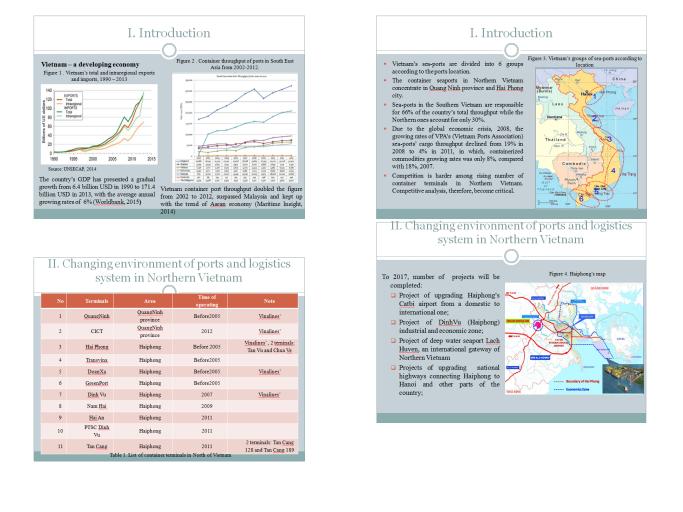
# A DEA analysis on Container Terminals in Northern Vietnam, 2005-2014

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**Abstract:** Sea-ports in Northern Vietnam have experienced a rapid growth of container throughput volume in recent years. To accompany with such development, huge investments also have been performed to enhance local ports capacity. It becomes a crucial task for the port authorities or the port stevedoring industry to improve the ports efficiency in order to customize national resources. In this paper, Data Envelopment Analysis (DEA) is employed to evaluate the relative efficiency of container terminals in Northern Vietnam by collecting data from terminals since 2005 up to now. The development progress of the given terminals will be presented before providing a relative comparison among those year by year. The DEA result is then analyzed and suggestions with regard to changes in local economic environment in near future are contributed.

Key words: Northern Vietnam, container terminals, ports efficiency, DEA



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## III. Methodology

- DEA (Data Envelopment Analysis) is a quantitative method broadly applied to evaluate the relative efficiency of decision making units (DMU) by examining multiple inputs and outputs of a production process.
- In port industry, various scholars named outputs and inputs are: container throughput, number of berth, total berth length, number of crane, CY area. (<u>Tongzon</u>, 2001), (Park, 2010), (Young, 2012)
- In this study, DEA Output oriented CCR is employed because container terminals
  operate under constant return to scale and DEA-SOLVER is used to run the model.
- In this study, DEA is employed to analyze efficiency of terminals in Northern Vietnam in 2012, 2013, 2014. The data of container throughput of terminals from 2005 to 2011 is used to <u>analyse</u> those terminals' performance

## IV. Analysis $\bigcirc$

- The 2 terminals in <u>QuangNinh</u> province have very low efficiency, due to mostly the bad competition with others in <u>Hai Phong</u> city.
   There are only 2 out of 5 terminals under the control of <u>Vinalines</u> are relatively efficient, named Doan X, and Dinh Vu. The others' low efficiency can be explained by the high number of old handling equipment.
   The most efficient container terminals in the area are small ones with one or two berths and the annual throughput less than 400,000 teus.
   All terminals in Haiphong city are in the Cam River which connects to the Gulf of Tonkin and ports which locate more closely to the river mouth are more likely to be efficientones.

- From 2005 to 2011:
- $\diamond$
- Containers imported and exported in the North of Vietnam through mainly terminals in Haiphong city. The <u>marketshare of Vinalines'</u> terminals declined significantly through the given period. In 2005, the share is 86%, then decreased to 77% in 2006 and 51% in 2011. Last year, the figure even down to 34%.

V. Discussion -0

#### In the aspect of Ouang Ninh province:

Transport connectivity to hinterland should be paid more attention. More investment in transport system, especially rail way and inland water way. New industrial zones locating near to ports

#### In the aspect of Haiphong city

- There are two many terminals including both general cargo and container ones on the Cam river's bank. This fact put those terminals under pressure of congestion.
- Investment in roads improvement is not enough but in all kind of transport, expecially rail way and inland water way.

				(	)			
	_			No of	Berth	Neef		
			TEU			No of		
	No	DMU		Berth	Length	Crane		Efficiency
				Input 1	Input2	Input 3	Input 4	
		QuangNinh	240580	3	680		49000	
		CaiLan	72295	3	594		151000	
		Haiphong	964000	10	1850		343565	
		Dinh Vu	455775 232412	2	425		210000	
		Nam Hai		3	600		215000	0.35717
	6 7	Greenport Transvina	396000 104644	1	304 120			1 0.66944
	8	Doan Xa	244014	1	220	3	65000	0.00944
		Doan Aa PTSC	155205	1	220	3		0.721695
		Hai An	183000	-	150	4		0.936566
	10	Hai Ali				-	50000	0.950500
			Tab	le 2. DEA	result of	f 2012		
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North		city has acc Vietnam but	the mos	t efficie		inals in	the area	oughput of is not highly l sign for poi