



EFFECT OF INDIRECT COSTS ON CORPORATE PROFITABILITY OF BREWERIES IN AFRICA: EVIDENCE FROM NIGERIA.

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Abstract

This study investigated the effect of indirect costs on corporate profitability of breweries in Nigeria. Specifically the study seeks to find the extent to which factory electricity generation, product promotion, general expenses and cost of advertisement affects profitability of breweries in Nigeria. In carrying out the study, ex-post facto research design involving secondary data collected from the annual statements of the two companies was used. The data collected from the secondary source were analyzed using descriptive statistics and multiple regression analytical method. Analysis of variance (ANOVA) and Durbin-Watson statistical analytical method were also used for the analysis of the variables. At the end of the study, the analysis reveals that there is a significant relationship between the profit of the companies and indirect costs. The implication of the findings is that indirect costs affect the profitability of the companies, suggesting that the companies should properly manage their costs in order to reduce the extent of expenditures on them so as to increase profit. Based on the findings of the study, it was recommended that Brewery companies whether local or multinational should consciously formulate policies geared towards effective cost control in view of its impact on profitability and secondly that financial managers should pay attention to the management of each component of indirect costs as the adverse effect on one could negate the positive effect on the other components.

Keywords: *Indirect Costs, Corporate Profitability, Breweries, Nigeria, Africa*

1. INTRODUCTION

Manufacturing companies in Nigeria are facing the major challenges of input costs, which appears to have been the bane against business growth, low profitability and closure of business operations (Okvvo and Ugwunta 2012). This problem has led to the reduction of number of breweries operating in the country as most of them prefer to operate outside the shore of the country and import their final products to the country for consumption. This for instance was possible due to high cost of inputs and indirect cost such as electricity cost, promotion cost, general costs and advertisement cost.

Prior researchers have noted that the number of breweries' operating in the country was thirty-three (33) with about total capacity of twenty million hectoliters in 1990 but this has dropped significantly from the thirty three in 1990 to four in 2012.

One main astonishing fact about this fall is that breweries was one of the most important viable area in the country in 1990 but suddenly declines to pitiable stage in the late 2012. The reason and implication of the scenario is that production will inadvertently be low with no corresponding increase in the turnover.

The ban on importation of essential raw materials such as barley malt and flour as well as the ability to cope with the use of locally generated substitutes could might accounted for these fall on the number of firms, low productivity, stunted growth and high input and indirect costs. Before the dwindling nature of these firms in Nigeria, Ola (2001) observed that it was one of the sectors that were contributing to about 28% of the MVA, huge opportunity for massive employment and about 30% of the nation's GDP. Though, the ban on the importation of barley malt in this area remains a problem, it however provides opportunity for diversification of resources. For instance, farmers and research institute were forced to device a new means and substitute for these resources and to aid in militating against the shortfall

in the raw materials and to increase the production and cultivation of such new substitute.

Grains such as maize, and sorghum for example came into commercial production following the ban of imported ingredients which also led to the increase of employments, economic base and profitability of these young farmers. It is important to note that the above contribution can only be sustained if the main users -that is brewery firms-make profits that would enable them to remain in business. These include incurring low costs in the acquisition of such raw materials, increased profitability. If the dearth rate of firms is high for instance, economic growth and development will be hindered. The economic benefit arising from the Brewery industry can only be maintained when the brewery firms make profit which guarantee that they remain in business. That is to say that the brewery firms should be capable of making profit that will outweighs the expenses incurred in generating the profit. The shutting down of brewery firms continuously as a result of input cost being high is one of the factors that could hinder the nation from rapid economic growth and development. According to Equity Research Report (2006),it was stated that high cost of input costs such as raw material and barley malt which have some implications on the profitability of the brewery firms remains one of the essential challenges. The substitute created and the subsequent ban of barley malt with it being replaced with other local materials as a result of restriction on its importation remains a challenges that have continuously contributed to the decline in the profitability of the firms. The rate of packaging, transporting and storing equally have gone up spontaneously so also is the wage rate which have risen up high compared to the price of the local materials (yin xia 2003).

Okwo and Ugwunta (2012) noted that the production of beer in commercial quantity began in Nigeria in the 1949. At this time, the only first firm that was in existence is the Nigerian Breweries Ltd plant at Igunlu in Lagos State. This company continued to be the only company that produced beer until in the early 1960s which saw the emerge of Golden Guinea, Guinness, West African Breweries and north Breweries in 1962, 1963,1964 and in 1970 respectively. A phenomenal growth in the number of breweries occurred in the second half of the 1970's; this was induced partly by government's decision to ban the importation of beer into Nigeria in 1978. Between 1992-1998 most manufacturing companies experienced severe difficulties as a result of high costs of indirect expenses leading to the fall in production levels (Onuoha 2009),He also noted that since then, the industry has continued to grow slowly while many branches shut down production. During this period, capacity utilization fell to an all-time low of 30 percent (Onuoha, 2004). Increasing success with local substitutes for barley malt has improved the capacity utilization rate to about 64 percent in 1999 for multinational breweries.

Ogben (2009) observed that indirect costs are all other costs incurred in the manufacturing process which cannot be traced directly to any of the units being produced and this includes costs of foreman's salary, depreciation of factory plant and machinery, factory rent and rates, factory cleaning, insurance of factory plant and machinery, factory power and factory repairs. According to Ogben (2009),these costs affect the level of corporate profitability of companies. So many studies (Cynthia and Birger 1991;Owusu 2010;Adjeii 2012) have been carried out on this subject matter but most of them are in foreign countries. This is the major research gap which this study will fill. Hence given the important contributions of the brewery sector to the Nigerian economy, this research sought to evaluate the effect of indirect costs on the profitability of brewery companies in Nigeria.

Okwo and Ugwunta (2012) and Ogben (2009) argued that most of these problems were caused by high overheads which according to them have direct consequences on the profitability of industry. Factory electricity generation, promotion, repairable and general expenses are some of the indirect costs imparting negatively to the survival of companies in Nigeria. Moreover, the high costs of depreciation owing to weather conditions, interest paid for borrowed money, repairs of existing facilities, high tax rates in the country and insurance payments were said to have been a bane to smooth businesses in Nigeria. In view of the above problems of overheads costs in the business activities of companies in Nigeria especially the brewery industry, research of this nature becomes highly important. Some of these problems have been highlighted by other researchers (Cynthia and Birger 1991;Owusu 2010;Adjeii 2012) in other developed and developing countries but no such known research has been carried out in Nigeria. It is based on these premises that this study will seek to investigate the effect of indirect costs on corporate profitability of breweries in Nigeria. However, the following specific objectives were considered.

1. To find out the extent to which factory electricity generation affects the level of corporate

- profitability of brewery companies in Nigeria.
2. To ascertain the relationship between product promotion and corporate profitability of companies in Nigeria.
 3. To find out the effect of general expenses on the corporate profitability of brewery industry in Nigeria.
 4. To determine the effect of cost of advertisement on the profitability of the firm in Nigeria.

The benefits or level of achievement that shall accrue from this are numerous. Brewery Companies of Nigerian economy will benefit from result of this work as this will awaken enough consciousness towards proper and indirect costs management. Researchers also, will find this work of great relevance, as a reference material to assist them in further research into similar areas of study in the future. Students of Accountancy and related discipline will find this work useful for it will increase their understanding of cost management and level of achievement.

2. OVERVIEW OF BREWERY INDUSTRY IN NIGERIA.

The production of beers in commercial quantity started in Nigeria in 1949 with the establishment of Nigerian Breweries Ltd plant at Igunlu in Lagos State. Guinness Nigeria Pic was incorporated in 29th April 1950 and listed on the Exchange in November 1950 (Nigeria Stock Exchange Fact Book, 2011). It has four brewery locations namely Ikeja Brewery, Ogba Brewery, Benin and Aba Breweries. Its product range are Guinness Stout, Harp, Guinness Extra Smooth, Gordon Spark, Malta Guinness and Smirnoff Ice (Guinness Nigeria pic annual reports and accounts 2009).

Guinness Nigeria Pic produces Guinness Stout which is sold over the countries of the world. Its popularity is based on its natural goodness and its unique flavour. In 1759, Mr Arthur Guinness established his brewery on a four-acre site near the Western entrance to the city of Dublin Ireland, called St. James Gate. Although the Gate has disappeared, the brewery now covers 66 acres and is one of the largest in the world (Guinness Nigeria Pic 2006). In 1938, the demand for Guinness made it necessary to build a second brewery at Park Royal near London and the third Guinness Brewery was opened in Nigeria at Ikeja in 1963. Unlike the breweries at Dublin and Park Royal, Guinness in Nigeria is bottled at the brewery and the Ikeja brewery has the largest bottling hall of any Guinness brewery in the world. The worldwide popularity of Guinness has led to the establishment of breweries in Malay Asia, Cameroon, Ghana and Jamaica. Guinness is brewed under Guinness supervision in Kenya, Sierra-Leone, Australia, Trinidad, Canada, Mauritius, New Zealand, Seychelles, Liberia, Indonesia and Venezuela (Guinness Nigeria Pic 2006). In 1959, Guinness produced her first larger beer, called Harp in Ireland and shortly afterwards expanded this market. Harp was brewed in the Guinness Nigeria Limited brewery in Benin. Harp later failed due to a problem of quality, which could not be solved using the conventional brewing methods and so it had to be dropped. It was replaced by Satzenbrau which still trailed behind such popular larger beer brands like Star and Guilder brewed by Nigeria Breweries Plc. Nigerian Breweries Plc.

Nigerian Breweries Plc (NB Plc) was incorporated in 16th November, 1946 and listed on the Exchange in 5th September, 1973. (The Nigerian Stock Exchange Fact book 2011). It is the country's pioneer brewery. It started a joint venture between United Africa Nigerian Company (UAC) and the Heineken of Holland. Specifically, on November, 16 1946, UAC and Heineken signed a contract for the incorporation of Nigerian Brewery Limited in the capital city of Lagos with share Capital of 300,000 pounds. Both parties were to be one third-shareholders. The other shares were held by five European trading houses in Nigeria which had to be brought on board by UAC, to guarantee their interest and support in the new venture. UAC had earlier entered into an agreement with them on the 10 July, 1946. They were G.B Ollivant of Manchester, John Holt and Co of Liverpool, Companies Francaise de l'Afrique Occidentale (CFAO), Societe Commercial de O'Quest African (SCOA), and Union Trading Company (UTC) of Basle, Switzerland (NB 2006). Under the broad terms of agreement, UAC was to be responsible for the commercial and administrative management of the new company, while Heineken had technical control, with Nathan, Swiss Company saddled with the responsibility of providing the technical brewing installations. On 2nd June, 1949, the first bottle of star larger beer came off the bottling line, from its modest plant at Iganmu. On what was then the outskirts of Lagos. However, there were teething problems at the beginning, not the least of which was the



acceptability of the new product. That problem was further compounded by another larger problem of perception. Apparently, worldwide shortage of grains during the world war II forced European brewing houses to cut back on brewing barley, thus reducing the original gravity of beer from its standard 12% to 4%, just so they could continue to meet their demand for beer. Some of this water war beer, which left most beer drinkers with a bitter after taste, naturally filtered its way into Nigerian market. To began to roll out locally brewed beer at about the same time that this problem was still rippling did not help matters at all for the new company. And then in addition somehow, many Nigerian consumers refused to accept the fact, at beginning, that Heineken, which already enjoyed an excellent worldwide reputation was technically responsible for the brewing of star (Ogunbiyi 2007).

Then came the even bigger problem of bottling and packaging. First because Nigerian did not have a bottle manufacturing company of its own, all the bottles needed for the beer have to be imported at exorbitant costs. And as if that problem as not enough, the company driven ostensibly by a desire to give new buyers of star more beer for their money, bottled the beer in a bigger 65c; bottle as different from the standard, more familiar 60cl bottle of the imported, more expensive beer. Naturally, this fuelled suspicion in the minds of an already skeptical consuming public that the quality of the new beer had to be inferior, if it contained more beer for less money. But the new management was undaunted. Faced with these early problems, it knew it had to do two things, and these were devise a novel sales method that would ensue that the new product promptly reached the consumers and secondly, do what no one had done before in Nigeria, embark on a serious, sustained advertising of a consumer item. On the technical side, Heineken had the challenge of proving that star was brewed according to international standards. Heineken followed up on the challenges by dispatching its then technical director Mr. J.A Emmens to Nigeria in August 1950, barely months after the brewery opened, to ascertain and ensure that its quality was commensurate with the Heineken standard.

From the outset, it was clear that a key factor to the effective distribution and sale of star would depend on the activities of the five trading houses, which were themselves part owners of the new company and had maintained established sale outlets, prior to 1949. Apart from these trading houses and their outlets, there were the 'members only' clubs which were frequented by expatriates (Ikoyi Club, Boat Club, Island Club etc) and even Kingsway stores, which was a subsidiary of UAC. Thereafter, an in-house sales team was put in place, under the supervision of a sale manager, who in turn appointed poorly-equipped salesmen who literally carried beer cartoons into small hotels, restaurants and even sold directly to consumers from their trucks. Equipped with some below the line advertisement materials as incentives, these salesmen perpetrated beer parlours with the new product. By 1951, the company had started to help advertise those hotels, restaurants that sold star beer.

In its inception in 1949, NB Plc had only Star larger beer but over the years it had broaden its product range to include Guilder, Legend, Heineken, Maltina, Amstel Mala and Farouz, Maltina Sip-it, Gulder max and Climax. It has five brewery locations; 1 malting plant, 7 sales regions and 149 key distributes. Nigeria got her independence on 1st October 1960. Mindful of the imminent economic implications of the nationalist favour, the UAC-led Nigerian Breweries limited took unprecedented step of selling off 10% of its shares to a number of its leading Nigerian Distributors. The period 1984 through 1986, was however different because the volume of sales within the period suffered a huge decline changing from 76% to 18%. The growth of turnover in the firms has generally been accompanied by the increase in turnover and volume of production. The deteriorating performance of the firm between the period 1984 through 1986 is a clear indications of the rationing of foreign exchange policy of that time, which was necessitated by the severe balance of payments crisis of the post oil boom era. The import license allocation of the company could hardly satisfy the one third of its foreign exchange requirements. The government mandatory backward integration policy I the mid- 1980s saw the company establishing a 15,000 hectare farm estimated to worth N30,000,000 in Gbakoji, Niger State. The farm is highly mechanized and produces mainly maize, rice and sorghum, with soya beans and cowpeas as rational crops. The main crops used as replacement for barley malt. Prior researchers have noted that the number of breweries' operating in the country was thirty-three (33) with about total capacity of twenty million hectoliters in 1990 but this has dropped significantly from the thirty three in 1990 to four in 2012.

One main astonishing fact about this fall is that breweries was one of the most important viable area in the country in 1990 but suddenly declines to pitiable stage in the late 2012. The reason and



implication of the scenario is that production will inadvertently be low with no corresponding increase in the turnover. The ban on importation of essential raw materials such as barley malt and flour as well as the ability to cope with the use of locally generated substitutes could have accounted for these fall on the number of firms, low productivity, stunted growth and high input and indirect costs. Before the dwindling nature of these firms in Nigeria, Ola (2001) observed that it was one of the sectors that were contributing to about 28% of the MVA, huge opportunity for massive employment and about 30% of the nation's GDP. Though, the ban on the importation of barley malt in this area remains a problem, it however provides opportunity for diversification of resources. For instance, farmers and research institute were forced to device a new means and substitute for these resources and to aid in militating against the shortfall in the raw materials and to increase the production and cultivation of such new substitute.

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3.0 REVIEW OF RELATED LITERATURE

Okwo and Ugwunta (2012) in their study titled the impact of firm's input on firm profitability; using the Nigeria Brewery industry noted that one of the main challenges bedeviling brewery firms is the tremendous increase in the cost of inputs. This led to the declining profit and shut down of business in Nigeria. A cross sectional data generated from the annual reports and accounts of 14 brewery companies in Nigeria for a period covering 1999-2010 was used. Several measures of profitability were evaluated and matched with some important known input costs incurred by brewers. The findings of the study revealed that the ratio of selling and general administration expenses has a statistically and positive relationship with the firms operating cost among brewery firms in Nigeria.

Moreover in a study done by the Equity Research Report (2006) titled comparative analysis of the profitability of selected Breweries in Nigeria. The selected breweries include the Nigerian Breweries Pic, Guinness Nigeria Pic, Champion Breweries Pic and Jos International Breweries Pic. The profitability of brewery firms were measured using market share by turnover, earning (profit) after tax, latest stock price, price earnings ratio (EPS), profit sales ratio, twelve months trading earning per share, market capitalization, share outstanding, Return on Equity (ROE), Return on Asset (ROA), Net asset per share, profit margin, shareholders fund, Beta, Dividend yield (DY), and 5-year Dividend yield Average percentage, derived from 2005 financial reports of the Breweries. The analysis showed that brewery firms have casual relationship with the profitability of the firms.

Furthermore the survey of financial profitability of Ghana Breweries limited carried out by Owusu (2010) indicates that high costs of overhead expenses affect the effectiveness and efficiency of the industry. The study equally noted that using shareholders and lenders fund and the appropriateness of capital structure of firms is also a major problem for the industry. Finding also indicate that irrespective of the severe challenges faced by cheaper brand on its goods and the harsh economic environment that followed the merger of Ghana Breweries, the firm's profitability over the period under study was not satisfactory. This study was carried out using survey research design were questionnaire were issued and data collected were analyzed using Pearson product moment

coefficient correlation.

Ogobodu (2009) in his study of 'Profitability through Effective management of Materials' observed that the manufacturing industry in Nigeria is faced with a number of operational challenges which have reduced the number from 30 in the early 1980s to the small margins was at 2006. The increased in the cost of operation and imported raw material costs have led to the demise of smaller breweries leaving only the breweries with greater capital bases, advertising, retailing, and distribution links. He maintained that at present, about 7 breweries are listed in the NSE at the first tier markets. There are noticeable differences or schism/variations that exist between the large firms and small firms in the turnover, performance, distribution channels and market capitalization. We have for example the like of Nigeria breweries Pic and Guinness Nigeria Pic and the competitors like Jos international breweries of Ilesha and the smaller ones (about two in number) are government owned and having direct link with some international breweries such as Heineken (Nigeria Brewery). The competition that exist between Guinness sand Nigeria Brewery divides Nigeria market into a large duopolistic market structure. This led to the incurring of high overheads so as to outweigh the competitor and increased the value added.

Alex (2008) observed that the price of inputs such as barley and hops are high and is one of the impediments to the high price of beer. The result however tend to agree with the finding of India (2003); Booze (2009) and Begian (2009) who in their individual studies discovered that profit is affected by inflame in input costs.

Kuijis and Kims (2007) who studied on the impact of raw material prices, wages, and profitability in china's industry—how was profitability maintained when input prices and wages increased so fast? This study was situated in this area because of the increase in the cost of raw materials and wages which over the years has risen sporadically. It was the intention of the paper to analyze and quantify the impact of the input costs on performance so as to determine how and the extent these input cost have affected the performance of breweries in China. Combining the information generated from the cost of input -out table using time series analysis, the estimate of what happened to the technical efficiency was arrived at. Based on the statistical analysis done, it was found that performance increased significantly from 2002 to 2008 in the sectors, although, some firms in the sectors did not have their prices increased as such. Findings also show that input prices led to the decline in the quality of products and that there is a gap between one price and input price which stood at 4% in 2005 to 4.3% in 2006.

Demire (2008) in his study of Determinants of Manufacturing Firm Profitability under Uncertainty and Macroeconomic Volatility: Evidence from and Emerging Market. The paper investigated the effect of micro-economic uncertainty explores the impacts of macroeconomic uncertainty, country risk and external shocks on profitability of real sector firms after controlling for the share of financial investments in total assets. A bi-annual data was used, which ranges between 1993 through 2003 for 172 firms in Turkey. Portfolio choice model was adopted so as to sustain profit margins in the face of uncertainties, risks and rivalry. Finding shows that there is a negative relationship that exist between risk and uncertainties and firm performance. The empirical findings based on dynamic panel estimation techniques confirm that increasing uncertainty, country risk, real interest rates and capital flow volatility have a significantly negative effect on manufacturing firm profitability. In contrast, increasing short-term financial investments are found to be reducing the negative effects of risk, volatility and higher interest rates at a significant level. Overall, firms appeared to be using short-term investments as a way of hedging against risks and uncertainties in the market.

Owolabi and Alu (2012) in their study of the relationship between input costs and profitability stated that the existence of firms and ensuring the going concern gross depend on liquidity and working capital management of firms using, an Ex-post - facto research involving trend analysis of five years financial statements of five manufacturing companies brought much to bear in this topic .He used multivariate analysis to test the research hypothesis. The result show that each working capital components affect the level of profitability at varying rates but these effects are not the same when pooled together . the paper recommend for firms to adequately plan and control their cost of operation and adjust their other input cost so as to increase the production of brewery products.

2.3 THEORETICAL MOTIVATION

This research is anchored on system theory, which concerns the internal functioning of the organization and the interactions between the organization and its external environment (Wehrick, Cannice and Koontz, 2008). Management of indirect costs is the objective of a sub-system which is production department, stores department, purchasing department and production planning department etc. The overall objective of the organization as a system is to create a positive level of achievement for its stakeholders. Sub-system objectives must be in harmony with the system objective.

4.0 METHODOLOGY

The design used for this study is Ex-post-facto research design. The study used only secondary data which are to be collected from the selected list of Brewery Companies quoted in the Nigeria Stock Exchange. Twenty (20) years data was used in this work. This ranges from 1993 to 2012. The study made use of secondary data sourced from the annual reports and accounts of listed brewery firms in Nigeria stock exchange. Among the companies operating in Nigeria at the moments, only two (2) companies were selected for use in this study. These are Guinness Nigeria Pic and Nigerian Breweries Pic. The selection was based on the viability, years of existence, profitability and asset base of the companies. The data used were extracted from the annual reports and accounts of the two sampled. Journals, the companies Websites and Internets materials were mainly used in this study.

5.0 ANALYTICAL METHOD/TECHNIQUES

A multiple regression techniques were used for the study. Nwabuokei, (2001) put the general models of multiple regression in the form

$$Y = b_0 + b_1X_1 + b_2X_2 + \dots + e_i$$

- (1) Where Y is a function of x and e_i is the error term,
 b_0 is the intercept

Adopting this formular, we have that $P = b_0 + b_1f + b_2p + b_3g + b_4a + e_i$

- (2) Where $p =$ is the corporate profit of the companies measured by Return on Assets
 F is the factory electricity generation cost
 P is the promotional costs G is the general expenses and A the advertisement costs.

Corporate profit of the companies were taken as the dependent variables while factory electricity generation costs, promotional costs, general expenses and advertisement costs were regarded for the purpose of this study as the independent variables. In the analysis of the data generated from this study, tables and graphs were employed. This is for the descriptive anlysis. In addition to this regression was also done using Univariate, bivariate and multivariate analyses. The multivariate analyses include the Ordinary Least Square (OLS) Regression, Ranked (OLS) Regression, Factor analysis and Cluster analysis. The test of Hypotheses were also done in order to determine the significant or otherwise of the variables used. Relationship and effect were also tested. Independent samples T-test is conducted for each hypothesis.

6.0 RESULTS

Table 1: Regression Results for Aggregate and Individual Company

		Nigerian Breweries	Guinness	Nig. Pic	Aggregate
Intercept	(t)	956706.755	-358509.310		-1722943.037
Electricity cost		0.103 1.590	0.252*		0.899*
Prom cost					
Gen cost		0.628*	0.105		0.620*
Advert cost		-0.933*	0.094		2.486*
R		0.957	0.739		0.925
R ²		0.917	0.955		0.855
S dj R		0.893	0.913		0.821
f-statistics		38.551	0.884		25.514
			31.347		

Source: SPSS version 17.0

* indicates that coefficient is significance at 5% significant level

Table 2: Analysis of Variance (ANOVA) - Regression of Profitability of Nigeria Brewer Plc

Analysis of overall equation

Source	Df	SS(Sum of Squares)	MS (Mean square)	F	P value
Regression	4	7.572E14	1.893E14	38.551	0.0000
Residual error	14	6.875E13	4.911E12		
Total	18	8.260E14			

Source: Statistical data obtained from statistical package (SPSS)

Table 3: Correlations- Regression of NB PLC Profitability

	P	EC	PC	Gc	Ac
Pearson Correlation	1.000	.788	0.15	.800	.942
Fact elc	.788	1.000	.248	.608	.771
Prom	.015	.248	1.00	.296	-0.058
Gen Exp	.800	.608	.296	1.000	.859
Advert	.00	.000	.413	.00	.
P	17	17	17	17	17
Fact elc	17	17	17	17	17
Prom	17	17	17	17	17
GenExp	17	17	17	17	17
Advert	17	17	17	17	17

Source: Statistical Data obtained from statistical package (SPSS)

The regression equation is given by $P = 056706.76 + 0.103 \text{Fact Elc} + 1.59 \text{Prom} + 0.628 \text{Gen exp} - 0.933 \text{Advert}$ (i) A unit change in Fact El would lead to (0.103) unit increase in P, with other variables held constant, (ii) A unit change in Prom would lead to (1.59) increase in P, with other variables held constant, (iii) A unit change in Gen Exp would lead to (0.628) unit increase in profit, with other variables held constant, (iv) A unit change in Advert would lead to (-0.933) unit decrease in profit, with other variables held constant. (v) P equals 95706.76 when all the independent variables are zero.

Table 6: Analysis of variable (ANOVA)-Regression of Guinness PLC Profit Against independent variables- Adv, Gen, PROM, FAC

Model	Sum of squares	Df	Mean square	F	Sig.
1 regression	2.123E14	4	5.208E13	31.347	0.000a
Residual	2.032613	12	1.693E12		
Total	2.326E14	16			

(a) Predictors: (Constant), Adv, Gen, PROM, FAC

(b) Dependent Variable: Profit

Source: Statistical Analysis of SPSS

Table 7: Correlations- regression of Guinness PLC profit against independent variable-Correlations

		PROFIT	FAC	PROM	Gen	AdV
Pearson	PROFIT	1.000	.855	.473	.096	.834
Correlation	FAC	.855	1.000	.373	.175	.944
	PROM	.473	.373	1.000	.424	.371

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