

Čudanov, Mladen; Jaško, Ondrej; Săvoiu, Gheorghe

Article

Public and Public Utility Enterprises Restructuring: Statistical and Quantitative Aid for Ensuring Human Resource Sustainability

Amfiteatru Economic Journal

Provided in Cooperation with:

The Bucharest University of Economic Studies

Suggested Citation: Čudanov, Mladen; Jaško, Ondrej; Săvoiu, Gheorghe (2012) : Public and Public Utility Enterprises Restructuring: Statistical and Quantitative Aid for Ensuring Human Resource Sustainability, Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 14, Iss. 32, pp. 307-322

This Version is available at:

<https://hdl.handle.net/10419/168756>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<http://creativecommons.org/licenses/by/4.0/>

PUBLIC AND PUBLIC UTILITY ENTERPRISES RESTRUCTURING: STATISTICAL AND QUANTITATIVE AID FOR ENSURING HUMAN RESOURCE SUSTAINABILITY

Mladen Čudanov¹, Ondrej Jaško² and Gheorghe Săvoiu^{3*}

^{1,2)} University of Belgrade, Belgrade, Serbia

³⁾ University of Pitesti, Pitesti, Romania

Abstract

This article presents a quantitative approach to restructuring public and public utility enterprises, particularly during downsizing requests. The large number of employees in the public sector can be one of the causes for economic instability at country level. That is particularly visible in the context of the euro zone crisis and economic/political instability in countries like Greece, Portugal, Ireland, Spain and Italy. Our approach is based on the statistical analysis of productivity oscillation and setting of performance standards in public and public utility enterprises based on the aforementioned productivity. Data background is given through job descriptions, organizational charts, salary reports and monthly performance reports, in most cases part of organizational information systems. It is recommended for quantitative data to be analyzed on a monthly basis, during a period of 30 or more months. Our method increases procedural fairness and accuracy, because quantitative, statistical, impartial and objective approach is applied for estimating parameters which could be related to downsizing. However, the application of this method is not limited to downsizing, as during its application in more than 20 public and public utility enterprises it was sometimes applied to increase output or reduce costs not necessarily connected to labour. Although it finally refers to downsizing, this method can provide fairer and more impartial approach than the subjective estimate of employee surplus, and its arbitral distribution within the enterprise.

Keywords: public/public utility enterprises, downsizing, productivity, performance, procedural fairness and accuracy

JEL Classification: L32, L97, L98, M12, M54

Introduction

This paper presents a quantitative approach to restructuring and downsizing in public and public utility enterprises. Public and public utility companies are often catalysts of economic instability; due to their bloated structure and number of employees often burdening financial aspects of public governance (Aharoni, 2000; Birdsall and Nellis 2003,

* Corresponding author, **Gheorghe Săvoiu** – gsavoIU@yahoo.com

Kessides et al. 2009). The recent examples show instability in Euro area countries such as Greece, Portugal, Ireland, Spain and Italy (Gros and Mayer, 2010), stating the large number of employees in public sector (Whelan 2009) as one of the causes of economic instability in these countries. Thus, the over-employment in the past may primarily be the problem of mixed services – supplied by private companies and/or public institutions, involving public funds, and heavy regulation (Stare and Jaklič 2011), which mostly have experienced restructuring during the transition process. This paper does not focus on the macroeconomic aspects of the problem. Our main objective is the organizational level of company sustainability and the fitting of corporate human resources to the real environment needs and capacities. The approach presented in this paper could, if properly used, prevent an unjustified increase in number of employees in the companies and cure the inflated number of employees, which is common practice and frequent situation in public and public utility companies. Those problems are the main reason for downsizing being among public sector and administration reform strategies (Awortwi, 2010). Downsizing has been a continuous trend in corporate practice since the 1980s, and this tendency still exists (McKee-Ryan and Kinicki, 2002; Landry, 2004). In order to achieve our goal, we have focused on developing a quantitative, efficient, reliable and objective method of estimating the number of employees and similar related parameters in the context of restructuring and downsizing. The output of our method can be used as a decision support in various industrial activities, although our main goal was to determine an optimal number of employees in public and public utility sector. The process of estimating an optimal number of employees is based on data that is easily collectable by consultants, or, as in many cases, already exists in electronic form. A significant part of the data input in our method is derived from salary calculation data, related to the employee's monthly working hours in a company. The other part of the data input concerns measurable quantitative monthly output of the employee. The collected indicators do not have to cover the complete set of the employee's outputs from job description, making our method applicable in a practical way. We can observe the employee's output as a population in statistical terms, and use collected data as a sample. If the sample is representative, the results of the analysis can be used as a support in managerial decisions.

After a relatively simple statistical analysis of the employee's work and results, the standard performance is calculated. Then, the common positions are grouped in categories similar to Porter's chain of value creation and in relation to the existing data and standard performance we can find the optimal number of employees, which is often lower than the actual number of employees. In order to ensure reliability, the period of observation should exceed 30 months; anyhow, in actual projects, even shorter periods of 18 months have provided a better support to managerial decisions than traditional methods. Further in the paper we will describe in detail the method with examples of performance indicators for several positions in different companies. Also, we will discuss the benefits of standard performance measurement calculated by our approach over commonly used and often obsolete work norms. Afterwards, discussion of results application in the process of restructuring and downsizing will be presented, and possibilities for application in other areas such as compensation management and workforce motivation will be given as propositions for future research.

1. Statistical data and method

This paper section will generally describe the new method intended to ensure human resource sustainability. Our practical experience in the application of the method comes from restructuring projects of more than 20 public and public utility enterprises in South-Eastern Europe, where we were engaged as consultants. Also, we have applied the method and its variations in a few privately owned or state-owned enterprises. We have observed that the operational conducting the method does not pose problems, especially as the model was refined in the previous several engagements. The main problems came from the corporate politics balance of power, and resistance to change expressed by attempts from the unions to hinder its application, strikes threats and spreading of rumours among employees. Further discussion will be divided into two parts:

- the operational description of the method detailed in sub-sections 2.1 Data background, 2.2 Classification of labour and connection of classes with performance indicators and 2.3 Calculation of results; these parts will be mainly concerned with practical issues that may affect application of our approach; the main aim of the paper is to make our approach replicable, and give support to the reader in order to avoid common pitfalls and obstacles we have faced during the implementation of our approach.
- the debate on advanced issues concerning this method is elaborated in part 3. Discussion, and is mainly concerned with interpretation of results and placing the application of our method into a wider organizational, social and economic context.

1.1 Data background

The application of this method relies on the quality of the data observed and recorded (or gathered), while inaccurate or incomplete data support would consequently lead to “garbage in, garbage out” results (Redman 2008; Cervo and Allen 2011; Goh 2011), which would not accurately describe real condition in the company. To maximize the practical usability of our method, while having in mind consultants and researchers, our method should be based on data that can, as a rule, be easily collected during interviews in a company (Čudanov and Jaško, forthcoming, 2012), and be as simple as possible, but not simpler, according to the famous Einstein recommendation. Therefore data background for our method is based on: a) job descriptions and organizational chart; b) salary reports; c) existing monthly performance reports.

The *job descriptions* can be defined as formal documents which, among other things, describe duties, responsibilities, contributions, outcomes, required qualifications, reporting relationship and common collaborating relations of a position in an organizational structure. All the job descriptions formalize job division on the basis of job analysis, and explicitly clear out the important issues regarding the functions of individual positions in the organizations. Therefore, regarding the job descriptions as a very useful tool for management and organization, some researchers state all responsible staff should have specific duties recorded in the individual written job descriptions (Ahmed 2009). Although the job descriptions are disregarded as bureaucratic by organizations that perform creative and non-repetitive tasks, since 1973, Reimann has used them in order to measure formalization of organizational structure, and during the last decade a number of authors

have regarded job descriptions as an increasingly useful tool for organization and human resource management (Torrington, Hall and Taylor, 2005; De Bono, Van Der Heijden and Jones, 2009). Therefore, the organizations in general, and especially those in the public sector, should have systemized the job descriptions, for often it is a legal obligation. The documents compiling the job descriptions already existed in each of the over 20 organizations that we have applied our method to, and if that is not the case, such document should be created for the sake of the organization. Therefore, we can say that the first document required is easily accessible. In order to clarify the job descriptions, the organizational charts as diagrams or graphic representations of the organizational structure are very useful in practice. Unfortunately, from our experience they are not as common as the job descriptions, and often are not updated to the existing state. Nevertheless, in such form organizational charts can still help clarifying findings from job descriptions. If the organizational charts are not available, the systematic, tabular summaries of the job division with position titles and often some additional data can also be useful. Once having job division clearly pictured, the consultant can recognize the performance measurements which are important enough to be included in the workforce assessment.

The *salary reports* are the second important document that provides data for this new method. Almost all companies with a large number of employees, especially in public services, naturally use automated software for salary calculation, instead of calculating salaries manually. Ironically, the so-called core salary data is not necessary for further calculation, so actual figures on earnings can be blinded, and we even prefer if that data is not disclosed (so that data remains confidential). Payroll data includes employee identification, attendance, wage rates, deductions, earnings, and cumulative earning totals (Frankel, 1984). Often, if the salary is related to performance, other employee related data is included, like the employee performance measurements. For our method, the most important part is attendance. It is usually included in automatically generated reports (Table no. 1)

Table no. 1: Example of the payroll report

No.	Time Period	Month no	Season	Employee ID number	Personal ID number	Surname	Name	Payment Code	Attendance- payment class	Attendance hours base	Amount paid	Calculation ponder	Sector code	Sector name	Department code	Department name	Position code	Position name
1	2008-01	1	W	1000	*	*	*	1	Regular attendance	184	*	2.71	2	*	*	*	*	*
2	2008-01	1	W	1000	*	*	*	2	Night shift	6	*	2.71	2	*	*	*	*	*
3	2008-01	1	W	1000	*	*	*	4	Holiday compensation	24	*	2.71	2	*	*	*	*	*
4	2008-01	1	W	1000	*	*	*	24	Sunday work	24	*	2.71	2	*	*	*	*	*
5	2008-01	1	W	1000	*	*	*	60	Shift work	184	*	2.71	2	*	*	*	*	*
6	2008-01	1	W	1000	*	*	*	94	Transport refund	0	*	3.03	2	*	*	*	*	*
7	2008-01	1	W	1000	*	*	*	96	Regress payment	0	*	2.71	2	*	*	*	*	*
8	2008-01	1	W	1000	*	*	*	97	Meal refund	184	*	2.71	2	*	*	*	*	*
9	2008-01	1	W	1000	*	*	*	98	Former work	0	*	2.71	2	*	*	*	*	*

Source: Data extracted and blinded with * by the authors as an anonymous example

Such reports are easily accessible, and they can be generated operatively from existing salary databases, in a matter of minutes. Consultants need only the support of top management and it is very useful to repeat how actual salary amounts could be left out, because they are not crucial for calculation. The example of the report is copied from the actual data used in calculation, and confidential data is covered with an asterisk. It is an abridgement from the total report for one employee, having columns of different data, and rows represent different classes of attendance / payment additions, which comprise total salary. Due to the limitation in the paper's page space, the exemplified report is limited to only one month. The categories in the classification of attendance and payment are different from one enterprise to the next. However, several classes emerge in most enterprises: a) regular attendance; b) shift attendance; c) attendance in night shifts; d) attendance on holidays; e) attendance on weekends; f) overall attendance; g) vacation; h) paid leave; i) sick leave (usually classified in further categories, up to 7 days, 7-30 days and above 30 days); j) maternity leave; k) benefit calculations (for meals, transportation, etc.); l) stimulations, etc.

Most important support for our method is to find data on actual attendance, expressed in attendance hours per month. That data is needed in order to calculate individual productivity later. Usually, it is not equal to regular attendance, or even to overall summed attendance. Companies, especially public companies, usually have legal restrictions on the amount of regular payment that is allowed to employees. Sometimes, a way to surpass legal restrictions without breaking the law is to "bloat" attendance data, or to use elaborate classification which will redundantly value attendance. Therefore, it can be often confusing and misleading. Our sincere recommendation is to establish direct contact with the representatives of accountancy (or of other function in charge of salary calculation), and to try to clear out, in direct communication, which category is the most accurate description of actual attendance. That data is often veiled in a marginal category, such as benefit calculation basis.

Various benefits are calculated on the basis of actual attendance, like luncheon and meal refunds, and most accurate data needed for later productivity calculation can be found in those columns. In rare cases, at least part of the salary relies on actual performance, and performance indicators are included in salary data. In such cases, one third of the data analysis is performed only to check official salary data.

The third and maybe the most important data source are performance reports. The best case scenario is when work norms are given for all important task performed by employees, and norm-hours are tracked and used in order to calculate salaries. Since that is not often the case, other data can substitute norm-hours with acceptable reliability. Companies track their performances through monthly, quarterly or annual reports. The employee reports often contain performance indicators for that position. The approach proven as best over time is not to surfeit indicators while gathering available data. In our practice, a smaller number of well-selected indicators is better than larger number of inadequate indicators for a position. It is common for performance indicators to be correlated with each other (Popova and Sharpanskykh, 2010). A group of employees often performs a range of various tasks, which are all correlated with one performance indicator. Consultants gathering this data should bear in mind that they are gathering performance *indicators*, not overall performance data. So, if we accept the definition of performance indicator given by Popova and Sharpanskykh

(2010) as a quantitative or qualitative indicator that reflects the state/progress of the company, unit or individual, our measurements are integrated into that definition, because our indicators reflect overall work. For example, employee working on public tendering, or public procurement administration performs a variety of tasks, but all those tasks are indicated by the number of public procurement processes concluded. Under different legislations, processes are different depending on value, and often performed by different employees, like small and large public procurement. If e.g. one employee concludes 12 public procurement processes in January, it does not mean that his/her work was limited only to that and that he/she spent 176 working hours only on that, although other activities were related to those procurements. However, if in March he/she concludes 4 public procurements, this does not fully prove that he/she worked three times less, but indicated that something is wrong with performance, and if such situations occur frequently and for a group of workers, indications are much stronger. In more complicated cases, which are more related to the practical business environment, if, e.g. in May there are 100 processes of small public procurements concluded, and 15 processes of large public procurements concluded, and in June the same year there are 50 processes of small public procurements concluded, and 10 processes of large public procurements concluded, we can estimate the overall amount of work performed by those employees. If the rule of thumb is that to conclude one process of large public procurement the amount of work is three times larger than that for small public procurement, and another rule of thumb is that other work in public procurement department is correlated to the number of public procurements, we can integrate all work in that department and calculate that performance was 145 norm working units in May and 80 norm working units in June. If the number of attendance hours is basically the same, something is wrong: how can productivity differ so much? To take another example, accountants perform a range of various jobs, and the amount of those jobs is correlated with the number of rows on buyer / supplier records. It could be stated that the amount of overall work for most departments or employee groups correlates with few, or even one performance indicator.

Other examples of performance indicators could be:

- tons of fuel used in boilers for public heating, indicating the overall amount of work for hard-fuel boiler operators; the more coal is used for heating, the more tasks are performed by boiler operator, and an alternative for this performance indicator is heat produced by the boiler, measured in [MJ] or other appropriate unit.
- the number of meals served to employees in a company restaurant, for its employees; in general, hygiene maintenance, administration, storage and other related jobs depend on number of meals; we can state that if in one month the employees have served 50% more meals overall amount of work was roughly 50% larger.
- for employees in a call-centre, the good performance indicator could be number of accepted calls; some calls will last 15 minutes, some 30 seconds but in a period of one month duration would converge to normal distribution and indicate the overall work performed by the call centre employees.

The job of consultants in this phase is to gather performance data that will picture the overall work of employees with highest reliability, while minimizing the time needed to gather that data. A detailed example of indicators is given in Jaško, Čudanov, Krivokapić

(2010). It is very important that performance indicators are gathered for larger period, best results are obtained when we have *monthly indicators for a period of three years or more*. As the central limit theorem states, the distribution of experimental data will tend toward a normal distribution if the number of measurements is sufficiently large. In general, a sample larger than 30 measurements is considered sufficient for the central limit theorem to take effect (Aczel and Sounderpandian, 2002). Period of three years with monthly tracked performance indicators covers 36 periods, but in practice very similar results were obtained even with half of that period.

Following table summarizes usage of different data sources. As can be noticed, such data is commonly found in organizations that have an appropriate management information system. In our practical experience in more than 20 enterprises, data was easily extracted in e-form with help from the information systems staff, thus facilitating further restructuring. ICT is connected with organizational changes, for example companies that use Technology Enhanced Learning (TEL) and Knowledge Management tools to a larger extent, have a better perception of the organizational changes in their company as shown by Čudanov, Săvoiu and Jaško (2012). In this case, ICT is rather a catalyst than a direct cause of the organizational changes.

Table no. 2: Summary of data sources used for this method

Organizational documents	Extracted data	Usage of data
Job descriptions and organizational chart	Division of labour, duties and responsibilities, departmentalization	General overview of company, selection of most important performance indicators, its association with particular employees
Salary reports	Attendance & performance data	Calculation of performance and productivity
Existing monthly performance reports	Performance data	Calculation of performance and productivity

1.2 Classification of labour and the connection of classes with the performance indicators

After the data is gathered, next step is classification of labour in company by their performance contribution. The basic idea is to group employees that contribute to same performance indicators. It provides us with the background needed to calculate all productivity indicators, by dividing the performance indicator in one period by the attendance hours in the same period. Using the example given previously, if the employees on public procurement have 140 normed units in May, and 80 normed units in June, while attending 880 hours in May and 1056 hours in June, we can say that on average their productivity was 0.1591 normed units per hour in May and 0.076 normed units in June. Discrepancy of data clearly indicates that something is wrong in that department, which will be the topic of the next phase. In the classification of labour phase, our job is to recognize employees that have contributed to public procurement, so we can sum their attendance hours to the example amount of 880 or 1056. In time, several approaches for labour classification have emerged: a) the bottom-up approach by criteria of gathered

performance indicators; b) the process approach, by criteria of processes described in quality management system; c) the typified organizational structure approach, as developed by Mintzberg and Porter; d) the existing organizational structure approach – by criteria of departmentalization.

The first approach is rather intuitive and totally direct. Consultants need to analyze the performance indicators gathered and the job descriptions, and connect the employees with existing performance indicators, having in mind that all employees are associated with at least one performance indicator. Specific cases, where employees contribute to one performance indicator 40% of their time and 60% to another can increase the precision of calculation if carefully analyzed, without making it much more difficult. Often, mere job titles suggest classification and job descriptions are used to re-check it.

The second approach, like the third and the fourth, are indirect. The idea is to first classify employees in categories indicated by existing quality assurance documents or theory, and then, in the second step, connect those indicators with performance indicators. Quality management documents often map key processes within the organization and list the participators among the employees. The consultant's task is very easy in this step, simply translating existing documents into acceptable form. In the second step, processes (for example process of public procurement or process of meal preparation in the company restaurant) are connected with the performance indicators gathered, which are also often at least suggested in quality management documentation.

The third alternative, in the case where quality management is not widely implemented, the good alternative is to use standard processes from Porter's value chain or Mintzberg's organizational structure. Since those forms are not elaborated to the level of operative activities, consultants can use elaborations of Porter's value chain presented in our previous papers (Krivokapić and Čudanov, 2010; Jaško, Krivokapić and Čudanov 2010; Jaško, Čudanov, Krivokapić, Jevtić and Săvoiu, 2011). The advantage of this approach is that consultants can develop their efficiency performing tasks on same pattern, and in time classification becomes routine, just like assigning indicators to Porter's or Mintzberg's categories. Another benefit is that, in time, a sound milieu for benchmarking can be developed. Porter's elaborate model can be used as a common form for representing various organizational structures, and afterwards, a comparison of number of employees assigned to support function, among other comparisons is possible. For example, such questions can be posed as, why does accounting, consisting of accounting managers, accountants and other accounting staff as typical jobs employ 1,5% of total workforce in one public company, while in another public company of similar size and accountancy demands that percentage is 0,8%, or why are performance indicators different in similar companies?

The fourth alternative is to classify employees according to organizational structure. It is often a path of least resistance, and, by our experience, yields the least reliable results. Also, results are not comparable, and consultants fail to take chance of developing extensive database comparable by organizational structure and performance indicators. However, the method is very easy to apply, because classification of employees is in most cases same as their allocation in different departments, and the performance indicators can be associated with organizational structure, and are often suggested by the analysis of reports given by that organizational department. Overall, the output of the phase described in this part of the paper should practically be a spreadsheet containing extracted data. It

should either represent unique identifiers of employees (like employee ID numbers etc.), percentage of time dedicated to performance indicator (0-100%) and performance indicator (either represented by unique name or by unique code). It is the output of the first approach, and is represented in Table no. 3.

Table no. 3: Synthesised output of data collection phase

Employee ID	Percentage of working time dedicated to performance indicator	Performance indicator
004563	100%	Composite indicator of public procurements concluded
005673	30%	Number of calls in the call centre accepted
005673	70%	Number of formal e-mail enquiries answered
001256	100%	Number of meals served in the enterprise restaurant

1.3 Calculation of results

When the data is gathered, it should be calculated into indicators that could give the quantitative basis for restructuring and eventual downsizing. Our approach has these basic steps: a) calculation of monthly performances as productivity indicators in observed period; b) calculation of average productivity in observed period; c) calculation of standard deviation of productivity in observed period; d) calculation of standard performance for the employee/group of employees; e) calculation of average efficiency in achieving standard performance.

The first step is based on a simple formula of calculating productivity of employees:

$$PR = \frac{Q}{L} \quad (1)$$

where: PR – productivity, Q – quantity of output, calculated by summing performance indicators, L – Amount of work invested, calculated by total hours of attendance.

Our result should be a spreadsheet with x columns in width, where x is equal to the number of time periods that the data is gathered for, and y rows, where y is the number of employees/employee groups, where employee groups share once more common indicators. In the absence of all data, where productivity cannot be calculated, performance indicators alone or even summed attendance hours could give acceptable results, similar to productivity based results. Our strong suggestion is to use months as time periods, because during the period of 30 days daily variations in productivity are averaged and a reliable indicator is proposed; the data for employee attendance is often available on a monthly basis (or twice per month, which can easily be summed) because salary calculation and data for performance indicators is often tracked on a monthly basis.

The calculation of average performance is also a simple matter, where following formula is used:

$$APR = \frac{\sum_{i=1}^{i=n} PR_i}{n} \quad (2)$$

where: APR – Average productivity, as arithmetical mean of productivity in observed period, PR_i – Productivity for the period of i .

The calculation of standard deviation of productivity in observed period is the third step, performed by the following simple formula:

$$\sigma = \sqrt{\frac{1}{n} \sum_{i=1}^{i=n} (PR_i - APR)^2} \quad (3)$$

The calculation of standard performance for employee / group of employees uses formula where standard deviation of productivity is added to the arithmetical mean of productivity (average performance). According to three sigma rule (Pukelsheim, 1994), and with the presumption of normal distribution of productivity variable, we can estimate that probability for our variable to be at range below $\mu + \sigma$ is approximately 85% (depending on distribution of our variable). That concept is illustrated by Figure no 1. Therefore, we estimate that standard performance or better results is theoretically achieved within the observed timeline with the same employees, same organization and same equipment in 15% of the cases.

$$SPR = APR + \sigma \quad (4)$$

where: SPR – Standard performance aimed to be achieved by the employees, σ – Standard deviation in productivity.

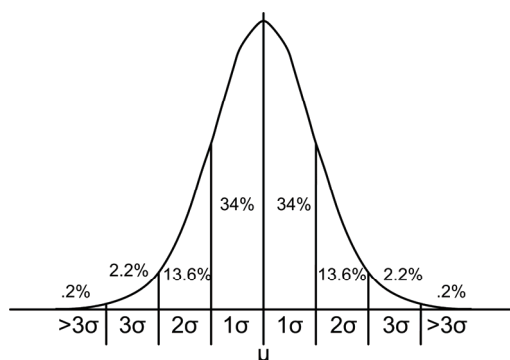


Figure no 1. Illustration of three sigma rule

The calculation of average efficiency in achieving standard performance is the least strict step in this method. It should be performed with care of specificities of the task performed.

The general formula is given below:

$$AE = \frac{APR}{SPR} \times e \quad (5)$$

where: AE – Average efficiency in achieving standard performance, e – Specific factor

The specific factor is chosen with greatest care, and must be explained with objective facts, and often it is one, or one increased with few percents as minimal expected variation in productivity on a monthly scale. For specific jobs, where variation in productivity is imminent, or decrease in output in unacceptable, it can be calculated as acceptable variation

in productivity, or maximum acceptable decrease in output (in %) + 1. Sometimes it is absolute imperative that full output be obtained on peaks of demand, and that necessity explain variation in productivity – employees sometimes just wait in attendance for demand peaks. That can point to the need for better planning of work rather than downsizing.

2. Discussions and interpretation of results

The interpretation of results is the most important part of the application of the method. The quantitative, impersonal approach to estimate surplus of workforce can increase trust in fairness of downsizing, which can be very important because the number of employees recognizing the downsizing process as unfair has much decreased performance even if they “survive” the downsizing process (Armstrong-Stassen 2004). However, the careless interpretation of results can diminish positive effects. It must be communicated to the employees that their own performance, not benchmarking with different companies has influenced figures. Chipunza and Samuel (2011) show that communication has a significant positive influence on survivor attitude. Following that, description of main output figures needs to be communicated to the employees directly, or via management representatives. The average productivity and standard deviation are easily explainable concepts. The standard performance can be explained as performance achieved in several monthly periods by those same employees, on same equipment, in same processes and organization. So there is no reason why such performance should not be achieved constantly, instead of only during peaks of increased productivity, especially because in theory, if performance data has normal distribution such results should be obtained in approximately 15% of periods.

The average efficiency in achieving standard performance can be explained as desired minimum to be obtained in the present organizational, internal and external environment. It is a number larger than zero, usually around one. If the average efficiency in achieving standard performance is less than one, this indicates that with the same number of employees, the company can produce more output or provide more services, or that the existing output can be produced with fewer employees, if adequate organizational changes, including downsizing, are implemented. For example, if this number is 0.8523, it indicates that in this period observed the group of employees has achieved 85,23% of the standard performance. Thus, either their output needs to be enlarged, or 14,77% of that number of employees is surplus. In the hypothetical case where the group has 23 employees that performed 1200 output, they should either keep headcount and increase output to $1200 : 0.8523 = 1407.95$, or decrease the number of employees by $23 \times 0.1477 = 3.39$ (rounded to three employees). The decision between two alternatives is dependent on the organizational strategy and need of their internal or external customers for additional output.

However, if the decision is in favour of downsizing, our method does not point to concrete employees being downsizing victims. It identifies the groups of employees with the lowest efficiency in achieving standard performance, calculate that e.g. out of 23 employees three are candidate for downsizing. It is a job and a hard decision for a superior of theirs, who knows each of them personally, to choose which three employees are to be downsized. Exact method of downsizing is not limited by our approach, and it can be voluntary leave, line reduction or targeted discharge. All approaches have their strengths and weaknesses, and our method even supports alternative methods to downsizing, and in the latter case the

whole group of 23 employees can have salary reduction of 14.77%, or can reduce other business costs in the same amount instead of discharging three colleagues, which is in most cases a better alternative compared to downsizing.

If the standard performance is analyzed in more depth, it can be compared to official labour output standards. Some companies, especially during centralized corporate management era, have developed labour output standards, such as standard hours for completing monthly financial report along with supplemental documents. Often, most activities have been covered with normed hours, and during the planned economy era, the employee number for most companies, even in Serbia and Romania, was calculated on the basis of those norms. All activities expected to be performed within a time period (year, month, etc.) were summed, with their overall number of occurrences multiplied by norm hours for each activity, yielding the overall monthly number of hours, which was divided by the number of working hours in that month, and the result was the necessary number of employees. However, most of those norms were calculated even decades ago, before computers, internet and other technological advances and, unless limited to strictly manual work, are obsolete.

Calculation of number of employees by such means is indeed calculating how many workers with technology and organization from the 1970's or a similar period, when standards were established are required to perform that job today. Also, such standards are often negotiated with unions rather than based on objective facts. On the other hand, standard performance measures dynamic output and sets norm on basis of recent productivity.

The trade unions' resistance is common in downsizing (Burnes, Katsouros and Jones, 2004). The application of this method can be beneficial for responsible approach to downsizing, which can be more beneficial to long-term organizational performance (Cascio, 2002, Tsai and Shih 2011). Researchers conclude that performance declines following downsizing are due in part to an associated decrease in employee morale, and therefore, urge treating employees in a manner perceived to be fair and respectful to maintain trust and commitment and avoid productivity losses (Trevor and Nyberg, 2008). Van Dierendonck and Jacobs (2010) have shown two important facts regarding downsizing fairness:

- for survivors, procedural justice matters more than distributive justice, i.e. fairness of the procedures used to implement the downsizing is more important to them than the outcomes resulting from the downsizing, e.g. feeling that the benefits' severance provided are adequate;
- the impact of fairness is stronger in countries with an individualistic (versus collectivistic) culture, which can be interesting for transitional countries (Andolsek and Stebe, 2004).

The lateral contribution of the application of our method is that often in company performance indicators start to be tracked with greater care, and used in compensation calculations. A large number of employees in public and public utility enterprises can be a problem of lesser degree compared with their inefficiency. If the application of our method results in change resistance and union pressure, strikes or political demonstration blocks downsizing attempts, efficiency of public and public utility enterprises can be increased in a

different way – by improving efficiency. Tracking productivity, giving a fair and reachable (although higher than their average productivity in the last few years) working standards can motivate employees, give them attainable goals and increase their output. On the other side, they can be motivated to decrease costs and improve efficiency of business in order to avoid downsizing. As consultants, we prefer that direction of application over downsizing.

Conclusions

This paper presents a quantitative, statistical, impartial and objective approach to restructuring public and public utility enterprises, often burdened with excess employees and inefficiency. Our method is based on calculating achievable productivity, and setting that as performance standards instead of obsolete labour standard hourly norms. The standards are set on the basis of employee performance in that enterprise, and are achievable in approximately 15% of time periods by the same employees, with the same equipment, and processes in the same organizational, internal and external environment. If it has to come to downsizing, this method can provide a fairer and more impartial approach than the subjective estimation of employee surplus and its arbitral distribution within the enterprise, and employees and union representatives often saw it as more acceptable alternative. There are several limitations to our approach. Companies that have large seasonal oscillations in demand often show lower results, and our method indicated unexplained large surplus of employees. For example, employees in communal heating plants have a peak during winter months and overhaul projects, while during summer they are mostly free, and half of the employees cannot be downsized because their activities are not demanded during summer. However, this new method gives good background for negotiation, and since often local government has more public and public utility enterprises under its authority, some employees in such companies can be transferred to other companies where peak demand is in the summer. Another important limitation is that our method is dependent upon data extracted from the very same employees under threat of downsizing. Thus, it is often very hard to obtain the data. However, if there is political will and sufficient social capital for the downsizing project to be initiated, data providers can be explained that the better and more complete the data is, this new method yields more reliable results and from the experience of more than 20 public and public utility enterprises the results are then more favourable to the employees.

However, the results of this method do not have to be used for downsizing. The results can make the employees of public and public utility enterprises question themselves on variations of their productivity. Although they will not say it aloud or at least in official talks, they recognize variations are partly their fault. Our experience covered strange situation in which trade union representatives strongly opposed results during official meetings and after the meetings they frankly congratulated consultants on the correct assessment of employee surplus, stating that the ratio of surplus is precisely distributed over smallest organizational units or employee groups, and that employees can indeed work more efficiently. If that attitude is transformed into a larger output, cost savings that do not need to be connected to salaries, from the perspective of governmental budget results are the same as with downsizing, without taking unpopular actions. From our perspective, it is always better to find an alternative to downsizing, if possible, because it is not humane to conceive of people as surplus. People are never surplus – there could be the shortage of

work, efficiency and productivity which has to be solved, the downsizing should be the last alternative to be applied only if other approaches to restructuring and organizational change are not possible.

References

- Aczel, A. D. and Sounderpandian, J., 2002. *Complete Business Statistics*. 5th ed. New York, USA: McGraw-Hill Higher Education.
- Aharoni, Y., 2000. The performance of state-owned enterprises. In: P. A. Toninelli, ed. 2000. *The Rise and Fall of State-Owned Enterprise in the Western World*. New York: Cambridge University Press, pp. 49–72.
- Ahmed, A., 2009. Good manufacturing practices. *ISBT Science Series*, 4(1), pp. 6-10.
- Andolsek, D.M. and Stebe, J., 2004. Multinational perspectives on work values and commitment. *International Journal of Cross Cultural Management*, 4(2), pp.181–209.
- Armstrong-Stassen, M., 2004. The influence of prior commitment on the reactions of layoff survivors to organizational downsizing. *Journal of Occupational Health Psychology*, 9 (1), pp. 46-60.
- Awortwi, N., 2010. Building new competencies for government administrators and managers in an era of public sector reforms: the case of Mozambique. *International Review of Administrative Sciences*, 76(4), pp. 723-748.
- Birdsall, N. and Nellis, J., 2003. Winners and Losers: Assessing the Distributional Impact of Privatization. *World Development*, 31(10), pp. 1617-1633.
- Burnes, B., Katsouros, M. and Jones, T., 2004. Privatization and the European Union: the case of the public power corporation of Greece. *The International Journal of Public Sector Management*, 17 (1), pp. 65-80.
- Cascio, W.F., 2002. Strategies for responsible restructuring. *Academy of Management Executive*, 16 (3), pp. 80-91.
- Cervo, D. and Allen, M., 2011. *Master Data Management in Practice: Achieving True Customer MDM*. New Jersey, USA: John Wiley and the Sons.
- Chipunza, C. and Samuel, M.O., 2011. The Influence of Downsizing Organisational Strategies on Survivor Qualities in an Economically Volatile Environment. *Journal of the Social Sciences*, 28 (2), pp. 87-98.
- Čudanov, M. and Jaško, O., forthcoming 2012. Adoption of Information and Communication Technologies and Dominant Management Orientation in Organizations. *Behaviour & Information Technology*, [online] Available at: <<http://www.informaworld.com/smpp/content~db=all~content=a923093688~frm=titlelink>> [Accessed 27 December 2011].
- Čudanov, M., Săvoiu, G. and Jaško, O., 2012, Usage of Technology Enhanced Learning (TEL) Tools and Organizational Change Perception. *Computer Science and Information Systems Journal*, 9 (1), pp. 287-304.

- De Bono, S., Van Der Heijden, B. and Jones, S., 2009. *Managing Cultural Diversity - Maastricht School of Management Series in Intercultural and Global Management*. London, UK: Meyer&Meyer.
- Dinu, V., 2010. Commercial activity and the sustainable development. *Amfiteatru Economic*, Vol XI(27), pp.5-7.
- Frankel, S., 1984, *Introduction to software packages*. Washington, USA: National Bureau of Standards.
- Goh, T. N., 2011. Six Sigma in industry:some observations after twenty-five years. *Quality and Reliability Engineering International*, 27(2), pp. 221–227.
- Gros, D. and Mayer, T., 2010. How to deal with sovereign default in Europe: Towards a Euro(pean) Monetary Fund. *CEPS Policy Briefs*, Iss. 202, pp.1-10.
- Jaško, A., Čudanov, M. and Krivokapić, J., 2011. Analiza sistematizacije radnih mesta u procesu pripreme za downsizing. In: J. Zubović, ed. 2011. *Aktivne mere na tržištu rada i pitanja zaposlenosti*. Belgrade, Serbia: Institut ekonomskih nauka, pp. 234-260.
- Jaško, O. et al., 2011. Classical solutions for improvement of restructuring process and representation of organizational structure and alternative future solutions of quantum economics. *Econophysics, Sociophysics & Other Multidisciplinary Sciences Journal*, 1(2), pp. 36-46.
- Jaško, O., Krivokapić, J. i Čudanov, M., 2010. Standards of job classification as organization design tool based on Mintzberg's and Porter's theoretical assumptions. In: Mijatović, I., Živković, N. (eds), *Proceedings of the 7th Conference Standardization, prototypes and quality: a means of Balkan countries' collaboration*. Zlatibor, Serbia, 8-9 June 2010. Belgrade, Serbia: University of Belgrade, Faculty of Organizational Sciences.
- Kessides, I., Miniaci, R., Scarpa, C. and Valbonesi, P., 2009. *Toward defining and measuring the affordability of public utility services*. *World Bank Policy Research Working Paper 4915* [online] s.l: The World Bank/Development Research Group/Environment and Energy Team. Available at: <http://www-wds.worldbank.org/servlet/WDSCContentServer/WDSP/IB/2009/04/28/000158349_20090428083002/Rendered/PDF/WPS4915.pdf> [Accessed 21 December 2011].
- Krivokapić, J. i Čudanov, M., 2010. Tipizacija srodnih radnih mesta kao osnova za interni benčmarking u grupi preduzeća. In: editor or name of organisation, In: Faculty of Organizational Sciences, *Conference proceedings - the XII international symposium Symorg*. Zlatibor, Serbia, 9-12 June 2010. Belgrade, Serbia: University of Belgrade, Faculty of Organizational Sciences.
- Landry, J.T., 2004. Downsizing in America: Reality, Causes, and Consequences. *Harvard Business Review*, 82 (2), p. 39-46.
- McKee-Ryan, F.M. and Kinicki, A.J. 2002. Coping job loss: a life-facet perspective. *International Review of Industrial and Organizational Psychology*, 17(2), pp. 1-29.
- Olaru, M., Dinu, V. et al., 2010. Responsible Commercial Activity of SMEs and Specific Values of Sustainable Development In Terms of the European Excellence Model. *Amfiteatru Economic*, XI(27), pp. 10-26.
- Popova, V. and Sharpanskykh, A., 2010. Modeling organizational performance indicators. *Information Systems*, 35(4), pp. 505-527.

- Pukelsheim, F., 1994. The Three Sigma Rule. *The American Statistician*, 48(2), pp. 88-91.
- Redman, T.C., 2008. *Data Driven: Profiting from Your Most Important Business Asset*. Boston, USA: Harvard Business Press.
- Reimann, B.C., 1973. On the Dimensions of Bureaucratic Structure: An Empirical Reappraisal. *Administrative Science Quarterly*, 18(4), pp. 462-476
- Stare, M. and Jaklič, A., 2011. Towards explaining growth of private and public services in the emerging market economies. *Amfiteatru Economic*, XIII (30), pp. 581-598.
- Săvoiu, G. et al., 2011. A Corporate Model of Similitude for SMEs Reunion into a Corporation, Viewed from the Angle of Physical Thought, and Its Complex Economic and Social Impact. *Amfiteatru Economic*, XIII (29), pp.10-27.
- Săvoiu, G., Vasile, D. and Tăchiciu, L., 2012. Romania Foreign Trade in Global Recession, Revealed by the Extended Method of Exchange Rate Indicators. *Amfiteatru Economic*, XIV(31), pp.173-194.
- Săvoiu, G. and Dinu, V., 2012. Solutions for the Statistical Analysis of the Economic Phenomena Described as Opposed, Partially or Entirely Compensated Fluxes: A Case Study on the Exports and Imports of Romania and the Baltic States. *Transformations in Business & Economics*, Vol. 11, No. 1 (25), pp. 54-71.
- Torrington, D., Hall L. and Taylor, S., 2005. *Human Resource Management*. 6th ed. London, UK: Prentice Hall.
- Trevor, C.O. and Nyberg, A.J., 2008. Keeping your headcount when all about you are losing theirs: Downsizing, voluntary turnover rates, and the moderating role of HR practices. *Academy of Management Journal*, 51(1), pp. 259-276.
- Tsai, P.C.F and Shih, C-T., 2011. *The Relationship between a Responsible Downsizing Strategy and Firm Performance: Are Labor Unions a Stepping Stone or a Stumbling Block*. [online] Available at: <<http://academic-papers.org/ocs2/Papers/A5/537-734-session/1-RV.doc>> [Accessed 17 January 2012].
- Van Dierendonck, D. and Jacobs, G., 2012. Survivors and Victims, a meta-analytic review of fairness and organizational commitment after downsizing. *British Journal of Management*, 23(1), pp. 96-109.
- Whelan, K., 2009. *Policy Lessons from Irelands Latest Depression*. UCD Centre for Economic Research Working paper series, [online] Available at: <<http://www.ucd.ie/t4cms/wp09.14.pdf>> [Accessed 28 November 2011].