consider a group of juridical independent companies as a united economic actor. Interestingly, there is no juridical difference between consolidated corporations and (other) networks.

Consolidated statements have been common in the United States since the early 1900s, when interconnected corporate entities first began to appear in the form of "holding companies". J.P. Morgan's U.S. Steel, formed in 1901, is a classic example. As recently as 1977, consolidated accounts were rare in Japan. In 2000, consolidated statements had also become compulsory in Japan (Hornigren et al. 2002, p. 518). Actually, the legislation concerning consolidated corporations is quite young. The regulations regarding the financial statement of consolidated corporations were for the first time mentioned in Finland in 1980 (Järvinen et al. 2002, p. 11). During the 1980s, interest in the financial statements of consolidated corporations grew in tandem with capital markets. Present legislation has been greatly affected by the International Accounting Standards Board (IASB) and the Financial Standards Accounting Board (FASB).

The relationship between the entities forming a group is determined based on the majority of voting rights or by other factual authority. Voting rights determine which companies will be considered as a united economic entity. If the parent company has over 50 percent of the voting rights, it has the majority. Another alternative is to make an agreement concerning the factual authority over the entity. For instance, the contracting parties may agree who has the right to nominate or discharge board members. The factual authority primarily means juridical arguable power to control and make decisions. A second characteristic is united management. Consolidated corporations can be classified as subordinated or paralleled groups according to ownership. In a subordinated group, the subsidiaries are totally controlled by the management of the parent company. In paralleled groups, none of the subsidiaries can compel another subsidiary to take unwanted actions.

The consolidated corporation is primarily an economic concept. It is defined as an entity which aims at combined economic targets. The objective of the financial statement of a consolidated corporation is to

give a true and fair view. Because the consolidated corporation forms a united economic entity, the information released by juridically independent companies is inadequate. On the other hand, information based merely on the financial statements of the juridically independent companies can, in many ways, be misleading (Järvinen et al. 2002, p. 25–26).

The consolidated financial statement shows profit after the elimination of internal transactions, while the consolidated balance sheet shows the financial position and the shareholder's equity in the group after eliminating internal receivables and liabilities, as well as internal ownership of the group companies. Consolidated accounts are also needed to determine distributable earnings. The parent company cannot pay dividends that would exceed the free shareholders' equity deducted from undistributable items in the consolidated balance sheet. (Committee for Corporate Analysis 2002, p. 17) The financial statements of consolidated corporations must be transformed to follow the uniform principles of accounting (Ahti et al. 2001, p. 16). The financial statement of a consolidated corporation is of great practical importance. Since investors are interest solely in the figures of a consolidated corporation, the market cap of the parent company will be defined primarily on the strength of the financial statement of the consolidated corporation.

According to Cox (1999), the power of control is based on the market position and mutual power relationships of the network parties, whereas in a consolidated corporation power is based on ownership. A network is not a juridical actor. A network can be formed (as a temporary construction), for example, by companies that act in a supply chain and have the same end-customer. In practice, a company may take part in several networks. Interestingly, being part of a network increases the number of the company's stakeholders. In addition to the views of shareholders, the company must also take into account several new parties, including competitors, indirect suppliers, and customers.

Considering a network as a united economic entity calls for an exact definition of its boundaries. Furthermore, this presumes accounting conventions similar to those in consolidated corporations. However, even though legislation requires that the parent company draft a financial statement for the consolidated corporation, a network's focal company does not have such responsibility. In terms of a network, the consolidated financial statement should be regarded as a possibility, rather than a responsibility. It may offer useful advantages for each party. Naturally, it requires very open, trust-based cooperation.

In genuine networks, none of the companies consider the whole entity but, instead, try to sub-optimize. Because the market position guides the development of networks, a sub-optimizing company may endanger the development of the whole network, and indirectly the internal development of other parties in the network. The cost accounting systems of the network companies produce useful information regarding the whole network. Such data should be collected together, by means of the financial statement of the consolidated corporation.

2.2 Modelling the consolidated financial statement of the network environment

By learning from consolidated corporations and their accounting methods, we can broaden our view concerning the profitability of a network as a whole. In this paper, the supplier network is referred to as a consolidated network. The profitability of the network is examined through this concept. The consolidated statement summarizes the statements of the parent company and the subsidiaries into one statement by

eliminating internal business transactions. Figure 1 illustrates the environment of the consolidated network. The consolidated network, in its basic form, consists of the customer (A) and its supplier(s) (B).

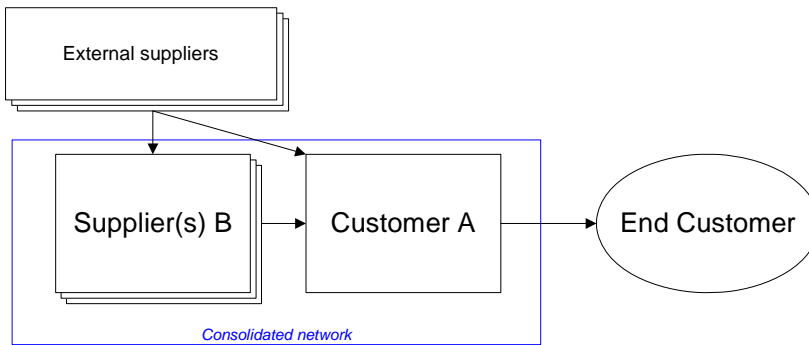
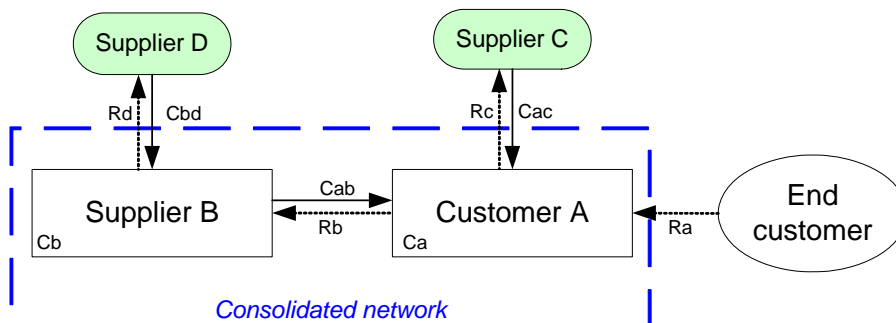


Figure 1 The idea of a consolidated network

In order to determine the profitability of the consolidated network, the parties involved and their elements of profitability should be analyzed thoroughly. Profitability can be measured by the return-on-investment (ROI) criterion (Kaplan – Atkinson 1998, p. 500). The ROI measure calculates the ratio of profit to assets (capital). Profit consists of two components: revenue (price x volume) and the costs which can be affected by a number of decisions. There are two types of capital: fixed assets and net working capital. The main factors of profitability are income and costs compared to the capital invested. There are risks or uncertainties associated with these elements.

Transferring incomes, costs and capital between customer and supplier will have no influence on the profit of the consolidated network. Internal development can have little effect on improving profitability, unless it affects the total costs of the entity. In other words, in order to increase profitability, it is possible to a) increase revenues, b) reduce costs, or c) release invested capital. It should be noted that not only the revenues and costs outside the consolidated network but also the assets inside the consolidated network have an influence on profitability. The revenues in particular are paid by the end customer.

Figure 2 illustrates the elements of profitability in the context of the consolidated network. The parties of the entity (A, B) have their own revenues (R_a , R_b) and costs (C_{ai} , C_{bj}). The internal costs of a company (C_b) can be separated from the purchasing costs (C_{bd}) of a certain supplier (D). The assets of the consolidated network can naturally be divided into the assets of the customer (A_a) and the assets of the supplier (A_b).



- | | |
|--------------------------------|---|
| R_a = Revenues of Customer A | C_a = Internal costs of Customer A |
| R_b = Revenues of Supplier B | C_b = Internal costs of Supplier B |
| R_d = Revenues of Supplier D | C_{ab} = Purchasing costs of Supplier B to Customer A |
| R_c = Revenues of Supplier C | C_{ac} = Purchasing costs of Supplier C to Customer A |
| | C_{bd} = Purchasing costs of Supplier D to Supplier B |

Figure 2 The elements of profitability in the consolidated network

To help in analyzing profitability, it is assumed that a major part of the revenues of the supplier are generated by customer A. In these special cases, it is easier to separate those elements that should be taken into account in the context of the consolidated network. Subsequently, the revenues of supplier B equal the revenues of supplier B from customer A. The internal costs and revenues ($C_{ab} = R_b$) mean internal invoicing in this context.

The consolidated network should be seen as an entity when analyzing its profitability (profit (ab), ROI-%(ab)). The revenues of the entity can be summarized as follows (Equation 1):

$$\text{Revenues (ab): } R(ab) = R_a + R_b \quad (\text{Equation 1})$$

The costs of the consolidated network can be summarized by taking into account all the cost elements involved. The total costs of the entity are calculated in Equation 2.

$$\text{Costs (ab): } C(ab) = C_a + C_{ab} + C_{ac} + C_b + C_{bd} \quad (\text{Equation 2})$$

The profit of the consolidated network represents the difference between the revenues and the costs as follows. The internal invoicing is naturally eliminated in the calculation (Equation 3).

$$\begin{aligned} \text{Profit (ab): } P(ab) &= R(ab) - C(ab) \\ &= R_a + R_b - (C_a + C_{ab} + C_{ac} + C_b + C_{bd}) \quad | \quad C_{ab} = R_b \\ &= R_a + R_b - (C_a + R_b + C_{ac} + C_b + C_{bd}) \\ P(ab) &= R_a - (C_a + C_{ac} + C_b + C_{bd}) \quad (\text{Equation 3}) \end{aligned}$$

When estimating the return-on-investment, it is not self-evident which assets should be taken into account. It is obvious that the total assets of the customer (A) should be included. However, from the supplier's viewpoint, the assets related to this customer relationship should be separated from the total assets. This demands much from the accounting of the company. The ROI-% of the consolidated network is calculated in Equation 4:

$$\text{ROI-% (ab): } ROI(ab) = [R_a - (C_a + C_{ac} + C_b + C_{bd})] / (A_a + A_b) \quad (\text{Equation 4})$$

The total costs of the consolidated network consist of the internal costs of the companies and the purchasing prices paid outside the entity. Transferring incomes, costs and capital between customer and supplier will not, as such, have any influence on the entity's profit. They can be considered profit-sharing within the consolidated network. If it is not possible to influence the revenues from the end customers, the only way to improve profits would be to reduce costs. If the supplier wants to take care of new tasks, the cost reduction of the customer (C_a , C_{ac}) should be greater than the increases in the supplier's own costs. Moving activities (assets) between the parties should lead to more effective use of the assets. Outsourcing outside the consolidated network should be considered for costs and assets.

The interaction costs of the relationships in the consolidated network context require separate consideration (Equation 5), since the internal costs of a company (C_a , C_b) include too many different types

of cost elements, thereby hindering any deep analysis. Especially, these internal costs include the interaction costs of the business transactions between the parties. From the total internal costs of a company, the transaction costs with a specific network partner should be separated (e.g., $Ca(tb) =$ transaction costs of A from transactions with B). The rest of the costs are then designated as “other internal costs” (e.g., $Ca(i) =$ other internal costs of A).

Internal costs of A: $Ca = Ca(tb) + Ca(i)$ (Equation 5)

When estimating the potential cost reduction or value added in the consolidated network, the internal costs of the parties and costs of the transactions between the parties should be analyzed more thoroughly. Friction between the transactions should be analyzed at a detailed level, transaction by transaction (e.g., Williamsson 1975, 1985). The transaction costs, including at least negotiating, monitoring, and enforcing costs can be classified in many different ways for different purposes (Väntsi 1999). It should also be noted that temporary structures always contain the learning costs. On the other hand, a well-established network structure may hide several other types of inefficiency.

3 Applicability of the consolidated view on business

3.1 Potential benefits

The consolidated cost structure of the supplier network is a simple application of the consolidated network concept. A traditional way to examine an end-product’s cost structure is to analyze the first-tier supplier’s cost structure. For example, one result could be that materials and supplies total 80 percent of the purchase price. By summing up each cost item separately from all the suppliers, the result looks somewhat different. The network entity may reveal quite a different cost structure. Only less than 30 percent of the materials and supplies came from outside this network. This also helps in assessing the network’s value-adding work.

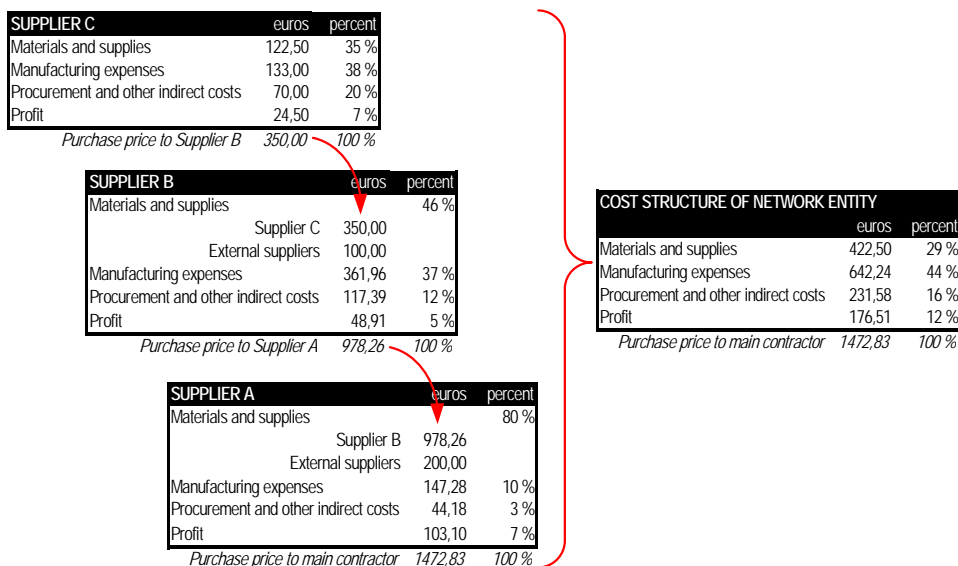


Figure 3 Cost structure of the supplier network

Figure 3 above depicts an illustrative cost structure for network companies and, more importantly, the consolidated statement of the network companies. Redistribution of work within the network parties is reasonable from the network entity’s point of view if the total cost of an end product decreases.

Outsourcing makes it possible for the main contractor to remove activities out of sight – and out of the financial statement. However, these activities have not disappeared at the level of the network entity. These cost items remain in the financial statement of the consolidated corporation. In contrast to the cost structure in Figure 3, the profit row should be disclosed from the consolidated financial statement. One should bear in mind, however, that the consolidated cost structure does not necessarily reveal the return-on-investment level in the network. Nevertheless, a deeper analysis of the capital invested in the network (assets) would be needed to gain a more comprehensive view of the elements of profitability in the supplier network.

An adequate level of profit is always an extremely interesting question when utilizing open-book management. In mature markets, even 10 percent sounds sufficient to many managers. As shown in Figure 3, even 5 to 7 percent profit levels add up to 12 percent profit in the end-product. Therefore, it must be understood that after consolidations of the financial statements, an adequate level of net profit may be higher than ten percent. The most important thing is to maintain the competitiveness of the end-product. Preserving competitiveness requires efficient operations from all parties, and in the long run, continuous improvement of productivity, as well. Knowing the cost structure of the network entity helps in directing development efforts in the right directions (where the largest potential exists).

In addition, cognizance of the real cost level makes it possible to set realistic targets. In markets with decreasing price rates, actors typically set percentage based on annual cost reductions. It is not unusual that the main contractor states that suppliers must decrease prices by 2-5 percent annually. These kinds of cost reduction targets should be based on facts – not on illusions.

3.2 Feedback from the managers

Feedback on the idea of the consolidated network was obtained from six persons who participated in interviews concerning the topic. The interviewed persons are highly experienced in network partnership relationships (three managing directors, business controller, production director, and procurement professional). The interviewees represented manufacturing companies in two separate networks, chosen among the cooperative partners of the research group. At the beginning of the interview, the consolidated cost structure of the network was briefly demonstrated to the interviewees by means of Figure 3.

The consolidated cost structure of the network was considered very beneficial. Clear benefits were seen in the cooperative relationships. The same benefits were also recognized in a competitive business environment. The sources of benefits are listed below in order of importance: 1) recognition and creation of value in cooperation, 2) distribution of profit inside the network, 3) pricing situations and estimations of the entity's profitability, and 4) (new) product development.

Calculations regarding the consolidated cost structure in practice were considered to be forthcoming during the next five years. According to the interviewees, the probability is higher for some other network than those networks of their own companies. On the other hand, one interviewee representing a system supplier remarked that the OEM of the network has already adopted the principles of the consolidated cost structure. The most important barrier to the use of the consolidated cost structure is the lack of appropriate information. Lack of openness in cooperation and the amount of work required were also seen as significant barriers. The interviewees totally disagreed that the idea was useless.

4 Conclusions and implications

4.1 Discussion on the applicability of the construct

There are a number of barriers hindering adoption of the consolidated network. Among the main barriers there are 1) issues related to the trust among the companies and willingness to participate in a certain consolidated network and 2) practical issues related to the limitations of the accounting systems of the participant companies.

The partners in the consolidated network may aim at uncommon superior goals. In such occasions, most companies place their visions higher than a network vision and will not be willing to fully adopt the principles of a consolidated network. Moreover, one must bear in mind that partners in one network may be competitors in another network at the same time. Therefore, they may not be very willing to uncover any data about their cost structures, for instance. Certain supplier companies are also temporarily involved in many networks, particularly in several supply chains, which increases the complexity in the real-life business networks.

Many of the practical problems that the accountants within consolidated networks will face in the future are analogous to the problems related to the accounting within consolidated corporations. Laws and restrictions have set standards for financial accounting. As a simple implication, the accounting periods should be common to all of the partners of the consolidated network. Furthermore, as a more demanding requirement for the consolidated network, consolidation will be possible if only the calculation structures are standardized enough. It is important that the logic behind them within the network is based on shared principles. Obviously, this requirement will prevent some partners from joining the consolidation.

In the consolidated corporations, there are double accounts for every transaction. The transactions should be classified to be either internal or external from the consolidated entity's perspective. Situation is exactly the same in the consolidated networks. However, companies may belong to several consolidated networks – contrary to the situation with consolidated corporations, where a subsidiary company can belong to only one group. If this is the case, internal transactions should be allocated to the right networks, one by one. If data are used in the consolidated networks also for cost accounting purposes, even more classification work has to be done. At least a part of the companies' own expenses have to be reclassified. A part of the formerly own expenses will now become internal costs of certain consolidated networks. Situation is typical for cost accounting, where one book keeping transaction is allocated to several costing objects. Provided that a certain company is a part of a real consolidated corporation that belongs to several consolidated networks and, furthermore, wants to use data for cost accounting purposes, we must admit that situation looks terrible complicated, almost too complicated.

In traditional systems, the costs are normally allocated to certain accounting objects, such as products and customers. This kind of information is, however, surprisingly limitedly available in the companies. Analogously to the activity based costing (ABC) systems in the companies (see e.g., Kaplan and Atkinson 1998; Sievänen et al. 2003), one is able to identify transactional costs in the context of the consolidated networks, and allocate them to a specific network. In a comprehensive ABC system, the calculated cost structures of products also include capital costs. Separating the products that belong to a certain network relationship would enable the capital invested in that relationship to be estimated. Despite its theoretical power, one should bear in mind the practical limitations of ABC. In changing business environments, for instance, the cost of free capacity can not be estimated properly. At the vision level, however, the ROI

should be calculated in real-life business networks and should include a detailed analysis on capital invested inside the networks.

4.2 Conclusion and further work

There has been a significant need to consider inter-organizational entities. Those companies focusing narrowly on their core business have lost direct authority and much knowledge. The consolidated network can offer one way to regain this lost knowledge. Recently, the value added to the customer has been emphasized in the strategies of these companies. The company's own profitability can be guaranteed by offering something that is concretely valuable to the customer. Thus, the companies are willing to take care of, not only their own profitability, but the profitability of the customer, as well.

Despite the fact that the consolidated corporation does not exist as a juridical actor, its financial statement forms one of the cornerstones when assessing the economic situation of a public company. The consolidated corporation can be seen as a concrete entity, the financial accounting of which is regulated by laws and regulations. Applying some of the principles of the consolidated financial statement to a network context would be an issue of management accounting which is not strictly regulated. In certain companies, the consolidated figures are considered "funny money", of little practical use.

The laws concerning transfer pricing show that there could be laws within management accounting. However, establishing a consolidated network and reporting its financial statements is an entirely voluntary activity at the moment. The idea of a consolidated view on business has received very positive feedback. The recognized benefits included value creation, profit calculation and profit sharing, as well as some other ways to improve performance within the cooperative network.

Despite the positive signals from managers, there is no reason to believe that this practice will spread quickly. It is somewhat unclear 1) who would be responsible for and who might be interested in a consolidated network, 2) which companies are allowed to participate in a trust-based open relationship, and 3) how to standardize the accounting methods used in a network context, not to mention the resources needed for the accounting of the consolidated network.

In this paper, the presented idea is restricted to networks involving mainly long-term relationships. However, the idea could also contribute to more dynamic, short-term network relationships. The financial statement of the consolidated corporation has shown its ability to handle such entities. The idea to use these methods in the modern network context is a new one. The regulated use of the financial statement of the consolidated network is improbable in the near future. Perhaps, it should not be seen as the ultimate goal. Applying parts of the idea of the consolidated network to real networks has helped us as researchers and our cooperation partners to understand many of the concepts within the network economy: extended enterprise, virtual organisation, open-book management, and value-added services, for example. Using the consolidated network as a metaphor provides a way to communicate in supply chains and virtual organizations, as well.

Although this paper has concentrated on the actual cost calculations within consolidated network, the consolidated network approach seems to be useful also when budgeting or estimating costs within the networks. The most sophisticated management accounting systems include a proactive part. As an implication for further research, we hypothesize that the consolidated network approach may turn out to be useful also as a proactive and prospective management instrument.

Moreover, further research should focus on a more thorough analysis of the similarities and differences between consolidated corporations and networks. Interviewing not only the participants of the networks but also the representatives of consolidated corporations should allow for a more comprehensive comparison. In addition, both a consolidated income statement and balance sheet will be calculated from the figures of a case network, in order to more concretely show the applicability of the consolidated network.

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