Evaluation of Manufacturing and Human Capital Reporting as Predictors of Cost of Capital Among Listed Manufacturing Companies in Nigeria

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Abstract

Cost of capital remains the main issue to investors, especially in the manufacturing sector as it plays a significant role in business initiation. This study examined manufacturing and human capital reporting as predictors of cost of capital among the listed manufacturing companies in Nigeria. Ex-post facto research design was adopted. The population of this study was derived from 75 listed firms in the Nigerian Exchange Group (2023) from where the sample of 22 listed manufacturing firms was selected using purposive sampling technique. Radom Effect method of Panel Regression was adopted for data analysis. Findings revealed that manufacturing capital reporting has greater effect on cost of equity capital than human capital reporting, financial reports by manufacturing films in Nigeria have not been well integrated and this has impacted negatively on their costs of debt and costs of retained earnings. The study recommended that the Federal Government should make the business environment more conducive to ensure an enhanced ease of doing business especially for manufacturing companies in Nigeria. Also, Manufacturers Association of Nigeria (MAN) should collaborate with non-governmental organizations (NGOs) and government agencies to ensure that adequate financial credit is made available to manufacturing sector investors in Nigeria at low rates of interest.

Keywords: Cost of Capital, Human Capital Accounting and Manufacturing Capital Accounting

Introduction

There has been growing concern in recent years among investors and academics regarding the increasing cost of capital. According to Garcia-Benau (2013), cost of capital is a company's calculation of the minimum return that would be necessary in order to justify undertaking a capital budgeting project. A company's investment decisions should always generate a return that exceeds the firm's cost of capital used to finance the project; otherwise, the project will not generate a return for investors.

The costs of capital relevant to investors include cost of equity, cost of debt, cost of preference share, and cost of retained earnings (Steyn, 2014). Cost of debt has been defined by Steyn (2014) as the effective interest rate that a company pays on its debt, such as bonds and loans. The cost of retained earnings equals the return shareholders should expect on their investment, it is called an opportunity cost because the shareholders sacrifice an opportunity to invest their money for a return elsewhere and instead allow the firm to build capital (Zhou, Luo & Wu, 2022).

Human capital and manufacturing capital integrated reporting can serve as a valuable tool for exchanging information with stakeholders, enhancing transparency, and eliminating information asymmetry. While human capital reporting is the process of identifying, measuring, recording, accumulating, analyzing, classifying, summarizing, interpreting, and communicating information about human resources to interested parties, helps to generate material wealth for the economy

(Ama, 2016), manufacturing capital reporting is the process of identifying, measuring, recording, accumulating, analyzing, classifying, summarizing, interpreting, and communicating information about the production of goods and provision of services and some examples include buildings, equipment, and infrastructure is often created by other organizations, but includes assets manufactured by the reporting organization for sale or when they are retained for its own use (IIRF, 2021).

In Nigeria, investment decisions are relatively difficult to make due to high level of market inefficiency caused by low access to market information (Michael, Acha & Essien, 2017). Since integrated reporting provides greater financial information to investors and shareholders, there is need to find out whether the implementation of integrated reporting will enhance the cost of capital of listed manufacturing firms in Nigeria for enhanced investment decision-making process.
The problem however, is the high level of deceit that characterizes the Nigerian economy. Could Nigerian manufacturing firms adopt integrated reporting and stand a chance to access capital at least cost? What is the level of implementation of integrated reporting among manufacturing firms in Nigeria and what is the effect on cost of capital? The study was embarked upon to answer this question.

Review of Related Literature

This section presents the conceptual and theoretical review underpinning human and manufacturing capital reporting and cost of capital. The section also reviews empirical works on the subject-matter.

Conceptual Framework

The conceptual framework of the paper covers manufacturing capital reporting, human capital reporting, cost of capital and its measurements.

Manufacturing Capital Reporting

These are tangible, manufactured objects that the organization depends upon for carrying out its operations. They are used in the production of goods and provision of services and some examples include buildings, equipment, and infrastructure. The manufactured capital includes factories, plants, buildings, and products manufactured by the reporting organization, be it with the intention of sale or for its own use (International Alliance, 2022).

It consists of manufactured physical objects (as distinct from natural physical objects) that are available to an organization for use in the production of goods or the provision of services, including: − Buildings − Equipment − Infrastructure (such as roads, ports, bridges, and waste and water treatment plants). Manufactured capital is often created by other organizations, but includes assets manufactured by the reporting organization for sale or when they are retained for its own use (IIRF, 2021).

Human Capital Reporting

Human resource reporting, also known as intellectual property reporting or human capital accounting, according to Ama (2016) is the process of identifying, measuring, recording, accumulating, analyzing, classifying, summarizing, interpreting, and communicating information about human resources to interested parties. Human resource reporting is an attempt to recognize

the human resources of an organization, quantify them in monetary terms, and show them on the company's statement of financial position, formerly called Balance sheet (Ama, 2016).

Petty (1691) was of the opinion that labour was "the father of wealth" and it must be included in any estimate of national wealth. Therefore, Human capital refers to as factor of production, coming from human beings; we use to create goods and services.

Cost of Capital

According to Garcia-Benau (2013), cost of capital is a company's calculation of the minimum return that would be necessary in order to justify undertaking a capital budgeting project. The term is used as an evaluation of whether a projected investment or financial decision can be justified by its cost, and encompasses the cost of both equity and debt, weighted according to the company's preferred or existing capital structure. A company's investment decisions should always generate a return that exceeds the firm's cost of capital used to finance the project; otherwise, the project will not generate a return for investors.

Measures of the Cost of capital

The measures of cost of capital are outlined as follows:

Cost of Equity Capital: Aliyu (2019) defines cost of equity capital as the rate at which investors discount the expected dividends of the firm to determine its share value. It is the minimum rate of return that a firm must earn on the equity financed portion of an investment project in order to leave unchanged the market price of the shares. Cost of equity can be calculated as follows:

KE = D/NP Where: KE = cost of equity capital; D = dividend per equity share; and NP = Net profit from an equity share.

Cost of Debt: cost of debt has been defined by Steyn (2014) as the effective interest rate that a company pays on its debt, such as bonds and loans. The cost of debt can refer to the before-tax cost of debt, which is the company's cost of debt before taking taxes into account.

KD = (RR + CS) × (1 –T), Where: KD = cost of debt; RR = rate of return; CS = credit spread; and T = tax rate

Cost of Retained Earnings: the cost of retained earnings equals the return shareholders should expect on their investment, it is called an opportunity cost because the shareholders sacrifice an opportunity to invest their money for a return elsewhere and instead allow the firm to build capital (Zhou, Luo & Wu, 2022).

Cost of earnings is measured using the following formula:

KRE = (FD ÷PS) +G, Where: KRE= cost of retained earnings; FD = upcoming year's dividend; PS = share price; and G = growth rate

Theoretical Framework

The study's theoretical framework is anchored o the Signaling Theory, which is a general phenomenon applicable in any market with information asymmetry attributed to Morris (1987). The signaling theory recognizes the separation of ownership and management and recognizes that the market pressures motivate managers to disclose information. Managers have more information about the company than others such as owners and investors. To distinguish themselves from other

companies, managers may desire to send signals to interested parties; owners, investors, and governmental agencies. In this regard disclosure is considered to be one of the means that can be used.

The assumption of signaling theory that individuals are acting in their own self-interest, as in agency theory, has been criticized. Also, a number of authors criticize the assumption of equal distribution of power. They argue that it is not individuals who exercise power but institutions (Gray, Owen & Adams, 2009).

The present study is anchored on signaling theory given its emphasis on information asymmetry; indicating that information asymmetry can be reduced when the party with more information signals it to others. This suggests that integrated reporting of human and manufacturing capitals which integrates more information is capable of enhancing greater accessibility to other stakeholders, thereby, reducing cost of capital.

Review of Empirical Literature

Major and Biragbara (2023) studied human capital costs and financial performance of listed healthcare firms in Nigeria. The study used ex-post facto research design. The target population comprised of all the seven listed healthcare firms in Nigeria which were sampled to five (5) using purposive (Judgmental) sampling technique. Secondary data were used and it was sourced from annual reports and statement of accounts of the selected firms between 2012 and 2021. Descriptive Statistics, Unit Root Test and Ordinary Least Square Regression were employed with the aid of Microsoft Excel, SPSS 25 and E-View 12. The result of the study showed that training and development cost has negative and significant effect on return on assets. Furthermore, the result indicated that employee costs had positive and significant effect on return on assets. It was also revealed that health and safety costs had negative and insignificant effect on return on assets of listed healthcare firms in Nigeria. The study generally concluded that, there is a negative and significant effect of human capital costs on financial performance of listed healthcare firms in Nigeria under the period of the study between 2012 and 2021.

Although the study is related with the preset study since it was also conducted on human resource accounting, the gap between them is that the former bordered on healthcare firms whereas the preset study is concerned with listed manufacturing firms.

Vitezić and Petrlić (2018) carried out a study on human accounting reporting - concept and impact on performance of Croatian companies. The purpose was to investigate the extent to which the international integrated reporting framework is recognized in Croatian companies and whether a higher level of efficiency encourages companies to socially more responsible performance. A content analysis of 138 companies was conducted according to their reports and performance by selected relevant indicators. Results affirmed that companies that are more transparently report about their results through data on economic, environmental and social aspect of business have greater efficiency measured by financial results. The study recommended the adoption of integrated reporting for all Croatian companies.

The study of Vitezić and Petrlic (2018) is related to the present study because both studies border on human accounting reporting. However, while cost of capital features as the dependent variable in the present study, the former used performance as dependent variable. Also, while the present study was conducted in Nigeria, the former was conducted in Croatia.

Huda, Gagan and Allan (2018) conducted a study on manufacturing accounting reporting and financial performance: empirical evidences from Bahraini listed Insurance Companies. The purpose of the study was to explore integrated reporting among five listed Insurance companies in Bahrain and its effects on their financial performance. Content, descriptive and linear regression analyses were employed to analyze the collected data over a period of four years from 2012 to 2015. Study findings revealed that there was a wide variation of companies' compliance with integrated reporting and the use of non-uniform disclosure formats. The study recommended the creation of a uniform manufacturing accounting reporting format for a better result and easy comprehension and comparison between the companies.

Huda, Gagan and Allan (2018) study has close relationship with the present study since both studies are concerned with manufacturing accounting reporting. The gap between the two studies however, is the use of financial performance as dependent variable in the former and the use of cost of capital in the present study. Another gap is the content analysis used in the former as against panel regression used in the present study. Also, while the former was delimited to 2015 as study area, the present study will be updated to 2022.

Gulcin, Tugce and Figen (2017) studied manufacturing accounting reporting: a template for energy companies in Russia. The aim of the study was to make company value measurable and therefore more understandable and comparable by quantifying the environmental and social implications, as well as the financial statements. Financial reports of seven (7) companies operating in the energy sector were examined. The study found that manufacturing accounting reporting was more effective strategy for an enhanced report quality.

The relationship between Gulcin, Tugce and Figen (2017) and the present study cannot be over emphasized as both studies focus on manufacturing accounting reporting. However, the point of departure between the two studies is that while former was concerned with energy companies in Russia, the present study focuses on manufacturing companies in Nigeria.

Methodology

The study adopted ex-post facto because the incident under study has already occurred while none of the variables was manipulated in the course of the study. The study population was derived from 75 listed firms in the Nigerian Exchange Group (2023) from where a sample of 22 firms was selected using purposive sampling technique. The sample selection criteria were that the selected firm must be consistently quoted for a period of 10 years (2013 – 2022), the selected firm must contain up to date data prepared and presented in line with International Financial Reporting Standard (IFRS) guideline as at 2013 to 2022 as sourced from internet sources of published audited annual financial statements.

Descriptive statistics and random effect model (REM) were used for data analysis. A tripartite model including cost of equity (KE), cost of debt (KD) and cost of retained earnings (KRE) was specified.

The cost of equity (KE) model is specified as follows:

$$KE = \beta_0 + \acute{\alpha}_1 HCA + \acute{\alpha}_2 MCA + \acute{\varepsilon}\ldots \quad \ldots \quad (I)$$

Where; KE represents cost of equity capital, HCA represents human capital accounting, MCA represents manufacturing capital accounting

$$KD = \lambda_0 + \lambda_1 HCA + \lambda_2 MCA + \acute{\varepsilon}\ldots \quad \ldots \quad (2)$$

Where; KD represents cost of debt;

$KRE = \phi_0 + \phi_1 HCA + \phi_2 MCA + \acute{e} \ldots \quad \ldots \quad (3)$

Where; KRE represents cost of retained earnings.

The decision rule for the study is as follows:
i. Reject null hypotheses if the probability value is greater than the significant level of 0.05 (ie if p>0.05)
ii. Do not reject null hypotheses if the probability value is less than the significant level of 0.05 (i.e if p<0.05)

Result of the Findings

Descriptive Statistics

Descriptive analyses were conducted in this sub-section. These include minimum values, maximum values, mean and standard deviation.

Table 1: Mean and Standard Deviations of Study Variables

```
. summarize ke kd kre hca  mca
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Variable	Obs	Mean	Std. Dev.	Min	Max
ke	70	25.87714	23.5348	2.5	75.4
kd	70	46.51714	88.96354	1.4	312.3
kre	70	83.62714	189.4675	1.2	615
hca	70	11.45	1.85001	10	16.7
mca	70	12.61714	2.713945	9	18

Source: Authors' Computations using STATA (12)

Results presented in Table 1 on the summary of statistics used in the analysis indicates that the mean value for cost of equity capital was 25.88, with standard deviation of 23.53, the mean value of cost of debt stood at 46.52 and standard deviation of 88.62. The mean value of cost of retained earnings was 83.63 with standard deviation of 189.47. The mean value of human capital accounting was 11.45 with standard deviation of 1.85 while the mean value of manufacturing capital accounting was 12.61 with standard deviation of 2.71. Hence, the data set were clustered and exhibit homogenous characteristics among the study variables across the selected firms as most of these variables recorded values of standard deviation that were less than the values of their respective mean scores. The implication of this is that there is no wide variation between the study variables in the cross sections.

Table 2: Correlation Matrix

```
. pwcorr ke kd kre hca mca
```

	ke	kd	kre	hca	mca
ke	1.0000				
kd	-0.2160	1.0000			
kre	-0.2319	0.9964	1.0000		
hca	0.0939	-0.0572	-0.0436	1.0000	
mca	-0.1385	0.0475	0.0536	0.3815	1.0000

Source: Authors' Computations using STATA (12).

Table 2 shows correlation among variables of the study in order to inspect the presence of multi co-linearity in the data set. The table indicated that the correlation values among the independent variables were below 0.4. According to Kwahar and Onov (2017), to be free from the problem of

multi co-linearity, the inter-relationship between the independent variables should not be greater than 0.4. Thus, it can be safely stated that, the data set is free from the problem of multi co-linearity.

Panel Regression Analysis

The study adopted random effect based on the pre-tested result of Hausaman Specification test.

Table 3: Correlated Random Effects - Hausman Test

```
. estimates store fixed

. hausman random fixed
```

	——— Coefficients ———			
	(b) random	(B) fixed	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
hca	-.5676551	-.2619346	-.3057204	.2509348
mca	.7856017	.6315777	.154024	.1951948

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

               chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =          1.53
             Prob>chi2 =        0.4645
```

Source: Authors' Computations using STATA (12).

Hausman specification test conducted in Table 3 as condition for selecting the most efficient panel data model revealed a Chi^2 value of 1.53, which was not statistically significant at 5%. This showed that the dataset did not meet the asymptotic assumption of Hausman specification test. As a result, random effect model was chosen.

Table 4: Random Effects of the Cost of Equity Capital Model-

```
corr(u_i, X)    = 0 (assumed)                    Prob > chi2         =     0.0310
```

ke	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
hca	-.0202795	.013686	-1.48	0.138	-.0471036	.0065446
mca	.9470382	.434043	2.18	0.029	.0963296	1.797747
_cons	16.42208	11.60328	1.42	0.157	-6.319934	39.16409
sigma_u	27.997597					
sigma_e	6.6123751					
rho	.94716761	(fraction of variance due to u_i)				

Source: Authors' Computations using STATA (12).

The summary of panel regression results as presented in Table 5 shows that a unit increase in HCA results in 20.2% decrease in KE which is not significant at 0.05% level. Results show that a unit increase in MCA results in 94.7% increase in KE and is significant at 5% level. Thus, while human capital accounting has no significant effect on cost of equity capital, manufacturing capital accounting does exert significant effect on cost of equity capital in Nigeria. The implication of this is that, manufacturing capital accounting has greater effect on cost of equity capital than human capital accounting. This finding is in recognition of the accounting of human capital as liability rather than properly accounting for its asset status in recognition of its profit yielding role.

Table 5: Random Effects of the Cost of debt Mo

corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.9649

kd	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
hca	-.5676551	4.370775	-0.13	0.897	-9.134216	7.998906
mca	.7856017	2.960613	0.27	0.791	-5.017094	6.588297
_cons	43.10474	56.62802	0.76	0.447	-67.88414	154.0936
sigma_u	67.844433					
sigma_e	60.741593					
rho	.55507	(fraction of variance due to u_i)				

Source: Authors' Computations using STATA (12).

The results of panel regression result as presented in table 5 shows that a unit increase in HCA results in 56.7% decrease in KD which is not significant at 0.05% level. Results show that a unit increase in MCA results in 78.5% increase in KD and is also not significant at 5% level. Thus, both human capital accounting and manufacturing capital accounting have no significant effect on cost of debt in Nigeria. This indicates that financial reports by manufacturing films in Nigeria have not been well integrated and this has impacted negatively on their costs of debt.

Table 6: Random Effects of the Cost of Retained Earnings Model

corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.9636

kre	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
hca	.0034148	9.689401	0.00	1.000	-18.98746	18.99429
mca	1.654898	6.563977	0.25	0.801	-11.21026	14.52006
_cons	62.70796	123.1367	0.51	0.611	-178.6356	304.0515
sigma_u	135.54293					
sigma_e	134.32352					
rho	.50451849	(fraction of variance due to u_i)				

Source: Authors' Computations using STATA (12).

The results presented in Table 6 shows that a unit increase in HCA results in 0.3% increase in KRE which is not significant at 0.05% level. Results show that a unit increase in MCA results in 165.5% increase in KRE and is also not significant at 5% level. Thus, both human capital accounting and manufacturing capital accounting have no significant effect on cost of retained earnings in Nigeria. This indicates that financial reports by manufacturing films in Nigeria have not been well integrated and this has impacted negatively on their costs of retained earnings.

Diagnostic Tests

Table 7. B**reuasch-Pagan-Godfrey Heteroscedasticity test**

Test Statistics	Probability	Decision
ke	0.2039	Residuals are homoscedastic
Kd	0.1786	Residuals are homoscedastic
Kre	0.2299	Residuals are homoscedastic

Source: Authors' Computations using STATA (16). (*) means significant at 5%

The results presented in Table 7 shows that, the residuals based on Breausch-Pagan-Godfrey Heteroskedasticity Test results indicate that the residuals are homoscedastic (that is, they have constant variance) as p(0.2039, 0.1786, 0.2299) > 0.05. Thus, the series are not affected by the problem of heteroskedasticity.

Conclusion

Cost of capital remains the main issue to investors, especially in the manufacturing sector as it plays a significant role in business initiation. The key components of cost of capital are cost of equity, cost of debt and cost of retained earnings. In Nigeria, cost of capital has no significant effect on human and manufacturing capitals of listed manufacturing companies.

Recommendation

Based on the findings of the study, the following recommendations are made:

i. The Federal Government should make the business environment more conducive to ensure an enhanced ease of doing business especially for manufacturing companies in Nigeria.
ii. Manufacturing association of Nigeria (MAN) should collaborate with non-governmental organizations (NGOs) and government agencies to ensure that adequate financial credit is made available to manufacturing sector investors in Nigeria at low rates of interest.

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