AN ANALYTICAL STUDY OF MONTHLY TURNOVER AND COST STRUCTURE OF RUBBER INDUSTRY IN KERALA

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ABSTRACT

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The present paper is an attempt to examine the monthly turnover and the cost structure of Rubber Industry in Kerala. The study of monthly turnover and the cost structure of Rubber Industry in Kerala are very important and much significant for the Rubber industry in Kerala. The researcher prepared a questionnaire keeping in mind all the important aspects related to indigenous rubber and import of rubber.

The present study is based on primary data. Primary data was collected from the Rubber industrial units (Sole Proprietor, Firm and Company) from three regions of Kerala i.e., Southern Region, Central Region and Northern Region through a structured questionnaire. Questionnaire was constructed after consulting the experts in the field of Rubber industry. Based on their suggestion, some items were deleted and some items were modified. The responses of the users were, by and large, encouraging. They responded freely in highlighting different aspects of rubber industry.

To conclude, there is significant difference in the monthly turnover for different Rubber Industrial Units in Kerala. In other words, we can say that as nature of ownership changes, there is a change in monthly turnover. Likewise, the percentage share of different components of cost namely overhead cost and fixed cost of Rubber Industry in Kerala based on ownership is different and it is found more for sole proprietorship and firm respectively. The percentage share of different components of cost of Rubber Industry in Kerala based on operation is same.

KEY WORDS: *Monthly turnover, Cost structure, Rubber Industry, Overhead cost, Fixed cost.*

JEL Codes:, D00, D24, L60, L65.

1. INTRODUCTION

There is a significant place for rubber industry in the economy of Kerala. The rubber industry of Kerala is one of its most important industries, accounting for the major amount of rubber production in the state. Rubber is the major agricultural product of Kerala and almost 90% of the total rubber production in India is accounted by the state of Kerala. The rubber industry in Kerala also provides employment to a large number of people of this region.

In this backdrop, the present paper is an attempt to examine the monthly turnover and the cost structure of Rubber Industry in Kerala. The study of monthly turnover and the cost structure of Rubber Industry in Kerala are very important and much significant for the Rubber industry in Kerala. The researcher prepared a questionnaire keeping in mind all the important aspects related to indigenous rubber and import of rubber.

2. METHODOLOGY

The present study is based on primary data. Primary data was collected from the Rubber industrial units (Sole Proprietor, Firm and Company) from three regions of Kerala i.e., Southern Region, Central Region and Northern Region through a structured questionnaire. Questionnaire was constructed after consulting the experts in the field of Rubber industry. Based on their suggestion, some items were deleted and some items were modified. The responses of the users were, by and large, encouraging. They responded freely in highlighting different aspects of rubber industry.

Here, the sample comprises of two hundred and thirty three Rubber industrial units (233) of the total population (LM) of 590 with the Confidence level =95%, Confidence interval=5%, Level of Significance=5% and the Z value=1.96 (Two Tailed). The territorial spread of the field of investigation is confined to three major regions in the state i.e.: Southern Region (Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha), Central Region (Kottayam, Idukki, Ernakulum, Trissur, Palakkad, Malappuram), and Northern Region (Kozhikode,

Wayanad, Kannur, Kasaragod). From Southern Region, sixty three units (27.0%) are selected and from Central Region one hundred and eighteen units (50.6%) are selected and from Northern Region, fifty two units (22.3%) are selected for the study. Since the exact target figure for Rubber manufacturing industrial units working in the state are available (590 units), systematic sampling method is used in the study.

3. RESULTS AND DISCUSSION

Now let us make an analysis of the monthly turnover and cost structure of Rubber industry in Kerala and test it with the following variables provided below.

AREA OF STUDY, AREA OF OPERATION AND THE MONTHLY TURNOVER

Here, we make an analysis on the Area of study and Area of operation of Rubber industry in Kerala with the monthly turnover.

Table: 1
Area of study, Area of operation and the monthly turnover

Dependent Variable: Monthly turnover				
Area	Area of Operation	Mean	Std. Deviation	N
Southern Region	Local	1134203.24	1478936.33	32
	National	2208110.02	1250182.01	17
	International	2658445.47	1085934.62	14
	Total	1762708.10	1477729.01	63
Central Region	Local	550074.00	801766.11	65
	National	1170477.78	1128341.26	40
	International	2141036.16	1121745.38	13
	Total	935655.86	1080722.58	118
Northern Region	Local	1029098.94	1083289.52	29
	National	1155078.98	1105307.90	17
	International	1917065.43333333 360000	1076183.42113822 5400000	6
	Total	1172742.40	1103686.96	52
Total	Local	808676.06	1098912.87	126
	National	1405315.19	1218769.77	74
	International	2319821.19	1107009.54	33
	Total	1212191.44	1249762.26	233

Source: Computed from field Survey

The average monthly turnover of southern region is 1762708.10±1477729.01, central region 935655.86 ±1080722.58 and northern region1172742.40±1103686.96.

Table: 2
Two- way ANOVA

Tests of Between-Subjects Effects- Monthly turnover					
Dependent Variable: Monthly turnover					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	90129303854236.120[a]	8	11266162981779.516	9.270	.000
Intercept	361893264294336.800	1	361893264294336.800	297.775	.000
Area	17742730779576.547	2	8871365389788.273	7.300	.001
Operation	45286946612091.700	2	22643473306045.850	18.632	.000
Area * Operation	5910312612133.894	4	1477578153033.473	1.216	.305
Error	272232821513708.940	224	1215325096043.344		
Total	704734214487984.200	233			
Corrected Total	362362125367945.100	232			
a. R Squared = .249 (Adjusted R Squared = .222)					

Source: Computed from field Survey

Univariate General linear model was examined and it found that statistically there is significant difference among the Rubber industry in Kerala based on its area p=0.001; p<5%. Similarly there is significant difference among the Rubber industry in Kerala based on its operation p=0.000;p<5%. The interaction effect is verified and found that there is no significant difference among the Rubber industry in Kerala based on its operation p=0.305;p>5%.

NATURE OF OWNERSHIP AND THE MONTHLY TURNOVER

Here, we make an analysis on the monthly turnover of Rubber industry in Kerala with the help of ANOVA Table provided below.

Table: 3
Nature of ownership and monthly turnover
(Descriptive Statistics)

	N	Mean	Std. Deviation	Std. Error
Sole Proprietor	121	832710.64	1048781.06	95343.73
Firm	67	1330589.13	1330771.07	162579.56
Company	45	2056292.16	1197152.34	178460.93
Total	233	1212191.44	1249762.26	81874.64

Source: Computed from field Survey

The average monthly turnover of Sole Proprietorship form of business is 832710.64±1048781.06, Firm 1330589.13±1330771.07 and Company 1212191.44± 1249762.26.

Table: 4
Nature of ownership and monthly turnover

ANOVA					
Monthly turnover					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50426665353594.310	2	25213332676797.156	18.591	.000
Within Groups	311935460014350.800	230	1356241130497.178	**Result**	
Total	362362125367945.100	232		**Significant**	

Source: Computed from field Survey

Now it is imperative to examine the monthly turnover of Rubber Industry in Kerala with the Anova. Here Anova test was done for different Rubber Industrial Units in Kerala is 18.581 and the P Value obtained .000; P<0.05. That is, there is significant difference in the monthly turnover for different Rubber Industrial Units in Kerala. In other words, we can say that as nature of ownership changes, there is a change in monthly turnover.

NATURE OF OWNERSHIP AND PERCENTAGE OF COSTS

Here, we make an analysis on the different types of costs (Material Cost, Labour Cost, Machine Cost and Overhead cost) of Rubber industry in Kerala with the nature of ownership (Sole Proprietorship, Firm, Company) and Area of Operation (Local, National and International). Multivariate Analysis of Variance (MANOVA) was performed to examine the statistical significance. Thus one objective was formulated in this regard.

Objective:- To assess the effect on percentage of costs at Rubber industry in Kerala based on ownership and area of operation.

Hypothesis:- The effect on percentage of costs at Rubber industry in Kerala based on ownership and area of operation is identical.

Table: 5
Nature of ownership and costs (Descriptive Statistics)

	Ownership	Area of Operation	Mean	Std. Deviation	N
Material Cost	Sole Proprietor	Local	46.156	5.8175	77
		National	46.375	6.1105	32
		International	45.333	4.2283	12
		Total	46.132	5.7270	121
	Firm	Local	45.077	5.2334	39
		National	46.000	5.4772	20
		International	46.000	5.5032	8
		Total	45.463	5.2752	67
	Company	Local	45.600	4.4522	10
		National	50.273	4.9683	22
		International	47.923	6.3438	13
		Total	48.556	5.5126	45
	Total	Local	45.778	5.5294	126
		National	47.432	5.8522	74
		International	46.515	5.4090	33
		Total	46.408	5.6425	233
	Ownership	**Area of Operation**	**Mean**	**Std. Deviation**	**N**
Labour Cost	Sole Proprietor	Local	17.753	5.1277	77
		National	16.969	4.6105	32
		International	17.667	4.5594	12
		Total	17.537	4.9160	121
	Firm	Local	17.795	4.7250	39
		National	18.150	4.8696	20
		International	15.125	4.5493	8
		Total	17.582	4.7678	67
	Company	Local	18.800	4.2635	10
		National	18.182	6.0130	22
		International	19.615	5.9797	13
		Total	18.733	5.5776	45
	Total	Local	17.849	4.9154	126
		National	17.649	5.0948	74
		International	17.818	5.3119	33
		Total	17.781	5.0085	233
Machine Cost	Sole Proprietor	Local	12.390	2.4450	77
		National	12.625	1.7180	32
		International	11.917	1.8320	12
		Total	12.405	2.2120	121
	Firm	Local	12.462	1.5702	39
		National	13.000	1.6859	20
		International	13.000	1.6903	8

		Total	12.687	1.6163	67
	Company	Local	12.000	1.4907	10
		National	12.955	4.1113	22
		International	10.846	3.2875	13
		Total	12.133	3.5071	45
	Total	Local	12.381	2.1349	126
		National	12.824	2.6242	74
		International	11.758	2.5621	33
		Total	12.433	2.3755	233
Overhead cost (Employee salary, rent, advertisement etc.)	Sole Proprietor	Local	12.221	2.8406	77
		National	12.313	1.6152	32
		International	13.083	1.5050	12
		Total	12.331	2.4610	121
	Firm	Local	12.308	2.0151	39
		National	11.150	1.4244	20
		International	13.125	1.4577	8
		Total	12.060	1.8900	67
	Company	Local	11.500	1.5092	10
		National	10.636	4.3044	22
		International	11.615	1.8502	13
		Total	11.111	3.2349	45
	Total	Local	12.190	2.5194	126
		National	11.500	2.7411	74
		International	12.515	1.7522	33
		Total	12.017	2.5188	233
Fixed cost (Bank loan, other fixed expenses irrespective of production	Sole Proprietor	Local	11.481	3.3349	77
		National	11.719	1.6893	32
		International	12.000	1.7581	12
		Total	11.595	2.8448	121
	Firm	Local	12.359	2.1823	39
		National	11.700	2.1051	20
		International	12.750	1.7525	8
		Total	12.209	2.1144	67
	Company	Local	12.100	2.1833	10
		National	7.955	4.5511	22
		International	10.077	4.4434	13
		Total	9.489	4.3673	45
	Total	Local	11.802	2.9530	126
		National	10.595	3.3635	74
		International	11.424	3.2310	33
		Total	11.365	3.1609	233

Source: Computed from field Survey

The percentage of material cost incurred for the Rubber Industry in Kerala was assessed. It found that the percentage of material cost of sole trader who specializes in local area is 46.15±5.81, national level 46.375 ±6.11 and at international level it is 45.33±4.22.

The percentage of material cost of firm which specializes in local area is 45.07±5.23, national level 46±5.47 and at international level it is 46±5.50.

The percentage of material cost of company which specializes in local area is 45.60±4.45, national level 50.27±4.96 and at international level it is 47.92±6.34.

The percentage of labour cost incurred for the Rubber Industry in Kerala was assessed. It found that the percentage of labour cost of sole trader who specializes in local area is 17.75±5.12, national level 16.96 ±4.61 and at international level it is 17.66±4.55.

The percentage of labour cost of firm which specializes in local area is 17.79±4.72, national level 18.15±4.86 and at international level it is 15.12±4.54.

The percentage of labour cost of company which specializes in local area is 18.30±4.26, national level 18.18±6.01 and at international level it is 19.61±5.97.

The percentage of machine cost incurred for the Rubber Industry in Kerala was assessed. It found that the percentage of machine cost of sole trader who specializes in local area is 12.39±2.44, national level 12.62 ±1.71 and at international level it is 11.91±1.83.

The percentage of machine cost of firm which specializes in local area is 12.46±1.57, national level 13±1.68 and at international level it is 13±1.69.

The percentage of machine cost of company which specializes in local area is 12±41.49, national level 12.95±4.11 and at international level it is 10.84±3.28.

The percentage of overhead cost incurred for the Rubber Industry in Kerala was assessed. It found that the percentage of overhead cost of sole trader who specializes in local area is 12.22±2.84, national level 12.31 ±1.61 and at international level it is 13.08±1.50.

The percentage of overhead cost of firm which specializes in local area is 12.30±2.01, national level 11.15±1.42 and at international level it is 13.12±1.45.

The percentage of overhead cost of company which specializes in local area is 11.50±1.50, national level 10.63±4.30 and at international level it is 11.61±1.85.

The percentage of fixed cost incurred for the Rubber Industry in Kerala was assessed. It found that the percentage of fixed cost of sole trader who specializes in local area is 11.48±3.33, national level 11.71 ±1.68 and at international level it is 12±1.75.

The percentage of fixed cost of firm which specializes in local area is 12.35±2.18, national level 11.70±2.10 and at international level it is 12.75±1.75.

The percentage of fixed cost of company which specializes in local area is 12.10±2.18, national level 7.95±4.55 and at international level it is 10.07±4.44.

Table: 6
Nature of ownership and costs- Two-way MANOVA

Multivariate Tests[a]						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	1.000	71344921.460[b]	5.000	220.000	.000
	Wilks' Lambda	.000	71344921.458[b]	5.000	220.000	.000
	Hotelling's Trace	1621475.488	71344921.458[b]	5.000	220.000	.000
	Roy's Largest Root	1621475.488	71344921.458[b]	5.000	220.000	.000
Ownership	Pillai's Trace	.090	2.095	10.000	442.000	.024
	Wilks' Lambda	.910	2.112[b]	10.000	440.000	.022
	Hotelling's Trace	.097	2.129	10.000	438.000	.021
	Roy's Largest Root	.084	3.725[c]	5.000	221.000	.003
Operation	Pillai's Trace	.101	2.341	10.000	442.000	.011
	Wilks' Lambda	.901	2.344[b]	10.000	440.000	.011
	Hotelling's Trace	.107	2.347	10.000	438.000	.010
	Roy's Largest Root	.079	3.510[c]	5.000	221.000	.005
Ownership * Operation	Pillai's Trace	.128	1.476	20.000	892.000	.081
	Wilks' Lambda	.876	1.481	20.000	730.607	.080
	Hotelling's Trace	.136	1.483	20.000	874.000	.079
	Roy's Largest Root	.080	3.553[c]	5.000	223.000	.004
a. Design: Intercept + Ownership + Operation + Ownership * Operation						
b. Exact statistic						
c. The statistic is an upper bound on F that yields a lower bound on the significance level.						

Source: Computed from field Survey

The result in the MANOVA table shows that Wilks' Lambda value based on ownership is 2.112; P = .022, P< .05; statistically significant. Thus Null hypothesis is rejected. That means the percentage share of different components of cost of Rubber Industry in Kerala based on ownership is different. Similarly Wilks' Lambda value based on operation is 2.344; P = .011, P<0 .05; statistically significant. Thus Null hypothesis is rejected. That means the percentage share of different components of cost of Rubber Industry in Kerala based on operation is different. The interaction effect of the Wilks' Lambda value is 1.481; P = .080, P>0 .05; statistically not significant. Thus Null hypothesis is

accepted. That means the percentage share of different components of cost of Rubber Industry in Kerala based on operation is same.

Table: 7
Nature of ownership and costs -Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Material Cost	457.514[a]	8	57.189	1.849	0.069
	Labour Cost	138.156[b]	8	17.27	0.681	0.708
	Machine Cost	54.151[c]	8	6.769	1.208	0.295
	Overhead cost	94.492[d]	8	11.812	1.921	0.058
	Fixed cost	348.850[e]	8	43.606	4.96	0.000*
Intercept	Material Cost	318460	1	318460.044	10295.511	0.000*
	Labour Cost	46528.1	1	46528.063	1834.367	0.000*
	Machine Cost	22455.9	1	22455.948	4007.858	0.000*
	Overhead cost	21165.4	1	21165.388	3441.929	0.000*
	Fixed cost	18947.9	1	18947.928	2155.425	0.000*
Ownership	Material Cost	131.424	2	65.712	2.124	0.122
	Labour Cost	79.506	2	39.753	1.567	0.211
	Machine Cost	17.046	2	8.523	1.521	0.221
	Overhead cost	43.183	2	21.592	3.511	0.032*
	Fixed cost	115.816	2	57.908	6.587	0.002*
Operation	Material Cost	128.514	2	64.257	2.077	0.128
	Labour Cost	9.663	2	4.831	0.19	0.827
	Machine Cost	22.542	2	11.271	2.012	0.136
	Overhead cost	36.394	2	18.197	2.959	0.054
	Fixed cost	83.193	2	41.597	4.732	0.01*
Ownership * Operation	Material Cost	115.977	4	28.994	0.937	0.443
	Labour Cost	74.884	4	18.721	0.738	0.567
	Machine Cost	19.156	4	4.789	0.855	0.492
	Overhead cost	16.139	4	4.035	0.656	0.623
	Fixed cost	101.527	4	25.382	2.887	0.023
Error	Material Cost	6928.75	224	30.932		
	Labour Cost	5681.68	224	25.365		
	Machine Cost	1255.07	224	5.603		
	Overhead cost	1377.44	224	6.149		
	Fixed cost	1969.14	224	8.791		
Total	Material Cost	509193	233			
	Labour Cost	79487	233			
	Machine Cost	37329	233			
	Overhead cost	35120	233			
	Fixed cost	32412	233			
Corrected Total	Material Cost	7386.27	232			
	Labour Cost	5819.84	232			
	Machine Cost	1309.22	232			
	Overhead cost	1471.93	232			
	Fixed cost	2317.99	232			

a. R Squared = .062 (Adjusted R Squared = .028)
b. R Squared = .024 (Adjusted R Squared = -.011)
c. R Squared = .041 (Adjusted R Squared = .007)
d. R Squared = .064 (Adjusted R Squared = .031)
e. R Squared = .150 (Adjusted R Squared = .120)

Source: Computed from field Survey

From the Anova table it is clear that statistically there is no significant difference among the percentage of different components of cost based on the ownership of Rubber Based Industries in Kerala, except Overhead cost(p=0.032) and Fixed cost (p=0.002). Similarly statistically there is no significant difference among the percentage of different components of cost based on the operation of Rubber Based Industries in Kerala, except Fixed cost (p=0.001). The interaction effect shows that statistically there is no significant difference among the percentage of different components of cost of Rubber Based Industries in Kerala, except Fixed cost (p=0.023).

CONCLUSIONS

The important conclusions of the present analysis are the following.

- The average monthly turnover of Rubber based Industries in Kerala in southern region is Rs. 1762708, central region Rs.935655 and for northern region, the turnover is Rs.808676.

- The average monthly turnover of Local Rubber based Industries in Kerala is Rs.656153 National Rs. 1405315 and for International, the turnover is Rs. 2319821.

- The average monthly turnover of Sole Proprietorship type Rubber based Industries in Kerala is Rs. 832710 Firm Rs. 1330589 and for Company, the turnover is Rs. 2056292.

- The material cost incurred for the Rubber Industry in Kerala was assessed and it found that 46.40%±5.64, labour cost 17.78%±5.00, Machine Cost 12.43%±2.37, Overhead cost (Employee salary, rent, advertisement etc.) 12.017%±2.51, Fixed cost (Bank loan, other fixed expenses irrespective of production) 11.365%±3.16.

  To be more specific, the percentage share of different components of cost namely overhead cost and fixed cost of Rubber Industry in Kerala based on ownership is different and it is found more for sole proprietorship and firm respectively. The percentage share of different components of cost of Rubber Industry in Kerala based on operation is same.

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