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The Viability of Implementing a Container Terminal at Port of Açu – A Preliminary Analysis

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Introduction

- Changes in the organizational and technological structure of maritime transport, especially involving general cargo → Containerization.
- Containerization process, affected ports, retroportuary terminals and logistics systems in general, and allowed large cost reductions through economies of scale.
- In order to withstand these changes, the Brazilian port sector underwent a process of privatization of services, which began in the last decade of the last century (Law 8630/1993 and Law 12815/2013).

Objective

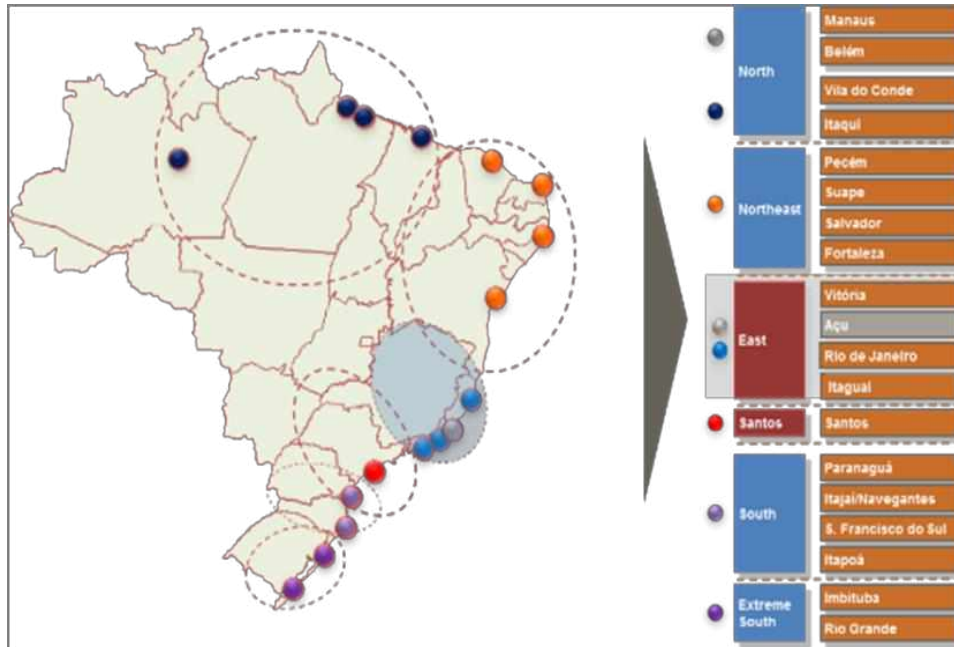
- The objective of this paper is to evaluate the implementation of a container terminal in Port of Açu, focusing on capturing cargo of potential competitors in the region where the port is inserted.
- Port of Açu: positioned with a Private Landlord Port management model.
- Private Landlord Port management structure has some cost advantages, mainly in manpower management, and in investment decisions when compared with potential competitors.
- Ports located in the region of influence of Port of Açu operate basically with a Landlord governance system.

Container throughput in the Brazilian market and the Eastern Cluster

- Container shipping in Brazil is carried out mainly by container liner services in deep-sea operations and cabotage.
- In Brazil, cabotage are held for Brazilian flag vessels (Law 9.432/1997) and involve: cargo transportation between Brazilian ports; cargo transportation between Brazilian, Argentine and Uruguayan ports (Mercosur cargoes); as well as cargo transshipment for connection with the long haul.

Container throughput in the Brazilian market and the Eastern Cluster






























Brazilian container ports clusters and its hinterlands



Brazilian container ports clusters throughput in teu

Main port clusters	2015	2016	2017
North Cluster	677,645	655,449	658,103
Northeast Cluster	998,148	989,372	1,111,564
East Cluster	742,611	676,301	777,259
Santos Cluster	3,762,565	3,502,895	3,761,633
South Cluster	3,171,107	3,130,949	3,155,209
Brazil/Total	9,352,076	8,954,966	9,463,768

Container throughput in the Brazilian market and the Eastern Cluster

	Port of Açú	Port of Vitória	Port of Rio de Janeiro	Port of Itaguaí	Port of Santos
Concession Model 	<ul style="list-style-type: none"> Private terminal Land owned Productivity: trained personnel 	<ul style="list-style-type: none"> Public port area Time limited concession Regulated by ANTAQ Must use casual labor 	<ul style="list-style-type: none"> Public port area Time limited concession Regulated by ANTAQ Must use casual labor 	<ul style="list-style-type: none"> Public port area Time limited concession Regulated by ANTAQ Must use casual labor 	<ul style="list-style-type: none"> Public port area Time limited concession Regulated by ANTAQ Must use casual labor 
Inland Access 	Roadway: <ul style="list-style-type: none"> BR-116, BR-101 And BR-356  Projected Railway <ul style="list-style-type: none"> EF-354 and EF-118 	Roadway: <ul style="list-style-type: none"> BR-101, BR-262 and ES-080  Railway: <ul style="list-style-type: none"> FCA and EFVM 	Roadway: <ul style="list-style-type: none"> BR-101, BR-040 And BR-116  Railway: <ul style="list-style-type: none"> MRS 	Roadway: <ul style="list-style-type: none"> BR-101, BR-040 and BR-116  Railway: <ul style="list-style-type: none"> MRS 	Roadway: <ul style="list-style-type: none"> SP-160, SP-15 and SP-021  Railway: <ul style="list-style-type: none"> MRS and ALL 
	Project: <ul style="list-style-type: none"> Draft: 15,5 m LOA: 400 m Beam: 56 m 	<ul style="list-style-type: none"> Draft: 10,7 m LOA: 242 m Beam: 32 m 	<ul style="list-style-type: none"> Draft: 14,3 m LOA: 340 m Beam: 48,5 m 	<ul style="list-style-type: none"> Draft: 14,3 m LOA: 334 m Beam: 48 m 	<ul style="list-style-type: none"> Draft: 13,9 m LOA: 334 m Beam: 48 m 
Expansion Area 	<ul style="list-style-type: none"> Expansion possible even after Phase II 	<ul style="list-style-type: none"> No expansion capacity 	<ul style="list-style-type: none"> No expansion capacity 	<ul style="list-style-type: none"> No expansion capacity 	<ul style="list-style-type: none"> No expansion capacity 

Port of Açú will become a very competitive alternative for the Southeast Region and for the entire ECSA transshipment

The comparison between Porto do Açú and its main competitors

Port of Açu

Port of Açu layout



Port of Açu Location



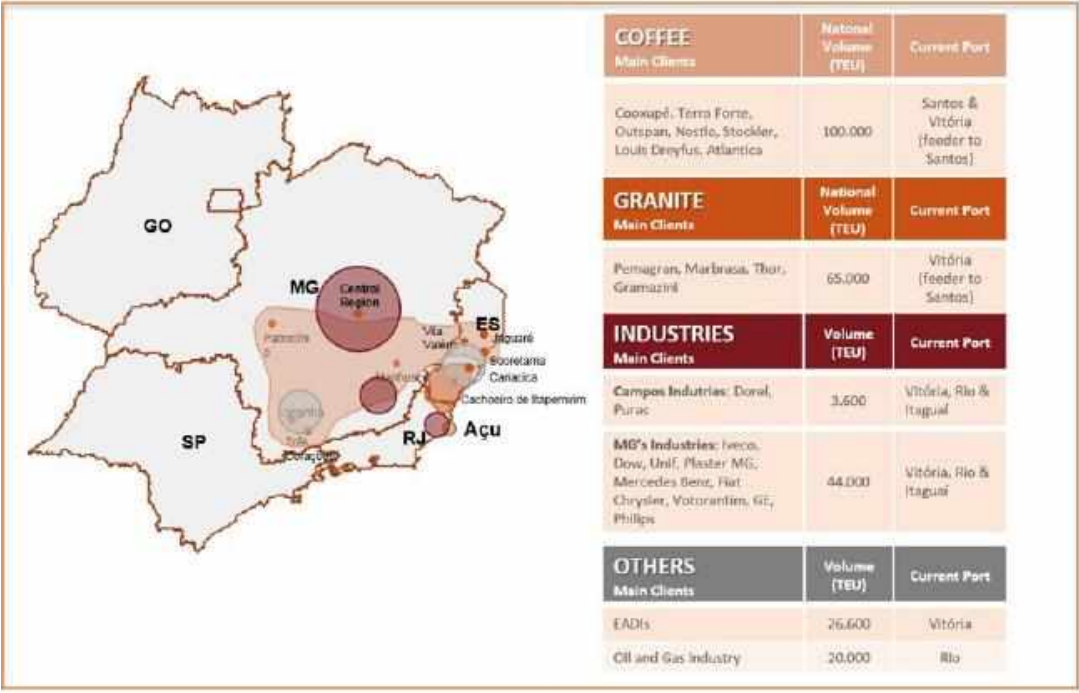
Installation site of the container terminal



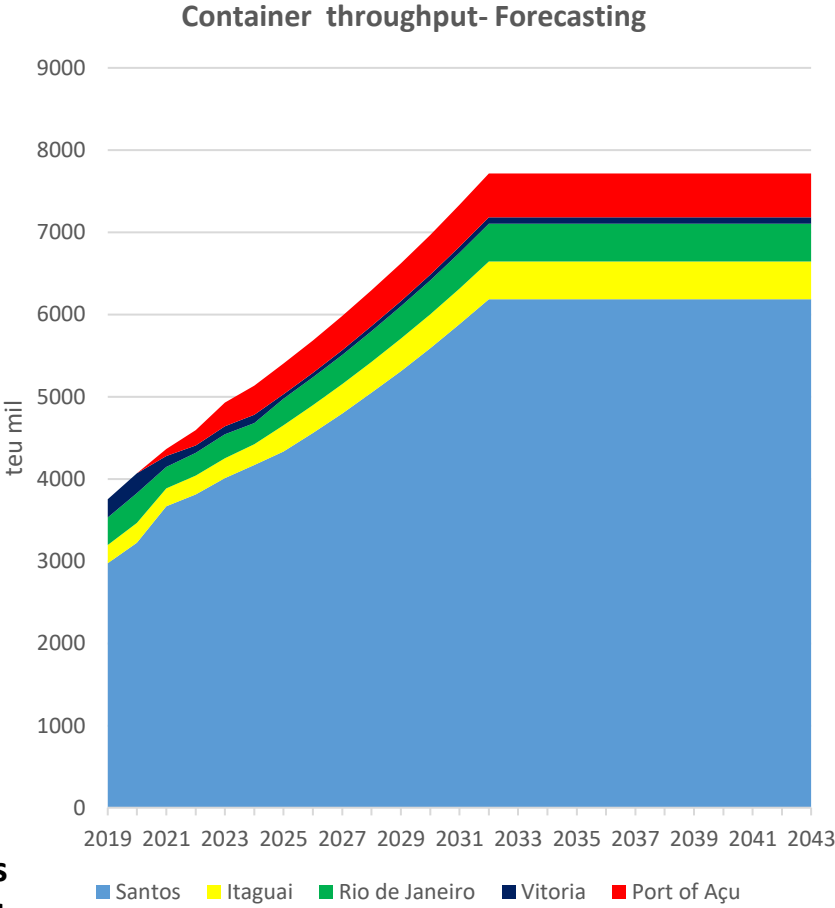
Feasibility Analysis

- Cargo demand for the region adjacent to Port of Açu estimation.
- Sizing of the facilities of Port of Açu (international and local market benchmarks).
- New container terminal competitiveness was analyzed, considering its implementation costs and estimated cargo handling fees, as well as the cost of maritime access to the terminal.

Estimation of the cargo handling curve



The estimation considered the container throughput of the ports of the Eastern Cluster and also of Santos (except transshipment cargo) and compared its variation with the Brazilian GDP



Port cost estimators per box

- Cost of one access to the maritime access channel and the berthing
- Handling cost in the terminal also calculated per box
 - Implementation (CAPEX) and
 - operation cost and the cost of personnel (OPEX and SG&A)



Cost of maritime access channel and berthing (Four large groups: access, tugboats, pilotage and quay)

Cost of maritime access channel and berthing – Values in R\$/box

Port	Access	Pilotage	Tugboats	Quays	Total cost
Itaguai	88.52	43.25	96.30	6.61	234.68
Rio de Janeiro	88.52	32.51	96.30	4.07	221.40
Santos	71.56	17.23	67.64	0.02	156.45
Vitória	67.89	28.24	91.42	0.00	187.55

Cost of maritime access channel and berthing – Values in R\$/box

Boxes/ship	Access	Pilotage	Tugboats	Quays	Total cost
500	51.19	47.37	187.25	0.02	285.83
600	51.19	39.48	156.04	0.02	246.73
750	51.19	31.58	124.83	0.02	207.62
800	51.19	29.61	117.03	0.02	197.85
1000	51.19	23.69	93.63	0.02	168.52
1500	51.19	15.79	62.42	0.02	129.42



Infrastructure (CAPEX) and operational (OPEX) costs

- Benchmarks – Drewry and Brazilian container terminals performances.
 - 650 m quay length – 2 berths
 - 200,000 m² of container handling yard
- Operating and personnel costs.
 - Santos Brasil (Port of Santos): Container Terminal of Paranaguá (Port of Paranaguá) and Terminal of Vila Velha (Port of Vitória)

Implementation and operational costs and return for the investor

Year	2019	2020		Year	2019	2020
Equipment - Total (R\$ MM)	61.1	138.7		Civil Work - Total (R\$ MM)	276.2	160.2

- Equipment

- Portainer
- Reach stacker
- Transtainer
- Trucks
- Scanners
- Terminal Operating System
- Power plug Reefer
- Road Balance

- Civil Work

- Quay
- Container Courtyard
- Gate
- Warehouse
- Utilities Infra

Implementation and operational costs and return for the investor

Operating and personnel costs	Total cost/box
Container Terminal of Paranaguá (Paranaguá)	R\$ 478.27
Santos Brasil (Santos)	R\$ 363.17
Terminal of Vila Velha (Vitória)	R\$ 394.16
Port of Açu	R\$ 411.87

Container terminals revenue	Revenue per box
Container Terminal of Paranaguá (Paranaguá)	R\$ 1.344,39
Santos Brasil (Santos)	R\$ 695,06
Terminal of Vila Velha (Vitória)	R\$ 985,71
Port of Açu	R\$ 1.008,39

Financial Model

- In order to verify the viability of the terminal and its net present value (NPV), a financial model was performed based on the revenues obtained by the tariffs and handling curve, its CAPEX, OPEX and SG&A costs, as well as taxes (PIS, COFINS and ISS), depreciation and income tax/CSLL.
 - Discount rate (WACC)
 - 10,00% (usual)
 - 8,03% (ANTAQ)
 - Tariffs
 - Average rate: R\$ 1,008,39
 - Terminal of Vila Velha/Vitória: R\$ 985.71
 - Santos Brasil/Santos: R\$ 695.06

$$CashFlow = EBITDA - (I \mp) \pm Variation Working Capital - CAPEX$$

Port of Açu container terminal NPV Analysis

Rate	WACC	NPV
Average rate (R\$ 1,008,39)	10.00%	R\$ 120,302,587.18
Average rate (R\$ 1,008,39)	8.03	R\$ 278,711,867.73
Terminal of Vila Velha/Vitória (R\$ 985.71)	10.00%	R\$ 93,085,556.48
Terminal of Vila Velha/Vitória (R\$ 985.71)	8.03	R\$ 245,277,867.62
Santos Brasil/Santos (R\$ 695.06)	10.00%	(-) R\$ 255,809,426.86
Santos Brasil/Santos (R\$ 695.06)	8.03	(-) R\$ 183,312,416.13

Conclusions

- The result of the feasibility analysis of a container terminal in Port of Açu presented satisfactory results; charging the average tariff of 3 different terminals a positive NPV and charging the value of the main competitor.
- As far as the maritime access to the port is concerned, it can also be considered competitive. However, the conditions of tugboats and pilotage can be improved, since the volume of access of cargo ships is still low.
- Port of Açu is a new, developing and totally private port located in southeastern Brazil, responsible for most of the national GDP, brings many advantages for the installation of a port for containerized cargo in this place.
- However, there are still negative factors, such as: poor and limited road access and disconnection with the Brazilian rail network, which is already inefficient for transport of containers. Logistics on land is essential for the flow of containers.



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