Evaluation of Factors Affecting Labor Productivity in Turkey by Using Herzberg Motivation-Hygiene Theory

Aynur KAZAZ, Turgut ACIKARA, Bayram ER

***Abstract*— Human resource is one of the basic components of construction projects. Therefore, productivity improvement in construction industry mainly depends on an increase of labor productivity. However, for a productivity improvement the motivation concept must be clearly understood. Since, motivation and labor productivity are directly correlated; in the literature many motivation theories were developed by different researchers. Motivation- Hygiene theory which was developed by Herzberg is one of the broadly accepted one. In this study, it was aimed to investigate the relation between motivation and labor productivity. For this purpose, first a questionnaire was administered to 126 craft workers to determine the factors affecting labor productivity and Relative Importance Index (RII) was used for ranking them. Finally, 22 factors were investigated by using Herzberg's Motivation-Hygiene theory. The results revealed that in Turkish construction industry hygiene factors set has more impact on labor productivity compared to job enrichment factors set.**

***Index Terms*— Construction, labor productivity, motivation, relative importance index, Turkish construction industry**

I. Introduction

Motivation can be simply defined as the whole factors which ensure craft workers to finish their tasks wishfully. Actually, motivation is one of the most important facts that affect labor productivity [1]. Therefore, it is clear that an effective motivation of craft workers will increase their productivity [2]. Since motivation and factors affecting labor productivity are highly correlated; the factors affecting motivation will also affect labor productivity. In this sense, identifying the factors affecting motivation is an important tool for labor productivity improvement.

Human resource is the combination of knowledge, skill and experience of labor force gained from past to present [3].

Nowadays, human resource has the most important role in ensuring productivity improvement. Especially, labor productivity has a big impact on project costs in construction industry. Therefore, increasing labor productivity became an important goal for project managers.

The aim of this study is to analyze the factors affecting labor productivity in context of motivation theories. For this purpose different motivation theories were investigated and Herzberg's Motivation- Hygiene theory was used for evaluating the factors.

Manuscript received March 24, 2016; revised April 15, 2016.

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II. Herzberg's Motivation- Hygiene Theory

Since motivation theories are correlated with productivity, in recent years many researchers used them in their studies. The most known motivation theories in the literature are Maslow's Need Theory, Herzberg' Motivation-Hygiene Theory, McGregor's Theory X and Theory Y, Expectancy Theories of Vroom and Lawler and Ouchi's Theory Z [4], [5], [6], [7], [8], [9]. This study, bases on Herzberg's Motivation-Hygiene theory.

According to Herzberg there are two different factors which lead to satisfaction or dissatisfaction. These factors exist independently and simultaneously within an organization. Therefore, in Motivation-Hygiene Theory of Herzberg Maslow's Hierarchy of Needs was divided into higher and lower levels according to job enrichment and hygiene factors, respectively. Job enrichment refers to the satisfier factors where hygiene factors to dissatisfiers. In other words, satisfier factors leads to productivity improvement while dissatisfiers lead to productivity reduction. The factors included in job enrichment and hygiene factors sets are shown in Table 1.

TABLE I
Summary of Factors sets of Motivation-Hygiene of Herzberg [5]

Hygiene Factors/Job Context Factors	Job Enrichment Factors/Job Content Factors
Salary	Achievement
Job Security	Recognition
Working Conditions	Responsibility
Status	Advancement
Company Policies	The work itself
Supervision-technical	Possibility of growth
Interpersonal relations	

In the literature Herzberg's Motivation-Hygiene theory was used by many researchers for different purposes. For example, Borcherding and Oglesby investigated the relation

ISBN: 978-988-14048-0-0
ISSN: 2078-0958 (Print); ISSN: 2078-0966 (Online)

between job satisfaction and productivity; Borcherding and Garner determined the factors leading to satisfaction and dissatisfaction among craft workers; Mansfield ve Odeh conducted a study related with construction operatives' motivation; Olomolaiye investigated the relation between motivation and productivity of bricklayers and Ruthankoon and Ogunlana to evaluate the applicability of Motivation-Hygiene theory in Thailand construction industry [10], [11], [12], [13], [14].

III. METHODOLOGY

The results of the researches related with labor productivity revealed that factors affecting labor productivity varies from region to region. Kazaz et.al. [2] identified 37 factors affecting labor productivity in Turkish construction industry. 22 of these factors were compatible to Herzberg's job enrichment and hygiene factors sets.

Goodrum et.al. stated that craft workers can better evaluate the factors affecting their productivity. Therefore, in this study, the perception of craft workers was considered to determine the factors [15]. For this purpose, a questionnaire including the compatible 22 factors was prepared. Each factor was organized on a 5-point Likert-scale where 1 and 5 represents "not significant" and "extremely significant", respectively. The questionnaire was administered face-to-face to 126 craft workers employed in 4 different construction projects in Turkey. During the interviews necessary interventions were made and thus, all questionnaire results were used in the statistical analysis.

RII was used for ranking the factors. RII is a statistical method which represents the relative importance of a variable among other variables. The numeral interval of RII method used for 5-point Likert scale is shown in Table 2.

Table II
Numeral Intervals of RII Methods

Min RII Points	Definition	Max RII Points
1,00	not significant (NS)	1,80
1,80	somewhat significant (SS)	2,60
2,60	Significant (S)	3,40
3,40	very significant (VS)	4,20
4,20	extremely significant (ES)	5,00

IV. DISCUSSION OF RESULTS

The reliability of the questionnaire was tested by the Test of Internal Consistency. According to Kaiser if the Cronbach's alpha value of a questionnaire lies between 0,600 and 0,900 then the questionnaire is reliable. In this study, The Cronbach's alpha values of job enrichment and hygiene factors set were calculated as 0,720 and 0,668, respectively which confirmed that the questionnaire was reliable [16].

In Table 3 and 4 the investigated factors and their RII scores are represented. As seen from the tables hygiene factors, also known as job context factors, and job enrichment factors, also known as job content factors, set included 15 and 7 factors, respectively.

Table III
Hygiene/Job Context Factors

Rank	Productivity Factor	RII Score	Effect Level
1	Working in social insurance	4,68	ES
2	On-time payment	4,60	ES
3	Amount of pay	4,52	ES
4	Camping conditions	4,51	ES
5	Health and safety conditions	4,50	ES
6	Quality of site management	4,39	ES
7	Systematic flow of work	4,36	ES
8	Relaxation allowances	4,31	ES
9	Discontinuity of work	4,17	VS
10	Material management	4,09	VS
11	Schedule compression	3,80	VS
12	Design complexity	3,52	VS
13	Crew size and efficiency	3,45	VS
14	Disruption	3,44	VS
15	Site congestion	3,15	S

Table IV
Job Enrichment/Job Content Factors

Rank	**Productivity Factor**	**RII Score**	**Effect Level**
1	Incentive payments and financial rewards	3,98	VS
2	Occupational education and training	3,54	VS
3	Giving responsibility	3,54	VS
4	Work satisfaction	3,44	VS
5	Firm reputation	3,21	S
6	Worker participation in decision making	3,04	S
7	Sharing problems and their results	3,03	S

The results of the study revealed that among the investigated factors "working in social insurance" factor was the most important hygiene factor. In other words, in craft workers perspective working with social insurance has more impact on their motivation compared to other factors within the job context factors. In Turkey, insuring the craft workers can be evaluated in context of company policy and practices. "On-time payment" and "amount of pay" were ranked in 2nd and 3rd places within the hygiene factors, respectively. This result indicates that high salary which is not paid on time dissatisfies the craft workers more, compared to low salary paid regular on time. In this circumstances, paying the salary regular on time and salary amount are related with

ISBN: 978-988-14048-0-0
ISSN: 2078-0958 (Print); ISSN: 2078-0966 (Online)

"Company policies and administration" and "salary" subtitles, respectively within the hygiene factors set.

On the other side, among job content factors, which are defined as the conditions directly related with execution of a task, "incentive payments and financial rewards" came to the forefront. The questionnaire result revealed that "incentive payments and financial rewards" is accepted as a kind of promotion among craft workers in Turkish construction industry. "Occupational education and training" of craft workers is the most important component of vocational improvement. Therefore, this factor was placed in the 2nd rank within the job enrichment set. Similarly, "giving responsibility" factor which was evaluated under "responsibility" subtitle was ranked in 3rd place.

In Hygiene factors set 8 factors were accepted as extremely significant while 6 factors as very significant and one as significant. On the other side, none of the factors within the job enrichment set were extremely significant. Only, 4 and 3 factors were very significant and significant, respectively.

The average RII scores of each factors set indicate that the impact level of both set is very significant (Table 4). However, the RII scores of factors belonging to Hygiene factors and job enrichment set ranged between 3,15-4,68 and 3,03-3,98, respectively. Point to consider in this study is that "material management" which was on the 10th place in Hygiene factors set had a higher RII score compared to the most important job enrichment factor (Table 2 and Table 3). In other words, the first 10 factors within the Hygiene factors set have more impact on motivation compared to job enrichment factors in craft workers' perspective in Turkey.

Table V
Ranking of Factor Groups

Name of Group	Number of Investigated Factors	Median RII Score	Effect Level
Hygiene Factors	15	4,10	VS
Job Enrichment Factors	7	3,40	VS

V. Conclusion

Since, labor productivity provides many economic benefits in construction projects; this topic has attracted the attention of many academicians and sector participants [17]. In several studies, motivation theories were used as a toll for attaining labor productivity. Herzberg's Motivation-Hygiene theory is one of the widely accepted theory in the literature. Utilizing this theory within the management will provide a productive job environment in organizations [1]. Therefore, understanding and evaluating the applicability of this theory is an important issue for the construction industry to improve productivity.

In this study, the factors affecting labor productivity in Turkish construction industry were evaluated in context of Herzberg's Motivation-Hygiene theory by considering craft workers' perspective. For this purpose a questionnaire was administered face to face to 126 craft workers. In the scope of the study among 22 factors 15 of them were investigated under hygiene factors set and the left under job enrichment set which leads to job dissatisfaction and job satisfaction, respectively.

The results revealed that, Hygiene factors set factors influence the motivation of craft workers more compared to job enrichment set factors. Therefore for productivity improvement in construction projects, the management must focus on hygiene factors set.

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ISBN: 978-988-14048-0-0
ISSN: 2078-0958 (Print); ISSN: 2078-0966 (Online)