OUTSOURCING OF LOGISTICS AND GLOBAL COMPETITIVENESS –A CASE STUDY ON JAWAHARLAL NEHRU PORT TRUST

Toorban Mitra[1] and Dr. Krushna Mohan Pattanaik[2]

Abstract: With the emergence of global competitiveness in port sector, it is imperative that a port is not just operational but also effective in its service provision. Logistics performance, *ceteris peribus*, stimulates this effectiveness of a port significantly in terms of its performance. In this context it is illuminated that outsourcing of logistic activities and competitiveness of a port are co-habitants. In view of the present background set, the present study makes an intervention to explore performance of various outsourced stakeholders involved in logistic service provision for Jawharlal Nehru Port Trust (JNPT) which may include service provision of various Container Freight Stations (CFS), Inland Container Depots (ICD) and Logistic Operators under JNPT. Using secondary data collected from various stake holders to establish standard port operation indicators, this paper makes an endeavor to measure the comparative performance of each of these stakeholders which in turn would facilitate their respective macro operational impact on the effectiveness of JNPT to face growing global competitiveness in the coming times. As a follow up, strategic options are suggested for improvement and retention of competitive performance of outsourced stakeholders involved in logistics service provisions in JNPT's operations.

Keywords: Outsourcing in Logistics, Container Freight Station, Inland Container Depot, Import Cycle, Export Cycle, Dwell Time.

1. INTRODUCTION

The early part of 21st century India witnessed a paradigm shift in the understanding of facilitating factors for port competitiveness and assumes outsourcing as one of the panacea for survival of ports. Unlike the traditional approach of over emphasizing the concept of economies of scale as a way out for reducing operational cost, which is more often difficult to achieve, ports exclusively look at outsourcing of logistic activities as a survival strategy. Such tendency is imperative in an environment of economic constraints where each company tries to reduce its operational costs and improve quality of service delivery, and thereby optimizing its profits. Further, at a time when Total Quality Management (TQM) is an integral part of organizational goals, outsourcing of activities is a trend setter for logistics operations of a port is essential to have delighted customers. The causal links between competitiveness and outsourcing in the port sector is further illuminated by the on-set of recession in 2009 on wards wherein customer delight rather than customer retention has provided anxiety in industry to assume operational strategies as evolving.

Adding to the above anxiety is the astrayed understanding of the notion of competitiveness in the context of maritime sector which to an extent has led to an over simplified understanding of port competitiveness and thereby policies to achieve the same.

Traditional conceptualization of competitiveness could be seen as strategic options adopted by a firm to provide unique value to its customers and thereby standing on a competitive edge. Academic attempts which vividly illuminated conceptualisation of competitiveness in maritime sector in the above lines are not scarce. However, such approach in defining competitiveness has less relevance to maritime sector as port is a system of complex web of network of inter-related depended activities of various stakeholders. Therefore, the definition of port competitiveness has to consider from the perspective of an integrated system of competitiveness and not as ports competitiveness *per se* (Parola *et al*, 2016). In this context, Scaramelli (2010) highlights that in literature on port competitiveness, the definition of competitiveness is inappropriate and incomplete as port operations involve various stakeholder and all are part of an integrated logistics management system. In a system where there are quite a few stakeholders and each one tries to achieve optimality of their respective business goals facilitated by exclusive strategic business solutions, it is very difficult to define port competitiveness, *ceteris paribus*, based on physical performance of a port.

Port competitiveness has several dimensions and can be achieved as a result of increasing competitiveness of each of the stakeholders involved in the system (Parola *et al*, 2016). In this context, Robinson, R. (2002) acknowledges that ports compete on supply chain activities in terms of customer delight and not on operational efficiency. Adding to the above, Heaver (1995) states that port competition and competitive strategies are related to logistics system of the port and thus related to terminals of the port. Therefore, while defining port competitiveness, terminal efficiency is an essential element that needs to be considered. Further, terminal efficiency could be improved through outsourcing of service provisions. The inter linkages between performance of a port and outsourcing is much acknowledged in the literature on port performance (UNCTAD, 2014; Draskovic, 2013). It is in this context that the present study makes an intervention in the academic literature on port competitiveness by including

[1]Research Officer, Indian Maritime University – Kolkata Campus, Email: tmitra@imu.ac.in
[2]Assistant Professor, Indian Maritime University, Kolkata Campus, Email: kmpattanaik@imu.ac.in

terminal efficiency and outsourcing elements in the methodology of measuring port competitiveness via port performance.

2. DETERMINANTS OF COMPETITIVENESS

A spate of factors in the likes of private investment in port sector, strengthening of trade relationship between countries, cost competition, to mention a few have all contributed to the increasing realisaton of the importance of competitiveness in maritime transportation. In the literature on port competitiveness, there is no universal consensus on the determinants of port competitiveness. Scaramelli (2010) points out the determinants of port competitiveness in terms of competition in lights of operator levels, port authority levels, tariff levels, goods handled, etc. On the other hand, Taghavi *et al* (2017) illuminates hinterland connectivity, geographical location of a port, physical infrastructure, etc. as elements of port competitiveness. Still Draskovic (2013) studies port performance and competitiveness from the perspective of outsourcing. Heaver (1995) connects performance strategies with port terminal efficiency. In this context, Wu and Lin (208) point out that efficiency can be a potential indicator of competitiveness.

3. METHODOLOGY AND DATA

As is evident from the above discuss that there is a conceptual confusion that exists in terms of defining competitiveness in maritime sector. Further, there is no consensus on the indicators of port competitiveness. Much of the focus in literature on port competitiveness has been on identifying the determinants of port competitiveness and measuring such identified determinants (Parola *et al*, 2016). In this scenario, the present study tries to make partial equilibrium analysis in terms of measuring terminal efficiency as an indicator of port competitiveness via port performance. It is in this context that the present takes an infant step to include outsources CFS activities of the port to measure terminal efficiency with a presumption that there exist a direct positive relationship between efficient CFS activities and terminal performance and thus port competitiveness. In this context, an attempt is made to consider Jawaharlal Nehru Port Trust (JNPT) as a case point. The reasons for including JNPT for the present study are provided below.

Jawaharlal Nehru Port Trust (JNPT) was commissioned on 26th May, 1989 at Navi Mumbai (formerly known as the Nhava Sheva Port) is India's No. 1 container port handling more than half of the container cargo across all major ports in India. It occupies a prominent place among the most modern ports in India and is ranked 28th among the top 100 container Ports in the world.
JNPT serves the maritime industry through its five container terminals and one twin berth liquid cargo jetty. The container terminals are

(i) Jawharlal Nehru Port Container Terminal (JNPCT),
(ii) Nhava Sheva International Container Terminal (NSICT),
(iii) Gateway Terminals India Container Terminal (GTICT),
(iv) Bharat Mumbai Container Terminal (BMCT) and
(v) Nhava Sheva India Gateway Terminal (NSIGT).

For evaluation of the performance of the terminals at JNPT as an indicator of port competitiveness via port performance, Data Envelopment Analysis (DEA) is performed. The use of DEA technique for measurement of efficiency is widely acknowledged (PjevČeviĆ *et al*, 2012). Data envelopment analysis (DEA) is a nonparametric method used for the estimation of production frontiers. It is used to empirically measure productive efficiency of Decision Making Units (DMUs). In the present study, Overall Dwell Time of CFS of JNPT is considered as input, terminal wise number of containers (TEUs) handled at JNPT was considered as output and the terminals are taken as Decision Making Units.

The present study is purely based on secondary data collected from the virtual space of Jawaharlal Nehru Port Trust Mumbai. The period between January to December 2018 is considered for analysis. In the absence of data on terminal wise number of containers handled at JNPT between the period October to December, 2018, a projection data is used for the same period. Also, for the present study, except BMCT, other four terminals of JNPT namely JNPCT, NSICT, GTICT, and NSIGT are considered. The reason for the such exclusion is non availability of data for BMCT for a significant timeline considered under this study.

4. ANALYSIS OF RESULTS

As discussed above, for the present study, the DEA considers overall dwell time of CFS is taken as input and terminal wise number of containers handled is used as outputs with terminals as Decision Making Units. The tentative reasoning for taking these variables for the study is based on the presumption that the dwell time of a CFS in terms of export and import cycle directly effects terminal performance, keeping other factors constant. It is expected that for a container based port, the lower is the dwell time of a CFS, the better is the performance of a port in terms of evacuation of container via performance of a terminal. In this connection, it is presumed that if a container stays at a CFS for less time after leaving port or reaches port in a shorter time after leaving CFS, the number of containers handled at a particular port would increase, keeping other factors constant. Since containers are handled at a terminal of a port, if the overall dwell time of a CFS falls, the performance of a port increases in terms of number of containers handled by terminals. Therefore,

if a CFS is attached with a terminal and the overall dwell time of the CFS is less, the higher are the number of containers handled by that terminal, keeping other dynamic factors of performance constant. Thus, the better is the port competitiveness. With this proposition, below are discussed the results of the DEA conducted for the aforementioned four terminals of JNPT.

Efficiency of the terminals: The analysis using DEA states that GTICT is most efficient among four terminals working at JNPT, whereas, JNPTC, NSGIT and NSCIT ranks second, third and fourth (Table-1).

Table -1: Efficiency Scores of Terminals

Terminal ▶	JNPTC	GTICT	NSCIT	NSGIT
Input-Oriented CRS Efficiency	0.89712	1	0.38233	0.76303
Sum of lambdas	0.902	1	0.395	0.688
RTS	Increasing	Constant	Increasing	Increasing
Optimal lambda with Benchmarks	0.902	1	0.395	0.688
	GTICT	GTICT	GTICT	GTICT
Source: DEA as conducted by Authors				

Efficiency input target: Table -2 shows the efficiency input target for four terminals with respect to CFS Dwell time for January to December of 2018. As GTICT is most efficient among the four (as per Table 1), that has been chosen as benchmark and the other three terminals are compared with GTICT.

Table – 2: Efficiency Input Target Scores

Terminals ▶ / Months ▼	JNPTC	GTICT	NSCIT	NSGIT
Jan	41.31	45.8	18.1	31.49
Feb	36.98	41	16.2	28.19
Mar	38.25	42.4	16.76	29.16
Apr	40.36	44.74	17.68	30.76
May	47.75	52.93	20.92	36.4
Jun	47.81	53	20.94	36.44
Jul	46.19	51.2	20.23	35.21
Aug	49.16	54.5	21.54	37.48
Sept	46.55	51.6	20.39	35.48
Oct	45.64	50.6	20	34.79
Nov	40.59	45	17.78	30.94
Dec	37.98	42.1	16.64	28.95
Source: DEA as conducted by Authors				

Efficiency output target: Table -3 shows the efficiency output target for four terminals w.r.t. number of containers required to be handled throughout the year 2018 to achieve efficiency. As GTICT is most efficient among the four, that has been chosen as benchmark and the other three terminals are compared with respect to GTICT.

Table 3: Efficiency Output Target Scores

Terminals ▶ / Months ▼	JNPTC	GTICT	NSCIT	NSGIT
Jan	87013	96460	38119	66329
Feb	80533	89277	35280	61390
Mar	69227	76743	30327	52771
Apr	83026	92040	36372	63290
May	78892	87457	34561	60138
Jun	76503	84809	33515	58317
Jul	74853	82980	32792	57060
Aug	107894	119608	47267	82246
Sept	79805	88470	34962	60835
Oct	79042	87624	34627	60253
Nov	78287	86786	34296	59677
Dec	77538	85957	33968	59106
Source: DEA as conducted by Authors				

The findings of the DEA are the following
GTICT is the most efficient terminal whereas NSCIT is the least efficient terminal among all four functioning at JNPT.

In comparison to GTICT, there is a scope for decreasing overall dwell time or increasing the number of containers handled without changing in overall dwell time.

Performance of the terminals depends to a great extent on increase or decrease in overall dwell time.

5. CONCLUSION AND POLICY SUGGESTIONS

The most efficient and least efficient terminals of JNPT under the present study are GTICT and NSCIT respectively. Hence, JNCPT, NSCIT and NSGIT needs to relook to the functioning of their respective outsourced CFS agencies and suggest for necessary improvements.

Keeping other factors constant, there is a scope before the inefficient terminals either to reduce dwell time through their respective outsourced CFS activities or to increase the number of containers handled or both. Hence, terminals need to search for root cause of inefficiency of the outsourced CFS activities and necessary steps need to be taken to overcome the same.

Improvement in performance of the outsourced CFS activities directly contributes towards the improved performance of the terminals and thereby overall competitiveness of JNPT. Therefore, to play as more competitive to the maritime industry, JNPT also needs to play a crucial role in improving efficiency of the terminals. It can provide necessary supports to assist the terminals to be more efficient.

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