

# Comparative Study on Sustainability Balanced Score Card (Susbsc) and Firm Value

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**Abstract:** This work was done to carry a comparative study on the effect of Sustainability Balanced Scorecard (SUSBSC) on Firm Value among manufacturing firms listed on the Stock Exchanges of Nigeria and South Africa. The research design employed was the expo facto method. The study depended wholly on secondary data collected from the annual reports and account of the selected manufacturing companies from the year 2009-2018. Descriptive statistics and correlation matrix were employed alongside the pooled regression to investigate the relationship between Sustainability Balanced Scorecard and Firm Value. The results based on our findings revealed that Balanced Scorecard Financial perspective, measured as Return on Assets (ROA) when regressed as standalone variable with other variables, has a positive effect on firm value of quoted manufacturing firms in both Nigeria and South Africa though it is statistically significant in influencing manufacturing firms in Nigeria, it is not significant in South Africa. The study based on the findings recommends that looking at the statistically significant influence of SUSBSC in Nigeria, managers should take seriously the issue of SUSBSC and that managers who wishes to improve their firm value through sustainability activities should engage on less or moderately cost environmental sustainability activities in Nigeria. This will make such firms to engage on more or a wide spread sustainability activity that will impact lives positively thereby increased their firm values while in South Africa, managers may not put much effort in using sustainability balanced scorecard in increasing their firm values as this has insignificant effect on firm value.

**Keywords:** Comparative, Sustainability, Balanced, Score Card, Firm and Value

## I. INTRODUCTION

The everchanging face of accounting profession is becoming more complex and perplexing. Burros (2017) paints a picture that is dramatically different from the one we are used to, pointing at the emergence of new competitors, new markets and changing tastes of the 21<sup>st</sup> century consumer, and emphasized a paradigm shift of 'change and opportunity' that faces the profession today. In other words, the big accounting firms have become vast, international and concentrated, culminating in major businesses, with products and market shares, business solutions and profit performance as watchwords. No doubt, accountants are creatures of the market and providers of financial services. The business environment of today is fast-changing, and requires strategies to examine whether all the relevant information is available to the people who need them to make effective and more informed decisions.

The Balanced Scorecard (BSC) is probably one of the most important recent accounting innovations. It is built to enhance organizational value by allowing top managers to better manage their companies' key organizational processes resulting in an improved competitive market position and company value (Kaplan and Norton, 2001). The BSC emphasizes development or improvement and not just attainment of certain objectives and if an organization does not continually advance, it will eventually lose out to competitors Kaplan, (2010).

However, according to Ricart, Rodriguez and Sanchez, (2005), integrating sustainability development with the BSC approach is still at an early stage. Fakoya (2013) emphasis that an all-embracing sustainability approached by South African organizations is a way to limit negative of both social and environmental impacts. Sustainability can be incorporated within the BSC by means of two possibilities (Figge, Hahn, Schaltegger & Wagner 2002); firstly, by integrating environmental and social measures into the existing four BSC perspectives. The integration of sustainability into the BSC will also provide a framework to evaluate and ensure that sustainability is part of the day-to-day processes

of the company. It also emphasizes the cause-and-effect relationship between sustainability and corporate strategies (Butler, Henderson & Raiborn, 2011).

Though, Figge, Hahn, Schaltegger and Wagner (2002), insist that it is important to formulate a Sustainability Balance Scorecard (SUSBSC) for a specific business unit and then to identify environmental and social aspects that are strategically relevant to that business unit. SUSBSC can be described as a traditional BSC that integrates economic, environmental and social issues that aim to transform the so-called soft factors into long-term strategic goals and contribute to sustainability in an integrated way. (Chai, 2009; Figge et al., 2002) The five perspectives of the SBSC allow a balance between short-term and long-term objectives, between desired outcomes and the performance drivers of those outcomes, and between the objective measures and more subjective measures.

There are several channels through which inadequate service inputs could affect firm value. This study therefore will address how other variables (SUSBSC) relate to manufacturing sector growth in Nigeria and South Africa. Exploring the explanatory power of these variables will fill the knowledge vacuum that currently exists in the study of manufacturing sector growth in the two countries. It is based on the above background that this study intends to examine sustainable balanced scorecard and firm value: a cross country analysis.

### Statement of the Problem

The traditional BSC is found to have a broad scope of financial and non-financial information, but nevertheless it has to evolve further in order to provide an integrated management system that addresses the unavoidable contribution to sustainable development (Hansen & Schaltegger, 2012; Schaltegger & Lüdeke-Freund, 2011). Hansen and Schaltegger (2012) in their study recognized that the incorporation of certain sustainability issues in BSC has been neglected, and therefore, needs to be adapted to the changing business environment.

Moreso, prior studies reviewed, concentrated in studying one country only, examples, the study of Maduekwe and Kamala (2016) carried out in Cape Metropolis South Africa, Al-Mscen and Mohammad (2015) carried out in Jordanian Companies, Okoye, Odum and Odum (2017) did a study on Manufacturing firms in Nigeria and Mohammed (2015) did his work on Nigerian Banks, etc hence basing their studies coverage on one country. In this study therefore, we extended our scope to cover two large countries in Africa which are regarded as giants of Africa; Nigeria and South Africa, comparing the effect of SUSBSC on their firm values on Country specific.

### Objectives of the Study

The main objective of the study is to carry out a comparative study on the effect of Sustainability Balanced Scorecard on Firm Value among Manufacturing Firms listed on stock exchanges of Nigeria and South Africa. Specific objectives include to:

1. Evaluate the effect of Social Sustainability Balanced Scorecard on the value of firms listed on the Nigeria and South Africa Stock Exchanges
2. Ascertain the effect of Environmental Sustainability Balanced Scorecard on the value of firms listed on the Nigeria and South Africa Stock Exchanges

### Research Hypothesis

To guide this study, the following hypothesis has been formulated:

Ho: Social and Environmental Sustainability Balance Scorecard has no significant effect on the value of firms listed on Stock Exchanges of Nigeria and South Africa.

## II. CONCEPTUAL FRAMEWORK

### Balanced Scorecard (BSC)

Correia, Langfield-Smith, Thorne & Hilton (2008) see BSC as a tool that provides an improvement in both internal and external communication and monitoring of organizational performance against strategic goals. Hence, BSC can be defined as a strategy for planning, used by the management to structure business actions according to the vision, mission and strategy of the company.

### Sustainability Balance Scorecard (SUSBSC)

Sustainability reporting acts as a key driver of good corporate social responsibility performance and plays a vital role in improving not just communication, but also credibility and trust between organizations and their stakeholders. Sustainability reporting also provides a clear framework to allow shareholders and investors to compare companies on

their [corporate social responsibility] standing and track performance – both good and bad – year on year, (Litten, 2005). A sustainability report provides a format for managers to improve the quality of the organization's integrated economic, social and environmental objectives for the relevant communities, stakeholders and practitioners (Caraiani, Lungu, Dascalu, Cimpoeru, & Dinu, 2012).

The concept of a sustainable balanced scorecard can be described as a traditional BSC that integrates economic, environmental and social issues that aim to transform the so-called soft factors into long-term strategic goals and contribute to sustainability in an integrated way (Chai, 2009; Figge, Hahn, Schaltegger & Wagner (2002). For the purpose of our work, the researchers' will only limit to only social and environmental sustainability due to the nature of the work.

### **Social Sustainability**

The effects of climate change on health provide evidence that social sustainability hinges on environmental sustainability. According to the World Health Organisation, the net effect of climate change will be negative. (WHO 2013)

### **Environmental Sustainability**

The earth system that we depend on is resilient (Ludwig, Walker & Holling, 1997). This means that it is able to maintain its integrity or return to a state of equilibrium after a disturbance usually abrupt shifts in the earth system can cause it to lose its resilience and become unsustainable. (Holling, 1973, Scheffer, 2009, Lélé, 1998).

### **Firm Value**

Value maximization constitutes the primary purpose of a firm (Berle & Means 1991; Dolenc, Stubelj and Laporšek 2011). According to Brigham and Houston (1999) firm value is the value given to the coordination of financial markets and corporate organizations in its growth process. It is achieved when a firm takes into account the long-term impact of management's decisions on profits.

### **Sustainability Balance Score Perspective and Firm Value**

Sustainability perspective consists of social and environmental performance indicators and highlights the importance of social and environmental responsibilities as a corporate goal. However, companies define sustainability differently from each other. For that reason, indicator system which is set up to measure sustainability will vary from company to company because these indicator systems will be based on the strategy and goals of the related company. Weights of the balance score card dimensions will also depend on the goals and culture of each company (Epstein & Wisner, 2001). Organization's strategic management should develop certain metrics for achieving sustainability goals. Butler, Henderson & Raiborn, (2011), in their study stated that management goals should be quantifiable, controllable and include all components. Thus, potentials of value added processes which are in the social and ecological aspects are revealed. So this situation, prepare the implementation process of the strategy. In addition to the advantage of preparation, company can gain experiences in terms of environmental and social sustainability department. This will led to increases in the internal acceptance about sustainable balance score card.

### **Theoretical Framework**

The study hinges on Survival-based theory. Differently put as 'survival of the fittest' theory. Social Darwinism assumed that competition is normal since it produces the fittest business which survived and prospered through adopting to its environment or have become the most efficient and economic producer of all.

Khairuddin, (2005) outlined some assumptions for this theory. In order for the firms to survive, organizations must employ or adapt strategies that should be focused on efficient operations and has the capacity to respond quickly to the constantly changing competitive environment. This is true since the firm that survive such competition is the firm that is able to adapt to the prevailing business environment. This imply that based on the survival of the fittest theory, the firm will simply not survive if the firm fail to adapt to the changing environment and handle current trends efficiently.

Based on the above statements, this study will be anchored on this theory, survival-based theory because it best demonstrates the choice of salvaging the company from bad to better.

## **III. METHODOLOGY**

The research design employed is the expo facto method. The study depends wholly on secondary data collected from the annual report and account of selected manufacturing companies listed on Nigerian Stock Exchange, and Annual Reports of companies domicile on the Johannesburg Stock Exchange website. These data were collected for the ten -year period from 2009 through 2018. The population total of listed manufacturing firms in Nigeria is thirty-five (35) (Nigeria Fact Book, 2019) and forty-five (45) listed manufacturing firms in South Africa (Johannesburg Stock Exchange Fact Book,

2019), bringing all the population to eighty (80) listed in Nigeria Stock Exchange and Johannesburg Stock Exchange firms. The sample of this study consist of a cross country analysis of which all the 35 listed manufacturing firms on the Nigerian Stock Exchange and all the 35 listed manufacturing companies on the Johannesburg Stock Exchange as at December, 2018, considerations were given to only those firms whose data were accessible. The reason why we choose these countries are: firstly, these two countries have similar economic behaviours over the decades, hence, they are good representative of West African and South African regions. The econometric techniques adopted in this study are the panel fixed and random effect regression techniques. In evaluating the pooled regression results, we used Pooled Generalized Least Square (GLS) multiple regression analysis and simple regression analysis. The individual statistical significance test (T-test) and overall statistical significance test (F-test) was used. Importantly, the goodness of fit of the model was ascertained using the coefficient of determination (R<sup>2</sup>). Our panel analysis was done after descriptive statistics, normality test, correlation analysis, variance inflation test (test for multicollinearity) and Test for Heteroscedasticity.

**Model Specification**

The model shows that there are significant differences among the components of balance score card, sustainability balance score card as well as firm value in the samples of companies from the two countries. In order to study whether the observed differences in firm value are related to the differences in firm characteristics associated with each country, we estimate the following basic regression model:

**Functional Form of Variables drawn from Nigeria**

**Model 1: Balance Scorecard Sustainability Model from Nigeria Data**

$$Tobin\ q_{it} = \beta_0 + \beta_1SUS_{it} + \sum_{\lambda}Time\ dummies + \sum_{\eta}Firm\ dummies + \epsilon_{it} \dots \dots \dots (1)$$

One can ask whether our empirical tests are robust to the generic relation between corporate value and corporate systems of these two countries. In order to find out whether the change in value is specifically related to each country's score card characteristics, we model several interaction variables which measure the relationship between firm performance and country-specific score card characteristics bringing our third set of regression equations to be specified as

$$Tobin\ q_{it} = \beta_0 + \beta_1\ BSC_{it} + \beta_2SUS_{it} + \beta_3FSIZE_{it} + \sum_{\lambda}Time\ dummies + \sum_{\phi k}Interaction\ variables + \epsilon_{it} \dots \dots \dots (2)$$

**Model 2: General Model specified for South Africa Manufacturing Firms**

$$Tobin\ q_{it} = \beta_0 + \beta_1\ ROA_{it} + \beta_2INTBP_{it} + \beta_3CUSP_{it} + \beta_4LDP_{it} + \beta_5SUS_{it} + \beta_6FSIZE_{it} + \epsilon_{it} \dots \dots \dots (3)$$

**Operationalization of Variables**

- Tobin Q** in Numbers is computed as Market Capitalization + Total Liabilities - Cash flow divided by Total Asset
- Corporate Social Responsibility (SUSBSC=CSR):** Disclosure in Dummy (1, 0) is measured as "1" for companies that have a section in the Annual Reports for social responsibility or Community activities and "0" otherwise
- Environmental Sustainability Disclosure (SUSBSC=ESD):** in Dummy (1, 0) is measured as "1" for companies that have a sustainability sections in the Annual Reports and "0" otherwise
- Asset Tangibility Ratio (AT R)** in Percentage is computed as Non-current Asset divided by Total Asset
- Firm Size:** in Thousands is computed as Total Asset divided by US annual Average Exchange Rate. This measure is best for comparing companies with different currencies
- Debt to Total Asset (Debt to TA)** in Percentage is computed as Total Liabilities divided by Total Asset

**Decision Rule**

The hypotheses formulated in this study were tested based on coefficients regression statistics. The decision reach on hypotheses are based on the result obtained from regression calculation and tabulated value of the regression to be distributed. If the computed value of regression is more than the probability of 10%, the null hypotheses (Ho) are accepted and the alternate hypotheses (Hi) rejected. But if the value of Probability (P-value) is less, then the null hypotheses (Ho) will be rejected.

**Presentation/Analysis of Data**

In this study, we carry out a comparative study on the effect of sustainability balanced scorecard on firm value, as evidenced from listed Manufacturing firms in Nigeria and South Africa, for the period of 2009 to 2018. Descriptive statistics and correlation matrix were employed alongside the pooled regression to investigate this relationship. Added

to the above, the variables for this study include Firm Value using TOBIN q as dependent variable while independent variables include Balanced Scorecard Financial Perspective (FINP), Internal Business Process Perspective (INTBP), Customer Perspective (CUSP), Learning and Development Perspectives (LDP), and Sustainability Balanced Scorecard (SUSBSC).

**Table 1: Descriptive Statistics of our Variables from Firms in Nigeria**

	TOBINQ	ROA	INTBP	CUSP	LDP	SUSBSC	FSIZE
Mean	2.063857	7.119029	35.98177	11.66520	10.88109	10.88109	11.37637
Median	1.445000	5.800000	32.52000	9.555000	9.060000	9.060000	11.30500
Maximum	11.78000	53.96000	85.59000	196.6200	45.97000	45.97000	14.67000
Minimum	0.390000	-37.06000	4.760000	-90.70000	1.010000	1.010000	6.820000
Std. Dev.	1.662639	10.21244	16.07152	24.69615	6.952564	6.952564	1.683734
Skewness	2.233010	0.508890	0.854910	1.951490	1.895292	1.895292	-0.018658
Kurtosis	9.258451	7.207874	3.471428	16.66641	8.064008	8.064008	2.038466
Jarque-Bera	862.0725	273.3220	45.87525	2945.891	583.5185	583.5185	13.50331
Probability	0.000000*	0.000000*	0.000000*	0.000000*	0.000000*	0.000000*	0.001169*
Sum	722.3500	2491.660	12593.62	4082.820	3808.380	3808.380	3981.730
Sum Sq. Dev.	964.7651	36398.56	90144.48	212855.0	16870.01	16870.01	989.4015
Observations	350	350	350	350	350	350	350

Source: Researchers’ computation (2019): Note: \*1% Level of Significance.

The results expressed in Table 1 helps to provide some insight into the nature of the selected quoted manufacturing firms in Nigerian used in this study. First, it can be observed that on the average, in a 10-year period (2009-2018), the sampled firms in Nigeria were characterized by positive TOBIN q = 2.063857. This is an indication that most quoted firms in Nigeria have a positive firm value. Also, the large difference between the minimum and maximum values of the total assets (FSIZE) showed that the sampled quoted firms in this study are not mainly dominated by either large or small firms and are widely dispersed.

**Country Specific Analysis**

**Model 1: Balance Scorecard Sustainability Model from Nigeria Data**

$$Tobin\ q_{it} = \beta_0 + \beta_1SUS_{it} + \sum_{\lambda}Time\ dummies + \sum_{\eta m}Firm\ dummies + \epsilon_{it} \dots \dots \dots (1)$$

In other to test our hypothesis (HO) which states that sustainability balanced scorecard does not have significant relationship with firm value, and the model specified earlier as follows:

$$Tobin\ q_{it} = \beta_0 + \beta_1SUS_{it} + \sum_{it} \dots \dots \dots (2)$$

A simple regression analysis was conducted and the result obtained is presented as Table 2.

**Table 2: Balanced Scorecard Sustainability Perspective Influence on Firm Value.**

Cross-sections included: 35  
Total panel (balanced) observations: 350

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.403948	0.164043	14.65440	0.0000
SUS	-0.031255	0.012709	-2.459241	0.0144

Source: Researchers summary of Nigeria firms analysis (2019) from E-view 9.0 statistical package

**Balanced Scorecard Sustainability Perspective (SUS)**, based on the t-value of -2.459241 and P-value of 0.01 in table 2 above, was found to have a negative influence on our sampled quoted manufacturing firm’s value (TOBIN q) and this influence is statistically significant at 1% level as its P-value is within 0.1. This result, therefore suggests that we should

reject our null hypothesis (H0) which states that Sustainability Balanced Scorecard (SUSBSC) does not have significant relationship with firm value. This means that quoted manufacturing firms in Nigeria that engages more on environmental sustainable activities are rated lower in scorecard value by their investors and shareholders and this higher sustainability activity therefore drives the value of their firms significantly negative. This result by implication shows that investors and shareholders do not want the managers to excessively engage on activities that will not bring immediate gain to them or increase their dividend base. Therefore, as this influence is statistically significant, management should pay more attention on the activities that will increase firm’s profitability and less attention on environmental sustainability activities embark on them more if they wish to be rated high in their balanced scorecard by investors and shareholders as well as invariably drive the value of their firms forward. Therefore on the basis of efficient use of sustainability balanced scorecard to generate firm value, those firms with less sustainability activities are valued higher than those with high sustainability activities and management of firms should take note of this when considering activities that will boost the value of their firms.

**Table 3: TOBINQ Pooled Generalized Least Square (GLS) Regression Result**

Cross-sections included: 35

Total panel (balanced) observations: 315

Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.049140	1.062414	5.693771	0.0000
ROA	0.045365	0.007360	6.163601	0.0000
INTBP	-0.009170	0.005678	1.615046	0.1037
CUSP	-0.000135	0.001881	-0.071797	0.9428
LDP	-0.005265	0.015129	-0.348029	0.7281
FSIZE	-0.339802	0.085106	3.99270-6	0.0001
AR(1)	0.802608	0.032796	24.47278	0.0000
R-squared	0.707500	Mean dependent var		2.058127
Adjusted R-squared	0.701802	S.D. dependent var		1.643884
S.E. of regression	0.897683	Akaike info criterion		2.643973
Sum squared resid	248.1973	Schwarz criterion		2.727364
Log likelihood	-409.4258	Hannan-Quinn criter.		2.677291
F-statistic	124.1655	Durbin-Watson stat		1.860760
Prob (F-statistic)	0.000000			

Source: Researchers’ summary of Nigeria firms analysis (2019) from E-view 9.0 statistical package

The result of our descriptive statistics is presented in Table 4.

**Table 4: Descriptive Statistics of our Variables for Sampled Manufacturing Firms in South Africa**

	TOBINQ	ROA	INTBP	CUSP	LDP	SUSBSC	FSIZE
Mean	1.772657	6.652286	36.99643	9.865771	16.35554	0.922857	12.91106
Median	1.325000	6.925000	37.64000	7.720000	15.76000	1.000000	13.05000
Maximum	23.57000	36.24000	95.38000	149.8700	180.1400	1.000000	16.01000
Minimum	0.260000	-38.10000	2.480000	-97.60000	-20.57000	0.000000	8.470000
Std. Dev.	2.255938	7.982294	18.26045	27.19156	14.64355	0.267200	1.520161
Skewness	7.060265	-1.805436	0.139412	1.703364	4.333589	-3.169630	-0.446863
Kurtosis	59.53718	12.91311	2.470198	14.06897	47.83065	11.04655	3.097000
Jarque-Bera	49522.69	1623.243	5.227154	1956.031	30404.89	1530.277	11.78561
Probability	0.000000*	0.000000*	0.073272**	0.000000*	0.000000*	0.000000*	0.002759*
Sum	620.4300	2328.300	12948.75	3453.020	5724.440	323.0000	4518.870

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Sum Sq. Dev.	1776.151	22237.24	116371.9	258044.0	74837.28	24.91714	806.4999
Observations	350	350	350	350	350	350	350

**Source: Researchers' computation (2019); Note: \*1% ; \*\*5% Level of Significance.**

The results expressed in Table 4 helps to provide some insight into the nature of the selected quoted manufacturing firms in South Africa used in this study. First, it can be observed that on the average, in a 10-year period (2009 -2018), the sampled firms in South Africa were characterized by positive TOBIN q 1.772657. This is an indication that most quoted firms in South Africa have a positive firm value. Also, the large difference between the minimum and maximum values of the total assets (FSIZE) showed that the sampled quoted firms in this study are not mainly dominated by either large or small firms and are widely dispersed. This is confirmed by the wide variations recorded in the standard deviation values of the variables used.

Furthermore, the Table 4 shows that on the average of ten years period, that the firms sampled are characterized by positive Balanced scorecard financial perspective value of (ROA=6.652286). This shows that during the period under study, the financial measures that convey the economic consequences of the action undertaken by the sampled firms that focused on profitability options were positively recorded. However, the wide variation between the maximum and minimum values of balanced scorecard financial perspective (ROA) which stood at 36.24000 and -38.10000 respectively justifies the need for this study as we expect that those firms with higher balanced scorecard financial perspective will have higher firm value than those with smaller or negative balanced scorecard financial perspective value.

Similarly, Balanced Scorecard Internal Business Perspective (INTBP) value on the average stood at 36.99643. This shows that large number of our sampled firms recorded positive INTBP value during the period under study. In other words, large numbers of the sampled firms were engaged with activities that can result into financial success and customer's satisfaction, such as cost and quality assurance activities, relating to the business process. Although, the maximum and minimum values of INTBP shows a wide variation as it stood at 95.38000 and 2.480000 respectively. This wide variation also justifies the need for this study as we assume that firms with higher balanced scorecard internal business perspective will have higher firm value than those with less Internal Business Perspective (INTBP).

Furthermore, Balanced Scorecard Customers Perspective (CUSP) shows a positive value of 9.865771. This means that most of our sampled firms were involved in activities that provide quality goods and services, ensure effective delivery of the goods and services and ensures that customers satisfaction are sustained. However, there is a high variation between the maximum value of CUSP that stood at149.8700 and minimum value that stood at-97.60000. This wide variation in CUSP values among the sampled firms justifies the need for this study as we assume that firms with higher CUSP value will have higher firm value than those firms with low CUSP value. The same assumption is also expected from the value of Learning and Development Perspective (LDP) and balanced scorecard Sustainability Perspective (SUSBSC) respectively as they both show wide variations as well in their maximum and minimum values respectively.

Lastly, in table 4, the Jarque-Bera (JB) which test for normality or the existence of outliers or extreme values among the variables shows that all the variables are distributed normally at the 1% level of significance except Balanced Scorecard Internal Business Perspective (INTBP) which is normally distributed at 10% level of significance. This implies that any variable with outlier are not likely to distort our conclusion and are therefore reliable for drawing generalization. This also implies that the least square estimation can be used to estimate the pooled regression model.

The study on trying to diagnose for the presence of multicollinearity in our data used, as well as evaluating the association among the variables adopted, employed the Pearson correlation coefficient (correlation matrix) analysis. The result obtained is presented in Table 5.

**TABLE 5: Pearson Correlation Matrix**

	TOBIN	ROA	INTBP	CUSP	LDP	SUSBSC	FSIZE
TOBIN	1.00	0.17	0.04	0.03	0.06	0.03	0.10
ROA	0.17	1.00	0.14	0.18	0.10	0.00	0.06
INTBP	0.04	0.14	1.00	0.01	0.35	0.02	0.26

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CUSP	0.03	0.18	0.14	1.00	0.03	0.09	0.01
LDP	0.06	0.10	0.35	0.03	1.00	0.07	0.03
SUS	0.03	0.00	0.02	0.09	0.07	1.00	0.09
FSIZE	0.10	0.00	0.03	0.01	0.03	0.09	1.00

Source: Researchers Computation (2019)

The use of correlation matrix in most regression analysis is to check for multi-collinearity and to explore the association between each explanatory variable (ROA, INTBP, CUSP, LDP, SUSBSC, and FSIZE) and the dependent variable (TOBINQ). Table 5 focused on the correlation between firm value measured as TOBINQ and the independent variables (ROA, INTBP, CUSP, LDP, SUS, and FSIZE) of the quoted manufacturing firms in South Africa. The finding from the correlation matrix table shows that all our independent variables, (ROA = 0.17; INTBP = 0.04; CUSP=0.03, LDP=0.06, SUS=0.03 and FSIZE=0.10) were observed to be positively and weakly associated with Firm value measured as TOBIN q. In checking for multi-collinearity, we notice that no two explanatory variables were perfectly correlated. This means that there is no problem of multi-collinearity between the explanatory variables. Multi-collinearity usually results to wrong signs or implausible magnitudes in the estimated model coefficients obtained. There will also be bias in the standard errors of the coefficients.

### MODEL 2: General Model Specified for South African Listed Manufacturing Firms:

$$\text{Tobin } q_{it} = \beta_0 + \beta_1\text{ROA}_{it} + \beta_2\text{INTBP}_{it} + \beta_3\text{CUSP}_{it} + \beta_4\text{LDP}_{it} + \beta_5\text{SUS}_{it} + \beta_6\text{FSIZE}_{it} + \sum_{it}\dots\dots\dots(5)$$

In other to examine the impact relationships between the dependent variable TOBINQ and the independent variables (ROA, INTBP, CUSP, LDP, SUSBSC, and FSIZE) and to also test the formulated hypothesis given, the study used a pooled multiple regression analysis, to test the hypothesis, owing to the fact that the data had both time series (2009-2018) and cross sectional properties (35 quoted manufacturing firms in South Africa). The first pooled interaction based multiple regression result we obtained shows a result that has an autocorrelation problem, just exactly what we observed from data gathered from quoted manufacturing firms in Nigeria.

Auto correlation problem is a problem that is predominantly with time series data and our data also have a time series characteristics as it cut across ten (10) years period, 2009-2018. The autocorrelation problem in our regression result was confirmed by the Durbin-Watson value of the result being 0.435336 which is less than 2 or approximately 2 that is the rule of thumb.

In other to correct for the autocorrelation problem in the result, we can use different methods such as using Cruch-Godfrey L-M test, or re-estimated the regression equation by introducing AR variable into the estimate. But for the purpose of this study, we corrected the autocorrelation problem observed in our regression result by re-estimating our equation with AR variable into the estimate and the Generalised Least Square (GLS) result obtained as a result of the correction is presented as table 6 and is interpreted below.

**Table 6: TOBIN q Pooled Generalized Least Square (GLS) Regression Result From Data Collected from Quoted Manufacturing Firms in South Africa.**

Cross-sections included: 35

Total panel (balanced) observations: 315

Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.046315	1.168838	0.895176	0.3714
ROA	0.006149	0.006313	0.974084	0.3308
INTBP	0.007923	0.004552	1.740597	0.0828
CUSP	-0.000196	0.001235	-0.158713	0.8740
LDP	-0.002858	0.004171	-0.685273	0.4937
SUS	-0.005035	0.109959	-0.045793	0.9635
FSIZE	-0.007758	0.085097	0.091169	0.9274

AR(1)	0.825362	0.016454	50.16079	0.0000
R-squared	0.891830	Mean dependent var		1.732921
Adjusted R-squared	0.889363	S.D. dependent var		2.063656
S.E. of regression	0.686414	Akaike info criterion		2.110399
Sum squared resid	144.6476	Schwarz criterion		2.205702
Log likelihood	-324.3878	Hannan-Quinn criter.		2.148476
F-statistic	361.5890	Durbin-Watson stat		2.375584
Prob(F-statistic)	0.000000			

Source: Source: Researchers’ summary of South Africa firms analysis (2019) from E-view 9.0 statistical package

In table 6, R-squared and its adjusted R-squared values were (0.89) and (0.89) respectively. This is an indication that all the independent variables jointly explain about 89% of the systematic variations in Firm value (TOBIN q) of our sampled companies over the ten-year period (2009-2018) while 11% of the systematic variations are captured by the error term. The F-statistics 361.5890 and its P-value of (0.00) portrays the fact that the TOBIN q regression model is well specified.

**Test of Autocorrelation:** Using Durbin Watson (DW) statistics which we obtained from our regression result in table 6, it is observed that DW statistic is 2.375584 which is approximately 2, agrees with the Durbin Watson rule of thumb. Showing that our data are free from autocorrelation problem and as such fit for the regression result to be interpreted and result relied on. Akaike Info Criterion and Schwarz Criterion which are 2.110399 and 2.205702 respectively further strengthen the fitness of our regression result for reliability as they confirm the goodness of fit of the model specified. In addition to the above, the specific findings from each explanatory variable are provided as follows:

**Balanced Scorecard Sustainability Perspective (SUS),** based on the t-value of -0.045793 and P-value of 0.96 in table 6 above, was found to have a negative influence on our sampled quoted manufacturing firm’s value (TOBIN Q) in South Africa and this influence is statistically insignificant since its P-value is more than 10%. This result, therefore suggests that we should accept our null hypothesis (H0) which states that Sustainability Balanced Scorecard (SUS) does not have significant relationship with firm value. This means that quoted manufacturing firms in South Africa that engages more on environmental sustainable activities are rated lower in scorecard value by their investors and shareholders and this higher sustainability activity therefore drives the value of their firms negatively. However, this influence is not statistically significant and therefore, should be ignored by managements. This result by implication shows that investors and shareholders in South Africa does not want the managers to excessively engage on activities that will not bring immediate gain to them or increase their dividend base. Therefore, as this influence is not statistically significant, management should pay more attention on the activities that will increase firms profitability and less attention on environmental sustainability activities but since sustainability activities does not significantly influence firm value in South Africa, management as well as policy makers should ignore it, when considering activities that can drive balanced firm values among manufacturing firms in South Africa.

**Test of Control variable: Firm size (FSIZE) and Firm Value (TOBIN q),** based on the t-value of 0.091169 and P-value of 0.93 in Table 6 above, was found to have a positive influence on the quoted manufacturing firm’s value (TOBIN q) in South Africa and this influence is statistically insignificant because the p-value is more than 10%. This invariably means that in terms of rating of firm’s value by investors and shareholders, firms with large sizes are rated higher than firms with small sizes. Therefore, as this influence is statistically insignificant, management should pay less attention on the activities that will increase their sizes more such as investment and expansion activities, since it does not significantly affect the value of their firms in South Africa. This means that large firm sizes (FSIZE) does not drives the value of firms significantly and could be ignored by the managements.

**Comparative Analysis of Countries Specific Results**

The result provided an insight into the nexus between balanced scorecard and firm values of manufacturing firms quoted across countries used for this study (Nigeria and South Africa) and the result is presented in table 7.

Table 7: Summary of Country Specific Analysis

VARIABLES	NIGERIA		SOUTH AFRICA	
	T-Statistics	P-value	T-Statistics	P-value
ROA	6.163601	0.0000	0.974084	0.3308
INTBP	1.615046	0.1037	1.740597	0.0828
CUSP	-0.071797	0.9428	-0.158713	0.8740
LDP	-0.348029	0.7281	-0.685273	0.4937
SUS	-2.459241	0.0144	-0.045793	0.9635
FSIZE	3.992706	0.0001	0.091169	0.9274
<b>AFTER INTERACTION</b>			----	-----
INTBP*CUSP	-0.396050	0.6923	-1.401437	0.1620
LDP*ROA	-3.760915	0.0002	-0.429097	0.6681
ROA	7.116768	0.0000	2.519066	0.0122
FSIZE	4.278219	0.0000	1.800767	0.0726
R-SQUARE	0.707500	0.00	0.891830	0.00

Source: Researchers summary of Country Specific analysis (2019) from E-view 9.0 statistical package

The country specific analysis is carried out to examine the effect of balanced scorecard on firm value on each of the selected country. This will enable us examine the impact of each country balanced scorecard measured as balanced scorecard financial perspective, balanced scorecard internal business process perspective, balanced scorecard customer’s perspective, balanced scorecard learning and development perspective, balanced scorecard sustainability perspective and firm size used as a control variable on firm value of manufacturing firms quoted in their stock market.

From the result, we observed that the independent variables used for this study jointly explains about 71% of the systematic variations of the dependent variable in Nigeria while 89% of the systematic variations of the dependent variable (TOBIN q) was explained in South Africa. This shows that while error term captured only 29% of other possible variables other than the ones we used, that can impact our dependent variable in Nigeria, about 11% is captured by error term in South Africa.

Also, from the summary of comparative result in table 7 above, Balanced Scorecard Financial perspective, measured as Return on Assets (ROA) when regressed as standalone variable with other variables, has a positive effect on firm value of quoted manufacturing firms in both Nigeria and South Africa. However, while it is statistically significant in influencing manufacturing firms in Nigeria, it is not significant in South Africa. But table 7 showed a significant result when used in an interaction model in both Nigeria and South Africa. This means that shareholders in Nigeria consider actions taken by firms management that may lead to profitability increase or expansion as a significant measure in grading the value of such manufacturing firms in Nigeria than in South Africa. The implication of this result is that in Nigeria, for every \$1 in balanced scorecard financial perspective(ROA) of quoted manufacturing firms will lead to a positive increase of \$616 in the value of the firm and if ROA is interacted with other variables, it will lead to about \$712 increase in firm value in Nigeria and \$252 increase in value of firms in South Africa and this effect is statistically significant at 1% level. Although when tested as standalone variable in South Africa, every \$1 increase in ROA recorded by their quoted manufacturing firms, will lead to about \$97 positive increase in their firms value (TOBIN q). Hence, managers and policy makers should ensure that they maintain good balanced scorecard financial perspective if they want to increase their firm’s value among their shareholders and investors in both Nigeria and South Africa.

#### IV. Summary/Conclusion

The main objective of this study is to carry out a comparative study on the effect of sustainability balanced scorecard on firm values of quoted manufacturing firms in Nigeria and South Africa. In the course of the study, we verified the suitability of the data gathered in South Africa as we also did for that of the Nigerian manufacturing firms through the use of descriptive and diagnostic tests. The variables for this study include Firm Value using TOBIN q as dependent variable while independent variables include Balanced Scorecard Financial (FINP), Internal Business Process Perspective (INTBP), Customer Perspective (CUSP), Learning and Development Perspectives (LDP), and Sustainability Balanced Scorecard (SUS). In other to examine the impact relationships between the dependent variable TOBIN q and the independent variables (ROA, INTBP, CUSP, LDP, SUSBSC, and FSIZE) and to also test the formulated hypothesis given, the study used a pooled multiple regression analysis, owing to the fact that the data had both time series (2009 - 2018) and cross sectional properties (35 listed manufacturing firms in Nigeria and South Africa) respectively. Furthermore,

consistent with previous studies, this study concludes that there is significant effect of Sustainable Balance Scorecard perspectives on Firm Value of both Nigeria and South Africa listed Manufacturing Firms

### V. Recommendations

From the findings of the study, the researcher hereby recommends the following:

1. Management should pay more attention to the activities that will drive their financial performance positively, to embark on them more if they wish to be rated high in their balanced scorecard by investors and invariably drive the value of their firms forward. Therefore on the basis of efficient use of balanced scorecard financial perspective to generate firm value, those firms that embark on more activities that drive financial performance higher are valued higher by investors than those with less financial performance activities. Managers and policy makers should therefore ensure that they maintain good balanced scorecard financial perspective if they want to increase their firm's value among their shareholders and investors in both Nigeria and South Africa
2. Shareholders in both Nigeria and South Africa, consider internal business results that lead to financial success and satisfaction of customers such as cost reduction and quality sustainability as a measure of firms value among manufacturing firms in both countries. The implication of this result is that in both Nigeria and South Africa, for every \$1 increase in INTBP value will lead to about \$162 and \$174 increase in firm value in both Nigeria and South Africa respectively, management are encouraged to pay more attention to INTBP because of its effect on firm value in both countries.
3. Shareholders in both Nigeria and South Africa do not consider balanced scorecard customers perspective, such as providing quality goods and services, as a measure of firm value among manufacturing firms in both countries and this have negative influence on firms' value in both countries. Shareholders in both countries should encourage balance scorecard customers perspective because it results to providing quality goods and services which positive result will boost the firm value.
4. Management are advised, considering LDP negative result in both Nigeria and South Africa, which means that for every \$1 increase in LDP value will lead to about \$35 and \$69 decrease in firm values in both Nigeria and South Africa respectively, to always consider the cost of each project of LDP on firm value.
5. Looking at the statistically significant influence of SUS in Nigeria, managers should take seriously the issue of SUS and that managers who wishes to improve their firm value through sustainability activities should engage on less or moderately cost environmental sustainability activities in Nigeria. This will make such firms to engage on more or a wide spread sustainability activities that will impact lives positively thereby increased their firm values while in South Africa, managers may not put much effort in using sustainability balanced scorecard in increasing their firm values as this has insignificant effect on firm value.

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