

A Marginal Monetary Worth (MMW) Human Valuation Model

Krishan Rana *

Suneel K. Maheshwari **

Abstract

Academicians and companies are working on ways to measure human capital. In a biotech, software or telecommunications company, the truly valuable assets are not the physical assets like networked computer systems or the new lab equipment, but the minds behind it all. Assessing the value and effectiveness of human capital is generally difficult; let alone trying to attach a dollar amount to it. There is enormous amount of work going on in this area and several researchers have described qualitative models for measuring human capital in organizations. However, only a few researchers have proposed quantitative models. Some executives define human capital as a part of a set of intangibles that a company cannot control. In this paper, we propose a human valuation model based on the marginal monetary worth of key individuals. An individual's marginal worth is estimated based on her/his market value, current compensation, and the perceived worth that includes one's experience, qualification, training, performance effectiveness etc. The proposed concept is described and illustrated with an example.

Keywords: Human Valuation, Marginal Worth, Intangibles, Quantitative Model.

* Professor, Department of Computer Information System, Virginia State University, Petersburg, VA 23806, USA.

** Associate Professor, Marshall University, Huntington, WV 25755, USA.

Introduction

Human resource accounting is not a new field of research in economics. Economists consider human capital as a production factor, and they explore different ways of measuring its investment in industry, education, healthcare, and other areas. Accountants have been recognizing the value of human assets for more than half a century. The American Accounting Association defines human resource accounting as “the human resources identification and measuring process and also its communication to the interested parties.” There are two reasons for including human resources in Accounting. First, people are a valuable resource to a firm so long as they perform services that can be quantified. Second, the value of a person as a resource depends on how much she/he is employed. When a firm invests in human resources by acquisition and training, it anticipates a future generation of profits and services that will be produced by these assets.

Companies as well as academicians are working on devising ways to measure human capital. A company’s success is embedded in its people, and what’s in their heads. It is more so in biotech, software, or telecommunication industry. Otherwise, how could it be possible that a company with a tiny share of a market niche, some rented office space, and a few computers goes public before it has profits, and after the IPO, it is valued in the hundreds of millions. The answer may lie in what the company may not be disclosing. Analysts and experts agree that nearly 75 percent of the sources of value in a company are never reported and we have yet to come up with an accounting system that can record it all. The hidden value in a company is usually lumped under “intangibles,” thought of as soft, rather than hard, assets. But soft is a misnomer. Hightech business is what has driven our economic boom thus far, and what is truly valuable in a biotech, software, or

a telecommunications company is not the networked computer systems or the new laboratory equipment, but the minds behind it all.

Employees and their ideas, as opposed to hard assets, are increasingly driving the value of an organization in this economy. So, you not only have people creating a lot of value, but they are highly valued themselves, and switching jobs more frequently than ever before. The concept of human valuation has met with number of obstacles over the last half-a-century. Three general problems are: 1) how to quantify the economic value of future changes in productivity that arise from personnel activities, 2) how long will the economic value from some personnel activities will continue to or assumed to accrue, and 3) how the mobility of individuals will affect the length of payoff for the firm. Due to these problems it is hard to assemble data in a format that can be used by the top management to make decisions.

Literature Survey

There are numerous factors that influence the economic value of human resources across individual, institutional, and market level analysis. Kendrick (1984) and Kopelman (1986) define economic value of personnel activities in relation to their capacity to enhance the economic value of the firm. These activities are economically productive if they lead to increase in quantity and quality of employees= services, and if the revenues associated with the incremental increase exceed the variable costs associated with the change (Steffy and Maurer, 1988).

Various theories were proposed over time to measure the economic value of human capital and each of these theories had some impact on the issue. Three of the theories are: Firm-Specific Human Capital, Human Resource Accounting, and Utility Analysis. The underlying question is that of measurement of productivity resulting from personnel activities. Two general measures that have been used in these theories as the basis of valuation are replacement cost and current market valuation. A brief description of each of these theories is presented below.

The firm-specific human capital is defined as the net present value of income stream of the firm that can be attributed to human resource investment (Hashimoto, 1981; Mangan, 1983). As per the proponents of the firm-specific human capital theory, the firm increases its human capital when the marginal economic contribution of employees exceeds the marginal labor costs of generating increased product (Steffy and Maurer, 1988).

However, measuring the relative contribution of human resources may not be feasible because changes in total value of the firm may be due to synergy of both human and nonhuman product inputs. To mitigate this problem, some labor economist argue that the mean compensation value of employees over the long run still approximate the economic value of successful personnel activities (Doeringer and Piore 1971). It is therefore argued that compensation, reflecting the current market value, is a valid surrogate for the expected productivity value (Steffy and Maurer, 1988).

Human resource accounting is a method for systematically measuring both the asset value of labor and the amount of asset creation that can be attributed to personal activities (Friedman & Lev, 1974; Lau and Lau, 1978). This definition was proposed by human resource accountants, who wanted to formally incorporate the value of human contribution to the value of their firms. However, this idea was not much patronized because of the stringent public accounting standards (Tsay, 1977). To value human resources as an asset the potential of the human service resource should be accurately evaluated and verified (Dittman et al., 1976; Flamholtz, 1985). The human resource accounting uses the compensation and the replacement cost as the basis for valuation.

The utility analysts measures the economic contribution of personnel activities according to how effective they are in identifying and modifying individual behaviors, hence the future service contribution of employees (Steffy and Maurer, 1988, pp. 279).

Utility analyst, Brogden (1946) focused on economic contribution

of the selection process based upon a predefined criterion. Over time utility analysts have modified processes to find alternate procedures for valuation and generalize their analysis to personnel activities other than selection. In the process they have also considered the fact that labor is mobile. Huber (1974) used a techniques called probability encoding to estimate the value of employee's human services. Casico and Ramos (1986) decomposed each job into its constituent tasks. Each task is then assigned a part of the pay to based on the weighted importance of each task. The biggest challenge faced by the utility analyst is probably the valuing the standard deviation of the criterion distribution in dollars and is generally referred to as the estimation problem (Bobko, Karren, and Parkington, 1983).

Most of these models in the open literature are descriptive and do not provide a practical way of evaluating the worth of an employee. We propose a Marginal Monetary Worth (MMW) model to estimate the marginal worth of key employees in an organization. The reason for evaluating the key employees is that after a certain level, the labor market becomes homogeneous and the marginal worth of employees equals to their compensation. It does not mean that the employee is not contributing to the company but the replacement cost is not significantly different from what their current cost is to the organization.

The proposed Marginal Monetary Worth model takes into account most of the general measurement problems discussed earlier. The model facilitates the process of decision making for the management in retaining the existing talented work force and thereby increasing the synergic benefit of the productive group to the organization. The basis of measurement is the replacement cost and the benefit received above the current compensation paid and the probable replacement cost is considered as an asset. The marginal monetary worth is defined as the difference between the current compensation and the market value or the replacement cost of the employee.

The Marginal Monetary Worth Model

We describe a marginal monetary worth model for evaluating an

employee and a procedure to estimate it. We suppose that the employee is not indispensable and persons of similar qualification and experience are available. The marginal monetary worth is defined as the difference between the salary and benefits paid to the current employee and that of the replacement of the current employee. The replacement value includes the salary and benefits, hiring and training cost etc. of the new employee who would be hired in place of the current employee if the current employee quits the organization. We also assume that the effectiveness of the replacement is not substantially different from the current employee because of the similar qualification and experience, training, organization culture, teamwork, supervision, and other such factors.

The procedure for the evaluation of the marginal monetary worth is described as follows. First of all, a differential matrix is required to be developed. A differential matrix is an evaluation of an employee by assigning merit points on each of the desired attributes or job specific factors in comparison to an average professional, with similar qualification and experience, in the field of employee's expertise. Let the merit points of an attribute i be M_i . If the current employee is considered equivalent to an average professional, a merit point of 1 is assigned; otherwise, a merit point of less than or more than is assigned depending on whether she/he has inferior or superior effectiveness on a given desired attribute. Based on the organizational culture and other job requirements, each of the desired attributes is then assigned a comparative weight, W_i , such that the sum of the weights assigned equals unity. Then the composite value of an employee is calculated as follows:

$$\text{Composite Value, } V = \sum_{i \in I} M_i W_i \quad (1)$$

Where, I is the set of all desired attributes considered important for the position the current employee holds. The expression in (1) above means that merit points of each attribute is multiplied by its weight of importance, and the products are then added together.

The value so calculated can be interpreted as follows. A value of 1 means that the employee is equivalent to an average professional in the area of his/her expertise. A value of 1.5 means that the employee is one and a half times as good as the average professional, and less than one means he/she is less effective than the average person.

Having estimated the value of an employee, the next step is to determine the monetary worth of the employee. It is easier to find from the published data the average and distribution (variance etc.) of the current salary structure of most category of professions. Let μ_s and σ_s be the mean and standard deviation of the compensation for the category of the employee. Then the average monetary worth of the employee is stated as follows:

$$\text{Average Monetary Worth, } AMW = V * \mu_s \quad (2)$$

Suppose a composite value, V , for an employee is 1.25. This means the employee is twenty-five percent superior to an average person of his/her expertise. If the average salary in the job market for the category is \$100,000, then the average monetary worth of the employee is \$125,000. However, some organizations have a policy to maintain their position in the industry in terms of salary and benefits. In order to maintain their position and prestige, organizations like to attract superior personnel and provide higher salary and benefits compared to the average salary in the industry.

Employee salaries are generally dispersed over a range and are specified of having a statistical distribution. Normal distribution or a bell curve is the most common and appropriate type of distribution when dealing with large numbers. Let z be the deviation desired by the organization from the average salary structure. Then the monetary worth of the employee is stated as follows:

$$\text{Monetary Worth, } MW = V * \mu_s + z \sigma_s \quad (3)$$

Where, z is the standard normal deviate. $z = 0$ means that the

organization maintains its salary structure equivalent to the average market structure. For example, if the organization desires to maintain its employee salaries at 60th percentile, $z = 0.25$, and for 70th percentile, $z = 0.53$. Z-values can be obtained from Normal curve tables given in any Statistical textbook (2004).

When an employee quits the organization, a new employee needs to be hired as a replacement. The hiring process would cost additional expenses and training of the new employee. The marginal monetary worth of an employee, as defined earlier, is the difference between the annual cost of the new employee and the current employee. Therefore, the marginal monetary worth will be as follows:

$$\begin{aligned} \text{Marginal Monetary Worth, MMW} &= V * \mu_s + z \sigma_s - \text{compensation} \\ &\text{of the current employee} \\ &+ \text{Hiring and training cost of the replacement.} \end{aligned} \quad (4)$$

The marginal monetary worth can be a positive or a negative value. If all key employees of the organization are evaluated based on the model stated above and their marginal monetary worths are added together, the sum will yield the value of total human assets in the organization.

$$\text{Total Human Assets} = \text{Sum of MMW of all key employees} \quad (5)$$

Illustration With an Example

The basic data for this model will come from the job title or job responsibilities of the position. We need to identify the basic desired attributes or critical factors relevant to the firm's profitability, success, and market share etc. pertaining to the individual job title or position. For example, we assume five desired attributes: leadership, managing skills, initiative, operational ability, and efficiency; and write a differential matrix in Table 1. Column 1 lists the desired attributes. Merit points, weights or importance assigned to the desired attributes, and the weighted merits are listed in columns 2, 3, and 4, respectively. A weighted merit is obtained by multiplying a merit point by its

weight. Please note that the sum of weights in column 3 is always equal to 1. The differential matrix is based on 1:1 ratio for an equally effective candidate for replacement. A better candidate, therefore, gets a merit point more than one and a less effective candidate gets a merit point less than one. For example, leadership of the employee in table 1 is rated ten percent superior and the operational ability is rated forty percent superior to an average employee, whereas the initiative attribute of this employee is rated ten percent inferior to an average employee. Weights are assigned based on the importance of the position to the organization. A position may not have the same importance for all desired attributes and different organizations assign different importance to the desired attributes. For example, the operational ability and leadership of the employee considered in Table 1 are assigned thirty percent and twenty percent weight respectively. This means that operational ability is fifty percent more important than leadership in this

Desired Attributes	Merit Points	Weight	Weighted Merit
Leadership	1.1	0.20	0.44
Managing Skills	1.2	0.25	0.30
Initiative	0.9	0.20	0.18
Operational ability	1.4	0.30	0.42
Efficiency	1.0	0.05	0.05
Composite Value =			1.39

organization as the weights assigned are 0.30 and 0.20, that is, in the ratio of 3:2. The weights can be assigned by a committee of senior managers and then averaged out. The weighted merits are then added to obtain the composite value of the employee.

Table 1 A Differential Matrix of an Employee

From the differential matrix, we estimate the value of this example employee to be 1.39. This means that this employee is 1.39 times as

good as an average professional or thirty-nine percent superior to an average professional in the area of his/her expertise. Suppose the salary structure of the employee's category /expertise has a mean of \$100,000 and a standard deviation of \$20,000 then the monetary worth of the employee,

Monetary Worth of the employee, $MW = 1.39 (\$100,000) + 20,000 z$.

If the organization wants to keep its salary at a one standard deviation higher than the average market salary, then

Monetary Worth of the employee, $MW = \$139,000 + \$20,000 = \$159,000$

The salary of one-standard deviation higher than average salary puts it in eighty-fourth percentile. Assuming that the annual compensation of the current employee is \$110,000 and the hiring and training expenses of the replacement is \$10,000, the marginal worth of the employee can be estimated as follows:

Marginal Monetary Worth of the employee, $MMW = \$159,000 + \$10,000 - \$110,000 = \$59,000$

Total Human Assets = Sum of MMWs of all key employees.

The total human assets calculated above may be reflected in the balance sheet as an asset. The market value for a person will change every year and therefore the incremental values of the key personnel need to be computed every year. The skills of the person and job requirements may also change every year, and this may again necessitate the computation of the marginal monetary worth of the human capital. Normally, the value of an asset decreases over a period of time due to depreciation. However, the human capital may actually be worth more with an additional year of experience.

Conclusion

This paper deals with estimating the marginal monetary worth of an employee. We have described a quantitative model for the marginal monetary worth and total human assets for organizations. It is a practical tool for organizations and also easy for implementation. This model does not evaluate the worth of human capital but helps compute the marginal worth of key employees. The model can be used for hiring decisions by the management or for adjusting compensation to its employees.

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