Arab Academy
for Science Technology & Maritime Transport

The International Maritime
Transport and Logistics Conference
"Marlog 11"

50 Years Of Excellence

INVESTIGATING THE EFFECT OF TERMINALS' SERVICE ATTRIBUTES ON ATTRACTING SHIPPING LINES: A STATED CHOICE APPROACH

11 Marlog 2022

Towards a SUSTAINABLE BLUE ECONOMY

20 - 22 March, 2022
Hilton Green Plaza Hotel

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Introduction

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Introduction

- Shipping is the lifeblood of the world economy.

- About 80% of world trade volume transported through sea, which makes ports and their hinterlands vital for global trade.

Introduction

- Terminal utilization rates are expected to increase over the next few years, as result of globalization, putting further pressure on the already congested terminals;

- Congestion occurs when terminal demand (i.e. cargo volume) exceeds its supply (i.e. available capacity).

Introduction

- It has been deeply rooted in planners' minds that spending more on terminal infra and super structure projects is the solution for ending congestion.

Introduction

- Port Integration developed as an alternative way to solve congestion;
- Horizontal integration: Integration of container terminals among themselves especially if they are owned by the same company;
- Vertical integration: Integration between terminal operators and shipping lines within the global supply chains.

Research Methodology

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Research Methodology

- The research focus on the national container companies operating under the supervision of the Holding Company for Maritime and Land Transport .
- Four main ports over the Mediterranean Sea (Alexandria Port, El-Dekheila Port, Damietta Port, and Port Said Port).

Research Methodology

- This research constructed a survey tool that combines Two data collection methods; Revealed Preference (RP) and Stated Preference (SP) or Stated Choice (SC).
- Surveys collect information about the factors that affect liners' terminal choice decisions.

Revealed Preference (RP)

- Information collected about actual choices made by customers,

  RP data can be used to estimate statistical demand models.

Stated Choice Experiment Design

- In the SC experiment each respondent receives a number of choices (hypothetical scenarios) to select one or more alternatives from a set of limited options.

Pilot Survey

- In order to ensure reliable parameter estimates, a small-scale pilot survey was conducted among a group of researchers at the Maritime Research and Consultation Center (MRCC) before launching the full-fledged questionnaire to a list of 20 shipping lines that operates in the region.

SURVEY DESIGN, IMPLEMENTATION, AND PRELIMINARY RESULTS

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Survey Design

- This research investigates the important factors that control shipping liners decisions when selecting a container terminal by using a custom-made instrument design.

- Two data collection methods are used; namely, Revealed Preference (RP) and Stated Preference (SP) or Stated Choice (SC).

(RP) Survey Implementation

Factors attracting liners to a port of call	Rank
Approach channel	
Guidance	
Towage	
Port information systems	
Port dues	
Administrative procedures and systems	
Waiting time	
Service time	
Connectivity to other ports	
Connectivity to hinterland	
Customs procedures	
Safety and security	

(RP) Preliminary Results

- By combining the responses, port dues, waiting time, and service time are the top three important factors that attract shipping lines to a port of call.

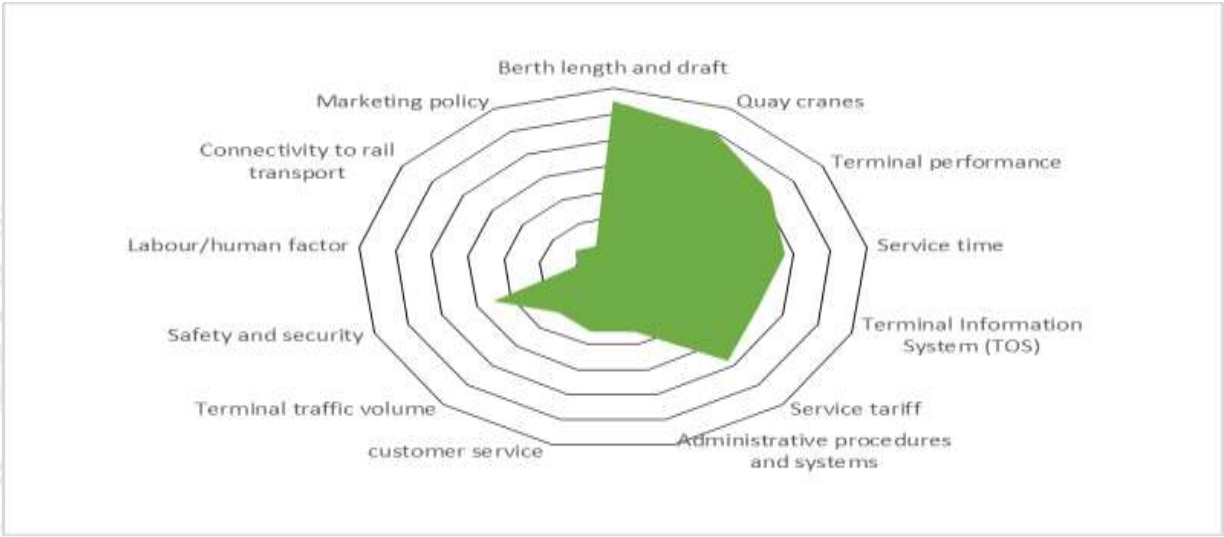
- Connectivity to hinterland is the least important factor from a shipping line's view point, which is an early indication to the way liners view Egyptian ports (being points of cargo loading and unloading rather than integral parts of the total supply chain).

(RP) Survey Implementation

Factors attracting liners to a container terminal	Rank
Berth length and draft	
Quay cranes	
Terminal performance	
Service time	
Terminal Information System (TOS)	
Service tariff	
Administrative procedures and systems	
Customer service	
Terminal traffic volume	
Safety and security	
Labour/human factor	
Connectivity to rail transport	
Marketing policy	

Preliminary Results

- By combining the responses, berth length and draft, quay cranes, and terminal performance are the top three important factors that attract shipping lines to a container terminal.
- On the other hand, the analysis showed that labour/human factor is the least important factor from a shipping line's view point, which might be an early indication to the transition towards automation.



(SC) Survey Implementation

After choosing 6 factors, these factors were presented in terms of seven measurable attributes to appear in the SC survey and allow for data processing and modelling.

Factor	Measurable Attribute	Unit of Measurement
Port Infrastructure	Water draft	m
Cost/Port Charges	Terminal Handling Charge (THC)	$/Full 20' Container
Cost/Port Charges	Terminal Handling Charge (THC)	$/Full 40' Container
Empty Container Management	Free dwell time on empty containers	days
Cargo Volume	Import/Export cargo balance	Import %/Export %
Port Congestion	Actual/Scheduled Service Time	%
Port Efficiency	Terminal productivity per crane	Gross Moves per Hour (GMPH)

(SC) Survey Implementation

Factors	Alexandria Terminal	El-Dekheila Terminal	Damietta Terminal	Port Said Terminal	Another Terminal (Please state its name or specify its operation/service properties)
Water draft, (m)	18	14	14	14	
Terminal handling charge (THC), ($/Full 20' Container)	85	85	79	80	
Terminal handling charge (THC), ($/Full 40' Container)	160	128	178	120	
Free dwell time on empty containers, (days)	5	10	5	10	
Import/Export cargo balance, (Import %/Export %)	50/50	50/50	70/30	30/70	
Actual/Scheduled Service Time, (%)	0.56	1	1.25	1	
Terminal productivity per crane, (Gross Moves per Hour - GMPH)	25	35	35	15	
Which terminal would you choose?	□	□	□	□	□

Example from the (SC) survey

Conclusion

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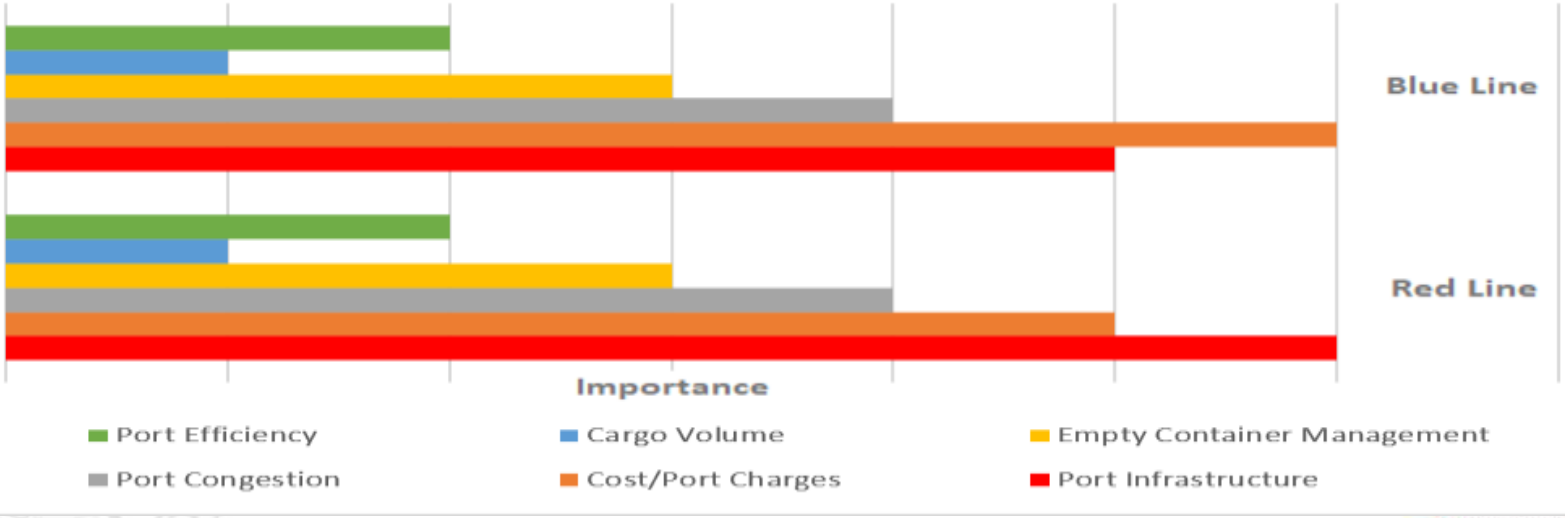
Conclusion

- Preliminary data analysis showed that Port Infrastructure and Cost/Port Charges are the most important factors shipping lines look for when choosing a container terminal, while Port Efficiency and Cargo Volume come least in importance.



Next Steps

- The complete dataset, when collected, will be used to develop discrete choice models of terminal switching behaviour.

- Forecasting shipping lines' behaviour will play a major role towards port resilience strategies to adapt to changing conditions, and recover positively from unexpected circumstances like the Covid 19 pandemic.

- Integration will help optimize terminals performance and national market share through transforming the system from: Terminal Equilibrium To a state of System Optimum.

Thank YOU

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