

Determining The Contribution Of Human Resource Accounting (HRA) On Financial Statement Of Nigerian Banks Using The Mantel Test Analysis

Ijeoma, N., Bilesanmi, A. O., Aronu, C. O.

ABSTRACT: Human resource accounting is viewed as the process of identifying, measuring and communicating information about human resources in order to facilitate effective management within an organization where, the various decisions relating to hiring, training, developing, conservation, recruiting, allocation and selection of employees have to be made by the top management of any organization. This study examines the contribution of human resource accounting on the financial statement of banks in Nigeria using the Mantel Test Analysis. The method of data collection used in this study is field survey method which involved the use of questionnaire and interview. From the findings, it was observed that there exist a strong positive resemblance between the responses of Zenith Bank Plc staff and responses of First Bank Plc staff with an association of 98.43% and a p-value of 0.00 which falls on the rejection of the hypothesis assuming 95% confidence Interval. Also, it was concluded that the application of human resource accounting measures, management of banking Institutions will see its human resource as assets to be maximized rather than expenses to be minimized, which will lead to greater productivity in most of the key areas that guarantees the success of the institution.

Keywords: Communication, First Bank, Zenith Bank, Resemblance, Staff, Organization, Management

1 INTRODUCTION

Our main asset is our people” How true is this often repeated statement made by management of organizations? The success or otherwise of an organization depends on how best the scarce physical resources are utilized by the human resource. What is important here is that the physical resources are being activated by the human resources as the physical resources cannot act on their own. In spite of the important role played by human resources in organizations, accounting is still based on an industrial paradigm in which only physical and tangible property is considered asset. It is in the light of the above that accountants began research into the area of Human Resource Accounting (HRA). Although, it is relatively a new field, its development has already passed through several discernible stages. The first stage of development from 1960 to 1966 was marked by interest in human resource accounting and the derivation of the basic HRA concepts from related bodies of theory. The initial impetus for the development of HRA came from a variety of sources including; the economic theory of human capital, organizational psychologists’ concern for leadership effectiveness, and a concern for human assets as components of corporate goodwill. [1], believes that the human resource is the most vital part of any organization, as it makes sure there exists a symbiosis between financial and all other physical resources towards the achievement of organizational objectives and goals. Conveniently, financial assets are accounted in the books of accounts as per the general principles of accounting, but does not account for the human asset. Although many efforts have been made by many thinkers in this area, proper/appropriate and fully validated model of performance based on human resource accounting is not yet available. However, some authors have been able to put writings in the area. Human Resource Accounting is a process of identifying and measuring data about human resource and communicating this information to interested parties. Therefore, it is an attempt to identify and report investment made in resources of an organization that are not presently accounted for under conventional accounting practices. Moreover, human resource accounting helps to measure the value of employees, which helps the management take vital decisions related to human resources in order to increase production. It requires the measurement

of the performances of an organization and the optimum use of the resources under the direct and indirect control. Hence, the overall valuation is important for decision-making in order to achieve the organizational objectives and improve the output. According to [2] HRA aims at depicting the human resources potential in money terms while casting the organization’s financial statements. The traditional accounting procedures which have been practiced since long have come to stay as acceptable norms. As a result whenever a new accounting system is developed, it is pitted against the strength of the traditional system, which is considered to be comparatively objective and free from any bias. [3], expressed that human measures is the profit lever of the knowledge economy. [4], argues that employees interact together and transform other resources of the organization so as to add value and that what results from this transformation is reflected in the profit of the organization. He further posits that high priority and constant appraisal need to accrue to human resources as increased moral will result to better transformation and higher reflection of profit. In their contribution, [5] concluded that human resource accounting can be used as a political tool to demonstrate mismanagement of human resources, this is a situation which could negatively impact on performance and consequently on profit. Also, they added that it could be used as a pedagogical instrument for analyzing and structuring and thus better understanding, personal problem from the applied perspective and thus being better able to balance applied values against other values. In spite of these views and findings, human resource of an organization is yet to be recognized in the balance sheet. Auditors make a true and fair opinion on the financial statements despite the fact that it does not reflect the values of these ‘soft asset’ often referred to as our greatest assets. Shouldn’t this traditional valuation be called into question as human capital is an increasingly important part of an enterprise’s total value? This practice seems to have negative effect on the competitive position of an organization. It could equally hamper the performance of the employee ([4]; [5]). This traditional practice could again influence the financial position of an organization. The current accounting system has not been able to provide the actual value of employees’ capabilities, knowledge and experiences. This seems to

indirectly affect future investments of a company as each year the cost on human resource development and recruitment increases. Haven't the Accounting Standard Setters seen the need to legislate HRA or do they see it as lacking symmetry with traditional resource. All these are the worries of this present study. It is against this backdrop that this research work intends to make a formal study on these issues with a view to proffering solution. Hence, this study tends to access the contribution of human resource accounting (HRA) in improving the financial position of Nigerian Banks using Zenith Bank Plc and First Bank Plc as a case.

1.1 Managerial Accounting Perspective of HRA

[6], suggested that the value of human capital should be more fully considered when making decisions about the acquisition and disposal of people and noted that the accounting practices currently employed by companies can have an undue influence in driving the strategic decisions of these companies. He also noted that there are parallels between the process of acquiring an employee (a human capital asset) and that of acquiring a fixed capital asset. However while most companies acknowledge the contributions of its employees, they do not think of the acquisition or disposal of human capital assets in the same way or with the same thoughtful planning or strategic thinking as they do fixed capital assets. According to [7] utilized the HRA measure of expected realizable value, and found that employees' participation in a management development program increased the value of the individuals to the firm. In addition he noted that the HRA measures provided upper level management with an alternative accounting system to measure the cost and value of people to an organization. Thus HRA represented either a paradigm or way of viewing human resource decisions, and the set of measures for quantifying the effects of human resource management strategies upon the cost and value of people as organizational resources. [8], indicated that too many business leaders have no generally accepted definition or accounting procedure for tracking training investments, and stated that a lower training investment is not automatically better for an overall return on investment. [9], reported that expressing human resource interventions in financial terms and or cost benefit terms is more effective than using soft accounting information such as data on job satisfaction. Because the classical function of accounting is the determination of the value of the economic activity, performing analysis with hard numbers such as cost-benefit analyses helps us determine how resources should be used by human resources for various interventions. In their view, [2], opined that, personnel working for a determined enterprise are actually participating in a value creation process. That is, any economic activity makes the firm incur cost. One traditional classification takes into account the cost categories of raw materials, industrial plants, and personnel. They further explained that, when adding income flow to an organization's market, goods and services, if it is superior to the cost flow, it becomes value added. This value is a consequence of the interaction between materials and human resources in production.

2 MATERIAL AND METHODOLOGY

2.1 Data Collection

The method of data collection used in this study is field survey method; this involved the use of questionnaire and interview. The purpose is to give a clear understanding of the concept of human resource accounting in an organization. The study covers the two branches of Zenith Bank Plc and three branches of First bank Plc in Awka Town. The total population of study was 49 and 72 staff respectively and a random sample of 43 and 63 staff respectively were drawn from the branches of Zenith bank Plc and First Bank Plc in Awka. This includes both management and administrative staff of the bank. The statistical tool used in analyzing the data was the Mantel Test Analysis.

2.1 Simple Mantel Test

The mantel test is a permutation technique that estimates the resemblance between two proximity matrices computed about the same object. The matrices must be of the same rank, but not necessarily symmetric, though from practice this is often the case. The Mantel technique was first introduced as a solution to the epidemiological question where interest is on whether case of diseases that occurred close in space also tends to be close on time. [10] explained that multivariate tables of observations are usually condensed into resemblance matrices among any sampling unit of interest computed using proximity measure; in this present study the canonical measure was used as a measure as was displayed by the DA (distance over objects of group A) and DB (distance over objects of group B). Hence, the technique was used to compare matrix of spatial distances in a generalized regression approach by [4]. Since [5], the Mantel test has always included any conceivable proximity matrices; [11]; [12]; [13]; [14]; [15]. Letting dA_{ij} and dB_{ij} represent the distance

observational units i and j as derived from the observations for variables A and B , where, $DA = \left(dA_{ij} \right)$ and

$DB = \left(dB_{ij} \right)$ denote the corresponding $n \times n$ distance

matrices. The normalized Mantel statistic, defined as the product – moment coefficient between distance matrices DA and DB , is

$$r_M(AB) = \frac{\sum \sum (dA_{ij} - \bar{dA})(dB_{ij} - \bar{dB})}{\sqrt{\left[\sum \sum (dA_{ij} - \bar{dA})^2 \sum \sum (dB_{ij} - \bar{dB})^2 \right]}} \quad (1)$$

Where $\sum \sum$ denotes the double summation over i and j which ranges from one to n and $i < j$ by symmetry of DA and DB , and \bar{dA} and \bar{dB} are means of distances derived from the A and B raw data respectively. The testing procedure is given as stated by [3]:

1. Considering two symmetric resemblance matrices (similarities) A and B , of size $(n \times n)$, whose rows and columns correspond to the same set of objects. Compute the Pearson correlation (alternatively, the spearman correlation) between the corresponding objects of the upper-triangular (or lower-triangular) portions of these matrices, obtaining the mantel correlation (often called the standardized Mantel statistic) $r_M(AB)$, which will be used as the reference value in test.
2. Permute at random the rows and corresponding columns of one of the matrices, say A , obtaining a permuted matrix A^* . This procedure is called 'matrix permutation'.
3. Compute the standardized Mantel statistic $r_M(A^*B)$ between matrices A^* and B , obtaining a value r_M^* of the test statistic under permutation.
4. Repeat steps 2 and 3 a large number of times to obtain the distribution of r_M^* under permutation; then, add the reference value $r_M(AB)$ to the distribution.
5. For a one – tailed test involving the upper tail (i.e., H_{1+} : distances in matrices A and B are positively correlated), calculate the probability (p – value) as the proportion of values r_M^* greater than or equal to $r_M(AB)$. For a test in the lower tail, the probability is the proportion of values r_M^* smaller than or equal to $r_M(AB)$.

Note that for symmetric distance matrices, only the upper (or lower) triangular portions are used in the calculations while for non symmetric matrices, the upper and lower triangular portions are included. The main diagonal elements need not be included in the calculation, but their inclusion does not change the p- value of the test statistic.

2.2 Data presentation (see Appendix)

2.3 Research Hypotheses

H_{01} : Accounting for human resources does not improve the financial position of Zenith Bank Plc.

H_{11} : Accounting for human resources improves the financial position of Zenith Bank Plc.

3.0 DATA ANALYSIS AND RESULT

Inputting the data in Table 1 and Table 2 on R 2.13.0 command window; [16], where Item1A, Item2A, Item3A, Item4A, Item5A, Item6A, Item7A and Item8A are objects of matrix A; that is, responses obtained from Zenith Bank Plc while Item1B, Item2B, Item3B, Item4B, Item5B, Item6B, Item7B and Item8B are responses obtained from First Bank Plc.

```
R > A <-matrix(c(30, 6, 2, 5, 23, 10, 0, 10, 25, 12, 3, 3, 35, 5, 0, 3, 15, 10, 8, 10, 32, 8, 0, 3, 25, 10, 3, 5, 22, 15, 3, 3), nrow= 8, byrow = TRUE)
```

```
R > B <-matrix(c(50, 6, 2, 5, 43, 10, 0, 10, 45, 12, 3, 3, 55, 5, 0, 3, 35, 10, 8, 10, 52, 8, 0, 3, 45, 10, 3, 5, 42, 15, 3, 3), nrow = 8, byrow = TRUE)
```

```
R > DA <-dist.quant(A, method = 1)
```

```
R > DB <-dist.quant(B, method = 1)
```

Below is the elements of distance matrices DA which contains objects of matrix A on a class distances based on the canonical measure (method =1). Where the result displayed by DA expressed that the distance between Item1A and Item1A; Item2A and Item2A; Item3A and Item3A; Item4A and Item4A; Item5A and Item5A; Item6A and Item6A; Item7A and Item7A; Item8A and Item8A, is 1, distance between Item1A and Item2A is 9.695360; Item1A and Item3A is 8.124038; Item2A and Item3A is 8.124038; Item1A and Item4A is 5.830952; Item2A and Item4A is 14.764823; Item3A and Item4A is 13.341664; ... ; Item7A and Item8A is 6.164414.

R > DA

	Item1A	Item2A	Item3A	Item4A	Item5A	Item6A	Item7A	Item8A
Item1A	1							
Item2A	9.695360	1						
Item3A	8.124038	8.124038	1					
Item4A	5.830952	14.764823	13.341664	1				
Item5A	17.378147	11.313708	13.341664	23.194827	1			
Item6A	4.000000	11.575837	8.602325	4.242641	20.149442	1		
Item7A	6.480741	6.164414	2.828427	11.747340	12.247449	8.124038	1	
Item8A	8.12.247449	9.165151	4.242641	16.673332	12.165525	12.569805	6.164414	1

Similarly, below is the elements of distance matrices DB which contains objects of matrix B on a class distances based on the canonical measure (method =1). Where the result displayed by DB expressed that the distance between Item1B and Item1B; Item2B and Item2B; Item3B and Item3B; Item4B and Item4B; Item5B and Item5B; Item6B and Item6B; Item7B and Item7B; Item8B and Item8B, is 1, distance between Item1B and Item2B is 9.695360; Item1B and Item3B is 9.165151; Item2B and Item3B is 8.124038; Item1B and Item4B is 5.830952; Item2B and Item4B is 14.764823; Item3B and Item4B is 13.928388; ... ; Item7B and Item8B is 8.124038.

R > DB

	Item1B	Item2B	Item3B	Item4B	Item5B	Item6B	Item7B	Item8B
Item1B	1							
Item2B	9.695360	1						
Item3B	9.165151	8.124038	1					
Item4B	5.830952	14.764823	13.928388	1				
Item5B	17.378147	11.313708	13.341664	23.194827	1			
Item6B	5.099020	11.575837	8.602325	6.164414	20.149442	1		
Item7B	7.211103	6.164414	2.828427	12.569805	12.247449	8.124038	1	
Item8B	14.764823	10.000000	6.164414	19.235384	14.000000	13.490738	8.124038	1

The mantel.rtest function was used to perform the mantel test for 10000 permutations, where "nrept" represents the number of permutations;

```
R > mantel.rtest(DA, DB, nrept = 10000)
```

Monte-Carlo test

Observation: 0.9842681

```
Call: mantel.rtest(m1 = DA, m2 = DB, nrept = 10000)
```

Based on 10000 replicates

Simulated p-value: 9.999e-05

4 DISCUSSION

From the result obtained above, it was observed that there exist a strong positive resemblance between the responses of Zenith Bank Plc staff and responses of First Bank Plc staff with an association of 98.43% which on the mantel.rtest function result was indicated as observation = 0.9842 and a P-value of 0.00 which fall's on the rejection region assuming a significance level of 5% ($\alpha = 0.05$); this implies that accounting for human resources can improve the financial position of Zenith Bank Plc and First Bank Plc. Hence, the null hypothesis was rejected p-value = 0.00 is less than $\alpha=0.05$ assuming a 95% confidence interval level.

5 CONCLUSIONS

From the finding it was observed that staff of the two Banks expressed strong resemblance in terms of improvement of accounting for human resources on the financial position of their banks. Hence, we conclude that human resource accounting will have a significant improvement on the financial positions of Banks in Nigeria. If truly, our greatest assets are our people, then there is urgent need for their values to be evaluated, recorded in books, operated and disclosed in the financial statements. To this end, the application of human resource accounting measures, management of banking Institutions will see its human resource as assets to be maximized rather than expenses to be minimized, which will lead to greater productivity in most of the key areas that guarantees the success of the institution.

REFERENCES

- [1]. Narayan, R. "A New Paradigm in the Era of Globalization". *Asian Journal of Management Research*, 2010, pages 237-244 .
- [2]. Parameswaran, R. and Jothi, K. " Human Resource Accounting". *The Chartered Accountant Journal*, 2005, 53(7): 867-874.
- [3]. Gul, A. "An empirical study of the usefulness of human resource turnover costs in Australia Accounting firms". *Journal of Accounting, organization and Society* 1984; 5-11..
- [4]. Steven, H.A. and Hannie, H. "Accounting for Human Resources". *Manager Auditing Journal*, 1993, 8(2): 23-27.
- [5]. Grojer, J. and Johansson, U. "Current Development in Human Resource Costing and Accounting". *Accounting, Auditing and Accountability Journal*, 1998,11(4): 495-506.
- [6]. Moore, R. "Measuring How 'Human Capital' Appreciates in Value over Time". *Plant Engineering*, 2007, 61(4): 29-30.
- [7]. Bullen, M.L. "Human Resource Accounting: A useful Tool for Measurement and Management in Organizations". *Leadership and Organizational Management Journal*, 2007, 5: 85-103.
- [8]. Davidove, E. A., and Schroeder, P. A. "Demonstrating ROI of Training". *Training and Development Journal*, 1992, 46(8): 70-71.
- [9]. Johanson, U. and Mabon, H. "The Personnel Economics Institute after Ten Years: What has been Achieved and where we are we going?" *Journal of Human Resource Costing and Accounting*, 1998, 3 (2): 65-76.
- [10]. Legendre, P. "Comparison of Permutation Methods for the Partial Correlation and Partial Mantel Tests". *J. Statist. Comput. Simulation*, (67), 37 – 73; 2000.
- [11]. Mantel, N. T. "The Detection of Disease Clustering and a Generalized Regression Approach". *Cancer Res.*, 27, 209 – 220, 1967.
- [12]. Hubert, L. J. & Schultz, J. "Quadratic Assignment as a General Data Analysis Strategy"; *British Journal of Mathematical and Statistical Psychology*, 29, 190-241; 1976.
- [13]. Aronu, C. O, Ebu, G. U. "Application of Mantel's Permutation Technique on Asphalt Production in Nigeria". *International Journal of Statistics and Applications*, 2013, 3(3): 81–85.
- [14]. Aronu, C. O, Ebu, G. U., Ogbogbo, G. O., Bilesanmi, A. O. "Partial Mantel Analysis on Estimating the Resemblance of Students Performance." *International Journal of Scientific and Engineering Research*, 2013, 4(7): 2269-2273.
- [15]. Aronu, C. O, Ebu, G. U., Ogbogbo, G. O., Bilesanmi, A. O. "Measuring the Resemblance in Weight of two Group of Broiler Birds using the Mantel Test Analysis." *International Journal of Agriculture and Forestry*, 3(4), 145-151, 2013.
- [16]. Dalgaard, P. *Introductory Statistics with R*. Springer, NY; 2002.

Appendix

Table 1: Distribution of Responses on whether Accounting for Human Resources improves the financial position of Zenith Bank Plc.

S/N	QUESTIONS	SA	A	SD	D	Total
1	Expensing values of human capital development/training might lead to lower investment consequently leading to lower return on investment.	30	6	2	5	43
2	When the cost of HR is capitalized like other physical assets, the profitability position will improve which will in turn enhance the market value of the firm	23	10	0	10	43
3	Inclusion of human resource in the financial statement will make the organization to be valued at its true potential	25	12	3	3	43
4	The assets of an organization as measured within the conventional accounting is not a complete reflection of the organization's asset	35	5	0	3	43
5	The true financial position of the organization can only be ascertained when the human resource asset is included in the balance sheet	15	10	8	10	43
6	Accounting for human resource will improve the financial position of the firm	32	8	0	3	43
7	Treating human resource as expenses to be minimized distort the financial statement.	25	10	3	5	43
8	Application of HRA measures would aid management to acknowledge the fact that investments in a company's human resource will result in long-term profit for the organization; thus enhancing the financial position	22	15	3	3	43

Table 2: Distribution of Responses on whether Accounting for Human Resources improves the financial position of First Bank Plc.

S/N	QUESTIONS	SA	A	SD	D	Total
1	Expensing values of human capital development/training might lead to lower investment consequently leading to lower return on investment.	50	5	2	6	63
2	When the cost of HR is capitalized like other physical assets, the profitability position will improve which will in turn enhance the market value of the firm	43	10	0	10	63
3	Inclusion of human resource in the financial statement will make the organization to be valued at its true potential	45	12	3	3	63
4	The assets of an organization as measured within the conventional accounting is not a complete reflection of the organization's asset	55	3	0	5	63
5	The true financial position of the organization can only be ascertained when the human resource asset is included in the balance sheet	35	10	8	10	63
6	Accounting for human resource will improve the financial position of the firm	52	8	0	3	63
7	Treating human resource as expenses to be minimized distort the financial statement.	45	10	3	5	63
8	Application of HRA measures would aid management to acknowledge the fact that investments in a company's human resource will result in long-term profit for the organization; thus enhancing the financial position	42	17	1	3	63