ESTIMATION OF EMPLOYEES' JOB SATISFACTION: AN EMPIRICAL RESEARCH OF THE ROMANIAN COMPANIES

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ABSTRACT

The paper aims to estimate the level of employee job satisfaction in the Romanian companies using the multinomial logistic regression model. The data were collected from 402 employees from 41 counties. Extrinsic and intrinsic factors are considered. The results reveal the fact the employee abilities appropriated to the job as element of intrinsic motivation, the atmosphere in the company and company objectives for this year known by employees as elements of extrinsic motivation, the employee perceptions about their leader such as: he takes good decisions, he appreciates his employees, he fairly distributes the tasks, he listen the employee opinions and the salary satisfaction level have a significant positive impact on job satisfaction. The model classifies correctly 205 of 273 people who are satisfied with their jobs. Overall, 74.1% of the cases are classified correctly.

KEYWORDS: *motivation, job satisfaction, extrinsic and intrinsic factors, multinomial regression logistic model, Romanian companies*

Introduction

The management of people at work is an integral part of the management process. To understand the critical importance of people in the organization is to recognize that the human element and the organization are synonymous. A well-managed organization usually sees an average worker as the root source of quality and productivity gains. Such organizations do not look to capital investment, but to employees, as the fundamental source of improvement. In order to make employees satisfied and committed to their jobs in the companies, there is need for strong and effective motivation at their various levels, departments, middle and top management.

Employee motivation is one of the major issues faced by every organization. It is the major task of every manager to motivate his subordinates or to create the 'will to work' among the subordinates. It should also be remembered that a worker may be immensely capable of doing some work; nothing can be achieved if he is not willing to work. A manager has to make appropriate use of motivation to enthuse the employees to follow them.

The main objective of the paper is to estimate the employees' job satisfaction using the multinomial logistic regression model.

Literature Review

Job satisfaction describes how content an ***individual*** is with his or her job. The happier people are within their job, the more satisfied they are said to be. Job satisfaction is a very important attribute which is frequently measured by organizations. According to

(Mitchell and Lasan, 1987), it is generally recognized in the organizational behavior field that job satisfaction is the most important and frequently studied attitude.

One of the biggest preludes to the study of job satisfaction was the Hawthorne studies. Further, the **Scientific Management** also had a significant impact on the study of job satisfaction. The initial use of scientific management by industries greatly increased productivity because workers were forced to work at a faster pace. However, workers became exhausted and dissatisfied, thus leaving researchers with new questions to answer regarding job satisfaction.

Some argue that **Maslow's hierarchy of needs** theory, a motivation theory, laid the foundation for job satisfaction theory. This theory explains that people seek to satisfy five specific needs in life – physiological needs, safety needs, social needs, self-esteem needs, and self-actualization. This model served as a good basis from which early researchers could develop job satisfaction theories.

Edwin A. Locke's Range of Affect Theory (1976) is arguably the most famous job satisfaction model. The main premise of this theory is that satisfaction is determined by a discrepancy between what one wants in a job and what one has in a job. Further, the theory states that how much one values a given facet of work (e.g. the degree of autonomy in a position) moderates how satisfied/dissatisfied one becomes when expectations are/aren't met. This theory also states that too much of a particular facet will produce stronger feelings of dissatisfaction the more a worker values that facet.

Another well-known job satisfaction theory is the Dispositional Theory. It is a very general theory that suggests that people have innate dispositions that cause them to have tendencies toward a certain level of satisfaction, regardless of one's job. This approach became a notable explanation of job satisfaction in light of evidence that job satisfaction tends to be stable over time and across careers and jobs. Research also indicates that identical twins have similar levels of job satisfaction. A significant model that narrowed the scope of the Dispositional Theory was the Core Self-evaluations Model, proposed by Timothy A. Judge in 1998. Judge argued that there are four Core Self-evaluations that determine one's disposition towards job satisfaction: **self-esteem**, general **self-efficacy**, **locus of control**, and **neuroticism**. This model states that higher levels of self-esteem (the value one places on his/her self) and general self-efficacy (the belief in one's own competence) lead to higher work satisfaction. Having an internal locus of control (believing one has control over her\his own life, as opposed to outside forces having control) leads to higher job satisfaction. Finally, lower levels of **neuroticism** lead to higher job satisfaction.

Frederick Herzberg's **two factor theory** attempts to explain satisfaction and motivation in the workplace1. This theory states that satisfaction and dissatisfaction are driven by different factors – motivation and hygiene factors, respectively. An employee's motivation to work is continually related to job satisfaction of a subordinate. Motivation can be seen as an inner force that drives individuals to attain personal and organization goals (Hoskinson, Porter, & Wrench, p.133). Motivating factors are those aspects of the job that make people want to perform, and provide people with satisfaction, for example achievement in work, recognition, promotion opportunities. These motivating factors are considered to be intrinsic to the job, or the work carried out. Hygiene factors include aspects of the working environment such as pay, company policies, supervisory practices, and other working conditions.

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[1] J. R. Hackman, G. R. Oldham (1976). "Motivation through design of work". *Organizational behaviour and human performance* 16: 250–279

Hackman & Oldham proposed the ***Job Characteristics Model***, which is widely used as a framework to study how particular job characteristics impact on job outcomes, including job satisfaction. The model states that there are five core job characteristics (skill variety, task identity, task significance, autonomy, and feedback) which impact three critical psychological states (experienced meaningfulness, experienced responsibility for outcomes, and knowledge of the actual results), in turn influencing work outcomes (job satisfaction, absenteeism, work motivation).The five core job characteristics can be combined to form a motivating potential score (MPS) for a job, which can be used as an index of how likely a job is to affect an employee's attitudes and behaviors.

The most common way of measurement of job satisfaction is the use of rating scales where employees report their reactions to their jobs. Questions relate to rate of pay, work responsibilities, variety of tasks, promotional opportunities the work itself and co-workers. Some questioners ask yes or no questions while others ask to rate satisfaction on 1-5 scale (where 1 represents "not at all satisfied" and 5 represents "extremely satisfied").

Research methodology

1. Data collection

The target population of the study were persons who live in urban area, who work in companies with at least 10 employees (including autonomous administration and corporations), who have a management position (general manager, manager, department manager, supervisor) and also who have at least 5 subordinates.

The sample size included 402 employees from small, medium and large sized Romanian companies. The questionnaire was been applied on individual employees, 21% of those working in trade activities, 32% in production activities and 47% in the service area.

The sample has been draw using the random systematic selection based on the random generation of phone numbers through CATI system (Computer Assisted Telephone Interviewing).

The study was performed in the period 11-22 June 2009 and the sample is considered representative for the examined collectivity, with an error limit of $\pm$ 4.9% at 95% probability.

2. Variable measurements

The questionnaire was specifically designed to accomplish the objectives of the study. The first section collected information about the company in which the employee works (number of employees, judicial regime, main area of activity and the amount of turnover in the previous year).

The second section contained the following items:
- Job and salary satisfaction levels were measured using a 5-point response scale in which '1' indicated 'very dissatisfied' and '5' indicated 'very satisfied'. Higher scores indicated greater levels of satisfaction.
- Intrinsic motivation was measured using six items derived from Low et al. (2001). Responses to the intrinsic motivation items were elicited on 4-point scales ranging from '1' ='strongly agree' to '4'= 'strongly disagree'. Lower scores indicated greater intrinsic motivation.
- Fifteen items were adapted from Boshoff and Allen (2000) to measure the employee extrinsic motivation in the organization. The responses were measured on 4-point

scales '1' ='strongly agree' to '4'= 'strongly disagree'. Lower scores indicated greater extrinsic motivation.

- The list of elements that employees wish to add to the company, if they would have the occasion and the main incentives received by employees in order to increase their motivation are measured using eight items. The responses are coded thus: if the employee cites the respective element then we coded as 1, else we coded as 0.
- A ten-item scale was used to evaluate the main motivating factors from the employee point of view. Each of these items used a 5-point scale ranging from '1'='least important' to '5'= 'very important'. Higher scores indicated the most important motivating factors.

In the third section of the questionnaire, demographic variables (such as age, gender, years of service, years of service on the actual position, number of subordinates, basic profession, salary) were statistically controlled due to their potential relationships with the variables of study. The age, years of service, years of service on the actual position, number of subordinates and salary were measured using 5-point scales. The basic profession was measured using a 4-point scale. Gender was coded as a binary variable (0=male and 1= female).

Research results

1. Respondents' profile

Of the 402 respondents, the majority were male employees (60.9%, n=245). Respondents who were 36–45 years old (30.1%) comprised the largest age group. One-third of the respondents (37.3%) are engineers, while only 27% of the interviewed persons state that they are economists. Regarding the years of service, 40% of employees state that they have over 10 years old in the company.

About one-third of respondents confess that they have over 10 years of experience in management position. As regards, the number of subordinates, 51.7% of respondents coordinates up to 49 persons.

2. The econometrical estimation of the employee job satisfaction using the multinomial regression model

The purpose of the present study is to make use of the data collected by survey in Romanian companies in order to build a regression model with dependent variable having as values the different categories of employee job satisfaction and independent variables the various elements of intrinsic and extrinsic motivation and also the employee opinions regarding the relationship with their leader. As the scope of any method is to be utilized in a wide area of applications, we will present in detail the process starting from the basic principles of multinomial logistic regression (MLR) and continue with the preparation of the data for the building of the model, the choice of the appropriate variables, the estimated model parameters and finally the validation of the model fitting and predictive accuracy. The statistical tool we used in our analysis is the SPSS package.

2.1. The Multinomial Logistic Regression (MLR)

The Logistic Regression (LR) method is used to model the relationship between a dichotomous (binary) dependent variable and a set of k predictor variables $\{x1, x2,..., xk\}$, which are either categorical (factors) or numerical (covariates). As the binary dependent variable can be always interpreted as the occurrence or not of an event E, the logistic regression model is an expression of

$$\log\left(\frac{prob(E)}{1-prob(E)}\right) = b_0 + \sum_{i=1}^{k} b_i \cdot x_i \qquad (1)$$

where the bi's denote the unknown logistic regression coefficients (b_0 is the intercept) while $prob$ (E) denotes the probability that event E will occur. The quantity on the left side of equation (1) is called a *logit*. So, the simple LR model can be used for predicting the probability of an event occurrence.

The model can be generalized in the case where the dependent variable is polytomous, i.e. its values are more than two categories. Suppose that a dependent variable (DV) has M categories. One value (typically the first, the last, or the value with the highest frequency) of the DV is designated as the reference category. The probability of membership in other categories is compared to the probability of membership in the reference category.

For a DV with M categories, this requires the calculation of M-1 equations, one for each category relative to the reference category, to describe the relationship between the DV and the independent variables (IVs).

Hence, if the first category is the reference, then, for m = 2… M,

$$\log\left(\frac{P(Y_i = m)}{P(Y_i = 1)}\right) = \alpha_m + \sum_{k=1}^{K} b_{mk} \cdot x_{ik} = Z_{mi} \qquad (2)$$

Hence, for each case, there will be M-1 predicted log odds, one for each category relative to the reference category. (Note that when m = 1 you get ln(1) = 0 = Z11, and exp(0) = 1.)

When there are more than 2 groups, computing probabilities is a little more complicated than it was in logistic regression. For m = 2, …,M

$$P(Y_i = m) = \frac{\exp(Z_{mi})}{1 + \sum_{h=2}^{M} \exp(Z_{hi)}} \qquad (3)$$

For the reference category,

$$P(Y_i = 1) = \frac{1}{1 + \sum_{h=2}^{M} \exp(Z_{hi)}} \qquad (4)$$

In other words, you take each of the M-1 log odds you computed and exponentiate it.

After estimating the coefficients of the model (2) by the method of maximum likelihood, we can readily calculate the logits and therefore the probabilities of each one of the categories. The final prediction is the category with the maximum probability.

2.2. The data

The dependent variable used in the model is the job satisfaction level that was measured using a 5-point Likert scale where 1=very dissatisfied and 5=very satisfied. We transform this variable and we allow having only three categories: 1=dissatisfied, 2=indifferent 3=satisfied.

The independent variables are the following:

- Salary satisfaction level having only three categories: 1=dissatisfied, 2=indifferent 3=satisfied.
- Elements of intrinsic motivation transformed into a dichotomous variable: 0=disagree, 1=agree.

- Elements of extrinsic motivation transformed into a dichotomous variable: 0=disagree, 1=agree.
- Employee opinions about their leader measured as a dichotomous variable: 0=disagree, 1=agree.

We consider the last category (satisfied) as the reference category for our model.
The multinomial logistic regression model will be:

$$\log(\frac{P(Y_i = m)}{P(Y_i = 3)}) = \alpha_m + \sum_{k=1}^{K} b_{mk} \cdot x_{ik} = Z_{mi} \quad \text{for m = 1, 2.}$$

2.3. Generation of the Logistic model

We have tried a lot of combinations of the predictor variables before constructing a valid model. A model can be characterized as "valid" if it fulfills some predefined accuracy measures. These accuracy measures are: (a) the significance of the model (we defined a valid model to have significance less than 0.05), (b) the significance of each variable of the model (every variable of the model should have significance less than 0.05), and (c) the classification table which compares the observed and the predicted groups (the highest the overall percentage of the classification table, the better the model is).

The final model has the following predictor variables: the employee abilities appropriated to the job as element of intrinsic motivation, the salary satisfaction level, the atmosphere in the company and company objectives for this year known by employees as elements of extrinsic motivation, the employee perceptions about their leader such as: he takes good decisions, he appreciates his employees, he fairly distributes the tasks, he listen the employees.

After building a model, you need to determine whether it reasonably approximates the behavior of data.

Pearson and Deviance goodness-of-fit measures presented in table 1 reveal the fact that the model adequately fits the data, the significance value being greater than 0.05. So we can say that the data are consistent with the model assumptions. The likelihood ratio test (table 2) shows whether the model fits the data better than a null model. Since the significance level of the test is less than 0.05, you can conclude the Final model is outperforming the Null.

For regression models with a categorical dependent variable, it is not possible to compute a single R^2 statistic that has all of the characteristics of R^2 in the linear regression model, so the following methods are used to estimate the coefficient of determination: Cox and Snell's R^2, Nagelkerke's R^2 and McFadden's R^2 (table 3) .The likelihood ratio tests (table 4) check the contribution of each effect to the model. Since the significance value of all most the variables are less than 0.05, we can say that all the variables effects contributes to the model.

Table. 1. Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	97.817	116	.888
Deviance	99.901	116	.857

Table 2. Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	305.916			
Final	153.275	152.641	16	.000

Table 3. Pseudo R-Square

Cox and Snell	.378
Nagelkerke	.472
McFadden	.294

Table 4. Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	1.533E2[a]	.000	0	.
How satisfied are you with your salary?	225.375	72.100	4	.000
Your abilities are appropriate to the job?	166.989	13.714	2	.001
There is a pleasant atmosphere in the company?	168.810	15.535	2	.000
Do you know the company objectives for this year?	158.028	4.752	2	.093
The leader takes good decisions?	162.051	8.775	2	.012
The leader appreciates his employees?	159.913	6.637	2	.036
He fairly distributes the tasks?	1.533E2[a]	.000	0	.
He listen the employees opinions?	1.533E2[a]	.000	0	.

All most the variables have statistically significant coefficients. Parameters with significant negative coefficients decrease the likelihood of that response category with respect to the reference category. Parameters with positive coefficients increase the likelihood of that response category.

The classification table shows the practical results of using the multinomial logistic regression model. Of the cases used to create the model, 16 of the 42 people who stated that they are dissatisfied with their jobs are classified correctly. Only 17 of the 86 people who are indifferent are classified correctly and 205 of 273 people who are satisfied with their jobs are classified correctly.

Overall, 74.1% of the cases are classified correctly. This compares favorably to the "null" or intercept-only model, which classifies all cases as the modal category. According to the case processing summary, the modal category is satisfied, with 69.5% of the cases. Thus, the null model classifies correctly 69.5% of the time.

Using the Multinomial Logistic Regression Model, you have constructed a model for predicting the job satisfaction level of the Romanian employees.

Parameter Estimates

grad_multumire[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
Nemultumit	Intercept	-4.327	.614	49.715	1	.000	
	[salariu=.00]	3.343	.719	21.589	1	.000	28.295
	[salariu=1.00]	1.369	.682	4.025	1	.045	3.931
	[salariu=2.00]	0[b]	.	.	0	.	.
	[abilitati_post=.00]	2.701	.812	11.078	1	.001	14.895
	[abilitati_post=1.00]	0[b]	.	.	0	.	.
	[atmosfera=.00]	2.110	.544	15.035	1	.000	8.251
	[atmosfera=1.00]	0[b]	.	.	0	.	.
	[obiective=.00]	1.357	.614	4.889	1	.027	3.883
	[obiective=1.00]	0[b]	.	.	0	.	.
	[decizii_bune=.00]	-.940	.844	1.242	1	.265	.390
	[decizii_bune=1.00]	0[b]	.	.	0	.	.
	[apreciere_angajati=.00]	.708	.567	1.562	1	.211	2.030
	[apreciere_angajati=1.00]	0[b]	.	.	0	.	.
	[repartizare_sarcini=.00]	-.575	.683	.707	1	.400	.563
	[repartizare_sarcini=1.00]	0[b]	.	.	0	.	.
	[pareri_angajati=.00]	0[b]	.	.	0	.	.
	[pareri_angajati=1.00]	0[b]	.	.	0	.	.
Indiferent	Intercept	-3.189	.401	63.153	1	.000	
	[salariu=.00]	3.064	.576	28.251	1	.000	21.405
	[salariu=1.00]	2.553	.442	33.342	1	.000	12.851
	[salariu=2.00]	0[b]	.	.	0	.	.
	[abilitati_post=.00]	2.036	.720	8.000	1	.005	7.657
	[abilitati_post=1.00]	0[b]	.	.	0	.	.
	[atmosfera=.00]	.724	.473	2.336	1	.126	2.062
	[atmosfera=1.00]	0[b]	.	.	0	.	.
	[obiective=.00]	.253	.565	.200	1	.655	1.287
	[obiective=1.00]	0[b]	.	.	0	.	.
	[decizii_bune=.00]	1.121	.504	4.952	1	.026	3.069
	[decizii_bune=1.00]	0[b]	.	.	0	.	.
	[apreciere_angajati=.00]	-.744	.453	2.693	1	.101	.475
	[apreciere_angajati=1.00]	0[b]	.	.	0	.	.
	[repartizare_sarcini=.00]	-.149	.486	.094	1	.760	.862
	[repartizare_sarcini=1.00]	0[b]	.	.	0	.	.
	[pareri_angajati=.00]	0[b]	.	.	0	.	.
	[pareri_angajati=1.00]	0[b]	.	.	0	.	.

a. The reference category is: Multumit.

b. This parameter is set to zero because it is redundant.

Table 5. Classification

	Predicted			
Observed	Dissatisfied	Indifferent	Satisfied	Percent Correct
Dissatisfied	16	1	15	50.0%
Indifferent	4	17	45	25.8%
Satisfied	4	14	205	91.9%
Overall Percentage	7.5%	10.0%	82.6%	74.1%

Conclusions

The paper estimates the level of employee job satisfaction in the Romanian companies using the multinomial logistic regression model. The data were collected from 402 employees from 41 counties. Extrinsic and intrinsic factors are considered. The results reveal the fact the employee abilities appropriated to the job as element of intrinsic motivation, the atmosphere in the company and company objectives for this year known by employees as elements of extrinsic motivation, the employee perceptions about their leader such as: he takes good decisions, he appreciates his employees, he fairly distributes the tasks, he listen the employee opinions and the salary satisfaction level have a significant positive impact on job satisfaction. The model classifies correctly 205 of 273 people who are satisfied with their jobs. Overall, 74.1% of the cases are correctly classified.

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