



# ACTIVITY-BASED COSTING AND

This article explores opportunities to examine customer  
profitability in ABC based on a case study of an  
actual ABC implementation in a small trading company.

# CUSTOMER PROFITABILITY

DOROTA KUCHTA and MICHAL TROSKA

**T**hough widely implemented in companies all over the world, most reports regarding activity-based costing (ABC) implementations do not mention how the ABC approach can be used for customer profitability analysis. Not every customer is a good customer, and not all revenue is good revenue. A company's "best customer" may actually be the customer that generates the biggest loss, while a low profile customer may be a company's "cash-cow."

In a well-known principle known as the "80:20 rule," Vilfredo Pareto observed that a small number of causes are responsible for a great number of results. Customer profitability varies greatly in a typical company, but in general the most profitable twenty percent of customers generate the company's profit while the remaining eighty percent lose most of it.<sup>1</sup> Since ABC allows management accountants to trace the costs of the resources used through activities and processes performed to the final cost objects (e.g., products, services, customers,

distribution channels, suppliers, etc.), the method becomes a tool for profiling customer profitability in ways impossible for traditional costing systems.<sup>2</sup> As a result, the information that ABC systems provide can help determine which products and customers are the most profitable, which activities are customer-focused, whether processes are customer value-added or not, and where efforts toward customer-related improvements should be made.<sup>3</sup>

Considering that enterprises in many industries learn to track and calculate costs and revenues from the customer's point of view, customer profitability analysis becomes increasingly necessary for manufacturing companies and practically indispensable for service oriented companies—especially in view of Drucker's suggestion that ABC's greatest potential impact is within service industries with their paucity of cost information.<sup>4,5,6</sup> Consequently, in a more competitive environment accompanied by decreasing customer loyalty, a growing number of companies

*DOROTA KUCHTA, Ph.D., Sc.D., is lecturer at Institute of Industrial Engineering and Management, author of two books and several articles on accounting, cost management, fuzzy, interval, and robust optimization. She can be reached at dorota.kuchta@pwr.wroc.pl.*

*MICHAL TROSKA, MSc, is a specialist in financial systems and a Ph.D. student at the Wroclaw University of Technology. He has over three years of experience as a project manager in implementing ABC systems in Polish companies. Currently, he specializes in implementing time-driven activity-based costing using the most recent IT tools. He can be reached at michal.troska@pwr.wroc.pl.*

have started to invest work, time, funds, or special treatment in their customers, shifting their focus from the products to the customers as the root cause of costs.<sup>7</sup>

Customer profitability analysis (CPA) shows how different customers, individually or as a group, contribute to profitability in terms of how they consume company resources and contribute to profitability.<sup>8</sup> Since CPA assigns the company's revenues and costs to customers and customer groups, customer profitability information becomes a natural byproduct of an ABC project where the assignment of the costs across the entire value chain and ultimately all activity costs reside in the two places where they actually originate:<sup>9, 10</sup>

1. Customers and service-recipients
2. Business-sustaining cost receivers

In other words, the customers and service recipients consume final cost objects such as products or service lines that have already consumed activity costs. Customers are the root cause and the purpose of a company's costs. Stated succinctly, "[W]ithout customers, actual or potential, there is no justification for the business to exist and to consume resources."<sup>11</sup> It becomes crucial to trace the costs of the company's customers against the revenues generated by each customer or customer class.

In the words of former Vice President Al Gore, "Management isn't about guessing, it's about knowing. Those in positions of responsibility must have the information they need to make good decisions. Good managers have the right information at their fingertips. Poor managers don't. Good information comes from good information systems."<sup>12</sup> To manage costs, management accountants must be able to identify the good customers and how to use CPA to profit from them. A case study of a trade company demonstrates how this is accomplished.

### **Project and company**

The project took place in a customer-oriented company that is a subsidiary of an international holding group whose yearly turnover exceeds 500 million €. One of its most important principles is to create lasting partnerships with customers by providing them with high quality products and excellent service. Despite its small size

with less than thirty employees, the company operates throughout Poland, and its service portfolio includes the full product offerings of its parent.

### **The aim and expected benefits of implementation**

The main purpose of implementing an ABC system in the company was to improve its accounting and process management. When the idea of implementing an activity-based costing system emerged, the company used a traditional (absorption) costing system that generated information only for the purpose of preparing financial statements, which did not provide executives with sufficient support in strategic planning and decision making. Accordingly, identification of company activities and processes—one of the basic steps in the implementation of ABC systems—supported the company's efforts in the implementation of the process-based ISO 9001:2000 standard.

An additional positive characteristic of the implementation were the favorable experiences that the chief executive officer had with other ABC systems. The CEO hoped to respond to pressure to employ a new costing system from the parent company's management that would improve the subsidiary's accounting and logistics functions. By knowing the real costs, the CEO saw a chance to gain a competitive advantage while supporting the strategic objectives set out in the plan developed by the parent company.

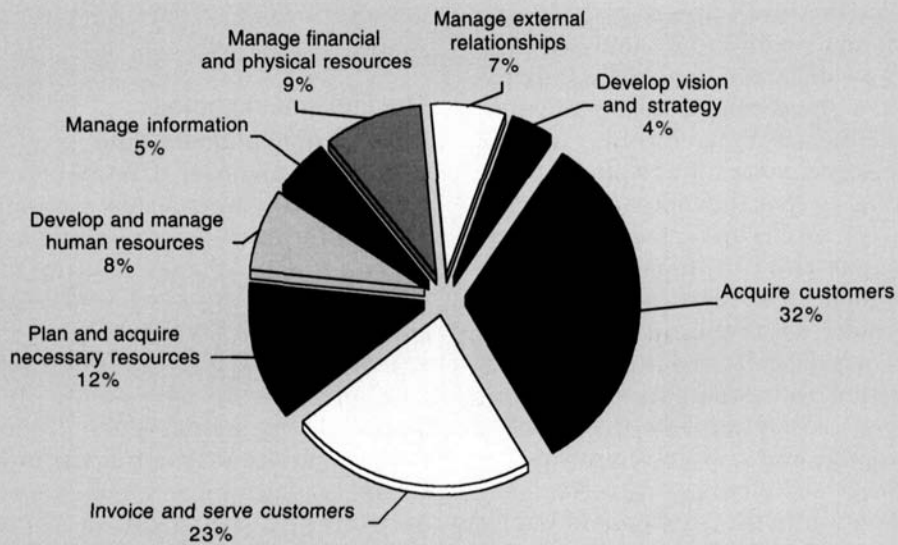
### **Activity-based costing system implementation**

The implementation of a complete ABC system took less than eight months by means of a process that followed several steps. First a project team sold the idea to the management and prepared an implementation schedule. Then, taking advantage of the company's small size, interviews were conducted with all employees, each of whom had already become acquainted with the concept of ABC during special training. Information gathered through the interviews and surveys included definitions of the major business processes and key activ-



**CPA SHOWS HOW DIFFERENT CUSTOMERS, INDIVIDUALLY OR AS A GROUP, CONTRIBUTE TO PROFITABILITY IN TERMS OF HOW THEY CONSUME COMPANY RESOURCES AND CONTRIBUTE TO PROFITABILITY.**

**EXHIBIT 1** Case Company Profile



ities of the company, the time spent by employees on each activity, the products of each activity, and the factors causing variations in their cost. The interviews also identified several work obstacles that could be used as a basis to improve company processes. Based on interview information, the project team developed and validated an activity dictionary.

### **Determining activity and process costs**

After creating the activity dictionary, the next step in building the ABC system was to determine how much the company spent to perform each of its activities. This began with an in-depth review of the general ledger and payroll system. As is typical of this company's industry, direct material costs were high (approximately seventy percent of the total costs) and were excluded from calculations. Additionally, all taxes and federal payments (two percent of total costs) were ignored.<sup>13</sup> The structure of the company's indirect costs was dominated by labor-based costs (forty-three percent), overhead related to logistics (11.5 percent), and the maintenance of the information system (ten percent). Employee surveys were used for labor-based costs where employees were asked to estimate the amount of time they spent on each activ-

ity. With this information it was possible to determine the proportion of wages and salaries, payroll taxes, employee benefits, and other personnel-related expenses that should be assigned to each individual activity. For non-personnel resources, the project team used a modified cost assignment method based on declaring the time spent on each activity.<sup>14</sup>

The results of calculating the unit costs of the activities and processes reflect the profile of the case company (see Exhibit 1). Processes responsible for the achievement of its strategic goals (i.e., "Acquire customers" and "Invoice and serve customers" together with "Plan and acquire necessary resources") account for nearly seventy percent of total expenses.

After calculating the unit costs of the activities and processes, the activity costs were assigned to the cost-objects: products and customers. This phase was critical, as determining activity-to-cost-object relationships has a direct impact on the accuracy of the model. Using specific cost drivers such as the number of invoices, number of invoice lines, number of sales calls, and number of deliveries or claims processed, the activity costs were allocated to the cost-objects and ultimately to customers in order to study customer profitability. The costs assigned to the customers consisted mainly

of indirect labor related to purchasing, sales, logistics, and information about the margin (i.e., gross profit minus direct material costs) that the company earns on each customer. This set the stage for performing the customer profitability analysis (CPA).

### Customer profitability analysis

The customer profitability analysis was conducted across six months for over 1400 customers that generated demand for any of company's activities during that period. According to the results calculated with the ABC model, customer profitability varied greatly. The company's profit was at its maximum after thirty percent of customers. At that stage the profit was 156.9 percent of the actual profit. The remaining customers either broke even or created losses and collectively lost almost sixty percent of profit, leaving the company with its actual profit. The profit at this stage was generated by only three percent of the most profitable customers.

But here a question should be raised—what was the main cause of such discrepancies in the profits generated by different customers? Why did the top twenty percent of the customers generate 155 percent while the bottom twenty percent cause a loss of 31.5 percent of total profits? The drivers of customer profitability had to be identified to answer these questions.

### Analyzing volume

Traditional methods work under the premise that high volume customers are profitable ones. Many companies improve customer service in order to expand operations and increase their market share thinking that these services create value and loyalty among customers who will then generate higher profits. But studies on customer profitability have revealed that high volume customers are not necessarily profitable. Different customers generate different demand for company activities from order entry through preparing and processing customer orders, customer invoicing right up to delivery of goods and providing customer support. Customer profitability analysis must work through all customer-related activities and their drivers.

Important conclusions can be drawn by looking more closely at the figures in Exhibit 2, which contains key data for selected customers. In the first analysis box of this exhibit, customer no. 7 was the most profitable—generating the most revenue—and despite the relatively small margin (due to volume discounts), it also generated the most income. Although this suggests that big customers are profitable, some of them can also lead to losses. The next two customers generated a comparable amount of revenue and margin, but note the discrepancy in their profits in terms of their origin. Customer no. 192 generated almost ten times more invoices, which raised its costs-to-serve by more than \$6,000 and lowered the company's profit. Similarly, customer no. 126, generating nearly twice the revenue of customer no. 636 and produced a profit only slightly higher than that of the customer no. 636 owing to its increased invoicing activity. Customer no. 30 generated even more revenue than customer no. 126 but also placed an extraordinarily high number of orders, which together with volume discounts (indicated by a lower margin/revenue ratio), led to an unsatisfactory seven percent return. A substantial correlation between the number of orders generated and the income obtained by company is noticeable. But this is only one of the possible drivers of customer profitability.

Another profitability driver can be identified by analyzing customer no. 30 and accounting for favorable volume discounts involved the company's sales support. Every time the customer applied for a volume discount the trade department had to generate a new offer proposal. The number of offer proposals processed by the department affected the company's income.

The second analysis box of Exhibit 2 compares selected pairs of customers with similar profiles except for the *orders processed* profitability driver. Customers with the higher number of proposals handled by the trade department consumed more company resources and thus produced higher costs (brought less profit) than customers who were able to place orders without any support. Clearly, the number of orders generated affected the company's profit as did the number of different products ordered.

**CUSTOMER PROFITABILITY ANALYSIS MUST WORK THROUGH ALL CUSTOMER-RELATED ACTIVITIES AND THEIR DRIVERS.**

**AT SOME  
POINT THE  
COST-TO-SERVE  
EQUALS THE  
MARGIN—A  
BREAKEVEN  
POINT IS  
REACHED.**

The third analysis box of Exhibit 2 shows key data for selected customers who each placed a single order during the considered period of time. By analyzing and comparing customer no. 479 with 1134 and customer no. 1148 with 352, the more invoice lines in a single order the lower profit it generated because of the higher processing cost.

Problems with the collection of accounts receivable are widespread in the distribution industry. Their influence on the profitability of the case company seems to be obvious, as shown in the fourth analysis box of Exhibit 2. The debt collection process started for customers no. 382 and 908 resulted in additional expenses for the company. The activity-based costing system made it possible to assign these expenses to the customers that caused them and thereby discover the actual profitability of the customers, which was lower than could be expected given the margins earned.

At some point the cost-to-serve equals the margin—a breakeven point is reached. It is difficult to state a general rule to determine whether it is profitable to deal with any given customer, since customer behavior varies greatly. The project team chose to examine the breakeven point of a single one-lined invoice with an average margin as a basis for further analysis as shown in the fifth analysis box of Exhibit 2. An elementary transaction was profitable when its amount was at least ca. 350 USD (customer nos. 531 and 785). Given this information, it was straightforward to analyze other, more complicated situations simply by adding an additional corresponding cost. For example, if customer (like no. 741) submitted inquiries that needed to be handled by the trade department or (like no. 637) placed an order for several products then these kind of purchases had to be worth at least ca. 500 USD to bring profit for the company. Consequently, the more complicated a transaction the higher breakeven point.

Correspondingly, analyzing customers that each placed a single order and moving toward less and less profitable customers, the project team identified two critical points as demonstrated from the data in the sixth analysis box of Exhibit 2:

- Small orders for less than \$200 imply a \$100 loss.

- An order for less than \$50 leads to over \$150 loss.

By further analyzing customer profitability, the project team noticed that some customers submitted inquiries that needed to be handled but did not place an order. Interviews with sales personnel revealed that on the basis of those inquiries the trade department had to prepare “pro-forma” proposals. Several customers submitted their inquiries out of necessity (to fulfill requirements regarding a public call for tenders or to meet the ISO Standard), but it became obvious that no purchase would be made in these cases. These inquiries were a clear loss for the company, which holds an ISO certification and is officially obligated to handle such inquiries. The seventh analysis box in Exhibit 2 demonstrates the impact of such situations on the company’s profit. The cost of a “pro-forma” offer can be literally treated as the cost of sustaining the quality system.

Lastly, it is essential to look more closely at the customers who generated the largest losses for the company, summarized in the final analysis box of Exhibit 2. This step is all the more important because practice often reveals that the largest customers generate the biggest losses.

The two customers who caused the largest losses for the company were regular clients. By analyzing their figures, the project team noticed that they generated moderate revenues and a high volume of invoices. They placed orders several times, but they were low-value orders. Moreover, customer no. 280 negotiated each transaction in order to obtain large volume discounts. The result was twofold—the customer generated a very low margin at sixteen percent and consumed additional company resources. Similarly, customer no. 562 generated half a dozen of small orders, but the most important reason for its lack of profitability was overdue accounts (\$980.26).

### **Managerial implications and conclusions**

The fact that only about 400 out of almost 1400 customers of this case company were profitable was surprising for its management, especially because some of the most unprofitable customers were regular ones. To change that situation, customer prof-

### EXHIBIT 2-1 Customer Profitability Analysis

Customer	Revenue [USD]	Margin [i] [USD]	Overhead [ii] [USD]	Profit or Loss [USD]	# of invoices	Margin/Revenue [%]
7	154,565.30	39,078.90	6,882.52	32,196.38	28	25.3
743	75,249.25	25,697.70	3,151.74	22,545.96	14	34.2
192	80,817.78	26,281.56	9,529.04	16,752.52	108	2.5
636	30,718.51	11,111.48	1,182.86	9,928.62	11	36.2
126	9,731.36	20,045.38	9,679.48	10,365.90	107	3.6
30	70,344.22	20,738.01	15,660.06	5,077.95	191	29.5

- [i] i.e., margin is calculated as the difference between the selling price and cost of goods sold  
 [ii] i.e., overhead (costs-to-serve) is the total amount of indirect costs traced to a customer

### EXHIBIT 2-2 Number of Proposals Processed

Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoices	# of offer proposals processed
121	23,224.08	8,968.04	1,647.87	7,320.17	15	3
50	21,904.03	9,361.58	2,595.48	6,766.11	16	18
327	6,635.14	2,378.26	1,027.56	1,350.70	13	0
406	8,721.93	2,755.93	1,501.54	1,254.39	11	9
759	3,383.04	1,183.09	881.05	302.04	6	6
884	2,878.84	1,030.89	763.46	267.42	6	0

### EXHIBIT 2-3 Invoice Lines in Orders

Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoices	# of invoice lines
479	985.14	474.96	178.81	296.15	1	1
1134	1,030.32	501.65	210	291.65	1	6
1148	643.24	352.92	176.91	176	1	1
352	846	412.09	246.1	165.99	1	12

### EXHIBIT 2-4 Invoice Lines in Orders

Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoices	Value of overdue accounts [USD]
310	5,215.00	2,321.68	1,340.12	981.56	18	0
382	6,585.51	3,163.52	2,346.09	817.42	17	15,917.40
908	4,730.10	2,228.94	2,027.17	201.77	19	12,768.80

### EXHIBIT 2-5 Collection of Receivables

Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoice lines	# of offer proposals handled
531	325.68	177.78	175.15	2.63	1	0
785	341.76	187.58	187.62	-0.03	1	0
741	475.05	221.29	249.66	-28.36	1	1
637	488.38	208.85	231.74	-22.88	10	0

### EXHIBIT 2-6 The Profitability of Small Orders

\$200 revenue — \$100 loss						
Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoice lines	# of offer proposals handled
307	164.86	68.2	174.26	-106.05	1	0
376	207.84	86.66	186.87	-100.2	3	0
\$50 revenue — \$150 loss						
Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoice lines	# of offer proposals handled
1079	55.41	22.32	173.65	-151.33	1	0
724	47.3	21.01	173.6	-152.59	1	0
843	44.05	19.93	173.59	-153.66	1	0

### EXHIBIT 2-7 The impact of Pro forma Offers

Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoices	# of offer proposals handled
1207	0	0	174.27	-174.27	0	1
1270	0	0	238.73	-238.73	0	2
1261	0	0	297.65	-297.65	0	3

### EXHIBIT 2-8 The Most Unprofitable Customers

Customer	Revenue [USD]	Margin [USD]	Overhead [USD]	Profit or Loss [USD]	# of invoices	# of invoice lines	# of proposals handled	Margin/Revenue [%]
562	848.92	217.79	1,103.35	-885.56	6	15	0	36.7
280	15,176.36	2,477.42	3,433.02	-955.59	24	65	25	16.3
143	5,586.91	2,050.90	3,267.60	-1,216.70	44	60	6	25.7

itability results had to be continuously analyzed and operational decisions had to be made accordingly.

The profitability drivers analyzed by this company were directly related to the cost drivers used to assign activity costs to the cost objects. Consequently, the most profitable customers were those who placed large orders, paid on time, received moderate volume discounts, ordered regular products and required standard delivery conditions.<sup>15</sup>

The literature identifies several sources of differences in profitability between customers, but in general they can be attributed to four major factors: differences in customer generated revenue, in customer service levels, in distribution channels, and in cost.<sup>16</sup> However, even an unprofitable customer can be worthwhile, as it is usually much easier (costs less) to develop an

existing unprofitable customer into a profitable one than to find a new profitable customer. From a managerial point of view, understanding the drivers of customer profitability leads to a variety of options to transform unprofitable relationships into profitable ones.

An analysis of customer profitability in the case company led to the recognition of the company's most important problem—small orders. As practice shows, this problem can fortunately be minimized and controlled by:

- Charging an extra service fee for handling orders below a minimum size or refusing such orders
- Managing product price by offering quantity discounts
- Offering special treatment to key customers (e.g., anytime delivery or immediate response)

- Educating customers about the cost of frequent orders and the benefits of large orders.<sup>17</sup>

These are only a few of the responses that can be used to turn unprofitable customers around. The case company considered creating a Web site with an on-line catalog and an order form (with standard volume discounts included) to decrease the involvement of sales personnel and to minimize order processing time.

Every company wants to keep its existing profitable customers and transform unprofitable customers into profitable ones while acquiring new, prospectively profitable customers. Yet, there is still a problem with unprofitable customers whose behavior cannot be adjusted. Should the company drop such customers completely? And how should this problem be handled in a company that is a subsidiary of an international holding group whose basic principle is to create lasting partnerships with their customers by providing them with high quality products and excellent service? What if some unprofitable customers are capable of referring other customers, who are profitable?

Activity-based costing can be a great tool for customer profitability analysis. Still, it is only a tool—not the answer to all the company's problems. While it provides more accurate information than traditional systems, whether the company's management will take advantage of this information is a question that must be answered in each individual case. ■

#### NOTES

- <sup>1</sup> Kaplan, R.S.; Cooper, R., 2000. *Cost & Effect: Using Integrated Cost Systems to Drive Profitability and Performance*, Harvard Business School Press, Boston.
- <sup>2</sup> Foster, G.; Gupta, M.; Sjoblom, L., 1996. "Customer Profitability Analysis: Challenges and New Directions," *Journal of Cost Management*, 10:1, 5-17; "Customer Analysis as a Foundation of Company

Profitability," TU-91.167 Seminar in Business Strategy and International Business, Juha Salomaa 52682S.

- <sup>3</sup> cf. Statements on Management Accounting, Statement Number 4CC—"Implementing Activity-Based Management: Avoiding the Pitfalls," Institute of Management Accountants & Arthur Andersen LLP, May 15, 1998; Gupta, M.; Galloway, K., 2003. "Activity-Based Costing/Management and its Implications for Operations Management," *Technovation*, 23, 131-138.
- <sup>4</sup> "Customer Analysis as a Foundation of Company Profitability," TU-91.167 Seminar in Business Strategy and International Business, Juha Salomaa 52682S.
- <sup>5</sup> Drucker P.F., "The Information Executives Truly Need," *Harvard Business Review*, January-February 1995, p. 54-62.
- <sup>6</sup> cf. Ginter, J.L.; La Londe, B.J., 1999. "A Summary of Activity-Based Costing Best Practices," *The Ohio State University's Supply Chain Management Research Group*, Paper #606.
- <sup>7</sup> Lebas M., 1999. "Which ABC? Accounting Based on Causality Rather Than Activity-Based Costing," *European Management Journal*, 17:5, 501-511; cf. "Customer analysis as a foundation of company profitability," TU-91.167 Seminar in Business Strategy and International Business, Juha Salomaa 52682S.
- <sup>8</sup> Pirttilä, T.; Hautaniemi, P., 1995. "Activity-Based Costing and Distribution Logistics Management," *International Journal of Production Economics*, 41, 327-333.
- <sup>9</sup> O'Guin, M.C.; Rebischke S.A., 1994. "Customer-Driven Costs Using Activity-Based Costing," *Handbook of Cost Management*, New York, NY: Warren, Gorham, and Lamont; Howell R., Soucy S., 1990. "Customer Profitability as Critical as Product Profitability," *Management Accounting*, 72:4, 43-47.
- <sup>10</sup> Cokins, G., 1996. "Activity-Based Cost Management Making It Work: A Manager's Guide to Implementing and Sustaining an Effective ABC System," *Irwin Professional Publishing*, Chicago, IL.
- <sup>11</sup> Lebas M., 1999. "Which ABC? Accounting Based on Causality Rather Than Activity-Based Costing," *European Management Journal*, 17:5, 501-511.
- <sup>12</sup> Vice President Albert Gore's National Performance Review, "Empowering Employees to Get Results Part II," 1994 [<http://govinfo.library.unt.edu/npr/library/nprprt/annrpt/redtpe93/23aa.html>].
- <sup>13</sup> See note 10 above.
- <sup>14</sup> Kaplan, R.S. 2001. "Activity-Based Costing: Modified Approach," *Harvard Business School*; Kaplan, R.S.; Anderson, S., 2003. "Drive Growth with Customer Profitability Management," *Harvard Business School*.
- <sup>15</sup> See notes 1 and 10 above.
- <sup>16</sup> Foster, G.; Gupta, M.; Sjoblom, L., 1996. "Customer profitability analysis: challenges and new directions," *Journal of Cost Management*, 10:1, 5-17.
- <sup>17</sup> Lyly-Yrjänäinen, J.; Paranko, J., 2001. "A New Approach to Product Costing in Logistics Business," *16th International Conference on Production Research*, 29.7.-3.8.2001, Prague, Czech Republic.