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THE COST LEADERSHIP STRATEGY AND ITS IMPACT ON FUTURE PERFORMANCE OF NON-FINANCIAL FIRMS; A CASE STUDY OF PAKISTAN

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ABSTRACT

The primary aim of every business is to earn profit and enhance performance over time to survive and achieve a competitive advantage. Companies spend most of their time and budget on research and development processes to find ways to increase performance. This research study is also related to the broad theme of cost leadership strategy and its impact on the future performance of corporations listed on the Pakistan Stock Exchange (PSE). The research design is based on co-relational research, and data is collected from 111 Pakistani corporations for seven years, from 2014 to 2020, by applying various statistical techniques and models are utilized, such as descriptive statistics, correlation matrix, Granger causality test, and regression models with the actual-fitted-residual graph. Further unit root ratio test and normality test are also used. However, return on assets (ROA) and sales growth ratio (SGR) are dependent variables to measure firm performance. Asset turnover ratio (AT), a ratio of sales to capital expenditures (SCE), and a ratio of staff to assets (STA) are utilized as dependent variables to measure the cost leadership approach. Firm size is the only controlling variable in this article. The results revealed that cost leadership strategy has a significant association with ROA and SGR while having a more positive relation with sales growth than ROA.

***Keywords*:** Granger causality, co-relational, cost leadership strategy, correlation, normality

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INTRODUCTION

This research is accomplished to see the impact of the cost leadership approach on the future performance of enterprises listed on the Pakistan Exchange. Ravšelj and Aristovnik (2020) Michael Porter invented five generic strategies; Cost Leadership is one that a business could put into operations to get a continuous competitive edge over its competitors within the same industry. Thus, the corporation earns a higher profit margin. Celtekligil's (2020) Resource dependency theory is grounded on the standard that a manufacturing enterprise must engage in transactions with other environmental actors and organizations to acquire resources. Sometimes it is beneficial; resources needed may be scarce, not always readily attainable, or controlled by uncooperative actors. This investigation also attached to the basics of the knowledge-based theory of the firm, which considers intellectualism the utmost vital strength of any enterprise (Del Monte and Pennacchio (2020).

Moreover, this ability of the enterprise brings a competitive advantage that ultimately distinguishes one establishment from another Santoro, Bresciani, et al., (2020). Ravšelj and Aristovnik (2019)These five strategies are encompassed into three indispensable categories: cost leadership, differentiation, and focus strategy, circling both types of markets, either wide-ranging or constricted market segments Porter (1980). Taipi and Ballkoci (2017), the industry ought to focus on conducting only one of these strategies instead of trying to apply two or more. If a business chases more than one approach, it will be "stuck in the middle" Porter (1980). Due to the fundamental contradictions in these policies, a corporation possibly overstretches its possessions and remains unsuccessful in implanting a flawless business attitude depending on more than one strategy.

Porter narrates these business strategies to achieve and maintain a competitive advantage. Cost leadership is the policy of trimming down the cost of operations to gain superiority over competitors in the same industries Stahl and Grigsby (1997). HERLIANSYAH (2019) Fundamental meaning of this strategy is to reduce the cost of functioning and factory overheads to pull off a competitive advantage. Some essential steps to derive this strategy by companies are effective functioning system to enhance the efficiency of companies, magnitude of a firm, scale economies, highly experienced managers, and using advanced scientific technology Reid (1993). Haque, Munawaroh, et al. (2021) cost leadership approach is a chief component of marketing strategy and is exceedingly effective in gaining market shares and attracting customers' attention. The administration of any public or private company wants to shrink the cost and expenditures of its manufacturing operations not just for one commodity but the entire variety of its company's products (Raoof et al., 2021)

In the viewpoint of Ramaswami and Namakumari (1996), the principal objective of the diminishing cost approach to face the challenges of the competitive corporation's surroundings is to develop the distinctive benefits of the organization. Any strategic planning of the operating and manufacturing process begins with apprehension and a dilemma of how to use the restricted income and savings of the corporation excellently(Abdulmuhsin et al., 2021). The flourishing enterprises, aiming to construct their central competencies and long-standing competitive return, formulate their premeditated priority to hand out actual encouragement for business rank strategies of business units incorporation. To arrive at a competitive edge in the future, a firm must convey a series of competent consumer products at a lesser cost

than opponents or grant clienteles a package of remunerations that its rivals cannot match, such as more quantity and high quality(Basheer et al., 2021).

The executives also want to maximize the equity assessment and the company's and its stock's worth. The best planning and financial possessions are indispensable to enhance the importance of corporations. However, reducing costs does not mean that the enterprises will start manufacturing inferior and cheap products. Best future performance might also be achieved by maintaining the price of products at the same level as other firms but by enhancing the merchandise benefits. Wang, Chin, et al. (2020) Porter states that a corporation has to formulate a strategic option between the two choices, reducing cost and enhancing the advantages by keeping costs simultaneously(Yan et al., 2020). To become victorious with any of these choices, the company has to spend a considerable amount of time identifying and producing ground-breaking solutions of only one strategy that maintains a solitary business unit that cannot follow the strategic choices. Strict cost control and monitoring system are obligatory for cost leadership entities.

It refers to some essential elements relevant to this approach that are comprehensive arrangements of modus operandi, repeated measurement of actual overheads, and control measures to deal with more thoroughly strategies to attain cost targets or preplanning the upper elevation of plans to arrive at the still higher rank Rushton, Croucher, et al. (2014). During the previous few years, the dominant industrialized authority has transferred (Germany, Japan, and the United States) to the new developing trade and industry forces, such as Russia, Brazil, China, and India. In 2007 after the financial crisis, a period of economic decline developed the need for corporations′ CEO due to the following prevailing questions in economies of the whole world: In which way can a corporation stay alive with restricted funds and in the surroundings of competitive edge. The universe's corporations are trying their best to deal with insufficient possessions and stay ahead of their rivals in business. The companies continued their competitive battle to accomplish a competitive position Ravšelj and Aristovnik (2020).

The utmost imperative ambition of this empirical research is to sightsee the collision of cost control strategy on the volume of sales growth, Return on assets (ROA), and the future financial health of the 111 manufacturing establishments on the Stock Exchange (PSE) in Pakistan for the trading duration of seven years from 2014 to 2020. The principle objectives of this research are:

- To emphasize the effects of cost strategy and its impact on the future performance of companies.
- To what extent of cost leadership strategy on sales volume and profit margin.
- The strategy has contributed to firm size, leading to meaningful competitive edge sales and financial health.

LITERATURE REVIEW

Scholars such as Baraza and Arasa (2020) refer to how to get better performance and effectiveness of firms. The chief objective of this study was to decide the outcome of good planning on the arrangements of corporations in Kenya with definite reference to East African Breweries Limited (EABL). An explanatory and qualitative investigation planning based on an intentionality approach was employed in this research. The core audience was workers of EABL, with intended respondents drained from the upper organization. Two principal methods, Questionnaires and

interviews were employed for data collection. Both authors also compare the cost leadership strategy with the differentiation and focus strategy to explore the efficiency of all three methods(Nuseir et al., 2020). Descriptive and inferential statistics were utilized to smooth the progress of data analysis. Regression analysis was used to calculate the correlation between competitive planning and the corporation's performance. From the conclusion of competitive strategies, it can be determined that cost leadership, differentiation, and focus strategies are indispensable for manipulating decision-making and enhancing managerial performance. This study put forwards to improve methods that are well associated with assisting the enterprises in surviving in competition and performing operations efficiently and competitively.

Authors such as Wang, Chin, et al. (2020) University of Agriculture and Technology in Kenya examine the outcome of management policy on enactment (profitability)of manufacturing firms in Kenya. This article collects statistics from 131 trading corporations sketched from 12 input industrialized subsectors in Nairobi and locality by questionnaire and an interview guide. Utilized cost leadership strategy as the independent variable, whereas firm performance as the dependent variable. This study adopts two tackles of analysis; Pearson's connection points toward an affirmative association between exogenous and endogenous indicators employed and regression to clarify the correlation. F- Stat and R-squared were also used to establish the model's strength and determine model goodness. The findings revealed that cost strategy significantly influences the performance of businesses. The results also indicate that leaders and executives of manufacturing corporations undertake cost strategies to enhance competitiveness and presentation. Haque, Munawaroh, et al. (2021) & Birjandi, Jahromi, et al. (2014), both the Accounting and Commercial Management department scholars at Islamic Azad University, Iran, researched this indispensable topic. This research study discusses several fundamental theories, explaining how the cost leadership approach impacts the return on assets (ROA) and profit margin of non-financial corporations on the Tehran Stock Exchange in Iran. This empirically investigated topic the consequence of strategy of cost leadership on return on assets (ROA) and upcoming performance of the corporations listed in Tehran exchange. The overall purpose of is to find out the answer of this question: how corporations maintain competitive edge by maximizing profit and reputation by minimizing cost of operations? To justify the answer, sample size is collected of 45 manufacturing firms from TSE for five years from 2009-to 2013. The rate of return on assets and sales growth rate are dependent variables taken to measure the future performance of corporations. At the same time, the sale to assets ratio, the sale to capital expenditures, and the staff to assets ratio are independent predictors of this research study. The statistical methods are employed to inspect the postulations of the regressions model. The results reveal a positive correlation between sales to capital expenditure and growth. However, a negative affiliation between assets sale with return on assets (ROA) and the future performance of the enterprises.

Valipour, Birjandi, et al. (2012) acknowledged the impact of business planning and decisions on the association between firms' performances with financial leverage through empirical investigation. For this article, data were collected through financial reports of 45 firms in the Tehran Security Exchange for eight years from 2003-to 2010. The dependent variable of this research study is company performance, whereas independent variables are business strategy, cost leadership strategy, financial leverage, and policy of product differentiation. This research paper has two controlling variables: firm size and dividend payout. Corporations are divided into

corporations with cost leadership strategies and firms with product differentiation tactics to verify assumptions. This empirical study reveals that corporations with cost leadership strategies positively associate financial leverage and dividend payout. The outcome recommended affirmative interaction between leverage and company size associated with performance with product differentiation strategy; however, there was a negative correlation between differentiation strategy and payout with turns.

RESEARCH METHODOLOGY

In this article, panel data is collected through financial reports of listed manufacturing companies in Pakistan, acquired from issued sources such as the approved website of the establishments, journals, and any relevant, consistent data sources. Financial statements of 111 manufacturing firms listed on the Pakistan Stock Exchange (PSA) are taken as a sample size to measure the impacts of the cost leadership approach to accomplish a competitive edge with the help of best performance. By employing this package, the researchers initially calculate central tendency, frequency distribution, association, and dispersion measures(Asada et al., 2020). Descriptive quantitative analysis is used to measure the impact of competitive strategies on a corporation's performance by using tables and figures; moreover, statistical techniques such as regression models, ginger causality, normality, and unit root tests were also utilized to determine the relationship between explanatory and dependent variables. The measurement summary of variables is given in table 3.1.

Table 3.1: Measurement of variables

VARIABLES	PROXIES	CALCULATIONS
Dependent variables		
Sales growth rate	$GROW_{i,t}$	(current year assets – last year assets)/last year assets
Return on assets	$ROA_{i,t}$	(Net income/average total assets)× 365
Independent variables		
Ratio of staff to assets	$STA_{i,t}$	number of employees/ total assets
Asset turnover	$AT_{i,t}$	Net sales revenue/Average total assets
Ratio of sales to capital expenditures	$SCE_{i,t}$	Sales revenue /{Net property, plant, and equipment (Ending) - Net property, plant, and equipment (Beginning) + Net intangible assets(Ending) - Net intangible assets (Beginning) +Depreciation and amortization for the Year}
Controlling variable		
Firm size	$FS_{i,t}$	log(current year total assets + previous year total assets)/2

This study aims to develop hypotheses relating to all the factors used in the study in the light of knowledge-based theory to support the literature of past scholars. The following are three hypotheses to be tested in this research.

$H_{1:}$ Cost leadership strategy has a significant impact on sales growth rate.

$H_{2:}$ There is a significant association between cost leadership and asset return.

$H_{3:}$ There is a significant impact of firm size on the performance of firms.

To examine the influence of cost management strategy on firms' future performance and return on assets (ROA), the following estimation model originated and engaged in work.

Model 1

$$GROW = \alpha + \beta_1(STA_{i,t}) + \beta_2(AT_{i,t}) + \beta_3(SCE_{i,t}) + \beta_4(FS_{i,t}) + \mu_{it}$$

Model 2

$$ROA = \alpha + \beta_1(STA_{i,t}) + \beta_2(AT_{i,t}) + \beta_3(SCE_{i,t}) + \beta_4(FS_{i,t}) + \mu_{it}$$

DATA ANALYSIS AND RESULT DISCUSSION

This study segment consists of several statistical techniques: descriptive stat, correlation matrix, regression models, regression line, and normality graphs. Besides these techniques, other statistical tests are also applied to see the impact of raw data in cost leadership strategy, such as the Hausman test, fixed effect test, and actual residual fitted graph.

Table 1: **Descriptive Statistics**

Variables	Observations	Mean	Minimum	Maximum	Std. Dev.
AT	777	129.7	3.412	632.7	81.97
SCE	777	0.376	-13574	2888	784.9
STA	777	4.4E-0	0.000	0.001	5.0E-0
ROA	777	21.54	-93.49	157.5	30.99
SGR	777	4.812	-92.81	252.7	27.26
FS	777	9.847	8.282	11.78	0.587

Note: In the above (table 4.1), ROA stands for the return of assets in days, AT for assets turnover, CE for a ratio of sales to capital expenditures, SGR means sales growth rate, STA represents staff to assets (number of employees working in a company) and FS demonstrate the size of a family.

In this table, the outcomes of descriptive statistics such as mean, standard deviation, and minimum and maximum limits of all independent, dependent, and control variables are discussed to see the consequences of the cost leadership strategy of 111 manufacturing companies public in Pakistan Stock Exchange for tradeoff period of seven years from 2014 to 2020. According to this table, the assets turnover (AT) is an independent variable; its average is 129.7, which falls between 3.413 and 632.7. The maximum value of assets turnover is 632.7 while the minimum is 3.413, and the average term ranges between these limits. However, the standard deviation of assets turnover is 81.97%. The above table indicates that the mean sales ratio to capital expenditures (CE) is 0.376. The lowest limit of capital expenditures is -13574, while the most significant limitation is 2888. The standard deviation is 784.9% and is also an independent variable. Staff to assets is also an explanatory outcome that indicates the relationship between the number of employees and the company's assets. The

average staff to assets (STA) value is 4.40E-07, which falls between 0.0000 to 0.0001. It represents that 0.000 is the lowest staff limit to assets while the most considerable value is 0.001. 5.0E-07% is the standard deviation of staff to assets.

Return on assets is a dependent variable with a mean value of 21.54, while the upper limit is 157.5 and a minimum value of -93.49. The standard deviation of return on assets (ROA) is 30.99%. Sales growth is a dependent variable in this research study, with a mean value of 4.812. The upper and lower limits of sales growth, respectively, are 252.7 and -92.81. The value of the standard deviation in percentage is 27.26%. The firm's size is the only controlling variable in this research study, whose average value is 9.847, while the upper and lower limits are 11.78 and 8.282. The standard deviation of it is 0.587%. All these results have been displayed above (table 4.1).

Table 2: Correlation matrix

	AT	SCE	STA	ROA	SGR	FS
AT	1					
SCE	0.091	1				
STA	0.003	0.002	1			
ROA	0.063	-0.183	-0.026	1		
SGR	0.034	-0.023	0.008	0.213	1	
FS	-0.106	-0.016	0.028	0.345	0.106	1

The above (table 4.2) indicates that asset turnover (AT) negatively correlates with firm size. The assets turnover ratio increases in a firm's minimum size, and the correlation value is -0.106. The relationship of assets turnover with all other variables is favorable as a direct proportion, and the correlation value between sales to capital expenditures (SCE) and assets turnover (AT) is 0.091. While with staff to assets (STA), return on assets (ROA), and sales growth (SGR), the correlation respectively is 0.003, 0.063, and 0.034. According to the correlation matrix table, the capital expenditures ratio has a more negative association with other variables than positive. ROA, SGR, and FS relationship with SCE are negative, while staff to assets and assets turnover positively correlates. The negative correlation value between ROA and SCE is -0.183, whereas SG is -0.023, and with firm performance, a relationship is -0.016.

On the other hand, a positive correlation of SCE with STA is 0.002. Ratio of staff to assets (STA) positively correlates with sales growth and the firm's size, whereas negative with return on assets. The negative relationship between ROA and STA is -0.026; however, the positive correlation value is 0.008 with SGR. Moreover, firm size has a positive relationship with a value of 0.028. Return on assets positively correlates with sales growth and firm size, whose values are shown in (table 4.2) above. The association of sales growth is also positive with the firm's size.

Granger causality test is the procedure to inspect causality between two variables to determine whether one variable affects the other variable or not: Is one variable taking part in the formation of another variable? Granger causality uses the probabilistic method and employs empirical data to calculate the correlation. If the probability value is above 5%, one variable is not affecting other variables, but in less than 5%,

variables cause each other Lopez and Weber (2017). Based on probability, we can develop hypotheses to test Granger causality. $H_{0:}$ SCE does not Granger cause AT, and $H_{1:}$ SCE does granger cause AT; as we can see from the above table that the probabilistic values of SCE and AT are more than 0.05; therefore, we shall accept the null hypothesis and will reject alternative hypothesis.

Moreover, the above table indicates FS does granger cause STA because the probability is less than 5%. Similarly, ROA does granger cause to FS, SGR to FS, and SGR also causes SCE further. In the hypothesis testing process, the alternative hypothesis will accept, and the null will be rejected. $H_{0:}$ SGR does not Granger cause to FS and $H_{1:}$ SGR does granger cause to FS. This test will accept the alternative hypothesis because the probability is 0.0056, less than 0.05, and reject the null hypothesis.

Table 3: Granger causality tests

Null Hypothesis:	Obs	F-Statistic	Prob.
SCE does not Granger Cause AT	217	0.46520	0.6287
AT does not Granger Cause SCE		0.53958	0.5838
STA does not Granger Cause AT	219	1.93736	0.1466
AT does not Granger Cause STA		0.86847	0.4211
ROA does not Granger Cause AT	219	0.61577	0.5412
AT does not Granger Cause ROA		1.13351	0.3238
SGR does not Granger Cause AT	219	2.37825	0.0952
AT does not Granger Cause SGR		2.73214	0.0674
FS does not Granger Cause AT	219	0.53194	0.5882
AT does not Granger Cause FS		0.01210	0.9880
STA does not Granger Cause SCE	219	0.17901	0.8362
SCE does not Granger Cause STA		0.16849	0.8451
ROA does not Granger Cause SCE	217	0.28287	0.7539
SCE does not Granger Cause ROA		0.30656	0.7363
SGR does not Granger Cause SCE	219	3.37231	0.0361
SCE does not Granger Cause SGR		0.28332	0.7536
FS does not Granger Cause SCE	217	0.50501	0.6042
SCE does not Granger Cause FS		0.19334	0.8243
ROA does not Granger Cause STA	219	2.81214	0.0623
STA does not Granger Cause ROA		1.36330	0.2580
SGR does not Granger Cause STA	221	2.91754	0.0562
STA does not Granger Cause SGR		1.28165	0.2797
FS does not Granger Cause STA	219	4.54908	0.0116
STA does not Granger Cause FS		2.56643	0.0792
SGR does not Granger Cause ROA	219	1.43875	0.2395
ROA does not Granger Cause SGR		1.82782	0.1633
FS does not Granger Cause ROA	219	0.58227	0.5595
ROA does not Granger Cause FS		6.39790	0.0020
FS does not Granger Cause SGR	219	1.69714	0.1857
SGR does not Granger Cause FS		5.25518	0.0059

Table 4: Panel unit root test: Summary

Variables	Cross sect	LLC	Stat	Im P	ADF	PP.
AT	777	0.000	-74.55	0.000	0.000	0.000
SCE	777	0.000	-131.1	0.000	0.000	0.000
STA	777	0.000	-408.9	0.000	0.008	0.000
ROA	777	0.000	-48.98	0.003	0.000	0.000
SGR	777	0.000	-37.20	0.000	0.000	0.000
FS	777	0.000	-5.878	0.002	0.000	0.000

The above table indicates that the probabilities values of AT are all significant as the P-value of Levin LC is 0.000, of Im Pesaran is 0.000, the probability of Augmented Duckey Fuller (ADF) Mushtaq (2011) is 0.000, and also of PP is 0.000 which indicates that overall impact of data is significant and therefore data is stationary. All probability values of sales to capital expenditures (SCE) are also significant as they are less than 5%, and data of SCE is also stationary. STA has all p-values equal to 0.000 rather than ADF, equal to 0.008; hence it is also less than 0.05 and is included in significant limits. The data of STA is stationary. Likewise, the above table represents that probability values of all independent, dependent, and control variables are under significant data limits; Therefore, all tha data is stationary in this article.

Model 1

$$GROW = \alpha + \beta_1(STA_{i,t}) + \beta_2(AT_{i,t}) + \beta_3(SCE_{i,t}) + \beta_4(FS_{i,t}) + \mu_{it}$$

Table 4.5: Dependent Variable: Growth

Fixed Effects Model

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	-796.6	94.42	-8.436	0.000
AT	0.349	0.042	8.347	0.000
SCE	-0.002	0.001	-1.318	0.188
STA	390695	33151	11.78	0.000
FS	76.77	9.275	8.277	0.000
R-Square	0.576	Mean dependent var		12.54
Adjusted R-Square	0.428	S.D dep var		37.38
S.E of regression	25.86	Akaike		9.564
Sum square residual	216000	Schwarz		10.63
Log-likelihood	-1976	Hannan-Quinn		9.984
F-Statistics	3.894	Durbin Watson		2.378
Prob(F-Statistics)	0.000			

The outcomes of panel data regression are exposed in the mentioned tables above. In (Table 4.5), the result of the redundant fixed effects model, while in (table 4.6) the results of the Hausman test model are shown. (Table 4.5) indicates the result of the regression model in which sales growth ratio (SGR) is utilized as a dependent variable to see the impact of cost strategy on the future performance of companies. For this purpose, the fixed effects regression model is applied because the probability value in

the redundant fixed effects table is significant, suggesting using the fixed effects model. The probability value in the Hausman test is also 0.000, which is significant and paves the way for fixed effects regression rather than a random model.

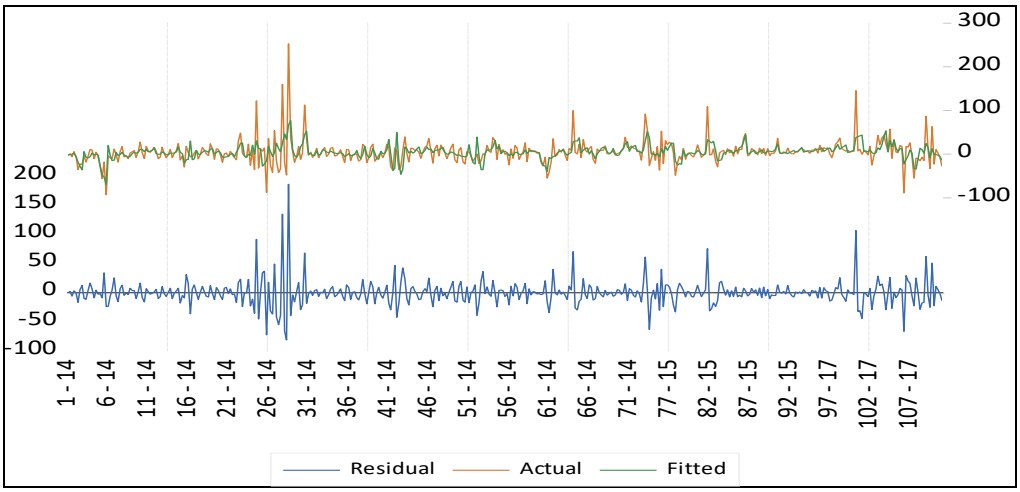
Table 4.5 sales growth is the dependent variable, and assets turnover (AT) is the independent variable. The coefficient between these variables is 0.349, indicating a positive correlation; the relationship between SGR and AT is significant because the probability value is 0.000. The relationship between sales growth ratio and capital expenditures (independent variable) is negative; the coefficient value of these variables is -0.002. The sign negative indicates a negative correlation. However, the probability value is 0.188, which shows showing insignificant association. Staff to assets as an independent variable in this research study, and its relationship with sales growth is positive because the value of coefficient between them is positive and is 390695. However, this relationship is also significant due to the significant probability value. The firm's size is used as a controlling variable in this research study because firm size can also affect the future performance of corporations. Association between this controlling and dependent variable is positive, and the coefficient value is 76.77. This relationship is also significant since the probability value is 0.000.

The value of R-Square is 0.577 and of adjusted R-Sq is 0.428. Adj R-Square means the coefficient of all independent variables affecting the dependent variable. The value of R-Square indicates that 42.85% of exogenous variables cause changes in the dependent variable. Further, F-statistics in the model is 3.894, and the probability value is 0.000, which shows that the overall model is significant. Durbin-Watson statistics are used to measure serial correlation, indicating that if the Durbin value is less than 1.68 and 1.96, there is no autocorrelation but if more than, it means that autocorrelation exists between variables. This model value of Durbin-Watson Statistics is 2.379, representing the existence of autocorrelation in variables.

The mean and standard deviation of dependent variance, the standard error of the regression, and a sum of residual squares of the model are also shown in a table with their values. Akaike information criterion (AIC) in this model is 9.564. AIC compares the quality of the statistical model to each other and estimates the model's performance (Basheer et al., 2021). The lower value of the Akaike information criteria indicates the best model. The second regression model value of AIC is 85397, which is less than the first model, indicating that the second model is better than the first one. Cost leadership strategy performs best for ROA rather than SGR. However, a figure of the Schwarz criterion is 10.63, also known as the Bayesian information criterion. The value of SC is always greater than AIC and is closely related to AIC. The model with a lower SC value is preferred over the greater value. In the second regression model value of SC is 9.604 less than in the first model. It also gives preference to the second model over the first.

Moreover, AIC and SC are both based on Log-Likelihood, which also tells us about useless variables which have no impact on other variables. A Hannan-Quinn criterion is an alternative to AIC and BIC and is based on Log-Likelihood. The value of HQC above (table 4.5) is 9.984.

Figure 4.1: Actual-fitted-residual graph



This diagram shows the values of actual, fitted (estimated), and residual variables in graphical form. An actual red line showing the original values of variable Y while fitted indicates predicted values calculated through the regression equation. The difference between actual and fitted is called residual and is calculated by subtracting estimated values from actual values. Blue lines on the graph indicate residuals, and their values are shown on Y-axis, while red lines are for actual and green for fitted. Values of an actual graph are also on Y-axis and predicted values on X-axis. Through this graph, we can easily find out the trend line. Further, the closeness between the red and green lines creates more homoscedasticity by reducing residuals.

Model 2

$$ROA = \alpha + \beta_1(STA_{i,t}) + \beta_2(AT_{i,t}) + \beta_3(SCE_{i,t}) + \beta_4(FS_{i,t}) + \mu_{it}$$

Table 4.6: Dependent Variable: ROA

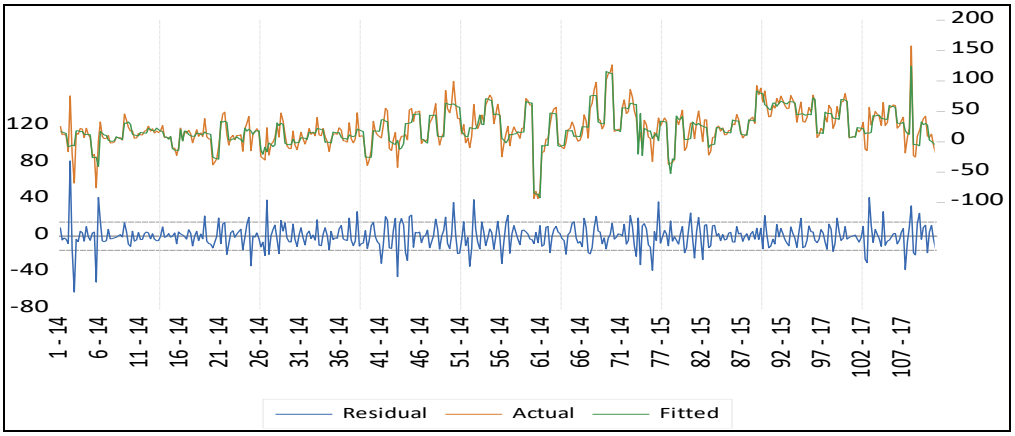
Fixed Effects Model				
Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	82.95	128.0	0.648	0.517
AT	13.96	7.082	1.971	0.049
SCE	-0.008	0.002	-3.733	0.000
STA	-60189	20540	-2.930	0.003
FS	-9.122	12.37	-0.737	0.462
R-Square	0.815	Mean dependent var		21.54
Adj R-Square	0.749	S.D dependent var		30.99
S.E of regression	15.51	Akaike		8.539
Sum square residual	77658	Schwarz		9.604
Log-likelihood	-17512	Hannan-Quinn		8.959
F-Statistics	12.55	Durbin Watson		2.037
Prob (F-Statistics)	0.000			

Results of the second regression model are shown in (table 4.6). In this model, return on assets (ROA) is used as a dependent variable to see the impact of the cost

leadership approach on companies' future performance. Assets turnover is an independent variable, and its relationship with ROA is positive because the coefficient between them has a positive numerical value of 13.96. However, this relation is significant because the probability value is less than 5%, and the probability value of 5% or less than 5% includes significant results. Ratio of sales to capital expenditures is also an independent variable while it has a negative relationship with the dependent variable in this model. The value of the coefficient between them is -0.008, and the relationship is significant due to the 0.000 probability value. Association of staff to assets (STA) with return on assets is negative because the coefficient value is -60189. This association is also significant; the probability value is 0.003, less than 5%. Firm size is the controlling variable in this model and negatively impacts ROA. The coefficient between FS and ROA is -9.121, and the probability value is 0.461 showing that the correlation is insignificant.

The above (table 4.6) value of the R - Square is 0.815 and of the adjusted R-Square is 0.749, indicating that 74.96% of all independent variables affect ROA, which is a dependent variable of this model. The other figure of F-statistics is 12.55, and the overall probability is 0.000, showing complete model is significant. To represent serial correlation figure of Durbin-Watson statistics is 2.037. However, the numerical values of mean dependent variance, S.D. of dependent variance, and S.E. of regression plus sum squared residual, respectively, are 21.54, 30.99, 15.51, and 77658.

Figure 4.2: **Actual-fitted-residual graph**



The Cross correlogram test is a function to find autocorrelation between independent versus dependent, between both dependent and independent variables in time lags. Autocorrelation between our variables does not exist, represented by only two cross correlogram graphs. The detail of these graphs is below in

This cross correlogram graph 4.3 includes tables between a dependent and an independent variable. ROA is a dependent variable, while AT is an independent variable in this research study. The graph indicates no autocorrelation because, at the start, two or three values indicate correlation but are under the dotted line, are not significant, and show no autocorrelation. If these lines are long and come out of dotted lines, there will be autocorrelation, the right block indicates negative autocorrelation, and the left block represents positive autocorrelation. Consequently, there is no autocorrelation between our variables.

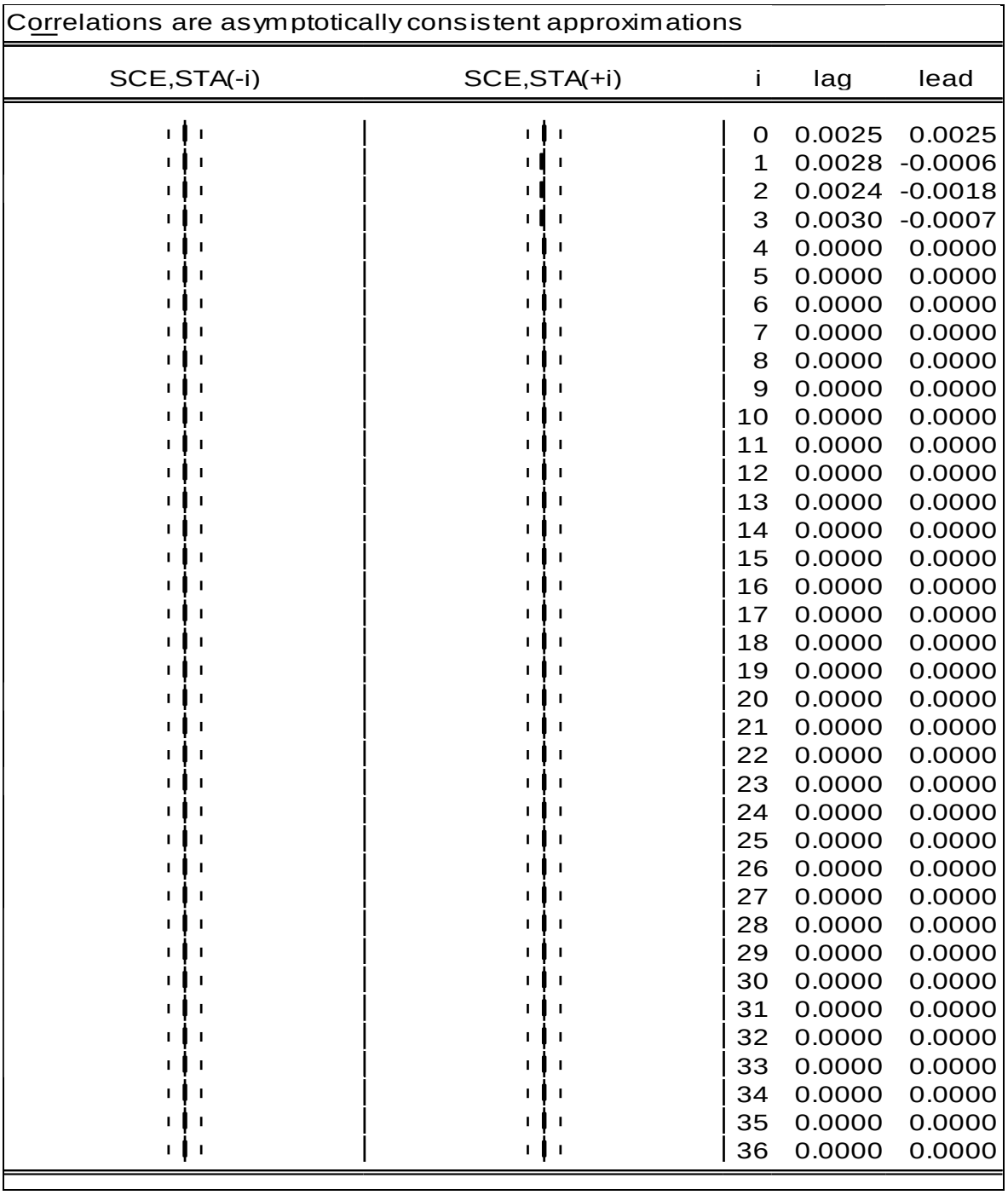
This cross correlogram is between independent variables SCE (sales to capital expenditures) and STA (staff to assets). It is clear from figure 4.4 that there is no exceeding line outside doted area, and hence no autocorrelation is present between variables. Only two cross correlograms are drawn in an article to indicate that autocorrelation is absent in our variables.

Figure 4.3: Cross correlogram test with growth

Correlations are asymptotically consistent approximations

ROA,AT(-i)	ROA,AT(+i)	i	lag	lead
		0	0.0610	0.0610
		1	0.0389	0.0478
		2	0.0457	0.0163
		3	0.0232	0.0019
		4	0.0000	0.0000
		5	0.0000	0.0000
		6	0.0000	0.0000
		7	0.0000	0.0000
		8	0.0000	0.0000
		9	0.0000	0.0000
		10	0.0000	0.0000
		11	0.0000	0.0000
		12	0.0000	0.0000
		13	0.0000	0.0000
		14	0.0000	0.0000
		15	0.0000	0.0000
		16	0.0000	0.0000
		17	0.0000	0.0000
		18	0.0000	0.0000
		19	0.0000	0.0000
		20	0.0000	0.0000
		21	0.0000	0.0000
		22	0.0000	0.0000
		23	0.0000	0.0000
		24	0.0000	0.0000
		25	0.0000	0.0000
		26	0.0000	0.0000
		27	0.0000	0.0000
		28	0.0000	0.0000
		29	0.0000	0.0000
		30	0.0000	0.0000
		31	0.0000	0.0000
		32	0.0000	0.0000
		33	0.0000	0.0000
		34	0.0000	0.0000
		35	0.0000	0.0000
		36	0.0000	0.0000

Figure 4.4: Cross correlogram test with ROA

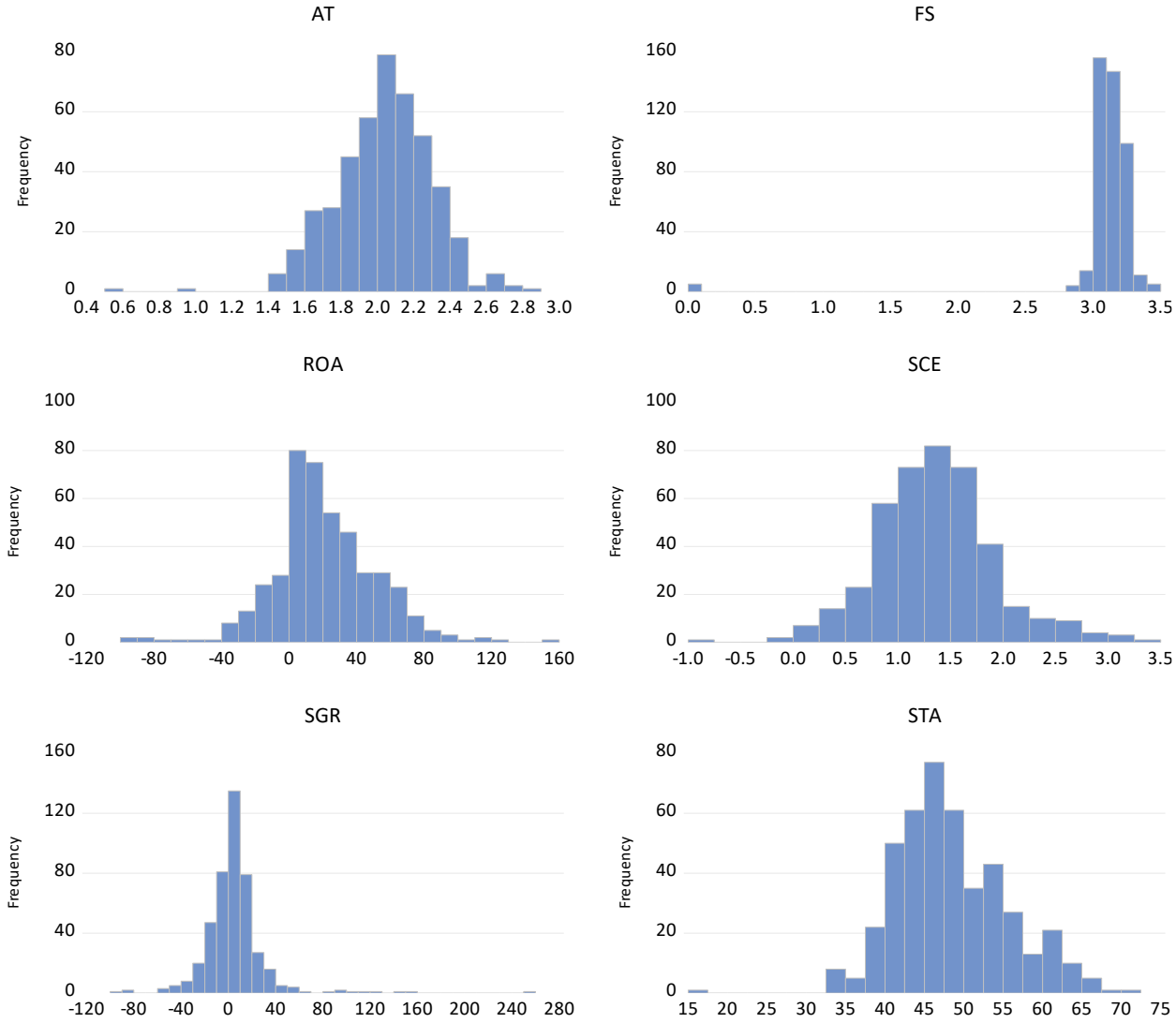


Correlations are asymptotically consistent approximations

SCE,STA(-i)	SCE,STA(+i)	i	lag	lead
		0	0.0025	0.0025
		1	0.0028	-0.0006
		2	0.0024	-0.0018
		3	0.0030	-0.0007
		4	0.0000	0.0000
		5	0.0000	0.0000
		6	0.0000	0.0000
		7	0.0000	0.0000
		8	0.0000	0.0000
		9	0.0000	0.0000
		10	0.0000	0.0000
		11	0.0000	0.0000
		12	0.0000	0.0000
		13	0.0000	0.0000
		14	0.0000	0.0000
		15	0.0000	0.0000
		16	0.0000	0.0000
		17	0.0000	0.0000
		18	0.0000	0.0000
		19	0.0000	0.0000
		20	0.0000	0.0000
		21	0.0000	0.0000
		22	0.0000	0.0000
		23	0.0000	0.0000
		24	0.0000	0.0000
		25	0.0000	0.0000
		26	0.0000	0.0000
		27	0.0000	0.0000
		28	0.0000	0.0000
		29	0.0000	0.0000
		30	0.0000	0.0000
		31	0.0000	0.0000
		32	0.0000	0.0000
		33	0.0000	0.0000
		34	0.0000	0.0000
		35	0.0000	0.0000
		36	0.0000	0.0000

A normality test: Normal distributed data or normality test is widely used in statistics. It has also called the bell-curved test or Gaussian curve Fraser (2020). The value of Jarque Bera is also above 5%, indicating the data's normality. The graphs of normality are shown below in figure 4.5.

Figure 4.5: data normality graphs



Scatter plots and regression lines: Using scatter plots, relationships between dependent and independent variables are also indicated in graphical form. A regression line is drawn to indicate a rate of change in one variable due to fluctuations in the second variable, and points below or above the fitted line represent residuals of the model.

a. Sales growth is a dependent variable; its relationship with other independent variables is shown below in scatter graphs. In these graphs, the dependent variable is shown on Y-axis while the independent variables are on X-axis. An association of SGR is indicated in separate graphs with each independent variable. Assets turnover is the independent variable in this figure.

Scatter points of the X-axis and Y-axis are shown in this graph every few values far away from the regression line; hence a sign of heteroscedasticity is significantly less and does not affect data.

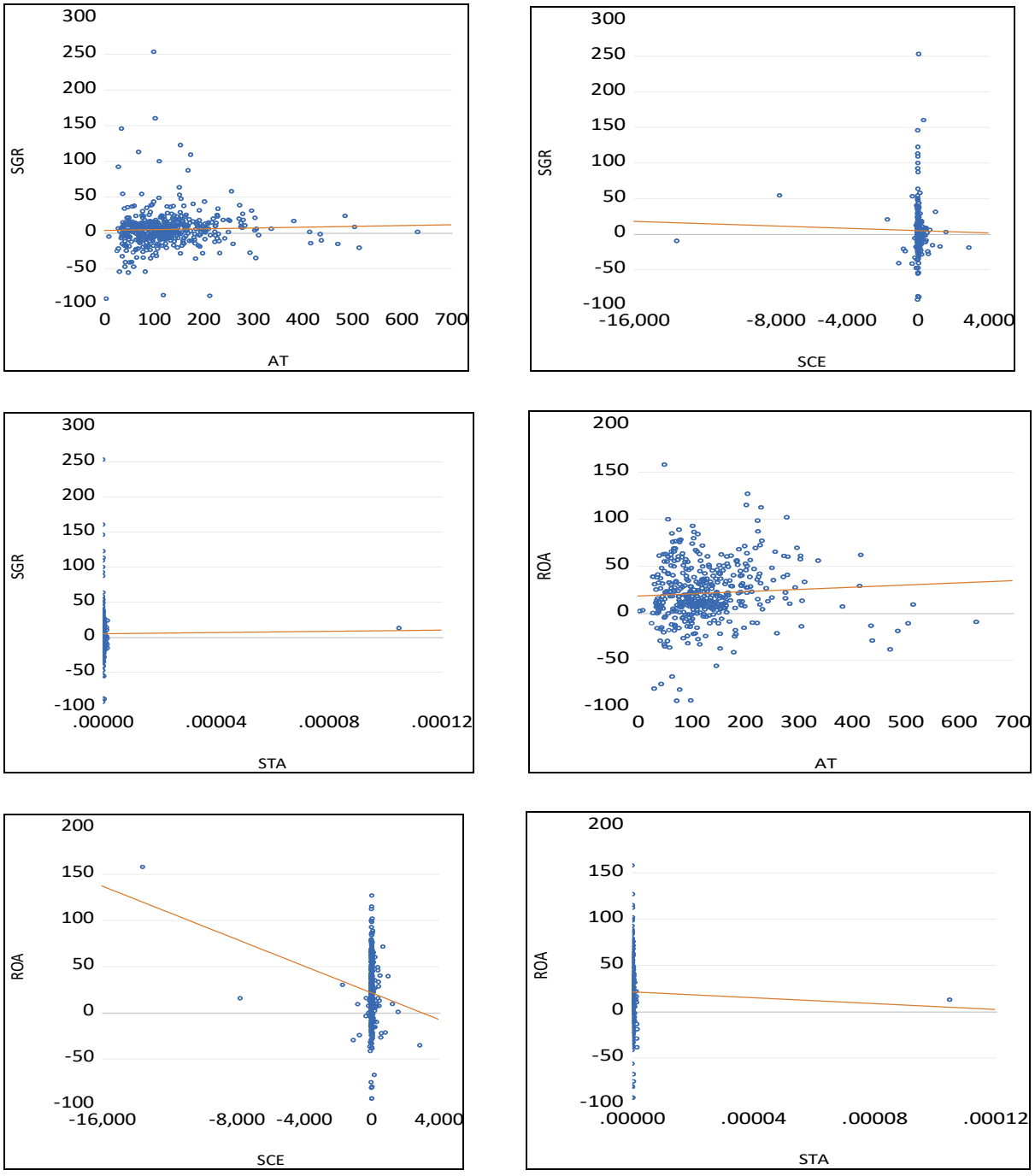
a. SCE is a proxy of the capital expenditures ratio and is an independent variable in this figure that causes sales growth changes.

In this graph, very few dependent and independent variables values are far from the fitted line, but they do not affect data because hetero is very low.

a. STR is a ratio of staff to assets and is an independent variable in this figure.

In the second regression model, return on assets (ROA) is the dependent variable while AT, SCE a,s STA (staff) is an independent variable, and through the same method, a graphical representation of these variables is demonstrated below in separate graphs.

Figure 4.6: Scattered Plots and regression lines



RECOMMENDATIONS AND CONCLUSIONS

The results discussed in chapter four above indicate that sales growth is a dependent variable in the first regression model and has a more positive association with independent variables. The association of sales growth with assets turnover, firm size, and staff to assets is significant. The overall probability value is also zero, which leads to significant relation. Thus based on the finding, we will accept the first alternative hypothesis that cost leadership strategy significantly impact sales growth rate. Return on assets (ROA) has more negative relation than positive with independent variables. It means that changing independent variables causes an inverse change in the dependent variable: increase causes decrease and vice versa. However, the correlation of capital expenditures, staff to assets, and assets turnover are significant with ROA. The overall probability of the model is also significant; thus, our second hypothesis is also accepted. From the above results of the ROA and SGR models, we can accept our third hypothesis because the return on assets and sales growth are employed as proxies of firm performance, and thus management strategy significantly impacts the future firm performance of companies.

Based on results and conclusions, some recommendations are developed to enhance business efficiency and improve the performance of companies listed in PSE to achieve future competitive advantages. It is recommended that in an attempt to lower the commodity's price, any corporation does not lower the level of quality. The highest quality is the primary aim of any business. Customers prefer more highly qualified products instead of cheap ones. Therefore, maintaining quality is the first aim of a firm, and after that, low prices. Low prices benefit the corporation if the only quality is good. Cheap products prove harmful to companies even if they have a low cost. To reduce costs company should try to diminish waste expenses, and high planning is also essential.

This article is based on the co-relation research study associated with the performance of firms and cost leadership strategy, including a few assumptions and supposing factors. The findings and recommendations of this study also have a limited scope and cannot be adopted universally because the business conditions of the entire universe are not the same.

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