

AN OPERATIONAL MODEL TO ANALYZE THE EVOLUTION OF WAGE BILL FOR SMEs IN ROMANIA

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Abstract: Through the large share in the volume of personnel expenses amount, the management of wage bill ensures proper knowledge of all these expenses, which are followed by financial managers, budget management controllers (they consider key variable control costs and performance) and human resources managers (because it expresses the results of remuneration policy). The important role of remuneration in motivating staff confers to wage bill a status of decisive factor in improving performance. Promotion activities, providing bonuses, transformation of remuneration systems to develop performance is expressed in the wage bill by handling which pass all the manipulation actions to improve enterprise competitiveness. Based on literature studies and their application within SMEs from South-West Development Region Oltenia, our paper proposes an operational model to analyze the evolution of wage bill on each of its factors of influence. This model is used both in the preparation of wage bill budget, but also in the analysis phase of its overall performance or at the level of its expenditures centers.

JEL classification: M40, M41, M51, M53

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1. ANALYSIS OF DEVELOPMENTS AND FACTORS OF VARIATION OF WAGE MASS INTRODUCTION

From one year to another, in conditions of normal activities, wage bill has a tendency to increase because of the action of the various social decisions social. The factors at the origin of developments in wage bill fall into two groups¹:

- a) a group which operates on quantity and quality staff;
- b) a group of factors which relate to changing wages and social costs.

The analysis of the impact of these factors is difficult, because their action is simultaneous and occur by increasing or decreasing the effects it causes on wage bill.

Variation in overall wage bill is explained by the influence of each of these two groups of factors mentioned above.

Qualitative and quantitative evolution of the personnel relate to:
- the change of the actual categories, determined by their employees and/or departures, internal movements of employees between categories or geographical areas;

¹ Martory B., *Tableaux de bord sociaux*. Pilotage, animation, decision, Editions Liaisons, Paris, 2004, p.158

- changes in training, on the basis of courses of training or studies, the graduation of educational establishments, by promotion;
- detected bursts of the time of employment, by recourse to more hours of work or reducing it by using the formula of the working time partially or recourse to technical unemployment over the period of interest.

Wage developments of premiums and social expenditure is recorded as a result of actions for which depend on the enterprise or are committed outside the community, such as:

- variation in wages and the premiums, which may be general and/or individual, in absolute value or expressed as a percentage, depending on the merit or seniority;
- the level of social expenditure, whose level can be triggered from the outside unit and affect the wage bill.

The difficulty of analysis difference in wage bill derives from the fact that all of these developments, such as very heterogeneous, it combines, overlap with their positive and negative effects, for in the end a value to appear correct, which is the only visible variant.

Analyzing the variance in wage bill is relatively easy for its principles. The difference that appears from one year to another, ΔMS , is expressed in absolute value or as a percentage, following to identify the effect of each factor which determined it. It can be done also vice versa, by knowing the changing of the factors and calculating the contribution of each in the change in total wage bill, after which it accumulates the results obtained. The difficulty is identifying the arithmetic order and consists in the possibility insulation satisfactory of the impact of each factor in the value difference in wage bill.

An initiative in two stages, which may use a logical procedure, can solve successfully the problem of identification influence each factor which contributes to this development of personnel costs:

1) *in a first stage must be identified and selected factors of influence to be measuring the impact*, having regard to experiences that many considered that the problems arising from imprecision knowledge of the phenomenon to be appreciated. On this occasion they respond to questions that may to provide the information required, such as: what is the age of the staff to be taken into consideration?; what is to be understood by the Noria² effect in the enterprise?; what must be taken into account in the criteria categorical absence?; what type of departures are retained?; which are the essential factors of wage bill changes in the enterprise?

2) *the second stage consists of measuring the actual impact of developments variation wage bill factor*. Arithmetic logic remains always the same: is measured the impact of one factor, trying, as far as possible, to eliminate the incidence of the others.

2. QUANTIFICATION OF FACTORS INFLUENCES OF DEVELOPMENT OF WAGE BILL

Outside changes of social costs and tax, which are triggered by decisions taken outside the enterprise, the variation of wage bill is due to domestic factors, which can and should be managed in its favor.

² Noria effect- reducing wage mass to actually built, which is explained by the replacement personnel in age to each other a bit younger, whose remuneration is significantly lower. Peretti J-M., *Dictionnaire des Ressources Humaines*, 3e edition, Vuibert, Paris, 2003, p.96

2.1 VARIATION IN ACTIVITY VOLUME

From the forecasts, any enterprise proposes to achieve its objectives, which can be achieved or, on the contrary, can record failures.

On short term, the need for the adaptation of the activity level at the actual request concludes to the choice of decision which will affect the total wage bill.

In this situation are also added external events or internal malfunctioning which interferes with their work and therefore the total wage bill. It is therefore legitimate and necessary to have recourse to measuring incidence of each factor that determines the variation of activity. Most of the times is measured the effect recourse to overtime, partial unemployment, by the time partially granted to employees, and for the unpredictable nature of events, such as stopping the manufacture, serious incidents or strikes of employees.

The impact of each factor of influence of the activity is relatively simple to be appraised, depending on the the enumerations and the additional costs that they generate, in absolute or relative value, but also as a percentage relative to the situation of the previous year. Such an example is presented in table no.1.

Table no.1 Impact of factors of influence on wage bill

No	Indicators	Employees	Management	Personnel	Total	N/N-1 (%)
1.	Wage mass -year N	600000	200000	90000	890000	-
2.	Strike march: 1800h M 1200hAd	-16875	-14285	-	-31160	-3,5
3.	Partial unymployment jan -feb 1200h M 2000hAd 600h C	-10715	-23810	-10715	-45240	-5,1
4.	Overtime Workshop MG 1000h M 400h Ad	+8930	+4760	-	+13690	+1,5
5.	Total changes of activity	-18660	-33335	-10715	-62710	-7,1

Source: Les cahiers ANDCP, no 32, p.27, La masse salariale

2.2 THE INCIDENCE OF CHANGE OF EMPLOYEES, AND OF REMUNERATION

The evolution of the personnel structure has an important impact on wage bill- it represents one of the basic solutions that the enterprise has at its disposal to undertaking to adapt to the requirements of the market, to changes in technology and the development of powers. In the enterprise are common departures to a pension or external mobility stemming from various causes.

It is therefore natural to measure incidence on actual wage bill movements that occurring in the enterprise, such as:

- those between enterprise and its environment (the the gae departures and intups);

- those within the company (exchange of categories, internal mobility);

Calculations can be done at two levels of complexity that have different accuracies. According to requirements will be one of these ways, having a higher degree of accuracy requires more detailed information and calculations much more difficult.

An example of determining the incidence of variation of the workers and the variation in wages bill was made at S.C. Popeci Utilaj Greu Craiova (table no. 2).

Table no. 2. Determining the actual incidences of personnel and remuneration on wage bill to S.C. Popeci Utilaj Greu Craiova

Indicators	Year 2008	Year 2009	Absolute variation	Percentage change (%)
Average effective	400	430	+30	7,5%
Average annual remuneration	30.000	3.100	+1.000	3,3%
Wage bill (MS)	12.000.000	13.330.000	+1.330.000	11,1%

Influence variation in population variation on wage mass will be, in absolute value:

$$\Delta MS^{\bar{E}} = 430 \times 30000 - 400 \times 30000 \Rightarrow \Delta MS^{\bar{E}} = 900000 \text{ RON}$$

$$\Delta MS^{\bar{S}} = 430 \times 31000 - 430 \times 30000 \Rightarrow \Delta MS^{\bar{S}} = 430000 \text{ RON}$$

Percentage change will be:

$$\Delta MS^{\bar{E}} = \frac{900000}{1200000} \times 100 \Rightarrow \Delta MS^{\bar{E}} = 7.5 \%$$

$$\Delta MS^{\bar{S}} = \frac{430000}{1200000} \times 100 \Rightarrow \Delta MS^{\bar{S}} = 3,6 \%$$

For a better analysis of the influences of these factors on wage bill it is preferable to determine accurate wage over the course of the year of inputs and outputs, taking into account: the remuneration and date of entering each new employee and the remuneration and date each employee who leaves your business. Calculus can be made for the year in which these movements or on a calendar year. In our case, on August, 1st 2009, in the enterprise have been hired two engineers with a cost of 3.000 RON/month. After two months, from October, 1st 2009, in the undertaking he went by his resignation a foreman, which had a cost of 2.000 RON/month. Variation in wage mass has been in this case:

$$5 \text{ months} \times 3.000 \times 2 = +30.000 \text{ RON}$$

$$3 \text{ months} \times 2.000 \times 1 = -6.000 \text{ RON.}$$

The evolution of the effectives has determined such an increase in 24.000 RON wage bill of the enterprise. It should be noted that in this case are not quantified variation and the records staff on wage bill. Thus, the departures may generate payments allowances, which can be recorded as indirect elements of cost for variations of effectives.

2.3 NORIA EFFECT

Noria effect measures, as we've pointed out above, impact of changes in compensation due to hiring and departures. It appears in replacements of employees departing with new employees. This effect occurs only when the number voluntary

redundancy is different from that of inputs, which is booked as an incidence of changes within the effectives.

Regarding the influence of Noria effect, it is generally negative, due to the fact that the payments for those departing are generally higher than those that come in, due to clearance seniority. Noria effect can measure the total wage bill when it seeks an increase of the competence at the positions remained vacant. The relationship of calculation is relatively simple, in the same way as its application (table no. 3).

Table no.3 Calculus of Noria effect at S.C. Popeci Utilaj Greu Craiova

Indicators	Beginning of the period	Inputs	Outputs	End of the period	Noria effect
No. of workers	400	30	20	410	
Average annual salary	15.000	13.000	16.000	14.800	-60.000
No. management	100	10	10	100	
Average annual salary	20.000	18.000	22.000	19.600	-40.000
No. personnel	30	5	6	29	
Average annual salary	30.000	28.000	32.000	31.310	-20.000
Total	8.900.000	710.000	732.000	*	-120.000

In the table it is observed that variation in total wage bill is -22.000 Ron, and the Noria effect decreases this indicator by -120.000 RON. The difference is explained by the influence of the effectives. Thus, in the enterprise are employed extra 10 workers (+130.000 RON) and leaves one worker (-4.000 RON). Total amount of the wage bill change is the amount that includes the Noria effect and the game of inputs and outputs of employees:

$$22.000 = - 12.000 + 10 \times 13.000 - 1 \times 32.000$$

2.4 GENERAL AND CATEGORIAL INCREASES

The need for knowledge of mass effects of general and categorial increases derive primarily from their importance on significant personnel costs. It is necessary that the informational system to contain such data to be consulted instantly in various cases, such as negotiating wage earners. Categorial increases regards a group of employees and general increases are attributed to staff assembly in manner variables, in the form percentage as an identical or semi hierarchical amount.

A social scorecard may contain three types of fundamental variables, allowing assessment of wage developments:

- increasings by level, which relate to the evolution of remuneration of a person or a group between two dates, usually from 1/1/N from 1/1/N+1;
- the mass effects, showing the percentage change of the wage bill between two periods, usually a year. Noted that an increase in the wage bill to 1/7/N by 6% it means an

increase in the wage bill by $6\% \times 6/12$, i.e. , 3% or, in the event that in the month of december is offered and the thirteenth monthly salary, the effect would be: $6\% \times 7/13$, i.e. 4 %;

- the effects of the report concerns the impact that increases that have accumulated in the course of the year N determines in the total of wage bill from the following year, N+1. For the example above, with the assumption that the salary will be 100 UM would result.

$$MS_N = 100 \times 6 + 106 \times 6 = 1236 \text{ UM}$$

$$MS_{N+1} = 106 \times 12 = 1272 \text{ UM}$$

The calculus of the report effect (e_r) is relatively simple:

$$e_r = \frac{MS_{N+1}}{MS_N} \times 100 - 100 \Rightarrow e_r = \frac{1272}{1236} \times 100 - 100 \Rightarrow e_r = 2,91\%$$

How to determine the incidences of general and categorial³ increases is presented in table no. 4. Table no. 4 provides an illustrative example of how to determine the three key variables that translate incidence of collective increases, i.e. the level increases, the effects of mass and the report of the two changes to the payment occurring within the year of N. So, on August, 1st is added an increase of 3% for the whole enterprise, followed by a new increase, of 2 %, on November, 1st.

Table no. 4 Table summarizing the incidences of general and categorial implications on wage bill

Report N-1: 2,30

Indicators	Variation (1)	Additional differences (2)	Report (3)	Weighting (4)	Effect (5)	(6) (7) Report for year N+1	
						Differe nce (3)-(5)	Divided by mass increase
General increase in level							
3,00%	3,00%	3,00%	3,07%	0,4167	1,28%	1,79%	1,72%
2,00%	5,06%	2,06%	2,11%	0,1667	0,35%	1,76%	1,69%
Incidence in N					1,63%		3,41
Report effect in N-1					2,30%		
Increase of MS in N					3,93%		

Column (1) presents cumulative incidence of both increases in wages, column (2) the contribution of each increase in cumulative growth, column (3) take into account the influence of the report effect of the two of year N, column (4) represents the ratio between the number of months of growth in a year, the column (5) results from reporting of the results from column (6) to increase wage mass of the year N.

2.5 INDIVIDUAL INCREASES

Individualization of remunerations is currently a reality by which it is desired to motivate employees according to qualification, the results and the powers of individual, and for that reason most of the enterprises shall give an important place increases custom. In many European countries are from the premium of seniority as a function of the life

³ www.merlane.com, Pilotage des effectifs et de la masse salariale, les Rencontres d'Affaires

cycle of active employee. This situation generates substantial fluctuations in wage mass from one year to another and it is appropriate to know them in detail. Measurement of such a phenomenon requires to be identified with precision and to identify its forms, which are:

- *sliding wage*, which means all remuneration increases on merit, not taking into account changing skills and of the nature of the work; it means that here shall be accounted on criteria of employees and bonuses (premium) or from advancement and promotions on merit;

- *seniority*, which determines pay increases are related to the fulfillment of a period of work during work life, regardless of the detailed calculations used;

- *technicality*, considered a means of improving the remuneration related to the access to a higher qualification.

Forms of an individual growth mentioned above are valid in the public sector, but are not necessarily used in the private sector. Calculus of individual influence increases depends on the information available. In the case where no has any information relating to individual increases in the system of payment and not about changes in the structure, this calculus can only be made by deduction. The impact of individual increases the impact will be defined as an element of residual developments calculated for the other components that determine the variation wage bill:

$$\Delta MS^{C_i} = \Delta MS - \Delta MS^{VA} + \Delta MS^{\bar{E}} + \Delta MS^{No} + \Delta MS^{C_g}$$

ΔMS^{C_i} - MS variation determined by individual increases;

ΔMS^{VA} - MS variation determined by activity;

ΔMS^{No} - MS variation determined by Noria effect;

ΔMS^{C_g} - MS variation determined by general increases.

If the system of payment provides the information required by including in a particular drawn up, the analyst will be able accurately determine the effect of increases individual variation on wage bill. Otherwise, it will have to recover this information through a special effort, but that offers satisfaction brought to an end.

2.6 STRUCTURAL DEVELOPMENTS

Changes in environment, which has significant consequences for enterprise market, including for the labor market, can cause significant changes in the structure on categories from one period to another. These changes have an impact on wage bill. When they are important, it is useful to know what impact of this phenomenon, which is no longer must be treated like a residue. To isolate this influence is the calculation of a "fictitious wage bill" based on population structure of year N weighted by specific remuneration for year N+1. The difference between this indicator and the average remuneration represents the impact of change in structure of the employees. Table no. 5 shows a situation where although the number of employees changes insignificantly, the effect of their redistribution on occupational categories it is important in relation to its effect on wage bill.

Table no.5 The influence of the structural changes on wage bill

Indicators	Engineers	Foremen	Economists	Workers	Total
Average annual effective N	140	180	70	2150	2540
Average annual effective N+1	165	195	65	2070	2495
Monthly average remuneration per employee in the year N	2500	1850	1600	1450	1540
Monthly average remuneration per employee in the year N+1	2700	2000	1700	1600	1707
Wage bill in year N+1 in structure and constant effective, i.e MS fictive: Effectives N X Remuneration N+1 (1)	378000	360000	119000	3440000	4297000
Rapport between MS fictive N+1 and MSN (2)	x	x	x	x	0,91%
Variation of average remuneration	x	x	x	x	10,84%
Effect of structure (3)- (2)	x	x	x	x	9,93%

Analysis of variance in wage bill must be known by management and by the heads of departments, to know the ratio of surplus to the activity and effort consented to it, the potential readjustments to be applied during new negotiations etc. The information desired and imputed to all these levels, the total wage bill and its development should be reflected in the scorecard to the division level, and for the management the best variant is its introduction to the social scorecard.

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