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A wage model consisted of job evaluation employee characteristics and job performance

İş değerlemesi kişisel özellikler ve iş performansından oluşan bir maaş modeli

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Abstract

Although several substantial attempts, there is still a lack of research investigating of how employee characteristics and performance are integrated into a wage structure. In this study, it is intended to develop a salary model that creates a wage level from overall score consisting of job evaluation, employee characteristics and job performance in order to ensure wage fairness and also enhance employee' satisfaction. In the first phase, a point factor job evaluation system including sixteen factors was adapted to determine the job scores of the white-collar jobs within a company. The score generates a basic payment. There will be extra pay for the staff who are well educated and experienced for the job. A method producing a score from employee characteristics in terms of "education" and "experience" factors was developed. Job performance was measured with how an employee achieves the task activities for eleven job evaluation factors. These three components were integrated to a composite score to translate a wage level. The system was implemented in a middle sized manufacturing company for white-collar jobs. The results indicated that the job point has significantly greater influence on wage level.

Keywords: Wage model, Job evaluation, Job analysis, Education, Experience, Job performance, Reward

Öz

Önemli girişimlere rağmen, kişisel özellikler ve performansın maaş yapısına nasıl entegre edileceği konusunda araştırma çalışmalarda eksiklik devam etmektedir. Bu çalışmada, ücret adaleti sağlamak ve personel tatminini yükseltmek için iş değerlemesi, kişisel özellikler ve iş performansında oluşan toplam skordan bir ücret düzeyi oluşturan bir maaş modelinin geliştirilmesi amaçlanmıştır. İlk aşamada, 16 faktörden oluşan puan yöntemi iş değerleme sistemi, bir işletmede beyaz yakalı işlerin iş skorunu belirlemek için uyarlanmıştır. İş skoru temel ücreti verir. İşin gerektirdiği düzeyden daha yüksek eğitim ve deneyime sahip olan personel için ek ödeme olacaktır. Eğitim ve deneyim yönüyle kişisel özelliklerden skor üreten bir yöntem geliştirilmiştir. İş performansı, personelin 11 iş değerleme faktörü için görev aktivitelerini nasıl başardığı olarak ölçülmüştür. Böyle üç bileşen, bir ücret düzeyine ulaşabilmek için bir birleşik skora dönüştürülmüştür. Sistem, orta ölçekli bir üretim işletmesinde beyaz yakalı işler için uygulanmıştır. Sonuçlar, iş puanının ücret düzeyinde daha büyük etkiye sahip olduğunu göstermiştir.

Anahtar kelimeler: Maaş modeli, İş değerlemesi, İş analizi, Eğitim, Deneyim, İş performansı, Ödül

1 Introduction

According to a widespread belief for the traditional wage-employment relationship, rewarding employees simply by straight salaries is not an ideal method for the modern competitive economy [1]. Organizations can establish different types of performance salary practices such as profit-related pay, stock-based pay, individual performance related pay, skill or competency-based pay and team-based performance related pay. Individual performance linked to pay rewards employee for reaching specific performance targets. The main objective of this system is to recognize strong and weak aspects of staff behaviors, which may need to be further developed, in an assessment period, and to reward employee to earn higher wage level. Traditional job evaluation processes are not entirely ideal as sole means for determining pay. Performance based pay systems are integrated with, or serve as a complement to, the job-based structure. It is more common to think of a scheme involving a combination of a basic pay linked to job score and a variable reward related to job performance. This study focused on such a model that creates a composite score including;

    a)   Job score obtained from a job evaluation plan,

    b)   Employee characteristics and,

    c)   Task performance, and then a wage level. Strategic compensation theory proposes that such linkages can lead employee to increase his/her job performance.

Job evaluation is a systematic approach to determine the relative values of different jobs in an organization [2]. It helps to develope and maintain a pay structure by comparing the relative similarities and differences in the content and the value of jobs [3]. It is based on equal pay legislation-equal pay for work of equal value. The role of job evaluation in salary administration has, then, grown in importance as more organizations have attempted to implement comparable worth policies [4],[5]. When the scores of jobs are determined, they may be easy translated into a base to achieve a balanced wage structure to be acceptable for management and labor in the organization. Most employees expect to be promoted to higher pay grade with their increased experience, greater knowledge and personal ability. Under job evaluation, however, there is "a rate for the job" and, if promotion is blocked, an individual is forced to remain at a certain level with no chance of improvement [6]. It is plausible that other personal and organizational influences and prevailing labor market wages for jobs should be considered for merit pay increases.

In several studies [7], the authors have investigated the relationship among (plus) experience, (over) education, job

performance and wages. In the traditional wage systems, employee wage is raised periodically (e.g. year) in accordance with an employee's age, experience, and relatively generous performance evaluations from his/her supervisor. Waldman and Spangler [8] developed a model of job performance based on employee characteristics (e.g. experience, ability), outcomes (e.g. feedback, job security), and the immediate work environment. Wilde [6] suggested a "band" of payments for each grade to enable employees to earn more for plus experience. The extra increment for each "plus grade" was suggested 90 per cent of the difference between the current and next grade, divided by five.

New pay systems take many different forms arisen in response to fundamental changes in the nature of work. These fundamental changes that impact pay system development include changes in the nature of the employment relationship, in technology, changes in business strategy, in organizational structure, and in job design [9]. Individual merit should play a major role in determining how organizational rewards are allocated. Convincing evidence exists that these pay systems have a marked impact on employee performance and organizational effectiveness. In a formal wage system that regulates pay for employees, the system consists of at least 8 wage grades. With each grade, there are a number of wage levels ranging from five to ten. Lower grades have fewer wage levels. An employee receive one wage level each year, up to the maximum level in his/her wage grade, if s/he successfully develops his/her skills and knowledge. Wage ranges of adjacent grades overlap in a systematic way. The wage in the middle level of a grade is between the highest level of the former grade and in the lowest level of the next grade. An employee who has the highest wage level in a grade can jump up the next wage grade only if s/he is promoted to a position in the higher grade. A prominent idea is that such a wage structure results in motivation problems on employees.

To our knowledge, there has been no study that creates a composite score consisted of fixed and variable components and also transforms overall score to a wage level in the related literature. In this study, we will frame the relationship among job score, employee characteristics, and job performance, and also reveal the effect of such components on wage. The basic superiority of the model developed in this study is that reward is not only contingent on the job but also employee characteristics.

The remainder of this paper is organized in six sections. Section 2 and 3 presents some information about job evaluation and point factor method and implementation of the system. In section 4, a scheme that formulates the effect of employee's plus characteristics on the wage system for the factors is developed while section 5 considers a method to convert job performance to a score based on job point. The implementation of the model for a period is placed in section 6, Section 7 contains a few concluding remarks.

2 Job evaluation

Job evaluation is a systematic procedure used to measure the relative worth of a job. Those relative values, then translated by the organization's pay structure, determine the salary paid for performing the job. The purpose is to develop an internally consistent job hierarchy to achieve a pay structure acceptable to both management and labor [10]. It enables to the design and establishment of human resources improvement procedures and fair pay system. It concerns the assessment of a value system

that encapsulates the importance of the parameters that reflect the responsibilities and duties required for a job. Job evaluation has been in common use by many large companies, and also governments (e.g. Department of Health in the UK), since World War II; small firms are less apt to use it. It is estimated that half of the U.S. employees are in jobs where wages are affected by job evaluation.

There are mainly two approaches for the evaluation methods as analytical and non-analytical. The methods are analytical methods (Factor comparison and Point factor) and non-analytical methods (Ranking and Classification). The most popular and perhaps the most understandable among them is the point factor method. It is widely used in industry (e.g. metal) because of its reliability in producing accurate result [5]. Point job evaluation system is based on four categories: skill, responsibility, effort, and working conditions. Each one has some factors varying from one industry to another, but the majority has been adopted. Widely used factors are;

- ❖ **Skills**; education, knowledge, experience, problem solving, decision making, complexity, language (foreign), software knowledge, communication, planning and organization,
- ❖ **Responsibilities**; research (and development), HRM, information resources, financial and physical resources, policy and service,
- ❖ **Efforts**; mental, physical, emotional,
- ❖ **Working conditions**; environmental conditions, hazards.

These factors have different weights in scoring jobs. There are two common methods for weighting the factors. One method is to select weights based on subjective or rational grounds. Evaluation committee simply determines points to factors in consideration with their collective judgement of relative importance. The other is to derive factor weights as a product of optimization methods such as linear programming or statistical modeling (e.g., multiple regression analysis). The selection of one of the above methods may depend on the organization's objective for job evaluation. One objective is the certification of its existing job-pricing practice. In this case, the factor weights obtained through statistical method formalize the job-valuing priorities that the organization seeks to affirm. The other objective is the modification of its job-pricing practice [11]. Organizations can attempt to alter present job-pay structure by reviewing factor weights.

Several attempts have been made to determine the weight of both the factors and their levels. Charnes et al. [12], Gupta and Ahmed [13] and Ahmed [2] used linear programming models in order to obtain the factor weights. Ahmed [2] used linear programming approach to evaluate the relative worth of various job factors by assuming that the number of steps in each job factor is finite and a linear combination of factor weights. Gupta and Ahmed [13] developed a linear goal programming model for determining the relative worth. One of the demerits of the goal programming approach is that the assessment of aspiration levels (goals) is subjective.

These models consider the factors weights as the decision variables and the levels as the parameters, and the wages in the market as the constraints. The most important disadvantage of these models is that they ignore the definitions of the levels while obtaining the level weights. Another disadvantage of these methods in the difficulty to define constraints as many as the

number of jobs and variables as many as the number of factors [14]. Das and Garcia-Diaz [5] develop a computerized statistical method based on the central distribution and correlation measures. Pittel [15] presents the update of the factor weights by using the market weights of the jobs in the multiple regression analysis model.

Kahya [16] uses survey and interviews to determine the factor weights by consensus in a company in the metal industry in Turkey. Dağdeviren et al. [17] and Kahya [18] utilize Analytic Hierarchy Process (AHP) in the job evaluation process to obtain the factor weights by the pairwise comparison of factors.

The fuzzy set theory provides a proper framework for description of uncertainty related to vagueness of natural language expressions and judgments. In the job evaluation literature, Gupta and Chakrabotry [3] handled the job evaluation problem in a fuzzy environment by constructing a fuzzy mathematical model. They showed that the results of their analysis were close to the choices of the decision makers. Kutlu et al. [14] and Kutlu et al. [19] proposed a multi-criteria fuzzy approach for the job evaluation problem.

In recent studies, Kareem et al. [20] use a point rating mathematical model to determine the appropriate wages for workforce. Shunkun and Hong [21] propose a 12-step methodology for job evaluation and use a modified AHP to determine the weights of factors. Chen and Jiang [22] utilize Interval AHP for point method in managerial job evaluation. Dogan et al. [23] were aimed to redetermine the importance of main and sub factors used in point factor method by human resource professionals located in different sectors based on the manifacturing sector in this study. For this purpose, data received from 40 human resource professionals was analyzed by analytic hierarchy process. It is found that the values found as a result of analysis and values in job evaluation scale developed by Turkish Metal Industry Employer's Union are quite close together. In order to establish a reasonable and scientific internal pay system, Sun and Luo's study [24] made an in-depth study on the application process of point-factor job evalustion approach. Questionnaire survey and statistical analysis methods were used to determine the factors of job evaluation system. Also, it focuses on the weight determination using improved AHP method.

Several recent studies ([10],[25]-[28]) have examined the validity and effect of a job evaluation system on wages and the use of job evaluation as a mechanism to incearse gender pay equality.

3 Implementing the job evaluation system

This study was conducted on a medium-sized furniture manufacturing company. The company management decided to establish a new salary system linked to job and performance evaluations in order to enhance employee perceptions of wage satisfaction and fairness. How a job evaluation process is implemented in a company has been outlined by some authors [10]. There exist a number of stages or steps in any organizational development implementation, including from establishing a compensation committee to testing internal and external consistency as given below.

3.1 Committee

The first step is to set up a committee to manage the company's strategic compensation policy. Group dynamic experts suggest that a well working group should be consisted of seven to nine members. The evaluation committee was formed by seven managers coming from a wide range of departments (manufacturing, planning, maintenance, marketing, finance, quality, and human resource), and was functioned as an oversight group that reviewed and approved the project as well as a working group that made judgements about job worth.

3.2 Factors

A sheet listing the factors and their weights in the job evaluation plans implemented by some companies in the country was given to the committee members. In a meeting, they came to an agreement and considered 16 factors to be applicable for evaluating the white-collar jobs (Table 1).

In many job evaluation plans in use, "knowledge" factor measures all the forms of knowledge required to fulfill job responsibilities satisfactorily. This includes theoretical and practical knowledge; professional, specialist or technical knowledge; and knowledge of the policies, practices and procedures associated with a job. A combination of three areas; practical knowledge, theoretical (educational) knowledge and experience leads to some disadvantages in evaluating jobs. In several experimental studies (e.g. [16],[18]), pearson correlation coefficients among "Knowledge", "Education" and "Experience" have been found larger than 0.80. It implies that these factors do not overlapped completely; while education levels required for jobs, for example, increase, the other knowledge areas may not change.

Table 1: Job evaluation factors and their level points.

Category	Factor	Points (‰)	1	2	3	4	5	6
Skill	Education	100	10.00	17.78	31.62	56.23	100.00	
	Knowledge	60	5.00	8.22	13.51	22.21	36.50	60.00
	Experience	90	9.00	16.00	28.46	50.61	90.00	
	Complexity	120	10.00	16.44	27.02	44.41	73.00	120.00
	Analytical and judgemental skills	70	14.00	28.00	42.00	56.00	70.00	
	Language	40	0.00	5.00	10.00	20.00	40.00	
Responsibility	Financial and physical resources	70	5.83	9.59	15.76	25.91	42.59	70.00
	Information resources	40	0.00	10.00	20.00	30.00	40.00	
	Communication and relationship	60	0.00	12.00	24.00	36.00	48.00	60.00
	Planning and organization	70	14.00	20.93	31.30	46.81	70.00	
	Research and development	30	0.00	7.50	15.00	22.50	30.00	
	Human Resources Management	60	0.00	12.00	24.00	36.00	48.00	60.00
Effort	Mental	60	12.00	17.94	26.83	40.12	60.00	
	Physical	40	10.00	15.87	25.20	40.00		
Working Conditions	Environmental conditions	50	10.00	20.00	30.00	40.00	50.00	
	Hazards	40	10.00	20.00	30.00	40.00		

In a word, knowledge required to perform a job may include a combination of different levels (higher or lower) for knowledge areas such as level 5 for practical knowledge, level 4 for theoretical knowledge, and level 6 for job experience. Moreover, if a reward system in the company relied on employee's individual characteristics (e.g. education level, experience years) is tended to establish, then defining a separate factor to measure each form of knowledge is inevitable.

The committee weighted the factors in terms of their relative importance to the overall work of the jobs via a Delphi technique by filling in a questionnaire.

3.3 Levels

Definitions of the levels including such concise words as "minimum", "light", "normal" are too general to permit any accurate measurement. However, they must be defined clearly to match a level to a job; e.g. "Providing and receiving routine information orally, in writing or electronically to inform work colleagues, clients, careers, the public or other external contacts" for a level of "Communication and relationship" factor. Each level has an associated point value. Allocating a rising number of points from lowest to highest level in each factor is satisfied with one of two ways to be by equal increments or by some form of progression. The choice is a combination of regular steps (arithmetic increments) or increasing steps (geometric increments) [18].

Under consideration of level definitions, we decided that the level points were weighted with.

- ❖ Arithmetic increment for seven factors (Analytical and judgemental skills, Information resources, Communication and relationship, Research and development, Human Resources Management, Environmental conditions, Hazards),
- ❖ Slowly geometric increment for three factors (Planning and organization, Mental effort, Physical effort),
- ❖ Rapidly geometric increment for the other six factors (Education, Knowledge, Experience, Complexity, Language, Financial and physical resources).

For arithmetic progression, the point of the first level is computed by,

$$w_1 = \frac{w_f}{n} \qquad (1)$$

and the others

$$w_i = w_1 * i \qquad (2)$$

Where

W_f : the factor point,

n : the number of level,

W_i : the point of level i,

$W_n = W_f$ (the last level point equals to the factor point).

In geometric progression, the point of level i can be determined by Equation (3).

$$w_i = a * b^i \qquad (3)$$

Subject to

$w_1 = w_f/n$, for slowly geometric progression

$w_1 = w_f/(2 * n)$, for rapidly geometric progression

The level points for each factor were computed by using above equations and given in Table 1.

3.4 Evaluating the jobs

Thirty five white-collar jobs, which require different duties, responsibilities, skills and personal attributes for successful execution, were satisfied in interview with the employees and the first line managers. Current job information can be gathered with a job analysis. The purpose of a job analysis is to elicit information pertaining to various types of jobs [29]. A more specific factor-based questionnaire including 27 questions under 16 job evaluation factor headings was designed. The questionnaires were distributed to all the white-collar staff. They filled out the questionnaires by indicating appropriate pre-defined responses or answering the questions as far as possible, seeking assistance from their own managers to ensure that the information provided was accurate and comprehensive. The questionnaires filled out by employees performing the related job were compared with each other to assess the most appropriate level for the each factor. The results were checked for consistency on a factor by factor against both the other jobs in the job family and same or very similar jobs elsewhere (externally). It was found that the job scores ranging from 210.55 to 902.50 points.

3.5 Grades

The next stage was deciding the number of grades and the point difference between the grades. Generally, the number of grades in the plan is recommended between 8 and 12, with a point increment ranging from 45 to 65 points (e.g. [30]). In this study, based on the pattern of job scores, we defined eight grades (pay band) with 100 points increments; the maximum point of the lowest grade (I) was applied to 300 points. Doubtless to say, the increments with 100 points for each grade are not satisfactory to ensure pay fairness. Due to higher point increments between grades, four sub-grades (labeled A, B, C, and D) with 25 points increments for each grade were defined (see Table 2).

4 Employee characteristics

Employee characteristics include such attributes as age, marital status, education, and job experience. In our wage system, the last two employee characteristics were found widely used components in reward systems.

Table 2: Point interval for grades and sub-grades.

Grade	Grade Range	A	B	C	D
I	000-300	000-225	226-250	251-275	276-300
II	301-400	301-325	326-350	351-375	376-400
III	401-500	401-425	426-450	451-475	476-500
IV	501-600	501-525	526-550	551-575	576-600
V	601-700	601-625	626-650	651-675	676-700
VI	701-800	701-725	726-750	751-775	776-800
VII	801-900	801-825	826-850	851-875	876-900
VIII	901-1000	901-925	926-950	951-975	976-1000

The principle in developing a reward is to produce a point for the plus attributes of an employee, and later transform this point to a wage level.

The factors in the plan can be subdivided into three structural groups;

a) The factors for which employee's characteristics may be different from the required level for the job performed; "education" and "experience" factors,

b) The factors from which employee is influenced; "physical effort", "environmental conditions" and "hazards" factors,

c) The factors linked to employee's job performance.

In this section, we will develop a scheme that formulates the effect of employee's plus characteristics on the wage system for the factors in the (a) group.

4.1 Education

Robst [31] states: "A worker is considered overeducated, if his/her education is greater than the job typically requires". Over education in the labor market is a persistent problem in all industrialized countries. The fact that many members of the labor force have higher level of qualification than is required for their jobs leads to various negative outcomes [32]. The major effect relies on overall productivity. The basic premise is that, as a consequences of frustration, overeducated employees are less productive than their correctly allocated colleagues; education doesn't guarantee increased productivity. Indeed, it is seems likely that overeducated employees would be more prone to morale problem [33], not to be rewarded with the higher wage level. That's not all. The bulk of the literature has reported that over-education is associated with a pay penalty [34]. Battu et al. [35] concluded that the pay penalty for over education ranges from 15% to 20%. Higher dissatisfaction generates lower work effort, this reduces employee productivity and thus the individual rate of return.

Nevertheless, employers tend to hire overeducated employees for several purposes. First, overeducated employees can insure the employer against high damages by offering improvisatorial, accuracy and quick solutions during a firm crisis. Over education will only be of value to the employer if a critical situation occurs [36]. Second, it is expected that the higher the levels of qualifications the more productive the employee, wherever s/he is employed. To overcome this, employers design training programs to increase employee job performance. The greater the education, the less job training an employer might have to invest for an employee [33].

When overeducated employees are rewarded, rewards would lead to increased job satisfaction and organizational commitment which produce high performance score. The key decision is that which reward strategy will be offered to ensure employee satisfaction, if an employee has higher education degree than required level for the job performed.

A widely used method classifying individuals as overeducated or undereducated in the literature is that an employee's actual education level is compared with the self-evaluated education requirement to determine whether s/he is overeducated or undereducated. These subjective methods lead to suspicious results. In this study, the required education level for each job was derived from job analysis, which has been largely neglected in most of the empirical studies. This is an objective method, and supposes a perfect relation between education required and job.

The information collected might be up to date by the time of release, especially in a rapidly changing work environment. Those whose education level is higher (less) than required level for the job performed is said to be overeducated (undereducated).

In the recent years, some studies ([37]-[42]) from both sociology and economics have presented the relationship between education, productivity, earnings, and job satisfaction. It is worth to note that many previous studies have focused on the overall effect of over education on productivity, ignoring reward strategy.

Some reward strategies to consider over/under education have focused on an extra pay for each different education level (e.g., $10 for a university –four years- diploma), a percentage of basic pay, or an additional pay for each different over/under education level. These options do not seem to be satisfactory for an education reward. In order to motivate overeducated employees, the scheme in this study is that an education reward is assessed with a half of the point difference between the required level for a job and the level versus with employee's education degree. To illustrate this point, when an employee has a graduate diploma (level 5)(100.00 points), and the required level for the job is "high school" degree (level 2) (17.78 points) (see Table 1 for level points), the extra increment will be 41,11 points ((100.00-17.78)/2). The minus point for less educated employee is the point difference among the levels. Appendix 1 shows plus/minus points (reward) versus employee' education degree.

4.2 Experience

As a well-known debate of the existing literature on wage structure in organization, The empirical question of whether wages increase with job experience remains still open, as stated by Felli and Harris [43]. It has been discussed that a positive effect of plus experience on wage reflects an increase in productivity. In order to ensure the developing in employee performance, an experience reward should be adjusted into wage structure of a company to motivate more experienced employee. This is the preferred estimate of Altonji and Williams [44] that the true effect of experience on wage would be approximately equal to 11% per 10 years. Only a few studies have focused on how experience can be included into a wage structure. Wilde [6] suggested a "band" of payments for each grade to enable individuals to earn more by means of plus experience. The extra increment for each "plus grade" was the difference between the current and higher grade, divided by five.

Doing a job for years and years may make employee more productive at work; does not always result in additional knowledge. For some specialized fields where employees should undertake all areas of practice without any guidance or supervision, plus experience leads to higher job performance. A fixed reward per a plus year for all jobs does not guarantee fair wage. It can be achieved by providing that the reward is produced contingent on the level of "experience" factor for a job. In a word, experience reward should depend on both employee and job, varying from one to another. The guiding principles behind the experience reward in our model were that;

i. The reward of an over/under experienced employee is related to the level point of required experience for the job performed by the employee,

ii. Maximum point to consider plus experience is nearly equal to level point of the experience factor. As a result of this principle, while an employee who performs a job with level 1 can take an experience reward less than 9 points,

the other one who performs a job with level 5 will be rewarded till 90 points,

iii. The number of plus years for each level is limited, and ranging from 3 years to 12 years.

The plus point per year was computed by dividing the level point to considerable maximum year, which ranges from 3 points to 7 points depending on the factor level, as depicted in Table 3.

To illustrate, when an employee performs a job with level 3 (3 years experience), and is working for 7 years in the company, the reward will be 16 points (4 points per a year and 4 years plus). For this level, an employee can take a reward limited to 28 points.

Table 3: Additional points for plus experience.

Level	Level point	Required experience (year)	Considerable maximum year	Maximum plus point	Point per a year
1	9.00	0.5	3	9	3
2	16.00	1	4	16	4
3	28.46	3	7	28	4
4	50.61	5	10	50	5
5	90.00	8	12	90	7

5 Job performance

Performance evaluation is the process that compares job standards with employee's job performance to measure how well the job is performed. Borman and Motowidlo [45] identified two broad classes of employee behavior: task performance and contextual performance (also called citizenship performance). They suggested that task performance relates to the proficiencies with which incumbents perform core technical activities that are important for their jobs. When employees use technical skills and knowledge to produce goods or service through the organization's core technical process, or when they accomplish specialized tasks that support these core function, they are engaging in task performance [46]. It is to be a part of one's job, and recognized by the organization's formal reward system. A large body of research has shown that performance evaluation and reward system can significantly influence employee behavior [47]. This finding is taken to imply by both theorists and practitioners that organizations can use these systems to ensure or increase the congruence between employee behavior and their own objectives [48]. Usable criteria to measure employee performance depends on nature of job. A great deal of research has been conducted in order to explicate the dimensionality of job performance, with many multidimensional models proposed [49]. In this study, our intent was not a attempt to produce which job performance criteria should be used to assess the employees.

We will develop a scheme converting a performance scale ranging from 1 to 5 into a performance reward point based on job score. The knowledge and skills reflecting how an employee performs the demands of his/her current job in terms of eleven job evaluation factors were designed as job performance criteria and labeled conceptually very similar to associated job factors (see Table 4). We suggest two method to convert job performance score to a score based on job score.

5.1 Method 1: Revision of related factor levels

An employee's performance score for a given criterion was assessed with scale 3 (average), when s/he accomplishes specialized task activities and processes with a desirable effort. If that's so, the employee does not get a wage increase, a reward. The principle to reward an employee to have a highest performance scale ("excellent") for a criterion is that the performance reward (point) is the difference between the base and next level points for the related factor. This principle presumes that an employee who performs a job with a factor level could not show a higher performance than the desirable effort required for the next factor level. The reward for performance scale 4 (or 2) is a half of difference between base and next (or previous) level points. As can be seen in Table 5, one scale improvement in "Job knowledge" criterion triggers a reward ranging from 1.61 to 11.75 points for scale 4, and from 3.22 to 23.50 points for scale 5 depending on the factor level applied to job. It indicates that reward does not only depend on employee but also on job level. Better performance ratings increase an employee's chance for climbing wage levels faster. Employees in higher wage levels of the same job is more performers than their less performer co-workers who remained at the lower wage levels.

Let compute the job performance score of an officer who performs the job scored by 274.62 points (grade I/C). The level matched to "knowledge" factor for the job is 2 (8.22 points). When the officer is rated with scale 5 ("much more average") for the "Job knowledge" criterion, the performance score will be +5.29 (13.51-8.22) points as the point for the factor level 3 is 13.51 points (see also Table 1). Similarly, for rated with scale 1 ("much below average"), the score is -3.22 (5.00-8.22) points. It will be +2.65 (or -1.61) points which is a half of maximum (or minimum) score for the performance scale 4 (or 2). When s/he is rated with scale 5 for all the criteria, the sum of the point differences between base and its next levels for related factors will be 98.92 points. Similarly, overall score for the lowest performance can be computed in consideration with previous level points. Theoretically, while the job has been graded with I/C, the actual wage grade including performance reward of an officer can take place into a grade among I/A (198.98 points) and II/C (373.54 points).

Table 4: Performance criteria.

Job Evaluation Factors	Levels	Points	Performance Criteria
Knowledge	6	60	Job Knowledge
Complexity	6	120	Overcoming obstacles to complete a task
Analytical and judgemental skills	5	70	Analytical thinking
Language	5	40	Language knowledge
Information resources	5	40	Software knowledge
Communication and relationship	6	60	Talking to others before taking actions that might affect them
Financial and physical resources	6	70	Working without mistakes
Planning and organization	5	70	Following through on tasks to completion
Research and development	5	30	Engaging in technical developments on own field
Human Resources Management	6	60	Supervisory responsibility
Mental effort	5	60	Solving a work problem

Table 5: Score differences dependent on performance scales for "Job Knowledge" criterion.

		Performance Score				
Factor Level	Level Point	1	2	3	4	5
1	5.00	-3.22	-1.60	0	1.61	3.22
2	8.22	-3.22	1.61	0	2.645	5.29
3	13.51	-5.29	-2.645	0	4.355	8.71
4	22.21	-8.70	-4.35	0	7.145	14.29
5	36.50	-14.29	-7.145	0	11.75	23.50
6	60.00	-23.50	-11.75	0	11.75	23.50

5.2 Method 2: Transformation function

We describe a transformation function to convert the performance score to a score based on job score. It is assumed that if an employee has an excellent (or very poor) performance, performance score will be a positive (negative) value that is a half of job score. In a word, the ratio of the performance-based wage for an employee is between -50 and +50 per cent. Clearly, the performance-based wage depends on both the job and employee's performance. For instance, when the performance score of the officer is able to reach to a score among 137.31 points (minimum) and 411.93 points (maximum), and then the new wage grade could vary from I/A to III/A grade, theoretically.

The transformation function can be written as,

$$PJP = \left[\frac{PP - 60}{40}\right] * 0,50 * JP \qquad (4)$$

Where PJP is the performance score based on job point, JP is the job evaluation points and PP is employee's performance score (%)(Figure 1).
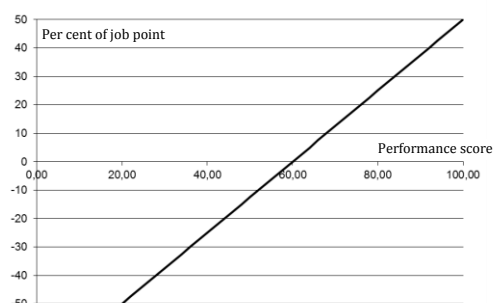

Figure 1: Per cent of job point versus performance score.

This pattern of the performance-based wage system contributes to employee to develop individual performance better. Higher performance score increases an employee's chance to climb up the next wage grade faster, and then there is a strong tendency to go up after such a wage promotion. Employees in higher wage grade can be more productive than the others who remain at the same or lower grade for the same job.

6 Application of the model

6.1 The wage policy of the company

Since the company was founded, depending on the economic and financial conditions of the company during the period, wages of the all staff twice in a year by a fixed rate around inflation rate based on consumer price index in the base period. The department managers had a right to suggest an additional (less) wage increment for an employee demonstrating high performance, assessed subjectively by the first supervisor, where employee performance plays limited role. As a result of growing global competition, the company management decided to implement a more performance-based wage system in the next period. In this section, we investigated the relationship between wages and variables to emphasize weakness of the company's existing wage system, and presented some advantages of the new wage system developed to increase employee satisfaction.

6.2 Overall scores

Employee characteristics: Job experience (number of years that employee is working in the company) and education level of each employee were obtained from the company's archival sources. The average length was 6.45 (s.d.=4.58) years for experience (Table 6). The majority of them was greater experience years that produced a 18.66 points reward per employee. Education level was a grouped measure that was coded from 1 (under high school) to 5 (four years university). Among them, 19 had graduated from four years university. 22 employees, who did not receive an education reward, had education levels required for their jobs. 33% of them were found to be apparently under-educated, which resulted in a decreasing reward of 42.47 points per employee on average. In current wage system, education and experience were strongly correlated with wage.

Table 6: Descriptive statistics.

	Mean	Standard Deviation
Education (level)	3.90	1.23
Experience (year)	6.45	4.58
job point (‰)	452.41	191.94
Job grade	10.69	7.73
Job performance (5)	3.40	0.49
Performance reward	20.32	24.20
Overall score	483.42	206.28
Wage grade	11.72	8.06

Job performance evaluations: Each performance criterion was rated on a five-points likert scale ranging from "1"="much below average" to "5"="much above average, extremely likely" by the supervisor. Lowest scale, "1", indicates that all the characteristics of a employee in terms of the relevant job factor are completely insufficient. A guide listing the scores for each level of the factors was prepared for computing the job performance scores. A performance evaluation questionnaire consisting of criteria to assess employee performance, employee name, and job information (job identification, team, and department) was designed. Ratings were made at the end of a six-month period of observation. One questionnaire per employee was distributed to the supervisors at work. They were asked to complete the questionnaires and turn them to HRM department in a week. It was guaranteed that their responses would remain completely confidential. All of the supervisors filled out the performance rating questionnaires for their each employee.

The job performance score of an employee comes up through the sum of the scores for these eleven criteria. The mean score was 3.40 of 5.00. It was seen that the reward scores changed from -28.31 to 90.12 points (mean 20.32 points). The results indicate that a half of employees did not have performance enough to climb up a wage grade. 33% of them performed the duties and responsibilities much more than expected for their jobs. Pearson correlation coefficient among the job grade and job performance was -0.135 (see: Table 7), which indicates that the employees working at qualified jobs did not have a higher performance than expected.

Overall scores: When the overall scores including job, performance, and employee characteristics for all employees were computed, it was seen that the overall scores varied from 225.10 to 991.86 points. The average score (483.42 points) consisted of

- ❖ 452.41 points for job evaluation score (93.58%),
- ❖ 10.69 points for employee individual characteristics (2.21%),
- ❖ 20.32 points for job performance (4.20%).

The components of the average score imply a weak impact of performance evaluation on wage increase, which is 4.20% of the overall score. Job score had greater influence on wage. The results indicate that the majority of employees climb up much more than one wage level. Only 15.38% of them downgrade from the job wage level.

6.3   New wage system

According to our model, grade range widens with increasing grades. Employee can receive a wage between the highest wage levels of two adjacent wage grades. It was seen that in general, while lower level jobs of complexity took place in grade I, advanced level jobs of complexity included in grade II and III. However, grades of chiefs and department mangers lay between IV and V, and VI and VIII, respectively. It is possible that an employee who performs a job with grade VIII/A can take a point of 1208.98 points (XI/A grade), whereas an employee who performs a job with grade I/A (e.g., telephone operator) can reach a point of 334.30 points (grade II/B). As a result of this pattern, it was decided that the wage range ±4 wage levels (sub-grades) for the jobs in grade I, ±6 wage levels for the jobs in grade II and III, ±8 wage levels (two wage grades) for the jobs in grade IV and V, and ±10 wage levels for the jobs in grade VI and VIII. From these limitations, for examples, an employee who performs a job in grade III/A can have a wage level between I/C and IV/C depending on individual characteristics and job performance scores. However, it is difficult an employee to reach the highest score for each performance criterion. For example, the employee who had the highest performance score was assessed with scale 5 for two criteria, scale 4 for three criteria, and scale 3 for the other criteria. Similarly, four employees in grade I received a wage increment between one and two wage levels. For the purpose of producing the wages of the grades, market wages of the identified 25 jobs from various departments derived from wages guide in the country. An agreement was achieved for the wages of grade I/A and grade VIII/A. The wage increments ranged from TL 50 to TL 500.

7   Conclusion

Individual performance related pay rewards employees for reaching specific performance targets. The main objectives of this system are both to increase individual performance and to reward the employee to achieve higher performance. It is more common to think of schemes involving a combination of fixed salary and a variable component that is performance dependent. The model discussed in this study focused on such a salary system producing a wage level from a combined score.

Different reward strategies are likely to have different effects on company's outcomes. Compensation theory proposes that linking pay to individual performance will improve productivity. Tying rewards to individual performance should motivate higher effort by increasing the instrumentality of job performance. It is believed that the developed reward approach in this study translating a score composed of job performance and employee's individual attributes to a wage level is superior to others.

Reward strategies to consider employee characteristics (e.g. education, experience, age) and job performance have focused on an extra pay for each different component, a percentage of basic pay, or an additional pay for each different level. These suggestions do not motivate employees. The scheme in this study is to create a wage level from overall score consisted of job evaluation, employee characteristics and job performance in order to ensure wage fairness and also enhance employee' satisfaction. Job score produces a basic pay. There will be two extra pay for staff who have higher characteristics than the required level for the related job. A method was developed producing a job point (score) from employee characteristics. Job performance was measured with how an employee achieves the task activities for eleven job evaluation factors. These three components were integrated to a composite score to obtain a wage level. From the related literature, as far as we know, there is not a model that creates a composite score consisted of fixed and variable components and also transforms overall score to a wage level. The basic superiority of the model developed in this study is that an overall score based on job point is produced from three components; job evaluation, employee characteristics and job performance.

The system guarantees that an employee's wage is restricted with his/her performance. For instance, the officer's score to create a wage theoretically varies from 198.98 points (lowest performance) to 373.54 points (highest performance). His wage grade will place between I/1 and II/3. This grade difference motivates the employees enough to increase their individual performances. However, it was seen during the pilot study that managers tended to protect his/her employees (lenient rated), which decreases the reliability of system. This drawback can be eliminated by evaluating group consensus.

A flexible decision support system (DSS) should be designed to handle the system succesfully in every period. The DSS must be consisted of four databases management system: Job Evaluation, Staff, Personal attributes and Performance evaluation. The information below must be placed in the databases.

- ❖ Job Evaluation Database: Degrees of the jobs for each factor and job point,
- ❖ Staff Database: Staff code, name and surname, date of birth, education level, code of the relevant job,
- ❖ Personal Attributes: All the information presented in Table 3 and Appendix 1,
- ❖ Performance Database: Staff code, code of the relevant job, information presented inf Table 5 and performance scores for each performance criterion.

Table 7: Pearson correlation coefficients.

	1	2	3	4	5	6	7
1. Education	-						
2. Experience	-0.164	-					
3. Job grade	0.591**	0.364*	-				
4. Job performance	-0.136	-0.147	-0.135	-			
5. Performance reward	0.019	-0.074	-0.052	0.806**	-		
6. Wage grade	0.625**	0.369*	0.985**	-0.063	0.029	-	
7. Current wage	0.433**	0.383*	0.860**	-0.150	-0.110	0.850**	-
8. New wage	0.463**	0.387*	0.882**	-0.138	-0.091	0.878**	0.997**

*: Correlation is significant at the 0.05 level (2-tailed). **: Correlation is significant at the 0.01 level (2-tailed).

Prior to each wage raise date, the databases should be updated besides deciding final score through the scores of personal attributes and performance. The grading was based on a linear relationship where the points along the grade followed an arithmetic progression. When this practice becomes a matter of concern, it is more reasonable to use a non-linear grade increment with points assigned according to a geometric progression. In this study, we did not intend to drive the job performance evaluation criteria to be used by the company to assess employees. As a new research, other applicable performance criteria can be investigated.

8 References

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Appendix A

Appendix A Table : Plus points dependant on employee' education degree.

Level	Education factor (Required education for the job)	Level points	Employee's education degree	Plus points
1	Under high school	10.00	Under high school	0
			High school	+3.89
			Professional school	+10.81
			Associate degree program	+23.12
			University	+45.00
2	High school	17.78	Under high school	-7.78
			High school	0
			Professional school	+6.92
			Associate degree program	+19.23
			University	+34.19
3	Professional school	31.62	Under high school	-21.62
			High school	-13.84
			Professional school	0
			Associate degree program	+12.31
			University	+34.19
4	Associate degree program	56.23	Under high school	-46.23
			High school	-38.45
			Professional school	-24,61
			Associate degree program	0
			University	+21.89
5	University	100.00	Under high school	-90.00
			High school	-82.22
			Professional school	-68.38
			Associate degree program	-43.77
			University	0