

## FINANCIAL ANALYSIS OF HUMAN CAPITAL MANAGEMENT IN DEPOSIT MONEY BANKS: EVIDENCE FROM AN EMERGING MARKET (NIGERIA)

*Nwakanma, Prince Chinaecherem\**

**Abstract:** *The Study examined the application of financial analysis to human capital management, using the Ordinary Least Squares procedure, and certain measures of human resources productivity in Deposit Money Banks that reflect the productivity of human resources in deposit mobilization, loan generation and growth of non-interest income, expressed as ratios of human resources maintenance costs. These were regressed against price earnings ratio, which is a measure of stock market valuation of securities and a proxy for performance in publicly quoted banks in Nigeria. It was discovered that human resources management made significant contribution to Deposit Money Banks' performance. The study recommends the adoption of strategic human resources management, as a means of improving the performance of Deposit Money Banks in an emerging market. It also recommends further study of environmental factors that are germane to human resources management in Deposit Money Banks.*

**Keywords:** *Human capital management, financial analysis, Deposit Money Banks, Granger Causality Model, Maintenance Costs*

**JEL Classification:** *M5, C58, G21, C5, J3*

### INTRODUCTION

The concept of human capital as a paradigm for economic growth and development stemmed from the recognition that of all the factors of production as propounded by economists, human resources or people are the most critical for optimal productivity. If it is understood that every other resource is at best dormant until the human factor is introduced then the importance of human capital assumes a more critical dimension (Mahalingam, 2001). Human capital theory evolved as behavioral scientists, economists, organizational experts, accountants, and other writers explored the role of human capital in socio-economic development (Becker, 1964; Ben-Porath, 1967; Schulz, 1960; Mincer, 1958). Thus human capital, which is the productive force embodied in an individual that enables the production of goods and services is termed an asset that has value to the individual, organization or society. The asset-quality of the individual is dependent on his level of education and training, experience, state of health and other innate attributes of the person (Todaro and Smith, 2006, Perkins, *et al.*, 2001).

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\* Department of Finance and Banking, University of Port Harcourt, Port Harcourt-Nigeria,  
E-mail: [nwakanma5@yahoo.com](mailto:nwakanma5@yahoo.com)

Firms acquire human resources as a necessary input in the production process and the attainment of designated objectives. The productivity of the employees in a firm is a matter of the attitude of the management towards them. If management considers its human resources as an asset rather than cost it would adopt an approach that seeks to manage its workforce in an integrated and strategic manner so as to ensure its long-run competitive advantage in product and service delivery to all the stakeholders (CIPD, 2010).

Nigeria joined the league of emerging markets when on the counsel of the International Monetary Fund (IMF) the country adopted the Structural Adjustment Programme (SAP) in 1986. The adoption of SAP brought about the institution of a market led economy that gradually replaced, to a large extent, the erstwhile public sector administered economy in the allocation of scarce resources. A major component of the policy was the liberalization of the economy for greater participation by the private sector which opened it up to greater competition aimed at enhancing efficient resource management in the economy. On the rationale for the adoption of SAP by Nigeria Alhaji (1991) remarked: "Along with other measures of SAP, deregulation is expected to ensure a more rational and efficient allocation and use of resources, promote competition, and facilitate industrial diversification and the stimulation of domestic production".

The banking sector which is viewed as pivotal to Nigeria's developmental efforts became the linchpin of deregulation. Alhaji (1991) adduced reasons for deregulation of the banking system when he explained that "...it was aimed inter alia, to facilitate easy mobilization of savings, encourage investments, transform maturities, reduce information and transactions costs, promote the growth of the money and capital markets, and finally to promote competition and ensure efficient allocation of resources throughout the Nigerian economy". This policy posture conforms to the financial repression hypothesis separately postulated by McKinnon (1973) and Shaw (1973) which asserts that financial repression can be counter-productive because the administrative control of interest rates drives them below the equilibrium or market determined rates, which invariably discourages savings thereby leading to excess demand for funds and misallocation of valuable resources.

The effect of deregulation was a rapid and unprecedented growth in the number of banks in Nigeria, which increased from 46 in 1986 at the inception of SAP to 120 in 1992. This explosion in the numerical strength of banks posed diverse challenges to the management of banks. One major aspect of banking operations that was overstretched was human resources. Because of the high demand for labour, it was believed that most banks employed persons without the requisite training and experience. This was accompanied by very high rate of labour turnover. The opportunity for training was also limited as the pressure to deliver to targets gave little room for proper seasoning of the available staff. The inevitable consequences of this were weak corporate governance and poor credit risk management in most banks. Coupled with a slowdown in the economy and ill-conceived strategic plans resulted in the distress of over 36 banks by 2004 (Soludo, 2004).

In 2004, the Central Bank of Nigeria (CBN) introduced some reform measures in the banking system in order to save it from systemic failure. A key component of this reform was an increase in the required minimum capital base of deposit money banks from N2b to N25b (twenty five billion) Naira. Banks were given up to 31<sup>st</sup> December, 2005 to comply or be phased out. This was informed by the need to make the banks more robust and capable of providing the needed stimulus for the growth and development of the economy (Soludo, 2004). However, recent developments in the Nigerian banking sector warranted the intervention of the Central Bank of Nigeria. Thus, disengagement of directors and top management staff in eight of the banks in 2009 became inevitable. It also reawakened the fear that the banks might still be plagued with poor performance due largely to weak corporate governance mechanism. The core of corporate governance hinges on the human factor at all levels of the organization. Emphasizing the importance of people Carnegie in Brown (1979) asserts: "Take away all my steel mills. Take away all my money. Leave me with my people and in five years I will have everything back." Collins (2001) stressing the importance of people remarked: "The executives who ignited the transformation from good to great did not first figure out where to drive the bus and then get people to get it there. No, they first got the right people on the bus (and the wrong people off the bus) and then figured out where to drive it". Thus the primary task of any management is to source the right people who will deliver the desired results.

Most work on human resources management (HRM) had focused on the measurement of human capital (HCA) under the framework of human resource accounting (HRA) in an attempt to place value on the human resources of a firm. Even though much progress has been made in this direction, however, the accounting profession is yet to fully develop a generally acceptable framework for reporting human capital (Bullen and Eyler (2010); thus, leaving it at the discretion of the management of individual firms. Nonetheless it is believed that the application of human resource accounting will be beneficial for both internal use of management and external use of investors in decision making.

The focus of this paper is to suggest a framework for the financial analysis of human capital in deposit money banks. Nigerian deposit money banks have not formalized the practice of HRA but they have made some progress toward the reporting of certain information on human resources. For example, most banks in Nigeria provide information about the cost of maintaining their human resources in terms of personnel emoluments and compensations including pension costs and number of employees. We argue that in as much as this form of reporting treats the maintenance of human capital as an expense rather than an asset and is incomplete because it buries other staff related costs like employee recruitment and training costs under other operating costs or overhead expenses. It could still serve the purpose, even if to a limited extent, of analyzing the productivity of human resources in the banking firm.

We hypothesize that human resources unlike other resources, physical and financial can be motivated to increase performance. Their motivation can be seen as the reward they get for the services they render to the banking firm. Motivation theorists and practitioners agree that non-financial incentives suffer the inadequacy of imprecise

measurement but that financial rewards are quantifiable and can therefore be useful in administration of incentive schemes. Thus, workers remuneration can be viewed as a proxy for measuring the reward for their contribution towards accomplishing the firm's objectives. Given a fair working environment and the provision of necessary facilities, one can argue that workers perception of the reward they get for their services will reflect on their commitment and level of output.

With respect to training, experience and other factors that are embedded in the worker, the reward given to the staff could act as a catalyst that could make those qualities produce to the extent that could significantly impact on the output of banks. Human beings are unique in the sense that they can react favourable or unfavourably to situations and their perception of how they are treated could affect their productivity. By identifying critical productivity measures of human resources in a banking firm, we examine their relationship to the performance of the firm in terms of profitability measures. This study is significant because it sheds some light on the extent to which the maintenance costs of human resources can be a factor in the measurement of the productivity of banking firms, which can be critical for their performance. It would be of importance to the management of deposit money banks and the regulatory agencies in formulating appropriate policies that would encourage the optimal utilization of human resources in banks. Furthermore, it would be useful in drawing attention to the need for a more systematic and formalized approach to human capital management. It would also underline the need to accelerate the search for an acceptable approach to the valuation and accounting report of the human resources endowment in banking firms and indeed, all corporate organizations for both internal and external application.

This paper is in five parts, following the introduction is the theoretical framework, after which is the research sample and method, then is the empirical results and finally concluding remarks.

## **THEORETICAL FRAMEWORK**

The concern of human capital management (HCM) is to integrate the concept of people as an asset to the enterprise that employs them in the strategic management of the enterprise's human resources (CIPD, 2010). This has resulted in the proposition of human resource accounting (HRA) by human resource experts who view such an innovation as vital to the enhancement of management's perception about the valuable and strategic importance of human resources as an organizational resource that needs to be accorded such recognition (Bullen, 2007). Various approaches have been employed in the accounting measure of human resources. Expected realizable value was employed by Flamholtz, Bullen & Hua (2003) to examine the impact of management development programme on the value of the individual to the firm.

Flamholtz (1999) approaches human resource accounting from the dual dimensions of cost and value. He opines that the cost of human resources can be broken down into acquisition costs and learning costs. These costs are reported as assets in the balance sheet with future economic benefits rather than as outright expenses. On the value

dimension of human resources, Flamholtz (1971; 1999) developed and subsequently elaborated on the Stochastic Reward Valuation Model (SRVM) which is an application of the general economic value theory in the determination of the present value of the future cash flows from the services of an individual to the organization. In their contribution, Lev & Schwartz (1971) advanced the use of the present value of future earnings. The present value of the value added by the enterprise is another measure proposed by Turner (1996). In his own contribution Casio (1998) proposed the use of human capital indicators such as innovation, employee attitudes and inventory of knowledgeable employees in measuring human capital. Much as the accounting measures attempt to measure the capital value of human resources, the information does not indicate the extent to which human resources utilization explains the performance of firms.

Financial ratio analysis has been used by most studies on banking firms to explain the effect of management decisions on the performance of banking firms. Uchendu (1995) employed the Ordinary Least Squares (OLS) to explain the Monetary Policy variables that influence deposit money banks' profitability in Nigeria, using various book values such as return on assets (ROA), adjusted net interest margin and return on equity (ROE) to proxy profitability. Similarly, Ogunleye (1995) employed OLS to estimate the Monetary Policy changes on the profitability of banking firms in Nigeria using ROE and ROA as measures of profitability. A more comprehensive study was undertaken by Nyong (1996) in which he applied simultaneous equation and OLS to examine the effect of Monetary Policy on both bank profitability and the capability of the regulatory authority (CBN) to enforce capital adequacy. In his formulation he included as one of the explanatory variables labour cost which he defined as the ratio of wages/salaries to number of employees. Balashanmugam, *et al.* (2000) examined the determinants of commercial banks' profitability in Malaysia with OLS. The authors made use of both micro, firm specific data and macroeconomic data in their analysis. They still employed ROE and ROA as profitability measures while various variables depicting efficient expense, as well as asset and liability management were incorporated.

None of the studies indicated above applied market determined measures of performance nor did they examine the extent human resources management affected the performance of banking firms. This study seeks to fill that gap in literature by investigating the influence of some human resources productivity measures on banking firms' performance using price earnings ratio as a measure of performance.

## **RESEARCH SAMPLE AND METHOD**

Banks occupy a prominent position in Nigeria and dominate the stock market in terms of volume of trade and market capitalization on the Nigerian Stock Exchange. They are also the largest deposit-taking financial institutions in Nigeria. In 2004 a major reform took place in the banking sector with the result that every bank now has a minimum paid-up capital of N25billion; a development that has greatly enhanced the volume of the assets and liabilities of the banks. The reform resulted in a reduction in the number

of banks from 89 prior to consolidation to 25 after the consolidation. Banks as service organizations, owe their competitive strength to the quality and performance of their human resources (Cuganesan, *et al.*; 2010). This makes the industry suitable for the study.

Of the twenty five banks, fourteen banks were included in the sample based on convenience and data availability. As a result of limited access to data, the study covered an average of four years which gave a total sample size of 54. The span of the study ranged from 2005 to 2008 reflecting the period following consolidation. Banks included in the study covered a broad spectrum of sizes; on the whole, the study sample represents about 80% of all assets of the banks in the country (Central bank of Nigeria Statistical Bulletin, 2009). All the study banks are quoted on the Nigerian Stock Exchange and enjoy active trading on their stocks. We adopted the Ordinary Least Squares Regression (OLS) as suitable for our purpose (Gujarati and Sangeetha, 2007, and Anderen, 2007).

OLS has been successfully used in studies involving the determinants of banks' performance (Uchendu, 1995, Ogunleye, 1995, Nyong, 1996, Demirguc-kunt and Huizinga, 1998). In our choice of variables we build on the assumption that human resources predominate and control the outcome of every other resource input in the banking firm. In that case, the productivity of the other resources can be predicated on the productivity of the human factor. For example, take the tremendous impact of technology. It owes both its creation and effective use to the human factor which invents and popularizes it through education and training. Equally, the application of technology through the human factor facilitates production. It is safe to argue that the variability in the productivity of a given technology in diverse settings might be attributable to the degree of mastery possessed by the users of the technology. In this wise, the case of the computer and information technology comes readily to mind. There are several applications embodied in the computer but the skill and dexterity of the individual user determines the limit to which the computer can be used in solving any given problem it was designed for. Todaro and Smith(2006) capture this idea most eloquently in their submission” The economic success stories of the “Four Asian Tigers”- South Korea, Singapore, Hong Kong, and Taiwan- are often attributed in part to the quality of their human resources ...”

The banking firm as often argued, depends on the technical and human skills of its employees to generate its various inputs and outputs. The higher the skills and dexterity embodied in the human resources, the greater all things being equal is the productivity of the firm. We therefore view the firm as an aggregation of human resources, whose individual and combined efforts determine the output of the firm. Since our study subjects are all quoted banks, we adopted a market determined measure of performance which should be more rational and unbiased in appraising the performance of the banking firm. In actual fact, we observed that the other likely measures of bank performance such as return on assets (ROA) and return on equity (ROE) performed poorly as a proxy for performance. We found price earnings ratio (PE) to be the best proxy for bank performance because it reflects investors' risk and return valuation of the stock. We take the significant sources of bank wealth as output measures of human resources.

Therefore, the basic regression model takes the form:

$$PE = f (DEPMCE, ALNMCE, ARVMCE) \quad (1)$$

Where:

PE = Price Earnings Ratio (a measure of performance)

ALNMCE= Ratio of Adjusted loans and advances to human capital maintenance cost

DEPMCE = Ratio of deposits mobilization to human capital maintenance cost

ARVMCE = Ratio of non-interest income to human capital maintenance cost

Data for the study were obtained from the annual reports and statement of accounts of the various deposit money banks included in the sample. The period analyzed was from 2005 to 2008. The choice of the time period was constrained by data availability at the archives of the Nigerian Stock Exchange. The banks even provided fewer time periods from their own archives. However, the years analyzed represent the period after banks' consolidation when the capital and capacity of the banks were generally increased.

The estimable equation takes the form:

$$PE = p_0 + p_1 DEPMCE + p_2 ALNMCE + p_3 ARVMCE + \mu \quad (2)$$

Where:

PE = Profitability Ratio

DEPMCE = Ratio of deposit mobilization to human capital maintenance cost

ALNMACE = Ratio of adjusted loans and advances generation to human capital maintenance cost

ARVMCE = Ratio of noninterest income to human capital maintenance cost

$p_0$  = Constant

$p_1, p_2$  and  $p_3$  = Estimate parameters

$\mu_1$  = error terms

The paper also made use of Granger Causality model as given in the estimation equations below:

$$DEPMCE_t = \sum_{i=1}^n \alpha_0 PE + \sum_{j=1}^n \alpha_1 DEPMCE_{t-j} + \mu_{1t} \quad (3)$$

$$PE_t = \sum_{i=1}^n \beta_0 PE_{t-i} + \sum_{j=1}^n \beta_1 DEPMCE_{t-j} + \mu_{2t} \quad (4)$$

$$ALNMCE_t = \sum_{i=1}^n \pi_0 PE + \sum_{i=1}^n \pi_1 ALAMCE_{t-j} + \mu_{3t} \quad (5)$$

$$PE_t = \sum_{i=j}^n \Omega_0 PE_{t-i} + \sum_{j=1}^n \Omega_1 ALAMCE_{t-j} + \mu_{4t} \quad (6)$$

$$ARVMCE_t = \sum_{i=1}^n \pi_0 PE_{t-i} + \sum_{j=1}^n \pi_0 PE_{t-i} + \sum_{j=1}^n \pi_1 ARVMCE_{t-j} + \mu_{5t} \quad (7)$$

$$PE_t = \sum_{i=1}^n \infty_0 PE_{t-i} + \sum_{j=1}^n \infty_1 ARVMCE_{t-j} + \mu_{6t} \quad (8)$$

$$ALNMCE_t = \sum_{i=1}^n \int_0 DEPMCE_{t-i} + \sum_{j=1}^n \int_1 ALAMCE_{t-j} + \mu_{7t} \quad (9)$$

$$DEPMCE_t = \sum_{i=1}^n \chi_0 DEPMCE_{t-i} + \sum_{j=1}^n \chi_1 ALAMCE_{t-j} + \mu_{8t} \quad (10)$$

$$ARVMCE_t = \sum_{i=1}^n \Phi_0 DEPMCE_{t-i} + \sum_{j=1}^n \Phi_1 ARVMCE_{t-j} + \mu_{9t} \quad (11)$$

$$DEPMCE_t = \sum_{i=1}^n \delta_0 DEPMCE_{t-i} + \delta_1 ARVMCE_{t-j} + \mu_{10t} \quad (12)$$

$$ARVMCE_t = \sum_{i=1}^n \$0 ALMACE_{t-1} + \$1 ARVMCE_{t-j} + \mu_{11t} \quad (13)$$

$$ARVMCE_t = \Delta_0 ARVMCE_{t-1} + \Delta_1 ALAMCE_{t-j} + \mu_{12t} \quad (14)$$

Where it is assumed that the error term or disturbances  $\mu_{it}$  are uncorrelated. To this causality model, we apply the F test.

There is some measure of controversy about the definition of inputs and outputs of banking business. For our purpose, we draw from the most commonly used definitions discussed in Favero and Papi (1995). In this case, we choose to adopt the hybrid approach where banking outputs comprise both stock and flow variables. Here bank products are defined as total loans and deposits, and proceeds from services. The use of stock variables to approximate the value of output can be justified as the loans and advances require constant production of services, so that they can constitute an acceptable proxy for banking output (Sealey and Lindley, 1977, Lucchetti and Zazzaro, 2000). In order to capture the quality of output, and therefore the level of protection against risk ensured by a particular balance sheet structure (McAllister and McManus, 1993, Lucchetti and Zazzaro, 2000), we have only considered performing loans. Finally, we have also considered certain items on the profit and loss account (income from fees and commissions) in order to capture the contribution made to output by banking services which are not reflected in the amount of loans and deposits (Lucchetti and Zazzaro, 2000). The use of maintenance cost of human resources as the deflator underscores the idea that the attraction and recruitment of highly skilled and productive workers is predicated on the ability of the banking firm to pay attractive compensation (Stiglitz, 1974, and Yellen, 1984).

The production factor is represented by the efforts of the human resources as copiously discussed above because all said and done, the efficiency of intermediation and capital utilization revolves around the human factor. We therefore deflate the products of banks by human resources maintenance costs to derive the productive efficiency of human resources. We consider that as a proxy for the productivity of human capital in the use of financial and material resources to generate outputs (Weihrich and Koontz, 1994). However, this measure varies somehow from the measure of productivity of capital or investment which is input over output in economics, that is, capital over output (Perkins, *et al.*, 2001).

Furthermore, the model abstracts from the other factors of production in the banking firm such as capital and assets per se. We carried out diagnostic tests to comply with the



underlying assumptions of the OLS procedure and observed that our data satisfied most of the assumptions except multicollinearity. We will revisit this later. These include homoscedasticity, specification bias, normal distribution of the residuals, etc. Hence the short-run model was estimated at their stationary level, and is therefore unbiased and consistent (Gujarati, 2004, and Koutayiannis, 1977).

### **ESTIMATION RESULTS**

Estimation results are given in equation 15 and take the form of:

$$D(PE) = -0.345001 + 0.350637 D(DEPMCE) - 0.069898 D(ALNMCE, 3) - 1.21553D (ARVMCE, 3)$$

$$t (-0.096464) \quad (2.733385) \quad (-1.344809) \quad (-2.102516) \quad (15)$$

Prob-t 0.9236                      0.0091 0.1857                      0.0414

R = 0.49

R<sup>2</sup> = 0.24

F-Value = 4.68

Prob F = 0.006759

DW = 2.89

t- Values are in parenthesis

The above result indicates that PE ratio was explained by the measures of human capital productivity showing a relationship (R) of 0.49 or approximately 50%. The coefficient of determination (R<sup>2</sup>) of 0.24 shows that the productivity of human capital explained about 24% of the performance of deposit money banks in Nigeria. The difference of 76% can be explained by other variables. The F-ratio is significant at 5% confidence level showing that the model has a good fit and is good for our purpose. We next consider the behavior of the individual human resources productivity measures as inferred from their coefficient estimates as discussed below.

#### **(i) Deposit Mobilization**

The measure of the productivity of human capital in deposit mobilization reveals that the variation has a positive and significant relationship with PE ratio. This is in line with apriori expectation because deposits represent the raw material of banks for meeting their intermediation function. Thus bank managements generally show a high disposition for deposit mobilization and often motivate their employees to drive for deposits.

#### **(ii) Loan Generation**

Loans and advances constitute a major source of income and risk assets to banks. Loans and advances were adjusted to provide for non-performing loans. We expected to have a positive or negative relationship between PE ratio and the human capital measure of loan productivity. The results indicate a negative sign for the human capital measure

of loan productivity. This might result from the tendency for a lax loan policy to create an incentive for credit officers to book loans without regard to quality that will lead to high loan growth rate with deterioration in profitability, which was recognized by the stock market as in this case. Another likely reason might arise from the general market perception of any bank with high loan profile as risky which compels the market to adjust its rating for the banking firm by demanding a higher rate of return.

### (iii) Non- interest income

Non-interest income arises from commissions and fees for services offered by the bank and increases in tandem with the skills and competences of staff in generating products that yield noninterest income. The significant and positive relationship is in consonance with apriori expectation that banks in a bid to hedge against lending risk motivate their workers to be creative in generating non-interest income. The stock market attaches significant importance to this as this source of income counterbalances the down side of lending risk.

Application of the Augmented Dickey- Fuller (ADF) test reported in table 1 indicates that the unit root test results show that the variables in the empirical model are integrated of the order Zero,  $I(0)$ , implying that they are stationary at their actual level.

**Table 1**  
**Unit Root Test of Stationarity Result**

<i>Variable</i>	<i>ADF</i>	<i>Order of Integration</i>
PE	-3.975766	I(0)
ALAMCE	-8.466308	I(0)
DEPMCE	-12.21389	I(0)
ARVMCE	-10.10563	I(0)

*Source:* Author's Computation

*Notes:* 5 per cent critical value= -2.9215

Furthermore, using the Johansen procedure, we conducted a test of the existence of long-run relationship among the series of the model. The Johansen test of co-integration shows that there exists four (4) co-integrating vectors in the model as shown in table 2 and displays the relationship of the model as viable for strategic human resources management.

**Table 2**  
**Johansen Cointegration Test**

<i>Likelihood Ratio</i>	<i>Eigenvalue</i>	<i>5 Per cent Critical Value</i>
87.73022	0.537038	47.21
51.53503	0.376747	29.68
29.31327	0.325280	15.41
10.82076	0.205648	3.76

*Source:* Author's Computation

We conducted Granger causality tests on the data, the bivariate tests involve the variables of PE ratio, DPMCE ratio, ALAMCE ratio, and ARVMCE ratio. The number of lags used in the analysis is two. It is determined using the Akaike and Schwartz criteria. To test for the causality, the Granger F-test is used. From the results obtained, the overall causality between PE ratio, DPMCE ratio, ALAMCE ratio, and ARVMCE ratio in either direction can be ruled out at 5% critical level of significance.

## **CONCLUDING REMARKS**

We hypothesized that human capital management in deposit money banks can have overriding influence on the performance of the banks. We examined the various approaches to human capital management in order to highlight the efforts being made towards the advancement of the strategic importance of human resources management. Of particular significance are the gains made towards the establishment of human resources accounting (HRA).

Further we considered the various OLS models that examined the effect of Monetary Policy on the performance of deposit money banks and observed that no attempt has been made to specifically model the effect of human resources management on the performance of deposit money banks. This paper has proposed a specification of the OLS model which makes it possible to isolate the impact of human capital management on the performance of deposit money banks. In so doing, the paper provides an empirical contribution to the question of human resources factors that are critical to the performance of deposit money banks in Nigeria.

We were able to establish measures for human resources productivity that can be used to enhance the performance of deposit money banks. Our empirical evidence points out that ratio of deposit mobilization to human capital maintenance costs and the ratio of non-interest income to human resources maintenance costs are the most significant explanatory variables for the performance of deposit money banks using price earnings ratio as the dependent variable. It follows that if deposit money banks could lay more emphasis on human resources development and design the enabling environment for effective and efficient performance, they could significantly maximize corporate value to all stakeholders of the bank.

We recommend further research in the area of environmental factors that can affect human resources productivity in the Nigerian banking industry.

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## APPENDIX

**Table I**  
**Short-Run Estimated Model**

Dependent Variable: D(PE)  
Method: Least Squares  
Date: 10/15/10 Time: 12:01  
Sample: 1 54  
observations: 54

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob</i>
C	-0.345001	3.576481	-0.096464	0.9236
D(DEPMCE)	0.350637	0.128279	2.733385	0.0091
D(ALAMCE,3)	-0.069898	0.051976	-1.344809	0.1857
D(ARVMCE,3)	-1.215553	0.578142	-2.102516	0.0414
R-squared	0.244473	Mean dependent var		-0.614468
Adjusted R-squared	0.191762	S.D. dependent var		27.24246
S.E. of regression	24.49153	Akaike info criterion		9.315797
Sum squared resid	25792.92	Schwarz criterion		9.473257
Log likelihood	-214.9212	F-statistic		4.637970
Durbin-Watson stat	2.886183	Prob (F-statistic)		0.006759

Source: Author's Computation Using E-Views Software

**Table II**  
**Model Stability Test**

Ramsey RESET Test:

F-statistic	1.774106	Probability	0.190058
Log likelihood ratio	1.944523	Probability	0.163178

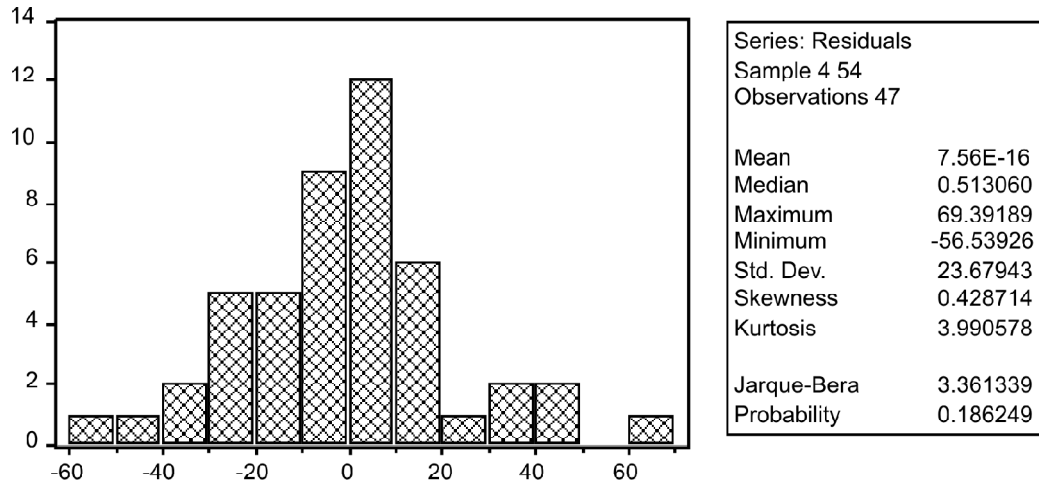
Test Equation:

Dependent Variable: D(PE)  
Method: Least Squares  
Date: 10/15/10 Time: 13:54  
Sample: 4 54  
Included observations: 47  
Excluded observations: 4

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob</i>
C	-3.847108	4.413414	-0.871685	0.3883
D(DEPMCE)	0.330861	0.128004	2.584769	0.0133
D(ALAMCE,3)	-0.072259	0.051545	-1.401857	0.1683
D(ARVMCE,3)	-1.379990	0.586156	-2.354305	0.0233
FITTED^2	0.019444	0.014598	1.331956	0.1901
R-squared	0.275093	Mean dependent var		-0.614468
Adjusted R-squared	0.206055	S.D. dependent var		27.24246
S.E. of regression	24.27401	Akaike info criterion		9.316978
Sum squared resid	24747.56	Schwarz criterion		9.513802
Log likelihood	-213.9490	F-statistic		3.984625
Durbin-Watson stat	2.849727	Prob(F-statistic)		0.007888

Source: Author's Computation Using E-Views Software

**RESIDUAL NORMALITY TEST**



Source: Author's Computation Using E- Views Software

**Table III**  
**Heteroscedasticity Test**

White Heteroskedasticity Test:

F-statistic	1.395158	Probability	0.240399
Obs*R-squared	8.133697	Probability	0.228471

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 10/15/10 Time: 13:56

Sample: 4 54

Included observations: 47

Excluded observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	275.2275	223.2621	1.232755	0.2249
D(DEPMCE)	-0.683489	5.433571	-0.125790	0.9005
(D(DEPMCE))^2	0.258216	0.129104	2.000057	0.0523
D(ALAMCE,3)	0.920969	1.991851	0.462368	0.6463
(D(ALAMCE,3))^2	-0.012887	0.021934	-0.587525	0.5602
D(ARVMCE,3)	-13.11084	22.26521	-0.588848	0.5593
(D(ARVMCE,3))^2	3.421458	2.406475	1.421772	0.1628
R-squared	0.173057	Mean dependent var		548.7855
Adjusted R-squared	0.049016	S.D. dependent var		959.2905
S.E. of regression	935.4849	Akaike info criterion		16.65661
Sum squared resid	35005278	Schwarz criterion		16.93217
Log likelihood	-384.4304	F-statistic		1.395158
Durbin-Watson stat	1.654593	Prob(F-statistic)		0.240399

Source: Author's Computation Using E- Views Software

**STATIONARITY TESTS**

**Table IV**  
**Unit Root Test for PE**

ADF Test Statistic	-3.975766	1% Critical Value*	-3.5682
		5% Critical Value	-2.9215
		10% Critical Value	-2.5983

\*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PE)

Method: Least Squares

Date: 10/15/10 Time: 14:00

Sample(adjusted): 3 54

Included observations: 49

Excluded observations: 3 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PE(-1)	-0.787857	0.198165	-3.975766	0.0002
D(PE(-1))	-0.125582	0.146857	-0.855129	0.3969
C	16.71641	5.134730	3.255558	0.0021
R-squared	0.456305	Mean dependent var		-0.219592
Adjusted R-squared	0.432666	S.D. dependent var		26.75396
S.E. of regression	20.15150	Akaike info criterion		8.903705
Sum squared resid	18679.82	Schwarz criterion		9.019531
Log likelihood	-215.1408	F-statistic		19.30314
Durbin-Watson stat	2.095504	Prob(F-statistic)		0.000001

Source: Author's Computation Using E- Views Software



**Table V**  
**Unit Root Test for Depmce**

ADF Test Statistic	-8.466308	1% Critical Value*	-3.5745
		5% Critical Value	-2.9241
		10% Critical Value	-2.5997

\*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DEPMCE)

Method: Least Squares

Date: 10/15/10 Time: 14:02

Sample(adjusted): 4 54

Included observations: 47

Excluded observations: 4 after adjusting endpoints

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob</i>
D(DEPMCE(-1))	-1.677714	0.198164	-8.466308	0.0000
D(DEPMCE(-1),2)	0.368050	0.125147	2.940936	0.0052
C	-1.079037	3.736703	-0.288767	0.7741
R-squared	0.713264	Mean dependent var		-1.586970
Adjusted R-squared	0.700231	S.D. dependent var		46.78470
S.E. of regression	25.61519	Akaike info criterion		9.385950
Sum squared resid	28870.06	Schwarz criterion		9.504044
Log likelihood	-217.5698	F-statistic		54.72563
Durbin-Watson stat	2.173582	Prob(F-statistic)		0.000000

Source: Author's Computation Using E- Views Software

**Table VI**  
**Unit Root Test for Alamce**

ADF Test Statistic	-12.21389	1% Critical Value*	-3.5653
		5% Critical Value	-2.9202
		10% Critical Value	-2.5977

\*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ALAMCE)

Method: Least Squares

Date: 10/15/10 Time: 14:26

Sample(adjusted): 5 54

Included observations: 50 after adjusting endpoints

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob</i>
D(ALAMCE(-1),2)	-2.603540	0.213162	-12.21389	0.0000
D(ALAMCE(-1),3)	0.594004	0.116780	5.086502	0.0000
C	0.234561	3.656666	0.064146	0.9491
R-squared	0.876878	Mean dependent var		-2.017600
Adjusted R-squared	0.871639	S.D. dependent var		72.12856
S.E. of regression	25.84186	Akaike info criterion		9.399993
Sum squared resid	31386.68	Schwarz criterion		9.514714
Log likelihood	-231.9998	F-statistic		167.3680
Durbin-Watson stat	2.434667	Prob(F-statistic)		0.000000

Source: Author's Computation Using E- Views Software

**Table VII**  
**Unit Root Test for Arvmce**

ADF Test Statistic	-10.10563	1% Critical Value*	-3.5653
		5% Critical Value	-2.9202
		10% Critical Value	-2.5977

\*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D (ARVMCE)

Method: Least Squares

Date: 10/15/10 Time: 14:27

Sample(adjusted): 5 54

Included observations: 50 after adjusting endpoints

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
D(ARVMCE(-1),2)	-2.414487	0.238925	-10.10563	0.0000
D(ARVMCE(-1),3)	0.442159	0.130206	3.395845	0.0014
C	-0.028647	0.431658	-0.066365	0.9474
R-squared	0.869061	Mean dependent var		-0.050000
Adjusted R-squared	0.863489	S.D. dependent var		8.260957
S.E. of regression	3.052205	Akaike info criterion		5.127730
Sum squared resid	437.8500	Schwarz criterion		5.242452
Log likelihood	-125.1933	F-statistic		155.9731
Durbin-Watson stat	2.239793	Prob(F-statistic)		0.000000

Source: Author's Computation Using E- Views Software

**Table VIII**  
**Multicollinearity Test**

<i>PE</i>	<i>DEPMCE</i>	<i>ALAMCE</i>	<i>ARVMCE</i>
1.000000	0.230758	-0.031633	0.025514
0.230758	1.000000	-0.072992	0.232666
-0.031633	-0.072992	1.000000	0.033256
0.025514	0.232666	0.033256	1.000000

Source: Author's Computation Using E- Views Software

**Table IX**  
**A Descriptive Statistics of Human Resources Productivity Measures and Performance Measures of Deposit Money Banks in Nigeria**

	<i>PE</i>	<i>DEPMCE</i>	<i>ALAMCE</i>	<i>ARVMCE</i>
Mean	20.62250	35.28985	25.05558	3.530769
Median	16.26000	28.92000	18.45000	3.500000
Maximum	101.1100	111.3300	74.90000	9.600000
Minimum	0.100000	0.030000	3.100000	0.500000
Std. Dev.	19.57952	22.84956	17.17156	1.561490
Skewness	2.649447	1.266885	1.257606	1.145211
Kurtosis	11.33768	5.086213	3.450960	5.962307
Jarque-Bera	211.4562	23.33994	14.14760	30.37948
Probability	0.000000	0.000009	0.000847	0.000000
Observations	52	52	52	52

Source: Author's Computation Using E- Views Software

**Table X**  
**Causality Tests**

Pairwise Granger Causality Tests  
Date: 10/15/10 Time: 14:35  
Sample: 1 54  
Lags: 2

<i>Null Hypothesis:</i>	<i>Obs</i>	<i>F-Statistic</i>	<i>Probability</i>
DEPMCE does not Granger Cause PE	47	0.83608	0.44049
PE does not Granger Cause DEPMCE		0.42554	0.65620
ALAMCE does not Granger Cause PE	49	0.68025	0.51174
PE does not Granger Cause ALAMCE		1.14022	0.32901
ARVMCE does not Granger Cause PE	49	0.62926	0.53771
PE does not Granger Cause ARVMCE		0.11239	0.89395
ALAMCE does not Granger Cause DEPMCE	49	0.43177	0.65208
DEPMCE does not Granger Cause ALAMCE		0.02526	0.97507
ARVMCE does not Granger Cause DEPMCE	49	0.56374	0.57313
DEPMCE does not Granger Cause ARVMCE		0.53125	0.59159
ARVMCE does not Granger Cause ALAMCE	52	0.74774	0.47898
ALAMCE does not Granger Cause ARVMCE		0.64706	0.52819

Source: Author's Computation Using E- Views Software

**Table XI**  
**Cointegration Test (Long- Run Estimated Model)**

Date: 10/15/10 Time: 14:38  
Sample: 1 54  
Included observations: 47  
Test assumption: Linear deterministic trend in the data  
Series: PE DEPMCE ALAMCE ARVMCE

Lags interval: 1 to 1

<i>Eigenvalue</i>	<i>Likelihood Ratio</i>	<i>5 Per cent Critical Value</i>	<i>1 Per cent Critical Value</i>	<i>Hypothesized No. of CE(s)</i>
0.537038	87.73022	47.21	54.46	None **
0.376747	51.53503	29.68	35.65	At most 1 **
0.325280	29.31327	15.41	20.04	At most 2 **
0.205648	10.82076	3.76	6.65	At most 3 **

L.R. test indicates 4 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

<i>PE</i>	<i>DEPMCE</i>	<i>ALAMCE</i>	<i>ARVMCE</i>
-0.002669	-0.007437	0.001727	0.094154
0.005176	-0.002785	-0.011398	-0.013464
0.000245	-0.003078	0.002299	-0.100426
-0.008548	0.001770	-0.005526	-0.024666

table contd.

Normalized Cointegrating Coefficients: 1  
Cointegrating Equation(s)

PE	DEPMCE	ALAMCE	ARVMCE	C
1.000000	2.786895 (1.57674)	-0.647267 (0.70519)	-35.28134 (19.2228)	25.22623
Log likelihood	-711.8361			

Normalized Cointegrating Coefficients: 2  
Cointegrating Equation(s)

<i>PE</i>	<i>DEPMCE</i>	<i>ALAMCE</i>	<i>ARVMCE</i>	<i>C</i>
1.000000	0.000000	-1.950296 (0.73660)	-7.888936 (4.68418)	54.48246
0.000000	1.000000	0.467556 (0.43903)	-9.829006 (2.79184)	-10.49779
Log likelihood	-700.7252			

Normalized Cointegrating Coefficients: 3  
Cointegrating Equation(s)

<i>PE</i>	<i>DEPMCE</i>	<i>ALAMCE</i>	<i>ARVMCE</i>	<i>C</i>
1.000000	0.000000	0.000000	-67.43580 (79.3584)	223.7337
0.000000	1.000000	0.000000	4.446516 (20.4077)	-51.07338
0.000000	0.000000	1.000000	-30.53222 (40.3383)	86.78231
Log likelihood	-691.4790			

Source: Author's Computation Using E-Views Software