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OPERATIONAL EFFICIENCY OF CHENNAI PORT & V.O CHIDAMBARANAR PORT

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Chennai Port

Chennai Port is the third oldest port in the country with a 135 old history. The port has 3 docks comprising of 24 berths, two international container terminals, an oil terminal and a car terminal. Chennai port is a cost effective port with well established infrastructure facilities, pipe line connectivity and rail/road/sea connectivity. The port has an open storage area of 6, 52,432 sq. metres and covered storage area of 52,708.75 Sq. metres. It handles multiple commodities like POL,containers, cars,cruise, edible oil, project cargo, fertilizers and other bulk cargoes. The Port also handles large parcels of 37M long/4.5M high/336 Tons Project cargo. It becomes hub port for containers, car exports and coastal cargo. Chennai Port's container terminals are operated by internationally renowned private operators.

Chennai Port Trust signed a Memorandum of Understanding with Southern Railway for optimizing rail throughput of Automobile traffic for export through Chennai Port. It is aimed to facilitate transportation of automobiles from Walajabad to Chennai Port. The Port has been awarded the "Best Tourist Friendly Harbour" by TTDC on 04.03.2016, in recognition of the world class infrastructure and Tourist Friendly services extended to Cruise Tourists and Cruise Vessels calling at Chennai Port. Chennai Port participated in Maritime India Summit 2016, held from 14- 16th April 2016 at Bombay Convention centre, Mumbai. More than 700 maritime delegates visited the stall, inquiring about trade facilitation measures available with the Chennai Port. The Port handled 51.10 Million Tonnes of cargo during 2013-2014.

V.O. Chidambaranar Port

V.O Chidambaranar Port was constructed on 11th July 1974 and it was declared as the tenth Indian major port. The Port located at south eastern coast of India and has glorious past in maritime trade. It is artificial deep sea harbour. The port is free fro littoral drift and siltation problems functioning with 2 arms. Zone A and Zone B (Anchorage Port)Zone A: Deep sea port having 4 berths to handle break bulk, dry and oil jetty to handle POL Products.Zone B: Lighterage port with facilities to operate vessels at mid stream only.

The total income was Rs.425.10 Crore and total expenditure was Rs. 300 Crore in the year 2013-2014.

Need and Importance

Firm's primary business operations results with the income of that firm. That income may increase due to various parameters. One parameter which is common and important for all organization is production. If production increases the income and expenditure of firm also increases. The operational performance is a subjective measure of how well a firm can use the parameters from its primary mode of business and how it helps to generate revenues. Port performance measurement is not only a powerful management tool for port operators, but also constitutes a most important input for informing regional and national port planning and operations . IT can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. Indian ports are poised for significant growth due to increase in containerization trade, greater cargo traffic at ports and Government active initiatives in recent years. Even though there is a need to be marked improvement in many parameters to get Indian ports at par with international standards.

Chennai Port and V.O. Chidambaranar Port are in the same state of Tamilnadu, and Operates with same policies and rules. Both are declared as Major Ports.

Scope

The researcher have done a pilot study for the above mentioned subject and found that all the major ports performance is based on the achievement of tonnage handled in that particular port. So that the port are ranked on the tonnage achieved but the fact that researcher came to know after the pilot study is that ports which are ranked first in performance may have less liquidity and rate of investment is less. This is because the performance of the port is not only with the quantity (tonnage) achieved, but there is a relationship between the cargo handled in the port, berth productivity , throughput achieved and most importantly the rate of earning capacity.

Objective of the Study

- To study the theoretical background of the Chennai Port and V.O. Chidambaranar Port.
- To study and find the relationship between the throughput and financial performance.
- To find out efficiency of the Chennai Port and V.O. Chidambaranar Port.

- To predict the future Income and Expenditure in the Year 2020.
- To analyze the data and give recommendations for the above mentioned study.

Limitatation

- The level of generalization possible in the analysis of ports is extremely limited as each port is different from other.
- This study does not focus on technical aspects of operational issues of major ports of Chennaiport and V.O. Chidambaranar port.
- Apart from Major ports the state run minor ports, intermediate ports and Private ports which are completely excluded in this study.

Data source

A pilot study is conducted by the researcher on sample of 2 major ports viz., ChennaiPort and V.O. Chidambaranar Port for the period of 2004-2005 to 2013-2014. The study has employed statistical tools like Karlpearson correlation, Percentage analysis and fit a straight line trend.

The task of data collection being after a researcher, problem has been defined and researched plan chalked out. The researcher in this study has assumed to workout with secondary data. The secondary data are those which have already been passed through statistical process. They refer to data which have already been collected and analyzed by someone else. The researcher when utilizing secondary data has to look into various sources from where he can obtain them. Secondary data may in a) Various Periodicals and Newspaper b) Various publications of the Central, State or Local Governments.

Table1.1, Traffic & Operating Income Of Chennai Port

Year	Traffic (Tonnage) (X)	Operating Income(Y)	dx=X-mean	dy=Y-mean	Dxdy	DX2	DY2
2004-05	43806.00	403.64	-10378.60	-189.40	1965728	107715337.96	35873.12
2005-06	47248.00	431.69	-6936.60	-161.35	1119234	48116419.56	26034.47
2006-07	53414.00	534.97	-770.60	-58.07	44750.28	593824.36	3372.36
2007-08	57154.00	628.09	2969.40	35.05	104071.5	8817336.36	1228.36
2008-09	57491.00	671.49	3306.40	78.45	259380.5	10932280.96	6154.09
2009-10	61057.00	718.35	6872.40	125.31	861166.7	47229881.76	15702.09
2010-11	61460.00	683.91	7275.40	90.87	661101	52931445.16	8256.99
2011-12	55707.00	627.11	1522.40	34.07	51865.12	2317701.76	1160.63
2012-13	53404.00	630.84	-780.60	37.80	-29505.1	609336.36	1428.69
2013-14	51105.00	600.33	-3079.60	7.29	-22444.1	9483936.16	53.11
Total	**541846.00**	**5930.42**	0.00	0.00	**5015348**	**288747500.40**	**99263.91**
Average	**54184.6**	**593.042**					

Inference

In the above table the researcher have used Karl Pearson's Coefficient of correlation as a statistical tool to correlate traffic (tonnage) and operation of Chennai Port from the year 2004-05 to 2013-14. Traffic as taken as variable X and Operating income as variable Y and its found that correlation result is 0.93, which clearly shows that the traffic handled in Chennai Port and the Operating income is Positively correlated.

Table 1.2, Traffic & Operating Income Of V.O. Chidambaranar Port							
Year	**Traffic (Tonnage) (X)**	**Operating Income(Y)**	**dx=X-mean**	**dy=Y-mean**	**Dxdy**	**DX2**	**DY2**
2004-05	15811.00	137.79	-7085.30	-106.73	756178.64	50201476.09	11390.23
2005-06	17139.00	159.04	-5757.30	-85.48	492105.22	33146503.29	7305.98
2006-07	18001.00	183.01	-4895.30	-61.51	301085.43	23963962.09	3782.87
2007-08	21480.00	195.35	-1416.30	-49.17	69632.389	2005905.69	2417.20
2008-09	22011.00	219.73	-885.30	-24.79	21942.161	783756.09	614.30
2009-10	23787.00	240.40	890.70	-4.11	-3665.23	793346.49	16.93
2010-11	25727.00	261.06	2830.70	16.55	46833.932	8012862.49	273.74
2011-12	28105.00	307.67	5208.70	63.16	328955.45	27130555.69	3988.55
2012-13	28260.00	364.02	5363.70	119.51	640988.97	28769277.69	14281.45
2013-14	28642.00	377.08	5745.70	132.57	761678.72	33013068.49	17573.48
Total	**228963.00**	**2445.15**	0.00	0.00	**3415735.7**	**207820714.10**	**61644.71**
Average	**22896.3**	**244.52**					

Inference

In the above table the researcher the correlation is calculated between the traffic (tonnage) and operation of V.O. Chidambaranar Port from the year 2004-05 to 2013-14. Traffic as taken as variable X and Operating income as variable Y and Karl Pearson's coefficient of correlation between the two is resulting as 0.96, which clearly shows that the traffic handled in V.O. Chidambaranar Port and the Operating income is Positively correlated.

TABLE 1.3,Operating Ratio Of Chennnai Port& V.O. Chidambaranar Port

	Chennai Port			**V.O Chidambaranar Port**		
Year	**Operating Income(X)**	**Operating ExpensesY)**	**Operating Ratio(%)**	**Operating Income(X)**	**Operating Expenses(Y)**	**Operating Ratio(%)**
2004-05	403.64	286.47	70.97	137.79	64.37	46.72
2005-06	431.69	312.95	72.49	159.04	61.57	38.71
2006-07	534.97	348.00	65.05	183.01	68.97	37.69
2007-08	628.09	400.85	63.82	195.35	74.76	38.27
2008-09	671.49	455.51	67.84	219.73	98.47	44.81
2009-10	718.35	532.84	74.18	240.40	118.61	49.34
2010-11	683.91	579.73	84.77	261.06	119.67	45.84
2011-12	627.11	564.80	90.06	307.67	143.02	46.48
2012-13	630.84	586.75	93.01	364.02	211.02	57.97
2013-14	600.33	594.17	98.97	377.08	231.41	61.37
Total	**5930.42**	**4662.07**	**781.16**	**2445.15**	**1191.87**	**467.20**
Average	**593.042**	**466.207**	**78.12**	**244.52**	**119.187**	**46.72**

Inference

In the above table the researcher the Operating ratio is calculated between the Operating expenses and operating income of Chennai Port and V.O. Chidambaranar Port from the year 2004-05 to 2013-14. Operating income as taken as variable X and Operating expenses as variable Y and Operating ratio for Chennai Port is 78.12% and Operating ratio for V.O. Chidambaranar Port is 46.72% which clearly shows more efficiency .

Table 1.4 Fitting a Straight line of Income of Chennai Port from 2004-2014

Year	**X**	**Income(in crores)(Y)**	**XY**	**X2**
2004-05	1	474.96	474.96	1
2005-06	2	520.26	1040.52	4
2006-07	3	673.70	2021.1	9
2007-08	4	890.40	3561.6	16
2008-09	5	853.44	4267.2	25
2009-10	6	903.15	5418.9	36
2010-11	7	875.77	6130.39	49
2011-12	8	840.36	6722.88	64
2012-13	9	883.68	7953.12	81
2013-14	10	811.75	8117.5	100
Total	55	**7727**	**45708**	**385**

Using the principle of least squares required equations are

1. 55a+10b=7727
2. 385a+55b=45708

Solving we get

a=38.9

b=558.7

Therefore Y= 38.9X+558.7 is the normal equation connecting the year andits corresponding income.

From the above normal equation it is possible to project the expected

income of Chennai port during 2020 A.D. This can be got by substituting

X=16 in the equation Y=38.9X+558.7& the income of Chennai port will be

Rs. 1181Crores.

Hence the principle of least square is boon to fit a straight line between

the year & income in Crores.

Table 1.5, Fitting a Straight line of Expenditure of Chennai Port from 2004-2014

Year	X	Expenditure(in crores)(Y)	XY	X2
2004-05	1	359.01	359.01	1
2005-06	2	361.90	723.8	4
2006-07	3	410.92	1232.76	9
2007-08	4	459.14	1836.56	16
2008-09	5	586.75	2933.75	25
2009-10	6	691.99	4151.94	36
2010-11	7	807.70	5653.9	49
2011-12	8	818.23	6545.84	64
2012-13	9	865.42	7788.78	81
2013-14	10	985.53	9855.3	100
Total	55	**6347**	**41082**	**385**

Using the principle of least squares required equations are

1. 385a+55b=41082
2. 55a+10b = 6347

a=74.8

b=223.3

Therefore Y= 74.8X+223.3 is the normal equation connecting the year and its corresponding Expenses.

From the above normal equation it is possible to project the expected expenses of Chennai port during 2020 A.D. This can be got by substituting X=16 in the equation Y=74.8X+223.3& the income of Chennai port will be Rs. 1420Crores.

Hence the principle of least square is boon to fit a straight line between the year & expenditure in Crores.

Table 1.6,- Fitting a Straight line of income of Chidambaranar port from 2004-2014

Year	X	Income(in crores)(Y)	XY	X2
2004-05	1	163.35	163.35	1
2005-06	2	181.58	363.16	4
2006-07	3	211.73	635.19	9
2007-08	4	225.04	900.16	16
2008-09	5	258.21	1291.1	25
2009-10	6	282.98	1697.9	36

2010-11	7	312.73	2189.1	49
2011-12	8	335.61	2684.9	64
2012-13	9	409.21	3682.9	81
2013-14	10	425.10	4251	100
Total	55	**2806**	**17859**	**385**

Using the principle of least squares required equations are

1. 55a+10b=2806
2. 385a+55b=17859

Solving we get

a=29.4

b=118.9

Therefore Y= 29.4X+118.9 is the normal equation connecting the year and

From the above normal equation it is possible to project the expected income of Chennai port during 2020 A.D. This can be got by substituting X=16 in the equation Y=29.4X+118.9 & the income of Chennai port will be

Rs. 589 Crores.

Hence the principle of least square is boon to fit a straight line between the year & income in Crores.

Findings

In Physical parameters traffic handled is emerged as a single most influential factor that solely determined the performance of ports during the entire observation period.

The researcher has worked the analysis of Chennai and V.O. Chidambaranar port with the help of Karl Pearson's Coefficients of correlation. Correlation is a statistical tool which measures and analyses the degree or extent to which the two variables fluctuate with reference to each other. It indicated that there is connection between the variables. Karl Pearson's coefficients of correlation help in measuring of linear relationship between the two variables.

Researcher has analyzed the Chennai Port and found that there is positive correlation of 0.94 between the physical performance (Tonnage/Traffic) and financial performance (Operating Income) as shown in the table 1.1. In case of V.O. Chidambaranar port also found positive correlation of 0.95 between traffic (tonnage) and Operating income of the Port which was shown in table 1.2. Both the ports have positively correlated with their traffic handled and operating income. But V.O. Chidambaranar port was high Positive correlation than Chennai port which is nearly 1 and it is accepted that the port is performing well in case of earning operating income.

Operating income resulting a firm's primary business operations, excluding extra ordinary income and expenses. It gives more accurate picture of a firm's profitability than gross income. Lower ratio is more efficiency. The ratio should be low enough to provide fair return to the shareholders and other investors.

The researcher has worked by using Simple Percentage tools to find the efficiency of port. Operating ratio of Chennai Port is 78.12% and V.O.Chidambaranar Port is 46.72%. The higher operating ratio shows inefficiency of port.

The total expenses incurred on V.O Chidambaranar Port major port had been brought under control gradually. This could be associated with downsizing of employees.

The researcher has worked the analysis of Chennai and V.O. ChidambaranarPort with the help of fitting straight line trend . It is a tool which predicts the future income and expenditure of above said port.

Researcher has analyzed and predicts the future income and expenditure of Chennai Port is 1181Crores and 1420Crores during the period 2020.

The income and expenditure of V.O.Chidambaranar Port during 2020 was predicted 589Crores and 403Crores.The Overall financial performance of two major ports during the study period is that the Chennai port total income and expenses are high as compared to V.O. Chidambaranar port. A good firm will always incurred the expenditure within the income of the port. So the study shows that V.O. Chidambaranar Port is quite encouraging.

Suggestion

Most Indian ports had obsolescent capacity that affects the operational efficiency of port. Apart from the tonnage there are so many parameters which influence the operating income of the port.

Both the ports are positively correlated in income. But V.O Chidambaranar Port is highly correlated than Chennai Port.The operating ratio of V.O. Chidambaranar was one of the lowest in major ports with 46.72 percent. So that it was possible only with strict monitoring of the expenditure at all levels.

Conclusion

The study comparing Chennai Port and V.O. ChidambaranarPort are similar because both are in the hinterland and operates with same policies and rules.

Development policies and the unplanned growth of interrelated industries are seen of late; in fact many ports have become the location for industrial clusters. Industrial clusters are geographic concentration of private companies that may compete with one another or complement each other as customers and suppliers in specialized areas of production and distribution.

The Critical changes underway in port sector have many facets that need to be brought under a comprehensive review and research scrutiny from contemporary perspective.