# Determinants of Profitability of Handloom Weaving Units Operating in Kumarkhali Upazila of Kushtia District in Bangladesh

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**ABSTRACT**

*This study is designed to explore the determinants of profitability of handloom weaving units operating in Kumarkhali upazila under Kushtia district of Bangladesh. Following multistage random sampling technique, the required data for this study are collected from 120 handloom unit owners who have been operating their units in this upazila. In the study, net profit and profitability of these handloom units are calculated using conventional statistical techniques. It is found that annual average net profit of the handloom units is Tk.274.3 thousands, which is 46.75% in terms of annual average profitability. The Cobb-Douglas production function model is employed to examine the factors that are responsible to increase or decrease the profitability of the handloom units. Finally, identification of the determinants of profitability is performed by estimating a log-linear regression model which confirms that sales revenue, and labor, capital and yarn inputs have positive effects on the profitability of the units. Therefore, it can be concluded that handloom unit owners can secure higher profit by increasing sales revenue, and labor, capital and yarn inputs.*

**Keywords:** *Handloom, Profitability, Determinants, Bangladesh.*

## INTRODUCTION

Handloom is an ancient and traditional industry in Bangladesh. In the country, there are about 183512 handloom units operating with 505556 looms. The industry supplies around 86.9 million yards of fabrics of different kinds in each month (BHB, 2008; BBS, 2003; Islam et al., 2013; Islam & Hossain, 2015). Mostly operating in the rural areas, the handloom industry contributes significantly to the development of rural economy of Bangladesh. In rural Bangladesh, 0.85 million workers earn income for their livelihood through employment in the handloom industry. Moreover, handloom industry in the country constitutes 48.04 percent of total employment in the cottage industry sector, and 49.46 percent of the total production of cottage industries (Hossain & Mondal, 1983; Islam & Hossain, 2015). There is a persistent tendency of domestic demand for cotton cloth to rise in Bangladesh as the population of the country is increasing over time. The country cannot meet up the total demand for fabrics for the huge population with domestic production only. Therefore, each year, 2 to 3 billion yards of fabrics are imported in Bangladesh to satisfy the domestic requirements (World Bank, 1999). At present, the total demand for fabrics in Bangladesh is around 1676 million meters, of which about 800 million meters are produced by handloom industry (BBS, 2003). Thus, handloom sector meets up about 50 percent of the local demand for fabrics in the country (Hossain & Mondal, 1983). It is reported that out of 505556 looms, there are about 193705 (38 percent of total loom) non-operational looms in the country, and 80 percent of them are non-operational due to the lack of working capital only (BBS, 2003, BBS, 1990). Only taking a few steps to operate these looms could create opportunity of work for about 4 million labors and would offset import requirement of fabrics significantly.

Kumarkhali upazila of Kushtia district is one of the most handloom concentrated areas in Bangladesh. Of the total labor force in the upazila, about 10 percent are engaged in handloom weaving activities. There are 5062 handloom units with 11426 looms in the upazila which produce 19.2 lac meters of cloth in each

month (BBS, 2003; Islam et al., 2013; Islam & Hossain, 2015). However, at present, many of the handloom unit owners are claiming that cloth production under handloom units is no more profitable and consequently, they are closing down their units.

Therefore, it is necessary to investigate the situation of profitability of handloom weaving units operating in this upazila and the factors that are responsible for increasing or decreasing profitability of the sector. Thus, the main objective of this study is to estimate the contribution of different factors to the profitability of handloom weaving units operating in Kumarkhali upazila under Kushtia District of Bangladesh.

## LITERATURE REVIEW

A good number of studies have been conducted earlier in the field of handloom weaving industry in home and abroad. Some of these studies are reviewed and synthesized findings are presented in this section. Chowdhury (1981a) and Rahman (1980) analyzed the profitability of weaving activities by handlooms, powerlooms, and mills operating in Bangladesh by calculating financial and economic internal rates of returns (IRRs) of these three alternative forms of fabrics production. The study found that handlooms are economically a more efficient production technique in terms of IRR in border prices, than either power loom operating under cottage industries or large mill for the weaving of every single type of fabrics. In the same field, Chowdhury (1981) computed the relative measures of economic efficiency in case of handloom and powerloom industries. The study found that handloom units are economically more efficient than powerloom units. Sobhan (1989) explored the productivity of different looms that are operational under different production systems. They found that productive efficiency of a handloom weaving units are higher than that of others production techniques.

Jaforullah (1999) examined the technical efficiency of handloom industry in the context of Bangladesh which found that technical efficiency of handloom industry of the country is only 41% and its technical efficiency might be improved by increasing its male and female labor ratio and decreasing its hired and family labor ratio and labor-capital ratio. Islam et al. (2013) assessed the profitability of handloom weaving industry in Bangladesh. The study found that handloom weaving activity is still profitable. They also found that per loom profit for small scale and large scale units is higher than for the medium scale units. Islam and Hossain (2015) conducted another study to assess the technical inefficiency of handloom weaving industry which is directly related to the profitability of the units. The study found that the average inefficiency of handloom weaving units is 0.245. They also identified the determinants of inefficiency of handloom units. They found that level of education of owners, experience of owners, age of owners and size of unit are significant factors that affect the level of technical inefficiency of the handloom weaving units.

Raihan (2010) investigated the possibility of how rural poverty in Bangladesh can be reduced through developing the handloom industry. He also has analyzed the factors that lead to closing down the handloom units in Bangladesh. The study found that handloom sector in the country is on the declining trend due to a number of factors including lack of education and skill of the workers, absence of organization of the weavers, and smuggling of cloth from other countries specially, from India. The study also found that near 0.2 million looms are now closed due to shortage of working capital. Ahmad and Islam (1989) and Ahmed (1999) studied the problems of handloom industry of Bangladesh. These studies found that quality raw materials of handloom production are not available at right time and at right price. Similarly, Latif (1998) attempted to explore the weakness of handloom industry of Bangladesh and found lack of technological knowledge and skills as well as financial severity of the weavers as the main problems of handloom industry of Bangladesh.

## METHODOLOGY

### Study Area and Data Collection

The present study is mainly based on primary data that are collected from the owners of handloom units operating in three villages of Kumarkhali upazila under Kushtia district of Bangladesh. Kumarkhali has 11 unions (local administrative units) and the headquarter. The headquarter is also considered as a union in this study. For selecting the sample, at the first stage, three handloom concentrated unions, from the total of 12, are selected purposively as all unions of the upazila are not equally handloom concentrated. In the next stage, one village from

each union is selected randomly, as the socioeconomic and demographic characteristics of people are almost same in all the villages. Finally, for selecting the respondents, the list of all handloom unit owners of the study area has been collected from Bangladesh Handloom Board (BHB), Kumarkhali branch and the sample respondents are chosen. In this connection, the handloom unit owners are categorized into two groups based on the size of units. Units which have 1 to 10 looms are considered as small units, and which have more than 10 units are considered as large units. From each group 60 respondents are taken and thus a total of 120 respondents are selected for the present study who are interviewed during the period of data collection.

### The Empirical Model

The empirical model is designed to assess the contribution of different factors that affect the profitability of fabrics production by handlooms of the sample units. It is found from the earlier studies (Islam et al., 2013; Islam & Hossain, 2015) and also from the field survey that profitability of handloom units depends mainly upon five key factors namely, total sales revenue, labor cost, yarn cost, capital cost, and other inputs cost. Some other geographic, socioeconomic, and demographic factors also affect profitability of the handloom units but these are not taken into consideration in this study as the focus is only given on investigating the profit function. The profit function of producing fabrics by handloom units, thus, can be written as:

$$\Pi_i = (TSR_i, LAC_i, YAC_i, CAC_i, OTC_i) \quad (1);$$

[where, $i = 1, 2, \ldots \ldots 120$]

Where, $\Pi_i$, $TSR_i$, $LAC_i$, $YAC_i$, $CAC_i$ and $OTC_i$ stands for profitability (profit-revenue ratio multiplied by 100), total sales revenue, labor cost, yarn cost, capital cost, and other inputs cost (rice powder, maize, kerosene, starch etc.) of producing fabrics in handloom units. To estimate the contribution of the key factors to

the profitability of handloom weaving units, the Cobb-Douglas type function is employed. The specification of the model is as follows.

$$\Pi_i = \beta_0 TSR_i^{\beta_1} LAC_i^{\beta_2} YAC_i^{\beta_3} CAC_i^{\beta_4} OTC_i^{\beta_5} e^{\mu_i} \quad (2)$$

The Ordinary Least Squares (OLS) method is employed to estimate the contribution of key factors to the profitability of handloom units. For this estimation, the Cobb-Douglas function is transformed into linear form by taking 'log' on both sides of the function as follows so as to fit to the OLS estimation method.

$$ln\,\Pi_i = \beta_0 + \beta_1 lnTSR_i + \beta_2 lnLAC_i + \beta_3 lnYAC_i + \beta_4 lnCAC_i + \beta_5 lnOTC_i + \mu_i \quad \ldots\ldots\ldots\ldots(3)$$

Where, $\Pi_i$ = profitability (profit-revenue ratio multiplied by 100) of handloom units; $TSR_i$ = total sales revenue per year in thousand Taka; $LAC_i$ = labor cost per year in thousand Taka; $YAC_i$ = yarn cost per year in thousand Taka; $CAC_i$ = total capital cost per year in thousand Taka; $OTC_i$ = other inputs cost per year in thousand Taka. $u_i$ is the stochastic error term, and $\beta_0$ to $\beta_5$ are coefficients to be estimated.

## RESULTS DISCUSSION

The results of the estimated profit function are presented and analyzed in this section. At first, analysis of the descriptive statistics of the collected data is made in Table 1 and in the next, interpretation of the regression results are provided in Table 2 to Table 5.

### Costs, Revenue and Profit of the Handloom Units

It is found that costs, sales revenue and profits are not same for all the handloom units. The average, maximum, minimum values of costs, sales revenue and profits are given in Table 1. From the table, it is found that the net profit of an average sample handloom weaving unit is Tk.274.3 thousands per year with maximum Tk.1237.0 thousands and minimum Tk.195.36 thousands per year.

**Table1.** *Costs, Revenue and Profit of Handloom Units for a Single Year (000 Tk.)*

| Costs, Revenue and Profit | Minimum | Maximum | Average |
|---|---|---|---|
| Sales revenue (TSR) | 417.9 | 6735.8 | 1956.5 |
| Labor cost (LAC) | 61.5 | 1156.8 | 385 |
| Yarn cost (YAC) | 147 | 3753 | 1235 |
| Capital cost (CAC) | 6.5 | 138 | 10.1 |
| Others input cost (OTC) | 5.5 | 165 | 52.14 |
| **Net profit** | **195.36** | **1237.0** | **274.3** |

**Source:** *Authors' own calculation based on field survey data*

Again, it is found that the average sales revenue of the handloom weaving units in the study area is Tk.1956.5 thousands with maximum Tk.6735.8 thousands and minimum Tk.417.9 thousands.

The cost analysis reveals that average labor cost, yarn cost, capital cost, and other inputs cost of handloom units are Tk.385 thousands, Tk.1235 thousands, Tk.10.1 thousand and Tk.52.14 thousands, respectively, in a year.

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## Regression Results

In this section, empirical results based on the econometric estimation are discussed. Specially, estimation results on the basis of equation (3) are represented and analyzed in this section. To understand the contribution of the key factors of profitability of the handloom units, this analysis is done in three phases. Firstly, all the collected data are considered together and the regression equation is estimated fitting all the data. Secondly, the respondents are divided into large and small owner groups with respect to the size of their handloom units and the regression is run separately for both groups. Thirdly, regression results of all, large and small owners are taken together and comparison is made to identify significant variations in the results.

## Regression Results for All Units

The estimated coefficients with regard to different factors of profitability in case of all the handloom weaving units are given in Table 2. Profitability of handloom units mostly depends on their sales revenue. From the results it is found that the coefficient of total sales revenue is 0.112 and statistically significant. This result means that 1.0 percent increase in total sales revenue, keeping other things remaining constant, would increase profitability by 0.112 percent. The coefficient of labor cost (0.049) indicates that 1.0 percent increase in labor cost, keeping other factors constant, would increase profitability by 0.049 percent. Again, yarn is an important input for generating profit by the handloom units. The value of coefficient of yarn cost (0.221) indicates that 1.0 percent increase in yarn cost, keeping other factors constant, would increase profitability by 0.221 percent. From the table, it is also found that the value of coefficient of capital cost is 0.052 which indicates that 1.0 percent increase in capital cost, keeping other factors constant, would increase profitability by 0.052 percent. Thus, it is found that all the factors have positive contribution to the profitability of handloom weaving units in the study area.

**Table2.** *Regression Results for All Units*

| Determinants | Coefficients | Std. error | t-value | p-value |
|---|---|---|---|---|
| TSR | 0.112*** | 0.031 | 3.61 | 0.004 |
| LAC | 0.049** | 0.022 | 2.23 | 0.028 |
| YAC | 0.221** | 0.089 | 2.48 | 0.015 |
| CAC | 0.052*** | 0.017 | 3.06 | 0.003 |
| OTC | -0.013*** | 0.014 | -3.25 | 0.002 |
| Constant | 1.316*** | 0.311 | 4.23 | 0.000 |
| **Total observation: 120; R-squared: 0.76; Durbin-Watson: 1.82** | | | | |

**Source:** *Author's own calculation; N.B: ***, ** and * indicate significance at 1%, 5% and 10%, respectivel*

However, other inputs cost has negative impact on the profitability of handloom units.

It is observed that the coefficient of other inputs is -0.031 which means that 1.0 percent increase in the cost of other inputs, keeping other factors constant, would decrease profitability by 0.031 percent.

Therefore, it can be conceived that handloom owners can secure more profitability by increasing total sales revenue, human labor cost, yarn cost, and capital cost except other inputs cost.

## Regression Results for Small Scale Units

Table 3 shows the regression results for small scale handloom units. The regression results indicate that labor cost and yarn cost are found positively significant in increasing profitability of the small handloom units, while expenditure on capital is found insignificantly related to profitability of the units although the direction of the relationship is positively.

On the other hand, cost of other input is found insignificant and negatively related to the profitability of small scale handloom units.

**Table3.** *Regression Results for Small Scale Units*

| Determinants | Coefficients | Std. error | t-value | p-value |
|---|---|---|---|---|
| ln TSR | 0.197*** | 0.063 | 3.13 | 0.003 |
| ln LAC | 0.131*** | 0.047 | 2.79 | 0.007 |
| ln YAC | 0.183** | 0.091 | 2.01 | 0.049 |
| ln CAC | 0.056 | 0.549 | 0.10 | 0.921 |
| ln OTC | -0.001 | 0.003 | -0.33 | 0.743 |
| Constant | 1.407*** | 0.224 | 6.28 | 0.000 |
| Total observation: 60; R-squared: 0.71; Durbin-Watson: 2.01 | | | | |

**Source:** *Author's own calculation; N.B: \*\*\*, \*\* and \* indicate significance at 1%, 5% and 10%, respectively*

It is found from Table 3 that the coefficient of total sales revenue for small scale units is 0.197 which is statistically significant. This, result means that if other things remain constant, 1.0 percent increase in total sales revenue would increase the profitability by 0.197 percent. Labor is an important factor that affects the profitability of the small handloom units. It is revealed that the coefficient of labor cost is 0.131 and statistically significant which indicates that 1.0 percent increase in labor cost would increase profitability by 0.131 percent. Yarn is also an important input of production of fabrics by the handlooms. Table 3 reveals that the coefficient of yarn cost is 0.183 and significant. Thus, it indicates that 1.0 percent increase in yarn cost would increase the profitability of the small handloom units by 0.183 percent. Thus, it can be concluded that increase in total sales revenue, labor cost and yarn cost of small scale handloom units would increase their profitability.

## Regression Results for Large scale Units

It is presumed that the contribution of key factors to the profitability of the large handloom units may be different from small scale units. Therefore, separate regression is again run for large handloom units, and the obtained results are shown in Table 4. The value of coefficient of total sales revenue, yarn cost, labor cost, capital cost, and other inputs cost are 0.159, 0.391, 0.519, 0.133, -0.216, respectively. They all are statistically significant and these results indicate that the handloom owners could achieve more profitability by increasing total sales revenue, labor cost, yarn cost and capital cost except the other inputs cost.

**Table4.** *Regression Results for Large Units*

| Determinants | Coefficients | Std. error | t-value | p-value |
|---|---|---|---|---|
| ln TSR | 0.159*** | 0.040 | 3.98 | 0.000 |
| ln LAC | 0.391*** | 0.093 | 4.20 | 0.000 |
| ln YAC | 0.519*** | 0.061 | 8.51 | 0.000 |
| ln CAC | 0.133* | 0.077 | 1.73 | 0.089 |
| ln OTC | -0.216** | 0.096 | -2.25 | 0.029 |
| Constant | 1.957*** | 0.713 | 2.74 | 0.008 |
| Total observation: 60; R-squared: 0.82; Durbin-Watson: 2.056 | | | | |

**Source:** *Author's own calculation; N.B: \*\*\*, \*\* and \* indicate significance at 1%, 5% and 10%, respectively*

As for explanation of the results in Table 4, it is found that 1.0 percent increase in total sales revenue contributes to increase in profitability of the large scale handloom units by 0.159 percent. It is also found that 1.0 percent increase in yarn cost, keeping other factors constant, would increase profitability of large units by 0.519 percent and 1.0 percent increase in labor cost would increase profitability by 0.391 percent. Table 4 also reveals that 1.0 percent increase in capital cost would increase profitability of the large handloom units by 0.133 percent. As is found in the table, other inputs pose negative contribution in increasing profitability of the large handloom units. Thus, the owners of large handloom units could have earn more profit by increasing investment on all the major factors of production.

## Comparison of Regression Results for Small Scale and Large Scale Units

Comparison of results of all the units, small scale units and large scale units is made in this section. From Table 5 it is found that sales revenue and yarn cost plays very strong and significant role in determining profitability of the handloom unit owners. In all cases owners could increase their profitability by increasing the sales revenue and expenditure on yarn input. Similarly, labor has significant and positive role

on the profitability in all three cases. This means that handloom unit owners could increase their

profitability by adding more labor in their units.

**Table5.** *Comparison of Regression Results*

| Determinants | Coefficients (all units) | Coefficients (small units) | Coefficients (large units) |
|---|---|---|---|
| ln TSR | 0.112*** | 0.197** | 0.159*** |
| ln LAC | 0.149*** | 0.231*** | 0.391*** |
| ln YAC | 0.321*** | 0.483*** | 0.519*** |
| ln CAC | 0.052** | 0.056 | 0.133 |
| ln OTC | -0.013** | -0.001 | -0.216* |
| Constant | 1.316*** | 1.407*** | 1.957** |
| | Total observation 120 | Total observation 60 | Total observation 60 |

**Source:** *Author's own calculation; N.B: ***, ** and * indicate significance at 1%, 5% and 10%, respectively*

Again, capital is significant for all units and large units but insignificant for small scale units. Thus, it is obvious that the large handloom unit owners could increase their profitability by increasing the number of handlooms in their units. Similarly, other inputs are significant in case of all units and large unit owners. As the coefficient of others input is negative, the large unit owners could raise their profitability by decreasing the use of others input.

## CONCLUSION

The present study is an effort to analyze the factors of profitability of fabrics production by handloom units in order to examine the contribution of key factors to the profitability. It is found that sales revenue, labor, capital, and yarn have significant and positive contribution to profitability of handloom weaving units. However, capital and other inputs have insignificant impact on profitability in case of small units. Thus, the owners of handloom units could secure more profit by increasing sales revenue, the use of yarn, labor, and capital inputs.

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