TECHNISCHE UNIVERSITÄT DRESDEN
Fakultät Wirtschaftswissenschaften

Dresdner Beiträge zur
Betriebswirtschaftslehre
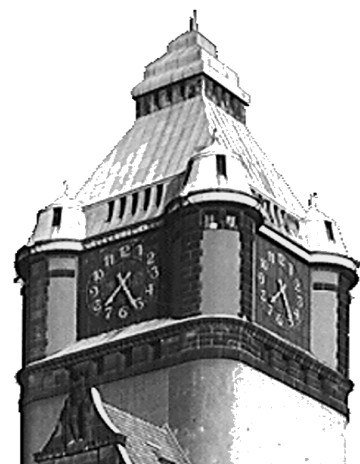
Nr. 35/00

Standardisation of Cost Accounting for Cost-Benchmarking.

Also presented at the 23rd Congress of the
European Accounting Association
in Munich, Germany on March 29-31, 2000.

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Standardisation of Cost Accounting for Cost-Benchmarking[1]

Abstract

Until recently the fact has been neglected that the range of options in cost accounting undesirably affects the validity of results in cost-benchmarking. For this reason, this paper presents the concept necessary to standardise cost accounting for cost-benchmarking. A practical example will be instructive to thoroughly illustrate the actual implementation of this concept.

Short Overview

➢ Cost accounting opens up a wide range of options with regard to recognition and valuation.

➢ Cost accounting provides the data for cost-benchmarking. Thus, these ranges of options, whose exploitation varies from company to company, undesirably affect the validity of the cost-benchmarking results.

➢ For the reasons stated above, it turns out to be necessary to set up standards for cost-benchmarking which are based on the ranges of options in cost accounting.

➢ The standardisation concept developed for benchmarking is quite as well applicable to other target items, such as quality, environment and time.

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1 Necessity and objectives of standardisations

It is a common concern of practical management and researchers to comparatively analyse different objects with the goal to evaluate the materiality of the objects compared. These are, e.g. plants, products and processes. Benchmarking has become a common tool in practical management to attain this goal (cf. Karlöf, B./Östblom, S., 1994, pp. 2, and Töpfer, A., 1997, p. 3). Adhering to the principle of benchmarking which implies to compare oneself with *the best of the best* on the market only a *cross-company* layout will lead the way to the goal.

Profitability is very often interpreted as efficiency and thus as the ratio between output and input. As a rule, input and output are chosen to be monetary quantities to guarantee objectivity, exactness and, as a consequence, credibility.

However, we are not sure to which extent these monetary quantities can fulfil the demands made on them, since they are obtained from accountancy that can be called *target accountancy* which is made to attain certain goals. External accountancy that is carried out – from the national point of view – in accordance with the regulations contained in the commercial code (in Germany: Handelsgesetzbuch) in connection with the Generally Accepted Accounting Principles is, for example, oriented towards the principle of conservatism. This is to avoid too optimistic an evaluation of both the owner's and the creditor's assets, their financial and profit situation (cf. Coenenberg, A. G., 1997a, p. 42). There are *ranges of options in view of recognition and valuation* to attain this goal. As a result of these ranges of options it is, e.g. necessary to draw up structural balance sheets for the purpose of comparative statement analyses to increase the significant weight (cf. Coenenberg, A. G., 1997a, pp. 567). The range of options is even wider for internal accountancy than for external accountancy. This is particularly true for cost accounting where the data for benchmarking should be taken from for the detailedness of data, which is essential for this purpose. Here we lack legal provisions so that the internal accountancy is carried through as target accounting for various goals, which is individually designed to meet the company's needs (cf. Coenenberg, A. G., 1997, p. 37, and Haberstock, L., 1997, p. 8).

One of the results of the existing and applied ranges of options in cost accounting is the fact that – without standardisations – the *significant weight of the benchmarking results and thus of the method itself is reduced*, because the cost differences identified by means of a variance analysis within a benchmarking procedure may have their cause either in inefficiencies or in the ranges of options that are possible in cost accounting. Hence it becomes necessary to standardise these ranges of options in accordance with the goals of benchmarking. Thus not only the

validity is improved but also the transparence of a variance analysis. This means practically that at the same time the overall analysis is accepted far better.

Therefore, this paper presents a *procedure* for the standardisation of the ranges of options for cost accounting with which the validity of benchmarking results can be improved.

Sticking to the goal just mentioned we are going to introduce a general and therefore abstract *concept* first. Starting from this, a *practical case* will be described to exemplify the concept.

2 Procedure for standardisations

If standardisations are to improve the significant weight of benchmarking results, the concept for the planned standardisation has to be part of the benchmarking process itself. This integration will be described shortly, whereas the benchmarking process itself will not be subject of this paper, however.

If we assume a general three-stage benchmarking procedure (s. Fig. 1, cf. Hoffjan, A., 1995, pp. 160, Hoffmann, W. H., 1996, pp. 39) it is reasonable that the standardisation should be implemented in the planning and analysis stage already and there before the variance analysis.
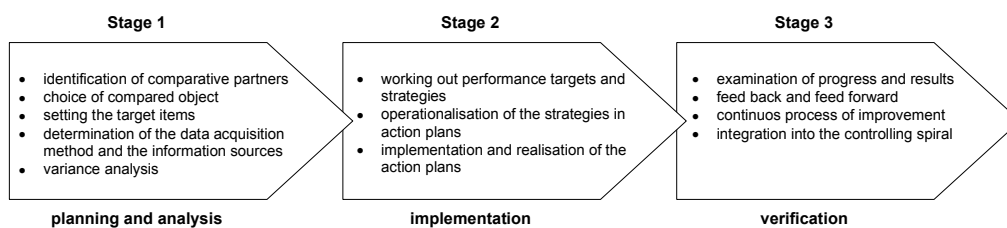
Stage 1	Stage 2	Stage 3
• identification of comparative partners • choice of compared object • setting the target items • determination of the data acquisition method and the information sources • variance analysis	• working out performance targets and strategies • operationalisation of the strategies in action plans • implementation and realisation of the action plans	• examination of progress and results • feed back and feed forward • continuos process of improvement • integration into the controlling spiral
planning and analysis	**implementation**	**verification**

Fig. 1:   *Three-stage benchmarking*

This means that the standardisations are based on the identification of comparative partners as well as the choice of compared objects (cf. Horváth, P./Herter, R. N., 1992, p. 7). Owing to the choice of compared objects it becomes possible to sufficiently define the relevant output in view of quantity and quality. If the comparison is to be made for the purpose of cost benchmarking using the data obtained from cost accounting (cf. Hoffjan, A., 1995, pp. 155), now – after an appropriate method for data collection has been chosen – the standardisations can be carried out in four steps as follows.

Step 1: Standardisation of the cost category accounting

For cross-company benchmarking cost accounting systems are utilised that are oriented towards different individual company goals. This expresses itself already in the first component of cost accounting, the cost category plan.

Before choosing different cost categories some basic questions have to be answered concerning cost accounting, such as whether to decide either for costs based on expenses or costs based on the value of used resources, and for full cost or marginal cost accounting. Moreover, an interpretation of the internal cost aspect operational dependence in view of the compared object and the related examination item is inevitable. For example, there may be accountable events that are clearly registered as costs from the point of view of the overall system *Comparative partners* (e.g., the overall enterprise) and which are allocated to one specific cost category, whereas from the point of view of the relevant sub-system *Compared object* (e.g., product, individual value-added stage or the like) it had to be ignored for the benchmarking to be carried out.

Thus, we face differences in view of recognition and allocation of business transactions to cost categories as well as cost categories to cost category groups. On the one hand, these differences may result from the new kind of consideration of the system *compared object*. On the other hand, they may be caused by the individual layout of the company's overall cost accounting. As a consequence, it becomes inevitable to develop and apply a standardised cost category plan. Comparing it with the cost category plans applied by the comparative partners this cost category plan contains fewer details concerning the differentiation of cost categories. That means that the standardised cost category plan provides only such *cost category groups* that are clearly and uniformly defined according to factual criteria. The definition of these cost category groups starts from the *lowest common denominator*, which is derived from the analysis of the individual cost categories (s. case 1 in Figure 2). Naturally, a further aggregation may be carried out in addition to the first, which depends on the benchmarking goal and the required information derived from it (s. case 2 in Fig. 2). The individual cost categories, which are differentiated by the comparative partners in different ways, are now allocated to the standardised cost category groups.
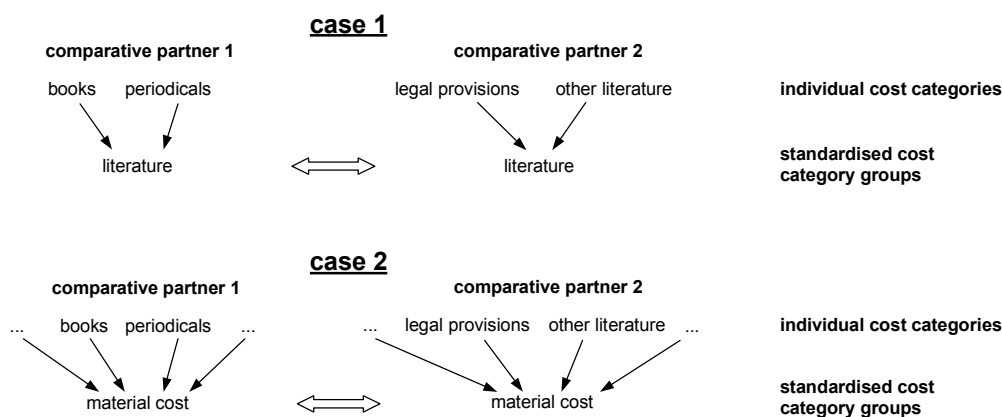

Fig. 2:   Grouping of cost categories

The different ways the comparative partners include details into cost categories do thus no longer affect the goal of the investigation.

This definition of the cost category groups together with the allocation of the individual cost categories is regarded as a first basic standard. To make the overall procedure efficient this first standardisation step is carried out, as a rule, during the collection of data. Since the data are usually collected by one person or group of persons, respectively to secure a uniform utilisation of the range of options, this standardisation is done implicitly only. This paper, however, will provide further information on the necessary explicit standardisations in the following.

Step 2: Analysis of options for recognition and valuation

To identify the starting points for further explicit standards it becomes essential to analyse the defined cost category groups to find out which ranges of options cost accounting opens up in the relevant cost category group in view of recognition and valuation.

Step 3: Standardisation of options for recognition and valuation

Now *one* standard is to be defined for each individual option for recognition and valuation. Thus, such standard presents a possible variant within the relevant range of options. It is derived from the benchmarking goal and its optimum attainment.

Step 4: Data collection by recognising standardisation

After determining the standards for recognition and valuation, the relevant data can be collected from the objects to be compared. The monetary quantities thus gained – here costs – lay the *foundation for the further progress of the benchmarking process*.

For all the steps described it is generally true that their actual application depends on the individual situation (e.g., the quality of accountancy) and the background on which the comparative partners carry out the benchmarking. A general approach can thus *only be stated on the conceptual level* – see earlier.

3 Standardisations and the variance analysis

Using the standardised data collected in step four a variance analysis follows now within the benchmarking process – see Fig. 1. The analysis primarily aims at the identification of the cost differences between the compared objects as well as the consequent separation in view of certain influencing factors and to explain the deviations this way. Owing to the standardisations performed it can be theoretically

excluded that the cost differences are caused by the ranges of options in cost accounting.

In terms of the variance analysis it may be interesting, however, to make the influence the standardisations have on the level of cost understandable. The group of influencing factors that relate to the added value activities connected with the compared objects so far, will now be extended by factors which represent the identified ranges of options of cost accounting. Thus, each time standardisation is carried out, one influencing factor can be determined as a maximum. This factor is then assigned a percentage of the cost difference.

In addition to the cost differences caused by added value the variance analysis thus demonstrates the development of cost from the unstandardised to the standardised state. In this way it illustrates the *influence of the ranges of options* on cost accounting.

When we follow this idea and make the *standardisations an integrate part of the variance analysis,* the standardisations may not be connected with the data collection process. On the contrary, a large amount of basic data is to be collected to be able to carry out standardisations afterwards from different points of view. To give an example: it is not enough to collect the standardised imputed depreciations alone but also the basic data such as purchase cost, useful life etc.

4 Field example

An actual field case taken from the *Municipal Waste Management Sector* has been chosen to illustrate the standardisation concept presented in this paper. Here, the standardisations have been an integral part of the cost benchmarking carried out. This cost benchmarking aimed at the comparative analysis of the waste management process *landfilling* in order to evaluate its profitability. Each comparative partner contributed several objects to be compared, i.e. landfills, to the cost benchmarking process. Altogether 31 landfills have been compared.

4.1 Standardisation of the cost category plan

The comparability of the benchmarking objects has been secured by defining standardised cost category groups. This is especially true for the selectivity among the cost category groups themselves.

Since each comparative partner has its own cost category plan that is adjusted to the individual needs, a comparison of the individual cost categories on the lowest level does not produce satisfactory statements. For this reason – as shown on the conceptual level earlier – cost categories have been grouped in an appropriate manner so that a *valid comparison* between the comparative partners and thus the objects becomes feasible on the aggregated level.

Following this idea, eight cost category groups (cf. Cantner, J., 1997, pp. 132) have been defined as the basis for the data collection and the consequent comparison for the waste management process *landfilling*:

1. employment cost

2. material cost

3. service cost due to outsourcing

4. other service cost

5. imputed depreciations

6. imputed interest charges

7. imputed provision cost

8. imputed risk cost

Making a difference between the two kinds of service cost seems redundant, at first sight. If, however, we have in mind the benchmarking target, i.e. to evaluate the profitability of the waste management process *landfilling*, we have to take into account the following fact: a much disputed tool to increase profitability is outsourcing to external third parties. As a natural consequence the percentage of the service cost increases compared to the other cost category groups. A separate cost category group has been established to be able to answer the question which service cost are caused by the removal of kernel activities of the process *landfilling*. Thus this *cost category group represents an informational requirement of the participating comparative partners* depending on the intended investigation goal. Other informational requirements can be fulfilled in the same way.

Thus we have a *uniform framework as a starting point* to implement the conceptual procedure presented. Now the options for recognition and valuation will be analysed and standardised within the chosen field example.

4.2 Analysis of options for recognition and valuation

Each standardised cost category group has been analysed to find out which options it opens up in view of recognition and valuation. The eight cost category groups presented have been divided into two classes: whether they are influenced by recognition and valuation options and are thus potentially suitable to be standardised or whether there are no such options and standardisation is not necessary as a consequence.

Cost category groups that are not suitable for standardisation

1. employment cost

2. material cost

3. service cost due to outsourcing

4. other service cost

Cost category groups that are suitable for standardisation

5. imputed depreciations

6. imputed interest charges

7. imputed provision cost

8. imputed risk cost

It is not surprising that the options for recognition and valuation showed up only for the imputed cost category groups, whereas the category groups with mainly basic types of cost remained unaffected.

Taking these analysis results as the basis, the relevant cost category groups could be standardised by means of standards that are to be determined.

4.3 Standardisation of options for recognition and valuation

By setting standards for each cost category group the option for recognition and valuation is thus standardised in the sense that a possible variant of the option is defined as binding (cf. Coenenberg, A. G., 1997, pp. 61, or Haberstock, L., 1997, pp. 77). It becomes obvious that this standard may, however, be derived from the particular investigation goal, which does not mean absolute but only *relative objectivity* in view of *transparency and understandability*.

Standards were defined for the identified standardisable cost category groups for the practical example. The imputed risk cost have not been taken into account, however, since the data required for the calculation have been missing with all comparative partners due to specific operational features until recently. For the remaining three standardisable cost category groups we pick out some of the defined standards for the normalisations as examples, which do not claim to be generally valid:

Imputed depreciations

All imputed depreciations have been calculated on the *basis of purchasing cost*. For the approach we had to answer the question how financial assistance has to be handled in accounting, since financial aids play an important – at least political –

part in the municipal waste sector. For this reason, a uniform approach was inevitable: the purchasing cost have been corrected by leaving out all financial aids. That means that the comparative partners applied the net method and increased the estimated purchasing cost by the financial aid given. As a result, the historical purchasing costs relevant for the cost benchmarking were calculated. Thus, the *gross method* was applied for all compared objects.

Another issue was to define uniform calculation methods for the imputed depreciations. The latter were linearly calculated in case of time-based depreciation. When unit-of-production-based depreciation was applied, the percentage of the quantity used during the accounting year was taken as the basis.

Imputed interest charges

The defined method of how to handle financial aids for the calculation of imputed depreciations also affected the calculation of the imputed interest charges, since they are based on the purchasing cost as well.

The imputed interest charges were uniformly calculated by *averaging*. The capital items deducted from total, i.e. capital items provided interest-free, were not included to prevent different financing structures from influencing the height of the imputed interest charges.

In view of the chosen interest rate we refer to the various ways discussed in literature. The actual interest rate chosen was 6 p.c. in accordance with the country-specific legal recommendations for charge calculation.

Imputed provision cost

For the waste management process *landfilling* cost accounting makes it necessary to calculate provision cost in dependence of the filling level of the landfill examined following the polluter-pays principle (cf. Coenenberg, A. G., 1997, p. 47). These provision costs are the equivalent to compensate the capital cost arising for the investment that will be inevitable for the closure and post-closure care of the landfill body (cf. Baum, H.-G./Cantner, J., 1998, p. 23). With the provision cost the depreciation principle is applied, however, the other way round: *The periodic resource consumption comes before the necessary investment.*

Unlike the calculation of depreciations, mathematical investment methods for the calculation of provision costs are applied (cf. Cantner, j., 1997, pp. 142), which have been standardised as well in view of the comparison carried out. This implies the determination of a uniform discount rate.

Principle of materiality

Since standardisations have to fulfil the principle of materiality like any other economic method, almost all options for recognition and valuation are identified in practice, but not all of them are standardisable by means of appropriate standards. An estimate of the cost-benefit ratio has to be made in the actual case for the aspect that is to be normalised. For reasons of materiality, as they have just been mentioned, it was decided for the practical example presented to not complete a standardisation with regard to the question in which case to apply time-based depreciation and in which case to apply unit-of-production-based depreciation. A standardisation would have made necessary an analysis and a uniform classification of all available capital assets. It has rather been assumed that the comparative partners, when choosing the method, realised the goal, which was to reflect the wear and tear by means of depreciation, with due regard to the principle of materiality.

4.4 Data collection in view of standardisation

After the relevant options for recognition and valuation had been normalised by means of standards, data could be collected and classified on the large scale and some calculations could be done. In this case, data were collected via a computer-based analysis and field interviews to apply the implicit standardisation immediately and in co-ordination with those responsible.

4.5 Standardisations as part of a variance analysis – a field example

To get a clear idea of the extent to which all standardised options influence costs and thus the cost benchmarking validity, the *overall variance* can be calculated. For this purpose the overall costs are calculated taking into account all defined normalisation. Afterwards, they are compared with the overall costs that are calculated without standardisations from the data of cost accounting for the relevant comparative partner. The overall evaluation related the cost to the relevant output *landfilled waste volume in cubic metres* (cost per unit) to obtain comparable data. For the 31 compared objects *landfilling* in the field example it has been found that the standardisations resulted in an average reduction of the overall costs per unit by about 26% (median approx. –29%, standard deviation approx. +32%, minimum approx. –65%, maximum approx. +68%). Figure 3 illustrates the overall situation.
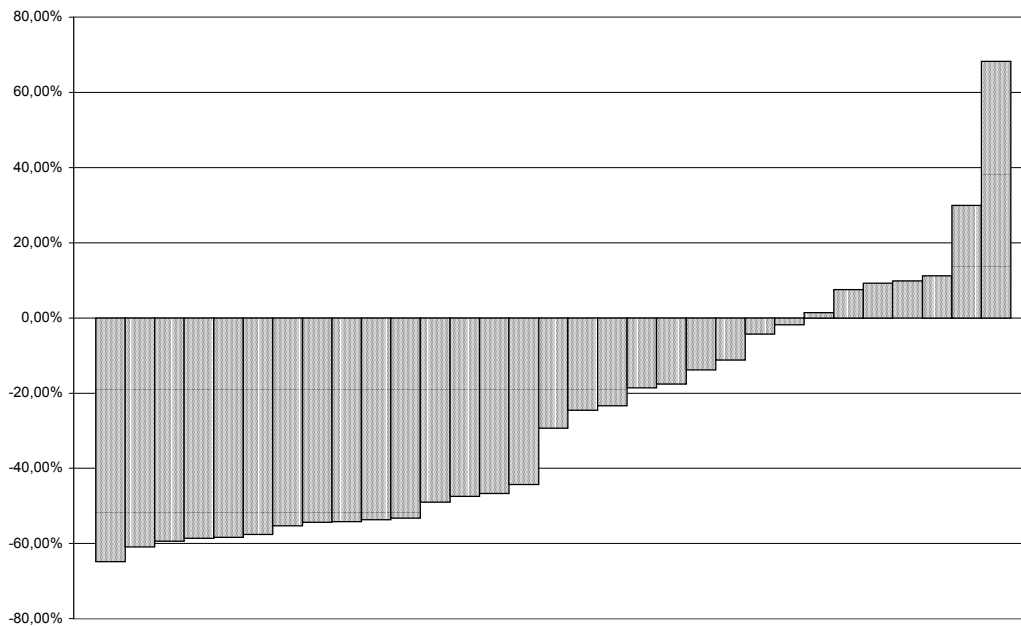
Fig. 3:   Total deviation of the 31 compared objects in per cent (ascending order)

In order to illustrate the influence of the defined standardisations in detail the variance analysis has to be extended by relevant influencing factors.

Influencing factors for the variance analysis

Basically it would be no problem to define each standardisation as an influencing factor. This would demonstrate its cost-related significance. This study, however, classifies the standardisations into the following three influencing factors beyond the limits of the cost category groups to get less but more exact components:

- financial aids:
  This influencing factor is to illustrate the *significance of financial aids* for the height of the cost reported. For this purpose, the standardisations, which served to eliminate the influence of financial aids on the height of cost, have been summarised. The approach for the purchasing cost started from the continuos application of the gross method which influences the height of the imputed depreciations and interest rates.

- method:
  This factor is to demonstrate the *significance of the choice of methods* for the calculation of cost – related to the three standardisable cost category groups. Thus this influencing factor summarises all standardisations that start from the relevant methods (e.g., average-cost method versus residual value method for the calculation of imputed interests).

- parameter:
  The parameters chosen for the calculation influence the height of cost in the same way. A parameter in this sense is, for example, the height of the interest rate for the calculation of the imputed interests. For this reason, this influencing factor summarises the relevant standardisations in order to demonstrate the *significance of the parameters chosen*.

The imputed provision cost may also be calculated by means of different methods with different parameters. For this reason, we apply standardisations for the imputed provision costs as well, which on the one hand can be classed with the influencing factor *method* and on the other hand with the influencing factor *parameter*. Experience and monitoring show, however, that the *imputed provision costs* are the largest *pool of costs* in the landfilling sector, which is moreover characterised by immense uncertainties in terms of planning. Because of this significance the comparative partners wished to indicate the influence of a standardised method (including the related parameters) on the height of the imputed provision costs separately.

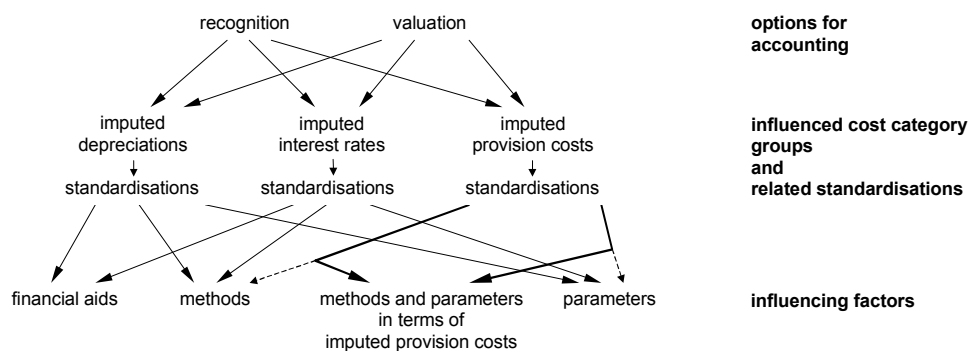As a result the standardisations are grouped into four influencing factors (s. Fig. 4).

Fig. 4:   *Grouping of standardisations into four influencing factors*

Concerning possible variance analyses and the field example, we can distinguish between the alternative variance analysis on the basis of actual performances on the one hand, and the cumulative variance analysis on the other hand, which is known from standard cost accounting (cf. Coenenberg, A. G., 1997, pp. 374, who also deals with the question of how to handle wider variations).

Alternative variance analysis on the basis of actual performances

For each influencing factor we can now calculate the related total costs. For this purpose *only* those standardisations are applied that are related with the influencing factor just considered. *The remaining standardisations are not taken into the*

consideration. For the influencing factor *financial aids*, e.g., the purchase costs can be adjusted in accordance with the necessary standardisation. On this basis, the imputed depreciations and interest rates can be calculated. Here, standardisation is neglected, however. Instead, the comparative partners use the methods and parameters that are usually applied.

The subsequent comparison of the total calculated costs for each influencing factor shows a ceteris paribus analysis result that can additionally be compared with the total costs, which arise when all standardisations are taken into account.

Cumulative variance analysis

This study, however, considers a *cumulative procedure*. First, the total costs for one selected influencing factor are calculated in the way we explained earlier. For the total cost calculation of the remaining influencing factors, the *standardisations applied for the previous, i.e. the first influencing factor* are continuously applied, however. The transition from one influencing factor to another causes a cost difference between the various total costs calculated. This difference is assigned to the influencing factor that was included last (s. Fig. 5).
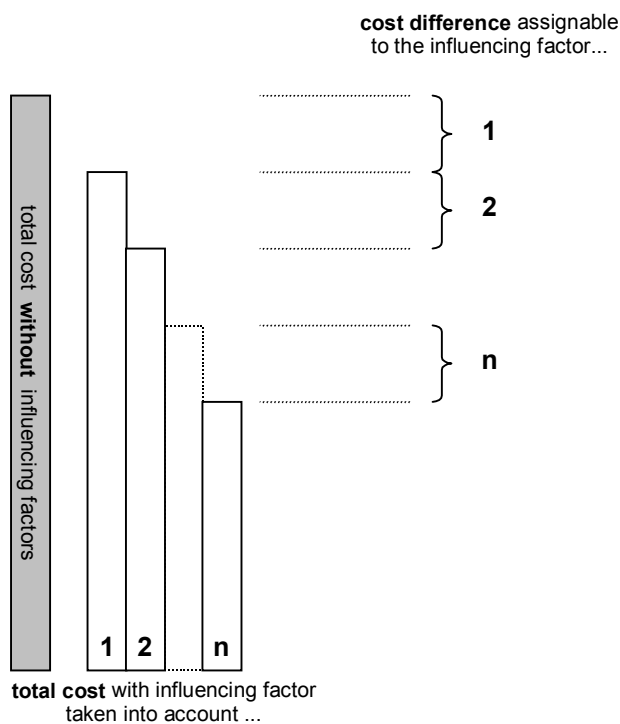

Fig. 5:   *Variance staircase of the cumulative variance analysis for 1 to n influencing factors*

However, this difference contains a certain percentage of wider variations due to the method applied. This deviation decreases with the order in which the influ-

encing factors are taken into account. Consequently, this order should be chosen with due regard to this condition.

For the field example the influencing factors were taken into account in the following order:

1. method

2. financial aids

3. parameter

4. methods and parameter in terms of imputed provision costs

We have already drawn your attention on the significance of the imputed provision costs for the comparative partners earlier in this paper. Therefore, they were considered last in the variance analysis. An indifferent statement has been made for the significance of the remaining three influencing factors. The order of factors has therefore been optimised in terms of efficiency: the expenses for data collection and processing were to be minimised.

Figure 6 shows the results obtained for a chosen compared object A, i.e., the development of total costs per unit – related to the filling waste volume in cubic metres – compared with an index over the four influencing factors that are based on each other (cumulative variance analysis).

pool of costs	index
total cost without influencing factors	100.00%
cost difference assignable to the first influencing factor *method*	-11.29%
total cost with the influencing factor *method* taken into account	88.71%
cost difference assignable to the second influencing factor *financial aids*	+20.58%
total cost with the influencing factor *financial aids* taken into account	109.29%
cost difference assignable to the third influencing factor *parameter*	+0.61%
total cost with the influencing factor *parameter* taken into account	109.90%
cost difference assignable to the fourth influencing factor *methods and parameters in terms of imputed provision costs*	-8.52%
total cost with the influencing factor *methods and parameters in terms of imputed provision costs* taken into account	101.38%

Fig. 6: *Indexed description of the total cost development (costs per unit) and the cost differences assignable to the influencing factors using the cumulative variance analysis*

The increase of costs is caused by the cost differences that can be assigned to the four influencing factors. The cost difference of -8.52%, which is assigned to the influencing factor *methods and parameters in terms of imputed provision costs*, is calculated as follows:

- The total costs are calculated after the influencing factor *methods and parameters in terms of imputed provision costs* has been taken into account less the total costs after the influencing factor *parameters* has been accounted for.

- Pay attention to the fact that the total costs with the influencing factor *parameter* accounted for may be calculated not only on the basis of the standardisations related to the third influencing factor *parameter*. Instead, all standardisations of the influencing factors one by three have to be applied.

- The same is true for the total costs obtained after the influencing factor *methods and parameters in terms of imputed provision costs* has been accounted for, i.e., the standardisations of the influencing factors one by four are to be applied for the calculation.

It has been considered useful for the analyses to *compare various objects* with each other in order to illustrate how differently the influencing factors affect the development of the total costs (costs per unit). The diagram in Fig. 7 illustrates this interpretation using three chosen compared objects A, B and C, which represent the process *landfilling*. Since the comparative partners have been assured of their anonymity the amounts in DM per cubic metre are not indicated. It can be shown that the standardisations have considerably changed A over the four influencing factors, the position of A remains however unchanged compared with B and C. The position of B compared with that of C remains relatively constant only over the first three influencing factors, however. With the fourth influencing factor the cost position changes significantly in favour of B.
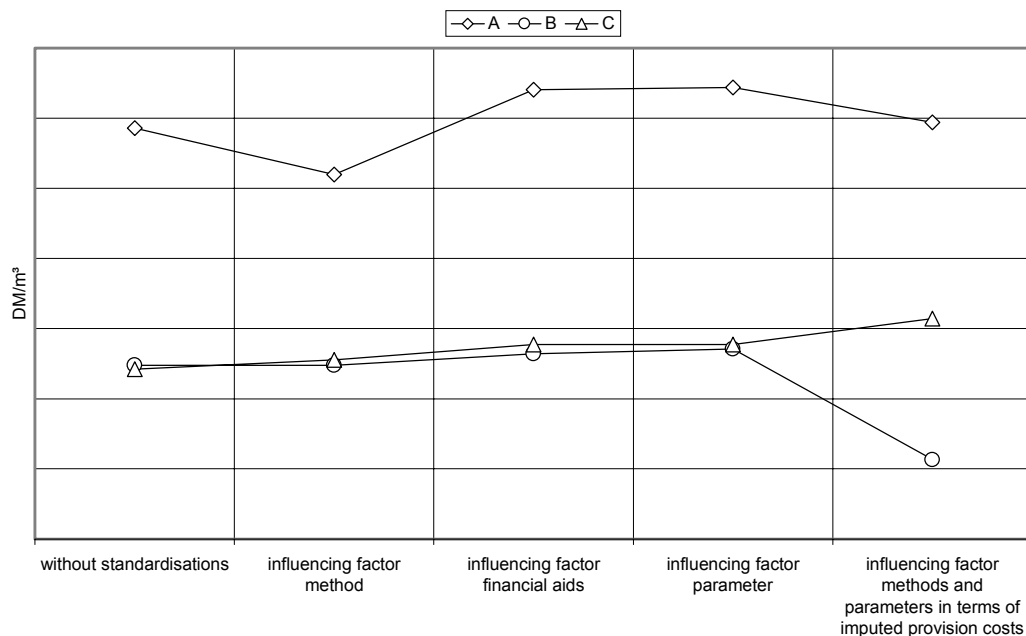
Fig. 7:   *Total cost development taking into account influencing factors that are based on each other (cumulative variance analysis)*

Since the total cost development over the four influencing factors could only be caused by the standardisable cost category groups, another analysis was completed to find out to which extent the individual standardisable cost category groups have contributed to the total cost development shown in Figure 7. Figure 8 gives a summary of these results.

For example, Figure 8 shows for the compared object A that 96% of the cost difference of −11.29% (cf. Figure 7), which is assigned to the influencing factor *method*, is caused by imputed interest rates and 4% of it by imputed depreciations.

	cost difference caused by...	influencing factor...			
		...method	*...financial aids*	*...parameter*	*...methods and parameters in terms of imputed provision costs*
compared object A	...imputed depreciations	4%	47%	0%	0%
	...imputed interest rates	96%	53%	100%	0%
	...imputed provision costs	0%	0%	0%	100%
	total	100%	100%	100%	100%
compared object B	... imputed depreciations	100%	100%	0%	0%
	...imputed interest rates	0%	0%	100%	0%
	...imputed provision costs	0%	0%	0%	100%
	total	100%	100%	100%	100%
compared object C	...imputed depreciations	89%	90%	0%	0%
	...imputed interest rates	11%	10%	0%	0%
	...imputed provision costs	0%	0%	0%	100%
	total	100%	100%	0%	100%

Fig. 8:   *Contribution of the cost category groups to the cost differences assigned to the influencing factors using the cumulative variance analysis*

Owing to the relationship between cost category groups and the related standardisations as well as the grouping of these standardisations into influencing factors there are 1 : n and 1 : 1 relations between cost category groups and influencing factors. Since there is a 1 : 1 relation between imputed interest rates and the influencing factor *parameter* as well as between the imputed provision costs and the influencing factor *methods and parameters in terms of imputed provision costs*, the cause of the relevant cost difference has to be indicated with 100% here. For example, the imputed provision costs are of no importance for the first three influencing factors. Only the fourth influencing factor *methods and parameters in terms of imputed provision costs* is relevant in this respect. If there is no cost difference, nothing has to be explained and the position as well as the total is 0%.

Since the total cost development is a function of the changing standardisable cost category groups, their percentage of the total costs naturally changes, too. Figure 9 shows this phenomenon for the imputed depreciations, figure 10 for the imputed interest rates and figure 11 for the imputed provision costs.
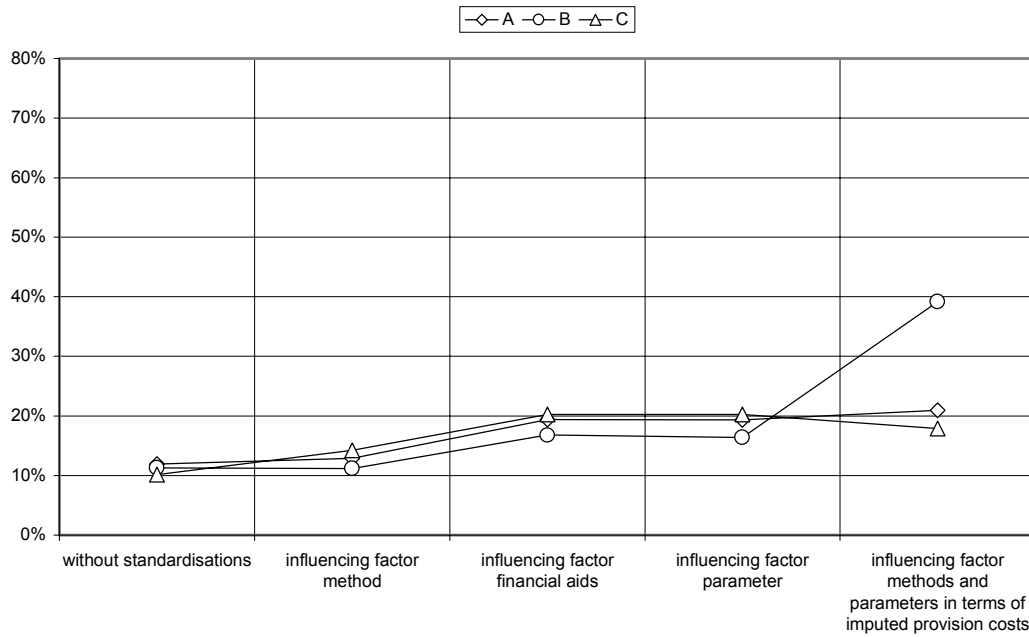
Fig. 9: *Development of the imputed depreciation percentage taking into account influencing factors that are based on each other (cumulative variance analysis)*
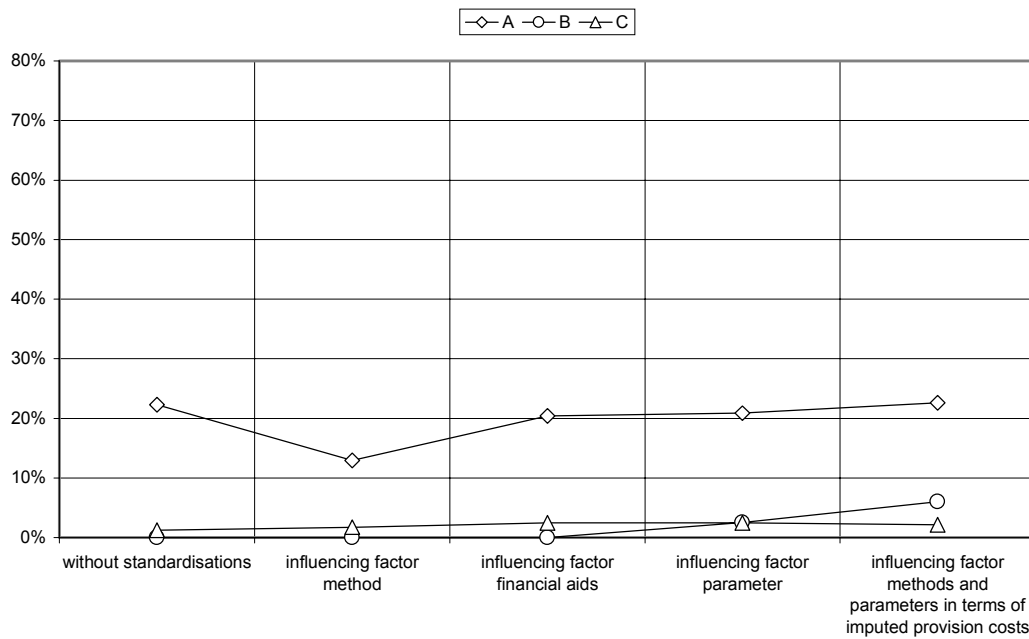

Fig. 10: *Development of the imputed interest rate percentage taking into account influencing factors that are based on each other (cumulative variance analysis)*
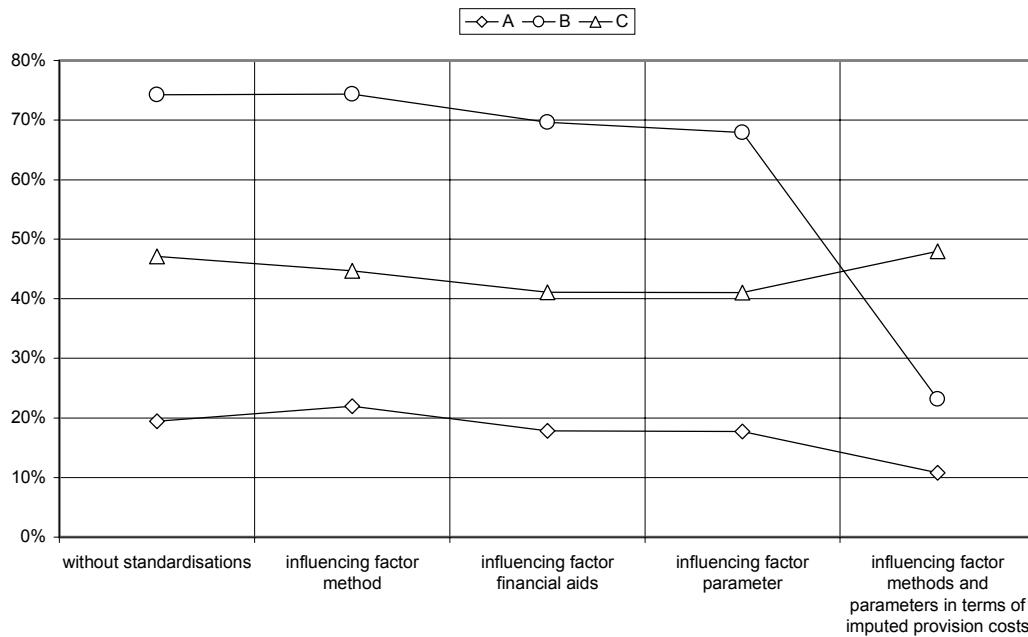
Fig. 11: *Development of the imputed provision cost percentage taking into account influencing factors that are based on each other (cumulative variance analysis)*

5 Conclusions

This study aims at the presentation of the standardisation method in benchmarking at the conceptual level. This conceptual level is to serve as the basis for the transfer into numerous practical applications. The field example demonstrated is meant to provide additional support. At the same time, this example reveals that the *concept is feasible and necessary.*

The necessity refers to the identification, discussion and solution – oriented towards the goals of the intended benchmarking – of the aspects in the planning and analysis phases of benchmarking which are behind the standardisations. Under certain circumstances this may lead to the fact that this method makes the participating comparative partners sensitive for the conscious perception of the possible significance of standardisations. A more exact analysis may quite as well show that the options in cost accounting are used uniformly to a large extent so that for reasons of materiality the standardisations are not put into practice.

Even if this study exclusively examines monetary quantities such as costs we should state that – particularly when benchmarking is extended to further objectives, e.g. quality, environment and time (cf. Horváth, P./Herter, R. N., 1992, p. 5) - *the need for standardisation is identified for non-monetary quantities as well.* Non-monetary quantities also involve – sometimes very complex – questions of evaluation that imply options for subjective evaluation. The basic question of how to evaluate environmental influences or quality aspects is to illustrate this issue.

Since standardisations can not at all eliminate subjectivity, which is connected with the determination of options by standards, it may be quite useful in some cases to examine the *influence that alternative standards produce*. This is particularly useful for the influencing factor *parameter*, where the Hoechster-Spinne (cf. Günther, T./Fischer, J., 1999, pp. 36) may serve as an analytical tool to illustrate the sensitivity of the quantity which is calculated taking into account this influencing factor.

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