



الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري
Arab Academy for Science, Technology & Maritime Transport



The International Maritime Transport and Logistics Conference "Marlog 9"
Impacts of the Fourth Industrial Revolution on Port-City Integration
"World Port Sustainability Program Aspects"



THE IMPACT OF MEGA EXPANTION PROJECTS ON
DAMIETTA CONTAINER TERMINAL COMETITVNESS

Dr. Ahmed Kamel
Head of R&D , DCHC

10-12- October, 2020

Contents



- Introduction
- Market overview : Characteristics , Concentration , Supply & demand
- East Med. Container Ports : Throughput, Market share and capacity
- Efficiency score of East Mediterranean Container Terminals
- The current developments of Damietta Container Terminal
- Conclusion and recommendations



Introduction

This paper investigates the competitiveness and efficiency level of top container terminals in the east Mediterranean market in terms of container volume.

Data Envelopment Analysis (DEA) technique used to benchmark the efficiency of each port. In addition, the researcher apply Herfindahl (H) index technique to measure market concentration and the degree of competition among the container ports included in the defined market.

The study tried to answer questions such as :

What are the efficiency scores for the ports included in this study? Which is the leader port in the east Mediterranean market? Could the current expansion projects and strategies of Damietta container terminal improve its competitiveness?

Introduction



Shipping lines and terminal operators face rapid changes and large amount of uncertainty. Technological developments, logistics integration and deregulation significantly changed the shape of maritime industry. Therefore, seaports that could not be able to be efficient are at risk of termination.

The horizontal integration (strategic alliances, mergers and acquisitions) has led to more concentration of demand for port services that accordingly, not only decrease the number of shipping lines demanding services from ports or container terminals but also sharply increase competition between ports.

Market characteristics

Geographically, East Mediterranean is the main links between East and West markets and it is intersection points with Asia, Europe and Africa. This enables such region to become transshipment and logistics centers between markets. Moreover, these regions are now growing markets that can offer containers due to the economic growth in Egypt, East Med. and Black Sea countries.

According to KPMG shipping insights: “when studying the current state of the shipping industry, it is impossible to miss the changes taking place in it. Major companies have decided to acquire close competitors in order to drive growth and increase market share significantly.

Many examples of ongoing consolidation in the shipping market. This leads to a market situation that can be described as an oligopoly simply because now over 60% of global shipping market held by only seven liner companies.”

Market concentration

The Herfindahl index (H) measures the degree of competition among firms in the market. It is defined as the sum of the squared market shares of (n) individual company. As such, it can range from $(1/n)$ to 1 moving from a large amount of small firms to a single monopolistic organization where $H=1$. A decrease in the Herfindahl index generally indicates a decrease in concentration.

Table (1) indicates that the (H) index were relatively small ranging from (0.125) to (0.137), which means that although Piraeus Greece and SCCT in Port Said East together account for about 47 % market share, the market was competitive during the last six years. It might be due to the high degree of competition among the other terminals operators in ports included in the study. In the same time, it is clear that market go towards concentration this was clear in 2019.

Measuring competition

The method of market shares

One of the easiest and traditionally implemented methods for measuring the competition in an industry is the market share method.

The competition of a market increases when more companies enter the industry. In this case, the concentration can be measured with the market share method.

This method is fairly quick and easy in execution, but has the disadvantage that it does not take under consideration the type of the market and some important competitive parameters, such as information about the supply of a port as well as the quality of the port services.

Measuring competition

The method of market shares

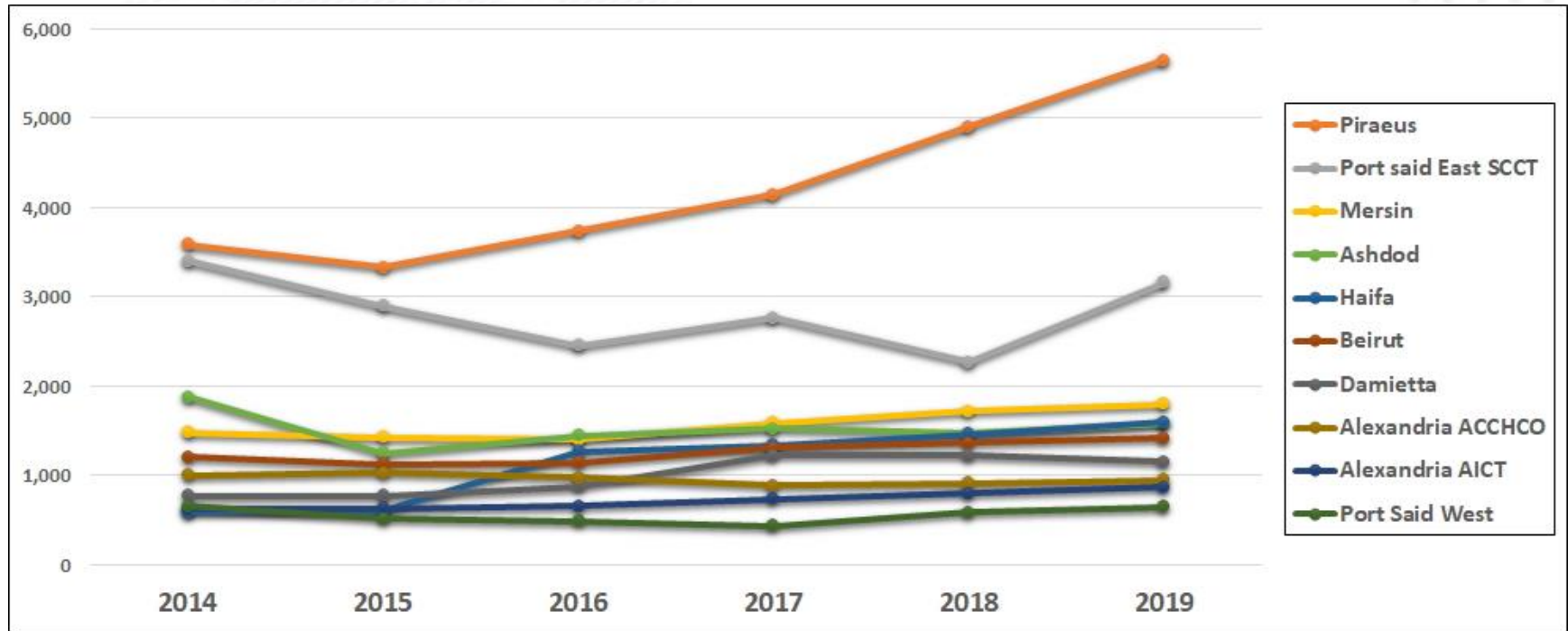
Rank	Port	2014		2015		2016		2017		2018		2019	
		Market Share	HHI	Market Share	HHI	Market Share	HHI	Market Share	HHI	Market Share	HHI	Market Share	HHI
1	Piraeus	22%	0.0480	22%	0.0489	24%	0.0563	24%	0.0568	27%	0.0703	27%	0.0749
2	Port said East SCCT	21%	0.0455	19%	0.0371	16%	0.0252	15%	0.0220	14%	0.0199	15%	0.0234
3	Mersin	9%	0.0087	10%	0.0095	9%	0.0085	9%	0.0087	9%	0.0087	9%	0.0076
4	Izmir	5%	0.0029	4%	0.0019	8%	0.0071	8%	0.0071	9%	0.0075	9%	0.0076
5	Ashdod	8%	0.0061	9%	0.0075	9%	0.0084	9%	0.0080	8%	0.0064	8%	0.0059
6	Haifa	8%	0.0056	8%	0.0065	8%	0.0064	8%	0.0062	8%	0.0063	8%	0.0060
7	Beirut	8%	0.0058	8%	0.0056	7%	0.0053	8%	0.0059	7%	0.0050	7%	0.0047
8	Damietta	5%	0.0024	5%	0.0027	6%	0.0031	7%	0.0052	7%	0.0044	6%	0.0031
9	Alexandria ACCHCO	6%	0.0040	7%	0.0047	6%	0.0039	5%	0.0027	5%	0.0024	5%	0.0021
10	Alexandria AICT	4%	0.0018	4%	0.0014	3%	0.0011	4%	0.0016	4%	0.0017	4%	0.0018
11	Port Said West	4%	0.0014	4%	0.0020	3%	0.0010	3%	0.0007	3%	0.0008	3%	0.0010
Total		100%	0.1321	100%	0.1278	100%	0.1262	100%	0.1250	100%	0.1332	100%	0.1382

Market demand and supply



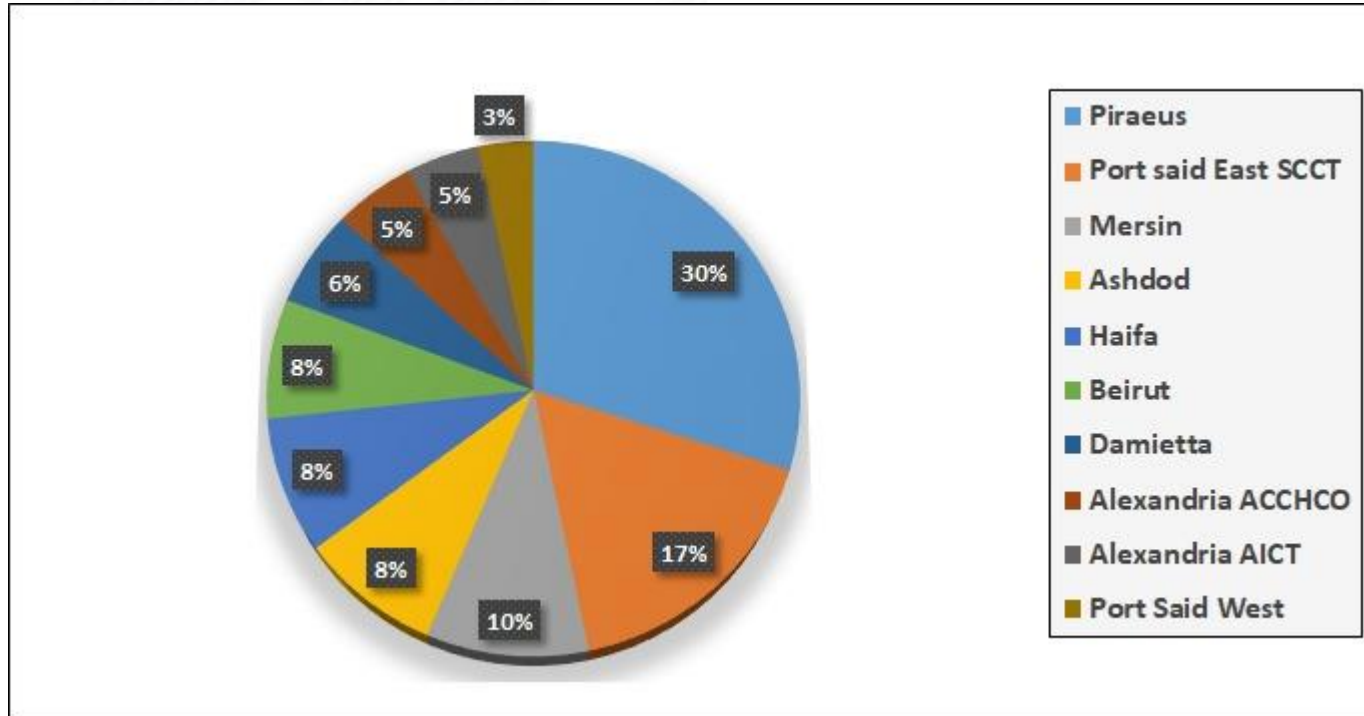
- Despite of the large amount of uncertainties over the global trade environment, container volumes achieved growth in 2019- even at much lower rate than the previous two years when overall increased by 6.7 % in 2017 and 5.2% in 2018. (Alphaliner).
- In addition to the demand side, the new normal also entails some new trends on the supply side.
- Ports and shipping companies appear to be focusing more attention on expanding activities to inland logistics. Major global container lines acquired regional carriers could be indication of industry behavior to adapt to changing conditions.
- Given the regionalization of trade flows and the trend towards restructuring supply chains, the new normal – despite the potential challenges – could generate opportunities, especially for developing countries striving to integrate more effectively into global trading networks.

Container throughput in the East Med. ports



Source: Researcher derived from various sources

Container Ports market share



Source: Researcher derived from various sources

BENCHMARKING THE EFFICIENCY AND COMPETITIVENESS LEVEL

There are many factors to be considered when assessing the port competitiveness such as throughput and market share, port location, accessibility and terminal infra/superstructure.

However, when evaluating the competition between ports, such elements should be used collectively rather than individually. For instance, from the above analysis it can be noticed that although Piraeus is the market leader in the East Mediterranean in terms of throughput and market share as well as terminal infra/super structure, it has less competitive advantage than Damietta and SCCT in terms of port location and accessibility.

In this paper, the efficiency of the main container terminals and port in the East Mediterranean container market is assessed using the Data Envelopment Analysis technique.

BENCHMARKING THE EFFICIENCY AND COMPETITIVENCES LEVEL

The data included in this paper used as benchmarking criteria. Terminal area, quay length & depth and number of gantry cranes are used as inputs (Table 4), while terminal throughput in 2019 are used as output criteria.

The DEA technique benchmark the efficiency of different firms (DMUs) in the market concerned. Table (4) shows that, Piraeus the most efficient container terminal in the defined market with score equal to 2.06, SCCT in Port said come second . Haifa, Beirut , Mersin and Alexandria (AICT) container terminals are third in the DEA Scale. Damietta ,Alexandria (ACCHCO.) and Port Said west are less efficient as their efficiency scores (0.89 to 0.47) below the average.

Efficiency score of East Med. Container ports

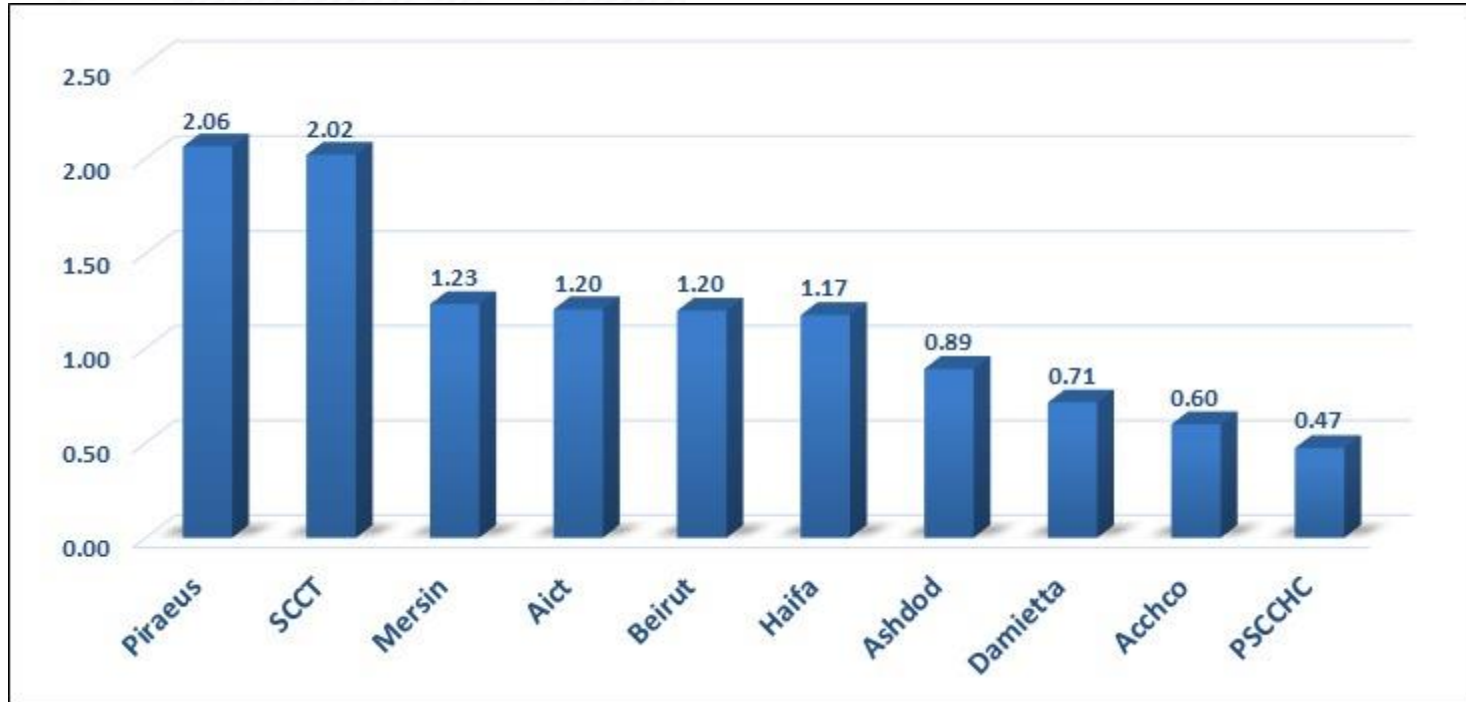


<i>no.</i>	<i>DMU</i>	<i>Quay Length</i>	<i>max. Draft</i>	<i>Vessel operation (Gantry)</i>	<i>Vessel operation (Mobile)</i>	<i>Total Area</i>	<i>Throughput 2019</i>	<i>Eff. score</i>
1	Piraeus	3630	19.5	35	1	973	5.650	2.06
2	SCCT	2400	16.5	21	0	1300	3.161	2.02
3	Mersin	2370	15.8	11	5	252	1.803	1.23
4	Aict	970	14.8	5	0	300	0.890	1.20
5	Beirut	1100	17.5	12	0	350	1.229	1.20
6	Haifa	950	15.5	18	0	745	1.470	1.17
7	Ashdod	1100	15.5	14	3	630	1.525	0.89
8	Damietta	1050	14.5	10	3	620	1.154	0.71
9	Aechco	1570	14	15	0	570	0.947	0.60
10	PSCCHC	950	15.5	10	1	572	0.700	0.47

Source: made by the Researcher



Efficiency score of East Med. Container ports



Source: Researcher derived from various sources

Utilization Vs Capacity



Port utilisation rate %				
<i>Rank</i>	<i>Port</i>	<i>Annual Capacity</i>	<i>2019</i>	<i>Utilisation</i>
1	Piraeus	5.500	5.650	102.7%
2	SCCT	4.600	3.004	65.3%
3	Mersin	2.600	1.803	69.3%
4	Ashdod	2.200	1.585	72.0%
5	Haifa	2.500	1.600	64.0%
6	Beirut	1.200	1.418	118.2%
7	Damietta	1.400	1.154	82.4%
8	ACCHCO	1.500	0.947	63.1%
9	AICT	0.790	0.872	110.4%
10	Port Said West	1.500	0.653	43.5%
Total		23.790	18.686	78.5%

Source: Researcher derived from various sources

Main development projects in Damietta Container Terminal



Item	Current	Future	Change
STS	10	13	30%
Quay length	1050	1450	38%
Stocking Yard	620	795	28%
Water depth	15	17	13%
Annual capacity	1.4	2	43%



Conclusion and recommendations

- The study concluded that for the years from 2015 to 2019, Port of Piraeus ranked first, SCCT Port Said ranked second, while the rest of ports follow.
- The results of DEA analysis in this research indicate relative inefficiencies of the national container terminals in Egypt.
- Expanding the physical infrastructure such as quay length, yard capacity, and advanced TOS will shape the future of efficiency and competitiveness of Damietta container terminal.
- Damietta container terminal is able to compete and attract new traffic after completion of current mega expansion projects , and will has a new shape and higher rank.
- Smart port technologies are the future of container terminals.



Thank you

Dr. Ahmad Kamel
ahmadekamel@gmail.com