The International Maritime Transport and logistics Conference

Towards Global Competitiveness in Maritime Industry

"INVESTING IN PORTS"

The Trends, The Future

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# BENCHMARKING THE EFFICIENCY OF THE EGYPTIAN AND LIBYAN CONTAINER PORTS

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# IN THIS SHOW

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- Aims, objectives and study limits
- Literature review
- Methodology
- Data collection
- Variables
- DEA analysis
- Results & conclusion
- Recommendations

# Containerization

- 4 cornerstones of the globalization: transport, trade liberalization, telecommunications & international standardization.
- Containerization is the backbone of intermodal transport.
- World seaborne trade steadily increased within the last two decades, more than 50,000 vessels.
- 14% are container vessels, more than 700 container terminals worldwide.

# Study Aims & Objectives

- **To** evaluate, assess and benchmark the relative efficiency of major 10 container ports in Egypt and Libya for the first time ,between **2012& 2016.**
- Ports are El-Dekheila, Alexandria, Damietta, Port Said, East Port Said & El-Sokhna from Egypt, and Tobruck, Misurata, Khoms & Tripoli from Libya.
- **To** determine inefficiency causes & the necessity to infra/super structure investment!
- **Results will** provide a valuable information/data for port managers in order to establish competitive strategies & to improve their resource utilization for ongoing improvements in operational efficiency.

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# Literature Review



- Most studies were centered on the advanced and emerging markets in the North America, Europe & N.E. Asia.
- Papers involved DEA in maritime industry consist only 26% in transport field.
- Measuring of container port efficiency in the South Mediterranean & North Africa using DEA is limited (seldom) through global academic research network due to data availability and market share of the region which is very low.
- North African ports, on the other hand, always considered as a part of MENA ports, and were never benchmarked individually before.
- This study reviews 23 previous studies, 7 related to area of study.

| Authors | Conclusions | Authors | Conclusions |
|---|---|---|---|
| Cullinane et al. (2005a) | no clear relationship between privatization or ownership that affects port efficiency | Cullinane et Al. (2005b) | some world-renowned container terminals are found to be currently suffering from inefficient production |
| Lin and Tseng (2005) | there is no significant differentiation between operating efficiency scores of corporate-owned vs. public ports | Cullinane and Wang (2006a) | container ports that have massive production scale also have higher efficiency scores |
| Tongzon and Heng (2005) | private sector participation, is useful for improving port operation efficiency | Lin and Tseng (2007) | several factors affect port efficiency, including the utilization of facilities |
| Al-Eraqi et al. (2007) | bigger ports are efficient | Cullinane and Wang (2010) | production size does not have a clear-cut relationship with the efficiency of a port |
| Sohn and Jung (2009) | bigger size of a port would increase the market share | Cheon et al. (2010) | ports will become more efficient if they have more decentralized. |
| ElSakty (2012) | developed The Damietta Port Performance Measurement System | Merk and Dang (2012) | most efficient container ports are not necessarily the largest ports |
| Rajasekar et al. (2014) | size of port always does not ensure efficiency | Serebrisky et al. (2015) | ports operated or managed by private companies are more efficient |
| VanDyck (2015) | larger ports are more efficient | Akinyemi (2016) | private sector participation in the port industry has improved port efficiency |

| Authors | Conclusions |
|---|---|
| Al-Eraqi et al., (2007) | Bigger ports are efficient due to large number of ships call and throughput |
| ElSakty (2012) | Measured Damietta Port overall Performance |
| Almawsheki and Shah (2015) | The inefficiency of container terminals in the Middle Eastern region may also be the result of issues including the Arab Spring revolutions in some countries in the region such as Yemen, Syria, and Egypt |
| Almawsheki et al., (2015) | Increase efficiency could increase port's revenue and increase the country's GDP |
| Elsayeh (2015) | The average of technical efficiency of Mediterranean container ports below 50% |
| Almadani (2015) | The Libyan container ports were in-efficient for year of 2010 |
| Ismail and Elgazzar (2018) | East Port Said port has the highest score in the efficiency index among Egyptian ports, El-Sokhna second, Damietta third position, Port Said fourth, El-Dekheila fifth and finally Alexandria sixth . |

# Methodology

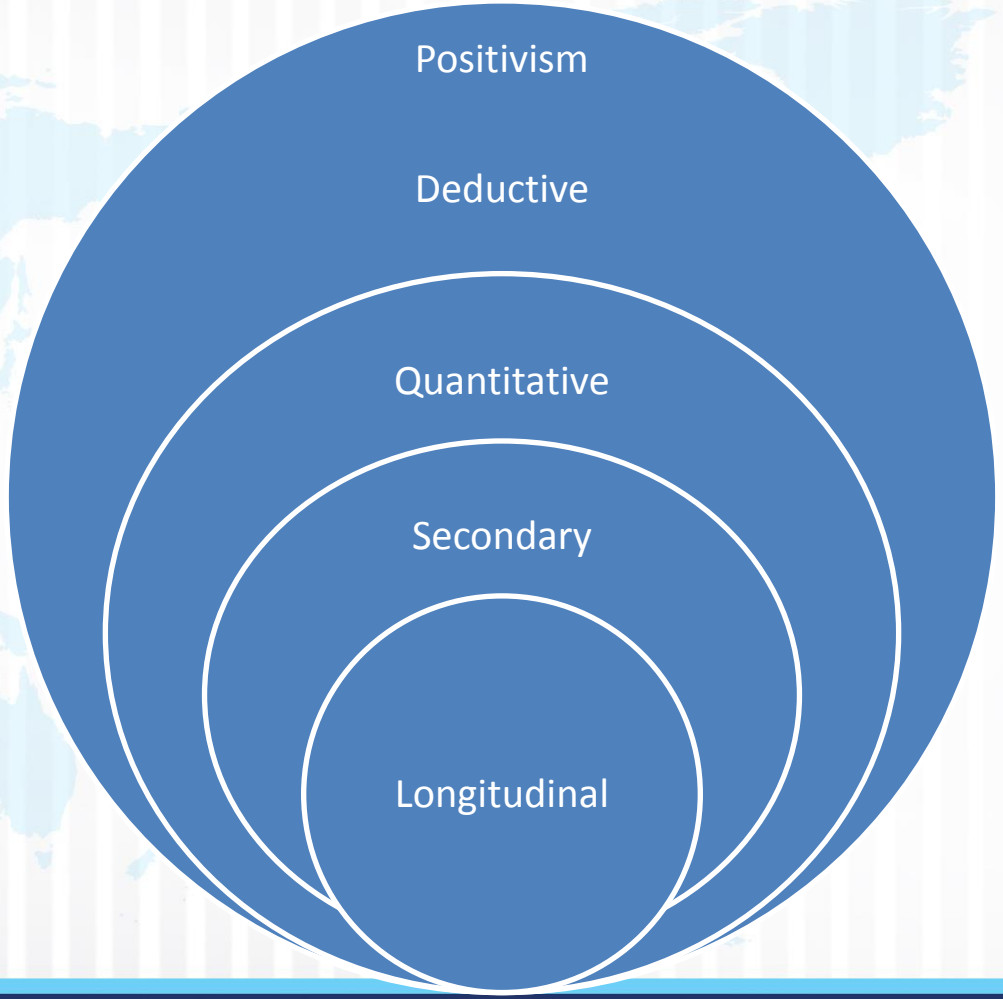
Philosophy= Positivism

Approach=Deductive

Method=Quantitative

Time Horizon= Longitudinal

Secondary Data



**Efficiency** is a level of performance that uses the lowest amount of inputs to create the greatest amount of outputs.

DEA–CCR output-oriented model attempts to maximize outputs, while using no more than the observed amount on any inputs , and can described as:

$$E = \frac{\sum_{i=0}^{N} v_i y_i}{\sum_{i=0}^{N} u_i x_i}$$

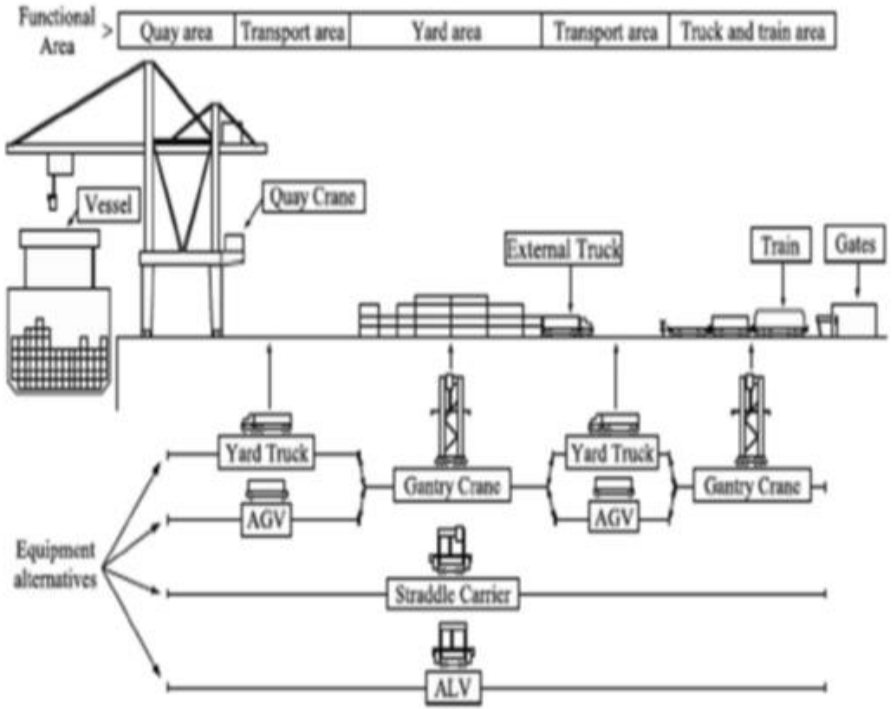
## Data Collection

Panel data for five years were collected from 2012 to 2016 from the Egyptian Maritime Data Bank, the Libyan Ports Company and certified websites, in order to rank the stated ports based on their achieved results.

# Study variables

## Inputs (Independent)

- Storage capacity
- Terminal area
- Quay length
- Draught
- Handling equip.




## Outputs (Dependent)

Container throughput "TEUs"

# DEA-CCR efficiency score



| Port | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Alexandria | 0.788 | 0.850 | 1.000 | 0.971 | 1.000 |
| El-Dekheila | 0.630 | 0.750 | 0.880 | 0.766 | 0.788 |
| Damietta | 0.653 | 0.594 | 0.613 | 0.624 | 0.706 |
| East Port Said | 0.882 | 1.000 | 0.994 | 0.935 | 0.765 |
| Port Said | 0.663 | 0.517 | 0.659 | 0.493 | 0.374 |
| El-Sokhna | 0.667 | 0.580 | 0.708 | 0.919 | 0.818 |
| Khoms | 0.740 | 0.830 | 0.680 | 0.738 | 0.559 |
| Tripoli | 0.303 | 0.320 | 0.230 | 0.210 | 0.136 |
| Misurata | 0.724 | 0.809 | 0.535 | 0.273 | 0.264 |
| Tobruck | 0.180 | 0.130 | 0.050 | 0.332 | 0.309 |
| Mean | 0.623 | 0.638 | 0.635 | 0.626 | 0.572 |

# Results & conclusion



1- Alexandria container port had an efficiency score equal to unity in 2014 & 2016.

2- East Port Said container port has an efficiency score equal to unity in 2013.

3- The performance of Libyan container ports from seaside operations is low, due to lack of efficient and specialized cranes.

4- The Libyan ports use insufficient equipment such as; external trucks for container transport, with some port tractors and trailers.

5- Among the stated ports (as the largest in both countries), **ULCC** can only be handled in one container port in Egypt .

6- Structure and layers of control & management of Libyan ports are highly complex, involving a multiplicity of ministries, government departments & agencies .

# Ports Competitiveness – Key Factors

| | | |
|---|---|---|
| Geographical Advantage | Handling Rates | Cargo volume |
| Accessibility (land and sea) | Ownership of seaport | Service level |
| Tradition & organization | Privileged carrier terms | Frequency of ship visit |
| Productivity & Efficiency | Government tax and duties | Port reputation for cargo damage |
| Preference of navigation | Customs regulations | Quick response to user needs |
| Preference of navigators | Handling Costs | Congestion |
| Facilities and equipment | Risk management | Shipment information |
| Product differentiation | Security and safety | Sustainability |

- Deeper water is required for the Egyptian container ports & terminals.
- Infra/super structure are urgently needed for the Libyan container terminals /port system & master plan as well, under the NPC & PM supervision.
- Qualified people at all levels are urgently needed also for the Libyan container terminals parallel to any efforts / steps to be taken.
- Must change to electronic procedures and payment in both countries.
- LPI for both countries should be improved.
- So, more investments are required.

# Current efforts and investments in Egypt

- Master plan of 4 phases already drew according to the country's' vision 2030.
- Dredging works in El-sokhna port & EPS in progress.
- Expansion of El-sokhna container yards as a new phase was adopted.
- 2 Pivotal hubs : El-sokhna & East Port Said according to 2050 vision.
- All new /planned logistics centers & dry ports in Egypt will directly connected to sea ports via railways / roads.
- Already large & various investments in the SC Zone.

# Current efforts and investments in Libya

- 3 plans for developing of 3 different ports are ready.
- Single – window is used in Khoms port since 2010.
- Sousa deep port DBOT concession agreement signed as the first ever Libyan infra-structure project in the country.
- Temenhint as a logistics center( hinterland ) for Misurata FZ was adopted.
- Although, these efforts, lack of national master plan, logistics centers & dry ports, as well as, the necessity to the professionals & HR developing programs


Thank you
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Any questions?


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- Graduate Admissions Officer - Graduate Studies Department.
- Procurement Officer - Purchasing and Warehousing Department.
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## Abdulla Wanis

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- Libyan expert in maritime transport
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- Editor : Robban Assafina magazine , Africa gate new and Sada economic website.

## Other own MARLOG papers

Wanis, A. and Ismail, A. (2018), Role of the global container shipping in a changing economic world, recent trends and future perspectives, *MARLOG 7 "The Gateway to the Future".* Egypt, Alexandria. 18-20 March 2018.