

## Profitability Analysis of Cotton Processing Industries - A Study in Telangana State, India

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### ABSTRACT

The purpose of the study is to evaluate the financial performance of cotton processing plants. Adilabad and Nalgonda Districts in Telangana state were selected as study locations and data were gathered from a sample of 10 ginning mills, 10 spinning mills, 10 weaving mills, one dyeing and printing mill and one garment manufacturing unit by using the personal interview technique. To analyze the collected data breakeven analysis and profitability ratios namely gross profit margin, operating profit margin, pre-tax margin and net profit margin were worked out. The

study revealed that all cotton processing plants are processing enough additional cotton than is required to achieve breakeven point and profitable ratios are also shown positive financial position and shock absorbing capacity of the processing units. The highest gross profit margin was observed in garment manufacturing unit (23.11%) followed by spinning mills (21.92%). Whereas, highest net profit margin was seen in weaving mills (8.13%) followed by garment manufacturing unit (7.02%).

**Keywords** Profitability, Value chain, Cotton processing, Breakeven point.

### INTRODUCTION

Cotton is a crucial source of income for millions of small farmers, and it generates substantial export earnings for the developing nations. For many rural laborers, especially women, cotton is a significant source of income (Sankar and Naidu 2017). Cotton play vital role in economic growth, global trade and reducing poverty. On average five people are employed by one metric ton of cotton. Cotton can also be grown in dry and arid regions since it is a crop resistant to climatic changes (<https://unctad.org/news>). Only 2.1% of the world's arable land is occupied by it, but it provides 27% of the world's textile needs.

About 80% of cotton is used in the apparel industry, 15% in home furnishings, and the remaining 5 % is primarily employed in non-woven applications

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including filters and padding. Almost nothing from cotton is wasted. It can also be utilized to make edible oil and animal feed, apart from its usage in textiles and clothing sector (<https://news.un.org>). Cotton is the main source of raw material for many textile industries. Although it has been replaced by the synthetic fibers to some extent it remained as major plant-based fiber for textile and apparel industry not only in India but across the globe (Suvagiya and Khunt 2020).

Gujarat, Maharashtra and Telangana are the three leading cotton growing states in India with the production of 94.97, 84.09 and 53.13 lakh bales respectively in the year 2022-23 ([cotcorp.org.in](http://cotcorp.org.in)). Telangana is the third largest producer of cotton in India. It is a major crop of the state next to paddy, accounting 32.77% of total gross cropped area (74.78 lakh hectares) (Planning Department, Government of Telangana's state statistical abstract 2020-21). Concentration of the cotton processing industries were also quite abundant in the state, after the state formation the number of ginning mills increased to 300 hundred and spinning industry of the state has an aggregate capacity of about one million spindles (Guruprasad and Chattopadhyay 2014). Telangana is also one of the important states in the weaving industry. There are about 50,000 power looms, 17,000 handlooms and skilled labor force working in the state ([invest.telangana.gov.in](http://invest.telangana.gov.in)).

There are five phases in the processing of the cotton which are important to obtain cloth from the cotton. Processing of cotton begins at ginning mill followed by spinning, weaving, dyeing and printing, and garmenting stages. As these processing units are inseparable from the value chain of cotton it is equally important to understand the financial health and profitability of these processing units. In order to examine the profitability of the processing units engaged in the cotton value chain, the current study has been undertaken.

## MATERIALS AND METHODS

Adilabad and Nalgonda Districts were intentionally selected for the study based on concentration of the processing units as many processing units located in these districts.

Processing of cotton takes place in five different stages namely ginning (separation of the cotton fiber from the seed cotton), spinning (producing yarn from the extracted fiber), weaving (conversion of yarn to greige fabric), dyeing and printing (conversion greige fabric into finished fabric) and garmenting (conversion of finished fabrics to various forms of clothes). A sample of 10 ginning mills, 10 spinning mills, 10 weaving mills, one dyeing and printing mill and one garmenting manufacturing unit were selected to get the necessary primary data. The data were gathered from all respondents by using well-structured and pretested schedule by personal interview method for the financial year 2021-22.

### Break-even analysis

To study and understand profitability of cotton processing units, break even analysis is used. The minimum quantity of the raw material, an industry has to process to run the business neither loss nor profit level was referred to be the breakeven quantity (Reddy *et al.* 2004). The relative economic efficiency of processing units can be judged based on the break-even quantity. It gives the interrelationship among the total revenue, cost and profit.

Margin of safety is a concept which associated with the breakeven analysis. The margin of safety indicates the quantity of the raw material processed over and above the break-even quantity. If margin of safety is high, which indicates the strength and shock absorbing capacity of the units. It is worked out by taking the difference between actual quantity processed and quantity at break-even point.

$$\text{BEP} = F \div (P - V)$$

Where, BEP= Break-even point

F = Fixed cost (Rs)

P = Price per unit (Rs)

V = Variable cost per unit (Rs)

Margin of safety = Total quantity – Quantity at BEP

### Annual income statement

Income statement is technically defined as overview of receipt and gains minus expenses and losses. It is prepared for the entire one year. It is useful to under-

stand business performance over time and is used to calculate profitability ratios for the various business units (Reddy *et al.* 2004).

### Profitability ratios

To examine the profitability of processing units engaged in value chain of cotton the following ratios were used.

#### Gross profit margin

It indicates profit accrued to the processing units after deducting direct cost of processing. It also conveys the per cent of direct cost towards processing.

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Sales}}$$

#### Operating profit margin

It indicates profit of processing units after deducting direct cost-plus administrative expenses. It is also called as earnings before interest and tax (EBIT).

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Sales}}$$

#### Pre-tax margin

It indicates the profit before paying tax. The processing units' interest expenses are indicated by the difference between operational profit margin and pre-tax margin. This shows the capital expenditure

cost which is very important in investment decisions.

$$\text{Pre-tax margin} = \frac{\text{PBT}}{\text{Sales}}$$

#### Net profit margin

It specifies the actual profit that is left with the processing unit after all expenses met. It is used to compare the tax structure of different countries or states or regions and it has implications in policy making for the growth and development of the sectors.

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Sales}}$$

## RESULTS AND DISCUSSION

The breakeven quantity and profitability ratios of the processing units, involved in the processing of cotton were worked out and the findings are presented in Tables 1 - 3 respectively. For the purpose of estimating the profitability ratio, the annual income statement is required, and it is depicted in Table 2.

### Profitability of ginning units (conversion of seed cotton to lint)

#### Break-even analysis of the ginning mills

Actual quantity of seed cotton processed in the ginning mills was greater than the calculated break-even quantity. The break-even quantity for the sample ginning mills was 12,931.42 quintals of seed cotton

**Table 1.** Break-even analysis of the processing units.

| Particulars                         | Ginning stage   | Spinning stage  | Weaving stage | Dyeing and printing stage | Garmenting stage |
|-------------------------------------|-----------------|-----------------|---------------|---------------------------|------------------|
| Fixed cost (Rs)                     | 66,17,125.26    | 9,39,19,517.86  | 13,25,366.50  | 7,40,657.89               | 27,12,600.00     |
| Variable cost (Rs/q)                | 9,844.47        | 29,140.26       | 43,961.63     | 65,430.65                 | 1,04,796.41      |
| Price (Rs.)                         | 10,356.18       | 34,000.00       | 51,831.95     | 73,600.00                 | 1,30,139.29      |
| Contribution margin (Rs/q)<br>(3-2) | 511.71          | 4,859.74        | 7,870.32      | 8,169.35                  | 25,342.87        |
| Actual quantity processed (q)       | 59,900.00       | 54,570.00       | 514.20        | 285.33                    | 190.22           |
| Break even quantity (q)             | 12,931.42       | 19,326.05       | 168.40        | 90.66                     | 107.04           |
| Margin of safety (q)                | 46,968.58       | 35,243.95       | 345.80        | 194.66                    | 83.18            |
| Break even percentage (%)           | 21.59           | 35.42           | 32.75         | 31.78                     | 56.27            |
| Break even returns (Rs)             | 13,39,20,116.82 | 65,70,85,536.51 | 87,28,532.96  | 66,72,797.62              | 73,22,984.01     |

**Table 2.** Annual income statement of the processing units.

| Particulars                        | Ginning stage<br>(in crores) | Spinning stage<br>(in crores) | Weaving stage<br>(in lakhs) | Dyeing and<br>printing stage<br>(in lakhs) | Garmenting stage<br>(in lakhs) |
|------------------------------------|------------------------------|-------------------------------|-----------------------------|--|--------------------------------|
| Gross revenue                      | 62.03<br>(100.00)            | 185.54<br>(100.00)            | 266.52<br>(100.00)          | 210.00<br>(100.00)                         | 247.55<br>(100.00)             |
| COGS                               | 56.34<br>(90.82)             | 144.88<br>(78.08)             | 209.85<br>(78.74)           | 182.39<br>(86.85)                          | 190.35<br>(76.89)              |
| Gross profit                       | 5.69<br>(9.18)               | 40.66<br>(21.92)              | 56.67<br>(21.26)            | 27.62<br>(13.15)                           | 57.20<br>(23.11)               |
| Marketing and<br>sales expenditure | 0.61<br>(0.99)               | 1.27<br>(0.68)                | 3.24<br>(1.21)              | 0.61<br>(0.29)                             | 6.93<br>(2.80)                 |
| Office and<br>administrative       | 0.32<br>(0.51)               | 4.14<br>(2.23)                | 2.97<br>(1.11)              | 1.33<br>(0.63)                             | 7.27<br>(2.94)                 |
| EBITDA                             | 4.76<br>(7.68)               | 35.25<br>(19.00)              | 50.47<br>(18.94)            | 25.67<br>(12.23)                           | 43.00<br>(17.37)               |
| Depreciation                       | 0.23<br>(0.37)               | 4.01<br>(2.16)                | 3.10<br>(1.16)              | 1.46<br>(0.69)                             | 4.50<br>(1.82)                 |
| EBIT (operational<br>profit)       | 4.54<br>(7.31)               | 31.24<br>(16.84)              | 47.37<br>(17.77)            | 24.22<br>(11.53)                           | 38.50<br>(15.55)               |
| Interest                           | 2.13<br>(3.44)               | 14.11<br>(7.61)               | 20.16<br>(7.56)             | 8.31<br>(3.96)                             | 17.42<br>(7.04)                |
| PBT                                | 2.40<br>(3.87)               | 17.13<br>(9.23)               | 27.22<br>(10.21)            | 15.90<br>(7.57)                            | 21.08<br>(8.52)                |
| Income tax                         | 0.69<br>(1.12)               | 5.11<br>(2.76)                | 5.54<br>(2.08)              | 2.10<br>(1.00)                             | 3.70<br>(1.49)                 |
| Net profit                         | 1.71<br>(2.75)               | 12.02<br>(6.48)               | 21.68<br>(8.13)             | 13.80<br>(6.57)                            | 17.38<br>(7.02)                |

Note: Figures in parentheses indicate the percentage.

which was 21.59% of the total quantity of seed cotton processed by the ginning mills. Margin of safety for the sample ginning mills was 46,968.58 quintals shows that selected ginning mills have sufficient shock absorbing capacity (Table 1).

#### ***Annual income statement of the ginning mills***

The income statement of the ginning mills is represented in the Table 2. The gross revenue of the sample ginning mills was Rs 62.03 crores and gross profit was Rs 5.69 crores. The operational profit i.e., earnings before interest and tax (EBIT) was Rs 4.54 crores, profit before tax was Rs. 2.40 crores and net profit was Rs 1.71 crores. Among the expenditures the cost of the good sold (COGS) had a maximum share of 90.82% followed by interest expenditure of 3.44% of the gross revenue.

#### ***Profitability ratios of ginning mills***

The result in the Table 3 revealed that gross profit

margin was 9.18% which indicates profit accrued to the ginning mills after deducting direct cost of processing i.e., 90.82%. Operating profit margin was estimated at 7.31% indicates profit of ginning mills after deducting direct cost-plus additional expenses. The difference between gross profit margin and operating profit margin (1.87%) shows other expenditure in processing of seed cotton to lint.

The pre-tax margin, which was determined to be 3.87%, represents the profit before paying taxes. The difference between operational profit margin and pre-tax margin was about 3.44% which indicates the ginning mills' interest costs. Net profit margin of 2.75% indicates the actual profit that is left with the ginning mills after all expenses met including taxation. The difference between pre-tax margin and net profit margin i.e., 1.12% indicates per cent of sales spent as taxes. The results of the study were comparable to those from Dhandapani and Babu's (2013) investigation into the financial performance of cotton mills, which reported an operating ratio of 6.95 % and

**Table 3.** Profitability ratios of the processing units.

| Particulars             | Ginning stage | Spinning stage | Weaving stage | Dyeing and printing stage | Garmenting stage |
|-------------------------|---------------|----------------|---------------|---------------------------|------------------|
| Gross profit margin     | 9.18          | 21.92          | 21.26         | 13.15                     | 23.11            |
| Operating profit margin | 7.31          | 16.84          | 17.77         | 11.53                     | 15.55            |
| Pre-tax margin          | 3.87          | 9.23           | 10.21         | 7.57                      | 8.52             |
| Net profit margin       | 2.75          | 6.48           | 8.13          | 6.57                      | 7.02             |

a gross profit ratio of 6.54 for the year 2009–2010.

### **Profitability of spinning units (processing of lint to yarn)**

#### ***Break-even analysis of the spinning mills***

The break-even quantity for the sample spinning mills was 19,326.05 quintals of lint which was 35.42% of the total quantity of lint processed by the spinning mills. The margin of safety was about 35,243.95 quintals and it is indicating the strength and shock absorbing capacity of the spinning mills (Table 1). The above results are in accordance with Sharma *et al.* (2010) reported break-even point at 41.95% for rice processing units.

#### ***Annual income statement of the spinning mills***

As indicated in the Table 2, The gross revenue of the sample spinning mills was Rs 185.54 crores and gross profit was about Rs 40.66 crores. The operational profit was Rs 31.24 crores, profit before tax was Rs 17.13 crores and net profit was Rs 12.02 crores. Among the expenditures the cost of the good sold (COGS) had a maximum share in gross revenue estimated as 78.08%.

#### ***Profitability ratios of spinning mills***

Gross profit margin was estimated at 21.92% shows profit accrued to the spinning mills after deducting direct cost of processing. Operating profit margin worked out to be 16.84% indicates profit of spinning mills after deducting direct cost-plus additional expenses (Table 3).

Pre-tax margin indicates the profit before taxation worked out to be 9.23% for the sample spinning mills and net profit margin approximated at 6.48% indicates the actual profit that is left with the spinning mills after all expenses met including taxation. It can be concluded that the spinning mills were in profitable conditions. Similar findings were made by Sridhar (2019), who reported an average gross margin of 26.18% in their study.

### **Profitability of weaving units (processing of yarn to greige fabric)**

#### ***Break-even analysis of weaving mills***

The break-even quantity of the weaving units was 168.40 quintals of yarn which was 32.75% of the actual quantity of yarn processed. The margin of safety was about 345.80 quintals (Table 3). The above results were in similarity with detailed project report on auto loom/rapier loom textile prepared by Bureau of Energy Efficiency (2010a). It revealed that break-even point of power loom unit in the first year of establishment was 26.88%.

#### ***Annual income statement of the weaving mills***

As shown in Table 2 the gross revenue of the mills was Rs 266.52 lakhs and gross profit was Rs 56.67 lakhs. The operational profit was Rs 47.37 lakhs, profit before tax amount was Rs 27.22 lakhs and net profit was Rs 21.68 lakhs. Among the expenditure the cost of the good sold (COGS) had a maximum share of 78.74% followed by interest expenditure 7.56%.

#### ***Profitability ratios of the weaving mills***

Gross profit margin worked out at 21.26% indicates profit accrued to the weaving mills after deducting direct cost of processing. Therefore 78.74% was the direct cost incurred towards processing of lint to greige fabric. Operating profit margin was obtained at 17.77% indicates profit of the weaving mills after deducting direct cost-plus additional expenses. Pre-tax margin of 10.21% indicates the profit before taxation.

Net profit margin was calculated at 8.13% shows the actual profit that is left with the weaving mills

after all expenses met including taxation. The difference between pre-tax margin and net profit margin i.e., 2.08% of sales spent as taxes (Table 3). It can be concluded that the weaving mills are in profitable condition. The aforementioned results were consistent with a study on the profitability of handloom cooperative societies by Mishra and Mohapatra (2020), which indicated a gross profit ratio of 17.68% and a net profit ratio of 9.50% in the fiscal year 2016–17.

#### **Profitability of dyeing and printing unit units (processing of greige fabric to finished fabric)**

##### ***Break-even analysis of the dyeing mill***

As depicted in Table 1, the break-even quantity of the dyeing mill was 90.66 quintals of greige fabric which was 31.78% of the actual quantity of greige fabric processed. The margin of safety was about 194.66 quintals of greige fabric. The following results are on par with the results of detailed project report on provision of insulation on dust collector in thermopac prepared by Bureau of Energy Efficiency (2010b).

##### ***Annual income statement of dyeing mill***

The gross revenue of the mill was Rs 210.00 lakhs and gross profit was Rs 27.62 lakhs. The operational profit was Rs 24.22 lakhs, profit before tax was Rs 15.90 lakhs and net profit was Rs 13.80 lakhs. Among the expenditure the cost of the good sold (86.85%) had a maximum share in gross revenue followed by interest expenditure of 3.96% (Table 2).

##### ***Profitability ratios of dyeing mill***

Gross profit margin was estimated at 3.15% indicates profit accrued to the dyeing mill after deducting direct cost of processing. Operating profit margin of 11.53 indicates profit of dyeing mill after deducting direct cost along with additional expenses. Pre-tax margin was obtained at 7.57% indicates the profit before paying tax. Net profit margin worked out as 6.57% shows the actual profit that was left with the dyeing mill after all expenses met including taxation. The above result suggests that the dyeing mill was operating in profitable condition (Table 3).

#### **Profitability of garment manufacturing unit (processing of finished fabric to garments)**

##### ***Break-even analysis of the garment manufacturing unit***

As shown in Table 1, actual quantity of finished fabric processed in the garment manufacturing unit was greater than the calculated break-even quantity. The break-even quantity was 107.04 quintals of finished fabric which was 56.27% of the total quantity of finished fabric processed by the unit. The margin of safety was approximated at 83.18 quintals. The above-mentioned outcomes are in concurrence with the study of textile industry in Bangladesh: An analysis of CVP by Ali and Ul-Huq (2016) found average margin of safety percentage was 53.59% in the financial year 2013.

##### ***Annual income statement of the garment manufacturing unit***

It is evident from data in Table 2 that the gross revenue of the garment manufacturing unit was Rs 247.55 lakhs and gross profit was Rs 57.20 lakhs, earnings before income and tax also called as operational profit was Rs 38.50 lakhs, profit before tax amount was Rs 21.08 lakhs and net profit was Rs 17.38 lakhs. Among the expenditure the cost of the good sold (76.89%) had a maximum share in gross revenue followed by interest expenditure (7.04 %).

##### ***Profitability ratios of the garment manufacturing unit***

Profitability ratios for the garment manufacturing unit were estimated and depicted in Table 3. Gross profit margin obtained at 23.11% indicates profit of the garment manufacturing unit after deducting direct cost of processing. Operating profit margin of 15.55% indicates profit of garment industry after deducting direct cost and additional expenses. Pre-tax margin estimated at 8.52% shows the profit before taxation of the unit.

Net profit margin indicates the actual profit that is left with the unit after all expenses met including taxation. Which was calculated at 7.02%. From the

above results it can be deduced that the garment manufacturing unit is in profitable condition. The results were in conformity with the results of project report on garment manufacturing prepared by Verma (2021) obtained EBITDA as 16.38%, PBT as 12.00% and PAT at 10.00% in the tenth year of establishment.

## CONCLUSIONS

The processing units involved in cotton processing namely, ginning mill, spinning mill, weaving mill, dyeing and printing mill and garment manufacturing unit are in better financial condition as indicated by the breakeven analysis and profitability ratios and have sufficient shock absorbing capacity as shown by margin of safety. Break even quantity was highest in garment manufacturing unit (56.27%) followed by spinning mills (35.42%), weaving mills (32.75%), dyeing mill (31.78%) and least in ginning mills (21.59%) indicates that ginning mill covers all its cost by processing lesser quantity of raw material compared to garment manufacturing unit. Gross profit margin was highest in garment manufacturing unit (23.11%) followed by spinning mills (21.92%) weaving units (21.26%), dyeing mill (13.15%) and ginning mills (9.18%). Net profit margin was highest weaving mills (8.13%) followed by garment manufacturing unit (7.02%), dyeing mill (6.57%), spinning mills (6.48%) and least in ginning mills (2.75%).

However, the processing units are facing some of problems like high cost of machinery, higher rate of interest, higher working capital requirement, shortage of electricity. As a result, the study suggests that the government should provide subsidies to the processing unit for the purchase of modern equipment. Additionally, as the majority of work is done with power, a steady supply of electricity should be guaranteed.

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