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Review
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The statistical analysis of the mobility and the labor force use*

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Abstract

The paper approaches some of the classical methods used in statistics for the analysis of labor force and proposes new ways of current analysis required for adopting optimal economic patterns and strategies. The proposed methods, the linear mean deviation used in the analysis of the external mobility of the labor force, the coefficient of variation used in the analysis of the external mobility of the labor force and two-dimensional table used the coefficient of internal mobility calculation, are illustrated by the premises, the calculus methodology, practical applications and guidance for their use in adopting and applying optimal economic policy.

Key words*: coefficient of mobility, employees, items*

JEL classification*: C40*

1. Introduction

The achievement of objectives in a company, in high effectiveness conditions is conditioned by supplying the necessary labour force within the company, in terms of number, structure and level of qualification. Labor force represents the main production factor and its statistical analysis requires the analysis of the various aspects characteristic to it. The economic efficiency increase depends on the optimal use of the labor force (Emilian, R., 2003).

The labor force managed by an economic agent is shown as the number of the employed personnel; this indicator can be established at a certain point or for a certain period of time. The number of personnel at a certain point represents the

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labour and it is monitored at the beginning and the end of period. It characterises the human potential available within the unit and it is considered to be a stock indicator.

The mobility of the labor force is determined by the change of the number of personnel as a consequence to files in and files-out of the employees, registered during the analysis period and which manifests itself with a different intensity depending on the requirements of the economical efficiency, of the activity and the rational use of the labor force (Rosen, S., 1986). The dynamics of the labor force is determined by a series of factors of objective and subjective nature. The staff mobility determined by the objective factors is generated by the real necessities of the productive process which can cause the increase of the number of employees as result of the company's activity extending or its reduction because of the restructuring, activity restraint or other causes (school, army, deaths). The mobility, determined by subjective and disciplinary factors is integrated in the labour force fluctuation. For the company, the unorganised character of the personnel's loss and especially the loss of skilled workers generates negative effects, the vacancies need to be filled, the new staffs needs a period of accommodation to the new conditions, costs connected to recruitment, etc.

The statistical analysis of the labor force deals with quantitative and qualitative aspects having direct influences on the financial and economic outcomes of an economic unit. In this article the author approaches some of the classical methods used in statistics for the analysis of labor force and proposes new ways of current analysis required for adopting optimal economical patterns and strategies. The proposed methods are the linear mean deviation used in the analysis of the external mobility of the labor force, the coefficient of variation used in the analysis of the external mobility of the labor force and two-dimensional table used the coefficient of internal mobility calculation. The paper is organized as follows: (1) Introduction, (2) The items of mobility, (3) The items for using the labor force and (4) Conclusion.

2. The items of mobility

During a given period of time subdued to statistical observations, the staff number of an economic unit varies due to the inputs and the outputs of the staff and as a result, the calculation of the synthetic item otherwise called the mean number of the personnel, noted with "*N*", is necessary. It is possible to be calculated at the level of unit and subunits, for the sum of the personnel and using categories, with the formula:

$$N = \frac{\sum N_z}{D_c} \qquad (1)$$

where $\sum N_z$ is the sum of the day-to -day scriptic number of personnel for a fixed period, and D_c is the given calendaristic period.

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For new subunits or units, regardless the date of their opening, the integral calendaristic period should be used for in the above formula in order to calculated *N*.

The following conventional data were used as an example:

The scriptic number of personnel at the economic unit „Alpha S.A." in January 2000 was:

1. Monday 1200
2. Tuesday 1202
3. Wednesday 1202
4. Thursday 1205
5. Friday. 1205
6. Saturday. 1205
7. Sunday. 1206
8. Monday 1206
9. Tuesday 1206
10. Wednesday 1206
11. 1206
12. . . . . -ii-
-ii- . . . . . -ii-
28. 1207
29. 1208
30. 1208
31. (Monday) 1210
Total . . . . . 39.795 human-days
For January $N = 1284$.

If the scriptic effective is approximately constant, *N* can be calculated as a simple arithmetic average of the scriptic day tot day effective from the beginning to the end of the given period, according to:

$$N = \frac{N_1 + N_2}{2} \qquad (2)$$

This analysis gives the possibility to find the causes generating one or another type of movement within the labor force, to estimate its mobility trends, to approximate its evolutions, to foresee and ameliorate its eventually negative economic effects (Gariety, B. S. and Shaffer, S., 2001).

We distinguish the external mobility of the labor force, that deals with the mobility of the labor outside the economic unit. This mobility has two senses: the movement from other economic units towards the analysed one and the mobility from the submissive unit towards the exterior.

The intensity of the mobility for both senses is quantified by means of the followings items:

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* The inputs coefficient (coefficient of employments), calculated as a report between the number of the employees for a fixed period (A) and the existent number at the end of the respective period (N_2), with the following formula:

$$K_a = \frac{A}{N_2} \times 100 \qquad (3)$$

* The outputs coefficient is calculated as a report between the number of those who leaved in the fixed period (A) and the existent number at the beginning of the period (N_1), with the following formula:

$$K_p = \frac{P}{N_1} \times 100 \qquad (4)$$

* The fluctuation coefficients relive the intensity of the "nimiety movement" of the labor force, and it is calculated as a report between the number of the fired or resigned people, from different reasons, and the mean number of personnel:

$$K_f = \frac{N_c + N_d}{N} \times 100 \qquad (5)$$

* The total movement coefficient is calculated as a report between the total number of inputs (A) and outputs (P) and the mean number of the personnel, from the following formula:

$$K_g = \frac{A + P}{N} \times 100 = K_a + K_p \qquad (6)$$

We exemplify the adding methodology of these items by means of the following conventional assigns:

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Table 1: The calculation of the items

Items	Year		Items	Year	
	2000	2001		2000	2001
1. The existent at the beginning of the period (people)	3200	3275	3.1. Natural Causes - total - illness - retirement - death	 25 9 12 4	 20 3 14 3
2. Inputs in the course of the fixed period - total (people)	150	100	3.2. Army	5	4
2.1. People hired directly by the unit - graduates - transfer - from the unemployed field	100 70 5 25	85 44 6 35	3.3. Transfer	4	8
2.2. Distributed by the job centre (people)	50	15	3.4. Resignation	6	8
3. Lives in the course of the fixed period - total	75	90	3.5. Dismissals from which: - reorganization of the activity - Disciplinary abbots	20 10 10	35 20 15
3.6. Other reasons	20	15	4. The existent at the end of the fixed period	3275	3285

Source: my own observations

The calculation of the items that characterizes the movement of the labor force and its dynamics, is presented in the table 2 from appendix. The informational contribution offered by these items is obvious.

In connection with the linear mean deviation method used in the analysis of the external labor force mobility, N. Vasilescu (2000) shows that the linear mean deviation can be decomposed in positive mean deviation and negative mean deviation.

We will note with x_r - the referential levels (base of comparison) of the scriptic effective of the personnel, x_i - the monthly (scriptic) effectives of personnel that are higher than the referential levels x_r ($x_i > x_r$), x_j - the monthly (scriptic) effectives personnel that are less than the levels x_r ($x_j < x_r$), n_1 - the number of months where the deviations were positive ($x_i > x_r$), n_2 - the number of the months where the deviations were negative ($x_j < x_r$), n_0 - the number of months from the fixed period ($n_0 = n_1 + n_2$).

We will have for the linear positive mean deviation:

$$\bar{d}_1 = \frac{\sum (x_i - x_r)}{n_1}(+), i = 1, n_1 \qquad (7)$$

and for the linear negative mean deviation:

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$$\bar{d}_2 = \frac{\sum(x_j - x_r)}{n_2}(-), i = 1, n_2 \qquad (8)$$

We observe that at the end of the fixed period, the balance account of the two types of deviation will be:

$$n_1 \cdot \bar{d}_1 + (-n_2 \cdot \bar{d}_2) = \sum(x_i - x_r) + [-\sum(x_j - x_r)] \qquad (9)$$

The general mean deviation will be:

$$\bar{d}_0 = \frac{n_1 \cdot \bar{d}_1}{n_0} + \left(-\frac{n_2 \cdot \bar{d}_2}{n_0}\right) = \frac{\sum(x_i - x_r) + [-\sum(x_j - x_r)]}{n_0}, \qquad (10)$$

and the general level of deviation both positive and negative will be

$$\pm\Delta_0 = \pm n_0 \cdot \bar{d}_0 \qquad (11)$$

We note with X the number of employed personnel, Y the number of the people who leaved and with Z the scriptic effective of personnel.

Supposing that we have the following conventional assigns:

Table 3: Conventional data for X and Y .

Month	Year 2000		Year 2001	
	Nr. of employees	Nr. of leaves	Nr. of employees	Nr. of leaves
1	35	25	55	45
2	45	55	60	75
3	50	35	75	45
4	10	12	50	65
5	11	8	65	35
6	20	15	70	65
7	25	30	35	40
8	15	10	25	30
9	8	7	15	20
10	12	10	55	25
11	20	12	75	65
12	35	20	45	50
Total	286	239	625	560

Source: my own observations

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For the scriptic effective of personnel, *Z*, we have:

Table 4: Conventional data for *Z*

Month	Year: 2000 - base of comparison	Year 2001 - current period
1	300	352
2	310	362
3	305	347
4	320	362
5	318	392
6	321	407
7	326	402
8	321	397
9	326	392
10	327	427
11	329	437
12	337	432
Total	3840	4709

Source: my own observations

The individual levels are determined with the following formula:

$$z_i = z_{i-1} + (x_{i-1} - y_{i-1}) \qquad (12)$$

The positive and negative absolute differences for *X, Y, Z*, in 2000 are presented in table 5 from appendix.

We notice that

$$x_1 + \sum(x_i - x_r) = x_{12} + \sum(x_j - x_r), \text{ (35+57=35+57)} \qquad (13)$$

and

$$y_1 + \sum(y_i - y_r) = y_{12} + \sum(y_j - y_r), \text{ (25+65=20+70)} \qquad (14)$$

These formulas can be used as a checking method for the correctness of the calculation.

The absolute positive and negative differences- - for *X, Y, Z,* in the current year 2001, are presented in the table 6 from appendix.

Again we notice that

$$x_1 + \sum(x_i - x_r) = x_{24} + \sum(x_j - x_r), \text{ (35+(57+120)=45+(57+110)} \qquad (15)$$

and

$$y_1 + \sum(y_i - y_r) = y_{24} + \sum(y_j - y_r), \text{ (25+(65+150)=50+(70+120)} \qquad (16)$$

these facts can be used as a checking method for the correctness of the calculation.

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Interpretation

At the end of 2000, taken as a comparing year, the difference between the number of the employees and the number of leaving people was of 47 employees and for the current period, 65 employees in 2001. Cumulating the two periods, for the 24 months, the difference between the employees and the leaving people is of 112 persons. It results from this simplified analysis that the inputs coefficient for the two analysed years is of 19.35 percents and the outputs coefficient of 20.8 percents.

The dichotomy of the linear mean deviation in positive deviation and negative deviation shows the fact that for the employees, the annual balance account is 0, in 2000 and for leaving people are 5, in 2001. The annual balance account of the employees is +10 and of the leaving people of 30. The data suggest a well-balanced and careful managerial politics of the human resources. For the mean number of personnel, *Z*, in 2000 the annual balance account is +37, and in 2001, the annual balance account is enough high, +95. This information correlatively analysed with the achievement of the affaires encodes and with the total expenses of the economic unit, gives the possibility of a rigorous analysis for the economic decision achievement.

The synthetic items of the linear mean deviation can be used in the anticipation of the evolutional tendencies of the 3 presented predictors; the knowledge of these tendencies can be extremely useful for an efficient managerial politics.

We will have for the variable X:

$$\bar{d}_1 = \frac{\sum (x_i - x_r)}{n_1} = 11.06 \qquad (17)$$

$$\bar{d}_2 = \frac{\sum (x_j - x_r)}{n_2} = 23.86 \qquad (18)$$

We note with $\bar{d}_1^{\,*}$ – the contribution of the positive mean deviation to the determination of the general mean deviation, $\bar{d}_2^{\,*}$ – the contribution of the negative mean deviation to the determination of the general mean deviation.

We will have $\bar{d}_1^{\,*} = 7.69, \bar{d}_2^{\,*} = 7.26$. Therefore, $\bar{d}_0 = \bar{d}_1^{\,*} - \bar{d}_2^{\,*} = 0.43$. The global level of the positive deviation ($\bar{d}_0 > 0$) is given by $\Delta_0 = n_0 \cdot \bar{d}_0 = 23 \cdot 0{,}43 \approx 10$ persons. It is obvious that the number of employees in December 2001 is bigger than the number of employees in January 2000 with $\pm\Delta_0$ that means 10 hired persons.

The significance of the other items is $\bar{d}_1 = 11.06$ and suggests that for each month of the 16 when the number of the employees was bigger than the previous month, the average of hires was of 11 persons. Analogue for $\bar{d}_2 = 23.86 \approx 24$; $\bar{d}_1^{\,*}$ is a tendency

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item, suggesting the cumulative mean level of the positive deviations which could be achieved from the beginning of the period and up to the current period. Its value is of approximately 8 persons, representing the monthly positive deviations average, which are extended to the entire interval of 23 months. For which deviations were recorded, no matter if these are as positive or negative. Analogue for $\overline{d}_2^*$.

The presented methodology is applied in a similar way for variables *Y* and *Z*.

Building the following time series on the basis of the cumulative levels of the analysed variables, the analyst can appreciate the type of the evolutional tendency and can correctly choose the proper statistic method for the adjustment and for the extrapolation of the evolutional tendencies.

Table 7: The time series on the basis of the cumulative levels of the analysed variables

Month	Year 2000			Year 2001		
	X	Y	Z	X	Y	Z
1	35	25	-	341	284	+52
2	80	80	+10	401	359	+62
3	130	115	+5	476	404	+47
4	140	127	+20	526	469	+62
5	151	135	+18	591	504	+92
6	171	150	+21	661	569	+107
7	196	180	+26	696	609	+102
8	211	190	+21	721	639	+97
9	219	197	+26	736	659	+92
10	231	207	+27	791	684	+57
11	251	219	+29	866	749	+47
12	286	239	+37	911	799	+42

Source: my own calculus

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6. lipanj 2006 10:42

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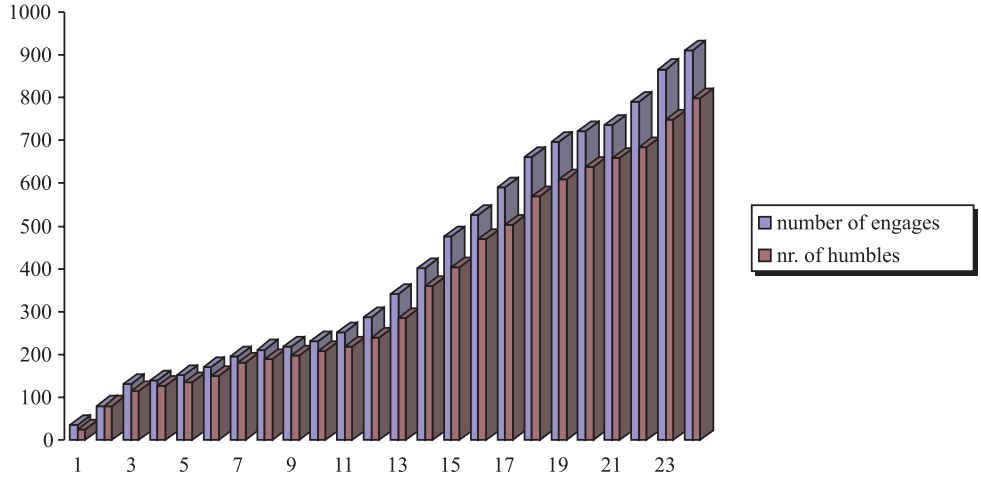
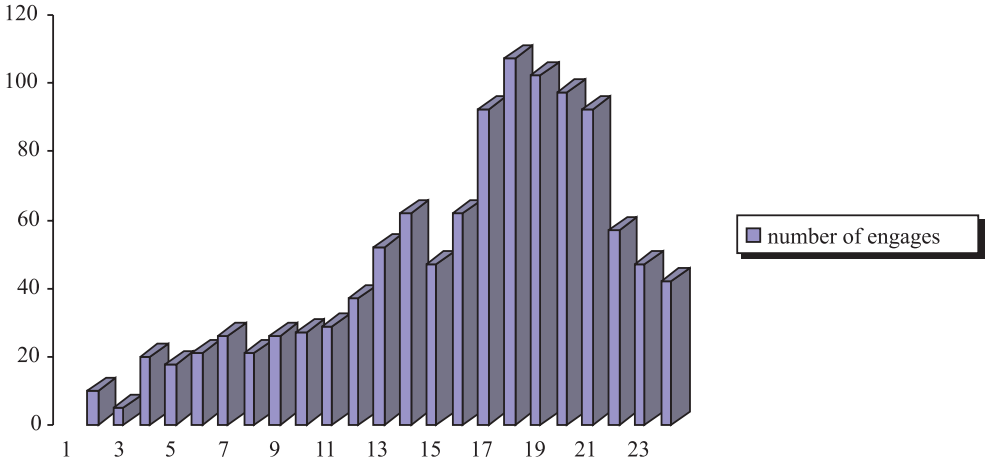
Figure 1: The representation of the evolutive tendencies of the personnel hires and leavings at the analysed economic unit between 2000-2001.



Source: my own calculus.

Figure 2: The graphic representation of the evolutive tendency of the monthly balance account of the personnel mean effective



Source: my own calculus.

This method does not offer only the possibility to continue the analyse of the data with the help of statistical -mathematical function in order to obtain a higher level of the probability, which assure the estimative levels in the prevision calculus, but these tendencies can be analysed correlatively with the other predictors which are taken into account in the optimization of the economical decision. It can be pointed out the

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possible existing of seasonability for these variables. The informational contribution is obvious.

By applying the method of the variation coefficients in the analysis of the external mobility labor force, we have considered the following conventional data:

Table 8: Conventional data to determined external mobility labor force

Month	Year 2000			2001		
	N_0 (people)	x_0-hires (people)	y_0-leaves (people)	N_1 (people)	x_1 (people)	y_1 (people)
January	300	55	35	350	50	40
February	320	60	45	355	45	40
March	335	25	15	350	20	30
April	345	20	35	340	15	10
May	340	25	30	345	10	15
Total	1640	185	160	1740	140	150

Source: my own observations.

The mean number of employees in 2000 is: $\overline{N}_0 = 328$. And for 2001 $\overline{N}_1 = 348$. From the calculation of the standard deviation results that σ_0=16,31. Therefore the coefficient of variation has the value ν_0=4,97% for 2002, and, σ_1=5,09, ν_0=4,97 for 2001.

The analysis of the results makes evident an increase in the degree of stability of the labor force during 2001 in comparison with the previous year (2000). The method of the variation coefficient can be used even when the effective of the employees is known from the beginning of the analysis and the mobility of the personnel in each month of the period that is subdued to the statistical analysis.

We notice that for the 2nd month:

$$N_2 = N_1 + (x_1 - y_1) \qquad (19)$$

for the 3rd month:

$$N_3 = N_2 + (x_2 - y_2) \qquad (20)$$

for the 4th month:

$$N_4 = N_3 + (x_3 - y_3) \qquad (21)$$

Therefore, we have:

$$N_i = N_{i-1} + (x_i - y_i) = N_1 + \left(\sum_{i=1}^{n-1} x_i - \sum_{i=1}^{n-1} y_i \right) \qquad (22)$$

The mean effective of the personnel will be

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$$\overline{N} = \frac{\sum_{i}^{n} N_i}{n} = \frac{\sum_{i}^{n}\left(N_1 + \sum_{i=1}^{n-1} x_i - \sum_{i=1}^{n-1} y_i\right)}{n} \qquad (23)$$

and the standard deviation

$$\sigma = \sqrt{\frac{\left[\frac{N_1 + \left(\sum_{i=1}^{n-1} x_i - \sum_{i=1}^{n-1} y_i\right)}{n} - N_1 + \left(\sum_{i=1}^{n-1} x_i - \sum_{i=1}^{n-1} y_i\right)\right]^2}{n}} \qquad (24)$$

The coefficient of variation

$$\nu = \frac{\sigma}{\overline{N}} \cdot 100 \qquad (25)$$

If $\nu \to 0$, then the stability of the economic unit is higher. (Stephens, L.J. 2004).

The internal mobility of the labor force quantifies the movement of the labor force within the economic unit, from one working point to another. Within the economic unit, the labor force can be found out in the two hypostases: the change of the working place in a certain period, this hypostasis being emphasized by the internal mobility coefficient, and the permanence of the personnel at the initial place of work, this hypostasis being emphasized by the internal stability coefficient.

Following the method of the two-dimensional table used in the calculation of the internal mobility coefficient, we will build the two-dimensional table used in the analysis of the two-dimensional variables (Yule, G. U. and Kendall, M. G., 1950), and we will note them with:

– *X*, the principal variable, the age in the economic unit (years)
– *Y*, the secondary variable, the age at the actual place of work (years)

We will consider the following conventional data:

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Table 9: The two-dimensional table used in the analysis of the two-dimensional variables

Y / X	0-5	5-10	10-15	15-20	20-25	25-30	Total f_i
0-5	302	-	-	-	-	-	302
5-10	52	108	-	-	-	-	160
10-15	16	18	34	-	-	-	68
15-20	3	2	10	15	-	-	30
20-25	1	3	4	-	12	-	20
25-30	2	5	3	3	-	7	20
Total	376	136	51	18	12	7	600

Source: my own observations.

Paying attention to the two-dimensional table we observe that integrating the number of the employees who maintained the initial place of work and reporting the obtained sum to the total number of personnel we will have, in fact, the internal stability coefficient. Therefore,

$$K_s = \frac{A_s}{N} \cdot 100 \qquad (26)$$

where A_s - represents the stable works, N - the total number of employees. In our case, K_s=0,80, or 80 percent. Starting from the obvious observation that the frequencies of the table form a "triangle of the internal mobility", we will obtain the following generalized formula:

$$K_s = \frac{\sum f_{ij}(B)}{\sum f_{ij}} \qquad (27)$$

where Σf_{ij}(B)- is the frequencies which form the hypotenuse of the mobility triangle. In the same way, dividing the sum of the employees who changed the initial place of work to the total number of personnel we obtain the internal mobility coefficient:

$$K_m = \frac{A_m}{N} \cdot 100 \qquad (28)$$

(A_m represents the number of the mobile workers, N- the total number of the employees). For the given example, K_m=0,20, or 20 percent. We obtain the following generalized formula:

$$K_m = \frac{\sum f_i - \sum f_{ij}(B)}{\sum f_{ij}} \qquad (29)$$

or

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$$K_m = \frac{\sum f_j - \sum f_{ij}(B)}{\sum f_{ij}} \qquad (30)$$

It is obvious that $K_s+K_m=1$, or 100 percent. Therefore, $K_m=1–K_s$, or , $K_m=100–K_s$, K_m, $K_s \in [0,1]$. In our case $K_m=0,20$, or 20 percent, therefore, the internal mobility of the labor force was minor. More $K_m \to 0$ and $K_m \to 1$ the efficiency of the use of the labor force is higher. In the same way, it can be applied the method of the linear mean deviation and of the variation coefficient for the internal mobility. This is presented in the same way.

3. The items for using the labor force

The quality of the labor result in an economic unit depends on, to a great extend, the employees' level of training and qualification. For the statistical analysis of the employees' level of qualification is used the mean category of qualification that is calculated as a pondered mean of the individual categories with the following formula:

$$\bar{c} = \frac{\sum cN}{\sum N} \qquad (31)$$

The index of the concordance between the mean qualification category and the rated mean category is:

$$I^c = \frac{\bar{c}}{\bar{c}_n} \cdot 100 \qquad (32)$$

The dynamic analysis of this item is done using the index of the mean qualification category:

$$I^{\bar{c}}{}_{1/0} = \frac{\bar{c}_1}{\bar{c}_0} \cdot = \frac{\sum c_1 N_1}{\sum N_1} : \frac{\sum c_0 N_0}{\sum N_0} \qquad (33)$$

The separation of the influence on factors:

a) the influence of the individual categories as a qualitative factor is determined by the following formula:

$$I^{\bar{c}(c)}{}_{1/0} = \frac{\sum c_1 N_1}{\sum N_1} : \frac{\sum c_0 N_1}{\sum N_1} = \bar{c}_1 : \bar{c}^*{}_1 \qquad (34)$$

where $\bar{c}^*{}_1$ is the mean category of qualification which the employees of the economic unit or of the effective formations of workers would have had if the individual

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category of qualification had been the one from the based period and the number of workers had been unchanged.

b) the influence of the number of employees as a qualitative factor is determined by the following formula:

$$I^{\bar{c}(N)}{}_{1/0} = \frac{\sum c_0 N_1}{\sum N_1} : \frac{\sum c_0 N_0}{\sum N_0} = \bar{c}_1^{\,*} : \bar{c}_0 \qquad (35)$$

It is obvious that $I^{\bar{c}} = I^{\bar{c}(c)}{}_{1/0} \cdot I^{\bar{c}(N)}{}_{1/0}$, therefore the reversibility test of the factors is verified.

The derivatives items can be calculated in the same way (the rhythm and the spore of the mean category of qualification).

The mean number of shifts can be determined:

– as a report between the total number of workers, who worked in all the shifts and the number of workers which worked in the shift with maximal charge (the shift with the biggest number of workers), by the formula:

$$\bar{n}_s = \frac{\sum N}{N_{s_{\max}}} \qquad (36)$$

– as a report between the time worked by the workers from all the shifts (measured in human-days or human-hours) and the time worked by the workers from the shift with maximal charge, by the formula :

$$\bar{n}_s = \frac{\sum t_z}{t_{zs_{\max}}} \text{ (human –days)} \qquad (37)$$

The index of the shifts number achievement is determined by the report between the mean number of shifts and the programmed work regime**,** by the formula:

$$I^s = \frac{\bar{n}_s}{n_r} \cdot 100 \qquad (38)$$

where n_r is the number of the programmed shifts. I_S has value 1 or 100%, when all the programmed shifts have an uniform charge $(I_S - 1) \cdot 100$ synthesises the unused reserve from the frame of the programmed number of shifts. This analysis, extended to the level of the places of work, would give the possibility to a detailed knowledge of the cover level of each link from the economic unit with the necessary labor force.

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4. Conclusions

In the present paper I have tried to present a few aspects connected with the statistical analysis of the mobility and of the use of labor force on economic unit level.

Because of the fact that the labor force is the most important factor of productivity, this statistical analysis is extremely important and implies much scientific accuracy. Without exhausting this subject, the author presents original methodological methods, in this article that can be directly applied on the statistics of the labor force as it is the method of linear mean deviation used in the analysis of the labor force which provides a strict starting point in order to substantiate the economic decision, the variation index used in the analysis of the external mobility of the labor force and the two-dimensional table used the coefficient of internal mobility calculation. These approaches can be extended also to other important issues regarding the activity of an economic unit, as well as the statistical analysis of the industrial production, of remunerations, of stocks, of financial results, etc.

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Statistička analiza mobilnosti i korištenja radne snage

Daniela-Emanuela Dănăcică[1]

Sažetak

U radu se istražuju neke od klasičnih metoda koje su se primjenjivale za analizu radne snage, te se predlažu suvremeni pristupi analizi koji omogućuju optimalne ekonomske uzorke i strategije. Predložene metode: linearna medijalna devijacija koja se rabi za analizu eksterne mobilnosti radne snage, koeficijent varijacije koji se rabi za analizu eksterne mobilnosti radne snage i dvodimenzionalna tablica koja rabi koeficijent za izračunavanje interne mobilnosti ilustriraju se pomoću premisa, metodologije izračuna, praktične primjene i naputcima za njihovo korištenje radi usvajanja i primjene optimalne ekonomske politike.

Ključne riječi*: varijable, koeficijent mobilnosti, zaposlenici, stavke*

JEL klasifikacija*: C40*

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Appendix

Table 2: The calculation of the items
Tablica 2: Izračun stavaka

Items	Level (%)		$I^{(\%)}_{1/0}$	$R^{(\%)}_{1/0}$
	2000	2001		
The inputs coefficient (coefficient of employments)	4.58	3.04	66.37	-33.63
The outputs coefficient	2.34	2.75	117.52	17.52
The input coefficient from the unemployed field	0.76	1.07	140.78	40.78
The fluctuation coefficient	0.80	1.31	163.75	63.75
The total movement coefficient	6.95	5.79	83.31	-16.69

Source: my own calculus

Table 5: The positive and negative absolute differences for *X, Y, Z* in 2000.
Tablica 5: Pozitivne i negativne apsolutne razlike za X, Y, Z u 2000. godini

Month	Year 2000					
	X		Y		Z	
	+	-	+	-	+	-
1	-	-	-	-	-	-
2	10		30		10	
3	5	-		20		5
4		40		23	15	
5	1			4		2
6	9		7		3	
7	5		15		5	
8		10		20		5
9		7		3	5	
10	4		3		1	
11	8		2		2	
12	15		8		8	
Total	57	57	65	70	49	12

Source: my own calculus

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Table 6: The positive and negative absolute differences for *X, Y, Z* in 2001
Tablica 6: Pozitivne i negativne apsolutne razlike za X, Y, Z u 2001. godini

Month	Year 2001					
	X		Y		Z	
	+	-	+	-	+	-
1	20	-	25	-	15	-
2	5		30		10	
3	15			30		15
4		25	20		15	
5	15			30	30	
6	5		30		15	
7		35		25		5
8		10		10		5
9		10		10		5
10	40		5		35	
11	20		40		10	
12		30		15		5
Total	120	110	150	120	130	35

Source: my own calculus

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