PRODUCTIVITY OF MICRO MANUFACTURING ENTERPRISES IN CHITTOOR DISTRICT, A.P.

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ABSTRACT

An expected outcome of economic reforms in India is enhanced pace of industrialization with manufacturing sector playing a crucial role by increasing its share in output via higher investments and increased productivity. This process of industrialization was also expected to usher in possibilities for the slow growing states to catch up with the fast growing ones. The productivity of labour is an essential condition for the progress of enterprises. However, Indian MSME sector is facing problems due to which labour productivity is showing decreasing trend in the recent time period. The important factors behind the low productivity of labour are sub optimal scale of operation, technological backwardness, supply chain inefficiency, increasing domestic and global competition, uncertain market scenario, lack of funds, change in the manufacturing technology, lack of infrastructure facilities and the low compensation. Along with this, scarcity of electricity, poor transportation facilities, excess to new and large markets, well developed industrial estate etc. are the most crucial issues which block the rise of productivity and output of small enterprises. A modest attempt is made in this article an empirical study on the productivity of micro manufacturing enterprises in Chittoor district. The universe of the study is Chittoor district, Andhra Pradesh only. Out of the categories of micro manufacturing enterprises, as classified by the District Industries Centre, 25 units each are purposely brought into the sample frame from agro, food and allied, mechanical and metallurgical, chemical, plastic and rubber, glass and ceramics and paper categories, for a meaningful analysis of cross sectional data. Stratified random sample technique is conveniently adopted. The data has been collected from the respondents through a questionnaire specially designed for the purpose. The data is annalysed with the help of structural ratios, technical coefficients, standard deviation, ratios and percentages.

KEYWORDS: *Productivity, Value Added, Inputs and Outputs, Cross Sectional Data.*

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Introduction

The manufacturing environment is now so competitive that the companies must not only continuously improve their performance, but also do it faster than others. Micro, Small and Medium Enterprises (MSMEs) significantly contribute to the industrial output of an economy, and must be competitive for the national economy to be competitive in this era of international business. Productivity is a concept as old as the industry itself. It has been variously understood, defined, modified, updated and modernised with the evolution of the manufacturing function. In the context of manufacturing industries, productivity measures the relationship between output such as goods and services produced, and inputs that include labour, capital, material and other resources. By 'resources', we mean all human and physical resources, i.e. the people who produce the goods or provide the services, and the assets with which the people can produce the goods or provide the services (Bernolak 1997). Production of more or

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better goods from the same resources or production of same goods from lesser resources results in increased productivity. In mathematical terms, productivity may be defined as the ratio of total output to total input. Productivity growth holds a critical role in the long-run economic growth of a country. According to the neoclassical growth theory, an economy's growth is driven by two distinct factors – inputs and productivity. As far as the first factor is concerned, higher growth is being achieved through increasing the factors of production. But factors of production are subject to diminishing returns, and certainly the growth rate may not be sustainable in the long run (Young, 1992; Krugman, 1996).

The term (K) is used to refer to fixed capital investment in plant and machinery. Total capital includes both fixed and working capital. Employment denoted by 'L' means hired workers and family member consists of both full time and part time. Value of Output denoted by 'O' is taken to mean the ex-factory value of output and is arrived at on the methodology followed by Central Statistical Organization, Government of India. Similarly, value added indicated by 'V' is estimated by deducting the total cost of inputs from the value of output. Wages (W) refers to remuneration paid as compensation for the work done by hired labor as well as notional wage cost of non-wage labour. Profit (P) is computed after subtracting wages, rent and interest, if any from valued added

The details of output and value added per unit of labour, capital etc are given in the Table 1. The output per unit of capital (O/K) is the highest 6.39 in agro, food and allied followed by mechanical and metallurgical (4.04), chemical, plastic and rubber (2.73), paper (2.20) and glass and ceramics (1.75). The average for all the units put together works out to 3.35. The average ratio is more than that of chemical, plastic and rubber, paper and glass and ceramics while lower than the remaining categories. It would appear that, glass and ceramics make less efficient use of capital as compared to remaining industrial categories. If the object is to maximize the rate of output per unit of capital, the agro, food and allied to have a popular appeal relative to the rest of the categories. This view is subject to the assumption that a part of the income accruing to workers will be saved and mobilized for reinvestment to generate and sustain the tempo of industrial growth. It has to be viewed as such due to the fact that the agro, food and allied category have employment-intensity and so distribution of income in the form of wages is relatively greater. Hence, such an assumption is made. However, as considerations of growth are to be taken care of by basic and heavy industries, consumer goods industries are to be guided and developed more by considerations of equity.

Table 1: Select Structural Ratios and Technical Coefficients

Name of category	O/K	O/L (Rs)	V/K	V/L (Rs)	V/O
Agro, food and allied	6.39	4,67,498.37	2.53	1,84,737.08	0.40
Mechanical and metallurgical	4.04	10,56,848.21	2.11	5,51,199.55	0.52
Chemical, plastic and rubber	2.73	7,55,007.35	0.85	2,34,658.09	0.31
Glass and ceramics	1.75	5,99,140.07	0.70	2,38,674.37	0.40
Paper	2.20	5,89,914.34	0.69	1,83,956.15	0.31
Average of all industries	3.35	6,01,876.92	1.33	2,38,389.26	0.40

Source: Compiled from field data

The output per labourer (O/L) is the maximum in mechanical and metallurgical (Rs.10,56,848.21) followed by chemical, plastic and rubber (Rs.7,55,007.35), glass and ceramics (Rs.5,99,140.07), and paper (Rs.5,89,914.34) whereas it is the minimum in agro, food and allied (Rs.4,67,498.37). The O/L ratio in the former is a little over 2.26 times greater than the latter. The mean of O/L ratio for all the industries commonly is Rs.6,01,876.92. This is higher than that of agro, food and allied, glass and ceramics and paper while lower than mechanical and metallurgical and chemical, plastic and rubber. Based on the O/L ratio, mechanical and metallurgical, chemical, plastic and rubber, glass and ceramics, paper, agro food and allied may be listed in the order of preference. Hence, these have to be encouraged in the descending order. This information is based on consideration of commercial profitability at the micro level. Even from a macro level, such a view could have been more welcome in a labour scarce economy. It may be noted that, the higher labour productivity in micro industry is directly related to high capital coefficient. The mechanical and metallurgical category with a capital output ratio of 1.58 times more than agro, food and allied category shows 2.26 times higher labour productivity. Perhaps a more relevant question here is given capital as scarce and relatively abundant labour, what is the amount of employment and output a unit of capital generates? A unit of capital generates 0.16 units of employment in agro, food and allied and 9.4621^{-07} units in mechanical and metallurgical. A unit of labour generates output of Rs.4,67,498.37 in agro, food and allied and

Rs.10,56,848.21 in mechanical and metallurgical. The net output generating capacity of a unit of capital in agro, food and allied is 7,47,99.74 (4,67,498.3 X 0.16) whereas it is (10,56,848.21 X 9.4621^{-07}) in mechanical and metallurgical.

A unit of capital adds a value of 2.53 in agro, food and allied followed by mechanical and metallurgical (2.11), chemical, plastic and rubber (0.85), glass and ceramics (0.70) and paper (0.69). On an average, it works out to 1.33. It means that, the V/K ratio in agro, food and allied is 3.66 times higher than paper and lesser than agro, food and allied and mechanical and metallurgical. The average ratio is more than that of chemical, plastic and rubber, glass and ceramics and paper. The value added by labour (V/L) ratio is the highest Rs.5.51 lakhs in mechanical and metallurgical while the lowest in paper (Rs1.84 lakhs). It stood at Rs.2.35 lakhs, Rs2.39 lakhs and Rs.1.84 lakhs in chemical, plastic and rubber, glass and ceramics and paper sequentially. If all the industrial units are put together, the average V/L ratio is Rs.2.38 lakhs. It is greater than that of all the industrial categories except mechanical and metallurgical and glass and ceramics. A unit of output (V/O) is likely to acquire much value in mechanical and metallurgical (0.52) vis-à-vis both the chemical, plastic and rubber and paper (0.31). The V/O ratio is 0.40 in each of agro, food and allied and glass and ceramics. When all the micro enterprises are taken as a whole, the V/O ratio is 0.40, which is equal to agro, food and allied and glass and ceramics but greater than that of paper and chemical, plastic and rubber and less than that of mechanical and metallurgical.

Table 2: Inter-Unit Variations in Productivity and Value added Ratios

Name of Category	Standard Deviation	Coefficient of Variation
Agro, Food and Allied		
O/K	5.0336	89.52
O/L	2119978.8402	140.33
V/K	2.1103	95.18
V/L	562963.6561	122.09
V/O	0.2302	54.55
Mechanical and Metallurgical		
O/K	19.3411	140.14
O/L	1014271.4831	107.52
V/K	14.9706	251.63
V/L	968097.4552	227.31
V/O	0.1777	49.96
Chemical, Plastic and Rubber		
O/K	7.1469	158.46
O/L	1011875.3022	122.13
V/K	1.4513	110.66
V/L	401726.9558	139.04
V/O	0.1592	39.52
Glass and Ceramics		
O/K	13.1566	293.66
O/L	341385.6932	51.64
V/K	10.5676	376.89
V/L	208078.6510	80.51
V/O	0.1422	37.45
Paper		
O/K	2.2053	283.74
O/L	216019.7220	414.81
V/K	0.8410	315.29
V/L	72889.8688	439.58
V/O	0.1047	359.98

Source: Compiled from field data

The inter enterprise variations in the productivity and value added ratios in the sample units are furnished in the **Table 2.** The coefficient of variation (CV) in O/K ratio is the highest, 293.96 per cent within the glass and ceramics category followed by paper (283.74 per cent), chemical, plastic and rubber (158.46 per cent), mechanical and metallurgical (140.14 per cent) and agro, food and allied (89.52 per

cent). In other words, the heterogeneity is more in the former as compared to the latter. The CV in O/L ratio has varied between 51.64 per cent and 414.81 per cent across the five categories. The homogeneity is higher within the units under glass and ceramics while lower within the units under paper. With regard to V/K ratio, the CV within the units in glass and ceramics is 376.89 per cent, paper 315.29 per cent, mechanical and metallurgical 251.63 per cent, chemical, plastic and rubber 110.66 per cent and agro, food and allied 95.18 per cent. It means the consistency in the V/K ratio is greater in the latter while it is the lesser in the former.

In respect of V/L ratio, the enterprises under paper with 439.58 per cent variation came first before all the categories whilst glass and ceramics with 80.51 per cent occupied the last place category. It is 227.31 per cent among the enterprises in mechanical and metallurgical category followed by chemical, plastic and rubber (139.04 per cent) and agro, food and allied (122.09 per cent). It means that the consistency is more in agro, food and allied as against paper category. In respect of V/O ratio, the CV is the highest in paper (359.98 per cent) enterprises whereas it is the least in glass and ceramics (37.45 per cent). In the rest of the categories it is in the order of 39.52-54.55 per cent. It may be informed that the inconsistence is more in the units under paper, glass and ceramics whereas less in the units under glass and ceramics. It may be concluded that, the inconsistency is more in respect of glass and ceramics in terms of O/K and V/K ratios and paper in respect of O/L, V/L and V/O ratios. Contrary to this, there is a greater uniformity and consistency in glass and ceramics in terms of O/L, V/L and V/O ratios and agro, food and allied in respect of O/K and V/K ratios.

Profits

The efficiency of any industrial unit will be measured by profit or loss it makes. It is the magnitude of profits or losses made by firms that will ultimately indicate their operational efficiency. Thus the viability of a unit is to be judged by the profits it can earn. Out of the sample units, 8 have incurred losses while the rest, 117 earned profits. The loss making units are spread over two each in chemical, plastic and rubber and glass and ceramics and 4 units in paper category. **Table 3** reveals the distribution of profit making units. It can be observed that, of the profit making units, 7.69 per cent earned less than Rs.1,00,000 worth profits, 47.01 per cent Rs.1,00,001-10,00,000, 22.22 per cent Rs.10,00,001-20,00,000, 5.13 per cent Rs.20,00,001-30,00,000, 3.42 per cent Rs.30,00,001-40,00,000, 1.71 per cent Rs.40,00,001-50,00,000 and the rest, 12.82 per cent, more than Rs.50,00,001. In the case of mechanical and metallurgical, paper and each of chemical, plastic and rubber and glass and ceramics, the highest 60 per cent, 61.90 per cent, and 47.83 per cent have earned profits in the range of Rs.1,00,000-10,00,000 sequentially. None of the units have earned profits below Rs.1,00,000 in chemical, plastic and rubber and glass and ceramics. Similarly units in the profit level Rs.20,00,001-30,00,00 were absent in agro, food and allied and mechanical and metallurgical, Rs.30,00,001-40,00,000 in the latter and Rs.40,00,001-50,00,000 in respect of each of chemical, plastic and rubber, glass and ceramics and paper. In the rest of the profit groups, the units are found in varying percentages.

Table 3: Distribution of Sample Units by Operational Results (Profits)

Profit (Rs)	Agro, food and allied	Mechanical and metallurgical	Chemical, plastic and rubber	Glass and ceramics	Paper	Total
Below 1,00,000	5 (20.00)	2 (8.00)	-	-	2 (9.52)	9 (7.69)
1,00,001-10,00,000	5 (20.00)	15 (60.00)	11 (47.83)	11 (47.83)	13 (61.90)	55 (47.01)
10,00,001-20,00,000	4 (16.00)	5 (20.00)	7 (30.43)	7 (30.43)	3 (14.29)	26 (22.22)
20,00,001-30,00,000	-	-	3 (13.03)	3 (13.03)	-	6 (5.13)
30,00,001-40,00,000	1 (4.00)	-	1 (4.35)	1 (4.35)	1 (4.76)	4 (3.42)
40,00,001-50,00,000	1 (4.00)	1 (4.00)	-	-	-	2 (1.71)
50,00,001 and more	9 (36.00)	2 (8.00)	1 (4.35)	1 (4.35)	2 (9.52)	15 (12.82)
Total	25 (100.00)	25 (100.00)	23 (100.00)	23 (100.00)	21 (100.00)	117 (100.00)

Note   **:** Figures in parentheses indicate the percentage to total
Source   **:** Compiled from field data

Industry- category wise return on investment is presented in the **Table 4.** Here capital is used to mean both fixed and working capital. The return on capital employed is the highest, 111.90 per cent, in mechanical and metallurgical followed by agro, food and allied (105.96 per cent), chemical, plastic and rubber (33.13 per cent), glass and ceramics (29.70 per cent) and paper (29.59 per cent). When all the sample units are considered together, the return on investment is found to be 61.45 per cent. This is more than that of chemical, plastic and rubber, glass and ceramics and paper while less than that of agro, food and allied and mechanical and metallurgical.

Table 4: Industry Category Wise Return on Investment

(Rs.)

Industrial Category	Capital Invested	Net Profit	% of col. (3) in col. (2)
Agro, food and allied	11,52,63,780	12,21,31,300	105.96
Mechanical and metallurgical	8,83,52,000	9,88,69,600	111.90
Chemical, plastic and rubber	10,41,00,000	3,44,88,000	33.13
Glass and ceramics	12,38,00,000	3,67,67,800	29.70
Paper	8,50,00,000	2,51,55,600	29.59
Total	51,65,15,780	31,74,12,300	61.45

Source: *Compiled from field data*

Conclusion

The MSME sector has an important contribution to make in enhancing the competitive strength of Indian industry, increase an avenue for new employment and harness the entrepreneurial skills available in abundance in the economy. From the view point of employment and output generation, investment in agro, food and allied industry is efficient. Thus agro, food and allied industry refute the argument that labour-intensive techniques generate more employment per unit of capital but required more capital per unit of output. Indeed, the labour - intensive techniques create more employment as well as output per unit of capital. The indicators of performance in terms of productivity and generation of value added have shown conflicting results. The O/L, V/L, and V/O ratios are in favour of mechanical and metallurgical category. The O/K and V/K support agro, food and allied category. However, agro, food and allied needs are prioritised and patternised on considerations of factor proportions and resources endowments while mechanical and metallurgical on the basis of net output generating capacity. It may be further noticed that, there are significant differences in the performance across the sample units between the categories and within the category. Finally, we may conclude that there are inter and intra category variations in the performance of sample units. In terms of profit, the highest 36 per cent of units in agro, food and allied exist in the profit level of Rs.50,00,001 and more. It may be concluded that, a little over 47 per cent of units have earned profits in the order of Rs.1,00,001-10,00,000. The mechanical and metallurgical category is lucrative in terms of profit, among the industrial categories.

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