IIUC Business Review
ISSN 1991-380X
Volume 2, August 2007 (Published in August 2009) (p 7-24)

Relationship between Productivity and Profitability: A Case Study of Apex Tannery Ltd.

Md. Zahangir Alam*
Serajul Islam**
Muhammad Mahbubur Rahman***

Abstract: *The study attempts to find out the relationship between productivity and profitability of a firm. It is intended to measure how effectively a firm can uses its assets and how effectively the firm manages its operation. The empirical analysis of the study covered a period of 5 years of the sample enterprise. The study shows that there has been a positive partial relationship between productivity and profitability of the sample enterprise. It also indicates that the performance of the sample enterprise in terms of productivity and profitability has been far from satisfactory during the study period. Also an attempt has been made in this paper to highlight the productivity trends of an industry by using a suitable approach. Finally, the study suggests to undertake every possible measure by the competent authority to improve the position of the productivity and profitability of the sample enterprise.*

Key Words: Productivity, Profitability, Price recovery, Performance appraisal.

1. Introduction

In Bangladesh most of the industrial enterprises under both public and private sectors are reportedly characterized by high cost, low or negative profit margins, and severe pressure from foreign competition and in such a situation there is a greater need for better resource utilization. It is not unlikely to find, for many industrial enterprises, that an increased net income is frequently associated with increased productivity, while contraction of net income may also be accompanied by a decrease in productivity. Since by any count, increased profit associated with increased

* Lecturer in Finance, Department of Business Administration, IIUC, Dhaka Campus.
** Assistant Professor, Department of Business Administration, IIUC.
*** Assistant Professor, Department of Business Administration, IIUC.

productivity is most desirable, it is essential to make the management of the enterprises aware of the fact that mere increase in profit without productivity gains will jeopardize the survival sometime in the long run. But before the management will respond to the call to measure and improve productivity, the relationship between profitability and productivity must be properly specified (Parsons & John, 1980). Every company wants to improve productivity and profitability, but there is no specific model to do this (Mahmud, 1997).

In every country, developing or developed, with a market economy or a centrally planned economy, the main source of economic growth is an increase in productivity. Productivity improvement results in direct increase in the standard of living. But the level of productivity is a serious bottleneck to the rapid industrialization of Bangladesh. For poor productivity coupled with other problems resulted in several hundred sick and dead industries (Rab, 1993). In Bangladesh low productivity has characterized investments in general and the industrial sector in particular. Moreover, the productivity in the Tannery sector is another area of serious concern because of the important role of this industry in the economy of Bangladesh. Tannery is a vital for earning foreign currency, which can play a significant role in the infrastructural development of the country. But the role played by this industry has been considered unsatisfactory. Because, production and capacity utilization of this industry has been deteriorated. Against this backdrop an attempt has been made in this paper to highlight the productivity trends of this industry by using a suitable approach.

2. Objectives of the Study

Attempt has been made to fulfill the following specific objectives:

i. To measure the productivity of the sample enterprise during the study period.
ii. To measure the profitability of the selected enterprise during the study period.
iii. To examine the relationship between productivity and profitability during the period.

3. Methodology of the Study

The study is the outcome of the secondary data. These data have been related to various types of productivity namely, total productivity, labor productivity and capital productivity; various types of profitability namely, net profit margin, total assets turnover and return on assets and value added. All these data were collected from annual reports of the sample enterprise where income statements and balance sheets have

been consulted. We selected a period of 5 years ranging from 2002-03 to 2006-07 for the study period. Relevant ratios namely total productivity, labor productivity, capital productivity, capital labor net profit margin, total assets turnover and return on assets have been calculated in the context of the sample enterprise for the study period in order to make the study more analytical and informative.

Simple regression model has been used to evaluate the trend line of return on assets and the relationship between productivity and profitability of the sample enterprise during the study period. Regression model is concerned with estimating the value of dependent variable on the basis of known or fixed values of the explanatory variable (s) i.e. independent variable (s) and it shows the degree of relationship between independent and dependent variables (Gujarati, 1995;1998)

Computational Aspect

The model is shown as follows:

$$\hat{Y} = \beta_0 + \beta_1 X_1$$

Where,

$\hat{Y}$ = Dependent variable

X_1 = Independent variable

β_0 = Intercept term (value of dependent variable in absence of independent variable)

β_1 = slope (change in dependent variable due to one unit change in independent variable)

The following table shows the form of ANOVA Table for Regression.

Table-01: ANOVA Table for Regression

Source	Degree of freedom	Sum of Square	Mean Square	F ratio
Due to regression	1	Regression (RSS)	RSS/1	[RSS/1]/[ESS/(n-2)]
Due to Error	n-2	Error (ESS)	ESS/(n-2)	
Total	n-1	Total (TSS)		

Source: *Research Methodology*, Bangladesh Open University, pp. 41.

The following hypotheses are relevant for the study:

$H_0: \beta_1 = 0$ i.e. there is no linear relationship between Y & X_1

$H_1: \beta_1 \neq 0$ i.e. there is a linear relationship between Y & X_1

If calculated F value is greater than tabulated F value at certain percentage of level of significance with [1, (n-2)] degrees of freedom, reject H_0 which indicates there is a linear relationship between

dependent variable (return on asset) and independent variable (total productivity) and vice versa (Research Methodology, BOU)

Strength of Association

The strength of association between dependent variable and independent variable is measured by coefficient of determination (r^2), which indicates the % of the variation in dependent variable explained by the regression (Gujarati, 1995;1998).

4. Limitations of the Study

The study suffers from the following limitations:

i. Since the study is on single unit, industry average comparison has not been done according to approach (Islam, 1996).
ii. Though productivity can be measured as per value added version and output version but value added has been used in the given study.
iii. Productivity may be calculated either at constant price or current price, but current price has been considered here.
iv. Though trends in profitability can be shown in different aspects but net profit to sales ratio and total assets turnover ratio have been used.
v. Trends in productivity also may be depicted in different ways but this study has considered total productivity; labor productivity in terms of value added to number of workers; capital productivity in terms of value added to total assets and value added to indirect wages.
vi. Productivity can be analyzed by using different approaches, but Quick Productivity Appraisal Approach (QPAA) has been used.

5.Theoretical Framework

5.1 Productivity: Productivity is the ratio between out and input (Bhatia, 1988). It compares the performance of this year with previous year which shows the improvements (deteriorations) achieved by the organization and reflects the return of resources employed. In order to measure productivity, output/value added can be compared with capital or with labor or with all input factors taken together. Taking all these productivity concepts into consideration total productivity may be defined as the ratio of the value of total output/value added to the value of all input factors (Sardana & Vrat, 1984).

Productivity analysis is important for productivity improvement. In enterprises productivity is measured to help analyzing effectiveness and efficiency. Its measurement can stimulate operational improvement: the

very announcement, installation and operation of a measurement system can improve labor productivity, sometimes by 5 to 10 percent with no other organizational change or investment (Prokopenko, 1987). Productivity indices help to establish realistic targets and check points for diagnostic activities during an organization development process, pointing to bottle-necks and barriers to performance. These are also useful in inter-country and inter-enterprise comparisons. Furthermore there can be no improvement in industrial relations or proper correspondence between productivity, wages levels and gain-sharing policies without a sound analysis system (Prokopenko, 1987).

5.2 Models/Techniques of Productivity Analysis

There are many models of productivity measurement and analysis in enterprises. The following major categorization of models is possible on the basis of approaches or Concepts on which they have been constructed (Sardana & Vrat, 1984).

i. Production Function Models.
ii. Financial Ratios as Measures of Productivity/Quick Productivity Appraisal Approach (QPAA).
iii. Production Based Models.
iv. Product Oriented Models.
v. Surrogate Models.
vi. Economic Utility Models.
vii. System Utility Approach Based Models.

Each of the above models has its merits when seen in the proper perspective. But there is no single universal model for productivity measurement of an analysis. Before selecting any model one should go through the model to see whether the model fulfils the following characteristics of a sound productivity measurement model (Prokopenko, 1987).

i. It should provide simple and unambiguous signals to improve performance (productivity, profit, quality);
ii. It should breakdown change in profit to reflect the contribution from each resource used in production (labor, capital, materials, energy) ;
iii. It should break down the contribution to profit change from each resource into productivity terms and a price recovery term;
iv. It should transform the above measures of change in profit into corresponding measures of change in profitability, change in cost per unit of output and change in performance index numbers (productivity index number);

v. It should be consistent signals for profit improvement regardless of the units in which the measure is expressed.

Considering the above characteristics QPAA has been selected for productivity analysis of the sample unit, because this technique fulfils the most of the above characteristics. Financial statements (Balance Sheet & Income Statement) are sufficient for required data to undertake the method.

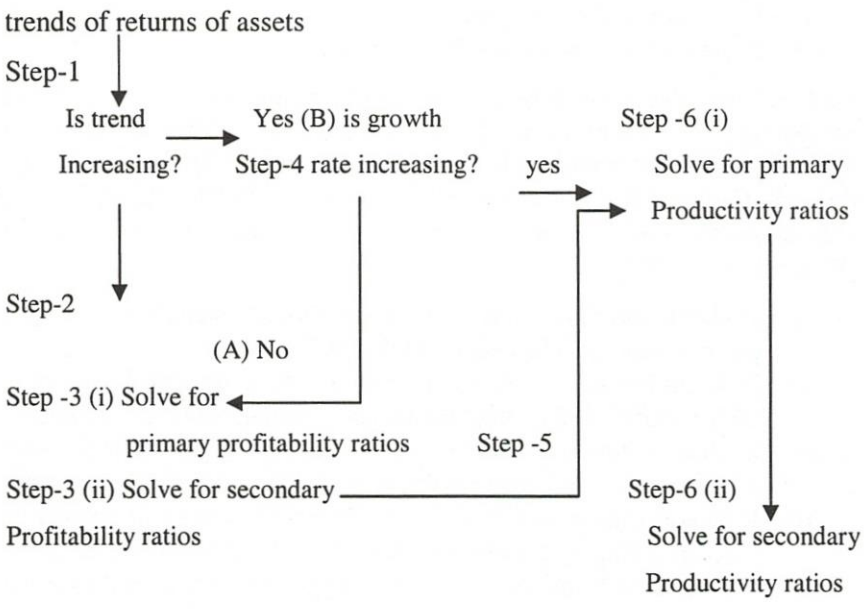
5.3 Quick Productivity Appraisal Approach (QPAA)

It is a systematic assessment of the company's profitability and productivity performance. The purpose of this approach is two fold:

- To isolate problem areas and identify priority areas for improvement;
- To establish productivity indicators for the whole organization.
- QPA consists of the three Components

i. Company performance appraisal (CPA): The approach suggests a flow of company performance appraisal which is shown below:

Flow Chart of Company Performance Appraisal



Source: E. Avedillo – Cruz 1984, p. 11

ii. Qualitative assessment: Qualitative assessment can be done by evaluating profitability & productivity trends.
iii. Inter-enterprise comparison: It is an exchange of information regarding costs, performance, efficiency and other relevant data between enterprises engaged in similar activities.

5.4 Trends in Productivity

In order to get the picture of overall performance of the company productivity ratios are to be calculated. But primary ratios are not enough to identify the priority area for improvement. That's why secondary productivity ratios are also to be calculated.

A. Primary Productivity Ratios:

i. Total Productivity= Value Added/ (Labor +Capital)

- Labor Productivity: It shows how well the labor force has been used.
  - ➢ Value Added to Total Working-Hours Worked Ratio
  - ➢ Value Added to Number of Workers Ratio
  - ➢ Value Added to Salaries/wages Ratio
- Capital Productivity: It shows how well available capital is allocated and managed.
  - ➢ Value Added to Total Assets Ratio
  - ➢ Value Added to Fixed Assets Ratio

B. Secondary Productivity Ratios:

- ❖ Value Added to Direct Salaries & Wages Ratio
- ❖ Value Added to Indirect Salaries & Wages Ratio
  - ✓ Value Added to Inventory Machinery Ratio
  - ✓ Value Added to Account Receivables Ratio
    - Value Added to Plant & Machinery Ratio
    - Value Added to Building Construction Ratio

5. 5 Profitability: The term profitability measures earning capacity of a enterprise (Hoque & Huq, 2006). It is a widely used financial measure of performance. The concept profitability may be used in two senses: commercial profitability and public profitability. Public profitability is based on economist's notion of cost and benefits from social point of view that is true opportunity cost and the benefits for the society as a whole, appears to be more appropriate measure of performance of enterprises, but commercial profitability is not measured from social

viewpoint (Kendrick & Creamer, 1965). In this study, commercial profitability has been considered.

5.6 Trends in Profitability

The Return on Assets (ROA) may be attributed to the performance of it's two component ratios:

ii. Net Profit Margin = Net Profit/Sales
iii. Total Assets Turnover = Sales/Total Assets

Return on Assets

A. Primary Ratios

i) Net Profit Margin

- ✓ Cost of Goods Sold to Net Sales Ratio (production area)
- ✓ Operating Expenses to Net Sales Ratio (marketing and administrative area)
- ✓ Financial Expenses to Net Sales Ratio (financial area)

B. Secondary Ratios

i) Total Assets Turnover

- ✓ Net Sales to Account Receivables Ratio (Finance)
- ✓ Net Sales to Inventory Ratio (production & marketing)
- ✓ Net Sales to Fixed Assets Ratio (production)

5.7 Relationship among Productivity, Price Recovery & Profitability

Profitability is one of the best measures for evaluating the overall performance of an enterprise (Gujarati, 1995;1998). But measurement of profitability alone cannot identify the cause of profitability changes. Profitability may be changed due to productivity or price cost movement. Therefore it is necessary to segregate profitability into productivity and price recovery. Considering the relationships among 3ps (productivity, profitability, price recovery) profitability is defined as the product of productivity and price recovery. The following demonstrates this relationship:

Out Value	= Out put Quantity	* Unit Price
↓	↓	↓
Profitability	= Productivity	* Price Recovery
↑	↑	↑
Input Value	= Quantity Used	* Unit Cost

Where:

Productivity = Output Quantity/ Quantity Used

Price Recovery = Unit Price/Unit Cost

5.8 Flow of Performance Appraisal

The first step of company performance appraisal is to compute Return on Assets (ROA) and second step is to determine its trend. Whenever the basic ratio –ROA or its growth is decreasing or constant, profitability ratios must be computed and their trends determined prior to productivity analysis.

6.0 Labor /Capital Relationships

Labor capital ratio may depict the behavior of labor productivity and capital productivity. An upward trend of labor productivity does not indicate that workers are more productive, it may be happened due to use of new equipments. An increasing trend in labor capital ratio reveals the use of more and more manpower resources per capital goods while a deceasing trend represents the use of more and more capital goods per labor unit (Prokopenko, 1987).

7.0 Findings & Analysis

7.1 Position of Productivity, Price Recovery & Profitability

The following table shows the positions of productivity, price recovery and profitability:

Table: 02- Positions of Productivity, Profitability and Price recovery

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Productivity	1.11	1.08	0.99	1.05	0.99	1.05
Price Recovery	1.14	1.10	1.09	1.09	1.15	1.11
Profitability	1.26	1.19	1.09	1.14	1.15	1.17

Source: Appendix-01

Notes:

i. Productivity = Total Production in Units/Direct Material Used in Units.
ii. Price Recovery = Sales Price per Unit/Cost of Production per Unit.
iii. Profitability = Productivity*Price Recovery.

The above table depicts that average productivity; price recovery and profitability of ATL for the period of 2002-03 to 2006-07 are 1.05, 1.11 and 1.17 respectively; productivity has been decreased in 2004-05, 2005-06 and 2006-07; there is an upward trend of price recovery in 2006-07, while downward trend in 2003-04, 2004-05 and 2005-06; and profitability has been increased in 2005-06 and 2006-07, while decreased in 2003-04, and 2004-05.

7.2 Flow of Performance Appraisal

The following table represents ratios of ROA and its trend values.

Table: 03- Ratio of ROA and its Trend Values

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Ratios (%)	1.50	1.20	2.13	3.18	1.85	1.97
Trend Values	1.73	2.28	2.82	3.37	3.92	2.82

Source: Appendix- 01 & 05

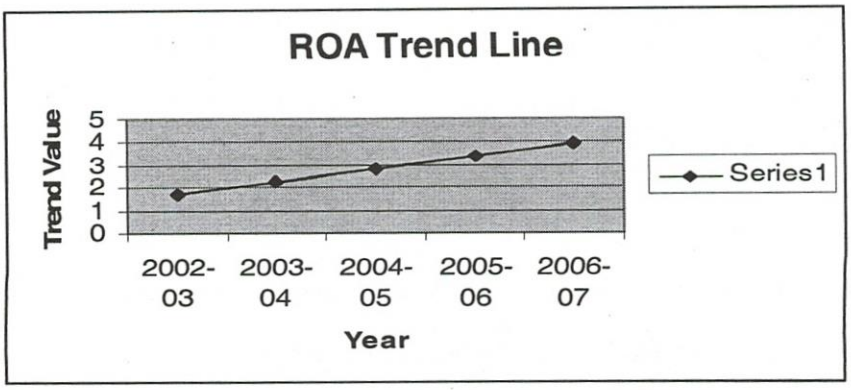
Notes:

i. ROA= Net Profit after Tax/Total Assets
ii. Regression model has been used to calculate trend values.

The above table reveals that average ratio of ROA and its trend value of ATL for the period of 2002-03 to 2006-07 are 1.97 and 2.824 respectively; ROA has been upwarded in 2004-05 and 2005-06, while downwarded in 2003-04 and 2006-07; and there is an upward trend of trend values of ROA in 2003-04 to 2006-07.

The ROA Trend Line has been plotted in the following graph:

Figure: 01



Source: Table- 03

7.3 Trends in Profitability

The following table represents the position of profitability of ATL during 2002-03 to 2006-07.

Table-04: Position of Profitability

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Net Profit Margin (%)	1.28	1.00	1.89	1.93	1.06	1.42
Total Assets Turnover	1.17	1.20	1.13	1.65	1.75	1.38
Return on Assets (%)	1.50	1.20	2.13	3.18	1.85	1.97

Source: Appendix-01

Notes:

i. Net Profit Margin = Net Profit after Tax/Sales
ii. Total Assets Turnover = Sales/ Total Assets
iii. Return on Assets = Net Profit Margin* Total Assets Turnover

The above table shows that average net profit margin and average return on asset of ATL for the study period of 2002-03 to 2006-07 are 1.42%, and 1.97%, respectively. There is an upward trend of net profit margin in 2004-05 & 2005-06, while downward trend in 2003-04, & 2006-07; and return on asset has been increased in 2004-05 and 2005-06 whereas return on asset has been decreased in 2003-04 and 2006-07.

7.4 Trends in Productivity

The following table shows the productivity ratio of ATL during 2002-03 to 2006-07.

Table: 04- Productivity Ratios

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Total Productivity	0.25	0.23	0.23	0.25	0.22	0.24
Value Added to Number of Workers	220056	199333	257923	257891	217725	230586
Value Added to Total Assets	0.11	0.10	0.09	0.12	0.11	0.11
Value Added to Direct Wages	68.08	60.37	62.59	50.72	48.00	57.95

Source: Appendix-01

Note: Total Productivity = Value Added/(Direct Labor + Equity Capital)

The above table depicts that average total productivity, average value added to number of workers, average value added to total assets, and average value added to direct wages of ATL for the period of 2002-03 to 2006-07 are 0.24, 230586, 0.11, and 57.95 respectively; there is an upward trend of total productivity in 2005-06 while downward trend in 2003-04 and 2006-07 and unchanged in 2004-05; value added to number of workers has been increased in 2004-05 while decreased in 2003-04, 2005-06 and 2006-07; value added to total assets has been up warded in 2005-06 while down warded in 2003-04, 2004-05 and 2006-07; and there is an upward trend of value added to direct wages in 2004-05 while downward trend in 2003-04, 2005-06, and 2006-07.

7.5 Labor Capital Relationship

The following table represents labor capital relationship.

Table: 05- Labor Capital Relationship

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Labor Productivity	220056	199333	257923	257891	217725	230586
Capital Productivity	0.11	0.10	0.09	0.12	0.11	0.11
Labor Capital Ratio	2000509	1993330	2865811	2149092	1979318	2197612

Source: Appendix-01

Notes:

i. Labor Productivity = Value Added/Number of Workers
ii. Capital Productivity = Value Added/Total Assets
iii. Labor Ratio Capital = Labor Productivity/ Capital Productivity

The above table reveals that average labor productivity, average capital productivity and average labor capital ratio are 230586, 0.11, and 2197612 respectively; increased in 2004-05 while decreased in 2003-04, 2005-06 and 2006-07; capital productivity has been up warded in 2005-06 while down warded in 2003-04, 2004-05 and 2006-07. The upward trend of labor capital ratio in 2004-05 indicates that the more and more manpower resources per capital goods have been used in 2004-05, while downward trend of labor capital ratio in 2003-04, 2005-06 and 2006-07 represent that the more and more capital goods have been used per labor units 2003-04, 2005-06 and 2006-07.

7.6 Relationship between Productivity and Profitability

The relationship between productivity and profitability may be shown with the help of the equation: $\hat{Y} = (0.035) + 0.409X$

The results have been shown in Appendix- 05, 07, 08 and 09.

The value of intercept term of (0.035) indicates that profitability would be. (0.035) units in absence of total productivity & the value of slope of 0.409 represents that the profitability would be changed in 0.409 units due to 1 unit changes in productivity in the same direction i.e. there has been positive relationship between profitability and productivity.

Co-efficient of determination (r^2) equal to 0.167 indicates that profitability (i.e. Return on Asset) has been influenced by total productively to the extent of 16.70 %. The remaining 83.30 % is explained by the other factors, which are not considered in our study. Therefore, it can be concluded that there exists a positive partial relationship between productivity and profitability.

Tabulated F value at 5 % level of significance with (1, 3) degrees of freedom equal to 10.1 (Gujarati, 1995;1998). As compared to table value of F, it is seen that calculated F value is lower than table value of F. This signifies that, null hypothesis (H_o) is not rejected, so alternative hypothesis (H_1) rejected, i.e. there is no linear relationship between productivity and profitability. This means, there is positive partial relationship between productivity and profitability but the relationship is not statistically significant (Gujarati, 1995;1998).

Conclusion

It is revealed from the study that there exists positive partial relationship between productivity and profitability in case of the sample enterprise during the study period. This is evident from the fact that the value of co-efficient of determination (r^2) between productivity and profitability has been calculated as 0.167. This signifies that only 16.70% of profitability has been explained by the productivity and remaining 83.30% has been explained by other factors. Moreover such relationship is not statistically significant. All the findings indicate that performance of the sample enterprise during the study period in terms of productivity and profitability has been unsatisfactory. This calls for taking immediate measures by the appropriate authority in order to improve productivity and profitability of the sample enterprise.

References

Bhatia, B., S.(1988), *Management of Productivity in Indian Industries*, New Delhi: Deep & Deep Publications, p. 8.

Gujarati, D., N., *Basic Econometrics,* McGraw Hill, 1995–1998, International Editions, p.32.

Haque, M., J., and Huq, B.,I., A. (2006), *Fundamentals of Financial Management,* Publication,Printing and Distribution Department, Bangladesh Open University, Gazipur, p.92.

Islam, A., A., (1996). *"Productivity Analysis of A Cement Company Using Quick Productivty Appraisal (QPA) Approach-* A Case Study of Chittagong Cement Clinker Grinding Co. Ltd." Chittagong University Studies (Commerce). Vol. 12,. pp. 155-172

Kendrick. J.,W. Cf., and Creamer., D. (1965), *Measuring Company Productivity: Handbook with Case Studies*: Conference Board. New York

Mahmud, A.(1997), *Inside Bangladesh Economy*, BIAM. pp.61- 64.

Parsons, Jphn (1980), *"Profitability Analysis in inter-enterprise Comparison: A New Approach"*. in Baily David and Hubbort. Tony.. (ed.) Productivity Measurement: An International Review of Concepts. Techniques. Programmes and Current Issues. England: Grower Publishing Co. Ltd. pp. 59-60.

Prokopenko, J. (1987), *Productivity Management*, International Labour Office, Geneva, p. 23.

Rab, A. (1993), *"Productivity Issues in Small Industries,"* Paper presented at the seminar organized by Association of Management Development Institute of Bangladesh., IBA, DU.

Research Methodology, Bangladesh Open University, pp. 41.

Sardana, G., D. (1984), & Vrat, P., *"Models of Productivity Measurement"* Productivity (1984 XXV), National Productivity Council, New Delhi, p. 271.

Appendix- 01: Financial Position of ATL (Figures in million)

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Sales (Tk.)	1728.28	1731.24	1716.04	2212.65	2535.43	1984.73
Sales (in SF)	22.89	21.84	21.06	25.39	23.13	22.86
Unit price/SF	75.50	79.27	81.48	87.15	109.62	86.60
Value Added	157.78	140.53	147.79	165.05	155.02	153.23
Unit Cost/SF	66.42	72.07	74.73	79.91	95.25	77.68
Gross Profit	165.87	130.04	145.24	165.55	149.00	151.14
Net After Tax	22.27	17.35	32.47	42.78	26.76	28.33
Fixed Asset	215.51	191.63	173.81	168.32	175.58	184.97
Current Assets	1263.89	1253.08	1350.80	1173.15	1276.46	1263.48
Total Assets	1479.40	1444.71	1524.61	1341.47	1452.04	1448.45
Shareholders Equity	601.70	598.39	611.05	628.64	655.40	619.04
Operating Profit	166.93	131.09	149.17	177.55	163.48	157.64
Cost of Sales	1562.41	1601.20	1570.79	2047.10	2386.43	1833.59
Share Capital	152.40	152.40	152.40	152.40	152.40	152.40
Goat Skin (SF)	6.75	7.83	7.01	4.95	6.38	6.58
Cowhides (SF)	14.12	11.93	14.98	17.61	17.92	15.31

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Direct Material (SF)	20.87	19.76	21.99	22.56	24.3	21.89
Goat skin (Tk.)	388.26	453.23	374.49	249.26	315.99	356.25
Cowhides (Tk.)	785.24	669.39	831.52	1096.79	1454.19	967.43
Direct Material (Tk.)	1173.5	1122.62	1206.01	1346.05	1770.18	1323.68
Direct Labor	21.73	23.93	24.36	26.45	30.25	13.88
Depreciation	28.70	24.86	21.84	22.13	24.09	24.32
Factory overhead	84.33	71.73	57.28	62.55	67.65	68.71
Cost of Production	1532.38	1543.02	1640.41	1891.56	2308.83	1783.24
Production (in SF)	23.07	21.41	21.95	23.67	24.24	22.87
No. of Workers	0.000717	0.000705	0.000573	0.000640	0.000712	0.000669

Source: Annual Reports of ATL during 2002-03 to 2006-07

Appendix: 02-Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Year [a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: Ratio

Appendix: 03-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.557[a]	0.310	0.080	0.73021

a. Predictors: (Constant), Year

Appendix: 04-ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.718	1	0.718	1.347	0.330[a]
	Residual	1.600	3	0.533		
	Total	2.318	4			

a. Predictors: (Constant), Year
b. Dependent Variable: Ratio

Appendix: 05-Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.168	0.766		1.525	0.225
	Year	0.268	0.231	0.557	1.161	0.330

a. Dependent Variable: Ratio

Appendex-06: Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Productivity [a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: Profitability

Appendex-07: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.409[a]	0.167	-0.111	0.00805

a. Predictors: (Constant), Productivity

Appendex-08: ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.000	1	0.000	0.601	0.495[a]
	Residual	0.000	3	0.000		
	Total	0.000	4			

a. Predictors: (Constant), Productivity
b. Dependent Variable: Profitability

Appendex-09: Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.035	0.071		-0.497	0.902
	Productivity	0.233	0.300	0.409	0.775	0.219

a. Dependent Variable: Profitability