Journal of Social and Economic Statistics

No.1, Vol.1, Summer 2012

CAPACITY UTILIZATION IN SMALL SCALE INDUSTRIES OF INDIA: SOME EMPIRICAL EVIDENCES FROM UNDERDEVELOPED INDUSTRIAL STRUCTURE

Hemanta SAIKIA [a]

Abstract

Capacity utilization is measured by simple indicators such as the output gap, based on installed capacity, which lacks both consensus and precision. The simple measure of capacity output has limited use as it overlooks problems such as seasonal grown-up of certain proportions; expansion of capacity due to fresh investment unavailability of install capacity to all units.. Therefore, direct measure of capacity utilization has several limitations. There is a lot of study on small-scale industries in India, but most of the studies use the direct measures of capacity utilization. So looking at above picture, this study attempts to incorporate some indirect estimating measures of capacity utilization such as trend-through-peak method, filter or trend based methods depending upon the availability of data. In this study is an endeavor to examine the performance of small industries especially the capacity utilization measured through various contemporary tools.

Keywords: capacity utilization, investment, capital.
JEL Classification: D920, J160, D240

Author's Affiliation

[a] - Assistant Professor, Department of Economics, Debraj Roy College, Golaghat-785621 Assam, India, Ph No-9435150739, hemantaassam@yahoo.com

1. Introduction

Industrialization is not a single, linear process. It is not simply a matter of the gradual accumulation of machinery and technology. The industrial development brings about transformation in the methods of production from hand mechanism to work done by machines and work done at home to production at bulky factories. Moreover, the developed countries of the Europe had expanded at a large scale from such industrial innovation and development for which about 74 percent of the world's industrial output takes place in the developed world (World Resource Institute, 1999, pp. 62). However, the majority of the Africa and South Asian economies received a little assistance from such industrial revolution.

In the latter part of the 20th century, the end of colonialism has stimulated awareness and concern over underdevelopment. Nevertheless, despite such overwhelming evidence of manufacturing success in developing countries, a substantial part of the world remains at risk of failing to establish a vibrant, competitive industrial economy. In the process of alteration from underdevelopment to development, the aspiration to lessen poverty has had a promising predominance over the desire to recognize, why some countries are prosperous and other underprivileged. Simultaneously, humanizing and sustaining growth in poor countries is a challenge not only because of economic strategies of these countries to support and maintain growth is difficult, but also because these need has to be supported by governance capabilities, which in poor countries are equally weak (Khan, 2008, pp.). However, from the point of view of production per head, this shift is less impressive and the change in the structure of production in these countries toward the industrial sector has not accompanied by similar changes the occupational change in the industrial structure of the labour force. For evidence, the share of the industrial sector has in India has increased from 29.1 per cent in 1990 to 26.2 percent in 2004 (Economic Survey, 2011, pp. 137). In contrast, they still almost 58 per cent people are engaged in the agricultural sector which is mainly due to the high population growth and pressure on the agriculture sector. In this paper an attempt has been made to estimate and analyze the capacity utilization in small scale industries of India in general and the State of Assam in particular where industrial development lagging behind.

In India, small-scale industrial sector is defined as an industrial undertaking, in which the investment in fixed assets in plant and machinery does not exceed Rs. 1 crore. The Government of India has enhanced this investment limit of Rs. 1 crore to Rs. 5 cores as small-scale industry, in respect of certain specified items. The small-scale industries have played a very important role in the socio-economic development of India during the past 50 years. It has significantly contributed to the overall growth in terms of the Gross Domestic Product (GDP), employment generation and exports. The performance of the small-scale industries, therefore, has a direct impact on the growth of the overall economy. In India, SSIs constitutes 95 per cent of the industrial units and contributes 40 per cent to the total industrial output of the country and 35 per cent of the direct export. There are about 3.6 million small-scale industrial units in India and these have employed approximately 19.3 million people, which is second highest next to agriculture (MSME, 2010). However, the growth of small-scale industries in the country is not evenly distributed among the states.

The growth of small-scale industries in the North Eastern Region of India is slow in comparison to the other parts of the country. The development pattern of the small-scale industries of the region is far from encouraging, and these are plagued by innumerable problems. The level of sickness of the sector is quite high, and this is being aggravated by the basic structure of industrial sector. In case of Assam, the scenario of small-scale industry is very underprivileged about growth, and production is concerned. The importance of this sector for a populous state like Assam stems from the fact that this sector is labour intensive and is therefore seen as an important source of generating the employment opportunities both for skilled and unskilled labour force. According to Economic Survey of Assam (2007-2008), there is 27,913 small-scale industrial units in Assam and providing employment to 1, 31,099 persons until 2006-2007, which are only 0.50 per cent of total population. So the contribution of SSIs in terms of employment in Assam is negligible and under privilege. In this framework, factors of production play a unique and decisive role in the production of goods and services. However, not only factors of production but also capacity utilization has been comprehensively used in the literature and is an extremely useful indicator of industrial

performance as it pictures both the use of scarce resources as well as the state of demand. Capacity utilization measures the proportion of available productive capacity of an economic unit that is currently utilized. The industry-wide capacity utilization is used to determine whether production conditions are rigid or flexible and thus whether restrictive or expansionary macroeconomic policies would be effective and also in assessing the future investment demand that trend to vary directly with the increase in capacity utilization. Market demand as well determines positively to capacity utilization. Excess capacity means that insufficient demand exists to warrant expansion of output.

On this study is an endeavor to examine the performance of small industries especially the capacity utilization measured through various contemporary tools. The main objectives of the paper are: (a) to analyze the trend and pattern of capacity utilization in small-scale industries in Assam; (b) to analyze the inter relationship between factor proportion, productivity and capacity utilization of small-scale industries in Assam (c) to highlight the problems of small-scale industries in Assam and to provide suggestive inputs.

2. Methodology

For carrying out the study, the state of Assam is being selected. The justification of the location selection is that the entire North Eastern states are industrially backward. There is not so much industry apart from some large-scale industries. However, the small-scale industries have played a vital role in the process of industrialization and employment generation in Assam. The study is based on the both primary and secondary data. Secondary data are collected from the publications of various organizations viz. National Sample Survey Organization (NSSO) data, Govt. of Assam publications, Ministry of Small-Scale Industry, Government of India, Directorate of Economics and Statistics, research publications of individual and institutional etc. A sample survey was also simultaneously conducted to measure the structure of SSIs. The primary data is collected by undertaking field study for investing the factor proportion and productivity on small-scale industries of Assam. For present study, the sample survey is conducted following multi stage sampling. In this study in the first stage, five districts are randomly selected out of 25 districts namely: Kamrup, Jorhat,

Golaghat, Dibrugarh and Lakhimpur district. In the 2nd stage about log proportionate sample size is collected from the districts, and the registered small-scale industries from each district is selected, which generates about 220 units.

3. Theoretical Framework:

To analyze the capacity utilization of the SSIs in Assam, various three main indirect methods of measuring the capacity utilization are employed:

a) Wharton School of Economics;

b) Minimum Labour Output ratio Method;

c) Minimum Capital Output ratio Method.

3.1. Wharton School of Economics:

This method has been developed by Klien for Wharton Econometric Forecasting Association (WEFA). In this method, entire time-series data on level output of different manufacturing firms on a graph is plotted. Then Peak level outputs are identified through inspection assuming that these peaks represent the output level obtained at 100 percent level of utilization. Afterwards, a straight line is drawn joining in the same manner to represent capacity output. Given these capacity output levels, rates of capacity utilization are calculated as the ratio of actual output and capacity output shown by the point on the straight line of the same year. The capacity utilization is aggregated at the industry level for a manufacturing sector as a whole using output added as weight.

However, as mentioned above this method has suffered from certain weakness; for which two other variants of this method are employed, which is expected to help in overcoming these weaknesses. Klein and Preston suggested a modified method. According to this method if p_t is defined as a ratio of observed value of output (X_t) to the computed value of output ($\hat{X}_t$), which is the value of Wharton Index (W_{hi}) of the individual industry then,

$$W_{hi} = \alpha + \beta p_t + k_t \qquad (1)$$

In the case of those industries where the regression coefficient of k is positive and significant advocated the presence of the unaccounted elements of bias. Therefore, the adjusted Wharton Index can be computer where bias is observed as.

$$\widehat{W}_{hi} = W_{hi} - k_t \quad (2)$$

This is the first variant of the Wharton Index which is used in the study. In the second variant, the entire time series to estimate the output trends rather than only the peaks is used. Therefore, this method uses the entire time series. After estimating the trend line the difference between X_t and $\hat{X}_t$ are calculated. From these differences $(X_t - \hat{X}_t)$ the maximum positive deviation is observed, and this value is added in the intercept. This procedure shifts the capacity line upward with the same slope. Therefore, capacity utilization rates are estimated from this modified capacity line.

3.2. Minimum Labour Output Ratio Method

The minimum labour output ratio method is based on the supposition that there exists the steady relationship in between labour and potential output. Therefore, any fluctuation in the labour and output ratio arises essentially due to deviation in the actual output from potential output to estimate capacity utilization with the help of the method, a time series of Labour Output Ratio (L/Y) at constant prices is constructed. From this series, a base year is selected in which the value of L/Y is minimum (L*/Y*). Given the lowest value of labour - output ratio, the capacity output for another time period is calculated by dividing the real labour of that year (L_t) by the lowest value of labour output ratio(L*/Y*). The ratio of utilization is obtained by dividing actual output of that year (Y_t) by the estimated output ($\hat{Y}_t$) Given the lowest value of labour output ratio.

$\hat{Y}_t = \frac{L_t}{\left(\frac{L^*}{Y^*}\right)}$ and the utilization is calculated as $U_t = \frac{Y_t}{\hat{Y}t}$

As most of the SSIs are labour intensive and so labour can be best applied for estimating the capacity utilization along with the lowest capital output ratio method.

3.3. Minimum Capital Output Ratio Method

The minimum capital output ratio method is based on the supposition that there exists the steady relationship in between stock of capital and potential output. Therefore, any fluctuation in the capital and output ratio arises essentially due to deviation in the actual output from potential output. The minimum capital output ratio method is an improvement over the Wharton Index of capacity utilization because it relates the fluctuation in the output with investment activities. To estimate capacity utilization with the help of the method, a time series of the capital-output ratio (K/Y) at constant prices is constructed. From this series, a base year is selected in which the value of K/L is minimum (K*/Y*). Given the lowest value of the capital-output ratio, the capacity output for another time period is calculated by dividing the real capital stock of that year (K_t) by the lowest value of capital output ratio(K*/Y*). The ratio of utilization is obtained by dividing actual output of that year (Y_t) by the estimated output ($\hat{Y}_t$) given the lowest value of capital output ratio.

$$\hat{Y}_t = \frac{Kt}{\left(\frac{K^*}{Y^*}\right)} \text{ and the utilization is calculated as } \hat{U}_t = \frac{Y_t}{\hat{Y}_t}$$

A modified version of this method was developed by Panic. The modification is that after constructing time series of capital output ratios at constant, a linear trend is fitted. The capacity-output ratio is taken to be the point on the trend line with the time derivative raised just enough so that it touches only one of the observed (K_t / Y_t) series.

In this study, five different methods of capacity utilization are used. However, all these methods use time-series analysis of estimating the capacity utilization, and sample data are cross section. For that, the Wharton School of Economics and minimum capital output ratio method are used for different group of industries. Even so, in determining the Peak level output, the regression method is used rather drawing a straight line to represent capacity output. Given these capacity output levels, rates of capacity utilization are calculated as the ratio of actual output and capacity output shown by the point on the regression line. If any observation is beyond the regression line, it is considered as using 100 per cent capacity.

4. Results and Discussion

In the context of present study, four different approaches of capacity utilization are used for estimation of capacity utilization. Firstly, Wharton method of capacity estimation and its variant-II is used followed by Minimum Capital Output ratio method and Minimum Labour Output ratio method. The 'Wharton method variant-I' is not used in the present study for which time series data is required.

Table 1. Industrial Category wise Capacity Utilization in Sample SSIs

Categories	Wharton method	Wharton method variant –II	Minimum C/O ratio method	Minimum L/O ratio method	Composite Average	SD
Repairing	44.25	45.56	46.36	44.71	45.22	0.93
Agro Based	26.24	55.51	60.85	57.17	49.94	15.96
Manufacturing	22.547	19.02	21.28	22.56	21.35	1.67
Forest Based	36.25	38.09	38.86	37.04	37.56	1.15
Chemical Based	40.387	41.98	44.07	41.04	41.87	1.61
Engineering Based	48.70	49.50	51.03	49.56	49.70	0.97
Textile Based	30.87	32.70	32.13	31.05	31.69	0.87
Rubber/Plastic Based	50.04	48.58	53.46	47.15	49.81	2.71
Others	25.14	24.11	26.13	55.54	32.73	15.23
Average	39.48	39.45	41.57	39.43	39.98	NA
Maximum	57.17	55.51	60.85	55.54	57.27	NA
Minimum	22.55	19.02	21.28	22.56	21.35	NA
SD	11.78	12.18	13.13	11.11	12.05	NA

Source: Calculated from data of field survey

From the table 1, the composite average capacity utilization in SSIs of the field survey data is 39.98 per cent with standard deviation of 12.05. The simple Wharton method represents on average capacity utilization in SSIs is 39.48 per cent followed by Wharton method variant II (39.45). The highest average capacity utilization is found for minimum capital ratio method (41.57).

Table 2. Cross Correlation Matrix of different Methods

Methods	Wharton method	Wharton method variant –II	Minimum C/O ratio method	Minimum L/O ratio method
Wharton method	1.000			
Wharton method variant –II	0.99*	1.000		
Minimum C/O ratio method	0.99*	0.98*	1.00	
Minimum L/O ratio method	0.99*	0.99*	0.99*	1.00

**Significant at 5 per cent level of significance.*

The diversion between the CU of different industries based on Wharton measures and Capital-Output ratio based method emerges because Wharton measures only account for changes in the output, whereas the measures based on Capital-Output ratio methods account for both the changes in output and changes in the productive capacity also (fixed assets). Therefore, the industries which have registered wide changes in their CU between Wharton measures and Capital-Output Ratio measures, suggest that in these industries, output has either increased faster than the expansion in the capacity (for those industries which have improved (their ranking in the capital- output ratio measures or output has increased at slower speed than the expansion in the capacity (in the case of industries which have lower ranks in the terms of capital-output ratio based measure, in comparison to Wharton measures). At the same time, the cross correlations of the above three methods are high and are significant at two tailed test. Therefore, four methods have strong correlation and representing the same measurement.

In order to know, how far the rates of utilization of capacity were stable over time for different industries, standard deviation of capacity utilization is being calculated. From the standard deviation of all four methods, the Minimum Labour Output method has lowest standard deviation of 11.11 and so may be considered as one of the better method of the capacity utilization for SSIs in Assam. In this method Agro based industries used highest capacity utilization (57.17 per cent) followed by other industrial group with 55.54 per cent

capacity utilization. The manufacturing industry utilizes the lowest capacity utilization with 22.56 per cent.

Higher average rates of capacity utilization with higher degree of stability in the rates of utilization, viz. the industries like Repairing, Engineering Based, and Chemical Based etc. In the case of these industries, actual rates of utilization arc very close to the high average rates of capacity of utilization. The other set consists of industries with higher average rates of utilization accompanied by higher degree of instability in the rates of utilization of capacity, like Agro Based, Others, Rubber/Plastic Based etc.

4.1. Capacity Utilization-Wise Number of Small Scale Industries

The distribution of industries in terms of capacity utilization revealed that about 47.64 percent units are utilizing only 20 to 40 per cent of total capacity and 32 per cent units in the CU range 40 to 60 per cent. The lowest numbers of units are found in the range of 80 per cent-100 per cent.

Table 3. Number of SSIs in various Capacity Utilization Ranges

Capacity Utilization Range (%)	Wharton method	Wharton method variant - II	Minimum C/O ratio method	Minimum L/O ratio method	Percentage (per cent)
(I)	(II)	(III)	(IV)	(V)	(II+ III+ IV+ V)/4
0-20	20	24	18	26	10.82
20-40	98	106	110	107	47.64
40-60	80	70	65	74	32.09
60-80	15	11	20	6	6.09
80-100	7	9	7	7	3.36
Total	220	220	220	220	-

Source: Calculated from data of field survey

The investment wise CU reflects that with the increase in investment in plant or machinery the CU are declined and it is seemed to be constant in the early range of 2-5 lakhs and than starts falling in the subsequent ranges of investment.

Table 4. Investment wise Capacity utilization in SSIs (In percent)

Investment Ranges (In Lakhs)	Wharton method	Wharton method variant –II	Minimum C/O ratio method	Minimum L/O ratio method	Average
(I)	(II)	(III)	(IV)	(V)	(II+ III+ IV+ V)/4
Less than 2	45	40	39	37	40
2 to 5	50	52	52	53	51
5 to 10	51	50	50	51	51
10 to 25	41	42	43	41	42
25 to 50	39	39	37	40	39
50 to 75	37	33	36	35	35
75 to 75+	25	21	20	21	21
Average	41.57	39.45	39.48	39.43	40

Source: Calculated from data of field survey

In case of urban and rural areas, the CU is 43.25 per cent and 36.72 per cent respectively. It indicates that in rural areas the CU is lower as compared to urban areas in all four measures of capacity utilization.

Table 5. Area wise Capacity Utilization in SSIs (In per cent)

Area	Wharton method	Wharton method variant –II	Minimum C/O ratio method	Minimum L/O ratio method	Composite average
(I)	(II)	(III)	(IV)	(V)	(II+ III+ IV+ V)/4
Rural	38.14	32.90	36.96	38.86	36.72
Urban	45.00	46.00	42.00	40.00	43.25
Average	41.57	39.45	39.48	39.43	39.98

Source: Calculated from data of field survey

5. Estimation of Capacity Utilization in Assam Based on Secondary Data

Following the same methods of capacity utilization along with the Wharton variant-I, for SSIs of Assam for the time period 2000-2001 to 2008-2009 (table:6), it is found that the composite average capacity utilization of SSIs in Assam are growing steadily. In the middle years the capacity utilization of SSIs are around 55 per cent until 2004-2005. In the time series data, the lowest SD is for Wharton variant-II (14.45).

Table 6. Capacity Utilization of SSIs in Assam

Years	Wharton method	Wharton method Variant –I	Wharton method Variant –II	Minimum C/O ratio method	Minimum L/O ratio method	Average	Growth Rate
	(I)	(II)	(III)	(IV)	(V)	(II+ III+ IV+ V)/4	
2000-01	36.27	35.45	76.99	100.00	41.69	58.08	
2001-02	37.95	37.14	65.26	96.62	41.26	55.65	-4.18
2002-03	38.82	38.82	58.70	99.23	43.81	55.88	0.41
2003-04	44.97	44.97	60.69	77.76	47.83	55.25	-1.13
2004-05	46.68	46.68	56.88	81.61	62.32	58.84	6.50
2005-06	54.37	54.37	60.38	28.46	63.26	52.17	-11.34
2006-07	60.47	60.47	61.69	81.08	63.99	65.54	25.63
2007-08	100.00	99.19	100.00	49.52	100.00	89.74	36.92
2008-09	94.01	93.20	82.50	48.54	100.00	83.65	-6.79
Average	57.06	56.70	69.23	73.65	62.68	63.86	5.75
Max	100.00	99.19	100.00	100.00	100.00	99.84	36.92
Min	36.27	35.45	56.88	28.46	41.26	39.66	-11.34
SD	24.01	23.84	14.45	25.66	23.09	22.21	16.86

Source: Calculated from data of MSME

In time series data, the highest capacity utilization is found for year 2007-2008 and lowest is for the year 2004-2005. Thus from the above analysis it is clear that growth rate of the capacity utilization of SSIs of Assam are almost the same even though the time periods are not same.

6. Factors Affecting the Capacity Utilization

There is paucity of studies regarding identification of different determinants that explain variations in the rates of capacity utilization in SSIs of Assam. Most of the studies until now that have been conducted have analyzed the importance of different determinants for the aggregate manufacturing using cross-section data. The study of Paul (1974) pertains to the cross-section of Indian industries for the year 1965, while the study of Goldar and Ranganathan (1991) deals with the cross-section of Indian industries for the year 1983 has analyzed the cross- section of industry for the year 1986. Although these studies are important contribution towards the understanding of different determinants of capacity utilization at the aggregate level, they are not able to through light on the relative impotence

of these variables for different industries because industry is just one observation in their study. Moreover, these studies have not identified determinants of capacity utilization from the investment decision of the firm based on the methodology evolved by Marris (1964) and expanded by other economists (Winston,1971) end Lecraw (1978)|.

Generally a lots of factor involves in the determining the capacity utilization. However, in this study the possible determinants of CU in the SSIs of Assam are investigated using regression analysis. Two multiple regression is conducted where first one analyze the factors that determine the CU and the inter relationship in between the profit and the CU as the ultimate goal of the firms are to attain a high profit level. The possible factors analyzed include are:

6.1. Regression Model

The linear multiple regression for estimating capacity utilization is

$$\mathbf{CU_i} = \alpha + \beta_1 \mathbf{CI_i} + \beta_2 \mathbf{CP_i} + \beta_3 \mathbf{SV_{3i}} + \varepsilon_i \quad (3)$$

$\mathbf{CU_i}$ = Capacity utilization; α = Intercept; β_i = Regression coefficients; $\mathbf{CI_i}$ = Capital intensity, measured by capital labour ratio; $\mathbf{CP_i}$ = Cost of Production; $\mathbf{SV_i}$ = Sales value; ε_i = Random error

6.2. Results and Discussion

From the regression analysis, it is found that the $\mathbf{R^2}$ and $\bar{\mathbf{R}}^2$ are both high even though extensive cross section data are used. The significant F statistics also reflects that the model fit the data well.

Table 7. Estimated Regression Equation for Estimating factors affecting Capacity Utilization

Variable	Coefficients	t
α	7818.72	0.192
β_1	0.693	0.397
β_2	1.474	11.25*
β_3	4.525	17.25*
F = 39.63* * Significant at 5 per cent level of significance, R^2 = 0.721 $\bar{R}^2$ = .696		

From the coefficient table: 7, F and two variables are found to be significant. Cost of production and Sales value for the product is significant. The coefficient of β_2 is 1.474 indicating that with the increase in the cost of production, the firms are utilizes more capacity of the plants. On the other hand coefficient of β_3 is 4.525 and is highly significant reflecting that with the increase in the sales for the product, the firms enhances their CU.

Residual analysis reflects that the adjusted predicted value and the predicted values are closer to each other. On the other hand, the Cook's Distance is under one and Mahalanobis distance is small. Therefore, over all the regression analysis is rigorous and represents the data well.

Table 8. Residuals Statistics for Estimating factors affecting Capacity Utilization

Values	Minimum	Maximum	Mean	Std. Deviation
Predicted Value	1.489	1.834	1.662	0.244
Std. Predicted Value	1.310	1.079	1.195	0.163
Std Error of Predicted Value	2. 6246	5.000	5.000	0.000
Adjusted Predicted Value	1.522	1.629	1.575	0.076
Mahal. Distance	1.011	3.056	2.034	1.446
Cook's Distance	0.000	0.561	0.281	0.397
Centered Leverage Value	0.260	0.381	0.321	0.086

Source: Calculated from data of field survey

At the same time when the model is being run discarding the capital intensity, the though $\mathbf{R^2}$ and $\mathbf{\bar{R}^2}$ are both increases significantly with 0.89.25 and 87.54 respectively. So

overall, the cost of production and Sales Value for the product is the main factor affecting the capacity utilization in small-scale industries of Assam.

Secondly, the trust is on the way capacity utilization is influencing the profit level of small-scale industries. Therefore, the regression analysis is again used to determine factors affecting the profit level incorporating the capacity utilization as one of the independent variable.

6.3. Regression-II

The linear multiple regression for estimating profit level is

$$\mathbf{PR_i} = \alpha + \beta_1 \mathbf{CI_i} + \beta_2 \mathbf{CP_i} + \beta_3 \mathbf{SV_{3i}} + \beta_4 \mathbf{CU_i} + \varepsilon_i \quad (4)$$

$\mathbf{PR_i}$ = Net Profit level; α = Intercept; β_i = Regression coefficients; $\mathbf{CI_i}$ = Capital intensity, measured by capital labour ratio; $\mathbf{CP_i}$ = Cost of Production; $\mathbf{SV_i}$ = Sales value; $\mathbf{CU_i}$ = Capacity Utilization; ε_i = Random error

6.4. Result and Discussion

From the regression analysis, it is found that the $\mathbf{R^2}$ (0.810) and $\bar{\mathbf{R}}^2$ (0.801) are both high even though extensive cross section data are used. The significant F statistics also reflects that the model fit the data well and analysis is significant.

Table 9. Estimated Regression Equation for Estimating Factors affecting Profit Level

Variable	Coefficients	t
α	- 45678.72	-0.21
β_1	5.0457	6.258*
β_2	-.045	-3.46*
β_3	2.016	4.04*
β_4	0.525	3.04*
F = 12.140* * Significant at 5 per cent level of significance, ** Significant at 10 per cent level of significance R^2 = 0.810 $\bar{R}^2$ = 0.801		

Source: Calculated from data of field survey

From the coefficient table: 9, F statistic and all variables are significant and now capital intensity and Sales value for the products are highly significant. The coefficient of β_1 is 6.2547 indicating that with the increase in the capital intensity the profit level also increase; while positive and significant sales variable is also found in the profit analysis as in the capacity utilization. Importantly even though significant relationship is found for CU as a regressor on profit level but its coefficient is very low and little influence on the profit level.

Residual analysis reflects that the adjusted predicted value and the predicted values are nearer. On the other hand, the Cook's Distance is just under 1 and Mahalanobis distance is also low. Therefore, over all the regression analysis is rigorous and represents the data well.

Table 10. Residuals Statistics for Estimating Factors affecting Profit Level

Values	Minimum	Maximum	Mean	Std. Deviation
Predicted Value	5.96	6.51	11.23	3.73
Std. Predicted Value	5.24	9.71	7.48	1.58
Std Error of Predicted value	3.45	5.25	5.23	1.26
Adjusted Predicted value	6.09	4.66	10.37	3.03
Mahal. Distance	4.04	7.50	15.77	8.29
Cook's Distance	0.05	0.15	3.28	1.25
Centered Leverage Value	1.04	1.43	2.23	0.84

Source: Calculated from data of field survey

It is noted that when the model is run discarding the capital intensity, the though $\mathbf{R^2}$ and $\bar{\mathbf{R}}^2$ are both increases significantly with 0.89.25 and 87.54 respectively. So overall, the cost of production and sales value for the product are the main factor affecting the capacity utilization in small-scale industries of Assam.

Table 11. Reasons behind Underutilization of Capacity in SSIs of Assam

Problems	Rank-1	Rank-2	Rank-3	Rank-4	Rank-5	Rank-6
Power Supply Problem	133 (60.5)	32 (14.5)	12 (5.5)	18 (8.2)	25 (11.4)	24 (10.9)
Lack of Demand	16 (7.3)	25 (11.4)	27 (12.3)	39 (17.7)	107 (48.6)	8 (3.6)
High depreciation Cost	15 (6.8)	19 (8.6)	49 (22.3)	86 (39.1)	34 (15.5)	7 (3.2)

High Raw material Cost	38 (17.3)	62 (28.2)	68 (30.9)	25 (11.4)	25 (11.4)	5 (2.3)
Labour Supply	10 (4.5)	57 (25.9)	14 (6.4)	21 (8.5)	9 (4.1)	5 (2.3)
Supply of raw material	7 (3.2)	24 (10.9)	48 (21.8)	22 (10.0)	17 (7.7)	16 (7.3)
others	1 (0.5)	1 (0.5)	2 (0.9)	9 (4.1)	3 (1.4)	16 155 (70.5)
Total	220 (100)	220 (100)	220 (100)	220 (100)	220 (100)	220 (100)

Source: Field Survey

Note: The data in brackets represents the percentage of industries reporting the problem out of total sample SSIs.

However, data are collected from the units and Power Supply Problem is considered as rank-1 problem by 60.5 per cent units and high raw material cost is considered as rank-1 problem by 17.3 per cent units. On the other hand high raw material cost is considered as second rank problem by 28.2 per cent units followed by labour supply by 25.9 per cent units. Therefore, power supply problem, raw material cost, high depreciation cost are the main problems behind the underutilization of the raw material cost.

7. Problems of the Small Scale Industries

Small Scale industries of Assam are presently facing various problems in comparison with larger units by an inequitable allocation system for scarce raw materials and imported components, lack of provision of credit and finance; low technical skill and managerial ability; and marketing contracts. The emphasis on employment is irrelevant, as the basic thing is the output that the economy needs for its growth. Problems are ranked and according to the consideration and data given by the firms.

Table 12. Ranking of the Problems of SSIs in Assam

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7	Rank 8
Loan From Bank	96 (43.6)	6 (2.7)	16 (7.3)	43 (19.5)	56 (25.5)	18 (8.2)	44 (20.0)	4 (1.8)
Marketing	14 (6.4)	28 (12.7)	25 (11.4)	36 (16.4)	23 (10.5)	50 (22.7)	39 (17.7)	3 (1.4)

Input Problem	30 (13.6)	23 (10.5)	29 (13.2)	43 (19.5)	27 (12.3)	42 (19.1)	31 (14.1)	3 (1.4)
Competition	25 (11.4)	35 (15.9)	26 (11.8)	18 (8.2)	17 (7.7)	21 (9.5)	5 (2.3)	11 (5.0)
Management	21 (9.5)	27 (12.3)	22 (10.0)	51 (23.2)	31 (14.1)	19 (8.6)	34 (15.5)	13 (5.9)
Communication	12 (5.5)	38 (17.3)	72 (32.7)	13 (5.9)	20 (9.1)	36 (16.4)	13 (5.9)	19 (8.6)
Power Supply	18 (8.2)	62 (28.2)	26 (11.8)	7 (3.2)	38 (17.3)	26 (11.8)	28 (12.7)	166 (75.5)
Others	3 (1.9)	0 (0.0)	3 (1.4)	8 (3.6)	7 (3.2)	7 (3.2)	25 (11.4)	4 (1.8)

Source: Field Survey

Accordingly, seven problems: (a) Loan from the bank (b) Marketing (c) Input Problem (d) Competition (e) Management (f) Communication problem (g) Power supply (h) Others, are considered for ranking purpose. From the ranking of various problems, it is 43.6 per cent units consider getting loan from a bank as a major problem for the SSI units. On the other hand, 28.2 per cent units consider interrupted power supply is the second major problems of the SSI units. Communication between the various departments of production is another main problem of the SSIs and considered as third problem by 32.7 per cent units. Similarly, 23.2 per cent units consider management as fourth main problem. Similarly Loan From Bank is the fifth main problem.

8. Conclusion

In Assam, there is not the immediate shortage of funds rather shortage of immediate profitable opportunities. Thus, the question of factor choice can be shifted to choice of appropriate techniques and the choice of viable small-scale industries. Some small-scale industries are getting turf industrial competition from the large-scale industries of other parts of India as well as foreign countries especially in the consumer goods sector. Therefore, it required to analyze industrial performance of small-scale industries in terms of various groups before establishing it. Further, the choice of factor must be viewed both from general economy as well as industry specific point of view as few technologies has the flexibility of choice; as Assam and other developing countries uses the technology developed by the

western countries. The capital labour ratio of SSIs has a significant effect either on the marginal or total cost. The choice of factors governs price of the factors of production as well as their productivity they provide. In SSIs, the native investors get difficulty in raising the funds and since Govt. can decide preference of technology only for the public sector undertaking industries not for the private sector. However, they can influence the price of the factors, which affects the choice mad by the private investors.

Farm level planning is also equally important with the economic planning. As for example, Japan's industrialization was a long extent the outcome of deliberate planning by a small group of firms, which cooperated with each other and with the government. At the same time, development of Infrastructure facilitates is required for most of SSIs in. It is found that some SSIs have no proper building walls. Even production plants lack proper facilities to protect it from climatic damages. There is also required a linkage between commercialization of agriculture and industrial development. The economy of Assam is an ago-based economy and so without proper linkage between agriculture-industry and marketing channels, and it is hard to get the growth of SSIs. In developing countries, generally there exists no unique relationship between the macro policy and micro industrial structure. A policy regime correcting the structural imbalance present in Assam can provide a better environment for development of the small-scale industries in Assam.

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