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Research and Improvement of Employee Motivation in Mining Companies: A Case Study of "Ibarski Rudnici", Serbia

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ABSTRACT

Research has been conducted to examine the effect of work motivation, work environment and incentives on the employee satisfaction in one of the most important mines in Serbia called "Ibarski rudnici". The empirical research was conducted in the period from September to November 2018, and 49 employees were examined. The questionnaire is compounded by the Likert's five-stage scale. In this study, the T-test is useful as part of the analysis used to test the satisfaction of the various aspects of the work. One-factor analysis (ANOVA) was applied for the research of the desirable characteristics of the manager in the work. Such a sample may not be fully representative, but is sufficiently informative in any case, since it can be concluded that some factors influence the work motivation in the analyzed company. The data was processed with the statistical package IBM SPSS Statistic 20. for Windows shows that: There is a positive and significant influence on the working motivation of employee satisfaction in the mining company. The analyzed models for investigating the motivation of employees indicate that a real managerial approach implies real knowledge and monitoring of employee preferences and preferences, as well as adequate material and non-material incentives, but also desirable qualities that each manager should possess.

Keywords: Work Motivation, Mining Company, Employee Job Satisfaction
JEL Classifications: M12, M54, L0, Q3

1. INTRODUCTION

Employee motivation can be defined as a business environment that connects the interests and needs of employees in the organization and affects the satisfaction of employees. One of the most important challenges in managerial activities is equalizing the needs of the organization and the needs of employees, because any mismatch inevitably leads to a disruption of the relationship between managers and employees. Bearing in mind that employees are the most important resource in the company, the development of employee motivation is a prerequisite for achieving the expected business results. Many studies confirm that the needs, the basic motivation factor of human behavior in the workplace, and that they are a strong foothold of identity.

Mines as complex, multi-layered hierarchical systems, with structured entity organization, operate on economic and other criteria subject to change. The effects of mining production depend not only on natural conditions, technical equipment and socio-economic environment, but also on human resources. The entire organization is made up of workers of various professions and qualifications. The most massive are definitely miners or diggers in the narrow sense. Bearing in mind that the business of mining companies, the driving force of stable economies, their business involves moderate and stable growth, constant improvement of employee satisfaction, guaranteed social needs, maintenance of working culture.

The intensive development of mining in the area of today's Serbia is practically practiced after the Second World War, when

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a large number of mines were opened under state ownership. Due to the social and economic significance and specificity of the ambient business conditions, mining has been trying to regulate its operations by the rules of operation since ancient times. The Mining Code, Mining Law or Miners' Law enacted by Despot Stefan Lazarevic on 29 January 1412, formulated earlier in 1390 (Radojcic, 1962).

An evolutionary return to the past points to the following features in mining: The orderliness, the definition of work rules, the determination of competencies, rights and obligations, normative conditionality, narrowly specialized knowledge and expertise, standardization and the like (Radosavljevic, 2016). Serbia currently has about 250 exploitation fields in which mining activities take place. Also, there are about 100 research fields, where some of the world's largest mining companies are present. Foreign mining companies invest between $ 10 million and $ 100 million annually on geological research in Serbia.

The Ibar Valley has long been recognized as a valley of mining. In written sources there are traces of mining and mining settlements in the 3rd century BC. Located between the two mountains, Kopaonik and Golija, on the road from the Apennine peninsula and the Dubrovnik region towards the Middle and the Far East. On the basis of written tracks, first mining in this region started with the exploitation of copper, then silver, gold, coal, and in recent history, mines of lead, zinc, asbestos, magnesite as well as construction and technical stone. In the village of Baljevac there is the headquarters of the Ibar coal mines, which includes the Pobrdje deposit. The first Ibar mine in the Raska municipality was opened in 1924, and it was founded by the company Savic and worked until the Second World War. During the war, he was taken over by the state and worked in disruptions. After the war, he continued to work as a state-owned company until 1992, when Elektroprivreda took over the mine and owned it until 2003. After that, all the mines were united into a public enterprise for underground coal mining (JP PEU) "Resavica." Organizational units of the mine with 459 employees are: Jarando (2 managers and 159 employees), "Usce" (where the pit is Tadenje and the surface mine Progorelica, (5 managers and 154 workers), "Separation and Cableway" (3 managers and 112 employees) and "Professional Services" (6 managers and 34 employees). To ensure safety and safety at work, the mine applies the following standards: ISO 9000 quality management system, (QMS) 14001 environmental management system (EMS), 18001 occupational health and safety management systems (OHSAS), integrated management system: QMS (ISO 9001, EMS - 14001) and OMS (OHSAS 18001).

The last few decades have seen a significant decline in mining production. The reasons for this are multiple: Outdated and incomplete legal solutions in the field of mining and geological research, inherited problems from the previous period related to the way of organization, legal status of mining companies and non-market manner of their business. Due to a certain inertia of management and expectations of problem solving by the state, lack of state, clumsy privatization in the conditions of sudden price jump, most of the mines and mining plants did not react in a timely manner to provide themselves with the benefit of improving the future.

The main objective of this paper is to review the current human resource management practice and its impact on maintaining the motivation of employees in the performance of tasks in the mining company, implementing an adequate system of motivation and their interaction. Bearing in mind that mining management does not provide satisfactory results in practice, it has initiated the choice of the topic and focused the goal of researching this paper. This work is characterized by the actuality and importance of the problems important for the economy of the mining industry, both from the macroeconomic aspect (increase in unemployment, living costs), and microeconomic aspect (dismissal of employees) and from the psychological aspect (risk and stress).

The aim of this paper is to study the factors that influence the motivation of labor in mining companies and become a very relevant field of research in practice. In addition to the overall goal of this study, the application of specific objectives is necessary: To provide an overview and measure employee satisfaction, to identify the weaknesses of the management that affect the motivation of employees, and to propose measures to improve employee satisfaction and increase motivation. The advantage of this research is in the discovery of behavior based on the mutual exchange of management ideas with employees, in order to continuously improve and strengthen these relationships.

2. LITERATURE REVIEW

It is envisaged that this research will be carried out in two phases, theoretical research and practical check. Researching sources of information and the achievements of mining management in developing employee motivation points to a negligible number of determinants that relate to this topic (27, 100). By searching sources in English, double sources were obtained. The closest focus of the research topic is the practice of motivation that contributes to increasing performance in mining companies (Du Plessis et al., 2013). These results can be accepted as rough indicators of openness and actuality of the research topic. The authors consider that there are several factors that motivate most employees in the mining sector. A review of literature suggests that job satisfaction is higher if managers treat employees with respect and respect, if employees estimate that their managers are competent, if the manager provides opportunities for promotion and if it is not too formal in relation to employees, and if employees believe that executives are working in their interest (Drafke, 2009).

Research has a scientific and social contribution to make mining companies more motivated by employees and achieve better performance. Management of human resources in mining companies is entrusted to mining management, which includes all aspects of employee relations in the company. One of the biggest problems in the mining company is to motivate employees

to achieve the goals of the company, because the employees contribute their work and behavior to achieving their tasks. Motives are psychological factors that move on to activity, direct and maintain activity in order to achieve a goal that can meet a particular need (Kordic and Pajevic, 2007). Many authors define motivation as an interaction of motives and incentives (Bandt, 2013). Motivation can be defined as an internal driving force that supplies the driving force for achieving goals and meeting needs. Therefore, employee motivation is one of the most important roles of mining management. In the theory and practice of motivation there are various recommendations to managers in order to increase the motivation of employees. Managers should motivate their employees to develop a sense of working, not to work because they have to work (Du Plessis et al., 2013). Lussier (2011) suggests that managers must satisfy employees to ensure productivity. In the context of an organization, motivation can be viewed from two aspects. From the perspective of an individual, motivation is an internal state that leads to the achievement of the goal. From the point of view of managers, motivation is an activity that ensures that people strive for and set goals. Both of these aspects have an important common meaning: Motivation is the effort to achieve results. One of the most prominent scientists involved in the study of job satisfaction is Paul Spector. He regards satisfaction with the job as "what a person feels about his job and different aspects of his work." In his research, he highlighted the reasons that conditioned the importance of job satisfaction and factors contributing to increased job satisfaction (Spector, 2003).

The goal of each mining manager should be to create such a business environment where people with a high degree of motivation to do their jobs are working. Internal motivation refers to the creation of a pleasant working environment. According to research, it has been proven that earning affects individual performance of an individual, which corresponds to Maslow theory. On the contrary, DuBrin has discovered that the use of non-cash incentives is stimulating employee satisfaction (DuBrin, 2012). Management of human resources in mining companies is a required task, which in the process of solving requires the synergy of mining and the management system. Al-Adaileh (2017) views as the ability of an organization to outperform its competitors not only through enforcing outstanding organizational practices but also through successful integration among all organizational components including leadership, human resources, organizational culture, organizational structure and organizational processes. The equipment of mining enterprises of ferrous metallurgy needs constant updating because of specifics of production processes. Innovations in technologies underlie maintenance of Russian enterprises of ferrous metallurgy competitiveness in the world and internal markets (Samarina et al., 2016). Based on the knowledge of motivation theory, it is a great challenge to define the aspects of work that affect the motivation of employees in mining.

3. METHODOLOGY

The satisfaction of the job cannot be directly measured, but indirectly. This can be done by the method of interviewing and interviewing an employee. This work is based on the application of primary and secondary data. Primary data is collected through structured questionnaires. Data collection for this survey was conducted in the period from September to November 2018. The researchers conducted informative interviews and surveyed 49 workers in the mining company "Ibarski rudnici". In order to protect the confidentiality of the participants, the data is encrypted in operation. For the purpose of this work, the JSS questionnaire was used by Paul's Spector (Job Satisfaction Survey), which he developed in 1985. Nine aspects of the job, according to Spector, make, salary, improvement, supervision, benefits, awards, working procedures, associates, nature of work and communication (Spector, 2003). The questionnaire is applicable in all types of organizations, and this is one of the reasons why it was applied in this research with some modifications.

Quantitative and qualitative methods were applied in the research. In the quantitative approach, the data collected are quantified and analyzed by statistical methods. The questionnaire was developed using the Likert five-stage scale. The questions in the questionnaire are structured in two parts, with the answers given by the grades 1 to 5 (1 - I completely disagree, 2 I do not agree, 3 - I do not have a position, 4 - I agree and 5 - I completely agree). Questions from the first part of the questionnaire include seven aspects of the job: (1). Material stimulants, (2). Improvements and awards, (3). Nature of work, (4). Organizational culture, (5). Control and supervision, (6). Communication and, (7). Employee loyalty. The questions are formulated to examine employee attitudes about work aspects that influence the motivation of employees in the mining company and affect their satisfaction. The second part of the questionnaire includes questions relating to the desirable characteristics of managers in the management of the mining company, from the aspect of the following assertions: Resourcefulness, determination, business, courage, objectivity, self-control, enthusiasm, criticality, personal culture and behavior and, honesty. One should not omit the fact that these qualities are cultural, ambient and organizational. These are dependent variables presented at the ordinal level, which represent individual assessed personality traits that employees rank according to the order of importance for mining management. The aim is to determine the hierarchy of the mentioned characteristics according to the degree of importance, median, x min, average rank. The data was processed with the statistical package IBM SPSS Statistic 20. For the first part of the question, in this study, the T - test of independent samples was applied, which examines whether the differences between the arithmetic meanings are statistically significant, i.e., whether the finding we found in the sample can be generalized to employees in mining companies. In this case, the differences in the claims between miners and managers on various aspects of work are compared. In the concrete case, the categorical independent constraints in the work are the workers in direct production, i.e., the parents (coded 1) and the managers (3 are encrypted), while the administrative staff were abstracted due to the more precise impact of the work aspects on the mentioned groups of employees. Continuous

dependent variables are aspects of the job. In the research, we will determine the size of the impact of the groups. Since the SPSS does not calculate the eta square (ηp2), how independent variables affect the dependents, the authors calculate it by using the results obtained and the interpretation is based on Cohen's guidelines (Cohen, 1988). Secondary data used in the study was collected from related magazines, books, and the Internet.

For the purpose of investigating the desirable characteristics of the manager, we apply a single-factor analysis of variance (ANOVA), in order to analyze the results in three different groups of working positions of employees in the mining company. The research question has a focus on discovering whether the results of measuring the manager's preferences of miners, administrative staff, and self-criticism of managers are different. The category independent variable is a working position of employees of three groups: Miners, administrative staff and managers. ANOVA shows whether there are significant differences between the mean values of the dependent variable in all three working group groups. The aim of the analysis is to determine whether the assessed characteristics differ significantly from the importance of the managerial invitation in the mining company.

4. RESULTS AND DISCUSSION

Based on the presented areas of motivation factors for employees, we have come up with a series of claims, i.e., indicators of employee attitudes. The main research question in the work should provide an answer to whether there are significant differences between the average values of the business aspects of miners and managers. The zero hypothesis will not speak of a statistically significant difference, while the alternative hypothesis will confirm the given difference. We create hypotheses in the following way:

H_0: There is no statistically significant difference between the average values of the business aspects of miners and managers.

H_1: The differences between the average values of the business aspects of miners and managers are statistically significant.

For the purposes of this study, the following hypotheses have been developed:

H_1: Employees are "satisfied" with salaries in the mining company;

H_2: Employees are "satisfied" with compensations in a mining company;

H_3: Employees are "satisfied" with the number of business trips;

H_4: Employees are "satisfied" with praise for their work;

H_5: Employees are "satisfied" with equipment for work in a company;

H_6: Employees are "satisfied" with work discipline in the company;

H_7: Employees are "satisfied" with a team organization in a company;

H_8: Employees are "satisfied" with a positive working atmosphere in the company;

H_9: Employees are "satisfied" with company control and control;

H_{10}: Employees are "satisfied" that one manager manages a large number of employees;

H_{11}: Employees are "satisfied" with interpersonal relationships in the company;

H_{12}: Employees are "satisfied" with the regularity of working meetings;

H_{13}: Employees are "satisfied" with the company's job security;

H_{14}: Employees are "satisfied" with learning aid;

A total of 49 questionnaires were available for the statistical analysis (N = 49). Among the respondents there were 4 women (8.2%) and 45 men (91.8%). Among them, 31 persons aged under 35 (63.3%), 11 persons aged 35 to 45 (22.4%) and 7 persons over 45 (14.3%) were interviewed. The data shows that the mine is dominated by a young population of employees. The level of education is dominated by employees of lower education 34 persons (69.4%), secondary education 9 persons (18.4%) and 6 persons with completed higher education or faculty (12.2%). From the aspect of length of service, employees with a past service of up to 20 years dominate, 26 persons (53.1%), followed by 16 persons with a service up to 10 years (32.7%) and 7 persons with a service over 20 years (14.3%). By insight into the data, workers in production 33 account for 67.3% of total workers, 11 administrative workers (22.4%) and 5 managers (10.2%).

Based on Table 1 and Table 2, we note that there are differences in arithmetic environments, which shows that employees are not completely satisfied with all aspects of work in mining companies.

H_0: Employees are "not satisfied" with salaries in a mining company;

H1: Employees are "satisfied" with salaries in the mining company;

Based on the data from the table, the results of the mean value test are compared. There was no significant difference between miners' results (M = 4.21; standard deviation (SD) = 0.69) and managers (M = 3.20; SD = 1.30; t = (4.35) = 1.69, P = 0.15 (both sides). The difference between the mean values of the marks by groups is (average difference = 1.01, 95% confidence interval (CI): −0.58-2.61). Therefore, the zero hypothesis is accepted and rejected by the alternative, with the conclusion that the difference is not significant but incidental.

Table 1: Group statistics

Working position	N	Mean±Standard deviation	Standard error mean
I think I'm just paid for the job I'm doing			
Workers in production	33	4.2121±0.69631	0.12121
Managers	5	3.2000±1.30384	0.58310
I receive compensation			
Workers in production	33	1.4848±0.50752	0.08835
Managers	5	2.4000±0.54772	0.24495
The company organizes business trips			
Workers in production	33	3.3636±0.69903	0.12168
Managers	5	2.6000±0.89443	0.40000
I often get praise for my work			
Workers in production	33	1.9697±0.91804	0.15981
Managers	5	2.6000±0.54772	0.24495
Work equipment is adequate			
Workers in production	33	3.6061±0.60927	0.10606
Managers	5	3.0000±0.70711	0.31623
Work discipline is respected			
Workers in production	33	4.4242±0.56071	0.09761
Managers	5	4.0000±0.00000	0.00000
The work is team-organized			
Workers in production	33	4.3939±0.60927	0.10606
Managers	5	4.0000±0.70711	0.31623
There is a positive working atmosphere in the company			
Workers in production	33	4.3333±0.69222	0.12050
Managers	5	4.0000±0.00000	0.00000
Excessive control and surveillance			
Workers in production	33	3.8182±0.68258	0.11882
Managers	5	4.2000±0.44721	0.20000
One manager manages a large number of employees			
Workers in production	33	4.2121±0.78093	0.13594
Managers	5	4.4000±0.54772	0.24495
Interpersonal relations are not violated			
Workers in production	33	4.8182±0.46466	0.08089
Managers	5	4.4000±0.54772	0.24495
Regular meetings are held			
Workers in production	33	3.9697±0.52944	0.09216
Managers	5	4.2000±0.44721	0.20000
I have a very important job security			
Workers in production	33	4.5152±0.61853	0.10767
Managers	5	3.6000±0.54772	0.24495
Employees help each other to learn			
Workers in production	33	4.0000±0.50000	0.08704
Managers	5	4.2000±0.44721	0.20000

H_0: Employees are "not satisfied" with compensations in the mining company.

H_2: Employees are "satisfied" with compensations in the mining company.

Based on the data from the table, the results of the mean compensation calculation were compared. There is a significant difference with miners (M = 1.48; SD = 0.50) and managers (M = 2.40; SD = 0.54; t = (36) = −3.72, P = 0.001 [both sides]). The difference between the mean values of the marks by groups is (average difference = −0.91, 95% CI: −1.41-−0.41). Thus, the zero hypothesis is rejected and accepts the alternative, with the conclusion that a statistically significant link between compensation for miners and managers is observed.

H_0: Employees are "not satisfied" with the number of business trips.

H_3: Employees are "satisfied" with the number of business trips.

Based on the data from the table, the results of testing the average value of business trips are compared. A significant difference was observed with miners (M = 3.36; SD = 0.69) and managers (M = 2.60; SD = 0.89; T = (36) = 2.20, P = 0.03 (mutually)). The difference between the mean values of the marks by groups is (average difference = 0.76, 95% CI: 0.05-1.46). Thus, the zero hypothesis is rejected, and accepts the alternative, concluding that there is a link between the average value of business trips with miners and managers.

H_0: Employees are "not satisfied" with praise for their work.

H_4: Employees are "satisfied" with praise for their work.

On the basis of the data from the table, the results of the median value test were compared. No significant difference was observed

Table 2: Independent samples test

Aspects of engagement	Levene's test for equality of variances		t-test for equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Standard error difference	95% confidence interval of the difference	
								Lower	Upper
I think I'm just paid for the job I'm doing									
Equal variances assumed	5.614	0.023	2.679	36	0.011	1.01212	0.37783	0.24584	1.77840
Equal variances not assumed			1.699	4.352	0.159	1.01212	0.59556	−0.58997	2.61421
I receive compensation									
Equal variances assumed	1.074	0.307	−3.724	36	0.001	−0.91515	0.24578	−1.41361	−0.41669
Equal variances not assumed			−3.514	5.098	0.016	−0.91515	0.26039	−1.58068	−0.24962
The company organizes business trips									
Equal variances assumed	0.450	0.507	2.200	36	0.034	0.76364	0.34713	0.05962	1.46766
Equal variances not assumed			1.826	4.770	0.130	0.76364	0.41810	−0.32693	1.85421
I often get praise for my work									
Equal variances assumed	0.327	0.571	−1.485	36	0.146	−0.63030	0.42451	−1.49125	0.23065
Equal variances not assumed			−2.155	7.950	0.063	−0.63030	0.29247	−1.30548	0.04488
Work equipment is adequate									
Equal variances assumed	0.617	0.437	2.034	36	0.049	0.60606	0.29797	0.00175	1.21037
Equal variances not assumed			1.817	4.943	0.130	0.60606	0.33354	−0.25433	1.46645
Work discipline is respected									
Equal variances assumed	41.994	0.000	1.672	36	0.103	0.42424	0.25369	−0.09027	0.93876
Equal variances not assumed			4.346	32.000	0.000	0.42424	0.09761	0.22542	0.62306
The work is team-organized									
Equal variances assumed	1.164	0.288	1.322	36	0.194	0.39394	0.29797	−0.21037	0.99825
Equal variances not assumed			1.181	4.943	0.291	0.39394	0.33354	−0.46645	1.25433
There is a positive working atmosphere in the company									
Equal variances assumed	17.875	0.000	1.064	36	0.294	0.33333	0.31320	−0.30186	0.96853
Equal variances not assumed			2.766	32.000	0.009	0.33333	0.12050	0.08788	0.57878
Excessive control and surveillance									
Equal variances assumed	1.477	0.232	−1.204	36	0.236	−0.38182	0.31701	−1.02475	0.26111
Equal variances not assumed			−1.641	7.210	0.143	−0.38182	0.23263	−0.92868	0.16505
One manager manages a large number of employees									
Equal variances assumed	0.452	0.506	−0.516	36	0.609	−0.18788	0.36403	−0.92618	0.55042
Equal variances not assumed			−0.671	6.763	0.525	−0.18788	0.28014	−0.85504	0.47928
Interpersonal relations are not violated									
Equal variances assumed	1.204	0.280	1.836	36	0.075	0.41818	0.22776	−0.04374	0.88011
Equal variances not assumed			1.621	4.913	0.167	0.41818	0.25796	−0.24849	1.08485
Regular meetings are held									
Equal variances assumed	0.017	0.898	−0.921	36	0.363	−0.23030	0.25000	−0.73733	0.27672
Equal variances not assumed			−1.046	5.846	0.337	−0.23030	0.22021	−0.77260	0.31199
I have a very important job security									
Equal variances assumed	0.478		3.121	36	0.004	0.91515	0.29325	0.32041	1.50989
Equal variances not assumed			3.420	5.669	0.015	0.91515	0.26757	0.25104	1.57926
Employees help each other to learn									
Equal variances assumed	0.148		−0.843	36	0.405	−0.20000	0.23727	−0.68120	0.28120
Equal variances not assumed			−0.917	5.633	0.397	−0.20000	0.21812	−0.74225	0.34225

with miners (M = 1.96; SD = 0.91) and managers (M = 2.60; SD = 0.54; t = (36) = −1.48, P = 0.14 [mutually]). The difference between the mean values of the marks by groups is (average difference = −0.63, 95% CI: −1.49-0.23). Hence, the null hypothesis accepts, and rejects the alternative, concluding that the difference is not significant, but random.

H_0: Employees are "not satisfied" with work equipment in the company.

H_5: Employees are "satisfied" with equipment for work in a company.

On the basis of the data from the table, the results of the testing of the mean value of the equipment for work were compared. There was a significant difference with the miners (M = 3.60; SD = 0.60) and managers (M = 3.00; SD = 0.70; T = (36) = 2.03, P = 0.04 [both sides]). The difference between the mean values of the marks by groups is (average difference = 0.60, 95% CI: 0.00-1.21). Thus, the zero hypothesis is rejected, and accepts the alternative, concluding that there is a link between the average value of business trips with miners and managers.

H_0: Employees are "not satisfied" with the work discipline in the company.

H_6: Employees are "satisfied" with the work discipline in the company.

Based on the data from the table, the results of the examination of mean value of working discipline are compared. It was noticed that there is a significant difference with miners (M = 4.42; SD = 0.56) and managers (M = 4.00; SD = 0.00; T = (32.00) = 4.34, P = 0.00 [both sides]). The difference between the mean values of the marks by groups is (average difference = 0.42, 95% CI: 0.22-0.62). Thus, the zero hypothesis is dismissed, and it accepts the alternative, with the conclusion that there is a significant difference between the mean values of the working discipline in miners and managers.

H_0: Employees are "not satisfied" with a team organization in the company.

H_7: Employees are "satisfied" with a team organization in a company.

Based on the data from the table, the results of testing the mean value of the team organization are compared. It was noticed that there was no significant difference with the miners (M = 4.39; SD = 0.60) and managers (M = 4.00; SD = 0.70; T = [36] = 1.32, P = 0.19 [both sides]). The difference between the mean values of the marks by groups is (average difference = 0.39, 95% CI: −0.21-0.99). Thus, the zero hypothesis is accepted, and it rejects the alternative, with the conclusion that the difference is not significant but incidental.

H_0: Employees are "not satisfied" with the positive working atmosphere in the company.

H_8: Employees are "satisfied" with a positive working atmosphere in the company.

Based on the data from the table, the results of testing the mean value of the positive working atmosphere in the company are compared. A significant difference was noted with the miners (M = 4.33; SD = 0.69) and managers (M = 4.00; SD = 0.00; T = (32.00) = 2.76, P = 0.00 [both sides]). The difference between the mean values of the marks by groups is (average difference = 0.33, 95% CI: 0.08 to 0.57). Thus, the zero hypothesis is rejected, and it accepts the alternative, concluding that there is a connection between the mean value of a positive working atmosphere in miners and managers.

H_0: Employees are "not satisfied" with company control and control.

H_9: Employees are "satisfied" with company control and control.

Based on the data from the table, the results of testing the mean value of the positive working atmosphere in the company are compared. No significant difference was observed with miners (M = 3.81; SD = 0.68) and managers (M = 4.20; SD = 0.44; T = (36) = − 1.20, P = 0.23 [mutually]). The difference between the mean values of the marks by groups is (average difference = −0.38, 95% CI: −1.02-0.26). Thus, the zero hypothesis is accepted, and it rejects the alternative, with the conclusion that the difference is not significant but incidental.

H_0: Employees are "not satisfied" that one manager manages a large number of employees.

H_{10}: Employees are "satisfied" that a manager manages a large number of employees.

Based on the data from the table, the results of the mean value are compared to one manager managing a large number of employees. No significant difference was observed with miners (M = 3.81; SD = 0.68) and managers (M = 4.20; SD = 0.44; T = (36) = −1.20, P = 0.23 [mutually]). The difference between the mean values of the marks by groups is (average difference = −0.38, 95% CI: −1.02-0.26). Thus, the zero hypothesis is accepted, and it rejects the alternative, with the conclusion that the difference is not significant but incidental.

H_0: Employees are "not satisfied" with interpersonal relationships in the company.

H_{11}: Employees are "satisfied" with interpersonal relationships in the company.

Based on the data from the table, the results of the average value of interpersonal relationships in the company are compared. No significant difference was observed with miners (M = 4.81; SD = 0.46) and managers (M = 4.40; SD = 0.54; T = (36) = 1.83, p = 0.07 [mutual]). The difference between the mean values of the marks by groups is (average difference 0.41 = 0.95% CI: −0.04-0.88). Thus, the zero hypothesis is accepted, and it rejects the alternative, with the conclusion that the difference is not significant but incidental.

H_0: Employees are "not satisfied" with the regularity of work meetings.

H_{12}: Employees are "satisfied" with the regularity of working meetings.

Based on the data from the table, the results of the average value of the regularity of work meetings in the company are compared. No significant difference was observed with miners (M = 3.96; SD = 0.52) and managers (M = 4.20; SD = 0.44; T = (36) = −0.92, P = 0.36 [mutual]). The difference between the mean values of the marks by groups is (average difference = −0.23, 95% CI: −0.73-0.23). Thus, the zero hypothesis is accepted, and it rejects the alternative, with the conclusion that the difference is not significant but incidental.

H_0: Employees are "not satisfied" with the company's job security.

H_{13}: Employees are "satisfied" with the company's job security.

Based on the data from the table, the results of the average value of employee safety in the company are compared. A significant

Table 3: Measures of association

Impact of employee engagement on job satisfaction	Eta	Eta squared
I think I'm just paid for the job I'm doing * Work Position	0.417	0.174
I receive compensation *working position	0.623	0.389
The company organizes business trips * Working position	0.527	0.278
I often get praise for my work * work position	0.578	0.334
Equipment is adequate * working position	0.311	0.097
Work discipline is considered * work position	0.328	0.108
Work is team-based * work position	0.383	0.147
The company has a positive working atmosphere * working position	0.172	0.030
Excessive control and supervision * working position	0.232	0.054
One manager manages a large number of employees * working position	0.111	0.012
Interpersonal relations are not violated * working position	0.356	0.127
Regular meetings are held * working position	0.294	0.087
Work safety is very important to me	0.430	0.185
Employees help each other to learn * work position	0.225	0.051

Table 4: Test of homogeneity of variances

What Makes a Good Manager?	Levene statistic	df1	df2	Sig.
Resourcefulness	0.665	2	46	0.519
Determination	5.609	2	46	0.007
Successabylity	0.469	2	46	0.628
Courageness	4.964	2	46	0.011
Objectivity	24.532	2	46	0.000
Self-control	1.419	2	46	0.252
Entusions	2.508	2	46	0.092
Criticism	1.391	2	46	0.259
Personal culture and behavior	4.111	2	46	0.023
Fair	2.932	2	46	0.063

difference was observed with the miners (M = 4.51; SD = 0.61) and managers (M = 3.60; SD = 0.54; T = (36) = 3.12, P = 0.00 [both sides]). The difference between the mean values of the marks by groups is (average difference = 0.91, 95% CI: 0.32-1.50). Thus, the zero hypothesis is rejected, and it accepts the alternative, with the conclusion that there is a significant difference between the average values of work safety in the company and the miners and managers.

H_0: Employees are "not satisfied" with learning aid.

H_{14}: Employees are "satisfied" with learning aid.

Based on the data from the table, the results of the average value of help in learning the employees of the company are compared. A significant difference was observed in miners (M = 4.00; SD = 0.50) and managers (M = 4.20; SD = 0.44; T = (36) = −0.84, P = 0.40 [mutually]). The difference between the mean values of the marks by groups is (average difference = −0.20, 95% CI: −0.68-0.28). Thus, the zero hypothesis is rejected, and it accepts the alternative, with the conclusion that there is a significant difference between the mean values of learning aid, both in the miners and in the managers.

Using the SPSS program, a partial eta square was calculated as part of the variance analysis. based on Table 3. Measures of Association, an indicator of the size of the impact of a partial eta square is presented in proportion to the variation of the dependent variable, which is covert by independent variables. High impact was achieved in the compensation position (38.9%) and praise (33.4%), while the average impact was observed in control and supervision (5.4%), and the smallest impact that one manager manages a large number of employees (1.2%).

In the further research, the order of the characteristics that the respondents rang according to their degree of importance for the managerial call in the mining industry was analyzed. Based on Table 4. The homogeneity test of variance determines in which properties the assumption of the homogeneity of variance has not been violated. Since the assumption is impaired with the traits: Decisiveness, courage, objectivity, personal culture and behavior, this means that there is a statistically significant difference between the mean values of the particular trait.

It is necessary to determine which group in the working position is different from the rest. Since a statistically significant difference was obtained in Table 5 of the ANOVA, the results of the subsequent analyzes should be looked at in order to more precisely determine where the differences are between the groups as can be seen from Multiple Comparisons of the results of advanced tests, *post-hoc* tests (Table 6). Differences between groups are evident through the mean difference column (*). The two groups within the working position differ from each other at the level of $P < 0.05$. Only miners and administrative staff are statistically significantly different, i.e., they differ significantly according to the desirable characteristics of managers in relation to managers in the company.

From Table 7, to which the authors came in using the ANOVA analysis using the survey data, it has been observed that honesty and personal culture and behavior are at the top of a range of desirable qualities that mine managers must possess. After honesty and personal culture and behavior, which share the first place with 59.2%, the objectivity is also very desirable, which is preferred by 57.1% of the respondents. The fourth position is business with 24.5%. Regarding undesirable characteristics, which should not admire the mine management, the most disadvantageous feature is the criticality with 12.2%. Therefore, the conclusion is drawn that the interviewed workers are not overly willing to suffer criticism.

Table 5: ANOVA

Skills	Sum of squares	df	Mean square	F	Sig.
Resourcefulness					
Between groups	2.247	2	1.124	1.709	0.192
Within groups	30.242	46	0.657		
Total	32.490	48			
Determination					
Between Groups	0.837	2	0.419	1.144	0.328
Within Groups	16.836	46	0.366		
Total	17.673	48			
Successabylity					
Between Groups	3.835	2	1.918	6.019	0.005
Within Groups	14.655	46	0.319		
Total	18.490	48			
Courageness					
Between Groups	4.885	2	2.442	4.702	0.014
Within Groups	23.891	46	0.519		
Total	28.776	48			
Objectivity					
Between Groups	1.395	2	0.698	2.521	0.091
Within Groups	12.727	46	0.277		
Total	14.122	48			
Self-control					
Between Groups	4.744	2	2.372	7.753	0.001
Within Groups	14.073	46	0.306		
Total	18.816	48			
Entusions					
Between Groups	6.594	2	3.297	9.844	0.000
Within Groups	15.406	46	0.335		
Total	22.000	48			
Criticism					
Between Groups	38.507	2	19.253	19.915	0.000
Within Groups	44.473	46	0.967		
Total	82.980	48			
Personal culture and behavior					
Between Groups	0.498	2	0.249	0.733	0.486
Within Groups	15.624	46	0.340		
Total	16.122	48			
Fair					
Between Groups	0.535	2	0.267	0.789	0.460
Within Groups	15.588	46	0.339		
Total	16.122	48			

5. CONCLUSIONS

The issue of motivation for management in modern business conditions is one of the most important ones that gets more and more important. In practice, it's a real challenge to motivate employees to work and be a loyal company. There is no unique solution, because each individual is a personality for himself, the company sui generis company, and the environment is different. For different people, identical needs often have a completely different meaning. "Ibarski rudnici", reflects the dredging mining economy of Serbia, which is struggling with daily existential problems and is functional in relation to the possibilities and costs of maintaining employee satisfaction.

This study provided the answer to the main research question that was supported in the literature. The outcomes of these researches define the motivational approach of employees in the mining sector. The results of the analysis in this paper prove that in addition to material stimulus, important and immaterial stimulants, as well as the desirable characteristics that each manager should have. Comparing with the study on developing employee motivation in the four mining companies in Ghana we conclude that employees are primarily motivated by earnings or compensation (Kuranchie-Mensah and Amponsah-Tawiah, 2016). When earning exceeds the level of satisfaction of basic living needs, motivational factors are a good will and a sense of work (Frey, 1997).

Although the material reward is an incentive motive, in practice no one is fully satisfied with the salary. However, employees, besides salary, can be strongly motivated and praised, promoted, gaining greater responsibilities, or advancement. Material and non-material incentives can create the creative potential of employees. Employee managers expect desirable qualities: Honesty and personal culture. In domestic practice, a rule of praise should be established, instead of criticism and punishment, especially bearing in mind the results of the survey that indicate that workers are not sympathetic to criticism, especially if they are frequent and ungrounded.

Table 6: Multiple comparisons Tukey HSD

Dependent variable	(I) working position	(J) working position	Mean difference (I-J)	Standard error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Resourcefulness	Production workers	Administrative staff	−0.51515	0.28229	0.173	−1.1988	0.1685
		Managers	−0.24242	0.38912	0.808	−1.1848	0.6999
	Administrative staff	Production workers	0.51515	0.28229	0.173	−0.1685	1.1988
		Managers	0.27273	0.43733	0.808	−0.7864	1.3319
	Managers	Production workers	0.24242	0.38912	0.808	−0.6999	1.1848
		Administrative staff	−0.27273	0.43733	0.808	−1.3319	0.7864
Determination	Production Workers	Administrative staff	−0.18182	0.21063	0.666	−0.6919	0.3283
		Managers	−0.40000	0.29033	0.361	−1.1031	0.3031
	Administrative Staff	Production workers	0.18182	0.21063	0.666	−0.3283	0.6919
		Managers	−0.21818	0.32631	0.783	−1.0084	0.5721
	Managers	Production workers	0.40000	0.29033	0.361	−0.3031	1.1031
		Administrative staff	0.21818	0.32631	0.783	−0.5721	1.0084
Successabİlity	Production Workers	Administrative staff	−0.63636*	0.19651	0.006	−1.1123	−0.1605
		Managers	−0.49091	0.27087	0.177	−1.1469	0.1651
	Administrative Staff	Production workers	0.63636*	0.19651	0.006	0.1605	1.1123
		Managers	0.14545	0.30443	0.882	−0.5918	0.8827
	Managers	Production workers	0.49091	0.27087	0.177	−0.1651	1.1469
		Administrative staff	−0.14545	0.30443	0.882	−0.8827	0.5918
Courageness	Production Workers	Administrative staff	−0.63636*	0.25091	0.038	−1.2440	−0.0287
		Managers	−0.74545	0.34585	0.090	−1.5830	0.0921
	Administrative Staff	Production workers	0.63636*	0.25091	0.038	0.0287	1.2440
		Managers	−0.10909	0.38870	0.958	−1.0505	0.8323
	Managers	Production workers	0.74545	0.34585	0.090	−0.0921	1.5830
		Administrative staff	0.10909	0.38870	0.958	−0.8323	1.0505
Objectivity	Production Workers	Administrative staff	−0.18182	0.18313	0.585	−0.6253	0.2617
		Managers	−0.54545	0.25243	0.089	−1.1568	0.0659
	Administrative Staff	Production workers	0.18182	0.18313	0.585	−0.2617	0.6253
		Managers	−0.36364	0.28371	0.413	−1.0507	0.3234
	Managers	Production workers	0.54545	0.25243	0.089	−0.0659	1.1568
		Administrative staff	0.36364	0.28371	0.413	−0.3234	1.0507
Self-control	Production Workers	Administrative staff	−0.72727*	0.19257	0.001	−1.1936	−0.2609
		Managers	−0.47273	0.26544	0.187	−1.1156	0.1701
	Administrative Staff	Production workers	0.72727*	0.19257	0.001	0.2609	1.1936
		Managers	0.25455	0.29832	0.672	−0.4679	0.9770
	Managers	Production workers	0.47273	0.26544	0.187	−0.1701	1.1156
		Administrative staff	−0.25455	0.29832	0.672	−0.9770	0.4679
Entusions	Production Workers	Administrative staff	−0.84848*	0.20148	0.000	−1.3364	−0.3605
		Managers	−0.59394	0.27773	0.093	−1.2665	0.0787
	Administrative Staff	Production workers	0.84848*	0.20148	0.000	0.3605	1.3364
		Managers	0.25455	0.31214	0.695	−0.5014	1.0105
	Managers	Production workers	0.59394	0.27773	0.093	−0.0787	1.2665
		Administrative staff	−0.25455	0.31214	0.695	−1.0105	0.5014
Criticism	Production Workers	Administrative staff	−1.81818*	0.34233	0.000	−2.6472	−0.9891
		Managers	−2.03636*	0.47187	0.000	−3.1791	−.08936
	Administrative Staff	Production Workers	1.81818*	0.34233	0.000	0.9891	2.6472
		Managers	−0.21818	0.53033	0.911	−1.5026	1.0662
	Managers	Production workers	2.03636*	0.47187	0.000	0.8936	3.1791
		Administrative staff	0.21818	0.53033	0.911	−1.0662	1.5026
Personal culture and behavior	Production Workers	Administrative staff	−0.21212	0.20291	0.552	−0.7035	0.2793
		Managers	0.11515	0.27969	0.911	−0.5622	0.7925
	Administrative Staff	Production workers	0.21212	0.20291	0.552	−0.2793	0.7035
		Managers	0.32727	0.31434	0.555	−0.4340	1.0885
	Managers	Production workers	−0.11515	0.27969	0.911	−0.7925	0.5622
		Administrative staff	−0.32727	0.31434	0.555	−1.0885	0.4340
Fair	Production Workers	Administrative staff	−0.15152	0.20267	0.737	−0.6423	0.3393
		Managers	−0.31515	0.27936	0.502	−0.9917	0.3614
	Administrative Staff	Production workers	0.15152	0.20267	0.737	−0.3393	0.6423
		Managers	−0.16364	0.31397	0.861	−0.9240	0.5968
	Managers	Production workers	0.31515	0.27936	0.502	−0.3614	0.9917
		Administrative staff	0.16364	0.31397	0.861	−0.5968	0.9240

*The mean difference is significant at the 0.05 level

Table 7: Order of preferred properties statistics

Skills for Manager	Resourcefulness	Determination	Successabylity	Courageness	Objectivity	Self-control	Entusions	Criticism	Personal culture and behavior	Fair
N										
Valid	49	49	49	49	49	49	49	49	49	49
Missing	0	0	0	0	0	0	0	0	0	0
Mean	3.8980	4.0816	4.1020	3.6735	4.5510	3.9388	3.8571	2.9796	4.5510	4.5510
Median	4.0000	4.0000	4.0000	4.0000	5.0000	4.0000	4.0000	3.0000	5.0000	5.0000
Mode	4.00	4.00	4.00	4.00	5.00	4.00	4.00	2.00	5.00	5.00
Standard deviation	0.82272	0.60679	0.62065	0.77427	0.54242	0.62610	0.67700	1.31482	0.57956	0.57956
Skewness	−0.273	−0.618	−0.065	−0.754	−0.618	0.041	0.180	0.096	−0.876	−0.876
Standard error of skewness	0.340	0.340	0.340	0.340	0.340	0.340	0.340	0.340	0.340	0.340
Kurtosis	−0.512	2.265	−0.312	0.350	−0.806	−0.326	−0.752	−1.304	−0.181	−0.181
Standard error of kurtosis	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668
Range	3.00	3.00	2.00	3.00	2.00	2.00	2.00	4.00	2.00	2.00
Minimum	2.00	2.00	3.00	2.00	3.00	3.00	3.00	1.00	3.00	3.00
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Sum	191.00	200.00	201.00	180.00	223.00	193.00	189.00	146.00	223.00	223.00

This work is a contribution to the confirmation of the hypothesis from the study by Kuranchie-Mensah and Amponsah-Tawiah (2016) report that motivation and employee satisfaction derive from real knowledge and observation of their preferences and not the result of a stereotype managers about employees. In order to achieve the full effects of labor motivation in a mine company, there is a need for a combination of desirable traits of mine management with employees. Regular practice in mining companies should be measuring employee satisfaction and monitoring their needs and preferences. In order for a company to operate successfully, mining management needs to understand the needs and requirements of its employees, as well as to find an optimal mix of material and immaterial incentives for its employees.

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