

## Traditional versus Activity-based Budgeting in Non-manufacturing Companies

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**crossref** <http://dx.doi.org/10.5755/j01.ss.82.4.6604>

### Abstract

The objective of this paper is to determine the utility of activity-based budgeting (ABB) taking into account advantages, possibilities, and difficulties associated with the implementation of this approach by an illustration of the budgeting process in a service company. This article is the result of literature studies in which techniques, such as critical analysis, generalization of other authors' views, and conclusion formulation have been used. To illustrate and extend, the case study method has been chosen for the analysis.

Literature studies have led to the conclusion that companies do not plan to move away from traditional budgeting altogether; they prefer modifying it and adapting to management needs with the possible use of new techniques, such as activity-based budgeting. The case study has offered the possibility to present advantages and disadvantages of using the method in a service company and has also served as a confirmation of surveys conducted by other researchers. It has added a more holistic and richer contextual understanding of the ABB nature and helped explain how it could change the budgeting procedure, and, further, the management. This paper bears theoretical and practical significance. From a theoretical point of view, it contains critical analysis of the possibilities for implementing new trends in budgeting. From a practical point of view, it could expand managers' knowledge about a new approach to budgeting.

**Keywords:** budget, traditional budgeting, activity-based budgeting, case study.

### Introduction

Among the most frequently used tools of management accounting is operational budgeting. The percentage of enterprises that use it is very high, above 90% in developed countries (e.g., 98% in Australia (Chenhall and Smith, 1998), 99% - in Japan (Wijewardena and Zoysa, 1999), 94% in Greece (Angelakis et al., 2010), and almost 100% in Finland (Hyvönen, 2005)). In developing countries the results are similar or slightly lower: in Turkey it amounts to 94% (Yalcin, 2012) and in India - 98% (Joshi, 2001), although the results are highly dependent on the period of data collection and sample selection e.g. large/small companies.

According to the research carried out between 1998 and 1999 (Szychta, 2001), 60 enterprises located in central and southern Poland (questionnaires were sent to 290 firms) were analyzed. 48 units (80%) answered positively the question about the use of the annual budgeting for the entire company. Annual budgets were not developed mainly by small and medium-sized retail and service companies. In later research (Wnuk-Pel, 2012), the percentage of Polish companies with a budgeting system was much higher. From the 257 surveyed entities, which properly completed the questionnaires, as much as 98,4% reported creating annual budgets and as much as 72,4% of these companies were preparing budgets for a period exceeding three years. It should be stressed that only 6% of these entities reported creating budgets for less than a year.

Budgeting is used, inter alia, for planning, coordination, and evaluation of activities, motivation and evaluation of the staff performance and for supporting the internal control system of the organization (Chenhall and Smith, 1998; De With and Dijkman, 2008; Angelakis et al., 2010; Farouk and McLellan, 2011; Yalcin, 2012). The survey carried out by De With and Dijkman (2008) has shown that the most frequently mentioned statements note that the budgets can support the planning (84,1%). Moreover, the budget is used for coordination the separate parts of responsibility centers to ensure that all parts of the organization are in balance with one another. The next objective of operational budget use is to enhance performance control and motivate managers (81,8%), to better allocate resources (77,3%) and coordinate activities (61,4%). According to another survey (Sleihat et al., 2012), budgeting is used primarily for planning (78,1%) and for controlling costs (76,5%). In Poland (Wnuk-Pel, 2012), budgets are primarily used to planning future activities (76,3%) and to their subsequent evaluation (69,9%).

The end of the 20th century has seen a growing criticism especially with respect to the usefulness of traditional budgeting for business management. Neely (2001) in his report, drawn primarily on the practitioner literature, lists the 12 most cited in literature weaknesses of budgeting, such as:

- budgets are time-consuming and costly to put together,
- budgets constrain responsiveness and flexibility are often a barrier to change,
- budgets are rarely strategically focused and often contradictory,

- budgets add little value, especially given the time required to prepare them,
- budgets concentrate on cost reduction and not value creation,
- budgets are developed and updated too infrequently, usually annually,
- budgets are based on unsupported assumptions and guess-work,
- budgets strengthen vertical command and control,
- budgets do not reflect the emerging network structures that organizations are adopting,
- budgets encourage 'gaming' and perverse behaviors,
- budgets reinforce departmental barriers rather than encourage knowledge sharing,
- budgets make people feel under-valued.

So far, survey respondents have mentioned the following disadvantages of traditional budgeting: budgeting is time-consuming and costly (72%), it detects problems slowly (64%) and it quickly becomes out of date (49%) (Libby and Lindsay, 2007); budgeting is mainly a 'number crunching exercise' (47,0%) and it does not reflect the strategy (56%) (Higgins, 2005).

Despite the drawbacks mentioned above, budgeting is still important in practice. 87,8% of the companies have not abandoned traditional annual budgets, nor have they had such plans (Ekholm and Wallin, 2010). Similar answers have been obtained from Dutch companies (De With and Dijkman, 2008): 70,7% of respondents claim to be satisfied with their budgeting process, 2,4% - very satisfied, and 17,1% - neutral. Satisfaction with the budgeting system in Polish companies has been expressed by 87,5% of respondents (40,7% identified it as: average) (Wnuk-Pel, 2012).

To eliminate or reduce disadvantages of traditional budgeting, some companies have implemented new solutions, designed to allow them adapting to new environmental conditions (such as technical progress, growing competition, and new customer expectations). One of them is activity-based budgeting, the concept based on activity-based costing (ABC). Taking into account the fact that budgeting is one of the most important tools of management accounting used by businesses, there is a necessity to adapt it to the changing needs of managers. In the light of the foregoing statements, the research gap in previous studies is obvious and creates opportunities for the future research.

The purpose of the paper is to present the essence of activity-based budgeting concept, as well as to determine its utility taking into account advantages, possibilities, and difficulties associated with the implementation of this approach by the illustration of a budgeting process in a service company. This article is the result of literature studies in which such techniques as critical analysis, generalization of other authors' views, and conclusion formulation have been used. To illustrate and extend the issues, a case study of a service company has been presented. The paper is organized as follows. First, the nature of the concept and its prevalence (both survey and case study) are shortly presented. Then, activity-based

procedure, used in the analyzed company, is shown. The paper ends with conclusions.

## Literature review

Activity-based budgeting (ABB) is not a new idea. Early writings on the subject appeared in the late 1990s. This approach was developed by the US-based CAM-I (ABB - the full name of the ABB-group is the Consortium of Advanced Management-International - Cost Management Systems, Activity-Based Planning and Budgeting Group) which focused its attention on the problems of planning in the traditional budgeting process. They concentrated on the connection between operational planning and financial results. The activity-based budgeting method is an extension of activity-based concepts into the budgeting realm (Hansen, 2011). The development of activity-based costing and management led to an immediate desire to extend the methodology into planning and budgeting (Cooper and Kaplan, 1991). The ABB method requires determination of the cost of planned activities based on their expected size and resources which they consume.

The primary advantage of activity-based budgets is that costs can be more accurately associated with activities, making the planning process more precise and corrections more effective. Companies using this approach report benefits, including<sup>1</sup>:

- establishing more realistic budgets,
- improving accuracy in identifying resource needs,
- better linking of costs to outputs,
- allocating more precisely the costs to staff responsibilities.

ABB implementation is related to some requirements which may prove to be insurmountable for many companies, especially smaller ones. The basic condition is the implementation of ABC, which involves a change in business perspective. It is associated with incurring both financial resources and time commitment of many people. It also requires a thorough knowledge of the organization (it has an impact on the quality of the generated data) and knowledge about activity-based concepts (often it is connected with the employment of specialized consultants).

To analyze the prevalence of ABB in the world, various surveys have been undertaken. The results of the survey of Dutch companies (De With and Dijkman, 2008) indicate that ABB has been implemented in 65,9% of the entities (21 companies), including 15,9% (5 entities), where it has been used for the whole company. However, these results are extremely high which may be due to the fact that the respondents were a small group of very large international companies, listed on the Amsterdam Stock Exchange (33 units from the population of 134, about 24,6%). According to Dahlgren and Holmström 'Very few companies in Sweden use ABB today (...)' All the companies that had implemented some form of ABC were still using a traditional budget.

<sup>1</sup> Retrieved August 26, 2013, from [http://www.cimaglobal.com/h-m-m-p/budgeting/activity-based\\_budgeting\\_abb.html](http://www.cimaglobal.com/h-m-m-p/budgeting/activity-based_budgeting_abb.html)

Table 1

**Selected research carried out in form of case studies**

<b>Authors</b>	<b>Date</b>	<b>Company</b>
Borjesson	1997	Swedish company
Block, Carr	1999	Digital Semiconductor (producer alpha chip and other semiconductor products)
Dahlgren, Holmström	2000	ABB Cewe (a manufacturing company)
Stevens	2004	Admin Co. (an administration service company for the direct-response insurance industry)
Kaplan, Anderson	2007	Sippican Corporation (a fictitious company – manufacturer of hydraulic control devices)
Pockeviciute	2008	X - agricultural holdings in Lithuania
Lin, Yahalom	2009	Keelung Harbor (second largest port in Taiwan)
Bengu	2010	HB (hypothetical company)
Capusneanu et al.	2013	Lupeni Mining Exploitation in Romania

Since some of the companies had only a partial implementation of ABC, it hadn't made sense to change the entire process to ABB'. Research in the form of a case study has also been carried out. Some examples are presented in Table 1. Research carried out in Poland in the years 2006-2008 (Wnuk-Pel, 2013) shows that the spread of the new methods is low. Wnuk-Pel (2013) has identified 71 companies which adopted ABC, but only 33 of them returned completed questionnaires. 17 companies employed ABB. A great majority of them implemented this method only in certain areas of activity (in other areas they continually used traditional budgeting). Only 2 of them gave up the traditional budgeting after ABB adoption. A moderate benefit of using ABB has been seen by the respondents in three areas: a better identification of demand for resources, a greater involvement of employees in budgeting, and a better acceptance of budgets. These studies have been limited by its form, the questionnaire survey. It is difficult to carry out a very detailed and accurate analysis of the ABB application in this form. To gain a deeper insight into the activity-based budgeting procedure, it is necessary to make greater use of other research methods in addition to surveys. A case study method enables a more in-depth analysis and a better understanding of the subject being studied and makes it possible to avoid a number of problems involved in the survey methods. In the paper, to illustrate and extend the issues, a case study of a hypothetical service company has been presented (this form has been applied by Tse and Gong (2009), Bengu (2010) in their research in the field of management accounting). This type of a case study may be called an 'instrumental case study' (Berg and Lune, 2012) and it plays a supportive role (Denzin and Lincoln, 2005) for a better presentation and analysis of the subject – the activity-based budgeting process.

**Activity-based budgeting illustration**

**Description of the SPEED-MAX Ltd. Company**

SPEED-MAX Ltd. is a logistics company operating in central Poland. It began its activities in 1992 from storage services for entities in the immediate geographic vicinity. Over the years, when the associated companies expanded

their activities, SPEED-MAX Ltd. came out to meet their changing needs and expanded the scope of its services. The priority objective of the company is the compliance with the expectations of the most demanding customers. At present, the company provides a range of services, the scope of which includes, among other tasks, short-and long-term storage of goods, ticketing and labelling, product packaging, assembling shipment, sorting, wrapping and repackaging, transport, customs, and other services performed on the basis of individual customer requirements (orders 'made to measure'). The company signs long-term contracts to ensure stable operation of both itself and its counterparties. These agreements are renegotiated annually to reflect changes in the entities and their environment. Transport services are not performed directly by the company. It does not have sufficient transport base, therefore, it is outsourced to an external company.

**The previous budgeting system in SPEED-MAX Ltd.**

The budgets in SPEED-MAX Ltd. were based on the analysis and the introduction of appropriate adjustments to the previous year budgets. The only certain information was the sales level, as it was defined in the contract and its modifications over the years were marginal. The company prepared budgets using the selling price, determined by a fixed value, equal for each of the recipients. This price may vary if the contractor company commissions additional activities that are not covered by the contract.

The company has decided to single out direct costs and indirect costs (identified as the costs that are not directly related to the service) in the cost structure. Direct costs include wages of staff magazine who are engaged in the activities, directly related to the services, and the cost of materials used by them. The materials necessary to perform additional services in accordance with the customer's order are primarily classified to these. The remaining costs are budgeted, based upon a determination of changes in the previous year. Management on the basis of the cost analysis and the environment observations have determined the percentage increases or decreases in their value. The budgeting method, according to this approach,

allows cost estimation but the results depend on the knowledge and competence of the management and employees, associated with the budgeting process. Statement in this form determines the approximate level of expenditures, only.

On the basis of the prepared reports, the company could only adjudicate that business is profitable. However, determination of the factors that influence it and other information which allows the analysis of its business was impossible. This is particularly important if the cost structure and a very high share of indirect costs in the total costs incurred by the company are taken into account. Proper cost allocation for specific products or customers may result in significant differences in the assessment of profitability and may lead to changes in management decision.

### Premises to change in the costing and budgeting system

The main factor that encouraged the management of SPEED MAX Ltd. to change the existing budgeting system was the need for more accurate and reliable information. In recent times, a decrease in entity profits was observed despite a steady increase in sales. This situation was not explained by the data generated in reports in the traditional budgeting system used. Determining the sales prices during the renegotiation of the previously concluded contracts was also a significant problem. The company had difficulties in estimating the costs to be borne to meet the requirements of individual customers. It was noted that clients had different needs, with size and diversity growing from year to year. The average price did not ensure competitiveness in the market.

Managers also noted other imperfections, associated with the existing budgeting system. Variances at the end of the year were at very high levels and budgeted values had little impact on the processes occurring in the company. It was a very serious problem, especially when it was paired with the percentage of indirect costs in the company. These costs represented approximately 75% of the total, and, therefore, their wrong allocation could lead to a significant distortion of the results (e.g. evaluation of the profitability of individual services or contracts). Rank of these problems was getting higher and the control was becoming more difficult.

The Board decided that the solution to above problems would be activity-based budgeting that would significantly

increase the amount of information, allowing many opportunities and cross-analysis of data in the enterprise. In the next part of the paper, the budgeting process based on the concept of activity based costing in SPEED-MAX Ltd. is presented.

### Main assumptions about ABC in SPEED-MAX Ltd.

The Controller of SPEED-MAX Ltd. with the Implementation team (consisting of staff from key company departments, including basic divisions, sales and marketing, accounting and administration, and IT) have pinpointed the key resources, which include employees (according to the exercised functions: staff magazine, logistics, and administration and supervision), area both storage and office space, and forklifts. The following table is extracted from the ABC system in SPEED-MAX Ltd. and provides the data concerning the selected resources.

Delivery takes place in eight specially customized ramps in the morning (from 6:00 to 10:00). On the basis of the relevant documents, each shipment is identified by its own number (which allows the linkage to both the supplier and the employee receiving it) and then fed into a computer system. Pallets of goods are transported by forklifts in storage, where, according to the number, they are placed in the appropriate storage area (dependent on storage time). If the goods are to be subjected to further treatment, they are placed in a separate sector.

Orders from customers are also placed in the system, which provides a possibility to better and more effective coordination over time. When the order is to be executed, suitable goods are imported for the control area. The next step is the completion of the outgoing party and its loading on the ramp (it takes place in the evening 18:00-22:00). Transportation services are provided by outside companies.

In company's operations, activities with the corresponding activity cost drivers that best reflect the causes of their costs have been distinguished. These drivers allow assigning a cost pool to cost objects identified by management.

Controller of SPEED-MAX Ltd. in consultation with the Implementation team have decided that the cost of activities will be allocated on costs objects (customers). This solution has been chosen because the sale is conditioned by contracts with clients (in addition, the customer determines the necessary actions).

Table 2

**Selected resources and their costs for a month in SPEED-MAX Ltd.**

Resources	Quantity	Individual theoretical potential (hours per person per month)	Monthly theoretical potential (hours per month)	Monthly practical potential (hours per month)	Unit cost (PLN per month)	Monthly cost (PLN)
	<b>1</b>	<b>2</b>	<b>3 = 1 * 2</b>	<b>4 = 80% * 3</b>	<b>5</b>	<b>6 = 1 * 5</b>
staff magazine	42 (people)	160	6 720	5 376	1 600	67 200
supervisors	13 (people)	160	2 080	1 664	2 750	35 750
storage area	28 000 (m <sup>2</sup> )					350 000

Table 3

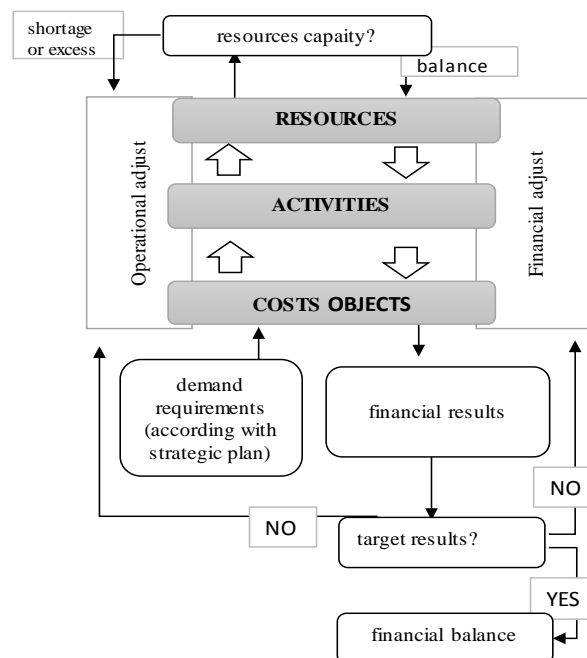
**Selected activities and drivers assigned to them for two clients in SPEED-MAX Ltd.**

Activities	Drivers	SMART Ltd.	BIGER Ltd.	Total
Internal transport	number of palets	21 300	11 600	66 000
Storage	number of pallets days	31 950	62 640	171 973
Quality control	number of control	320	450	1 490

Table 4

**Resources-Activities Dependence Matrix (natural units and PLN) in SPEED-MAX Ltd.**

Resources	Staff magazine		Supervisors		Storage area	
	man hour	PLN	man hour	PLN	m <sup>2</sup>	PLN
Internal transport	320	4 000	115	2 470	4600	42 368
Storage	410	5 125	70	1 503	25700	236 710
Quality control	340	4 250	219	4 705	600	5 526



**Figure 1.** Overview of the ABB-Approach

Table 3 presents specified activities with drivers associated with them (the term: ‘pallets days’ should be understood as a multiplying the number of pallets and the number of storage days).

In the next stage of ABC implementation in SPEED-MAX Ltd., based on interviews with employees and observations of the Implementation team made for the purposes of calculation, the resources are assigned to activities. Distribution of resources used by the resource drivers is presented in Table 4. The costs approach which allows calculating the cost of individual activities is also presented in Table 4.

### Activity-based budgeting system in SPEED-MAX Ltd.

After a year of implementation, when the Board of SPEED-MAX Ltd. noted the advantages of having a system based on activities, they decided to extend the system of budgeting element. In this process, the costs are planned for necessary activities for the provision of services to customers in the following period. Controller of SPEED-MAX Ltd., based on the procedure developed by Kaplan and Cooper (1998), distinguished 4 stages in the budgeting process:

1. estimation the expected volume of sales for the next period (on the basis of signed contracts),

2. establishment of the operational activities and determination of the necessary resources,
3. determination the potential of existing resources and comparing it with the predicted values,
4. if necessary, making any adjustments.

The budgeting cycle has been characterized in Figure 1. It shows the whole process, from its beginning until the end of the projected cost for the coming period. The budgeting process in SPEED-MAX Ltd. is presented in more detail in the following parts of the article.

### Forecast of sales volume

The first step in developing the budget in SPEED-MAX Ltd. is, similarly to a traditional approach, the translation of business strategy and long-term plans to the goals which company intends to achieve in the near term. In developing these assumptions, particular attention to factors which may thwart the implementation of the plans is to be paid. Then, the company should estimate sales for the coming period in cross-section of products or customers (depending on the needs and possibilities). This is a very important step, because it determines the planned level of activities.

SPEED-MAX Ltd. has five key customers. These are the companies with which SPEED-MAX Ltd. has been working for a long time. Their levels of purchased services vary due to the nature of their business. They are both smaller enterprises which have their branches in close proximity to the company, as well as larger entities with significant territorial dispersion. Sale is conditioned by previously signed contracts. Renegotiation has already taken place, so the budgeted amount of sales has already been defined. Table 5 shows the values on a quarterly basis, because in this perspective the budget is developed.

Sales on a quarterly basis are at a relatively constant level. The illustration of differences in sales volumes for each month and customers is presented in Figure 2.

The company serves not only very large customers the needs of which are considered permanent, regardless of the month (the company SMART Ltd.), but also entities characterized by seasonality, which make significant purchases in certain periods, and average – in others (BIGER Ltd. and SYScon Ltd.). Lider Ltd. is the company with generally constant needs, on average volume. The smallest of the supported clients is AMICO Ltd.; the size of purchases compared to the total number is relatively low.

Table 5

Sales plan (palettes) in SPEED-MAX Ltd.

	I quarter	II quarter	III quarter	IV quarter	Total
SMART Ltd.	64 000	55 900	51 000	63 900	234 800
BIGER Ltd.	51 300	52 500	34 200	36 400	174 400
SYScon Ltd.	38 700	36 700	49 800	48 800	174 000
Lider Ltd.	36 100	36 000	39 600	34 700	146 400
AMICO Ltd.	11 800	13 800	18 400	12 000	56 000
Total (palets)	201 900	194 900	193 000	195 800	785 600

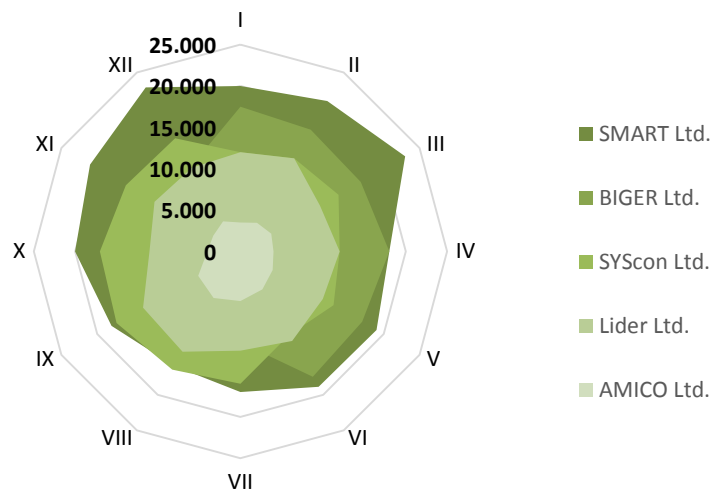


Figure 2. Sales to particular customers in month in SPEED-MAX Ltd.

Table 6

Selected consumption activity indicators in SPEED-MAX Ltd.

	Number of palettes	Number of pallets days	Number of control	Number of pallets days per palette	Number of controls per palette
	1	2	3	4 = 2/1	5 = 3/1
SMART SA	21 300	31 950	320	1,50	0,02
BIGER SA	11 600	62 640	450	5,40	0,04

### Indicators of consumption activities

For a more transparent presentation of the budgeting process in SPEED-MAX Ltd. only three resources will be taken into account: 1. Staff magazine, 2. Supervisors, 3. Storage area. Three activities will be considered: 1. Internal transport, 2. Storage, 3. Quality control; two customers will be chosen, 1. SMART Ltd. and 2. BIGER Ltd. In order to specify the number of activity cost drivers consumed by customers, it was necessary to calculate indicators of consumption activities in SPEED MAX Ltd. Sales are determined by the number of pallets, and, therefore, this value will be the basis for further discussion. Consumption activities indicators are calculated by dividing the number of activity cost drivers assigned to a customer by the number of pallets, bought by the customer during the period.

These indicators have been calculated by dividing the number of activity cost drivers in columns 2 - 3 by the number of pallets (column 1). For activity - Internal transport whose activity cost driver is the number of pallets (which is also the basis for calculating these rates) it is 1.

Then the obtained indicators have been assigned to separate activities, done similarly, through activities and its dependence on the activity cost drivers (drivers for specific activities are given in Table 3). On this basis it can be determined that the indicators for the specified actions are: Internal transport - the number of palettes/palette (= 1), Storage - number pallets days/palette, Quality control - the number of controls/palette.

### Forecast of activity volume

Through the use of the forecast of sales volume (expressed in the number of palettes) and the previously calculated consumption activity indicators for individual activities, the number of activity cost drivers needed to satisfy the projected demand can be estimated. The calculation of the activity cost driver forecast is followed by multiplying the consumption activity indicator (for particular customer and activity) by the forecast of sales. For activity: Storage, which activity cost driver is the number of pallets days, for customer: SMART Ltd. in the first quarter it could be as follows:

$$\text{consumption activity indicator} * \text{forecast of sales volume} = 1,5 \frac{\text{pallets days}}{\text{palette}} * 64\,000 \text{ palletes} = 96\,000 \text{ pallets days}$$

Indicators for particular customers have been used for more detailed information, rather than the averaged values. This allows the Controlling department to carry out the subsequent deeper analysis and faithfully presents an image of the future activities in relation to specific

customers. The data on the size of the projected activity cost driver on a quarterly basis to customers: SMART Ltd. and BIGER Ltd. Is presented in Table 7.

The data was estimated for each quarter, because the budget of SPEED-MAX Ltd. is developed in this structure.

### Forecast of resource volume

To determine the amount of resources needed to carry out the planned activities, the consumption resources indicators should be established. These indicators express the relation of resources drivers to the sum of activity cost driver, necessary for carrying out a particular activity. In practice, it is calculated by dividing the specific resources drivers allocated to a particular activity (Table 8) by the activity cost drivers assigned to this action. The following table sets forth the computation for the resource - the staff magazine and the results for two other resources which were calculated similarly.

Estimation of the required resources was done by multiplying the consumption resource indicators for a particular resource by the forecast of the activity volume in the budgeting period. This is very important because the company must determine whether it has the necessary capacity to perform the activities. Table 9 shows the forecast made for the resource - the staff magazine.

The planned resource usage, the staff magazine, does not exceed the practical potential (assumed 80% of the theoretical capacity). This points to the possibility of realization of planned activities with the current state of resource in SPEED-MAX Ltd. A similar procedure was carried out for other resources. The results of the analysis, together with available potential are presented below in Table 10.

This report shows that SPEED-MAX Ltd. has three resources which allow carrying out the planned activities, such as: the staff magazine, storage area, and forklifts. Problematic resources include: Logistics and administration staff, supervisors, and office space. The budgeted activities force the company to spending those resources at a higher level than currently held. This situation requires adjustments to the preliminary budget.

### Adjustments to the existing potential

Determining the anticipated needs of resources is a very important part of the process. Controller of SPEED-MAX Ltd. must decide whether the available resources are sufficient to support planned activities. In a situation where the amount of resources needed by the company in the next period is higher than the accessible, appropriate corrections

Table 7

**The number of activity cost driver in SPEED-MAX Ltd.**

Activity	Activity cost driver	I quarter	II quarter	III quarter	IV quarter	Total
<b>SMART SA</b>						
Internal transport	Number of palletes	64 000	55 900	51 000	63 900	234 800
Storage	Number of pallets days	96 000	83 850	76 500	95 850	352 200
Quality control	Number of controls	962	840	766	960	3 528
<b>BIGER SA</b>						
Internal transport	Number of palletes	51 300	52 500	34 200	36 400	174 400
Storage	Number of pallets days	277 020	283 500	184 680	196 560	941 760
Quality control	Number of controls	1 990	2 037	1 327	1 412	6 766

Table 8

**Consumption resource indicator in SPEED-MAX Ltd.**

Activity	Activity cost driver	Resources driver - (hours)	Consumption resource indicator – staff magazine
	1	2	3=2/1
Internal transport	66 000	320	0,00 <sup>2</sup>
Storage	171 973	410	0,00 <sup>3</sup>
Quality control	1 490	340	0,23

Table 9

**The demand for resource – staff magazine in SPEED-MAX Ltd.**

Activity	Activity cost driver	Forecast number of activity cost driver	Consumption resource indicator	Forecast number of resource
Internal transport	Number of palletes	785 600	0,00	3 809
Storage	Number of pallets days	2 248 600	0,00	5 361
Quality control	Number of controls	17 758	0,23	4 052
.....	.....	.....	.....	.....
<b>used (hours)</b>				64 359
<b>potential (hours)</b>				64 512
<b>difference (hours)</b>				+153

<sup>2</sup> This value is approximately 0,00, however, it is exactly 0,00(48).

<sup>3</sup> This value is approximately 0,00, however, with more accurate approximation it is 0,0024.



Table 10

**Comparison of available resources potential and budgeting demand in SPEED-MAX Ltd.**

	Budgeting demand	Available potential	Difference
Staff magazine	64 359	64 512	+153
Logistics and administration staff	24 619	23 040	-1 579
Supervisors	20 660	19 968	-692
Storage are	428 824	456 000	+27 176
Office area	16 620	15 600	-1 020
Forklifts	55 097	55 296	+199

Table 11

**Impact of adjustment on the resource – supervisors in SPEED-MAX Ltd.**

	I quarter	II quarter	III quarter	IV quarter	Total
Actual budgeting working hours	5 446	5 323	4 892	5 000	20 660
Actual potential	4 992	4 992	4 992	4 992	19 968
<b>difference</b>	-454	-331	100	-8	-692
New budgeting working hours	5 691	5 568	5 120	5 222	21 602
New potential	5 760	5 760	5 760	5 760	23 040
<b>difference</b>	69	192	640	538	1 438

should be made. Adjustments can be made from three perspectives:

- capacity, which involves increasing the resources, for example: employment of personnel, renting a storage or office area and purchase of the missing resource, such as computers or vehicles,
- consumption indicators, by increasing the efficiency of resources or activities,
- demand, when the above corrections are inapplicable, the forecasted sales should be reduced. In the analyzed situation demand adjustments are not possible because the contracts have already been concluded and the company has to fulfill them (these adjustments would necessitate renegotiation of contracts which the company would like to avoid).

After the necessary adjustments, Controller of SPEED-MAX Ltd. again should consider the question whether the newly defined potential is sufficient to meet projected needs. If the answer is yes, it should follow the activity based costing procedure. It is about the calculation of the cost, which will generate projected resources, billing it successively on the action and further, the cost objects.

As a result, costs for the future period are illustrated, and its financial results follow. If it turns out that their level is insufficient for the Board, there is the possibility of re-adjustment. It can occur through operational sphere, as a result of the adjustments described above, or through financial changes. They may have a twofold character: increase prices of products or services, or be the result of reducing the cost of resources used.

Table 12

**The rate of activity cost for selected activities in SPEED-MAX Ltd.**

Activity	Activity cost driver	Costs pool	Total number of activity cost driver units	Rate of activity costs
		1	2	3 = 1/2
Internal transport	Number of palletes	59 650	66 000	0,90
Storage	Number of pallets days	245 370	171 973	1,43
Quality control	Number of controls	15 451	1 490	10,37
.....	.....	.....	.....	.....

Table 13

**Expected results achieved on contracts with specific customers in SPEED-MAX Ltd.**

	<b>SMART Ltd.</b>	<b>BIGER Ltd.</b>
<b>Revenues</b>	4 930 800,00	3 662 400,00
<b>Activity costs</b>		
Internal transport	212 210,73	157 621,59
Storage	502 518,15	1 343 701,01
Quality control	36 580,52	70 158,84
.....	.....	.....
Total	3 734 074,58	5 569 137,62
<b>Results</b>	1 196 725,42	-1 906 737,62
<b>Results per palette</b>	5,10	-10,93
<b>Profitability</b>	24%	-52%

The process of making adjustments is continued until the expected results are equivalent to that required by the Board. For resource: ‘supervisors’, the management of SPEED-MAX Ltd., decide to hire two more employees (capacity adjustment). However, the company tries to maintain the highest quality of services, so it decides that they will mainly deal with the quality control process (consumption rate will be an increase from the current level of 15% to 20%). The existing employees through a significant reduction in exercise activities ‘quality control’, are then able to focus on other responsibilities (adjustment of consumption indicators).

This solution makes it possible to meet the demand for this resource.

**The budgeting costs of activities**

After collecting all the information included in the above points, Controller of SPEED-MAX Ltd. can calculate the cost of the planned activities. This requires the use of planned average rates of activity cost, and it is followed by dividing the costs pool attributed to the selected activity by the number of activity cost driver units of this activity (according to equation below).

rate of activity costs  $X = (\text{costs pool attributed to the activity } X) / (\text{total number of activity cost driver units } X)$

The rates for the chosen activities are calculated in the Table 12.

The costs of individual activities, attributable to a particular cost object (in this case, the customer) are obtained by multiplying the calculated rate of activity cost by the number of activity cost driver units consumed by the selected client. As a result, the cost of a specific activity for the object is received (according to equation below).

cost of activity  $X$  attributable to the cost object  $A$   
= rate of activity cost  $X$

\* number of activity cost driver units  $X$  consumed by cost object  $A$

After adding up the costs of all activities associated with the object, Controller of SPEED-MAX Ltd. calculates the total indirect cost (direct costs are recognized directly to cost objects). The sum of all indirect costs is equal to the general costs, allocation subject on the individual products. For a more pronounced enterprise view in the budgeting

period (for simplicity - year), a similar statement can be made, broken down by individual customers (Table 13).

It can be stated that the contract with SMART Ltd. ensures the implementation of more than twenty percent of profitability; however, in the budgeting period the company will suffer a high loss resulting from the contract with BIGER Ltd. All these factors make the average profitability of the SPEED-MAX Ltd. only 8%, which seems to be a fairly low level.

The main advantage of ABB is the ability to prepare budgets and monitor performance in a more efficient manner - based on more obvious reasons for the occurrence of costs, because services create the demand for activities which require use of resources. In SPEED-MAX Ltd., the basis for the budget preparation has been the volume of sales (specified in the previously signed contracts) which determined the amount of necessary activities; the planned use of resources was determined by these activities. This has allowed creating a more realistic budget, based on the actions assigned to each customer. This approach has presented the difference in the profitability of individual customers in the budgeting period. Controller of SPEED-MAX Ltd. has a greater capacity to analyze the data, thus, it provides a basis for making more rational decisions (e.g. price, discount). The implementation of ABB in SPEED-MAX Ltd. has resulted in an increased interest by both management and other employees. It was the result of changes in the budget perception, as employees could see the performance of specific tasks from daily work, not the statement of costs by nature only in the budgets.

The new budgeting system, however, has not resulted in the reduction of time spent on the budgeting process. This procedure still requires the involvement of both time and knowledge of many people. Some data has been estimated due to the high costs that would be linked to their collection. It is therefore necessary to periodically check this data. Controller of SPEED-MAX Ltd. is also aware that some of the resources and activities are not homogeneous and should be divided into smaller parts (simplification has been made to facilitate the application of the procedure).

Controller of SPEED-MAX Ltd. realizes that the budgeting process needs to be developed, but even in its current form, it generates more information than before. In the plans of SPEED-MAX Ltd. there are modifications of a computer system, so that most of the data will be collected and updated automatically (now some of them is entered manually at the end of the month).

## Conclusions

Activity-based budgeting, as illustrated in case study, requires determining the cost of planned activities, based on their expected size and consumed resources, so it is most useful for repetitive activities, especially for processes caused by demands, orders, products, services and customers. ABB requires a method, more detailed than traditional, the definition of production and sales demand, the available supply, acquisition cost, and efficiency of company resources. With effective ABB, however, managers can have much greater control over cost structure, particularly regarding fixed costs. They can focus on the effective realization of activities necessary for running a business and planned workload. The ABB approach also eliminates the problem of incompatibility with the implemented strategy, and, as a result, creates added value for the entity. The research shows that using ABB seems to be especially important in the light of the evolving needs on the usage of budgets. They become more a tool of communication information to shareholders and other stakeholders as well as the basis for control of the company with regard to its long-term strategy. This concept, however, does not solve all the problems found in the traditional approach. The budget drawn up in accordance with this approach is rather time-consuming (to obtain the necessary data) and expensive (even the cost of implementing ABC). This is probably the reason for the low prevalence of this method.

To conclude, this paper has theoretical and practical significance. From a theoretical point of view, it is the analysis of literature devoted to activity-based budgeting both in Poland and abroad. Research, both surveys and case studies, have made it possible to determine that budgeting is used on a large scale and companies do not intend to abandon it; furthermore, they intend to improve it and adapt to their management needs. From a practical point of view, the article could raise managers' awareness about the new concept and show them step-by-step the budgeting process (ABB). The illustration may allow a more accurate understanding of the activity-based budgeting essence and may empower taking a more conscious decision with regards to the modification of the budgeting system.

The interpretation should take into account some limitations of this study. The presented case concerns only one company and it has got illustrative nature. It allows tracing the budgeting process and supporting the conclusions drawn from studies, carried out by other authors.

Limitations of the research mentioned above present potential for further surveys. They can be conducted in the form of a questionnaire (this creates the opportunity for

generalization of the results) and in the case study form (it allows comparing the results with this study). Case study research can be carried out in other service companies as well as manufacturing companies. Subjects for the future studies should focus on the prevalence of activity-based budgeting, the factors influencing implementation of this new budgeting approaches as well as the factors that incline a company to remain with the current solutions. Also, it should determine the suitability of the information generated by the traditional and activity-based approach and the problems which may be associated with these systems.

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Ž. Pietrzak

#### Tradicionis versus veikla grįstas biudžeto sudarymas negamybos įmonėse

Santrauka

Veiklos biudžetas yra vienas iš dažniausiai naudojamų įrankių valdymo apskaitoje. Atlikta literatūros analizė (Chenhall, Smith, 1998; De Su, Dijkman, 2008; Angelakis et al., 2010; Faroukas, McLellan, 2011; Yalcin, 2012) rodo, kad biudžetas yra daug daugiau, nei planuotų veiksmų bei iš eilės einančių veiksmų išraiška - jis taip pat skatina koordinavimą ir vertinimą, padeda motyvuoti ir įvertinti darbuotojų efektyvumą ir palaiko vidaus kontrolės sistemą. 20-ojo amžiaus pabaigoje padidėjo tradicinio biudžeto verslo valdymo naudos kritika (Neely, 2001; Higgins, 2005; Libby, Lindsay, 2007).

Tobulinant arba keičiant biudžeto praktiką išryškėjo nauji požūriai ir metodai - vienas iš jdomiausių yra biudžeto metodas grįstas veikla (angl. *activity-based budgeting/ABB*). Tarptautiniai tyrimai rodo ABB naudą, lyginant su tradiciniu biudžetu (Liu, Tan, 2003; Stevens, 2004; Pocekeviciute, 2008; Lin, Yahalom, 2009; Capusneanu et al., 2013). Lenkijoje atlikti ABB tyrimai (Szychta, 2001; Wnuk-Pel, 2013) nesudaro išsamios ABB analizės, susijusios su tradiciniu biudžetu (privalumai, trūkumai ir jo naudingumas), ir neįrodo visapusiškos tvarkos rengiant ir kontroliuojant biudžetą pagal veiklos rūšis, ypač atsižvelgiant į ne gamybos įmones.

Atsižvelgiant į tai, paaiškėjo ankstesnių tyrimų spraga Lenkijoje, tai leido suformuluoti straipsnio tikslą - tai bandymas nustatyti ABB naudingumą atsižvelgiant į privalumus, galimybes ir sunkumus, susijusius su šio metodo įgyvendinimu, iliustruojant tai biudžeto procesu paslaugų bendrovėje.

Atliktas mokslinės literatūros tyrimas leido identifikuoti pagrindinius trūkumus tradiciniame biudžete ir nurodė ABB naudojimo galimybes. Ankstesni tyrimai leido nustatyti biudžeto sudarymo paplitimą: tradicinį (vidutiniškai per 95% visų tyrimo ) ir ABB (žymiai mažesnis taikymo lygis įmonėse, pvz., Nyderlandų įmonės - 65,9% iš 33 subjektų (De Su, Dijkman, 2008), Lenkijoje - tik 17 bendrovių, o dvi iš jų atsisakė tradicinio biudžeto po ABB priėmimo (Wnuk - Pel, 2013). Šie tyrimai leido pateikti išvadą, kad įmonės neplanuoja pereiti nuo biudžeto apskritai, jie norėtų jį pakeisti ir naudoti valdyme.

Patvirtinimui straipsnyje pateiktos kitų tyrėjų atliktos apklausos. Autoriai pristatė ABB procedūros pavyzdį hipotetinėje paslaugų įmonėje, kad išsamiau iliustruotų pagrindines prielaidas ir parodytų tikrus žingsnius ABB bei seką. Veikla grindžiama biudžeto sudarymu, kaip parodyta tyrimo pavyzdyje, nustato planuojamos veiklos išlaidas, remiantis numatomais naudojamais dydžiais ir ištekliais, kurie labiausiai naudingi išteklių naudotojams, kad atliktų pasikartojančias veiklas, ypač procesus reikalaujančius klientų, paslaugų produktų užsakymų. ABB sudaryti reikia, kad įmonėje būtų nurodyta išsamesnė informacija nei tradiciniu metodu, ne tik gamybos ir pardavimo paklausa, bet ir tiekimo, įsigijimo kaina bei įmonės išteklių efektyvumas. Esant veiksmingam ABB, vadybininkai turės daug daugiau galimybių kontroliuoti sąnaudų struktūras, ypač fiksuotų kainų srityje. Jie galės sutelkti dėmesį į būtinų veiksmų veiklų veiksmingam realizavimui versle ir planuojant krūvį. ABB taip pat pašalina nesuderinamumo problemą įgyvendinant strategiją, ir sukuria ūkio subjekto pridėtinę vertę. Atvejo analizė atskleidžia platesnį ir turtingesnį ABB konteksto supratimą bei padeda paaiškinti, kaip ji gali pakeisti biudžeto sudarymo procedūrą ir toliau valdyti. Tyrimai rodo, kad naudojant ABB, ypač svarbu, atsižvelgti į kintančias reikmes dėl lėšų panaudojimo biudžete. Jie tampa informacijos priemone akcininkams ir kitoms suinteresuotoms šalims, taip pat kontrolės pagrindu, atsižvelgiant į ilgalaikę įmonės strategiją. Tačiau tai neišsprendžia visų problemų, kurios yra tradiciniame požiūryje, biudžeto sudarymas remiantis šiuo metodu reikalauja daug laiko (norint, gauti reikalingus duomenis) ir yra brangus (ABC realizavimo savikaina).

Interpretuojant aiškinimus, reikia atsižvelgti į esminius apribojimus tyrimo, kurios autorius bandė sumažinti trianguliacijos tyrimo metodu ir palyginti su įvairių autorių atliktais tyrimais, kurie pateikti literatūroje bei atvejo tyrimo.

Tyrimo apribojimai - tai potencialas tolimesnėms studijoms. Šie tyrimai gali būti atliekami didesnės imties įmonėse, todėl jų rezultatai gali būti apibendrinti. Tikslėsius rezultatus galima pasiekti tiriant pvz., kitų paslaugų įmones (įmonių, turinčių panašias savybes, palyginimas), taip pat gamybos įmones (su galimais skirtumais, atsirandančiais dėl skirtingo verslo pobūdžio).

*Reikšminiai žodžiai:* biudžetas, tradicinis biudžeto sudarymas, veikla, grindžiama biudžeto sudarymu, atvejo analizė.

First received: September, 2013

Accepted for publication: December, 2013