

# A Study Between Overseas and Coastal Trade at Indian Major Vs Minor Ports

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## Abstract

Ocean transport still plays a vital role in international trade of India as it presently covers almost 95 percent of the total volume of trade of world trade, even in the post liberalisation period, despite the growth of air transport. Indian ports comprise of both Major as well as Minor Ports. Both of which cater to the massive expansion in the volume of India's sea borne trade, even, in this era of globalisation, in response to the emerging trend in global sea-trade. This paper therefore attempts to make a comparative study between the growth of Overseas and Coastal Trade at ports in India during the period 1980-81 to 2009-10 (over the four consecutive decades), thus, specifying the role of Major and Minor ports, with a view to assess both statistically and mathematically the performance of these ports in the above trade performance.

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**Keywords :** Overseas and Coastal Trade, Mathematical and Statistical methods, Trade Intensity, Indian Ports

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## Introduction

Ocean transport has played a vital role in the history of international trade of India since pre-historical times. In post independence period, according to the constitution of India, ocean transport sector is administered by both the Central Government and also the State governments, as it falls under the Concurrent List of the Constitution. Major ports are administered by the Central Government while the minor and intermediate ports are administered by the relevant State Governments of the nine coastal states, i.e. Andhra Pradesh, Odisha, West Bengal, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat. India has a coastline of 7600 kilometers, with a well-established port infrastructure, comprising of 13 Major Ports (12 government and 1 corporate) and 187 notified minor and intermediate ports, spreading across the above mentioned coastal states of the country. These ports mainly handle sizeable volumes of both overseas as well as coastal traffic, thus, acting as major gateways to country's international trade by sea. For instance, the Indian ports registered total cargo volume of traffic of 1,052 million metric tonnes (MMT) in 2015, and is expected to reach 1,758 MMT by volume in 2017 (Sau, (1997) ; Flor (2003)).

The role of these above mentioned Major and Minor Ports of India in country's external trade are significant, even in the context of globalization period, as it still consists of about 95 percent (lion's share) by volume (quantity) and about 70 percent by value of overseas trade through the seaports, in the post independence period, despite the tremendous growth of air transport system. Now, volume of both overseas and coastal seaborne trade consist of their respective volumes of imports (unloaded traffic) and exports (loaded traffic) of all commodities. Hence, the sum of volumes of overseas and coastal exports and imports equal the volume of total overseas and coastal trade respectively.

### Literature Review

In the relatively neglected branch of studies of Indian port literature, it has been found that the history and developmental issues, cargo handling aspects, general role and functioning of Calcutta Port Trust and other few major ports in India such as Haldia, Mumbai ports always had been focused. In this connection, mention may be made of Banerjee (1975), Stutchey (1978), Panda (1991), Ray (1993), Chakraborty (1995) (ed.) and Sau (1997), De (1999), with the first major pioneer to write the history of Calcutta Port (CP) by Mukherjee (1968). Besides them, various discussion papers such as those of Ghosh and De (1998) and (2001) had emphasized on the different aspects of the CPT and Haldia Port responsible for the decline of the CPT and the need of Haldia Port. Hence, main focus had been, so far, given on specifically, few above mentioned major ports in the overall trade performance, with almost very little or no focus on the role of both major and minor ports, specifically, in the nature of trade performance of ports of India. So, against the above, theoretical backdrop, this paper attempts to make a Comprehensive study between the growth of Overseas and Coastal Trade at ports in India during the period 1980-81 to 2009-10 (over the four consecutive decades), thus, specifying the role of Major and Minor ports in the above trade performance.

Now, the period of study have been analysed in two groups -

a) Major Ports for the period 1980-81 to 2009-10

b) Minor ports for the period 1989-90 to 2009-10. A shorter period is considered as consistent data for the previous years (till 1988-89) were not available. Hence, only the period of 1989-90 to 2009-10 are studied for the comparative study between major and minor ports at all ports in India.

### Objectives of Study

The main objective of this paper is therefore to make a comparative study between the growth of overseas and coastal trade, with a view to assess the role of Major and Minor Ports in the above trade performance of India, during the period 1980-81 to 2009-10, i.e over the consecutive four decades, in terms of

- i) Trends in the absolute growth of the volumes of both overseas and coastal trade respectively
- ii) Trends in the growth of total trade intensity in terms of the growth of Overseas Trade Intensity (OTI) and Coastal Trade Intensity (CTI) respectively
- iii) Relative growth of the volumes of both overseas and coastal trade respectively
- iv) Overall trend of growth of the volumes of the port traffic across the ports over the study periods

### Data and Methodology

Secondary data on the volumes of total traffic, measured in million tonnes (MT) handled by the ports of India are collected from the various publications of Basic Ports Statistics of India, Annual reports of the Indian ports Association and from the official website of Ministry of Shipping, Government of India.

Graphical, statistical and mathematical tools are used as methodology for this study. Simple graphical and diagrammatical tools are used to study the trends in the growth of overseas and coastal trade as well as their trade intensities at those ports. Moreover, as statistical method, square of correlation coefficient, (denoted by  $R^2$ ), a measure of the goodness of the fit of the trend lines

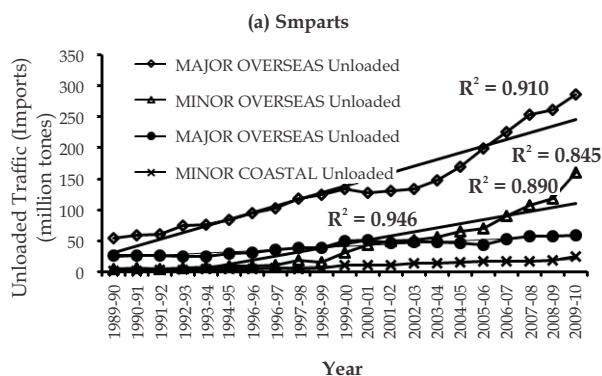
is used to study the degree of the linear dependence between the variables. The value of  $R^2$ , in this paper, measures the relative amount or percentage of the variation in the dependent variable (i.e, trade performance) which can be explained by the change in the independent variable (i.e, time) (Gujrati & Sangeetha (2008)).

Further, as mathematical tools, Compounded Annual Growth Rate (CAGR) is also used to compare the growth of port traffic between Major and Minor Ports. Again, this paper also uses  $\sigma$ -convergence to study about the nature of regional disparity of ports with respect to the volumes of their different types of port traffic. Moreover,  $\sigma$ -Convergence is also tested to find out whether there is any trend of convergence or divergence between the role of major and minor ports in the growth of overseas, coastal traffic over time. Since, different types of port traffics are the major determining factors causing regional disparities across the ports (Major and Minor ports),  $\sigma$ -convergence is therefore, calculated with respect to both the parameters (Sala-i-Martin, X. (2006)).

### Study of Overseas and Coastal Trade between Major and Minor Ports

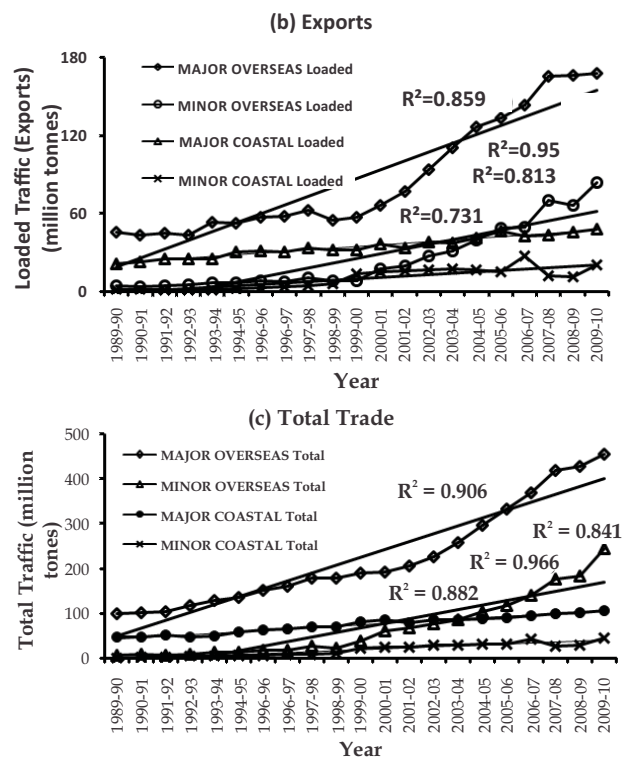
Figure 1 (a), (b) and (c) compare the trends in the absolute growth of both the volumes of overseas and coastal unloaded traffic or imports, loaded traffic or exports and those of trade between Major and Minor ports respectively.

**Figure 1 : Growth Trends of Overseas and Coastal (a) Imports (b) Exports and (c) Total Trade Respectively Between Major and Minor Ports**



It is found from the values of  $R^2$  of Figure 1(a) that there are greater variations in the growth of Overseas Imports ( $R^2 = 0.91$ ) at Major Ports as

compared to that in the growth of Overseas Imports ( $R^2 = 0.845$ ) at Minor Ports. But Minor Ports show greater variations in the growth of Coastal Imports ( $R^2 = 0.946$ ) as compared to that in the growth of Coastal Imports ( $R^2 = 0.89$ ) at Major Ports. In case of exports, Figure 1(b) shows greater variations in the growth of both the Overseas ( $R^2 = 0.86$ ) and Coastal Exports ( $R^2 = 0.95$ ) at Major Ports; whereas Minor ports reveal a greater variation in the volume of the overseas exports ( $R^2 = 0.813$ ) than that of coastal exports ( $R^2 = 0.731$ ). Next, for total trade from Figure 1(c), Major Ports also show greater variations in the growth of both Overseas ( $R^2 = 0.91$ ) and Coastal trade ( $R^2 = 0.97$ ) as compared to those in the growth of both Overseas ( $R^2 = 0.841$ ) and Coastal trade ( $R^2 = 0.882$ ) at Minor Ports.



Source : [www.shipping.nic.in](http://www.shipping.nic.in)

It is found that in case of Imports, Major ports therefore show greater variations in overseas trade, while Minor ports show that in coastal trade respectively. In case of Exports, role of Major ports are higher in both overseas and coastal trades as compared to those of Minor ports which are evident from the values of  $R^2$  from Fig 1(b). Moreover Major ports show greater variations in coastal exports, while Minor ports show the same

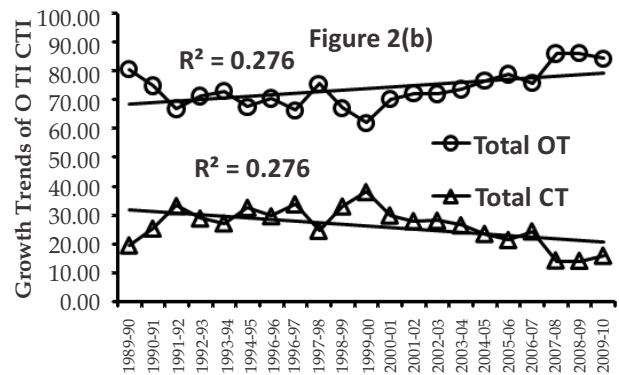
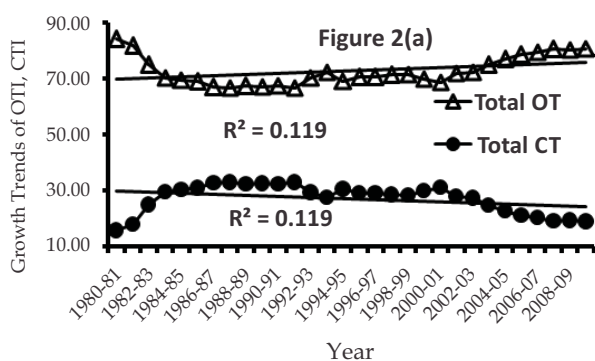
in overseas exports respectively. Hence, because of the greater variations in both overseas imports and exports, Major ports therefore reveal greater variations in overseas trade as compared to Minor ports. Again, because of the slightly greater variations in coastal exports at Major ports than those in coastal imports at Minor ports, the former ports reveal greater variations in coastal trade as compared to Minor ports. This may be because of the higher volumes of both the overseas as well as coastal traffic handled by Major Ports as compared to Minor Ports in India, owing to their greater cargo handling capacity and better infrastructural facilities at those ports.

### Growth Trends of Trade Intensities at Indian Ports

This section compares the growth trends of Total Trade Intensity between Major and Minor Ports. Total Trade Intensity comprises of Overseas Trade Intensity (OTI) and the Coastal Trade Intensity (CTI) at all ports. Overseas Trade Intensity (OTI) may be defined as the percentage share of the volume of overseas trade (OT) in the total volume of trade. Similarly, Coastal Trade Intensity (CTI) may be defined as the percentage share of the volume of coastal trade (CT) in the total volume of trade.

Figures 2 (a) and (b) reveal the trends in the growth of total trade intensity in terms of the growth of Overseas Trade Intensity (OTI) and Coastal Trade Intensity (CTI) between Major and Minor ports respectively.

**Figure 2. Growth Trends of Total Overseas and Coastal Trade Intensities at (a) Major and (b) Minor Ports**



Source : [www.shipping.nic.in](http://www.shipping.nic.in)

It is found from the values of R<sup>2</sup>s from Figures 2 (a) and (b) that both the OTI and CTI have shown much higher variations at Minor ports (R<sup>2</sup> = 0.28) than those at Major Ports (R<sup>2</sup> = 0.12), though, almost with the same values in both of the trade intensities in each case. This may be because of greater utilization of Major Ports than Minor ports in India over the said period.

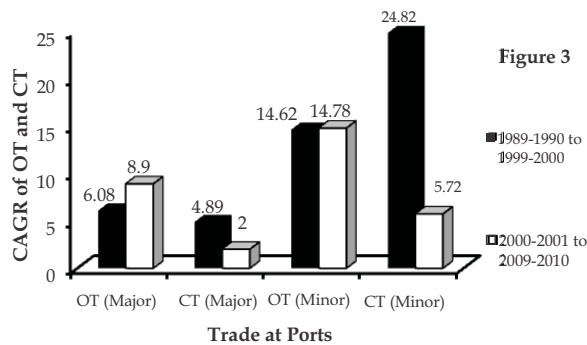
### Compounded Annual Growth Rates (CAGR) of Port Traffic

This section analyses the relative growth of the volumes of both overseas and coastal trade respectively between Major and Minor ports in India over the time period 1989-90 to 2009-10 in terms of Compounded Annual Growth Rates (CAGR) in Figure 3.

A comparative performance regarding the relative growth of the volumes of both overseas and coastal trade respectively between Major and Minor ports in India, during the period (1989-1990 to 2009-10) i.e, over these two consecutive decades, reveals that CAGR growth rates of Overseas trade (OT) have increased from 6.08 to 8.9 in case of Major ports, as compared to slightly higher growth from 14.62% to only 14.78% in case of Minor ports. Moreover, CAGR growth rates of Coastal trade (CT) has slightly declined from 4.89 to 2.0 at Major Ports than the sharp decline from 24.82% to only 5.72% at Minor ports over the said period (Figure 3). Hence, a greater dominance of Overseas trade (OT) than Coastal Trade (CT) in total trade at both Major ports and Minor Ports is found which may be because of globalization in post liberalization period. Moreover, overutilization of Major ports than Minor Ports is found in both overseas and coastal

trade which indicates greater size in their capacity utilization and better infrastructural development of the former ports than those at the latter ones.

**Figure 3 : Relative Growth of total Overseas and Coastal trade between Major and Minor Ports**



Source : [www.shipping.nic.in](http://www.shipping.nic.in)

### $\sigma$ -Convergence Analysis

This section applies the method of  $\sigma$ -Convergence technique to study the overall trend of growth of the volumes of the both the overseas and coastal port traffic across the Major and Minor ports over the study periods (1989-2010). The numerical values of  $\sigma$  convergence measured at period t are given below in Table 1.

It is found from Table 1, that sigma values of Overseas Trade (OT) as well as Coastal Trade (CT) are converging over time between Major and Minor ports. The  $\sigma$ -convergence here also measures the tendency of reduction in disparity across the above mentioned ports over these two consecutive decades.

**Table 1. Values of Sigma Convergence**

Year	$\sigma$ (OT)	$\sigma$ (CT)
1989-90	1.71746	2.21537
1990-91	1.678486	1.925344
1991-92	1.746115	1.745728
1992-93	1.675317	1.701349
1993-94	1.562519	1.585507
1994-95	1.555393	1.495654
1995-96	1.504385	1.497686
1996-97	1.530502	1.385795
1997-98	1.285546	1.43644
1998-99	1.414593	1.266571
1999-00	1.115677	0.86276

2000-01	0.812221	0.858602
2001-02	0.777075	0.785211
2002-03	0.756359	0.739529
2003-04	0.766529	0.714098
2004-05	0.732139	0.716655
2005-06	0.732232	0.73805
2006-07	0.684366	0.530986
2007-08	0.607957	0.876357
2008-09	0.597808	0.882179
2009-10	0.440516	0.60621

Source : Sala-i-Martin, X. (2006)

### Conclusion

First, it is found from the comparative study between the Major and Minor ports reveal that Major Ports of the country dominate the growth of both the overseas and coastal trades in total trade of the country, as is evident from the trends in the absolute growth of both the volumes of overseas and coastal unloaded traffic or imports, loaded traffic or exports and those of trade between Major and Minor ports respectively. Moreover, relative growth of overseas trade, particularly, dominates Major ports, as is also evident from the sharp rise in the values of Compounded Annual Growth Rates (CAGR) of overseas trade at Major ports over the period (1989-2010), compared to that in case of Minor ports. But there is a greater variation in the trade intensities at Minor ports than those at Major ports in the growth trends of both OTIs and CTIs, although, with the same variation in both of the trade intensities possibly implies its under-utilisation over the years.

Moreover, the converging trend of sigma values of overseas trade (OT) and Coastal trade (CT) between Major and Minor Ports over the years also vividly explains the growing importance of Minor Ports in total trade of the all Indian Ports in the recent period.

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