Measurement of Human Capital through Earnings Approach towards Calculating Weighted Average Cost and Economic Value Added of Firms

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ABSTRACT

EVA is a residual income measure which is calculated after subtracting the cost of capital from the operating profit generated by a business. The cost of capital considers the cost of equity and cost of debt only. This paper seeks to give recognition to human capital towards calculating the weighted average cost of capital of the firms to obtain the correct value of economic value added, which is an indicator of shareholders value. The paper throws light on capitalizing the human resources at the average rate of dividends of last three years(industry average) for the calculation of the book value of the human capital(the expectation of human capital has been considered as the expectation of equity shareholders). The average rate of dividend will be an independent rate which will facilitate comparison between human capital of various firms across the industry in the light of their respective staff costs. This will definitely lead to address the problem like labor turnover. Cost of labor turnover may be reduced by considering the expectations of the staff (staff cost) of various organizations.

Keywords: Human Capital; Weighted Average Cost of Capital; Economic Value added; Net Operating Profit after Tax

RESEARCH PROBLEM

The study seeks to calculate the book value of the human capital. Without measuring the human capital, the true value of weighted average cost of capital of firms cannot be calculated. The weighted average cost of capital without considering human capital fails to address the problems like labor turnover.

RESEARCH METHODOLOGY

For the purpose, secondary data of BHEL have been considered. Economic value added of the firm has been calculated both pre & post inclusion of human capital in the capital structure. Paired t-test has been applied to test the hypothesis.

REVIEW OF LITERATURE

Petty (1690) was the first to use this framework to estimate a country's stock of human capital. He calculated the human capital stock of England by capitalizing the wage bill to perpetuity at a 5 per cent interest rate.

Farr (1853) proposed estimating the earning capacity by calculating the present value of an individual's future earnings net of personal living expenses adjusted for deaths in accordance with a life table.

De Foville (1905) believed that the prospective method overestimates human capital by not deducting consumption expenditures from earnings.

Wickens (1924), sought to evaluate the stock of wealth in Australia's population by estimating the total discounted value of all the future streams of services to be generated by the country's citizens.

Houthakker (1959) and Miller (1965) argued that in a growing economy, every individual should benefit from an expected increase in his earnings on top of the gains in experience, seniority and other factors associated with age.

Since the approach based on income is forward looking, a dynamic economy interested in evaluating its future productive capacities would be more interested in this approach than the historical cost approach (Graham and webb, 1979).

Productivity is more relevant measure of a person's value to others; whereas gross productivity is a superior estimate of his total output to the society (Graham and webb,1979).

OBJECTIVE OF THE STUDY

The paper has the following objectives:

1. To give recognition to human resources of an organization as human capital by assigning book value to them so as to calculate the true cost of capital for the organization.
2. To capitalize human resources and find out cost of human capital to facilitate more accurate estimation of EVA of a firm.
3. To develop measures to control labour turnover cost.

Assumptions:

● To decide future earnings:

BHEL is a company of its own kind in the industry and hence forms an industry alone.

While estimating future earnings, following factors should be kept in mind:

▢ Smaller the period, more accurate the estimations of future earnings.

▢ While estimating future earnings on the basis of past earnings, weighted average of past earnings may be considered giving maximum weighted to recent earnings including bonus and employer's contribution to provident fund. In this paper compensation to employees have been considered as their earnings per year.

● To determine capitalization rate:

This is the most delicate issue and is entirely a subjective concept.

▢ It may be the rate of return that is required to attract investors to the particular organization.

▢ It is the cost of capital.

▢ It is the rate of earnings of the similar organizations in the same industry.

● Now, it has become the practice to offer stock options to the employees of various organizations, the return on equity can be considered as the return on human capital.

Limitations:

● Bharat Heavy Electricals Limited (BHEL) is the only company of its type in India; therefore, average rate of dividends of last three years (industry average) is the rate of dividends of the company itself.

HYPOTHESIS

H : $\mu_d = 0$ (where μ represents population estimate)

H : $\mu_d \neq 0$ (where μ represents population estimate)

Where μ_d is $\mu_1 - \mu_2$.

ANALYSIS OF THE STUDY

ECONOMIC VALUE ADDED

EVA is a residual income measure which is calculated after subtracting the cost of capital from the operating profit generated by a business. EVA measures whether operating profit is enough to bear the cost of capital. EVA is simply after tax operating profit minus the total annual cost of objective of any company. The one performance measure which accounts for the economic value created or destroyed is economic added, popularized by Stern & Stewart.

ASSIGNING BOOK VALUE TO HUMAN CAPITAL

The role of human resource can't be over emphasized. It's all-pervasive across departments of an undertaking. This paper seeks to facilitate the recognition of human resource as human capital for any business organization. For the purpose, human capital needs a book value. As per earning theory of capitalization, the staff cost can be capitalized at the rate of cost of equity. (Human resource being one of the stakeholders of the company). Logically, employees are more concerned with the sustainability of the firm they are working in. Cost of equity appears to be a reasonable rate at which staff cost can be capitalized. In this paper, the staff cost of different years have been multiplied by the cost of equity. i.e. average dividend of last 6 years (22.18%) as capitalization factor to calculate the book value of human capital.

A COMPARATIVE ANALYSIS OF EVA OF BHEL WITH AND WITHOUT HUMAN CAPITAL IN THE CAPITAL STRUCTURE

TABLE-1

(in Crores)

PARTICULARS	01-02	02-03	03-04	04-05	05-06	06-07
PROFIT BEFORE TAX (PBT)	662.83	802.43	1014.75	1581.63	2564.35	3736.07
PROFIT AFTER TAX (PAT)	467.94	444.51	658.15	953.40	1679.16	2414.70
PROV. FOR TAX	194.90	357.92	356.60	628.23	885.19	1321.37
TAX RATE %	29.40	44.60	35.14	39.72	34.52	35.36

SOURCE: ANNUAL REPORT BHEL

In the above table, tax rates have been calculated by the following formula:

Provision for tax/Profit before tax

TABLE NO. - 2

(in Crores)

PARTICULARS	01-02	02-03	03-04	04-05	05-06	06-07
STAFF COST (WORKERS &EMPLOYEE)	1444.6	1504.6	1639.5	1650.5	1878.6	2451.1
DIVIDEND	97.90	97.90	146.85	195.80	354.90	599.66
(average dividend in % of	22.21	22.14	21.75	21.62	21.33	22.17

last three years including the year in question)						

SOURCE: ANNUAL REPORTS BHEL

In the above table, average dividend for the year 01-02, has been calculated on the basis of the years 00-01and 01-02 (two years) only due to the non-availability of dividend amount for the year 99-00.

TABLE NO. 3 (in Crores)

PARTICULARS	01-02	02-03	03-04	04-05	05-06	06-07
EQUITY SHARES	244.76	244.76	244.76	244.76	244.76	244.76
SECURED LOAN (8.85% NON CONVERTIBLE, SECURED, REDEEMABLE,T AXABLE BOND	500	500	500	500	500	--------

SOURCE: ANNUAL REPORTS BHEL

TABLE NO. 4

Calculation of Human Capital: (in crores)

PARTICULAR	01-02	02-03	03-04	04-05	05-06	06-07
Human Capital(Staff Cost) Capitalized at last 3 years average of dividends	6504.27	6795.84	7537.93	7634.14	8807.31	11055.93

SOURCE: ANNUAL REPORT BHEL

TABLE-5

(IN CRORES)

YEAR	SOURCES	BOOK VALUE	COST	TAX RATE (PROV. FOR TAX/ PBT)	AFTER TAX COST	TAX ADJ BOOK VALUE	NOPAT	WACC with Human Capital (RS)	EVA WITH HUMAN CAPITAL	EVA WITHOUT HUMAN CAPITAL
01-02	EQUITY DEBT HUMAN CAPITAL	244.76 500.00 6504.27	22.21 8.85 22.21	29.40	22.21 6.25 15.69	54.36 31.25 1020.51	877.51	1106.12	-228.61	791.9
02-03	EQUITY DEBT H.CAPITAL	244.76 500.00 6795.84	22.14 8.85 22.14	44.60	22.14 4.9 12.27	54.19 24.50 833.84	767.57	912.53	-144.96	688.88
03-04	EQUITY DEBT H.CAPITAL	244.76 500.00 7537.93	21.75 8.85 21.75	35.14	21.75 7.75 14.11	53.24 38.75 1063.60	1063.53	1155.59	-92.06	971.54

04-05	EQUITY	244.76	21.62		21.62	52.92	1138.88	1074.29	64.59	1059.31
	DEBT	500.00	8.85	39.72	5.33	26.65				
	H.CAPITAL	7634.14	21.62		13.03	994.72				
05-06	EQUITY	244.76	21.33		21.33	52.21	1832.49	1311.50	520.99	1751.33
	DEBT	500.00	8.85	34.52	5.79	28.95				
	H.CAPITAL	8807.31	21.33		13.97	1230.34				
06-07	EQUITY	244.76	22.17		22.17	54.26	2436.42	1638.57	797.85	2382.16
	DEBT	---	-----	35.36	----	----------				
	H.CAPITAL	11055.93	22.17		14.33	1584.31				

SOURCE: ANNUAL REPORTS BHEL

In the above table, the cost of equity has been considered as the last three years average dividend including the year in question. As the cost of equity is not a tax deductible item, its after tax cost remains same whereas, the cost of debenture and the cost of human capital (staff cost) are tax deductible items, their respective costs have got the tax benefits equal to tax rate. The cost of debenture has been taken as 8.85% given in the table no. 3 above. Weighted average cost of capital is the total of tax adjusted book value. The formula for calculating EVA is

EVA= NOPAT-WACC.

Where, NOPAT is Net operating profit after tax and WACC is weighted average cost of capital.

TEST FOR HYPOTHESIS

H_0 : $\mu_d = 0$ (Null Hypothesis)

H_1 : $\mu_d \neq 0$ (Alternative Hypothesis)

Significance level is 0.05 and test method is paired t test, small and dependent samples. μ_d represents μ_1-μ_2.

X_A	X_B	d (X_A-X_B)	$(d_i - \overline{d})^2$	
(WITH H.C)	(WITHOUT H.C)			

-228.61	791.9	-1020.51	$(100.71)^2 =$	10,142.5
-144.96	688.88	-833.84	$(287.38)^2 =$	82,587.26
-92.06	971.54	-1063.6	$(57.62)^2 =$	3320.06
64.59	1059.31	-994.72	$(126.5)^2 =$	16002.25
520.99	1751.33	-1230.34	$(-109.12)^2 =$	11907.17
797.85	2382.16	-1584.31	$(-463.09)2 =$	2,14,452.34
		$\bar{d} = -1121.22$	$\sum (di - d)^2 =$	3,38, 411.58

Where X_A is EVA with human capital and X_B is EVA without Human Capital.

$$Sd = \frac{\sqrt{\sum(di - \bar{d})^2}}{n-1}$$

$$Sd = \frac{\sqrt{3,38,411.49}}{5}$$

$$Sd = \sqrt{67,682.3}$$

$$Sd = 260.15$$

$$SE = \frac{Sd}{\sqrt{n}}$$

$$SE = \frac{260.15}{\sqrt{6}}$$

SE = 106.18

DF = 6-1 =5

t = $\bar{d}$/ SE

t = - 10.56 (as t distribution is symmetrical, we need to take positive computed t)

 Critical t value is 2.5706

Since calculated t is greater than critical t, null hypothesis is rejected & alternate hypothesis is accepted.

CONCLUSION

There is significant difference in population values i.e. there is a significant difference between EVA with human capital & EVA without human capital. EVAs without human capital is always greater than EVAs with human capital during corresponding period. This shows that without considering the cost of human capital, accurate WACC can't be calculated. Therefore, cost of human capital is important for finding out the WACC of any firm.

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