FACTORS AFFECTING PROFITS RELATING TO PURCHASE AND SALES: A STUDY ON TITAS GAS TRANSMISSION & DISTRIBUTION COMPANY LIMITED

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ABSTRACT

The present study is an attempt to find out the factors affecting profits relating to purchase and sales of Titas Gas Transmission & Distribution Company Limited. The objectives of the study are to overview the affecting factors on profits, to determine the important factors that affect on profit relating to purchase and sales and to provide some suggestions and recommendations to enhance the profits. Correlation and regression have been applied to analyze the data. It is estimated that commercial, fertilizer and CNG are the most important factors to drive the profit both for the cases of purchase and sales. These three factors collectively explained the total variance of gross profit by 96.6 percent and 96.8 percent for the situation of purchase and sales respectively. The suggestions and recommendations are given to emphasize the purchase and sales on the identified factors to enhance the benefits of the company.

1. INTRODUCTION

Bangladesh is a developing country. The development of a country depends on uniform supply of power and energy that ensure the production levels of all sectors. The mining resource related to natural gas is one of the most important sources of generating power and energy. The mining source that has yet been discovered natural gas is one of the most remarkable resources of Bangladesh. In the power sectors power generation and captive power of

Bangladesh are mostly depended on the sources created from predominantly oil and gas. Oil is to be imported from foreign country but gas is collected locally from available local mining resources. For this reason gas sector is the very important alternative source of energy. Most of the fertilizer industry, CNG station, industry, commercial factory, bricks field and household utilize gas frequently. In the year 7017-2018, 968.7 BCF (Billion Cubic Feet) natural gas is produced in Bangladesh of which 39.76% BCF by three public companies (BGFCL, SGFL and BAPEX 3.68%) and 60.24% BCF of two foreign company (Chevron and Tullow) (Petro Bangla, 2018), and transmitted by GTCL and finally marketed or distributed by six companies (TGTDCL, BGDCL, JGDCL, PGCL, KGDCL and SGCL). The gas production and supply sector of Bangladesh plays a vital role for the economic development of Bangladesh. In FY 2018-2019 Gas supply sector contributed Tk. 1,92,939 million in the GDP of the national economy which was 0.80% of total GDP and growth rate was 6.69% (GOB: Bangladesh Bureau of Statistics, 2019). Among the six Gas Transmission and Distribution Company, TGTDCL, the largest gas distribution company in Bangladesh which distributed 61% of total gas distribution in the year of 2018 (Annual report of Petro Bangla, 2018). It was established on November 20, 1964 (Under the Companies Act 1913) following a significant gas discovery at Titas Gas Field in 1962. The company started its commercial operation by commissioning gas supply to Siddirganj Thermal Power Station on April 28, 1968 after construction of 14-inch dia 58-mile-long Titas-derma gas pipeline. After four decades of operation as a fully government owned company, 25% of its share offloaded from July 2, 2008 under direct listing Method (DLM) of Bangladesh Securities and Exchange Commission (BSEC) through Investment Corporation of Bangladesh (ICB) and enlisted with DSE (Dhaka Stock Exchange) in June 9,2008 and CSE (Chittagong Stock Exchange) in June 19, 2008. This is an initiative to identify factors affecting profits relating to purchase and sales of Titas Gas Transmission & Distribution Company Limited.

2. STATEMENT OF THE PROBLEM

The company has been playing a vital role in the development of the country through the contribution of creating energy and power that helps to run the machineries of industry, commercial activities, agricultural activities and household affairs. The sustainable developments of the mentioned sectors depend upon mainly successful purchase and sales operations of gas of the company. The Company Ltd is operating as the Transmission and Distribution Company both internal and external of Bangladesh. Company is purchasing gas directly from gas field like Hobigonj gas field, Shahazibazar gas field, Norsingdhi gas field, Kamta gas field and Rupgonj gas field etc. where both of the transmission and distribution activities are conducted. There are some remarkable problems that may herm the successful operations under the activities of purchase and sales of the company.

3. OBJECTIVES OF THE STUDY

The main objective of the study is to identify factor affecting profits relating to purchase and sales of Titas Gas Company Limited. For achieving the main objective some specific objectives are presented as follows:
- To overview the affecting factors on profits relating to purchase and sales of Titas Gas Transmission and Distribution Company Limited;
- To determine the important factors that affect on profit relating to purchase and sales of Titas Gas Transmission and Distribution Company Limited over the study period under review; and
- To provide some suggestions and recommendations to enhance the profits of the company regarding purchase and sales.

4. REVIEW OF RELATED LITERATURE

Some literatures relating to the topic are reviewed for finding out the research gap as follows:
Shawan and Maksud (2015) stated the operational, marketing and financial performances of Titas gas company Ltd. based on five years data to determine the current position, influential risk factors for consistent growth and contribution in the development of national economy, providing some suggestions as to make policies for the improvement of customers services, reduction of system loss and realization of account receivables for continuation of the reputation.

Baratil and Sepasgozar (2015) conducted a study on'' Factors Affecting on Productivity of Oil and Gas Construction Projects: An AHP (Analytical Hierarchical Process) Analysis"where itis shown that management factors are the important factors which affect the productivity of the oil and gas construction project and project's factors do not have significant effect on productivity.

Asaduzzaman & et al (2015) measured the financial performances of LPG Gas Ltd after restriction of installation of new pipe line and before and after the govt. restrictions of new gas connection in households from July 2009 to until due to a gas shortage in the country.

Shamsuzzoha (2017) stated that TGTDCL is responsible for distributing natural gas to its customers. This study shows the management should reduce the bureaucratic system, delegating both financial and administrative power, improving professionalism, introducing integrated computer system which will help to efficient customer services.

It has been found from the above literature review that a number of studies have been carried out by many researchers. Some researchers have drawn their attention on the performance measurement, management systems, and financial analysis of gas sectors. No works like Factors Affecting on Profits Relating Purchase and Sales: A Study on Titas Gas Transmission & Distribution Company Limited has been yet been done regarding the under taken topic. By the right use of the research results, the company as well as the policy maker, the interested researcher in this field can be benefited a number of information is available and they are very easy to create and share. The concern authority should apply them while functioning in this sector.

On the basis of above reviews it is found that there is no research work has been done on identifying the factors affecting profit relating to purchase and sale. There lies a research gap. So for fulfilling the research gap the researchers have selected the topic "Factors Affecting Profits Relating Purchase and Sales: A Study on Titas Gas Transmission & Distribution Company Limited

5. METHODOLOGY OF THE STUDY

To find out the factors affecting profit relating to purchase and sales of Titas Gas Company Limited only secondary data are used. Data are collected from the enlisted stock market that covered the period 2009-2019 of the study. The collected data and information have been compiled to estimate the gross profit, Govt. power, private power, fertilizer, industry, captive power, CNG, commercial and domestic for each of purchase and sales amount for each of the year under study and to analyze by using statistical tools and techniques like correlation and regression with the help of SPSS Version-22. Collected data are limited to purchase and sales volume which confined within some important categories of customers. However the gross profit depends on the enrolment of these main sorts of customers. For identifying relation between profit and different variables relating to purchase & sale the following hypothesis has been formulated for the study:

$H_0:1$ There is no positive relation for each of the purchase and sales related variables with the profit of the company for the period under study.

6. CONCEPTS OF RELATED TOPIC

Purchase: Purchase is the acquisition by the payment of money or its equivalent; buying, or a single act of buying (dictionary.com, LLC).

Sales: A sale is a transaction between two or more parties in which the buyer receives tangible or intangible goods, services, or assets in exchange of cash or promised to pay at a later. Seller makes sales with a view to generating income (Hermanson & et. al, 1998)

Gross Profit: Gross profit is the profit a company makes after deducting the costs associated with making and selling its products, or the costs associated with providing its services. The gross profit of a company is the total sales of the firm minus the total cost of the goods sold. The total sales are all the goods sold by the company. The total cost of the goods sold is the sum of all the variable costs involved in sales (Business Encyclopedia).

The Multiple-regression: Multiple-regression is a statistical procedure in which a dependent variable (Y) is modeled as a function of more than one variable ($X_1, X_2, X_3 \ldots X_n$). The population multiple-regression model may be written as:

$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots\dots + \beta_k X_k + \varepsilon$ where (β_0) is the intercept and other $\beta_i's$ are the slope terms associated with the respective independent variables. In this model, ε represents the population error term, which is the difference between the actual Y and that predicted by the regression model ($\hat{Y}$). The ordinary least-squares (OLS) criterion for the best multiple-regression model is that the sum of squares of all the terms be minimized (Gupta, 2007).

Variance Inflationary Factors (VIF): The application of multiple regressions involves the possible multi co-linearity of the explanatory variables. This condition refers to situations n which some of the explanatory variables are highly correlated with each other. In such cases, the values of the regression coefficients for the correlated variables may fluctuate drastically, depending on which variables are included in the model. One method of measuring co-linearity uses the variance inflationary factor (VIF) for each explanatory variable. This VIF is defined as follows:

$$\text{VIF} = \frac{1}{(1 - R^2)}$$

Where, R^2 represents the coefficient of multiple determination of explanatory variable X with all other x variables. If a set of explanatory variables are uncorrelated, then VIF will be equal to 1. If the set were highly Inter-correlated, then VIF might even exceed 10. However, other researchers suggest a more conservative criterion that would employ alternative to least-squares regression if the maximum VIF were not to exceed 5 (Lind, Marchal& Mason, 2002).

Correlation: Correlation Analysis is a statistical technique used to indicate the nature and degree of relationship existing between one variable and the other(s) (gupta,2007).

7. ANALYSIS AND INTERPRETATIONS

To find out the impact of important factors on dependent variable it is essential to prove the hypothesis and to sort out the analysis of data for the study as follows:

H_0: There is no positive association for each of the purchase and sales related variables with the profit of the company for the period under review.

Table 1: Pearson's Correlations of Profit with Purchase and Sales Related Variables of Titas

Power (gvt.)	Power (pvt.)	fertilizer	Industry	Cap.Power	CNG	commercial	domestic
Pearson's Correlationsof Profit withPurchase							
0.166	-0.264	0.813**	-0.876**	-0.788**	-0.807**	0.724*	-0.931**
Pearson's Correlationsof Profit withSales							
0.195	-0.140	0.806**	-0.856**	-0.752*	-0.681*	0.764*	-0.927**

Source: N=10, Compiled From secondary data, *Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

Table No. 1 indicates the pearson's correlations of profit with purchase and sales related variables of Titas Gas Company where purchase has the positive correlation with each of the factors Power (gvt.),fertilizer and commercial by the degree of 0.166, 0.813** and 0.724* respectively on the other hand it has negative correlation with rest of the factors. At the same time the sales has the positive correlation with each of the factors Power (gvt.), fertilizer and commercial by the degree of 0.195, 0.806** and 0.764* respectively on the other hand it has negative correlation with rest of the factors. Thus, the null hypothesis is accepted for each of the factors Power (gvt.), fertilizer and commercial in both of the situations of purchase and sales while the hypothesis is rejected for each of the factors Power (pvt.), Industry, Cap. Power, CNG and domestic. Thus, it is conclude that the factors Power (gvt.), fertilizer and commercial shows the positive impact on profit and Power (pvt.), Industry, Cap. Power, CNG and domestic indicate the negative impact on profit.

Regression Analysis

To have a better clarification the statistical tools multiple regression analysis is applied to analyze the data and the obtained results are shown as below:

Table 2: Model Summary for Purchase Related Variables of Titas

Multiple R	R Square	Adjusted R Square	Std. Error of the Estimate
0.966	0.933	0.900	0.928

Source: Compiled from secondary data by SPSS version: 22, Dependent Variable: Gross profit, Predictors: (Constant), Fertilizer, CNG and Commercial.

Table no. 2 shows the model summary for **purchase related variables of Titas** where the predictor variables are Fertilizer, CNG and Commercial collectively explained by 96.6 percent of the dependent variable gross profit. Moreover Multiple R, R-Square Adjusted R-Square and Std. Error of the Estimate are found to be 0.996, 0.993, 0.900 and 0.928 indicating quite a respectable result for well fit of model to the undertaken study.

ANOVA Test

Table 3: ANOVA-Test for Purchase Related Variables of Titas

Items	Sum of Squares	df	Mean Square	F	Sig.
Regression	710987.51	3	236995.84	27.89	0.00
Residual	50982.73	6	8497.12		
Total	761970.24	9			

Source: Compiled from secondary data by SPSS version: 22, Dependent Variable: Gross profit, Predictors: (Constant), Fertilizer, CNG and Commercial.

The above table shows that P-value is significant (0.00), so null hypothesis is rejected at 0.00 percent level of significance. On the basis of this analysis it is found that there exists a significance relationship between the population mean and the sample mean indicating the model is the best fitted for the study under review. The Model of the purchase related factors is as below:

Gross profit = 1530.50 + 0.44(Fertilizer) -2.82(CNG) +8.83(Commercial) +0.928

Table 4: Coefficients for Purchase Related Variables of Titas

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1530.50	710.13		2.16	0.07		
Fertilizer	0.44	0.20	0.33	2.24	0.07	0.52	1.93
CNG	-2.82	0.69	-0.51	-4.07	0.01	0.71	1.41
Commercial	8.83	3.33	0.35	2.65	0.04	0.64	1.57

Source: Compiled from secondary data by SPSS version: 22, Dependent Variable: Gross profit, Predictors: (Constant), Fertilizer, CNG and Commercial.

The measurements of the coefficients for purchase related variables of Titas have been depict in the above Table No. 4 where the Gross profit was taken as dependent variable and the independent variables were Fertilizer, CNG and Commercial under the study period. These mentioned variables above were extracted from eight independent variables as influential contribution to the dependent variable. The selected independent variables Fertilizer, CNG and Commercial were found to be statistical significant at 0.07 percent, 0.01 percent and 0.04 percent level of significant respectively. In the model, variance inflationary factors (VIF) were found from to be the lower of 1.41 to the highest of 1.93 indicates expected extend of multicollinearity. The coefficient of the predictors Fertilizer and Commercial had positive impact but CNG shows the negative effect on the dependent variable gross profit. On the other hands, unique and significant impacts on the dependent variable have been shown by the dependent variables CNG and Commercial.

Table 5: Model Summary for Sales Related Variables of Titas

Multiple R	R Square	Adjusted R Square	Std. Error of the Estimate
0.968	0.938	0.907	88.80

Source: Compiled from secondary data by SPSS version: 22, Dependent Variable: Gross profit,
Predictors: (Constant), Commercial, Fertilizer and CNG.

Table no. 5 shows the model summary for **sales related variables of Titas** where the predictor variables are Commercial, Fertilizer and CNG, collectively explained by 96.8 percent of the dependent variable gross profit. Moreover Multiple R, R-Square Adjusted R-Square and Std. Error of the Estimate are found to be 0.998, 0.938, 0.907 and 88.80 indicating quite a respectable result for well fit of model to the undertaken study.

Table 6: ANOVA-Test for Sales Related Variables of Titas

Items	Sum of Squares	df	Mean Square	F	Sig.
Regression	714654.13	3	238218.04	30.21	0.00
Residual	47316.11	6	7886.02		
Total	761970.24	9			

Source: Compiled from secondary data by SPSS version: 22, Dependent Variable: Gross profit,
Predictors: (Constant), Commercial, Fertilizer and CNG.

The above table shows that P-value is significant (0.00), so null hypothesis is rejected at 0.00 percent level of significance. On the basis of this analysis it is found that there exists a significance relationship between the population mean and the sample mean indicating the model is the best fitted for the study under review. The Model of the sales related factors is as below:

Gross profit = 1592.41 + 0.44(Fertilizer) -3.04(CNG) +9.51(Commercial) + 88.80.

Table 7: Coefficients for Sales Related Variables of Titas

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1592.41	619.73		2.57	0.04		
Fertilizer	0.44	0.19	0.34	2.35	0.05	0.49	2.05
CNG	-3.04	0.69	-0.48	-4.42	0.00	0.88	1.14
Commercial	9.51	3.02	0.44	3.15	0.02	0.53	1.88

Source: Compiled from secondary data by SPSS version: 22, Dependent Variable: Gross profit,
Predictors: (Constant), Fertilizer, CNG and Commercial.

The measurements of the coefficients for sales related variables of Titas have been shown in the above Table No. 7 where the Gross profit was taken as dependent variable and the independent variables were Fertilizer, CNG and Commercial under the study period. These mentioned variables above were extracted from eight independent variables as influential contribution to the dependent variable. The selected independent variables Fertilizer, CNG and Commercial were found to be statistical significant at 0.05 percent, 0.00 percent and0.02 percent level of significant respectively. In the model, variance inflationary factors (VIF) were found to be the lower of 1.41 to the highest of 2.05 indicates expected extend of multicollinearity. The coefficient of the predictors Fertilizer and Commercial had positive impact but CNG shows the negative effect on the dependent variable gross profit. On the other hands, unique and significant impacts on the dependent variable have been shown by each of the dependent variables included in the model.

8. CONTRIBUTION TO NATIONAL EXCHEQUER

Titas Gas Company is a profitable organization in Bangladesh. The earned profit is playing an important role in the national economy to the national Exchequer through payment of custom duty (CD), Value Added Tax (VAT), Corporate tax, Dividend (75%) and DSL (Debt Service Liabilities). It is also known that TGTDCL is the highest tax

payer in the energy sectors in Bangladesh. During the study period the contribution to national exchequer has been shown in the following table No. 8:

Table 8: National payment to government of Titas Figure in Crore Taka

Year	Dividend	Corporate Tax	DSL	CD/VAT	Total
2009-2010	173.44	195.25	52.67	9.1	430.46
2010-2011	160.59	262.74	51.75	13.7	488.78
2011-2012	211.98	312.44	44.16	6.04	574.62
2012-2013	211.98	393.01	48.11	15.55	668.65
2013-2014	259.67	311.34	43.02	1.38	615.41
2014-2015	281.92	326.79	25.02	23.53	657.26
2015-2016	111.28	338.1	24.97	9.25	483.6
2016-2017	148.38	347.18	24.32	7.34	527.22
2017-2018	163.22	342.89	24.28	28.08	558.47
2018-2019	185.48	362.6	25.74	18.73	592.55

Sources: Annual Reports of Titas Gas Transmission and Distribution Company Ltd. During 2010-2018.

9. DRAW BACKS

9.1. DRAWBACKS IN PURCHASING

The major drawbacks of the Titas Gas Transmission and Distribution Company Ltd. in case of purchasing are (website of Titas Gas Co.):
1) **No inlet metering system from the purchase of gas from GTCL:** TGTDCL purchases gas from gas field and GTCL. When gas is purchased from gas field there is inlet metering system and out let metering system but no inlet metering system in GTCL. So, there is drawback what amounts of volume actually purchased from GTCL are not ensured.
2) **Leakage in the pipe line:** The accounting life of pipeline is 20 years but most of the pipe line are old but is used. There is leakage in pipe line and system loss is incurred.
3) **Low pressure in transmission line:** Sometimes pressure of gas in the pipe line is low due shortage of gas production. It is also a problem that volume of gas is not accurate in that case.
4) **Gas turned into condensate:** When the temperature is low, gas turned in condensate as like as oil.
5) **Problem relating to failure of compressor:** The main activities of compressor are heating the gas and ensure the supply of gas. If compressors fail there is a disorder in supply of gas which is a vital problem.

9.2. DRAW BACKS IN SALES

Titas Gas Transmission and Distribution Company Ltd. distributes the purchased gas to its customers like power station, fertilizer factory, captive power, industry, commercial, CNG etc. at the time sales there are some drawbacks which are given below:
1) **Illegal gas connection:** Some customers are engaged in taking illegal connection by pass line, unauthorized load etc. Consequently, misuse is occurred and profit is lessened.
2) **No Metering:** There is any metering system in most of household's customers. So, they can consume unlimited gas.
3) **Shortage of Gas:** Shortage of gas supply due to misuse of the customers is a great problem of the company.
4) **Poor customer's services:** Customer service is not available frequently. For this reason, the customer handles the system as per their desires.
5) **Bad debts:** Huge amount of bad debts are occurred that harms the uniform sales. Consequently, profit is deteriorated.

10. CONCLUSION

It is concluded that the factors power (gvt.), fertilizer and commercial show the positive impact on profit and power (pvt.), industry, captive power, CNG and domestic indicate the negative impact on profit. The model of the both situation- purchase and sale estimates the factors fertilizer, CNG and commercial of which fertilizer, and commercial have positive significant impact on profit of the company but CNG has the negative impact on the same.

11. RECOMMENDATIONS

On the basis of the findings of the research work and the observations of the researchers the following suggestions are recommended for the betterment of the company:
1) More attention should be given to hold the better position in the situation of the factors power (gvt.), fertilizer and commercial in all respects of purchase and sales of gas;
2) Purchase and sales should be concise in the reasonable positions so the factors power (pvt.), industry, captive power, CNG and domestic are able to provide positive impact on profit;
3) Inlet metering system and outlet metering system should be introduced and strictly maintained and controlled by the company;
4) Replacement of old pipeline should be done to overcome the misuse of gas from the leakage through pipeline;
5) Gas production should be improved to maintain uniform pressure in the gas pipeline;
6) Compressor and heating systems should be improved to maintain uniform pressure in the gas pipeline;
7) Illegal gas connections should be stopped by the proper supervision of the company;
8) Metering system for all household customers should be introduced to overcome the misuse of gas;
9) Customers services should be improved by uniform supply of gas; and
10) Huge amount of bad debts should be reduced to enhance the uniform sales and profit.

CONFLICT OF INTEREST

The author have declared that no competing interests exist.

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