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PERFORMANCE OF UNORGANIZED FOOD AND BEVERAGE SECTOR IN INDIA

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ABSTRACT

In this paper the structure and functioning of the unorganized Food & Beverage Firms are considered. For this Unit level data of ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023 are considered. From this data the Food & Beverage firms having two-digit NIC code 56 are used. It was found that most of the firms use a very small amount of labour per firm. The firms show considerable variation in terms of location. All over India 6 states host more than half of the firms. There is also a rural urban divide among the firms. It is also observed that the HWE firms are more capital intensive than OAE firms. It is found that a small number of firms have contracts. The analysis shows wide variation of efficiency across the states and types of firms. In general, OAE firms are more efficient than HWE firms and rural firms are more efficient than the urban firms. Firms which have contracts are less efficient than those which don't have any contract.

Keywords: *Unorganized Food, Beverage Sector, ASUSE, OAE, HWE.*

Introduction

The Food and Beverage Service in India is one of the most vibrant industries(Indian Express, 2022). With growing population, increasing urbanization and increasing income this sector shows immense opportunity for growth. A large number of Food and Beverage Service firms are in the unorganized sector(Sarkar, 2022). The firms in this sector comprise of individuals or families selling ready-to-eat food through vendors, Dhaba, food carts, street stalls etc. Gupta & Gandhi (2016)discussed the problems related to production in the unorganized sector.

Thus, it is imperative to know how the firms in this sector are performing. The objective is to study how efficiently these firms are run. Various attempts have been made to measure the productivity and efficiency of the unorganized sector in India (Bairagya, 2013; Kathuria et al., 2013; Sengupta & Seth, 2017, 2019), but all these lacks special focus of unorganized food and beverage sector in India. Hope the present study will plague the lacuna.

The paper is organized as follows. A brief discussion of the data is given in section 2. Section 3 provides the basic framework of the analysis. Some summary statistics are analyzed in Section 4. Analysis and results have been given in Section 5 and finally conclusions are drawn in Section 6

Sources and Nature of Data

In this study the unit level data of ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023 has been used. From this the Unorganized Food and Beverage firms (two-digit NIC code 56) have been chosen. The survey was conducted between October 2022 and September 2023. This data falls into the Other Service category. Under this category the enterprises are divided into two categories – i.e., Own Account Enterprises (OAE) and Hired Worker Enterprises (HWE).

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OAEs do not use hired labour on regular basis in the reference year but the HWEs employ hired labour on fairly regular basis). Here hired workers include paid/unpaid apprentices, paid household member/servant/resident worker in an establishment. The reference period of the estimates generated for ASUSE 2022-23 refers to the period from October 2022 to September 2023. The data has been collected for three reference period, namely, last 30 days", last calendar month" and last accounting year".

The Data provides detailed information about outputs (measured in rupees) and inputs. The output is measured by Gross Value Added (GVA). This also provides value of capital used and Operating costs of the firms, labour used and other relevant information for 37 States and Union Territories. The Unorganized Food & Beverage sector includes activities of Restaurants, Bars with or without restaurants, Cafeterias, fast-food restaurants and other food preparation in market stalls, Ice cream mobile vendors, mobile food carts, Restaurant and bar activities connected to transportation, when carried out by separate units, Event catering, Activities of food service contractors (e.g. for transportation companies), Operation of canteens or (e.g. for factories, offices, hospitals or schools) on a concession basis (but departmental canteens run by government will be excluded), Tea/coffee shops, Mobile beverage vendors.

Framework of Analysis

For calculating efficiency Data Envelopment Analysis is applied. Following Ray (2012) the methodology is presented here. In order to conceptualize the notion of efficiency, consider a set-up of m different outputs:

$y \in R_+^m$ and n different inputs $x \in R_+^n$. For any output bundle *y*it is possible to define the input requirement set as:

$V(y) = \{x : x \text{ can produce } y\}$ (1)

Production theory imposes certain restrictions on the structure of *V(y)*(Varian, 1984).

- **Feasibility:** If (x^j , y^j) is actually observed then $x^j \in V(y^j)$. All observed input-output bundles are feasible.
- **Convexity:** V (y) is a convex set.
- **Free disposability of inputs:** If (x^0, y^0) is feasible then for any $x \geq x^0$, (x, y^0) is also feasible.
- **Free disposability of outputs:** If (x^0, y^0) is feasible then for any $y \leq y^0$, (x^0, y) is also feasible.

Based on this set, DEA measures are defined. An input oriented radial measure of technical efficiency of a firm producing output y^0 from inputs x^0 is

$E^*_f = \frac{1}{\theta_f^*}$ *Where* $\theta_f^* = min\, \theta_f : \theta_f x^0 \in V(y^0)$ *(2)*

The BCC (Banker, Charnes and Cooper 1984) measure of efficiency is defined as:

$\underset{\theta_f \lambda}{min} \theta_f$

Subject to:

$y_f \leq Y\lambda$,

$X\lambda \leq \theta_f x_f$,

$\sum \lambda_f = 1$ (3)

For our empirical exercise, we have considered a single output multi-input set-up. The inputs considered are of three types- capital input (K), Operating Expenses (OP), labour input (L) and Electricity (E) . For our empirical exercise, we have considered a single output multi-input set-up. The inputs considered are of three types- capital input (K), Operating Expenses (OP), labour input (L) and Electricity (E) .

DEA uses the Linear Programming technique to construct efficient frontiers and the corresponding input efficiency following the above specifications. We give a simple illustration of the method following Farrell (1957). Assuming constant returns to scale, production function can be reduced to a single isoquant by a constant division of Y, the level of output, as F (x_1, x_2) =1 Assuming constant returns to scale and convexity, the unit isoquant may be approximated by negatively sloped convex hull. Farrell postulated a non-parametric technique to construct these convex hulls from the observed input-output data.

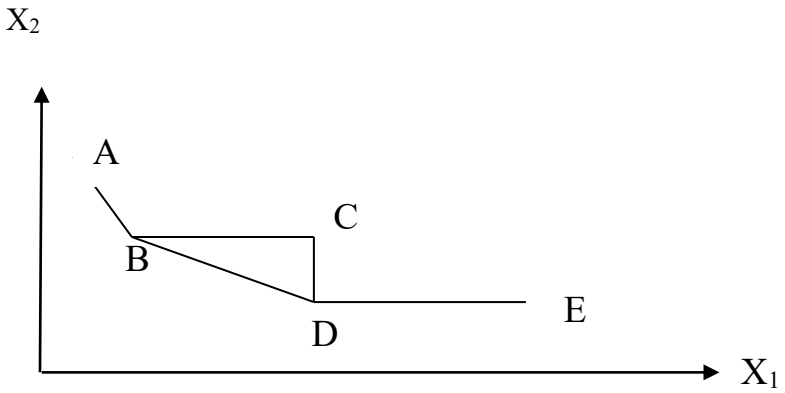

Figure-1

We illustrate the basic technique of Farrell (1957) with the figure below:

In the above figure we have five observations (A,B, C, D and E) of levels of inputs that produce unit output. Following Farrell's technique(Farrell, 1957), the constructed convex hull is ABDE. It is the non-parametric technique of Farrell that is generalized as DEA by Banker, Charnes and Cooper (Banker et al., 1984). In a multi-input multi-output structure, the convex hulls representing frontier technology could be constructed using linear programming technique within the DEA structure. This constructed isoquant gives us information of the empirical input requirement set (L(y)) – a generalization of the production function. An input requirement set L(y) gives us all the possible combination of inputs that can produce a given level of pre-specified output- y. In our example above we can construct the input requirement set corresponding to unit output level (y =1). Given an input requirement set L(y), it thus becomes pertinent to study how *"far"* a point in the input requirement set L(y) is away from the isoquant. Efficiency analysts utilized this idea to develop the idea of *distance function*. The distance functions measure *distances* radially(along a ray through the origin passing the point). The input distance function gives us the value of the scalar by which we can scale down a given input combination remaining within the input requirement set. On the other hand, input radial efficiency (Debreu-Farrell) can be defined as the extent to which current input can be scaled down without reducing the output. Hence input efficiency measure is just a reciprocal of input distance function.

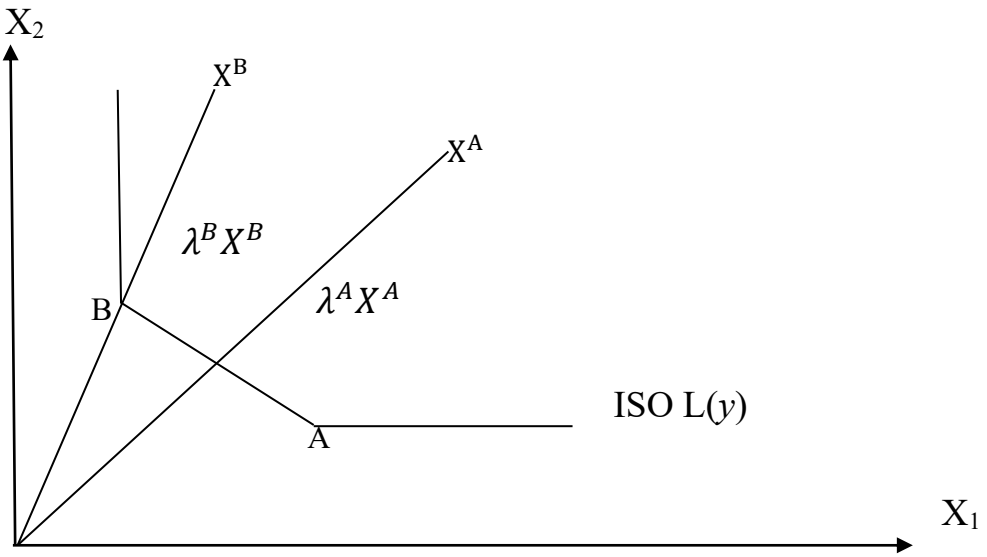

Figure 2

In figure 2, when we scale down from the point $X^A \equiv (X_1^A X_2^A)$ to the point $\lambda^A X^A \equiv (\lambda^A X_1^A, \lambda^A X_2^A)$ with $0 \leq \lambda^A < 1$, we reach the Iso L(y). Similarly, we reduce from X^B to $\lambda^B X^B$ to reach Iso L(y). In our above example, then λ^A is the efficiency index for the observation A and λ^B for observation B. The BCC (Banker, Charnes and Cooper) method generalizes this basic concept for the many-input many- output case.

Summary Statistics

This section describes some of the features of the firms in the unorganized Food and Beverage Enterprises in India. In this study the secondary data from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023 has been used. Table 1 to Table 4 describes some simple statistical properties of the variables that are used in the model.

Table 1: Estimated Number of Food & Beverage Firms According to Sector

Sector	Number	Percentage
Rural	1613325	48
Urban	1746660	52
Total	3359985	100

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table-1 shows the distribution of Unorganized Food& Beverage Firms According to Sector. Number of estimated firms in the urban sector is more than the rural sector. About 52 % of firms are in the urban sector and about 48% of the firms are in the rural sector.

Table 2: Estimated Number of Food & Beverage Firms According to Enterprise Type

Enterprise Type	Number	Percentage
OAE	2529588	75
HWE	830398	25
Total	3359985	100

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

According to NSSO the Own Account Enterprises (OAE) are those which do not use hired worker "on a fairly regular basis". On the other hand, those Enterprises which use at least one hired worker "on a fairly regular basis" are called Hired Worker Establishment (HWE). Here hired workers include paid/unpaid apprentices, paid household member/servant/resident worker in an establishment. From Table 2, it is seen that most of the firms are of OAE type. About 75% of the firms are of OAE type and about 25% of the firms are of HWE type. This implies that most of the firms are not using hired workers.

Table 3: Estimated Number of Food & Beverage Firms According to Having Contract

If the Firm have any Contract	Number	Percentage
Yes	4541	0.14
No	3355444	99.86
Total	3359985	100

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 3 shows the distribution of firms having contracts. From Table 3, it is clear that, most of the firms does not operate on the basis of contract. About 99.86% of the firms don't have any contract and only 0.14% of the firms have contract.

Table 4: Estimated number of Food & Beverage firms in different States & UTs

State/Uts	Rural	Urban	Total	Percentage of Total firm
Uttar Pradesh	286804	180554	467359	13.91
West Bengal	167891	177887	345778	10.29
Maharashtra	97949	246588	344537	10.25
Tamil Nadu	88710	185421	274130	8.16
Bihar	175429	58896	234326	6.97
Karnataka	94743	100246	194989	5.80
Andhra Pradesh	82941	81596	164537	4.90
Gujarat	37229	119975	157204	4.68
Madhya Pradesh	67668	83629	151298	4.50

Rajasthan	60587	80934	141521	4.21
Odisha	83513	36654	120167	3.58
Jharkhand	74026	43017	117043	3.48
Kerala	48704	52018	100722	3.00
Haryana	41433	42952	84385	2.51
Punjab	25410	57279	82689	2.46
Telangana	30161	44673	74834	2.23
Delhi	3111	52665	55776	1.66
Assam	35297	15989	51286	1.53
Chhattisgarh	20886	23564	44449	1.32
Himachal Pradesh	32264	7072	39336	1.17
Uttarakhand	20618	12086	32704	0.97
Jammu & Kashmir	9429	10934	20363	0.61
Meghalaya	8822	3677	12500	0.37
Tripura	5213	4861	10074	0.30
Manipur	3595	3456	7051	0.21
Goa	1975	4565	6540	0.19
Puducherry	1420	3825	5245	0.16
Sikkim	3053	1181	4235	0.13
Arunachal Pradesh	1945	1527	3472	0.10
Daman & Diu	900	2336	3236	0.10
Nagaland	411	1994	2405	0.07
Chandigarh	139	2096	2236	0.07
Ladakh	169	1172	1341	0.04
A & N Islands	513	828	1341	0.04
Mizoram	369	294	662	0.02
Lakshadweep	0	216	216	0.01
Total	1613325	1746660	3359986	100

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 4 shows the distribution of firms according to different States and Union Territories in India. Uttar Pradesh tops the list with 13.91 % of firms. It is followed by West Bengal (10.29 %), Maharashtra (10.25 %), Tamil Nadu (8.16), Bihar (6.97 %) and Karnataka (5.80 %). These six states hosts about 55.29% of the total firms.

Let us now turn to the operational characteristics of the firms. Table 5 and Table 6 show some variables which are crucial for the efficiency of the firms. Four variables are used for the calculation of efficiency of firms. These are - Gross Value Added (Rs), Capital (Rs), Operating Cost (Rs) and Number of Labour used. The tables below summarizes some statistical features of these variables for OAE and HWE firms.

Table 5: Unorganized Food & Beverage OAE Firms (All India)

Variables	Mean	S.D	C.V
Gross Value Added (Rs)	172269.6	117841.5	68.41
Capital (Rs)	218203.8	1856701	850.90
Operating Cost (Rs)	23970.18	23055.77	96.20
Labour	1.6	0.70	43.94

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 5 shows the summary statistics for OAE firms on All India Level. Average GVA produced by these firms is Rs. 172269.6 with considerable variation. The Coefficient of Variation (C.V) of GVA is 68.41. Average value of the capital used is Rs. 218203.8 and the Coefficient of Variationis 850.90, The Capital shows large variation. Average Operating Cost is Rs. 23970.18 with C.V of 96.2. OAE firm shows a very small amount of labour usage by firms, average being 1.6 per firm with relatively small variation. GVA per Labour (GVAPL) is Rs. 107669 and Capital – Output ratio is 1.27 for these firms

Table 6: Food & Beverage HWE Firms (All India)

Variables	Mean	S.D	C.V
Gross Value Added (Rs)	823821.6	1209329	146.80
Capital (Rs)	1132380	4241502	373.57
Operating Cost (Rs)	122110.3	665654.3	545.13
Labour	4.54	3.66	80.60

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 6 shows the average GVA produced by HWE firms is Rs. 823821.6, which is significantly higher than OAE firms, but in this case variation is also higher. Average value of Capital used is Rs. 1132380, and for Operating Cost it is Rs. 122110. All the values show that the HWE firms are using more capital and incurring more Operating cost than the OAE firms. The average value of labour used is 4.35 per firm. This means that on average HWE firms are using about 2.7 times of labour in comparison to OAE firms. For these firms GVAPL is 181458.5 and Capital-Output ratio is 1.37.

Results

Efficiency have been calculated using DEAP software. In the calculation one output GVA and three output inputs Capital (Rs.), Operating Cost (Rs.) and Labour are used. Using unit level data of ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023 efficiency scores are found out. The average efficiency scores are presented in the following table:

Table 7: Efficiency (VRSTE) of Food & Beverage Firms According to Sector

Sector	Mean vrste
Rural	0.672
Urban	0.586
Total	0.627

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 7 presents the average efficiency (Variable Returns to Scale Technical Efficiency, VRSTE) scores of unorganized Food & Beverage Firms According to Sector. It shows that efficiency is higher for rural firms (.672) than the urban firms (.586). The unorganized firm in the rural sector has some advantages regarding procurement of inputs. Argo-based inputs could be used easily and at a much cheaper rate than in the urban sector. Hence the result.

Table 8: Efficiency (VRSTE) of Food & Beverage Firms According to Enterprise type

Enterprise Type	Mean vrste
OAE	0.734
HWE	0.302
Total	0.627

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 8 shows the average efficiency of OAE and HWE firms. It is notable that OAE firms are more efficient than the HWE firms. OAE firms are basically family firms. These firms do not use hired labour. On the other hand, HWE firms are relatively large firms using more capital and labour. But ii is evident from the result that these are difficult to manage.

Table 9: Efficiency (VRSTE) of Food & Beverage Firms According to Having Contract

If firms have Contract	Mean vrste
Yes	0.461
No	0.628
Total	0.627

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 9 shows that the firms which do not have any contract are more efficient than those that have contract. This brings out the extractive nature of contract. Identifying the relationship most of the firms do not involve into the contract system.

Table 10: Efficiency (VRSTE) of Food & Beverage Firms According to States and UTs. & Enterprise Type

RECODE of State	OAE	HWE	Total
Tripura	0.907	0.360	0.855
Himachal Pradesh	0.897	0.330	0.794
Bihar	0.832	0.353	0.762
Manipur	0.813	0.340	0.745
West Bengal	0.802	0.337	0.743
Uttarakhand	0.840	0.365	0.740
Punjab	0.848	0.332	0.734
Haryana	0.810	0.286	0.708
Jammu & Kashmir	0.871	0.315	0.678
Odisha	0.746	0.316	0.667
Rajasthan	0.800	0.286	0.667
Uttar Pradesh	0.713	0.320	0.662
Delhi	0.853	0.316	0.653
Assam	0.770	0.310	0.652
Madhya Pradesh	0.748	0.296	0.647
Sikkim	0.723	0.264	0.632
Gujarat	0.743	0.305	0.606
Jharkhand	0.650	0.299	0.585
Lakshadweep	0.823	0.388	0.583
A & N Islands	0.768	0.235	0.581
Karnataka	0.679	0.299	0.565
Daman & Diu	0.718	0.325	0.565
Maharashtra	0.702	0.290	0.537
Kerala	0.695	0.304	0.532
Telangana	0.645	0.266	0.530
Goa	0.767	0.277	0.529
Chandigarh	0.773	0.281	0.527
Andhra Pradesh	0.585	0.275	0.518
Chhattisgarh	0.579	0.267	0.511
Meghalaya	0.581	0.369	0.505
Tamil Nadu	0.634	0.282	0.493
Ladakh	0.728	0.420	0.491
Mizoram	0.601	0.370	0.490
Arunachal Pradesh	0.606	0.264	0.487
Nagaland	0.772	0.352	0.467
Puducherry	0.532	0.313	0.416
Total	0.734	0.302	0.627

Author's calculation from ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023

Table 10 presents the average efficiency scores (VRSTE) of the different states and union territories. Total efficiency score for all the state and union territories together is .627. The efficiency scores are widely distributed over different states and union territories. Tripura tops the list with an efficiency score of .855 followed by Himachal Pradesh (0.794), Bihar (0.762), Manipur (0.745), West Bengal (0.743), Uttarakhand (0.740). In case of HWE firms highest efficiency scores is achieved in Ladakh (.420). From this table is clear that different states and union territories show significant amount of variation in efficiency score.

Conclusion

In this paper the structure and functioning of the unorganized Food & Beverage Firms are considered. For this Unit level data of ANNUAL SURVEY OF UNINCORPORATED SECTOR ENTERPRISES (ASUSE) 2022-2023 are considered. From this data the Food & Beverage firms having two-digit NIC code 56 are used. It gives detailed information about outputs produced, inputs used, capital used and other relevant features of unorganized Food & Beverage Firms all over India. For calculation efficiency, GVA, capital, labour and operating costs are considered.

It was found that most of the firms use a very small amount of labour per firm. The firms show variation in terms of location. All over India 6 states hosts more than half of the firms. The HWE firms are more capital intensive than OAE firms. There is a very small number of firms which have contracts.

VRSTE has been calculated using DEAP software. The analysis shows wide variation of efficiency across the states and types of firms. There are few states which are efficient in good measure i.e, efficiency score is greater than 70% but for a large majority efficiency is less impressive. There is also a rural urban divide among the firms. In general, OAE firms are more efficient than HWE firms and rural firms are more efficient than the urban firms. Firms which have contracts are less efficient than those which don't have any contract. Government help is necessary for raising the efficiency in general.

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