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Elimination of sandbagging behaviour in budgeting process for short term and long term goal setting

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Abstract

In this research we design a motivation system mechanism which prevents the occurrence of sandbagging in the goal-setting process. Goal setting is one of the most vital management processes in the company. However, it is vulnerable to several inefficiencies and malpractices, which hinder the company's development. One of the common phenomena is the hiding of information by employees regarding the real possibilities of business development in order to negotiate the lowest possible goals for their incentive systems (sandbagging).

The proposed solution is based on the introduction of the ex ante determined ambitiousness parameter to the bonus system, combined with the parameters for the evaluation of plan execution and the bonus grades for variable compensation. The model stimulates truth-telling behaviour for managers in the goal-setting process and eliminates sandbagging. The concept has self-learning ability – based on past performance, managers will adjust their behaviour to maximize their risk-weighted rewards.

Keywords: sandbagging, goal setting, budgeting process, political behaviour

1. Introduction

Performance measurement and incentive scheme design are a central issue in agency theory (Baker, 1992). However, as Lawler (1990, p. 58) noticed, “the literature on incentive plans is full of vivid descriptions of the counterproductive behaviours that ... incentive plans produce”. Corporate gaming, which is a manifestation of organizational politics, may be a source of substantial losses to a company. For example, research by Larkin (2014) shows that gaming behaviour by salespeople is estimated to cost the vendor as much as 6-8% of total revenue as a result of excess discounts.

These processes are of particular concern for controlling and human resources management units. Organizational politics are omnipresent and exert a strong influence on several vital management processes in the company such as strategic decision-making, resource allocation, goal setting and performance evaluation as well as recruitment decisions. As a result they have a tangible impact on the employee efficiency and market performance of a company (see, e.g., Benson, 2015; Chang et al., 2009; Larkin, 2014). Several pieces of research show that organizational politics take place on all levels of organization (see Ferris and Hochwarter, 2011; Kimura, 2015). Approx. 80% of employees are involved in such behaviour – as a tool of achieving specific goals, a daily job activity without exogenous motivators, and as a reciprocal or even retaliation actions (see Buchanan, 2008; Gandz and Murray, 1980).

For approximately half of the employees, playing organizational politics contributes to their personal career success. More seldom, they are used in order to achieve organizational goals (Buchanan, 2008, p. 58; Maineiro, 1994, p. 19). Consequently, the outcomes of organizational politics for the company can be either positive or negative. The positive effects include, among others, support for desirable policies and opposition to undesirable policies, contribution to organizational effectiveness, dealing with resistance to change, and resolving conflict between competing views. Much more research is devoted to the negative aspects of political behaviour (i.e. game-playing) at the organizational level. They result, among others, in diminished company efficiency, blocked or illusory goal attainment, created inflexibilities, delayed or more costly organizational change, and restricted information flows. For a broad review of organizational politics outcomes see, for example, Buchanan (2008), Chang et al. (2009), Child et al. (2009), and Ferris et al. (2007).

The primary platform in the company for goal setting is the budget process. Budgeting constitutes an important part of corporate management practice. If implemented well, it strongly supports company development; however, in real life it may create several dysfunctions which could turn out to be damaging to the company. Companies gain considerable benefits from both possessing well-prepared budgets and from the effective execution of the budgeting process itself. The benefits for a company brought by well-designed and implemented budgets are widely described in Libby and Lindsay (2010) and Uyar and Bilgin (2011).

From the strategic perspective, budgets allow such managerial challenges to be accomplished as establishing priorities and setting targets in numerical terms, allocating the resources according to these priorities, and providing co-ordination and consistent direction between current operating activities and the portfolio of projects and strategic initiatives. From the operational and annual perspective, the budget allows for a control of expenditure and efficiency improvement, helps to translate annual targets into short-term plans and actions, assigns responsibilities to budget holders, and allocates company operating resources. The budget is also a useful tool for establishing motivation systems for managers and their teams as well as monitoring and evaluating their performance.

However, during the budgeting process several errors and inefficiencies may arise, which may cause the process to eventually become counterproductive for the organization. The main problems associated

with the budgets and budgeting process (see Neely et al., 2001, p. 6-9; Hansen et al., 2003; Libby and Lindsay, 2010) are as follows:

- preparing budgets may be very time and resources consuming,
- setting the budgetary goals is subject to organizational politics and may be easily manipulated by managers,
- lack of resource allocation flexibility in the once-accepted budget,
- the created budget is not aligned with strategy – it does not address the current competitive challenges of the company.

In recent years the most widely known criticism of the use of traditional budgets in companies has been carried out by Hope and Fraser (2003). These authors have pointed to a number of budgeting problems, especially associated with granting fixed performance contracts under the budgets and then creating motivation systems encouraging to exceed those goals. As a result, the system itself creates incentives for managers to start political behaviour in order to manipulate target levels. As a response to problems associated with traditional budgeting, Hope and Fraser (2003) propose the use of the *Beyond Budgeting* concept. Briefly, this concept advocates a shift to relative goals based, for example, on market benchmarks or market shares, and performance evaluation based on peer reviews made jointly by representatives from different parts of the organization. This approach effectively eliminates the uncertainty resulting from market environment changes in goal setting and subsequent disruptions in their evaluation, and as shown by Kuvaas et al. (2016), due to its *de facto* variable goals system, may lead to increased work performance. However, it is to a limited extent an effective solution to the problems associated with asymmetric information between senior management and other employees (Al-Ubaydli et al., 2015; Baker, 1992).

Several problems associated with goal setting require a deeper redesign of the logic of organizational management systems. Recent research conducted by Deloitte among its customers confirms that the budgeting process frequently does not bring expected results in motivating employees for improved performance. “In many organisations there is a tendency towards sandbagging, which sees the under-estimating of sales and/or the over-estimating of costs so that results look better than forecast. This may help individual careers and bonuses but it does little for enterprise performance” (Horton et al., 2014, p. 17); see also (IBM, 2009).

Research by Libby and Lindsay (2010) confirms that sandbagging takes place in approx. 80% of companies and it is one of the most popular types of gaming behaviour. Ironically, companies with a developed culture of negotiation and openness to exchange views, which is theoretically considered as a favorable model by proponents of the participative budgeting approach and performance management best practice (see, e.g., Raghunandan et al., 2012; Locke and Latham, 2002), easily end up in the trap of underestimating planned revenues or overestimating planned costs by managers.

In many cases, the top management or owner of a company are aware of the risk of understating targets by employees and try to prevent it by imposing ambitious goals and hard negotiations during the budgeting process. Typically, however, top management has no knowledge about the scale of sandbagging in a company, so too hard an approach may lead to unrealistic targets.

Despite the above limitations and problems associated with goal setting and the use of budgets, especially in large enterprises, in practice no large corporation decides to abandon the budgetary process. Running a business without a structured financial and investment plan generates too many risks, such as uncontrolled cost increases or the blurring of responsibilities for individual managers. Research confirms that budgeting is widely used, even if it sometimes has the ‘necessary evil’ status (see e.g. Libby and Lindsay, 2010; and Rodríguez Rivero, 2013).

A proper approach to goal setting plays an important role in the management of the company. This paper is devoted to a design of a mechanism which creates a mediation platform between senior managers and their superiors in the goal-setting process, especially during the budgeting process. This concept allows to eliminate political behaviour from this process, which is a side effect dysfunction of the social exchange theory, and, thus, to protect the budgets and motivation systems from adopting either understated or unrealistically high targets. Combining the *top-down* with the *bottom-up* approach in deriving performance measures has a favourable impact on the understanding area (representing employees' better understanding about their performance and their units) which encompasses the majority of significant practices in operational performance management (15 out of 17) and has explicit positive correlation with performance improvement as shown in De Leeuw and den Berg (2011).

2. Impact of sandbagging on the organization performance

There are actually two transmission mechanisms through which sandbagging may substantially influence performance of the organization. Firstly, it is simply a bigger bonus size paid relative to value produced by the employee with sandbagging behaviour. This situation is depicted on Figure 1. Maximum gains are presented relative to the scenario with 100% execution of true objectives.

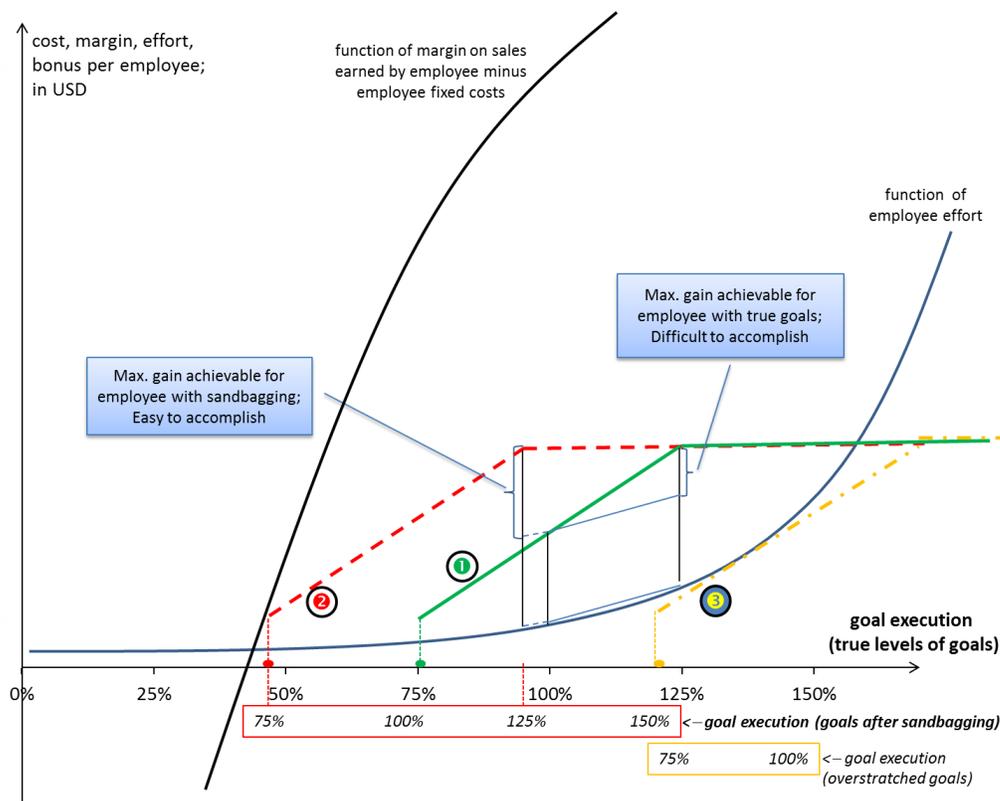


Fig 1. Gains from sandbagging behaviour

Source: own elaboration.

Line no. ① (green color) - depicts bonus payoffs when the employee agrees to a true level of goals.

Line no. ② (red color) - depicts bonus payoffs when the employee applies the sandbagging behaviour strategy. In a rational organization, it cannot exceed net contribution of employee to the results.

Line no. ③ (yellow color) - depicts bonus payoffs when the employer sets overstretched goals. The maximum overstretch of targets is when the bonus payoff function is tangent to the employee effort function.

However, the above result is additionally reinforced by a distribution of probability of achieving specific level of targets. Needless to say, accomplishing at least 110% of planned goals is much less probable than achieving at least 80% of planned goals. With the assumptions that achieving 100% of planned true goals is the most likely scenario, the probability function has normal or Poisson-shaped distribution, and the effort function is constant with respect to level of plan execution, the expected value of bonus obtained by employee applying sandbagging behaviour will be larger by 40% to 50% than without sandbagging behaviour.

Adjusting the above assumptions to business reality i.e. the most likely scenario of objectives execution is below 100% (as typical owner expectations result in stretched targets) and the effort function is monotonically increasing, the gain for employee from sandbagging behaviour will be remarkably larger than 50% of its bonus when proposing true objectives. Thus, this creates strong incentive for employees for sandbagging behaviour and, simultaneously, it leads to severe obstruction of the company development.

A typical manager receives a set of annual objectives to accomplish. Let's denote each of these goals as \bar{x}_i , and their level of execution as x_i . A typical bonus is then dependent on the difference (in nominal or relative terms) between \bar{x} and x for each i . Especially under participative goal setting, the described above strong incentive to understate the goals by employees results in a situation that employees are able to convince their supervisors to accept lower than the true targets (\tilde{x}_i) without sandbagging behaviour. A typical goal setting process leads to $\bar{x} < \tilde{x}$ where $\tilde{x} - \bar{x} = \varepsilon$. In order to avoid it, the bonus system has to be extended by an additional 'anti-sandbagging' component, denoted as γ function.

In the simple one-goal framework, the annual bonus B for an individual manager will depend on:

$$B(x, \tilde{x}, \varepsilon) = \varphi(x, \tilde{x}, \varepsilon) \cdot g \cdot \gamma(\tilde{x}, \varepsilon) = \varphi(x, \tilde{x}) \cdot g \cdot \gamma(\tilde{x}) \quad (1)$$

where:

$\varphi(x, \tilde{x})$ – employee performance in execution of budgeted goals (x vs. \tilde{x})

g – bonus grades for specific levels of goal execution (in EUR thous.)

$\gamma(\tilde{x})$ – 'anti-sandbagging' component in a motivation system

x – target execution

\tilde{x} – true level of targets

\bar{x} – level of targets agreed by an employee

ε – sandbagging size.

The initial task is to solve this problem with the simplest functional shape i.e. assuming linear form of anti-sandbagging function $\gamma(\tilde{x}) = \alpha\tilde{x}$, proportional form of evaluation of the plan execution $\left(\frac{x}{\tilde{x}}\right)$ without kinks and caps, and nominally fixed budget g for bonus payments. It takes a form as in formula (2).

$$B(x, \tilde{x}) = \varphi\left(\frac{x}{\tilde{x}}\right) \cdot g \cdot \alpha\tilde{x} \quad (2)$$

and the first order condition has a form as in (3):

$$\frac{\partial B(x, \tilde{x})}{\partial \tilde{x}} = \varphi'\left(\frac{x}{\tilde{x}}\right) \cdot \left(-\frac{x}{\tilde{x}^2}\right) \cdot g \cdot \alpha\tilde{x} + \varphi\left(\frac{x}{\tilde{x}}\right) \cdot g \cdot \alpha = g\alpha \left(\varphi'\left(\frac{x}{\tilde{x}}\right) \cdot \left(-\frac{x}{\tilde{x}}\right) + \varphi\left(\frac{x}{\tilde{x}}\right) \right). \quad (3)$$

Consequently, the optimization condition requires that the following condition has to be satisfied:

$$\varphi'\left(\frac{x}{\tilde{x}}\right) \cdot \left(-\frac{x}{\tilde{x}}\right) + \varphi\left(\frac{x}{\tilde{x}}\right) = 0. \quad (4)$$

The formula (4) clearly indicates, that linear form of the $\gamma(\tilde{x})$ function does not deliver any simple solution to the sandbagging problem and that an alternative approach has to be developed.

3. Elimination of sandbagging – basic concept with multiple targets and 1-year horizon

The essence of the solution proposed in this part of the paper is based on the formula (1) but it introduces a new form of anti-sandbagging component - the *ex-ante* non-linear connection between the bonus system and the ambitiousness of declared goals. This section presents the basic logic of the concept with the simplified example of a company with 1-year horizon incentive system for managers. The design of the parameters is discussed below and in part 4 of this paper.

The proposed system is based on two parameters, φ function and the weighting factor. The formula (1) for determining the annual bonus B for an individual manager bonus with multiple goals is rewritten into:

$$B = \sum_{i=1}^n w_i a_i \varphi(x_i, \bar{x}_i) g_i \quad (5)$$

where:

a – ex-ante declared measure of goal ambitiousness (taken from the \mathbb{A} array)

g – bonus grades for specific levels of goal execution (taken from the \mathbb{G} array)

w – the weight assigned to an i -th goal,

i – index of goals; from 1 to n ,

other variables – see the description for the formula (1).

The values of these parameters are taken from the assigned arrays. As described below, a typical array for parameters a and g is two-dimensional. The sum of w_i should be equal to 1 for system clarity. The system presented above can be easily modified to the more complex environment of budgeting and strategy perspective.

Parameter a replaces the $\gamma(\bar{x})$ function. It is critical for avoiding the problem of understating the annual targets. It allows the expectations of senior management (*top-down* approach) to be combined with a very precise assessment and the subjective decision of the managers about what level of goals they want to commit to for the coming period (*bottom-up* approach). Thus, it reconciles the opposing views in the goal setting through a participatory process.

A properly defined range of the ambitiousness parameters should be derived from at least a two-dimensional array, i.e. differentiate ambitiousness depending on the size or maturity of the business. The manager picks the l value in the \mathbb{A}_{kl} array, and the k value is determined by the actual financial data.

$$\mathbb{A}_{kl} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1l} \\ \vdots & \ddots & & \vdots \\ a_{k1} & a_{k2} & \cdots & a_{kl} \end{bmatrix} \quad (6)$$

where:

k – array's rows representing business size or maturity; $k \geq 1$

l – array's columns representing subsequent levels of goal ambitiousness; $l \geq 2$.

The example of the \mathbb{A} array is presented in Table 1 in Appendix.

The next component of the proposed system is the function φ for evaluating the achievement of the agreed goals. Its values are calculated after a period for which the goals have been set. This is a typical component of all motivation systems. Objectives execution is usually evaluated in terms of percentage of plan accomplishment i.e. $\varphi(x, \bar{x}) = (x/\bar{x} - 1) \cdot 100\%$ or as a nominal change i.e. $\varphi(x, \bar{x}) = (x - \bar{x})$, as an incremental business creation.

When designing it, it should be noted that a strictly linear evaluation of plan execution is usually not appropriate (e.g. 40% of plan execution = 40% value of evaluation parameter, 160% of execution = 160% evaluation), because then, with conjunction with the a parameter, it encourages very ambitious and even unrealistic plans. Generally speaking, a discrete-linear evaluation with a lower and upper cap is desirable (as illustrated on Figure 1).

Bonus grades for specific levels of plan execution (g) are the third component of the proposed model. As a rule, this parameter can take one of two forms – specific cash amounts for achieving the given targets or proportion of the employee's annual fixed salary. If g is expressed relative to the remuneration of the manager, the right side of the equation in formula (5) should be additionally multiplied by the individual manager's remuneration. The g parameter is correlated with the value generated for the company (equivalent to the profit share), in order to reward it no matter how ambitiously the original goals were set and it can also be differentiated by the size of the managed business (as in the ambitiousness parameter). So it gets the form of \mathbb{G}_{km} array as in the formula (7) below.

$$\mathbb{G}_{km} = \begin{bmatrix} g_{11} & g_{12} & \cdots & g_{1m} \\ \vdots & & \ddots & \vdots \\ g_{k1} & g_{k2} & \cdots & g_{km} \end{bmatrix} \quad (7)$$

where:

k – array's rows representing business size or maturity; $k \geq 1$

m – array's columns representing value created or growth achieved for the given targets; $l \geq 2$.

The value of the g parameter is calculated based on the actual performance, and not picked by the manager as in the case of the a parameter.

It is important to note that setting too low a maximum value for g encourages postponing transactions by those who have already reached their maximum target (one of the types of typical gaming behaviour). For this reason, the range for either g parameter or φ function should be broad. On the other hand, for managers who are at risk of under-performing the plan, the nonlinearity of the rating system encourages them to backdate transactions.

4. Adjusting the parameters to company specific profile

Several factors may influence the values of a , φ and g , depending on the company specific features. Besides political behaviour activities, the system should also take into consideration the issues briefly discussed below:

- intensity of the political behaviour with respect to sandbagging activities
In the case of historical evidence of the occurrence of sandbagging in the company (e.g. the accepted plans are relatively conservative and then systematically overperformed), parameter a should be modified accordingly. In particular, the benefit from ambitious planning should be increased and low coefficients for conservative planning should be assigned.
- aggressiveness of owner's expectations or overconfidence of senior management
The model is easily adapted to different levels of owner's expectations, primarily by reducing or increasing the variance of parameter a respectively. However, contrary to standard motivation systems, higher expectations of owners directly imply higher prospective bonuses. Similarly, the model proposes a practical mediating mechanism in the case of an overconfident attitude at senior management level.
- variable performance oriented culture
Regardless of the expectations aggressiveness, a company may have a different propensity to use variable remuneration components, depending on its culture and organizational context. The model is adjusted here primarily by modifying parameter g , which will assume low values for units where variable remuneration constitutes a small proportion of total remuneration and high values in units where variable remuneration is dominant in total remuneration.
- need to eliminate undesired activities/targets
A properly designed incentive system is also one that supports the budget process itself. By entering the array for parameter a and g in the proposed model, it can be easily communicated to managers what kind of goal proposals are undesirable. They are usually in the left column of the table, where for specific values in the plan and/or its execution, parameter a and/or g has a value of 0.

Values for individual parameters a and g should be systematically monitored on an annual or quarterly basis, whether they are too aggressive or mild, and modified accordingly. As a result, the system gradually converts to optimal parameter values. For example, if after the start of a system the managers manipulate by choosing targets that are always safe and then exceed them, then it is necessary to increase the penalties for not picking aggressive variants or raising the rewards for ambitiousness. The proposed system therefore has the ability to learn by itself. What is important, the adaptation process is not driven by changing expectations of the owner of the company or top management, but by the behaviour of the managers themselves.

5. Eliminating sandbagging in the medium and long term goals

Setting medium and long term goals may be associated by the problem of “hockey stick dreams”. This refers to situations when an organization fails to meet its ambitious strategic goals in the first year of long-term development plan and as a result the goals are replaced by the new ones, often at the similar levels as in the previous year of budgeting process.

The roots of the hockey stick dreams phenomenon lie in the general optimism and overconfidence of managers with long-term forecasting as well as in some aspects of the political behaviour (Bradley, 2017). This phenomenon is caused by several factors such as underestimating the risks regarding the implementation process, seeking personal gains, competing for resources during planning process etc. Hockey stick dreams, when tolerated over a few years, result in important dysfunctions similar to the sandbagging case – the underperforming managers are tolerated and company does not create new value. Below there is presented a correction mechanism for such mismanagement situations.

For a simplicity of the presented concept, the evaluation of objectives execution φ is evaluated in a linear way, and thus expressed by the relevant ratios (e.g. $\frac{x_t - x_{t-1}}{\bar{x}_t - \bar{x}_{t-1}}$) in the formula (8). In practice, more complex approach is typically adopted for φ function. The formula (8) is based on the incremental budgeting approach and bonus is paid only for new value created compared to the previous year.

The basic formula for setting goals for the medium- and long-term, which helps to eliminate both paying bonus for the hockey stick dreams and for sandbagging is presented below.

$$B_t = \begin{cases} \sum_{i=1}^n w_i a_i \frac{x_t - \bar{x}_{t-1}}{\bar{x}_t - \bar{x}_{t-1}} g_i, & t = 1 \\ \sum_{i=1}^n w_i a_i \frac{x_t - x_{t-1}}{\bar{x}_t - \bar{x}_{t-1}} g_i, & t \geq 2 \end{cases} \quad (8)$$

where:

t – time period;

$t-1$ for $t=1$ is the base year (i.e. t_0) in which the budgeting for the subsequent years is carried out;

other variables – see the description for the formula (1) and (5).

Typically, $t \in \langle 1; 3 \rangle$. The annual process of long-term goal setting should be performed on the rolling basis but solely for the final year ($t = 3$); for the earlier years the strategic goals should be fixed, with only minor adjustments possible (due to external factors). Implementation of the mechanism from the formula (8) not only protects against sandbagging due to the parameter a , but it also creates additional protection against hockey stick dreams compared to a standard 3-year fixed budget since the plan calculation for $t \geq 2$ is based on $\bar{x}_t - x_{t-1}$ instead of $\bar{x}_t - \bar{x}_{t-1}$.

6. Concluding remarks

Companies constantly face organizational politics. Political behaviour frequently takes place during the company's budgeting process (Libby and Lindsay, 2010), where incentives exist for employees to hide information about the real opportunities for business development and to negotiate lower targets (sandbagging) in order to maximize the received bonuses with the least effort possible. At the same time, the budget process also encourages the top management to impose on employees very ambitious goals which are unrealistic to achieve even if theoretically highly rewarded in the bonus system. Both phenomena are damaging to the company and result in its slower growth and higher wage costs in the medium term or increased employee rotation.

This paper presents a concept of an automatic mediating system design that prevents or partially neutralizes the occurrence of the abovementioned negative phenomena. The basic idea is to introduce to the bonus mechanism the parameter of ambitiousness and link the bonus paid not only with the achieved results but also with the *ex-ante* declared aspirations of the manager. Based on guidelines of targets from senior management, the manager determines individually the level of goals he or she chooses, knowing that a too conservative approach strongly reduces the chances of gaining a bonus. The optimal strategy for a manager is to propose target levels consistent with his or her true capabilities, provided that the design of the ambitiousness array does not stimulate more aggressive or cautious goals.

Once introduced in the company, the system should be reviewed regularly for its parameters in order to avoid systematically too low or too high levels of plan implementation, and neutralize the drawbacks of invariable goals system as shown in (Kuvaas et al., 2016). Its advantage is that it encourages managers to reveal their true preferences and thus also allows for self-learning of participants. When a manager realizes that he consequently understates his goals – e.g. due to individual risk aversion, which is typically the case (Rozin and Royzman, 2001) – and as a result receives low bonuses, he will eventually reduce such behaviour himself, because such behaviour does not maximize his personal benefit. In the worst case, if sandbagging persists and both the employees and the management stick not rationally to unchanged system parameters, it will result in a reduction in the company's costs – bonuses will be lower compared to the variant without introducing this system.

An important feature of the proposed solution is its versatility. It may be applied to a variety of units in a company and encompass not only financial goals, but also performance measures, market shares, etc. The system can be used for annual, quarterly and multi-year planning.

7. References

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Appendix

Table 1. Example of the \mathbb{A} array determining the measure of plan ambitiousness (a)

Change of margin on sales in t :	below -5%	<-5%; 0%)	<0%; 5%)	<5%; 15%)	<15%; 30%)	above 30%
Margin on sales in $t-1$:						
below EUR 10 mln	0	0	0	0.2→0.3	0.4→0.6	1.0
<10; 20)	0	0	0.1→0.2	0.4→0.6	0.7→0.9	1.2
<20; 50)	0	0	0.3→0.4	0.6→0.8	1.0→1.2	1.5
<50; 100)	0.1	0.2→0.3	0.4→0.6	0.8→1.0	1.2→1.5	1.8
above EUR 100 mln	0.2	0.3→0.5	0.6→0.8	0.9→1.2	1.4→1.7	2.0

Note: for example, the notation '0.1→0.2' for the second row and the third column means that if the manager declares 0% growth then the value of $a = 0.1$, if declares 5% growth then the value of $a = 0.2$ and for growth rates within the range <0%; 5%), the value of a will be calculated proportionally between 0.1 and 0.2.

Source: own elaboration.