10-31-2021

Measuring logistics performance in ports: a case of Alexandria in Egypt

Engy Mahmoud Helmy Awad

WORLD MARITIME UNIVERSITY

Malmö, Sweden

Measuring Logistics Performance in Ports:

A Case of Alexandria in Egypt

By

ENGY MAHMOUD HELMY AWAD
EGYPT

A dissertation proposal submitted to the World Maritime University in partial fulfilment of the requirements for the reward of the degree of

MASTER OF SCIENCE
in
MARITIME AFFAIRS

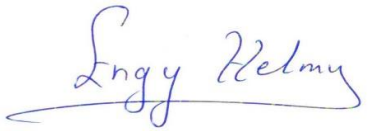
(PORT MANAGEMENT)

2021

DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views and are not necessarily endorsed by the University.

(Signature) : 

(Date) : 2021. 09. 21

Supervised by : Professor Dong-Wook Song

Supervisor's affiliation : Port Management

ACKNOWLEDGMENT

First and foremost, praises and thanks to Allah, the Almighty, for His showers of blessings throughout my research work to complete the research successfully.

I would like to express my deep and sincere gratitude to my research supervisor, Professor Dong-Wook Song, Professor (Korean Chair), Head of Shipping Management and Logistics & Acting Head of Port Management, for giving me the opportunity to do research and providing invaluable guidance throughout this research. His dynamism, vision, sincerity and motivation have deeply inspired me. He has taught me the methodology to carry out the research and to present the research works as clearly as possible. It was a great privilege and honor to work and study under his guidance. I am extremely grateful for what he has offered me. I would also like to thank him for the knowledge he gave to me, especially regarding shipping and port management which is very useful for me in my future career.

I owe profound appreciation to my colleagues, at the Egyptian Maritime transport sector for nominating me to study at WMU. Moreover, I am extremely grateful to my parents for their love, prayers, caring and sacrifices for educating, preparing me for my future and for boosting my spirit whenever I felt down.

I also would like to thank World Maritime University for giving me great experience and knowledge during the study program.

Finally, many thanks go to all the people who have supported me to complete the research work directly or indirectly.

ABSTRACT

This paper throws a comparative investigation on port performance to draw a conclusion on the relationship between customs procedures at ports and port performance. This research proposes a blue print for achieving high performance scoring at ports through improved customs procedures. Moreover, it aims at incorporating best practices and regulatory reforms that contribute to socio-economic development at ports from the port authority's perspective. To answer the specific research questions, the researcher assessed the status of maritime performance in Egypt while identifying the initiatives done by the Egyptian customs authorities to enhance trade facilitation, particularly non-tariff trade barriers. A case study of the Port of Alexandria - Egypt is applied.

Real world data are examined to perform an evidenced based approach. Time and cost to border and documentary compliance at ports were tested to examine the impacts of cumbersome customs procedures on trade flows. The empirical findings showed that time to export "documentary compliance" and cost to imports "documentary compliance" are statistically significant to trade flows. The Gravity model variables followed the typical pattern for imports flow. That is the variables for GDP, population, Language and Shared borders have positive effect on imports flows. However, distance and colonial ties showed significantly negative relation with imports flows.

Finally, the SWOT analysis reflected the current performance status of the case study Port depicting that high rate of cargo inspection and tight borders procedures by the Customs Authority, caused high dwell time for containers and intensive congestion rates.

Keywords: Customs. Trade facilitation. Trading across borders. Border compliance. Port performance. Mediterranean ports. Competition at Ports.

Table of Content

List of figures

List of Tables

List of Abbreviations

AAPA	American Association of Port Authorities
ACCHO	Alexandria Container & Cargo Handling Company
ACI	Advance Cargo Information System
AEO	Authorized Economic Operator.
AfDB	African Development Bank
AICT	Alexandria International Container Terminals
APA	Alexandria Port Authority
COMESA	Common Market for Eastern and Southern Africa
ECA	Egyptian Customs Authority
EDI	Electronic Data Interchange
EMDB	Egyptian Maritime Data bank
ESPO	European Sea Ports Organization
FAL	Convention on Facilitation of International Maritime Traffic
GAI	General Administration of Information
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GOEIC	General Organization for Export and Import Control
GTO	Global Terminal Operator
HPH	Hutchison Port Holding (operating AICT)
ICT	Information and Communications Technology
IMF	International Monetary Fund
ISFP	Integrated Solutions for Ports
JICA	Japan International Cooperation Agency
KPIs	key performance Indicators
LPI	Logistics performance Index.
MINTS	Misr National Transport Study
MOT	Ministry of Transport.
MTS	Maritime Transport sector.
NTMs	Non-tariff measures
OECD	The Organisation for Economic Co-operation and Development
PA	Port Attractivity

PCM	Port Competitiveness Modell
PPI	Port Performance Index
PPRISM	Port PeRformance Indicators: Selection and Measurement
SFA	Stochastic Frontier Analysis
SPS	Smart Port Solution
SSA	Sub Saharan Africa
SWS	Single Window System
TAB	Trading across Borders.
TFA	Trade Facilitation agreement
UNECE	United Nations Economic Commission for Europe
WB	World Bank.
WCO	World Customs Organization
WTO	World Trade organization
XML	Extensible Markup Language

CHAPTER 1

INTRODUCTION

1.1. Introduction

The Accelerated increase in cargo volumes in the last few decades has resulted in port congestion – causing disruptions in the shipping schedules and decline in performance efficiencies at ports. This made factors like; risks of late arrivals; time to customs and administrative compliance, differences between actual transit times and scheduled times; become of most important to both port performance and liner shipping performance (Notteboom, 2006).

The efficiency and quality of logistics services at ports have a big impact on international trade, whereby Devlin and Yee (2005) depicted that a weak operational activities and logistics infrastructure hinder international trade integration. On the contrary, economic liberalization, combined with; quality trade related logistics, increased economies of scope and scale, and high trade volumes in both operational and distribution activities (Gani,2017); enhance integration in international trade.

This chapter will provide background on the study, problem identification, objectives, methodology used and data collection means, research expected results, contribution and potential limitations.

1.2. Background

Today's realm of world ports has witnessed various regulatory and technological changes, causing instability and contested managerial environment in the ports sector. Ports now must enhance performance measures to be able to compete in the global maritime race (Cheon et al., 2018).

In 2013, Lam and Song studied ports in the supply-chain network context to capture the complexity of “Port Performance Measurements” and the multi-level interaction amongst various stakeholders. They concluded that a “A port that is a key node in the Seaport networks simultaneously create and sustain value for the port's users. The ports' performance indicators

help better understand the port's network performance and assess in positioning these ports within the complex dynamics of the global supply-chain."

Measuring port performance and how to rank ports internationally has been the puzzling question that baffled many Maritime professionals as well as scholars throughout the last decade. Ports can be compared in multiple ways; by value of trade or volume, by number of cruise passengers, storage capacity as well as port revenues. These are just some criteria that might be considered by shipper while evaluating "Port Performance"

In an attempt to set a framework for performance measurement at the global supply chain, the World Bank's introduced the "Logistics Performance Index" (LPI) concept back in 2007. This indicator aims at "Filling in the gap by developing a so-called unified framework for supply-chain performance measurement", with the main focus of removing border bottlenecks and trade facilitation. Nowadays, it's overlapping with domestic logistics (World Bank LPI,2018).

Six components of "Logistics Performance Indicators"

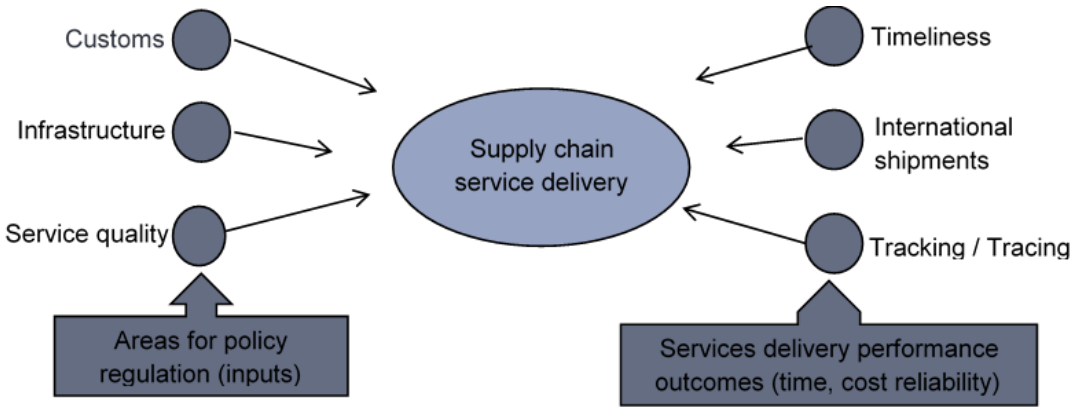


Figure 1: World Bank LPI, 2016.
Source: Developed by Author based on World Bank LPI report-2016.

The World Bank's "International Logistics Performance Index" (LPI) analyzes countries as per six indicators:

a. Border management clearance and customs efficiency
b. Infrastructure quality; particularly transport and trade related.
c. Arranging International shipments at competitive prices.
d. Efficiency logistics services.
e. Tracing and tracking consignments.
f. frequent reliable schedules and on time deliveries for international shipments.

According to the World Bank the above components were selected based on "empirical and theoretical research on the logistics professionals' practical experience in international freight forwarding". Figure 1 maps the LPI indicators divided into two main categories:

- Policy regulation areas; including (services, infrastructure and customs).
- Supply chain services performance outcomes; including (reliability, time and cost — international shipments, timeliness, and tracing and tracking).

The World bank attempts to standardize world performance measurement lead to the development of another indicator; named "Trading across border" (TAB); for economies to provide comparative bases for assessing customs complexity across case study trading partners within regions. TAB measures "The procedural requirements for importing and exporting pre-specified cargo units of standardized good type, along with time needed for completing the delivery". This indicator assesses the time for documentary and border compliance claiming that it proves substantially if lower on average than for others (International Finance Corporation, 2012).

1.2.1. An overview of the Egyptian Maritime transport

Egypt enjoys a wide network of sea ports including major commercial ports on the Red Sea, Mediterranean Sea, smaller ports and a number of specialized ports (i.e. mining, touristic and fishing ports). With (2,900 kilo metres) coastlines on the Mediterranean Sea, the Red Sea, and the River Nile, the marine activities highly influence the country's social and economic wellbeing (Saleh et al., 2006).

According to the Central Intelligence Agency- the World Factbook, the main economic activities in Egypt is located in a narrow strip of fertile land, along the Nile River, on the northeast corner of the country. Egypt's geographical location on one of the main trading and shipping routes on the Suez Canal, which acquired a new operating capacity through 2015 expansions, thus enhancing the connectivity between Far-East, Middle-East, North Africa and Europe. The country's natural resources are natural gas, petroleum, iron ore, magnesium, phosphates, asbestos, Zinc, lead, rear earth gypsum, talc and limestone. Agricultural products include wheat, corn, rice, beans, cotton, sheep, water buffalo, goats, cattle, vegetables and fruits. Industrial production includes food processing, textiles, pharmaceuticals, chemicals, hydrocarbons, light manufactures, metals, cement, and construction.

This research will start by defining the challenging areas that have been holding back the Egyptian Maritime sector as whole to come up with the suggested the areas for improvements. Some of these challenges are shown below:

#	Current challenges
1	Unclear roles of multiple decision makers causing:

	-Delay in the decision making process, -Confuse private investors and stakeholders. This negatively impacts the sector's competitiveness
2	Multiple layers of policy and investment decisions across port Authorities and various ministries, is leading to uncoordinated and unjustified investments, resulting in unutilized ports capacity.
3	"Taxing port" for short-term revenue to maximize fiscal revenues is negatively impacting port sector's and the country's maritime competitiveness and raising costs for exporters and consumers.
4	Regulating the sector through issuing decrees is leading to a complex regulatory and operational environment that support short term benefits and creating unlevelled playing field.
5	Not applying competitive and transparent tendering processes is resulting in sub-optimal deals for the government and people of Egypt.

Table 1:Challenges Facing the Maritime sector In Egypt
(source: Egyptian Maritime Transport Sector-Ministry of Transport)

Table 1 shows that the maritime and related logistics services in Egypt suffer from a number of regulatory and policy pitfalls including; absence of separating ownership and regulation, overlapping jurisdictions between different authorities in ports, domination of public sector in logistics services, heavy governmental control over pricing, and unclear regulations (ECES, 2007).

Shown below the Logistics performance indicator components for Egypt during the period 2007-2018. Figure 2 illustrates Egypt's LPI Scoring and Ranking over the period 2007-2018 whereby the year 2018 witnessed the highest score through-out the examined period with 3.18 points. Other than that the Egypt's score ranged from 2.37 to 2.98.

Figure 2:Egypt LPI Scoring and Ranking over the period 2007-2018.
Source: Developed by author based on world bank database.www.worldbank.org

YEAR	LPI RANK	LPI SCORE	CUSTOMS	INFRA-STRUCTURE	INTL. SHIPMENT	LOGISTICS COMPETENCE	TRACKING & TRACING	TIMELINESS
2007	97	2.37	2.08	2	2.33	2.38	2.62	2.85
2010	92	2.61	2.11	2.22	2.56	2.87	2.56	3.31
2012	57	2.98	2.6	3.07	3	2.95	2.86	3.39
2014	62	2.97	2.85	2.86	2.87	2.99	3.23	2.99
2016	49	3.18	2.75	3.07	3.27	3.2	3.15	3.63
2018	67	2.82	2.6	2.82	2.79	2.82	2.72	3.19

Table 2: Egypt LPI Scoring and Ranking over the period 2007-2018.
Source: Developed by Author based on world bank database.

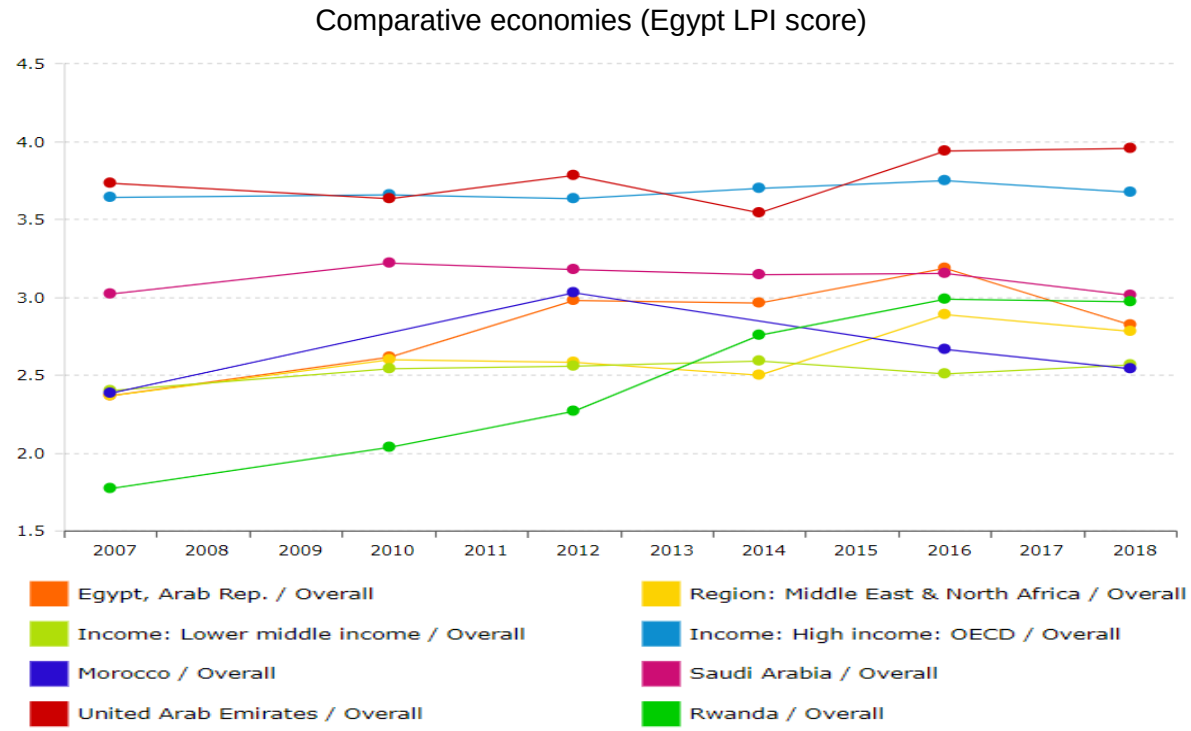


Figure 3:Country Score Card - Egypt LPI 2018
Source: Developed by Author based on World bank database.

Although Egypt's LPI score is higher than north Africa and middle east region weighted score yet countries like Saudi Arabia and UAE; with limited access to coastlines compared to Egypt's coastal access; managed to achieve higher scores than Egypt particularly in the year 2018. Moreover, few landlocked countries located in Africa achieved better LPI Scores than coastline countries. For instance, Rwanda scored 3.35 points in 2018 with 0.53 higher score points than Egypt for the same year.

Figure 4:Egypts' Ports map
(Source: https://www.spmarine.net/Ports.html**)**

Hinterland connectivity is well acknowledged as a decisive element in supporting port competitiveness. The extent to which a port is connected to different modes of transport capable of moving goods seamlessly and efficiently to/from the port is of paramount importance to enhance the performance of supply chains that are integrated with the port. Egypt has recently achieved significant infrastructural developments especially regarding the road network. There remain bottlenecks that need to be addressed to enhance and increase the use of rail and inland waterways as additional transport alternatives in line with Egypt's overall sustainable growth strategy. Road transport dominates the ports' hinterland links carrying 96-98% of Egypt's freight movement which reached 650 billion tonnes per year in 2016. (Ministry of transport, National Road Project, 2014)

Road is followed by rail carrying around 2.5-4% and inland waterways contributing to less than 1% of the freight movements. In view of this, Egypt has a large road network of 100,000 km and 1,150 bridges which increased with 3,200 km roads in 2020 according to the published National Road Project review. The port under study (Port of Alexandria) is linked by roads to the four major industrial cities located in the Greater Cairo Metropolitan Area (GCMA) which generates around two-thirds of Egypt GDP. (Ministry of transport, National Road Project, 2014)

According to the Egyptian Ministry of transport, the planned road projects are expected to further improve the accessibility to the ports and the relevant hinterland road network and support an improved and efficient traffic flow. Despite the achieved improvements, there exist some obstacles that are hindering the development:

i. There is a lack of regulatory road framework for the transport of perishable and dangerous goods.
ii. Overloading practices of trucks lead to deterioration of roads.
iii. Despite the development of inter-city connections, road connections to some ports have insufficient capacity and cause congestions at the entrances and exits of the sea ports e.g. Alexandra Port and West Ports Said. This leads to queuing problems and affect he traffic situation around the port (Ministry of transport 2017 Review).

1.2.2. The port of Alexandria as a case port

The Port of Alexandria is a major gateway port at Mediterranean Sea. Not only is the port a major gateway for containerized and non-containerized general cargo, liquid bulk and dry bulk, it is also an important gateway for specialized, roll-on/roll-off cargo and passengers.
According to the Egyptian Maritime administration "Port of Alexandria occupies the leading position in the ports of the Arab Republic of Egypt with regard to the volume of trade movement, through which about 60% of Egypt's foreign trade is traded" (Alexandria port authority, 2019).

Below are Port Characteristic for the year 2019:

Authority	***Alexandria Port Authority***
Container handled	(TEU) 945,689
General Cargo handled	(tonnes) 258,126.0
Dry Bulk handled	(tonnes) 17,148,635.0
Liquid Bulk handled	(tonnes) 3,991,447.0
Specialised Cargo handled	(tonnes) 25,426.0
Passengers	Not published for security reasons

Table 3: Alexandria Port 2019-overview
(source: Alexandria port authority. http://apa.gov.eg)

1.3. Problem statement

Despite the huge amount of investments that are push into developing the Egyptian Maritime transport infrastructure, yet these investments are not paying off in terms of the performance measurements scores. Where by Egypt's LPI score witnessed a decline from 3.18 points in 2016 to 2.82 points in 2018. In the meantime, the "Trading Across Borders indicator" (TAB) maintained a score of 42.2 points in 2018 and 2020. Furthermore, in spite of the high number

of piers and berths at port of Alexandria, due to the prolonged customs procedures and the high rate of cargo inspection by the Customs Authority, the port suffers from high congestion rates as well as dwell time for containers (i.e. containers are stacked 6 high; dwell time is up to 7 days for export and 12 days for imports). On the other hand, while the aforementioned port has many opportunities as it is connected to the inland waterway system of the Nile River, it faces the threat of overlapping its economic hinterland with the economic hinterland of the other Egyptian ports on the Mediterranean Sea (Alexandria port authority, 2019).

This weak maritime sector performance scoring coincided with establishing number of Projects at the port of Alexandria such as:

1. Enhancing and renewing the railway lines inside the port.
2. Establishing Bridge number 54 to link Alexandria port with the international coastal highway with 2.30 km length and 17.6 meters' width and s total cost of USD 57.7 million.
3. Adding new land area of 1 million square meters and establishing 2 corridors to connect the port with the Al-Tameer axis,
4. Constructing the multi-purpose terminal on the berths numbers 55-62, with total cost of USD 459.1 million and handling capacity of 80 million tons /berth (APA, 2020).

This paper shall examine the reasons behind weak maritime transport performance in Egypt despite the development projects taking place at the countries' ports. Ultimately it shall propose the key remedies required to improve the performance at ports and strengthen the country's international logistics performance scoring. This will be illustrated through studying the case of the Port of Alexandria which is the main gateway of the country's foreign trade "Alexandria port share is approximately 60% of the total Egypt's foreign trade in volume" (APA, 2020).

This research will lay out a detailed model of sustainable port performance criteria that emphasizes port competitiveness as well as social and economic yields. Meanwhile this research will present the main factors shaping sustainable port performance through comprehensive review of related literature as well as comparative analysis for benchmarks of the best practices.

As a result, the research findings will help; identify key elements of sustainable performance from port authorities' perspective; assist in establishing integrated ports system; reduce red tape in ports, facilitate customs procedures and document compliance, while creating benefits of lowering the cost and increasing economies of scale as well as reducing the duplication of

resources. The challenges, opportunities, strengths and weaknesses of port of Alexandria will be discussed accordingly.

1.4. Literature review

Over the last four decades, oiled with globalization, the maritime transport industry has experienced technological breakthroughs giving rise to transshipment, containerization and other major developments in cargo handling equipment and facilities (Olivier and Slack, 2006). These changes accompanied by the rise of ports expansions and relocating terminals to more peripheral sites to meet the current standards of Ultra large "Mega-ships" and hinterland connection (Asteris and Collins, 2007). This phenomenon has impacted port operations and thus performance measurements at ports.

According to Edwards and Thomas (2005) "performance indicators are pieces of information that are employed for measuring and assessing performance. KPIs are not just the basis for measuring performance. They are developed to reflect performance results, which are critical for success. KPIs allow the measurement of performance and realization of benchmarking. Thus, KPIs are the tool for communicating achievements and development over time and in comparison with competitors".

The Mediterranean Sea is one of the busiest shipping routes for commercial traffic and is used by the largest container ships, most of which are deployed on Far East - Northern Europe routes. The major transshipment hubs have been established in the east, west and central Mediterranean (ElNakib and Elzarka, 2014).

Gateway ports are the maritime gateways to their respective hinterlands and are mainly handling export and import cargo. George Lauriat mentioned in his article "Mediterranean Ports 2018 – Growth but capacity issues" that "Ports like the Tanger-Med port in Morocco, the Spanish ports of Valencia and Algeciras, Piraeus Port in Greece and Malta's Port of Marsaxlokk along with the Egyptian ports like Damietta port and East Port Said are transshipment hubs not only for freight moving throughout the greater Mediterranean region but also act as a connector to ports as distant as the Americas or Far East" (Lauriat, 2018).

The economies of scale pushed ship builders to the maximum vessel sizes on main haul services in order to implement aggressive cost leadership by reducing the average cost per slot on-board which further accelerated the development of the maritime industry. Henceforth, the deployment of larger vessels increased the need for transhipment operations both in large

mixed ports and pure hub ports in the Mediterranean (Notteboom et. al. Journal of Transport Geography, 2019).

The African Economic outlook anticipated that the expansion of the Suez Canal in late 2015 will lead to an increase in vessel traffic and, in turn, a substantial increase in public revenues. Meanwhile Egyptian Government will continue to strive to intensify the country's export volumes. For instance, in 2017 the Egyptian Government established an Export Development Authority, a Centre for Business Services for export development and eliminate a number of non-tariff export barriers (African Economic Outlook 2018, AfDB, 5).

1.5. Objectives of the study

Egypt has adopted effective tools to facilitate trade including, internet interface and EDI systems and SPS (Smart Port Solution) at ports. However, the promising impacts of these initiatives were quickly overrode by the red-tape, complex regulatory procedures, prolong documentary compliance and complicated customs processes (MTS, 2020).

Toward fulfilling the aim of this research we will be analyzing and examining the Egyptian customs procedures and associated IT systems to assess their impact on port operations. Our objective is to recommend reforms that will eventually lead to consistent customs procedures with timely, transparent and fair information. These reforms are said to help improving the Egyptian ports performance-measurements, while enhancing the overall transport and logistic system. Hence boosting economic development contributed to the maritime sector.

Ultimately this research shall propose some key remedies to improve the performance at ports, which will be illustrated through an empirical analysis of the Port of Alexandria-Egypt.

In this context, this study will provide an investigation of the status of maritime transport in Egypt in order to identify the gap in the actual performance at port while recognizing the impacts of macro-economic realm and trade liberalization.

Our research calibrates the impact of specific improvements in logistics performance (cost, time and reliability of customs procedures) on port attractiveness and increased trade.

This paper will be concluded by suggesting policy and regulatory reforms to improve such services and enhance Egypt's Maritime competitiveness.

1.6. Research questions

Ports are key members in the supply-chain which contribute to the economic and social wellbeing of any country, making the sustainability of their processes a crucial requirement. This study will attempt to answer the following questions:

- What are the factors affecting port performance?
- What are the implications of complex customs procedures on port performance and what are reforms required to enhance port competence?

In order to answer the above questions, the researcher will examine the implications of complex customs procedures on Port Performance through utilizing the case study of Port of Alexandria Egypt as follows:

- What are the main challenges facing the Egyptian Maritime sector, particularly Alexandria port?
- What are the international performance measurement scoring, for the Egyptian maritime sector (i.e. “Logistics Performance Indicator” (LPI) and “Trading Across Borders” (TAB)?
- What is the impact of customs and administrative procedures at ports on bilateral trade flows?
- What are the expected impacts of customs reforms, if any, on the performance indicators of the port?
- What are the managerial and regulatory reforms needed?

1.7. Methodology

The proposed methodology applied in this exploratory research will rely mainly on quantitative analysis of descriptive statistics of Port performance. Whereby a thorough investigation of the Egyptian and international port performance measurements; particularly, the port of Alexandria; will be examined. Alexandria port will be analyzed in terms of:

- Port's infrastructure, types of cargo handled and port's specifications,
- Review of the port's market environment
- Carry out port competition analysis focusing on competing ports and terminals (existing and new-built/planned) in the region.
- Analyzing Performance measurements scores for the port in terms customs and administrative procedures.

In an attempt to carry out the required analysis for this research, SWOT analysis is utilized to assess current and perspectives Port's situation through analyzing the internal capabilities, i.e. strengths and weaknesses, while evaluating the external opportunities and threats.
Furthermore, the Gravity model is used to estimate the impact of customs and administrative procedures on the bilateral trade in goods passing through ports. The gravity model is frequently used to analyze trade patterns and logistics services in many OECD publications (OECD, 2004; OECD, 2005; OECD, 2006)

1.8. Data collection

The availability and review of existing data will significantly affect the outcome of the study. The researcher will rely on both direct and indirect data collection techniques for data collected from official sources of the port authority, the port operators and the ministry of transport along with international databases as shown below:

- International Maritime Organization.
- World Trade organization.
- European commission.
- World Bank databases
- OECD databases.
- United nations UNCTAD
- AXS Marine database
- LIoyd's List Maritime intelligence.
- International labour Organization.
- Issued publications of the Egyptian Maritime Data Bank (EMDB)
- Data bases and publications of Alexandria Port authority's data center

1.9. Expected results

This research aims at identifying reasons behind the weak performance of maritime transport. Furthermore, it attempts to discuss the Port sector reforms based on best practices particularly in regard to customs and port administrative procedures. Ultimately it shall propose the key remedies required to improve the performance at ports, through illustrating the case of the port of Alexandria, whilst enhancing Egypt's Maritime competitiveness. Our findings can boost cooperation between public and private stakeholders that are directly or indirectly influenced

by logistics performance to improve the country's capacity to compete in today's global economy.

These key remedies are said to include policy recommendations such as the need for establishing an effective independent regulator for the maritime sector, enhancing the financial autonomy of port authorities, reforming applied customs procedures, accelerating automation procedures of ports, overcoming the scarcity and inconsistency of data, creating an efficient regulatory framework for multimodal operations, enhancing cooperation with international institutions, transparency, trade information portals, electronic payments and promoting public-private partnerships.

The expected results and findings will be illustrated in the light of the empirical analysis of the Port of Alexandria- Egypt.

1.10. Research significance

Most port performance studies have focused on port management to maximize throughput, while applying little emphasis on customs efficiency, which plays a key role in Port operations' timeliness, hence retaining/attracting port users, and consequently maximizing port's output.

Furthermore, the majority of the port performance studies in the past were concentrated on European, East-Asian and USA ports. Henceforth analyzing the concept of port performance in Middle eastern and north African peripheral ports would help the field to develop new knowledge. Overall, new theory development in the field is lacking. While majority of the studies borrow theories from the economics literature.

This thesis seeks to provide clarity on performance management at ports; by addressing the issues of weak performance, caused by cumbersome customs procedures, in a structured approach. Such an approach has been absent, at least to some extent, from the existing literature due to the evolving nature of the maritime industry that is highly influenced by Marco-economic and political changes.

1.11. Research structure

This research will be composed of 6 chapters as shown below:

Chapter	Description
1. Introduction	Chapter one will provide background introduction on the study, problem statement, objectives, Methodology, research Limitations and expected contribution.

Chapter	Description
2. Egyptian Maritime Transport Overview	Chapter two undertakes a literature review from an industrial point of view, which means it will review Egyptian Maritime Transport in general and APA in particular. The review will discuss APA from a geographical perspective, socio-economic, Natural and Berths characteristics, hinterland, current condition, future projects and the digitalization of the port.
3. Conceptual Framework and literature review	Chapter three will undertake a literature review from a conceptual point of view, which means it will discuss Data Collection Quantitative Secondary data on Port Performance will be collected from EMDB reports, Management Summary Report of APA, Operational Performance Standard from Ministry of Transport and customs procedures from GOEIC. Moreover, qualitative Secondary data will be collected from Previous Studies, Internet Data Sources, Literature Review and Previous Researches.
4. Empirical study and SWOT analysis	Chapter four will provide an empirical evidence that extensive customs and administrative procedures at ports hinder the trade flow thus degrade the ports' international scoring and competitive position. In doing so, the ordinary least square (OLS) and classical linear regression model (CLRM) will be presented in this chapter to test the regression model significance. Furthermore, the Gravity Model will be utilized into the OLS model to predict that the trade flow between two countries increases with the economic size of the two countries and decreases with the geographic distance between the countries. Finally, this chapter will utilize the SWOT analysis to assess current and perspectives Port's situation through analyzing the internal capabilities, i.e. strengths and weaknesses, while evaluating the external opportunities and threats.
5. Egyptian customs analysis	Chapter five will discuss the Egyptian customs processes while giving a special attention to the structure and legal regulation of customs clearance procedures at the Egyptian ports, particularly the port of Alexandria. This will help analyze the impacts of customs on port's performance whilst highlighting subsequent deficiencies, if any.
6. Conclusions and recommendations	Chapter six; this is the last chapter which will summarize all of the findings and discussions and will present recommendations for the future. It will briefly explain the limitations and suggest directions for future research.

Table 4: Research structure.
Source: Developed by Author

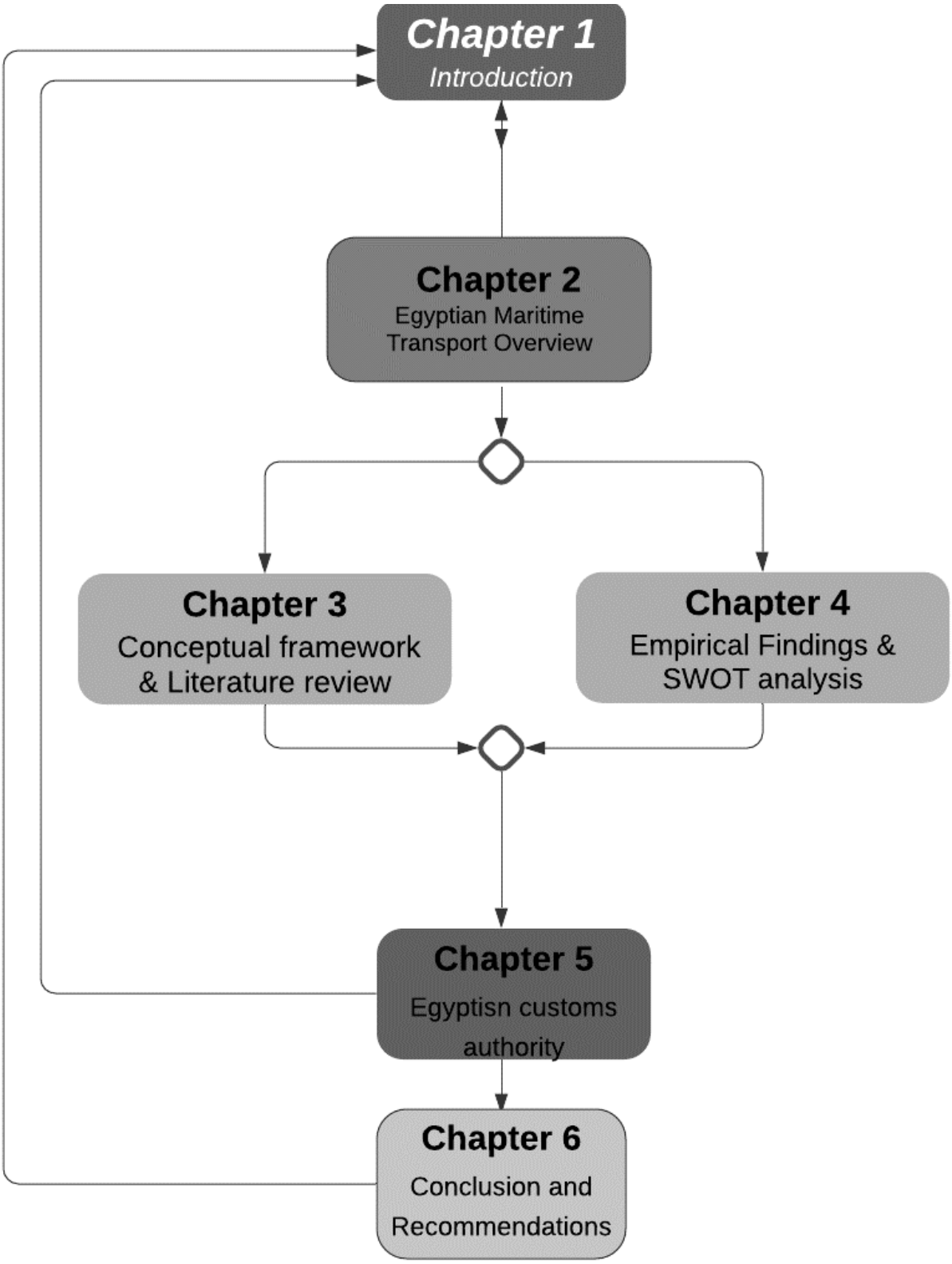


Figure 5: Research structure
Source: Developed by author

CHAPTER 2

EGYPTIAN MARITIME TRANSPORT OVERVIEW

2.1. Introduction

Ports play a strategic role not only in the transport of the countries' foreign trade but in the world's trade traffic as well. That said, National ports, whether commercial or specialized, have to comply with international maritime standards and compete with one another for providing competent services. For the Egyptian ports to play an active role in the integrated international supply chain, they need to utilize efficient operations and use enhanced infrastructure, and port equipment to achieve a competitive performance scoring.

According to the world bank LPI 2018 report, supply chain excellence is a matter of time, cost, and component of shipment quality (World Bank LPI,2018).

This chapter will introduce a brief overview on the Egyptian economy, Egypt's compliance status with the WTO trade facilitation agreement and the Egyptian maritime transport sector structure and Egyptian Ports' ownership. It will further summarize the main data of the case study ports 'Alexandria port authority' including the number and total lengths and depths of berths affiliated to the port authority (Alexandria Port, EL Dekeila port), problems facing these ports and domestic competition.

2.2. Egyptian economy

According to the IMF- world economic outlook, 2019, Egypt is the third largest economy in the Arab world. Services sector account for 47.5% of total GDP of the country, hence representing the most important sector of the economy. The profound segments within Services are; Retail and Wholesale Trade (10% of total output), Government (9%), Transportation and Communication (8%), Finance, Insurance and Real Estate (8%) and Tourism (4 %). Industry constitutes 30% of the output and the largest segments within this sector are: Manufacturing with 15.5% and Extractions with 13.5%. Agriculture constitutes 14.5% of output and finally, Water, Electricity, Construction and Sanitation are around 7%.

2.2.1. Egypt annual GDP-growth

Figure 6:Egypt_GDP_growth(2012-2020), Unit: percentage growth rate
Source:https://tradingeconomics.com/egypt/gdp-growth-annual

The above figure shows that Egypt GDP growth rate as follows:

- 2020 was highly impacted by COVID-19 pandemic, particularly during the first three quarters. However, the growth rate managed to rebound during the fourth quarter.
- 2019 was **5.56%**, with a **0.24% increase** from 2018.
- 2018 was **5.31%**, with a **1.13% increase** from 2017.
- 2017 was **4.18%**, with a **0.17% decline** from 2016.
- 2016 was **4.35%**, with a **0.03% decline** from 2015.

2.2.2. Egypt GDP from Transportation

Egypt is located on an important shipping and trade route between Europe, Africa and Far East. This unique geographical location was enhanced by the newly expanded Suez cannel. On top of that, the country oversees coastlines up to (2,900 kilometres) on the Red Sea, River Nile, and Mediterranean Sea, which magnifies the impact of the marine activities on the country's social and economic wellbeing (Saleh et al., 2006).

According to Eberts, (2000) “Transportation is inherently one of the driving factors of economic development”. To illustrate the contributions of transportation to the Egyptian economy, shown below Egypt's GDP from transportation throughout the period 2012-2020.

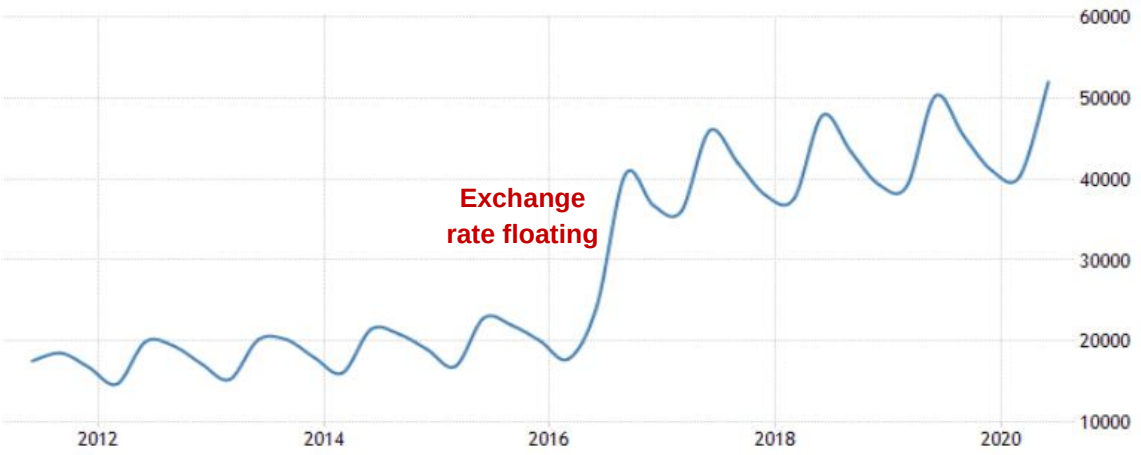


Figure 7:Egypt_GDP From Transport.Constant-Prices.unit:EGP Million(2012-2020)
Source: https://tradingeconomics.com/egypt/gdp-from-transport.

The above graph shows that there was a significant increase in the GDP derived from transportation, particularly in the year 2016. This sudden rise is contributed to; First: the substantial economic and financial reforms and the opening-up policies undertaken by the Egyptian government; Second: Economic adjustments and industrial restructuring; Third: November, 2016 exchange rate floating decision adopted by the central bank of Egypt. These reforms were part of the "International Monetary Fund" (IMF) conditions to extend a loan of US$12 billion granted to Egypt that year.

2.3. Egypt and the "WTO Trade Facilitation agreement"

"Trade facilitation" (TF) is "The simplification, harmonization, standardization and modernization of trade procedures" (Grainger, 2008).

According to the WTO "Egypt's current rate of implementation commitments to the WTO Trade Facilitation Agreement stands at 23.1% on September, 2022 with a time-frame spanning from February, 2017 to December, 2030 for the full implementation of the Agreement" (WTO TFA, 2021).

Trade facilitation measures aim at finding improvements within the trade

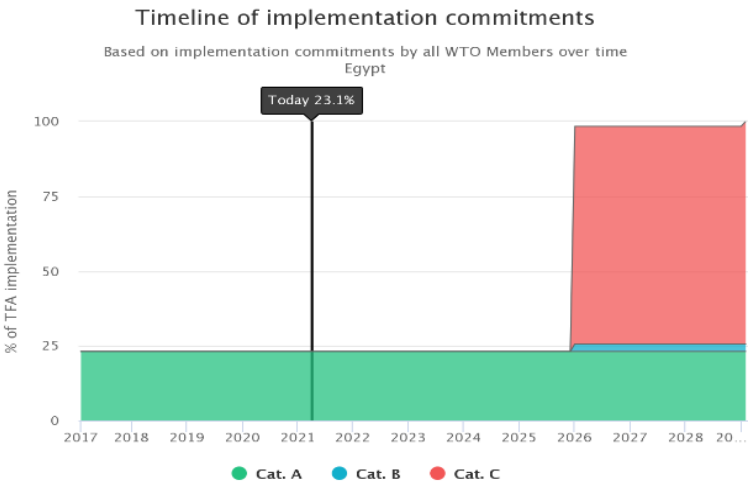


Figure 8:Egypt Rate of current &future implementation commitments of TFA(2017-2030)

and customs environment while reducing transaction costs between government and business. However, according to the World Customs Journal (2008), it is really difficult to measure the economic effectiveness of these measures due to the lack of standard parameters. For instance, "how to measure the benefits resulting from the standard trade document developed by the UN/ECE which forms the basis for the majority of trade and transport documents worldwide?" Moreover, no standard concept of a trade facilitation policy and no standard definition for trade facilitation exist. Additionally, the changing nature of the customs environment from one country to another makes improvements to certain aspects challenging in a way that brings immense savings in one country, while the same measures hardly change anything in other countries. However, recently there have been some attempts by economists to assess the economic impact of trade facilitation, instead of the past country-specific studies that used to be prevailing amongst academics, industry researchers, customs professionals, and research students (Tweddle, 2008). Newer studies by OECD are also trying to estimate the potential time and cost reductions of trade facilitation worldwide (OECD, 2018).

2.4. Trading across border

For assessing the Egyptian customs performance, trading across borders indicator under the world bank Doing Business data will be utilized. Trading across border indicator measures the time and cost for (1) documentary compliance, (2) border compliance, and (3) domestic transport. It further considers the product of comparative advantage for each economy when measuring export/import procedures (Doing Business, 2021).

According to the world bank – trading across border report, 2018; the prolonged documentary compliance procedures and its high associated costs accompanied by red-tape and complex bureaucratic logistics systems, cause inefficiencies and hinders improvements.

Shown below Egypt trading across border 2020 report indicating total time to export and import goods and the associated costs (Figure 9):

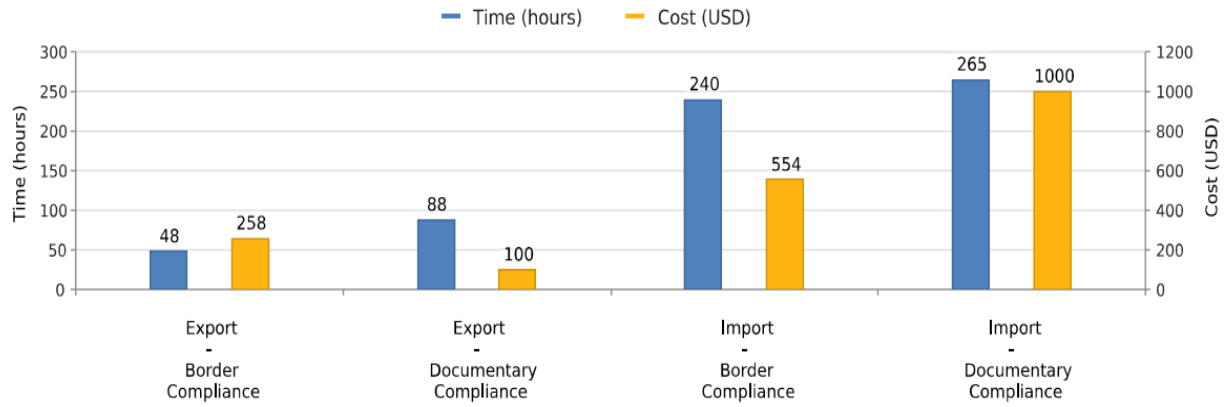


Figure 9:Trading across Borders, Egypt 2020-Time &cost for imports/exports compliance.
Source: WorlBank-Doing Busniess report, 2020.

2.5. Egyptian maritime transport

The easiness of trade at any country can be reflected in terms of the quality of its Maritime Logistics Systems, whereby a sound maritime logistics system acts as a trade facilitator and guarantees the smooth flow of materials. Particularly when equipped with multilateral, preferential, regional or free trade agreements, while lifting tariffs and non-tariff barriers. Free trade system, enables; increased exports, lower prices for consumers, greater choices of goods; benefiting from economies of scale (Wilson et al., 2005).

According to Saleh et al., (2006) Egypt has a unique geographical location qualifies the country to play a pivotal role in maritime transport between the east and the waste, however one essential requirement for this to happen is a reliable, timely and efficient logistics activities.

2.5.1. Egyptian Ports Overview

According to the statistical yearbook issued by the Egyptian Maritime transport sector-Ministry of transport in 2018, EGYPT has 15 commercial ports. The total berth lengths are 37.7 kilometers. In 2017, the Egyptian ports handled an average of 149.6 million tons of cargo including 6,240,928 containers (TEUs).

In 2020, the Egyptian ports handled 156 million tons of cargo in total, including 7.56 million TEUs, compared with 172 million tons during the year 2019 including 7.24 million TEUs, with a decline of 16 million tons (EMDB, 2021)

A report issued by the maritime transport sector in 2020 indicated that, Alexandria Port handled 55.6 million tons in 2020, compared with 62 million tons in the previous year, while Damietta Port handled 32.7 million tons, compared with 36 million tons in 2019.

As for the Red Sea Ports, they handled about 4.5 million tons compared with 5 million tons in 2019, while the ports of the Suez Canal Economic Zone, which include (East and West Port Said, and Sokhna) handled 63.2 million tons, compared with 58 million tons in 2019 (EMDB, 2020).

2.5.2. Egyptian Commercial Ports Ownership Structure

Most Egyptian commercial seaports are subject to landlord port governance model in running and operating their activities. Whereby the port authorities own and administer the infrastructure and the land whilst public and private companies provide port services. The public sector has – through the Holding Company of Maritime & Land Transport – shares in a number of terminal operators and stevedoring companies (EMDB, 2020).

A successful example of private sector investment in Egyptian ports is Alexandria International Container terminal (AICT), affiliated to the Chinese company Hutchinson Port. The Concession contract signed in 2006 for 25 years, scheduled to expire within 4 years.

The Egyptian ports are currently divided according to their administration and ownership into three groups; the first group includes ports affiliated to the Ministry of Transport, which includes the ports of Alexandria, Dekheila, Damietta, Safaga and some Red Sea ports, while the second group belongs to the Suez Canal Economic zone and includes the ports of East and West Port Said, Al-Adabiya and Al-Tour. As for the third group, it is represented by the ports of Arish in North Sinai, Abu Qir in Alexandria, Berenice in the Red Sea, and Jarjoub in Matrouh owned and run by the Navy.

Egyptian Ports and their relevant Authorities

First group: affiliated to the Maritime Transport sector, Ministry of transport	**Alexandria Port Authority**	**Alexandria port**
		El-Dekheila port
	Damietta Port Authority	Damietta Port
	General Authority for Red Sea	Ports Suez Port
		Zayteiat (Petroleum Dock Port)
		Hurghada port
		Safaga port
		Sharm El Sheikh port
		Nuweiba port
Second group: Economics zones governed with the investment Law No. 72 of 2017	General Authority for Suez Canal Economic Zone	West Port Said Port
		East Port Said Port
		El Arish Port
		El Adabiya Port
		El Sokhna Port

		El Tour Port
Third group: Ports owned and run by the Navy and perform commercial activities	Egyptian Navy	Arish Port
		Abu Qir Port
		Berenice Port
		Jarjoub Port

Table 5: Egyptian ports and their relevant authorities
Source: Egyptian Maritime transport Sector-Ministry of transport. http://mts.gov.eg/en/content/275/1-83-The-Egyptian-Ports-Capacity

In addition to the above commercial ports, there are 29 specialized ports divided in to: six fishing ports, five tourist ports, 11 petroleum ports, six mining ports and one special nature port.

The Organization Chart of the commercial Ports in Egypt

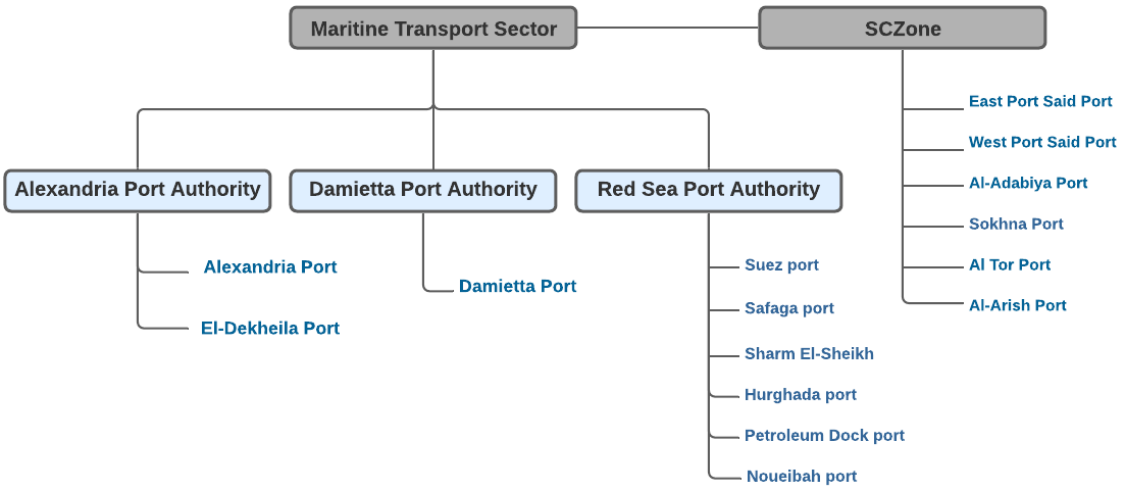


Figure 10: Organisation chart of the commercial Ports in Egypt.
Source: Developed by Author based on Egyptian Maritime transport sector, Ministry of transport.

2.6. Alexandria Port Authority as a case

The case of Alexandria port authority will be studied to answer our research questions. According to Alexandria port authority the port of Alexandria handles the highest volume of traffic of all other 15 Egyptian commercial ports, where approximately 60% of Egypt's foreign trade is handled by Alexandria Port (MTS, 2021). Alexandria port authority is composed of the port of Alexandria and its extension 'the port of Dekheila'. Shown below is a brief overview on these ports:

2.6.1. Port of Alexandria

The city of Alexandria is located at the west end of the river Nile between the Mariout Lake and the Mediterranean Sea (MTS, 2021). It is considered the second most important city, after the metropolis city of Cairo. It further embraces the main port in Egypt. Port of Alexandria

handles over 60% of Egypt's foreign trade. Alexandria port consists of two harbours (west and East) separated by a T-shaped peninsula. “The Eastern harbour is used for general cargo and the Western one is used for timber and bulk trade. The Eastern harbour is shallow and is not used in navigation while the western one is actually what is called Alexandria Port” (APA,2020).

The port is managed by Alexandria Port Authority (APA, established 1967) based on land-lord management model. The port administration responsible for;

- Ensuring good organization of work process, its regularity and to raise its efficiency to the optimal level for all the fields of activities;
- Maintenance of berths, breakwaters, waterways, capital and maintenance dredging works;
- Organization of stevedoring operations and inland transport undertaken through the competent companies.
- Provision of security within the customs fences of the port;
- Towage and pilotage operations as well as provision of navigational safety;
- Setup of tariffs for the services provided by the authority and the companies operating in the port.
- Provision of environmental security and response for emergency.

Figure 11: Alexandria Port Layout and zoning
Source: Alexandria Port authority

Alexandria Port Zones:

Zone 1 “It extends from naval base borders up to gate No.1. It consists of small berths starting from berth 1 up to berth 14. Berths 1-4 are mainly used for ship maintenance and small repair,

parking of off-shore vessels, tugboats, pilot boats, police boats and another auxiliary technical fleet. Berths 5-14 used for general cargo operations."

Zone 2 "Is located between berths 16 and 28 deals with 4 types of activities: homogenous cargos, passengers' terminal, bulk cargoes (mainly in big bags), and barge discharge."

Zone 3 "Is located between berths 35 and 44, and is used for handling general cargo, RO-RO, small feeder container ships."

Zone 4 "Is located between berths 45 and 68, and is used for handling containers, cement, coal, barge discharge, fertilizers, and general cargo."

Zone 5 "Is located between berths 71 and 85/2. The borders of this area extend from gate #12/13 till oil dock border including container terminal (HPH), and is used for handling of molasses, timber, some types of general cargoes, discharge of barges with wood products, grains and flour."

Zone 6 "(Oil Dock) is situated at the western boundaries of the port, encompasses oil berths 87/1, 2, 3, 4, 5, and is used for handling edible oil, oil products and for providing bunkers. It also includes berth 86 situated at the port's limits, used for handling livestock. The port does not include oil storage facilities, but oil berths are connected to a refinery through a 2 km. long pipeline." (APA, 2021)

2.6.1.1. The geographical location of the port

Berths	Longitude	Latitude
East of Alexandria	"34.5252 '52 °29East	"36.9492 '11 °31North

Table 6: Geographical location of Alexandria Port
source: Alexandria Port authority

2.6.1.2. Port's Berths characteristics

Cargo Type	Number of Berths	Berth Length (m)	Alongside depth (m)
Dry Bulk Terminal	2	758	10-14
Passenger and Tourist	5	768	10-12
RORO	6	916	10
Coal	10	1405	9-12
General Cargo	22	3295	6.5-10
Container	5	1110	12-14
Petroleum	2	1042	10-12

Table 7: Alexandria Port berths characteristics.
Source: Alexandria Port Authority.

2.6.1.3. Port Specifications

- Total area = 8.4 km2
- Water area = 6.8 km2
- Land area = 1.6km2
- Customs zone = 900000 m2
- Dry bulk terminal (seeds terminal) with total area = 7108 m2
- Petrol Terminal of Pipe lines of 2 km length.

2.6.1.4. Qualitative Allocation of Cargo Handling in the Port of Alexandria

The displayed figures illustrate the qualitative indication of cargo handled at port during the year 2019 in comparison with the year 2009. The figures exhibit an increase in the total percentage of dry bulk cargo in 2019 in comparison with 2009. On the other hand, a decrease in the total percentage of general cargo and a plateau in the total percentages of both containerized and liquid bulk cargoes appear in both years.

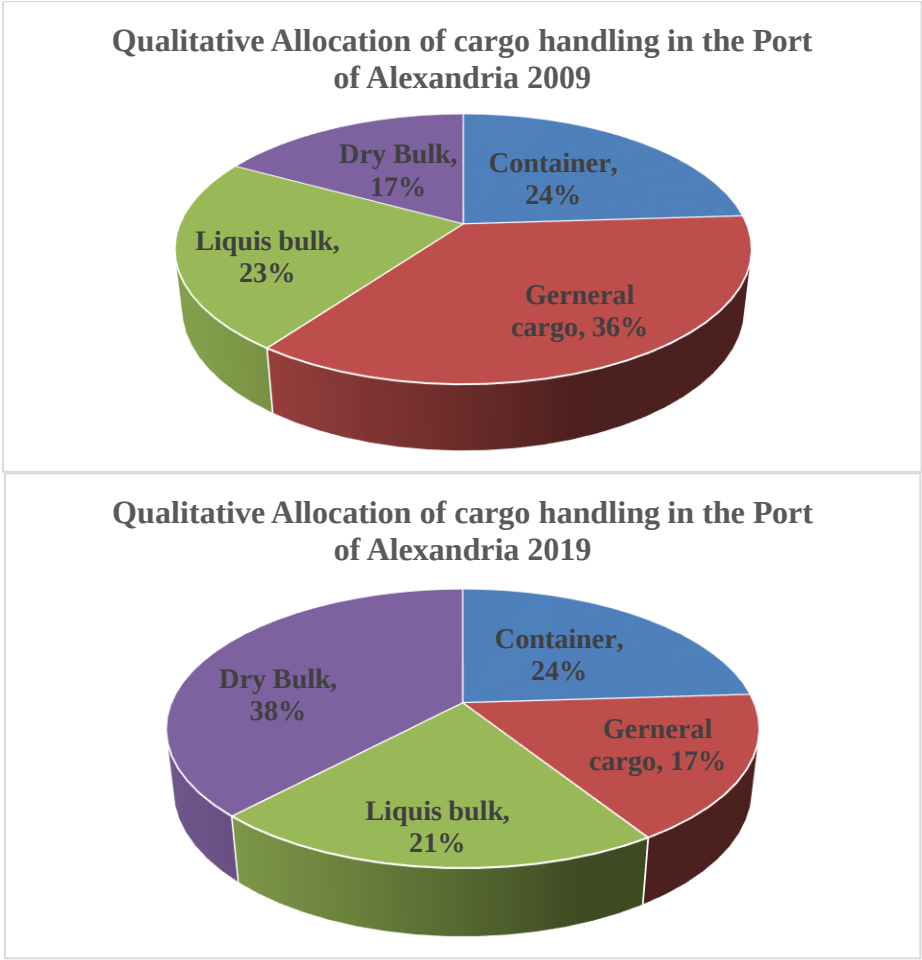


Figure 12: Qualitative Allocation of cargo handling in the Port of Alexandria 2009-2019.
Source: Alexandria Port Authority, 2020

2.6.1.5. Future Projects

Multi-purpose Terminal: planned Multi-purpose Terminal at berths 55 to 62 has an area of approx. 560,000 m² and a berth length of approx. 2,480 m. thereof, 2,000 m are designated for vessels and 480 m for barges. The depth at the quay wall will be 14 to 17 m. The project is expected to reach completion within 3 years starting 2019.

Logistic Zone – Nubaria Waterway: The project features a new two river basin ports. The project includes a railway trade center and a logistics zone to be linked to the (new) liquid bulk terminal and the planned multi-purpose terminal. It will be also linked to the national railway network by an access railway track (APA, 2020).

2.6.2. Port of EL DEKHEILA

Dekheila port is a natural extension of Alexandria Port; the construction operations of the port started in 1980, the port became partly operational in 1986 with the operation of the minerals

berth (berth No.90). Dekheila port takes the place of the former Dekheila Military air base west of Alexandria port with 7 km in sea and 10 km in land (APA, 2020).

Figure 13:El-Dekheila port layout and zoning
Source: Alexandria Port Authority

2.6.2.1. Port's Berths characteristics

Cargo Type	Number of Berths	Berth Length (m)	Alongside depth (m)
Oil	4	842	11.9-13.6
Minerals	2	640	14-18.9
Grains	2	1380	12-15
Container	2	1550	12-14
General Cargo	1	1050	12-14
Total	11	5462	-

Table 8: EL-Dekheila port berths characteristics
Source: Alexandria Port Authority

2.6.2.2. Qualitative Allocation of Cargo Handling in Dekheila Port

The displayed figures illustrate the qualitative indication of cargo handled at port during the year 2019 in comparison with the year 2009. The figures exhibit an increase in the percentage of containerized cargo and liquid bulk handled for the year 2019, as opposed to a reduction in the percentage of handled general cargo and dry bulk for each of the two years in question.

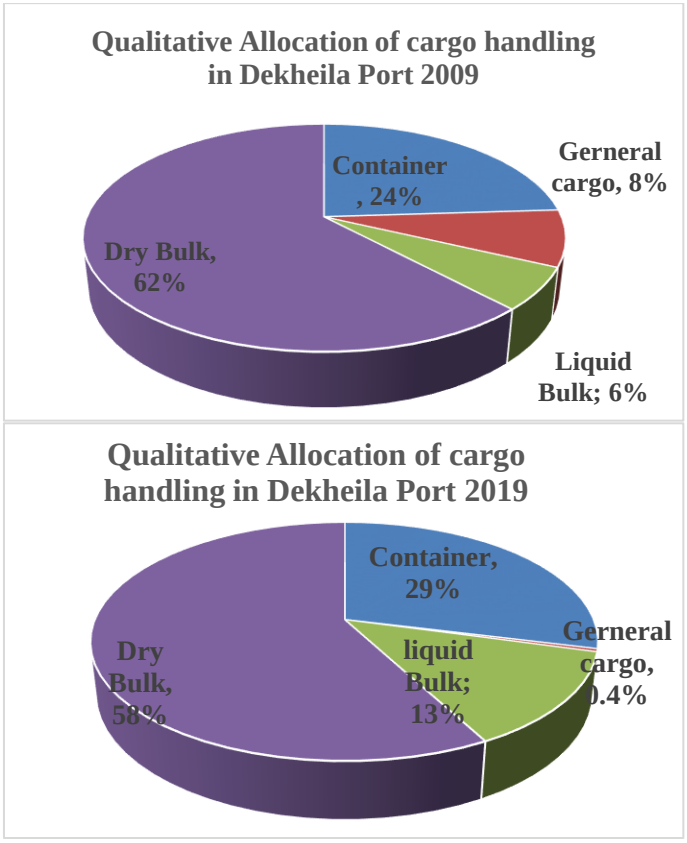


Figure 14:Qualitative Allocation of Cargo Handling in Dekheila Port 2009-2019. Source: Alexandria Port Authority, 2020

2.6.2.3. Future Projects

- A dry bulk terminal with a berth length of 750 m, a depth of 15 m.
- A dirty bulk terminal with a berth length of 500 m, a depth of 15 to 20 metres.

2.6.3. Major Problems of Alexandria Port authority

- Container dwell time is between 5 and 15 days.
- Customs clearance time is too high. This increases the time and costs.
- High congestion rate with containers stacked 6 high.

2.6.4. Private sector involvement

Most Commercial seaports in Egypt use the landlord managerial system to run and operate their activities on behalf of the government, who acts as organizer, controller and regulator. This Legal framework allows investors to establish specialized terminals within the framework of state legislation and rules, using B.O.T system through concession Contracts' terms

depending on the volume of investment and the specifications of the submitted economic feasibility studies. Shown below the private sector terminal operators in APA:

- Alexandria International Container terminal (AICT), operated by Hutchison Port Holdings (HPH), manages two terminals in Alexandria and Dekhila under a 25 years Concession contract.
- Alex. Cargo and Container Handling Co. (ACCHCO); operates two terminals in Alexandria and Dekhila. Alexandria Ports Authority is a shareholder in the company.

2.6.5. Domestic competition

The ABU QIR sea port represent a domestic competition to the ports of Alexandria and Dekheila, particularly after enhancing its' berths depth to reach 16m instead of 12m and after signing a memorandum of understanding with the Chinese Company-Hutchison to establish a container handling terminal with a capacity of one million TEUs annually. This project is expected to begin operating in 2022.

It's worth mentioning, that ABU QIR port is owned and run by the Navy which indicate that it doesn't have to comply with the rules and regulations of the Ministry of transports. This allow the port to enjoy the freedom of setting stevedoring rates and port's tariffs while exercising flexible procedures.

2.6.6. Alexandria Port Authority IT Systems

According to Alexandria port authority, both Alexandria and El Dekheila ports developed 12 modules, including:

- Registration of vessel arrivals
- Registration of Vessel sailing
- Ship/Berth planning module
- Container handling (for terminal operators)
- Registration of truck visits
- Registration of truck/cargo weight
- However, the Declaration of goods module isn't fully implemented yet.

The above modules provide extensive data management tools including standard and specialized reports. The shipping agencies and forwarders have access to the system through the web-site of the port using own unique and secure log-in data.

Alexandria Port joined the SPS (Smart Port Solution) initiative from the ISFP (Integrated Solutions for Ports), who is rolling out standardized Port Community Software over various Egyptian Ports. The SPS consists of various modules that are implemented according to the actual demand of the specific ports. Alexandria Port has implemented the SPS modules for Harbour, Port Simulator, General Cargo, Stevedoring, Warehousing, Gates, Rails, River, and Licenses (APA, 2020).

CHAPTER 3

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW ON PORT PERFORMANCE

3.1. Conceptual Discourse

It is a challenging task to find indicators for measuring the achievement-levels of the objectives throughout the progress of a project (Sanchez & Robert 2010). The concept of port performance and developments, clearly reflects an increasing demand for performance assessment across the networks of Port Management Programs worldwide. In Often times the focus is narrowly on terminal efficiency studies. However, in the recent decade there has been an awakened interest in port authority measures of performance (UNCTAD, 2016).

The Egyptian ministry of transport (MOT) joined the awakened interest in measuring port performance. Henceforth authorities in Egypt invest a large portion of money in developing the necessary infra-superstructure for the Egyptian ports, particularly the port of Alexandria. Yet the port's KIP's scoring kept lagging behind, leaving decision makers with a blur vision on the proper way-forward. That said, this chapter will describe the conceptual framework, research methodology and methods used in the research's data analysis process. Furthermore, it will identify data collection sources. This chapter is said to set a common understanding on Port Performance and answers the research questions tackling; factors affecting port performance and the most commonly used port performance measurements with a special focus on “Mean-time customs clearance”.

3.2. Research methodology and methods

This research is founded on a mixed method of qualitative and quantitative analysis that discusses actual performance issues at ports. To best identify the weak performance nodes and bottlenecks at ports, a case of Alexandria port authority will be examined in an attempt to suggest port performance enhancement mechanisms.

In the process of elaborating on this research, secondary data and statistics will be collected from official sources of the Egyptian ministry of transport, port authority, Egyptian Customs Authority, Egyptian ministry of finance, the port operators, and the Egyptian Maritime Data

Bank (EMDB). To a lesser extent, some other data will be gathered from online databases such as OECD, World Bank LPI and Doing Business reports, AXS Marine, WTO and UNCTAD.
Statistical software such as MATLAB will be used to analyze the gathered data, excel spreadsheets will be utilized as a tool for categorizing different information, to process different calculations and visually display the findings.
Data from the "World Bank Doing Business - Trading Across Borders" 2020 report will be examined to conclude the impact of Non-tariff trade barriers at ports (e.g. customs and administrative procedures) on the bilateral trade between country pairs. For initial determination, the Trading across Border eight performance indicators for imports/exports actual data - 2020 will be utilized as the independent variables. Additionally, macro-economic factors in the context of gravity model will be accounted for through using indicators such as GDP per capita, population, language, colonial and shared borders ties, as well as distance in nautical miles' between the trading country pairs. The data will be tested through using statistical tests; descriptive statistics, correlation test, regression analysis and so on.
A deductive reasoning will be conducted in a logical manner to investigate the causality relationship, between the port deficiencies and the logistics chain performance level. Henceforth identify the needs for reforms, when necessary. In light of this approach, SWOT analysis will be utilized to reverse the port's weaknesses and maximize its responsiveness to potential opportunities.
Equivalently, a literature review of relevant articles from; the Central Bank of Egypt, World Bank, UNCTAD, the Organization for Economic Co-operation and Development's (OECD), the American Association of Port Authorities (AAPA), and the European Sea Ports Organization (ESPO); will be used to make appropriate assumptions in the course of setting the analysis.

3.3. Data Collection Procedures

At the beginning of the research, the LPI and doing Business-trading across border data was examined particularly for the case study port. While the "World Bank's Logistics Performance Index" (LPI) intertwines the "Trade Facilitation" concept with the domestic logistics performance through removing border bottlenecks (World Bank LPI,2018), the "Trading across border" indicator reveals a comparative ranking on region specific economies with top export/import time and cost efficient procedures.

The information collected was documented in a draft inception excel spreadsheet. Subsequently, port handling, available capacity, vessel traffic and operational performance data was provided by the Egyptian Ministry of Transport, Port Authorities and the Egyptian Maritime data bank. Finally, the Egyptian customs standard processes for the treatment of import and export cargos in ports were collected from GOEIC "The General Organization for Export and Import Control".

Shown below the data collection chart for this research

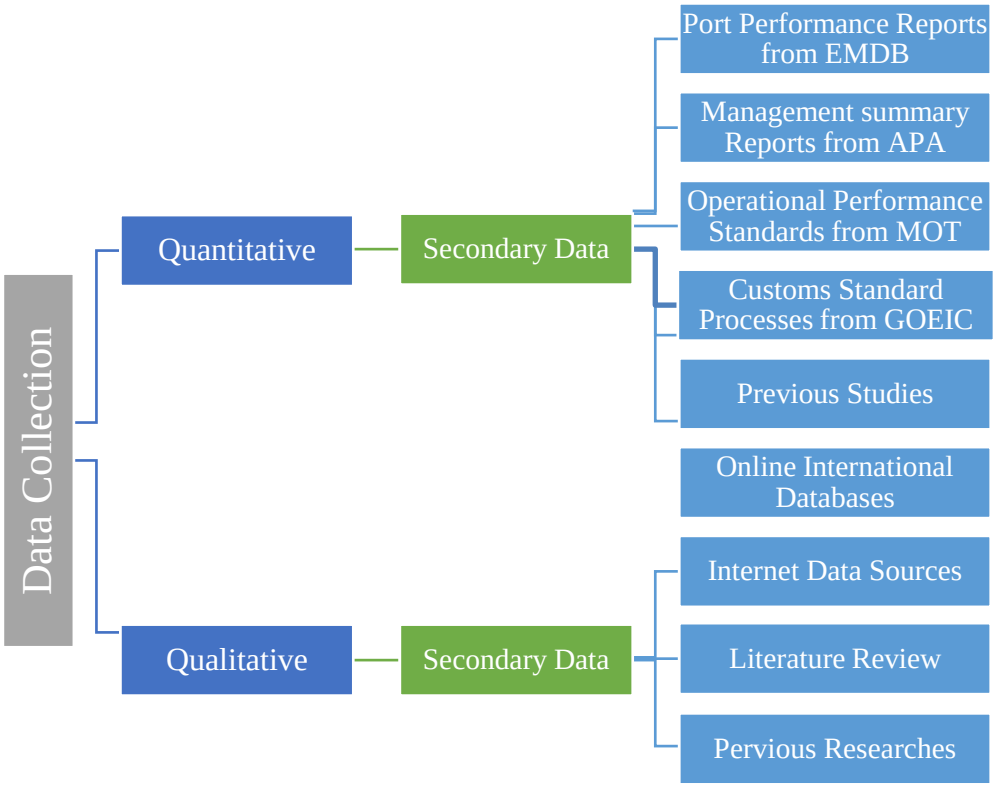


Figure 15: Data Collection Chart.
Source: Developed by Author

3.4. Data Input Requirements

The availability and review of existing data and studies, significantly determines the successful outcome of this research. Shown below are the previous studies reviewed:

3.4.1. General Data and Information

- Issued publications of the Egyptian Maritime Data Bank (EMDB).
- Data bases and publications of port authorities' data centers.

3.4.2. Studies on the national level

- Misr National Transport Study (MINTS), JICA study 2012.
- Review of Egypt`s port sectors
- Egypt sea port strategy (Final report, Mackinsy, May 31, 2008)
- "Study on multimodal transport and logistics system of the eastern Mediterranean region and master plan in the Arab Republic of Egypt (Final Report, August 2008, JICA)."
- Restructure of the Egyptian sea ports and national port policy (2002).

3.4.3. Studies on the port level

- Study of restructuring Alexandria Port (JICA, 1999).

3.5. Port competitiveness

The increasingly competitive realm of the world ports has resulted in a "potential diseconomies of excessive competitive pressure on port performance". The relationship between competitive rivalry and port performance was descripted in former studies as an inverted U-shaped relationship (Cheon et al., 2018) whereby ports facing greater competitive intensity tend to implement more vicious improvement programs to enhance their position (Ferrier 2001). However higher performance might be limited to port capabilities under the given input levels, particularly in the short run (Cheon et al., 2018).

Ng, Koi-Yu Adolf (2009), in his book "Port competition: the case of North Europe", drew a relationship between port performance and port competitiveness. He stated that "The most important concept within Port Competitive Management is Port Attractivity (PA) which can be understood as the potential ability of a particular port in convincing potential users to pay a certain amount of money to use its service, under the condition that the latter has demands on port services and are given a certain number of choices." Later in this book he introduced Port Performance Index (PPI) "…PPI is made up of time efficiency, locational efficiency and other qualitative factors agglomerated together…". Finally, he formulated a Port Competitiveness Modell (PCM) based on the used the case study analysis to conclude that "Port Competitiveness is not only decided by readily quantifiable factors like monetary cost and time but also on other less-readily quantifiable factors e.g. service quality, business strategies, beliefs and perceptions of port users, chances etc."

3.6. Port Planning strategies

In 1993, UNCTAD issued its report "Port authorities strategic planning" in which it specified the average number of years required to implement a new strategy. These strategies are associated with reform programs and development projects implementation.

Strategy	Advantage provided	Time (year)
Management reorganization	Overall Efficiency, reduce operating cost	1-2
Downsizing or Specializing	Market Focus, reduce Costs	2-4
Upgrading Labor Skills	Increasing Efficiency and expanding Capacity	2-3
Provision of New Services	Market focus, reducing costs for vessel/cargo	1-2
Sales and Promotion	Market Focus	1-3

Table 9: Strategic Planning for Port Authorities.
Source: Strategic planning for port authorities. UCTAD, 1993.

3.7. Port Performance

Many researchers see a statistically significant relationship between "Logistics Performance" at ports and bilateral trade flow (HE et al., 2021). Nonetheless, in 2018 Aminatou et al., referred to "Logistics Performance" in terms of cost, time and complexity in executing imports and exports activities.

Jürgen Sorgenfrei in his book "Port Business" (2018) identified a comprehensive overview of port performance measures in terms of KPIs where he stated that "Port performance can be measured with a set of indicators, often referred to as key performance indicators (KPI)... They should provide insight for the port management into operational details of the key areas of port business. They can be used, first, to compare performance levels with targets and second, to observe industry trends in performance levels." He further illustrated on that using the example of "the productivity for handling containers per hour (so-called moves per hour) may vary month to month" (Sorgenfrei, 2018).

According to Maria G. Burns. (2018) "Port Management may be defined as the process of organizing, monitoring, and controlling the activities of a seaport in a precarious global industry, in order to accomplish corporate goals, which are in line with its regional and national interests." She further added that "…As transportation nodes are handling increasingly larger cargo volumes, port authorities have been asked to measure and maximize their performance in terms of ships' turnaround time, efficiency, cargo operations, congestion, and market concentration through their regional clients..."

The "American Association of Port Authorities" (AAPA) continuously receives questions on how to rank ports internationally as well as nationally? Regardless the ambiguity of this

question, ports can be compared in multiple ways; by value of trade or volume, by number of cruise passengers, storage capacity as well as port revenues. Moreover, port efficiency, productivity or responsiveness can't be determined in terms of sheer size of a port, or traffic flow. These are just some criteria that might be considered by shipper while evaluating "Port Performance" (AAPA, 2020).

In 2013 Brooks et al. anticipated that "Within five years, we believe that it is likely that port performance benchmarking will happen on both efficiency and effectiveness vectors, with or without port cooperation in the process, as users become increasingly engaged in understanding and measuring end-to-end supply chain performance in order to improve their own competitiveness and create value for customers."

3.7.1. Factors affecting port performance

Turner et al. (2004) argued that Port Size has a significant impact on port performance through economies of scale. This can be measured in terms of number of berth, average berth's depths, and number of crane in the port.

The port's connectivity and network externalities influence its performance; whereby well connected port attracts shipping lines thus generates higher container volumes, because shipping lines values shipping networks, particularly when ports are connected with spoke ports and other local liner services (McCalla, 2003). Port's connectivity can be measured through the number of direct liner services in ports.

According to Cheon (2009) ports involved with Global Terminal Operator ('GTO') are expected to perform better. He further demonstrated that "These specialized entities usually adopt effective investment/management programmers for port infrastructures and superstructures".

In a study by Clark et al. (2004), Ports' performance is affected by its infrastructure condition. If ports' hinterland transportation networks are unfavorable to cargo movement, shippers/carriers may choose other ports (Turner et al., 2004). This can be measured on a national level in terms of "the percentage of paved roads in the total road network" (Cheon et al., 2018).

3.7.2. Measuring port performance

Measurements are key elements to close knowledge gaps. The European Sea Ports Organization (ESPO) precluded for Ports to have a proper set of "Performance Measures

indicators", at least for the European ports, beside the commonly used "volume statistics" (ESPO, 2012).

A project called PPRISM "Port PeRformance Indicators: Selection and Measurement", supported by the EU and under the leadership of ESPO, tried to build up a Port Performance dashboard with five clusters and these indicators are shown below:

Market Trends & Structure Indicators	Socio-economic Indicators	Environmental Indicators	Logistics Chain and Operational Indicators	Governance Indicators
1.Maritime traffic 2.Herfindahl-Hirschman Index (HHI) 3. Vessel Traffic 4. Market Share 5. Load Rate 6.Container dependency 7. Call size 8. Modal Split	9.Employment (Direct & Indirect) 10. Added value (Direct & Indirect) 11. Direct Gross added value per FTE 12.Financial health 13. Training per FTE 14. Investment.	15. Total energy consumed 16.Carbon footprint 17. Total water consumption 18. Amount of waste 19.EMS standard 20. Existence of Aspects inventory 21. Existence of monitoring programme.	22.Maritime connectivity. 23.Intermodal connectivity 24.On-time performance (Sea-going) 25.On-time performance (Inland waterways, Rail, Road) 26.**Mean-time customs clearance*** 27.Availability of Port Community Systems 28.Ship turnaround time	29.Integration port cluster 30. Extent of performance management 31. Existence of Performance Measurement 32.Formal reporting CSR 33.Market openness 34. Port authority investment 35.Safety/Security 36. Port authority employee productivity 37.Autonomous management

Table 10: "PPRISM: Port PeRformance Indicators: Selection and Measurement"
Source: https://www.espo.be/media/pages/12-01-25_-_PPRISM_WP4_Deliverable_4.2_Website.pdf

* The above table shows the "***Meantime customs clearance***" as a logistics chain and operational indicator for port performance. Extended time to customs clearance negatively impact the dwell time of cargoes at ports through consuming up the capacity of stacking areas whereby the overall capacity of terminal plays a major role in terminal congestion (Kia et al., 2002).

This is considered one of the major factors affecting port's logistics performance in Egypt in particular and the developing Africa as a whole as it results-in port's congestion and weak logistics performance scoring. Arvis et al. 2010 demonstrated that "Over 50 % of total land transport time from port to hinterland cities in landlocked countries in Sub-Saharan Africa (SSA) is spent in ports." Henceforth, reducing time customs clearance and port dwell time is critical for an improved port performance thus better integration in global trade.

The world bank publication (2012) titled "Why Cargo Dwell Time Matters in Trade?" argues that collusion between controlling stakeholders; large shippers, agencies, logistics operators, private terminal operators, and port authorities; may cause performance problems at ports. In order to decrease dwell times, governments need to combat collusive practices between public authorities and private sector. Whilst recognizing that reducing logistics delays won't merely occur through large-scale investments in infrastructure but rather requires efficient integration between all port stakeholders towards more simplified procedures (Raballand et al., 2012).

For container terminals, Container dwell times are one major factor for the determination of the storage capacity of the terminal. Long dwell times may drastically reduce the overall terminal capacity as they are often the limiting factor. Halving the container dwell time means doubling the yard storage capacity as the dwell time is a direct factor in the formula to calculate storage capacities.

The collected information regarding the container dwell times shows that Port of Alexandria and port of El Dekheila have high dwell times for import as well as for export. On the other hand, as best practice; in Western Europe, e.g. at the CTA Container Terminal Altenwerder in Hamburg, container dwell times are around 3- 4 days for both, import and export containers and for empty containers approximately 10 days.

Raballand et al. 2012 tried to Disentangle the reasons behind cargo delays in ports and they concluded that “Most African ports, go through a vicious circle of monopolists, laid back system, collusion and fraud favoring high dwell times”. This discourages global competition and enforces their market power.

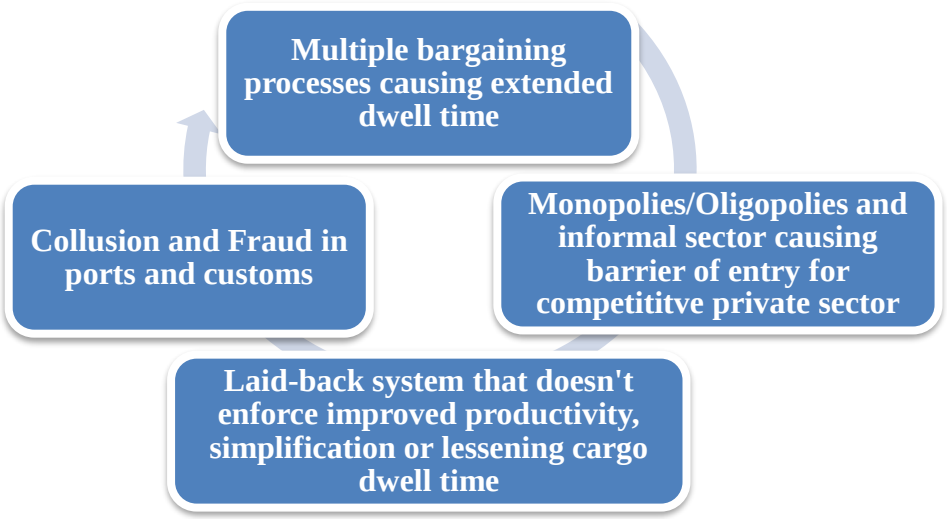


Figure 16:Cargo dwell time vicious circle.
source: Raballand et al. 2012

3.7.3. Drivers for improving port performance

According to Ro-Kyung Park and Prabir De (2004) globalization of production and consumption has been the main driver for change in the "Global Economic Order" throughout the last decade, followed by structural changes in logistics and port-hinterland relationships and finally, inter-port relations. These drivers have magnified the role of ports as an important node in the "Global Economic Order". Such an environment made "Port Production Economics" pivotal for port management.

3.7.4. Policy attributes to port performance

Existing and emerging drivers for future port industries were summaries by JP Rodrigue at 2010 International Transport Forum. This paper divided Maritime into shipping and the ports dimensions. It further went on identifying policy as one of the drivers of Change for Future maritime transport. When effectively utilized, policies and port governance can provide better access to capital while fostering competencies, innovation and reducing the overall transaction cost. Policy attributes for the port performance of maritime transport are:

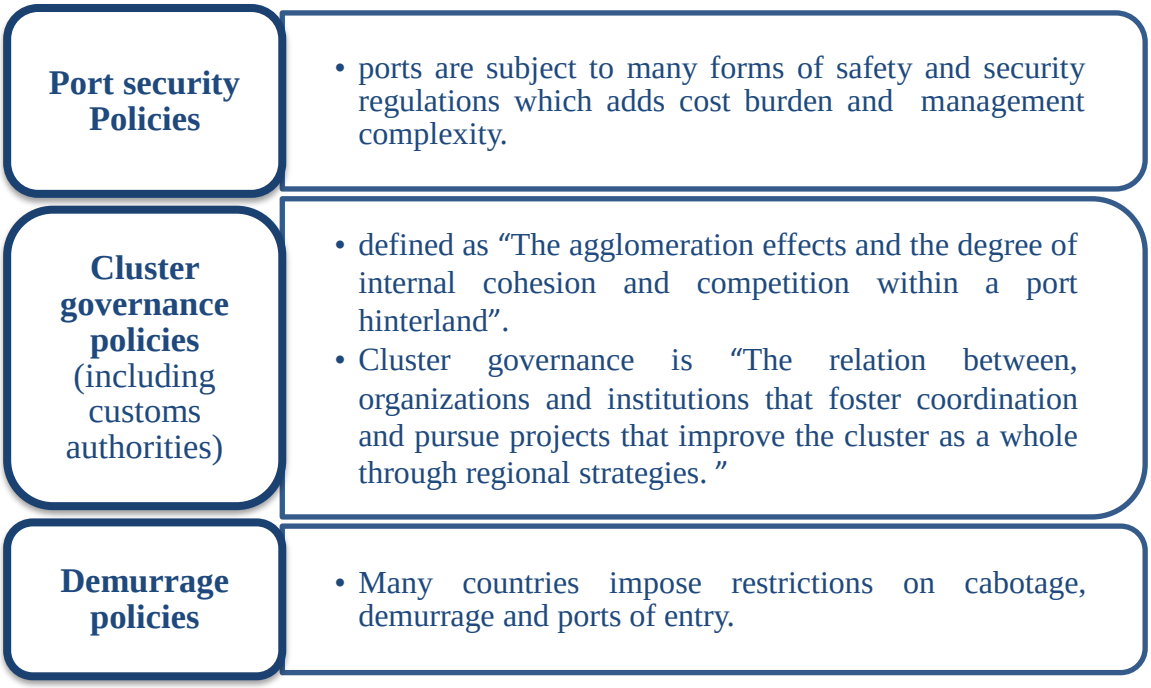


Figure 17: Policy attributes for ports.
Source: International Transport forum. 2010

3.7.5. Port performance and Capacity Expansions

Simultaneous solutions where examined in Dekker (2005) to determine 1) the optimal port expansion size that enhances port performance, and 2) the investment recovery period associated with capital investments. Dekker further divided ports' expansions into structural and non-structural capacity expansions as follows:

Capacity expansion	**Facility expansion** - Dredging works - More berths and cranes - Additional roal and rail connections - Land reclamation	
	Improved untilisation via management	**Supply managment** -Exchange of information -Removal of obstacles -Better terminal design -Improve yard and gate efficiency -Improved port-land interface - Reallocation of activities
		Demand Managemnt -Congestion pricing -Arrival management -Demurrage charges -Redirection of cargo flows -Slot auctioning

Figure 18:Port Expansion approaches
Source: Dekker, S. (2005). Port investment: towards an integrated planning of port capacity.

Facility expansion or Structural capacity expansions are the capacity measures that are characterized by; First, being capital intensive; such investments may have crowding-out effect, as they may be prioritized over other investments. Second, these expansions are more attractive in larger increment due to the effect of economies of scale in investment cost. Third, they require time by planning due to large-scale expansion works. Fourth, structural capacity expansions may activate late demand (i.e. deterred demand by congestion) due to accessibility improvements (Small, 1995; Rietveld, 1996), this results in induced demand due to a better network as well as demand shifts between routes. Consequently, ports may choose to use Structural capacity expansion as a strategy to deal with competition.

Non-structural capacity expansions are related to managerial, technological, economic and most importantly regulatory measures that 1) boost the handling capabilities at the supply side of port management, or 2) influence port users' behavior at the demand side of port management (Dekker, 2005).

3.7.6. Long Term Demand and port performance

Long term demand for any port will be affected by multiple global and local economic environment along with physical restrictive conditions (Cariou, 2020), such as:

- Natural harbor conditions: coastline, river, deep-water, smooth current, winds/waves, entry channel.
- Hinterland economy: Industry development, consumption, corridors.
- Connectivity & integration: Services, operators, frequency.
- Performance: Efficiency, price, quality, time.
- ICT level: EDI, digital systems, automation.
- Policy: Governance, FTZ, Investment.

In 2012 Adams B. Steven and Thomas M. Corsi found out that large shippers choose ports based on speed of delivery rather than freight charges while small shippers might favor lower freight charges. The managerial implications of this finding influences the investments decisions at ports where customers' needs direct the port's investment choices.

3.8. Non-tariff measures (NTMs) and Trade facilitation (TF)

The relationship between trade facilitation (TF) and trade flows is complex and hard to measure (Wilson et al., 2005). Both tariffs and non-tariff trade barriers are widely used to restrict trade, however in the last decade tariffs have fallen worldwide while the usage of non-tariff measures and behind the border measures has increased in many countries. NTMs such as customs, administrative red-tape, transaction costs (WTO 2012). Economists argues that reforms targeting non-tariff trade measures are claimed to benefit trade (Hassan, 2020). Nevertheless, in the recent years, countries spare no-efforts to expand bureaucratic practices of new non-tariff measures for various economic and political interests (Dee & Ferrantino, 2005).

The WTO defined “Trade facilitation” (TF) as “The simplification, harmonization, automation of the procedures applied to international trade, particularly the requirements and formalities related to importation and exportation as well as to international transit of merchandises.”

Non-tariff policies discussed in many international forums such as anti-dumping policies, rules of origin, quantitative restrictions and quotas, technical measures and standards to be met, and last but not least the domestic regulatory regimes (Dee & Ferrantino, 2005).

Customs can be defined as “The public service at the border that is tasked to ensure a safe and secure society, collect duties and taxes, and promote trade facilitation” (Grieco, 1990). In 2005

the World Customs Organization (WCO) adopted the "SAFE Framework of Standards to Secure and Facilitate Global Trade (SAFE FOS) that would act as a deterrent, to secure revenue collections and to promote trade facilitation worldwide".

During the last decade, the mission for Customs has become increasingly complex, due to its role in sustaining the global development. According to the world customs journal (2008) "The legal framework in each country is different, however we share these same goals. For instance, FOS and Provisional Standards agreed at the WCO are major attempts to establish common standards to address the common issues that every customs administration is facing today" (Aoyama, 2008).

CHAPTER 4

EMPIRICAL FINDINGS AND SWOT ANALYSIS

4.1 Introduction

Seaports primarily facilities the loading and discharging of vessels, storage of goods, as well as the transfer of passengers and goods to inland transport modes (Langen et al., 2018). In addition, ports are functional and spatial clusters of activities which are directly or indirectly linked to maritime transportation (Turró et al., 2018).

This chapter provides a quantitative evidence that extensive customs and administrative procedures at ports hinder the trade flow thus degrade the ports' international scoring and competitive position. In doing so, the ordinary least square (OLS) and classical linear regression model (CLRM) will be utilized to test the regression model significance. Furthermore, the Gravity Model is utilized into the OLS model to predict that the trade flow between two countries increases with the economic size of the two countries and decreases with the geographic distance between the countries.

This chapter will further present a strategic analysis of the Mediterranean ports competition status particularly transshipment ports. Moreover, it captures Alexandria port authority (port of Alexandria and port of El Dekheila) current situation and perspectives by analyzing the internal capabilities, i.e. strengths and weaknesses, as well as external environment, i.e. opportunities and threats. This information is used later on to analyze the main issues in these ports' performance. The SWOT analysis performed in this chapter represents the current status of information on Alexandria port authority regarding; Infra- and Superstructure, Public policies and services, landward accessibility and economic hinterland.

4.2 Impacts of customs on bilateral trade in goods

According to the OECD publication titled “Overcoming Border Bottlenecks” (2009) trade liberalization has been one of the main reasons of the recent international trade growth. However, border bottlenecks represent the weak links of the international trade. Whereby border bottlenecks (Customs and administrative procedures) generate complex, inefficient and outdated formalities (OECD, 2009).

Customs and administrative procedures at borders are necessary, however excessive local practices can hinder trade and thicken the border, particularly in developing countries (Milner et al., 2008). Shown below the regional average of the "World Bank Doing Business- trading across Border (TAB)" scores:

	Economy	TAB 2019	TAB 2020
Region			
	East Asia & Pacific	71.3	71.6
	Europe & Central Asia	86.7	87.3
	Latin America & Caribbean	69.2	69.1
	Middle East & North Africa	**60.2**	**61.8**
	OECD high income	94.3	94.3
	South Asia	63.9	65.3
	Sub-Saharan Africa	**53.6**	**53.6**

Table 11: "Trading Across Border regional scores."
Source: https://www.doingbusiness.org/en/data/exploretopics/trading-across-borders

The above table shows that the OECD countries have; the least borders procedures, number of documents and least transaction costs; while Africa and middle east have the most, indicating that the Middle East and African countries have the thickest borders in both years 2019-2020.

4.2.1 Methods and Variables Identification

This research will utilize the ordinary least square model (OLS) of the classical linear regression (CLRM) to examine data from the "World Bank Doing Business – Trading across Border" 2020 report. The "Trading Across Border" section focuses on "Customs and procedural requirements for importing and exporting a standardized cargo of goods at ports. It considers the product of comparative advantage for each economy when measuring export procedures, while for import procedures it focuses on a single, very common manufactured product (auto parts)." (Doing Business, 2020). Imports and exports data are expressed in terms of cost and time of Border compliance and Documentary Compliance. These indicators measure "The burdensomeness of customs and administrative procedures for the countries that responded to the doing business survey" (Doing Business, 2020). The detailed country pairs TBA reports prove that the economies with less efficient importers also prove less efficient exporters. Below is a breakdown of what these indicators measure:

Documentary compliance	Border compliance	Domestic transport
"Obtaining, preparing and submitting documents during transport, clearance, inspections and port or	Customs clearance and inspections	**"**Loading or unloading of the shipment at the warehouse or port**"**

Documentary compliance	Border compliance	Domestic transport
border handling in origin economy"		
"Covers all documents required by law and in practice, including electronic submissions of information"	**"**Handling and inspections that take place at the economy's port**"**	**"**Transport between warehouse and port**"**
"Obtaining, preparing and submitting documents required by destination economy and any transit economies"	**"**Inspections by other agencies (if applied to more than 20% of shipments) **"**	**"**Traffic delays and road police checks while shipment is in route**"**

Table 12: "Trading across borders indicators".
Source: "World Bank doing Business 2020.".

Furthermore, the gravity model is incorporated into the OLS model to estimate the effect of the corresponding customs and administrative procedures on the bilateral trade in goods. The gravity model is based on Newton's law of gravity. It assumes that "The economic mass of the two countries as measured by GDP, is hypothesized to have a positive influence on Trade flow between countries. The distance between the countries, which represent the travel cost, is hypothesized to have a negative effect on trade". This model further suggests that the common language, colonial ties and shared borders enhances trade flow.

4.2.2 Operationalization

The dependent variable in our model will be the 'Bilateral Trade in goods' between country pairs specified in the TAB report for 2020. While the Independent variables will basically be the eight TAB indicators for time and cost to import/export border and documentary compliance at ports. Furthermore, the gravity Model macro–economic variables will be included, as they are assumed to impact the bilateral trade in good between countries. For instants, the size of the population, GDP per capita and the geographical distance in nautical miles between partner countries. Finally, the shared language, historical colonial links and shared borders will be accounted for using dummy variables. The following table shows the dependent and independent variables' terms and definitions:

#	Indicator name	Long definition	Explanation	Source
Dependent variables				

#	Indicator name	Long definition	Explanation	Source
1	Exports	The data set presents estimate of bilateral trade flow for the year 2020 from the perspective of the reporting country. The reporting country selection is based on county pairs specified in the TAB country profile. Data expressed in Thousands USD	Exports and Imports represent the dependent variables. We are trying to draw a conclusion on the correlation between bilateral trade flow and time and cost to customs clearance at ports.	OECD database https://stats.oecd.org/
2	Imports			
Independent Variables				
1	Distance	The geographical distance between trading partner countries in Nautical Miles, particularly the "Great Circle distance between capital cities."	Used as a Proxy for travel cost. The Gravity model pattern assumes that increased distance generates higher cost thus it is expected to have a negative relation with trade flow.	International Trade Data https://www.macalester.edu/
2	Common language and shared colonial link, colonial history and shared borders	Countries that share colonial ties, primary language, land border or a small body of water border Data are expressed in terms of dummy variables.	These are the Gravity model indicators. They are assumed to have positive relation with bilateral trade flow.	- International trade data https://www.macalester.edu/ - Alternative history https://althistory.fandom.com
3	GDP per Capita (current USD)	"GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars."	Identifies the purchasing power of the country's residence. The purchasing power of people is assumed to have a positive relationship with trade in goods.	World Bank national accounts data, and OECD National Accounts data files.

#	Indicator name	Long definition	Explanation	Source
4	Population	Number of people living in each examined Country at 2020 year end.	Population size is assumed to have a positive relation with trade flow in goods	"World Bank's Doing Business 2020 report"
5	Cost to export: Border compliance (USD)	Informal payments and Insurance costs with receipts. Local currencies are converted to U.S. dollars based on the exchange rate on the day of answering the Doing Business questionnaire. These costs are paid by Private sector (exporters/importers) involved in international trade logistics activities.	Costs of customs and administrative procedures at ports. Higher customs clearance costs are negatively associated with trade flows.	"World Bank's Doing Business 2020 report"
6	Cost to export: Documentary compliance (USD)			
7	Cost to import: Border compliance (USD)			
8	Cost to import: Documentary compliance (USD)			
9	Time to export: Border compliance (hours)	Time to customs clearance and administrative procedures at ports. Time is measured in hours, and 1 day =24 hours.	Prolonged customs clearance process is expected to discourage shipping lines from using the port, particularly large traders. Steven & Corsi, (2012) concluded that "large shippers' choice of ports emphasizes the factors affecting speed of delivery more than the freight charges compared to small shippers."	"Doing Business World Bank 2020 report"
10	Time to export: Documentary compliance (hours)			
11	Time to import: Border compliance (hours)			
12	Time to import: Documentary compliance (hours)			

Table 13:Operationalization.
Source: Developed by Author

4.2.3 Descriptive statistics

Descriptive statistics is used to quantitatively describe and summarize the "Trading Across border" data for the selected country pairs. Time and cost to border and documentary compliance for importing/exporting the standardized goods act as the determinant of the efficiency of regulations and their implementation. Economies in a "customs union", have proven a substantially lower time for documentary and border compliance than for other non-

custom union country pairs. This clearly affects the mode and minimum results of the descriptive statistical analysis. Shown below the summary of our data set broken down to measures of central tendency (mean, median and variability), in this case, the maximum, minimum as well as the standard deviation and skewness:

Descriptive Statistics	*Time to export: Border comp. (hours)*	*Cost to export: Border comp. (USD)*	*Time to export: Doc. Comp. (hours)*	*Cost to export: Doc. Comp. (USD)*	*Time to import: Border comp. (hours)*	*Cost to import: Border comp. (USD)*	*Time to import: Doc. comp. (hours)*	*Cost to import: Doc. comp. (USD)*
Mean	72.28	552.90	50.85	139.14	94.18	644.52	60.56	189.58
Standard Error	5.41	36.02	4.66	11.92	7.51	41.01	5.64	18.81
Median	58.00	468.00	48.00	100.00	79.00	558.00	44.00	115.00
Mode	36.00	630.00	48.00	50.00	72.00	900.00	96.00	50.00
Standard Deviation	53.88	358.40	46.34	118.57	74.73	408.00	56.13	187.20
Sample Variance	2902.72	128449.36	2147.80	14058.41	5584.11	166462.78	3150.15	35043.23
Kurtosis	4.65	6.62	1.72	6.94	5.49	11.49	2.58	4.98
Skewness	1.94	2.23	1.41	2.32	2.20	2.59	1.59	2.13
Range	286	2092	199	714	396	2859	264	1000
Minimum	10	131	1	11	6	180	1	0
Maximum	296	2223	200	725	402	3039	265	1000
Sum	7156	54737	5034	13775	9324	63807	5995	18768
Count	99	99	99	99	99	99	99	99

Table 14:Descriptive Statistics analysis.
Source: Developed by Author

4.2.4 Correlation Matrix

Correlation analysis is used to understand the relationship between the variables. It is used to avoid ***Multi-Collinearity***, resulting from high correlation between the independent variables. These variables are based on bilateral trading data whereby they represent the cost and time to import/export document and border compliance for a standardized cargo of good. The correlation tests shown below reflect the absence of Multi-Collinearity amongst independent variables whereby none of the variables resulted in a correlation higher than 80%. Henceforth none of the variables needs to be removed.

	GDP per Capita	*Population*	*Distance*	*Time to export: Border comp.*	*Cost to export: Border comp.*	*Time to export: Doc. comp.*	*Cost to export: Doc. comp.*

GDP per Capita	1						
Population	-0.069	1					
Distance	-0.159	0.014	1				
Time to export: Border comp.	-0.372	-0.062	0.171	1			
Cost to export: Border comp.	-0.247	-0.134	0.162	0.625	1		
Time to export: Doc. comp.	-0.397	-0.085	0.141	0.686	0.435	1	
Cost to export: Doc. comp.	-0.161	-0.068	-0.005	0.396	0.471	0.380	1

Table 15: Exports Correlation Matrix.
Source: Developed by Author

	GDP per Capita	***Population***	***Distance***	***Time to import: Border comp.***	***Cost to import: Border comp.***	***Time to import: Doc. comp.***	***Cost to import: Doc. comp.***
GDP per Capita	1						
Population	-0.069	1					
Distance	0.041	-0.086	1				
Time to import: Border comp.	-0.379	-0.013	0.095	1			
Cost to import: Border comp.	-0.248	-0.124	-0.013	0.574	1		
Time to import: Doc. comp.	-0.349	-0.046	0.124	0.773	0.469	1	
Cost to import: Doc. comp.	-0.225	-0.021	0.051	0.563	0.495	0.583	1

Table 16: Imports Correlation Matrix.
Source: Developed by Author

4.2.5 T-test

The T-test is utilized to identify the explanatory variables affecting the dependent-variable (Bilateral trade in goods) assuming 20% significance-level using CLRM.

Shown below the relationship between the dependent-variable and the independent-variables in the regression-model:

$$\mathbf{Y_{ijt} = \alpha + \beta_1 X_{1ijt} + \beta_2 X_{2ijt} + \ldots\ldots\ldots + \beta_k X_{kijt} + \mu_t,\ t = Year\ 2020}$$

Where Y_{ijt} is the dependent-variable representing the bilateral trade flow (Exports/ Imports flows in USD) between county pairs (country i and country j). X_{1ijt}, X_{2ijt}…….X_{kijt} are the

independent-variables,α is the intercept and β is the coefficient of independent variables in reference to the dependent variable.

The Natural Logarithm of the variables (exports, imports, GDP per Capita, distance) are taken for convenience, as it helps transforming the highly skewed variables into more normalized dataset (Morgan & Teachman, 1988).

Even though only one year of data is examined, yet the data set are still on panels because of different exporting and importing country pairs. Henceforth estimation techniques are used to manage panels following the work of OECD studies (2005, 2009) and the work of Wincoop et al (2004). Shown below the model hypothesis:

H0: $\beta = 0$, if the probability value is more than 20%, then the null hypothesis is accepted, meaning that the variable is not significant and doesn't affect the dependent variable. Henceforth it can be omitted.

H1: $\beta \neq 0$, if the probability value is less than 20%, then the null hypothesis is rejected, meaning that the variable is significant and affects the dependent variable.

4.2.6 Regression analysis

The model is analyzed using MatLab application software. It started by collecting the bilateral trade data (Y) of the selected 99 county pairs for the year 2020. Moreover, date on 10 different independent variables ($\mathbf{X_{10}}$)for the same year were examined to reach a conclusion on the significance of these variables on the *Bilateral Trade in goods (Y)*. Shown below the regression results of customs administration on paired countries' trade flows (Exports and Imports).

Variables	***LN (Exports)*** ***Model 1***	***LN (Imports)*** ***Model 2***
LN (GDP per Capita)	1.486****	0.707****
	(0.000)	(0.000)
LN (Population)	1.143****	0.776****
	(0.000)	(0.000)
LN (Distance)	0.180	-0.471***
	(0.449)	(0.036)
Common language	-0.397	0.517*
	(0.324)	(0.148)
Shared borders	0.615	0.495*
	(0.238)	(0.191)
Colonial link	-0.232	-0.602**
	(0.598)	(0.085)
Cost to Border comp.	-0.001	0.000
	(0.248)	(0.528)

Time to Border comp.	0.007	-0.002
	(0.225)	(0.619)
Cost to Documentary comp.	0.002	-0.002**
	(0.219)	(0.077)
Time to Documentary comp.	-0.007*	0.003
	(0.200)	(0.423)
Adjusted R^2	0.769	0.68

Table 17: Models of customs administration on exports and Imports flows between the paired countries. Source: Developed by author.

i.e. "Significance at 20% alpha level=, 10% alpha level =**, at 5% alpha level=*** and at 1% alpha level = ****. The Adjusted standard errors are below the estimated coefficients."*
"Ln= The Natural Logarithm is taken for the variables (Exports, Imports, GDP per Capita, Distance) to maintain a normalized dataset."
The numbers in parentheses below each estimated coefficient are the P-values.

4.2.6.1 Exports Model Findings

The Exports model showed the macro-economic variables (GDP Per Capita, Population) with highly positive statistically significate relation with bilateral exports flows. The Gravity model variables; such as distance, Colonial ties, shared borders and common language; were insignificant to exports flows. In addition, the model resulted in statistically insignificant coefficients for the majority of the TAB variables with the "Time to Documentary compliance" as the sole exception. Time to Documentary compliance turned significant at 20%, indicating that prolonged customs administrative procedures have a negative impact on the exports flows whereby countries with thick border procedures typically burdens the country's exports. Meanwhile exporting countries try to promote their exports through facilitating the trading procedures. The model finding on "Time to Documentary compliance" is coherent with the findings of OECD (2009) study titled "Examining the Effect of Certain Customs and Administrative Procedures on Trade" in which they concluded that the reduction in cargo time at the borders generates 10% increase in the trade flows relative to the regional average."

The statistically insignificant costs variables; "cost to exports: border and documentary compliance"; can be explained in terms of the attempt of exporting countries to abide by minimal cost-levels, as a way to promote their exports while maintaining the pre-specified importers' prices. In 2013, Goldberg and Tille predicted that "Importers tend to have higher bargaining weight in a trade-deals relative to exporters, which can be translated into lower import prices and greater exchange rate pass-through into import prices in correlation to the size of trade transactions."

Finally, the overall goodness of fit for this model is 77%, whereby our model explains 77% of the variability in exports trade flows around the mean.

4.2.6.2 Imports Model Findings

The Macro-economic and Gravity model variables (GDP per capita, Population, distance, shared borders, and Common-language) were reflected in the right sign and statistically significant to the imports flow. Colonial ties between country pairs showed a statistically significant inverse impact on bilateral trade whereby ex-colonies are trying to avoid importing goods from their former colonial legacies. This finding contradicts the former conclusions of Sousa & Lochard, (2012); Berthou & Ehrhart, (2013) who provide evidence confirming that "Colonial trade linkages have generated colonial trade spillovers, having more trade with the former colonizer." The reason for reaching different findings, from previous research-work, is that this research included multiple colonial countries while previous researches focused exclusively on the British and the French colonial legacies.

Moreover, the time to border and documentary compliance between country pairs resulted in statistically insignificant coefficients to import flows, indicating that time to customs and administrative procedures is not important to the importing countries.

Cost to documentary compliance turned significant at 10% level indicating that importing countries might be using customs fees as an effective tool to protect their local industries through Protectionisms and Anti-dumping policies. The effects of import tariffs on local production was studied in multiple former empirical and structural work such as; Amiti & Davis (2012); Halpern, Koren, & Szeidl (2011), who estimated the implications of imports tariffs on total factor productivity for Hungarian firms. They concluded that as customs costs increases, the prices of imported goods increase, causing a plunging demand on these goods.

Tariff ↑ ➔ import price (P) ↑ ➔ import demand (Q)↓ ➔ import value (PQ)↓

Furthermore, Messerlin, & Zarrouk (2000) argued that "Customs and trade regulations are more likely protectionist and discriminatory ones, leading to trade conflicts. This hypothesis does not mean that industry-based standards have no protectionist or discriminatory content (they do, maybe even more than mandatory standards designed by public authorities). However, firms are generally unable to enforce trade barriers in the long run without the help of public authorities to protect local industries."

Finally, the overall goodness of fit for this model is 68%, whereby our model explains 68%of the variability in imports trade flows around the mean.

4.3 Competing Mediterranean ports

4.3.1 Mediterranean Transshipment Ports

The Mediterranean Sea is one of the busiest shipping routes for commercial traffic and is used by the largest container shipping lines, most of which are deployed on Far East - Northern Europe routes. The Mediterranean Sea can be divided into three regions when it comes to transshipment traffic (Lupi et al., 2019):

i. The Western Mediterranean: Algeciras, Tangier,
ii. Central Mediterranean: Marsaxlokkk, Gioia Tauro,
iii. Eastern Mediterranean: Damietta, Port Said, Piraeus.

Transshipment in the pre-mentioned ports serves two functions: Regional redistribution traffic and sorting between mainline services. To the west and at the northern exit of the Mediterranean, this "relay" transshipment between North Europe and transatlantic services plays an important role (Mounime et al., 2014).

Despite the increase in transshipment in most Mediterranean ports in recent years, growth has been slower than predicted. This is partly due to the impact of the ever larger ships that are also deployed on services calling at Mediterranean ports from overseas ports that serve as gateways to Southern Europe. This trend is more important for services from the Indian sub-continent and the Far East to the Mediterranean. According to George Lauriat (2018) “The Mediterranean has nine major transshipment hubs but two stands out because of their central location, the island of Malta’s Marsaxlokk port and Gioa Tauro in Southern Italy”. The strong development of the transshipment volumes at COSCO’s container terminal in Piraeus is an interesting development with volumes up by 19% 2018 (Piraeus Port Authority, 2019).

Figure 19: Transhipment Ports in Eastern Mediterranean Sea.
Source: Developed by the Author based on google map.

Transshipment volumes are footloose volumes that bring great risk and uncertainties to the hubs concerned, certainly when carriers are not (directly or indirectly via subsidiaries) financially involved in the terminal operations (Musso & Parola, 2017). Transshipment hubs base their competitiveness on a few critical factors e.g.:

i. Geographical position,
ii. Nautical accessibility,
iii. Operational performance (reliability and timeleness), and
iv. Pricing strategy.

In the Eastern part of the Mediterranean Sea the largest transshipment hubs are East Port Said, Piraeus, Gioia Tauro and Maraxlokk terminals. The development of these transshipment hubs is a result of the profound transformation of the container shipping business as a result of the dramatic throughput growth along the Europe-Far East trade lane (Notteboom et al.,2014).

The Mediterranean basin and its ports has recovered their own centrality, thanks to transit of almost all mother vessels via the route Suez/Gibraltar (Tadini, 2019). This has facilitated the emergence of transshipment hubs such as Gioia Tauro, Alegeciras and the Egyptian ports (mainly East Port Said) since the mid-1990s. The increase of vessel size on the maximum vessel sizes on main haul services in order to implement aggressive cost leadership by reducing the

average cost per slot on-board pushed the development further. The deployment of bigger vessels increased the need for transshipment operations both in pure hub ports in the Mediterranean and large mixed ports, mostly in Northern Europe (Notteboom et. al., 2019).

Egypt is trading through 15 commercial ports. Some of the Egyptian ports serve as gateways between markets outside of Egypt and Egypt, such as Port of Alexandria, El-Dekheila, Al-Arish, Suez, El Adabiya, Nuweiba and Safaga. Other ports act as transshipment hubs, such as East Port Said Port (MTS, 2020). In addition, there are ports, which follow both roles, i.e. they serve as gateway and transshipment ports; these include West Port Said Port, El Sokhna and Damietta serve as gateway and transshipment ports. With regard to passenger transport, some ports focus on cruise traffic, such as Alexandria, other ports handle ferry traffic, such as Hurgada and Safaga (MTS, 2020).

4.3.2 Transshipment Hubs – Controlled by Shipping Lines

According to the European commission (2013) "The development of a limited number of strategic alliances produced a strong concentration of the demand of container handling in a handful of players." Notteboom et al., (2013) concluded that "Sea carriers, in the Mediterranean Sea, mostly invest in terminals for controlling pure transshipment hubs via wholly owned subsidiaries or partially owned subsidiaries." All main transshipment hubs have an involvement (directly or via terminal operating companies) of the top tier container shipping lines to better control costs and operational performance. Examples are e.g. Maersk Line who is based in Algeciras and East Port Said, COSCO Shipping Ports owns the port of Piraeus and have minority shares in a number of Spanish ports, while CMA.CGM has a considerable involvement in the Marsaxlokk terminal.

Piraeus' rapid development and growth is predominately due to Piraeus Container Terminal (PCT), a subsidiary of China's COSCO Pacific. The takeover of COSCO and the completion of the upgrading of the container terminal (Terminal III) will increase the capacity to potentially 6.2 million TEU. This move has led to that COSCO is concentrating the transshipment traffic to Piraeus.

According to Notteboom et. al. (2019) the development so far has shown that pure transshipment hubs experience higher throughput volatility than ports with a mix of gateway cargo and transshipment cargo (see e.g. the development at East Said Port). By striving for a demand mix (i.e. gateway cargo and transshipment cargo), port managers and policy makers

involved in port management can expect to reduce throughput volatility and related negative external effects.

4.4 SWOT ANALYSIS

SWOT analysis of external opportunities and threats as well as internal strengths and weaknesses is important for port development and strategy formulation (GENCLER & ARTUKOGLU, 2010). It can provide a good basis for successful situation analysis (Chang & Huang, 2006).

In this study we will utilize theoretical and historical data of the port in question to carry out SWOT analysis in an attempt to assess current and perspectives case study Port situation through analyzing the internal capabilities, i.e. strengths and weaknesses, while evaluating the external opportunities and threats.

4.4.1 SWOT Analysis of ALEXANDRIA Port

The Port of Alexandria is a major gateway port at Mediterranean Sea. Not only is the port a major gateway for containerized and non-containerized general cargo, dry bulk and liquid bulk it is also an important gateway for specialized, roll-on/roll-off cargo and passengers.

4.4.1.1 Strengths

- Alexandria Port has a high number of piers and berths. Thus, the port is able to accommodate a high number of vessels as well as to handle various goods.
- The Alexandria Port Authority is considerably investing in new terminals, terminal yards, logistics areas, storage facilities and in- and outbound transport infrastructure. The Port authority plans new terminals, terminal yards, logistics areas as well as projects to improve vehicle and cargo traffic within the port area as well as to the hinterland.

4.4.1.2 Weaknesses

Infra- and Superstructure

- Some berths have a relatively low water depth compared to competing ports, e.g. Alexandria Container & Cargo Handling Company (ACCHO) at berth 49, 51, 53, 54

with 8.5 m and Alexandria International Container Terminals (AICT) at berth 71, 72 and 73 with 11.9 m.

- The demand for container stacking areas is higher than the capacity, e.g. at the ACCHCO and AICT terminals. Private containers operators reported that in order to continue to grow, there is a need for additional storage capacity. However, the port is fenced by the city; thus, the area constrains an expansion.
- Some quays and storage facilities are in a poor condition. These are in need for refurbishment, e.g. at the coal terminal.

Public policies and services.

- High rate of cargo inspection by the Customs Authority, causing the dwell time for containers to be high and congestion rate at port reaching a critical level with containers stacking up to 6 high; Alexandria International Container Terminals (AICT), operated by Hutchison Port Holdings (HPH), reported 7 days for export and 12 days for imports.

4.4.1.3 Opportunities

Landward Accessibility

- The port is connected to the inland waterway system of the Nile River. Nonetheless, the performance of inland waterways and barges provides much room for improvement. The port may benefit from a development as well as intensified use of the Nile River for freight transportation through the Nile Delta, to the Cairo metropolitan area and to Upper Egypt.
- The ACCHCO container terminal has a railway siding. However, the share and volume of inbound and outbound rail transport is low. Against the background of increasing export and import volumes, rail transport may represent an important complementary mode of transport.

Public policies and services

- The Egyptian government is keen to facilitate and increase export from Egypt. Due to the port's business focus on exports and the port's strong hinterland, the port may benefit from increasing export and import volumes.

Economic hinterland

- Due to the geographical location at the entrance of the fertile Nile Delta, a number of industries in the immediate hinterland as well as proximity to the Cairo metropolitan

area, the port of Alexandria has positioned itself as a main gateway to Egypt. This makes the port independent from transshipment volume.

- Due to the historical background and touristic attractions of the port and the city of Alexandria, the port is well suited to attract cruise vessels. Nonetheless, since the Arab spring revolution in 2011, cruise vessel calls have dropped significantly. There is a huge potential for a redevelopment of cruise tourism.
- The Egyptian population is young, with a median age of 23.9 years. According to the Egyptian Central Agency for Public Mobilization and Statistics, the population is expected to continue to grow and reach 120 million people in 2030. This may increase the market volume as well as handling import and export volume at the port.

4.4.1.4 Threats

Economic Hinterland

- The port's economic hinterland overlaps with the economic hinterland of the other Egyptian ports at the Mediterranean Sea. If other ports gain market share of the existing market volume, Alexandria may lose market share. Damietta and East Port Said Port may gain market share in export and import volume at the expense of Alexandria Port. However, due to the high development of the country as a waypoint in international trade between the West and East, it may just as well be that the market will grow and other Egyptian port's gains will not represent losses to Alexandria Port.

Infra- and Superstructure

- A major competing port, Damietta, is dredging the access channel, the port basin and berths up to 18 and 16 metres, respectively. This may attract more vessels as well as export and import cargo to Damietta, at the expense of Alexandria.

4.4.2 SWOT Analysis of El-DEKHEILA Port

The Port of El Dekheila is a major gateway port at the Mediterranean Sea, located adjacent to the Port of Alexandria. In addition to containerized general cargo, it is also an important port for dry, liquid bulk and roll-on/roll-off cargo.

4.4.2.1 Strengths

Infra- and Superstructure

- The capacity of container stacking yards is still higher than the demand. There is still room for further growth in handling volume.
- The capacity of bulk storage facilities is still higher than the demand. There is still room for further growth in handling volume.
- The Alexandria Port Authority invests in projects to improve the hinterland transport links. The Port Authority plans to construct a number of terminals, for dry bulk, dirty bulk and containers. There are plans to increase the grain storage capacity.
- The port benefits from the geographic location next to the port of Alexandria. The ports complement each other well, for instance with regard to handled goods and capacities.

4.4.2.2 Weaknesses

Infra- and Superstructure

- The demand for berths for grain vessels is higher than the capacity. This leads to high waiting time.
- The water depths are limited at AICT with 11.4 m and at GCSS with 13.4, 12.8, 12.8, 11.1, 9.4, 8.5 m
- The duration until the unloading permission for grain is granted, is high and leads to high waiting time of vessels.

Public policies and services

- High rate of cargo inspection by the Customs Authority, causing the dwell time for containers to be high.

4.4.2.3 Opportunities

Economic Hinterland

- Due to the geographical location at the entrance of the fertile Nile Delta, a number of industries in the immediate hinterland as well as proximity to the Cairo metropolitan area, the port of El-Dekheila has positioned itself as a main gateway to Egypt. In addition, the high share of export and import volumes make the port independent from transshipment volume.

- El-Dekheila Port is a main import gateway for grains. Against the background of an expected continued increase in import volumes, grain import volumes through El-Dekheila are likely to increase.
- The Egyptian population is young, with a median age of 23.9 years. The population is expected to continue to grow and reach 120 million people in 2030. The port may benefit from increasing demand as well as export and import volumes.

Landward Accessibility

- The grain mills throughout the country are equipped with railway sidings. However, the share and volume of inbound and outbound rail transport is low. Against the background of increasing import volumes, rail transport may represent an important complementary mode of transport.

Public policies and services

- The Egyptian government is keen to facilitate and increase export from Egypt. Due to the port's business focus on exports and its strong hinterland, the port may benefit from increasing export and import volumes.

4.4.2.4 Threats

Economic Hinterland

- The port's economic hinterland overlaps with the economic hinterland of the other Egyptian ports at the Mediterranean Sea. If other ports gain market share of the existing market volume, El-Dekheila may lose market share. Damietta and East Port Said Port may gain export and import market share at the expense of El-Dekheila Port. However, due to the high development of the country as a waypoint in international trade between the West and East, it may just as well be that the market will grow and other Egyptian port's gains will not represent losses to El-Dekheila Port.

Infra- and Superstructure

- A major nationally competing port, Damietta port, is dredging the access channel, the port basin and berths up to 18, 17 and 16 m, respectively. This may attract more vessels and cargo to Damisetta port, at the expense of El-Dekheila port.

4.5 Summary

High rate of cargo inspection by the Egyptian Customs Authority, at both ports (Alexandria Port and El-Dekheila port) causes the dwell time for containers to be high as well as worsening the congestion situation at the ports. Hence customs procedures reforms represent the milestone for performance improvements. Despite APA huge investments in infra-superstructure of the ports, yet the KIP's scoring of the ports kept lagging behind, leaving decision makers with a blur vision on the proper way-forward. That said, the next chapter will examine the customs procedures at the case study ports in an attempt to pin point the key reforms needed to unravel APA's weak performance scoring.

CHAPTER 5

EGYPTIAN CUSTOMS ANALYSIS

5.1 Introduction

Maritime transport, as the main part of the integrated maritime policy, is accompanied by a set of complex regulations and administrative procedures extracted from a variety of international and national regulations. Which not only tackles the maritime sector but also deals with customs, taxes, immigration, safety and security, etc. That is why the "competent public administration authorities" request a number of mandatory documents and information to be submitted upon the arrival or departure of the vessel/ cargo (OECD, 2018). On examining the actual practices at ports, procedural and administrative requirements have proven to encompass repetitions, duplications and excessive time consumption (Mammadov, 2020). Henceforth, creating additional time waste and costs, causing the maritime traffic to be less attractive.

Customs is "The public unit at the border that is tasked to ensure; secure and safe society, collect taxes and duties, and promote trade facilitation" (WCO, 2021). All countries share these same goals despite the underlying differences in the legal framework in each country (Tweddle, 2008).

The first efforts at the international level, to unify and facilitate trading across borders, were made 50 years ago, by the IMO when adopting the Convention on "Facilitation of International Maritime Traffic" (FAL). Egypt, as a maritime state, strives to comply with the international standards for ships arrival/ departure as well as the international Recommended Practice for cargo release at borders. In view of the above, the aim of this chapter is to give an overview of the activities carried out by the relevant bodies, particularly the Egyptian customs authority (ECA), while giving a special attention to the structure and legal regulations of customs clearance procedures at the Egyptian ports, particularly the port of Alexandria. This will help analyze the impacts of customs on port's performance whilst highlighting subsequent deficiencies, if any.

5.2 Egyptian customs

The Egyptian Customs is one of the governmental authorities affiliated to the Ministry of Finance. It has worked efficiently before applying the policy of economic closure. It followed

the European standards before its performance deteriorated during the periods of economic closure. At that time, the country's ministries, agencies, government and the public sector were the main importers and exporters. The customs has to accept all invoices from these bodies because they are approved by the official external procurement committees. This has resulted in the inactivation of the function of "value" according to the international standards, which was done by a customs pricing officer. This position has changed into a "Tariff" officer, whose job is restricted to looking into the international classification and determination of taxes for the classified item. The customs procedures have also been inactivated in the light of the list of concessions granted to these entities. The so-called development of customs took place under the pretext of returning customs to its basic function of 1962, which is the identification of the classified item, its value and the customs article according to the International Classification of Tariffs. This job has been divided among various bodies, including warehouses and warehousing bodies and other government authorities, despite the international definition of customs according to the International Convention for the "Simplification and Harmonization of Customs Procedures" (Revised Kyoto Convention) Chapter II of the General Annex Definitions: "Customs means the governmental body responsible for the administration of customs law and the collection of duties and taxes. It is also responsible for the application of other rules and regulations relating to the import, export, transfer or storage of goods".

These parties were operating in isolation without any coordination between them. When Egypt adopted the period of economic open door policy in the 1970s, and the import and export law 118 for the year 1975 and its amendments was issued, this situation continued, without evaluating the customs work according to this system even once.

5.3 Egyptian Customs Reform in October 2002

In 2002, Egypt requested the assistance of the International Monetary Fund (IMF) to develop its customs through Egyptian customs experts and the support of international experts. A diagnostic study was conducted about the time of customs release in the port of Alexandria. The result was shocking as the average release time was 22 days. According to the IMF, Egypt ranked amongst the worst five countries out of 180 countries. The Egyptian Customs authority (ECA) has defended itself arguing that the time it is responsible for starts from the time the importer submits to the customs declaration until the payment of customs taxes and other taxes and fees. While The international standards of the customs release time begin from the moment

the means of transport arrives until the completion of the customs release. This means that the customs and all other government bodies participate in the procedure starting from the reception of ships till the unloading is finished and customs clearance is completed. The ECA further digressed that they carry out the integrated duties of customs as well as other supervising agencies such as the "General Organization for Exports and Imports Control" (GOEIC) and other regulatory bodies. This resulted in working without any coordination or electronic connection among them since some of these agencies do not use electronic systems. Consequently, long cargo release time occurred along with inefficiencies and extra costs. According to OECD (2018) "There is a high potential of 15% trade cost reduction for lower middle-income countries, including Egypt, if the full implementation of the Trade Facilitation measures at ports and borderlines were Speeded-up". This report further concluded that "The developing countries, particularly in Africa, pay 40 to 70% more on average for the international transport of their imports than developed countries. In addition, exports and import procedures take 5-9 days longer in Middle east &North Africa than in OECD countries" (OECD, 2018).

The Egyptian customs procedures were re-engineered and all customs published regulations were abolished and an executive regulation of the Customs Law No. 66 of 1963 was issued under no. 10 of 2006. Its amendments included the latest international customs standards such as the subsequent revision and risk management to allow for non-risk shipments to be released through the green track (only checking documents). Incomplete shipments are returned to be completed have a yellow light, which represents a risk that is released through the red track (checked and inspected). The risk management system integrates with the subsequent review system to measure the voluntary commitment through inspecting subsequent records of importers and provide risk management with the results to adjust the standards.

5.4 Stakeholders in the Customs Clearance Process

Egyptian customs have standard processes for the treatment of import and export cargos in ports. For their tasks they rely on close cooperation with other authorities, such as GOEIC "the General Organization for Export and Import Control".

GOEIC, is an umbrella organization that includes several agencies to perform required services in the process of customs clearance on behalf of the Egyptian Customs. Before 2002-reforms GOEIC used to be 11 separate agencies, however 2002-reforms reorganized them under the

umbrella of GOEIC in order to channel communication with customs and allow for one stop shop for importers. The single agencies under the GOEIC umbrella are:

I. Quarantine Agency for agricultural goods, foods, etc.
II. Food Control Agency for ready-to-eat foods, such as conserved foods, etc.
III. Stamps (Board of Weights and Measures)
IV. Technical Classification Agency for movies and other media contents
V. Medicine Affairs
VI. Veterinary Agency for livestock
VII. Printed Goods for books, magazines, printed media contents, etc.
VIII. Radiation and Nuclear Control Agency
IX. Animal Feed Control
X. Telecommunication

For each specific commodity or good to be imported or exported, there are different agencies required performing tasks inside the process. While industrial goods require intervention from GOEIC only, the import of agricultural goods requires also the involvement of the agricultural agency.

5.5 Standard Process for Customs Clearance

The standard process includes the tasks of taking samples, followed by the processes from GOEIC. Then the importer has to pay customs duties (clearance) and he receives the right to evacuate his cargo from the port. The samples are taken in a warehouse or for special commodities, like grain and livestock aboard a vessel before it is berthed. This is usually done when the pilots are transferred to the respective vessels. Actual tasks of all agencies involved include the following sequence:

I. Sampling for approx. 90% of imported cargos. Which goods to be sampled is defined in the official service regulations for customs and GOEIC.
II. Samples are taken by GOEIC staff aboard a vessel or in a warehouse. For most cargos samples are taken in the warehouse during inspection from customs. For grain and livestock samples are taken before the vessel is berthed for unloading. Staff from agencies goes to vessel usually together with pilots.
III. Testing of samples is performed. The location of the testing depends on the cargo and the port. Not all ports are fully equipped with testing facilities for all types of goods.

They are performed either in the port, in close proximity to the port, but outside the port fence or in other governorates (e.g. Cairo). The maximum duration for testing and approval is 7 days. Some exceptions apply. For instance, duration for cement is 28 days and for foods in bottles and cans it is 15 days. Other exceptions apply for batteries or porcelain and bone china. In such cases the cargo can already be unloaded when the vessel is berthed and cargo can be moved out of port. If cargo is rejected by authorities, cargo must be re-sampled and re-tested or exported or destroyed.

IV. After successful testing, a declaration is issued by GOEIC and forwarded to customs. In some ports this is done electronically, while in other ports this is carried out manually. At the same time, the importer is informed directly by letter nowadays and will be informed by mail or SMS in future. Then the importer of his agent picks up information about progress of customs process. Customs then checks the volume of cargo declared and the actual volume imported. A difference of up to 5% between declared volume of goods and actual volume is tolerated, but respective customs duties must be paid or reimbursed by the importer. A difference above 5% requires a mandatory additional procedure with the ministry of trade.

V. The importer of his agent picks up paperwork and pays customs duties and service charges of the port. E-payment is not available in all Egyptian ports.

VI. With the information from the step above, customs will permit cargo to be imported on same day.

VII. The cargo is now cleared.

5.6 Egyptian Customs Authority structure

The structure of the Customs Authorities is geographically composed of 8 sectors, including the operational sector, which includes three geographic regions mentioned below. The aim of this structure is to ensure that each area contains all the necessary tools to achieve flexibility and speed of performance. Since the new structure has been implemented, many problems emerged as a result of the weakness of the structure and the multiple authorities and responsibilities, especially the financial departments of each region, which must refer to the Central Administration of Financial Affairs. All this led to duplication in procedures, which affected performance. Thus, the structure has to be redesigned based on the actual application since 2006.

5.7 Egyptian Ports Customs Regions

5.7.1 Northern and Western Customs Region

- Alexandria Port.
- Dekheila Port.
- Rashid Port.
- Abu Qir Port.

5.7.2 Central and Southern Customs Region

- Safaga Port.
- Hurghada Port.
- Aswan Port.

5.7.3 Eastern Customs Region

- Port Said East Port.
- Port Said West Port.
- Damietta Port.
- Port Tawfik (Suez)
- Adabiea Port.
- North Al-Sokhna Port.
- El Arish Port.
- Nuweiba Port.

5.8 Administration of Customs Policies and Procedures

According to the Egyptian Customs Authority, the Customs procedures in the Egyptian ports are managed centrally by the customs authority through a central administration of the customs sector, which is the customs regulations and procedures sector, headed by a deputy minister. This central administration has two general administrations: general administration of customs policies and procedures, and general administration of information management.

5.8.1 General Administration of Customs Policies and Procedures

The General Administration of Customs Policies and Procedures is responsible for the establishment, management and review of the customs procedures of the Egyptian Customs, so that customs procedures and regulations are in line with the latest international standards and facilitate international trade by reducing customs release time. This also includes all trade policies in coordination with the "Ministry of Foreign Trade and Industry". This is done by applying the import procedures issued by the Import and Export law no. 118 for the year 1975 and its Executive Regulation No. 770 of 2005 and its amendments, in addition to issuing publications and instructions to explain them. Its authority also includes issuing instructions based on the feedback provided by the supervising bodies regarding the inspection of goods, in addition to the management of the regional negotiations concerning the customs procedures of the Arab League, the COMESA and the international level of the Kyoto Protocol Management Committee to simplify and harmonize customs procedures at the "World Customs Organization" (WCO) and WTO trade facilitation negotiations with the Egyptian delegation from the Ministry of Commerce and Foreign Affairs. Each area has a customs administration to coordinate and support operations, which is connected through technical subordination to the General Administration of Customs Policies and Procedures. This aims to ensure the unification of customs procedures in all areas, which ensures the efficient management of customs procedures.

5.8.2 The General Administration of Information (GAI)

According to the Egyptian Customs Authority the GAI is a department of the Central Administration for Customs Policies and Procedures, which establishes and administers the integrated customs tariff for the customs department where all customs work tools are included and transferred to electronic data. Thus, when importers and exporters are register their information, the legislative requirements are presented in the form of appendices. Importers and exporters must meet these requirements such as the international classification of the item, the reductions when it is imported from the countries of the conventions, the value added tax and all the regulatory bodies to inspect the item in question. Thus, this administration is considered to be the electronic mind of customs and is the only reference to government authorities.

5.9 Challenges facing APA due to customs procedures

Since the new structure has been implemented, many problems emerged as a result of the weakness of the structure and the multiple authorities and responsibilities, especially the financial departments of each region, which must refer to the Central Administration of Financial Affairs in Cairo. All this led to repetition, duplication in procedures, time wastes and extra-costs, which affected performance at port as follows:

5.9.1 Productivity challenges

It was reported by the operations department at APA that due to the high rate of cargo inspection by the Customs Authority along with the need for consignees to attend the inspection and the low storage fees inside the port compared to the outer port storage areas, lead to the dwell time for containers in APA to be high, Customs clearance time is too high. This increases the time and costs as well as congestion at port. e.g. AICT reported 5 days for export and 12 days for imports. It is reported that the containers stacking in Alexandria port can be up to 6 high.

Thus, Complexity of customs procedures and high rate of physical customs inspection of containers (100%) create significant additional operational expenditures for the operator. Given the limited space available for inspections e.g. the inspection area in Alexandria port is 0.7 ha, while in El Dekheila port is 1 ha;

Egyptian customs scorecard shows a similar scoring to that of middle east and north Africa region. However, it depicts a performance that is substantially low in comparison to other Mediterranean countries (LPI, 2018).

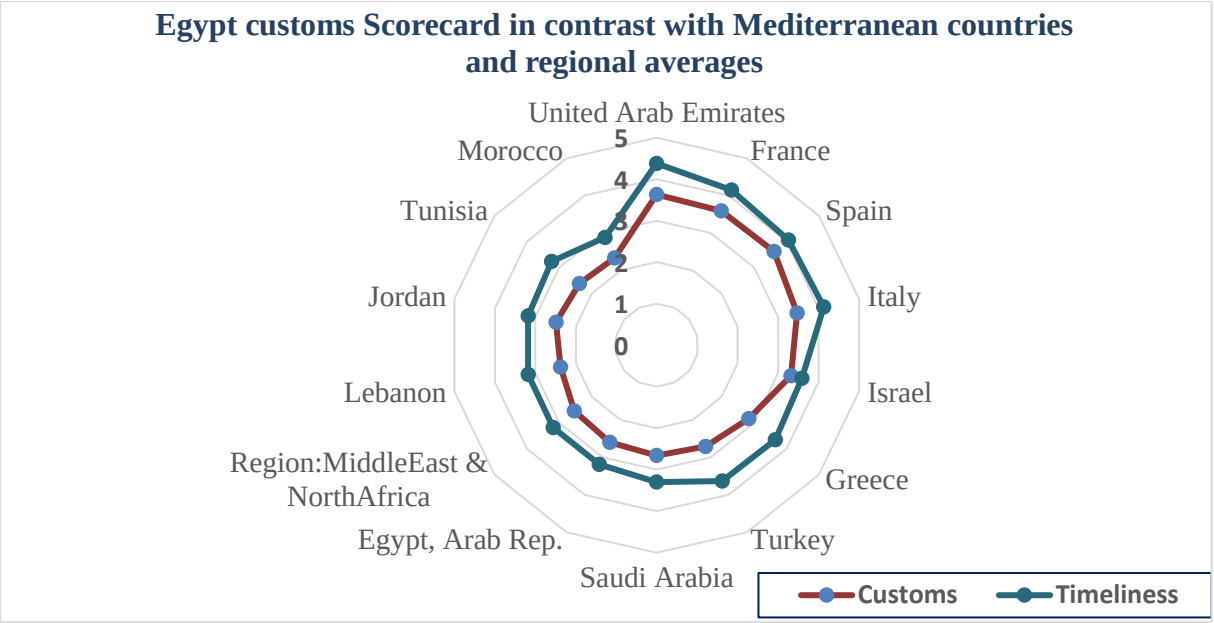


Figure 20:Egypt customs Scorecard in contrast with Mediterranean countries and regional averages. Source: Developed by Author based on LPI report, 2018. https://lpi.worldbank.org/international/scorecard/radar/254/C/EGY/2018#chartarea

5.9.2 Organizational challenges

No real-time registration of container yard positions during the yard operations. Inventory exercise required every 10 days, accuracy of positioning data is very low; (particularly in El-Dekheila Port) (APA, 2020).

5.9.3 Physical inspection challenges

APA reports show that customs procedures require the scanning of every container entering/leaving the terminal which occasionally causes high congestion. Customs IT system prescribes to physically inspect any container with Chinese origin. Additionally, APA reported that only about 30% of the trucks arrive on terminal with ready documents causing further latency and congestion.

5.10 National Initiatives to modernize the Egyptian Customs Authority (ECA) work mechanisms

In 2004 the World Bank published a paper analyzing the correlation of trade facilitation and the movement of cargo in terms of finished products in 2000-2001 through collecting data of 75 countries worldwide (Mann, Wilson & Otsuki, 2004). This paper concluded that the four

factors with far-reaching impacts on exports and imports of individual countries are: regulation environment, Ports' operations efficiency, customs environment, and the use of e-commerce. According to the world customs journal (2008), typical "Trade Facilitation measures" can be entire concepts such as "Single Window systems", standardization (electronic or paper-based), IT solutions such as "Electronic Data Interchange" (EDI), or even simplified procedures such as "Authorized Economic Operator" (AEO). Furthermore, customs techniques (e.g. risk analysis) can facilitate global trade by speeding up customs procedures.

In order to better enhance trade facilitation in Egypt, the ECA adopted some of trade facilitation measures as shown below:

5.10.1 The list decrees issued by relevant authorities to enhance simplified customs procedures

no.	Decree no.	Issuer	Date of publication	Content of the decree	Impact
1.	23	Minister of Finance and the ECA Commissioner	1/2019	Procedures importation to reduce the number of documents has been issued. This decree stipulates the acceptance of the **detailed invoice** in order to replace the **packing list** if the invoice includes the detailed information of the packing list. Further,	Decrease number of documents. In addition to not requesting the certificate of origin for the goods that have an invoice indicating the country of origin if the goods were exported by a producing company or the company owning the trademark.
2.	26	Minister of Finance and the ECA Commissioner	1/2019	The Commissioner of the ECA and the GOEIC Chairman's decree to obligate all customs offices and the branches of the GOEIC in ports to carry out customs inspections, examinations, matching and withdrawing samples, if necessary, for imported or exported goods at the	The container or packages destined for examination, inspection or withdrawal of samples are to be opened **once**.

no.	Decree no.	Issuer	Date of publication	Content of the decree	Impact
				same time through mutual committees.	
3.	304	Minister of Finance and the ECA Commissioner	30/4/2019	The amendment of some of the provisions of the executive regulations of customs law issued by the Minister of Finance's decree no. 10 of the year 2006. These provisions allow the traders to request adding more than one bill of lading before filing a declaration for the ECA if they are related to goods arriving on the same means of transport, stored in the same customs zone and have the same characteristics of the complete type of goods. By adding the bills of lading, this will give the customs administration the opportunity to make thorough reviews of the goods and make sound decisions regarding the estimation of the custom duties based on the correct headings.	These amendments affect the time of release of goods, the accuracy of the customs duties and the decrease of smuggling to maintain control over imports
4.	312	Minister of Finance and the ECA Commissioner	2/5/2019	The amendment of some provisions of decree no. 269 of the year 2018 regarding the collection of governmental duties and taxes through the electronic payment system. This decree stipulates that in case the trader does not pay	This decree has led to the compliance of the traders with the payment of due duties on stipulated times to avoid any penalties

no.	Decree no.	Issuer	Date of publication	Content of the decree	Impact
				the due taxes on time determined by the customs is fined with 5 % of the value of the consignment, with a maximum sum of 7000 L.E (USD 445.68).	
5.	444		10/7/2019	The amendment of some of the provisions of the executive regulations of customs law issued by the Minister of Finance's decree no. 10 of the year 2006. These provisions are related to the determination of the value for declared goods at the office of departure, submit the required documents and determine the correct heading and price as per the GATT agreement.	This decree led to the decrease of manipulation and customs smuggling. Further, it reduces the working hours relevant to every declaration whether at the office of departure or the office of arrival in order to determine the final value which allows the liquidation of the submitted guaranteed in case of any violation regarding the custom duties. This has contributed to maintaining control & facilitation of imports and exports
6.	461	Minister of Finance and the ECA Commissioner	16/7/2019	The amendment of some of the articles of the executive regulations of the customs law issued by the decree of the Minister of Finance no. 10 of the year 2006. These provisions are relevant to the preclearance. It is allowed to file the customs declarations using copies of the supporting documents. The trader can	This led to the facilitation of release process, the implementation of electronic processes and e- payment as well as activating risk management to determine high risk goods.

no.	Decree no.	Issuer	Date of publication	Content of the decree	Impact
				carry out the relevant customs procedures and issue the release order. The original documents are to be submitted upon the arrival of goods and the necessary inspections are to be carried out afterwards.	
7.	489	Minister of Finance and the ECA Commissioner	5/8/2019	Replacing article (1) of decree 394 of the year 2019 with a provision regarding the collection of the administrative fees for the release procedures for imported or exported consignments through the national single window.	These fees are related to penalties imposed on traders who are unwilling to remove their goods from the port, despite the fact that these goods have been cleared. Also to expedite movement and avoid storage of consignments.
8.	556	Minister of Finance and the ECA Commissioner	9/2019	Establishing a mutual committee composed of the ECA and GOEIC representatives to prepare a common list of the companies enlisted in the AEO program	Enhance faster trade movement and fast tracks.
9.	810	Minister of Finance and the ECA Commissioner	10/2019	Establishing a committee composed of the representatives of the ECA, GOEIC, and the National Authority for Food Safety program.	To review the criteria for joining the Authorized Economic Operator (AEO) program as per international best practices. To foster fast tracks.

no.	Decree no.	Issuer	Date of publication	Content of the decree	Impact
10.	3053	Prime Minister	12/2019	The mechanism of the mutual committees of inspection at the ports and customs offices	The decree states that a committee is to be established in every office in the inspection areas. These committees are composed of one or more representative of the ECA, the GOEIC, the National Authority for Food Safety, Agricultural and veterinary Quarantine, and the other relevant authorities or agencies. The committee is to develop the schedules for opening containers or packages containing imported goods or goods to be exported only once. The examination process is to take place within **3 workdays** from the date of filing the customs declaration, to expedite the process.

Table 18: Initiatives to modernize the work in the Egyptian Customs Authority (ECA).
Source: compiled by author based on Official Gazette

5.10.2 Single Window System (SWS)

5.10.2.1 Single window under TFA and FAL

On February 2017 the "Trade Facilitation Agreement" (TFA) entered into force, stipulating the implementation of "Single window system" as follows:

Article 4.1: "Members shall endeavour to establish or maintain a Single window, enabling traders to submit documentation and/or data requirements for importation, exportation or transit of goods through a single entry point to the participating authorities or agencies. Then the participating authorities shall notify the applicants through the Single Window in a timely manner."

Article 4.2: "One-time submission: where traders submit required data and/or documents to the SW he/she shall not be asked again for the same information."

Article 4.4: "Members shall use ICT to the extent possible."

On April 2019 it became a mandatory requirement for national governments to use Electronic Data Interchange (EDI) to exchange info. between ships and ports under 2016 revised Annex of the "Convention on Facilitation of International Maritime Traffic" (***FAL Convention).*** Standard 1.3bis of the convention stipulated that "Public Authorities have to establish systems for the electronic exchange of information by 8 April 2019. A period of no less than 12 months for transition to the mandatory use of the systems shall be provided from the date of the introduction of such systems." It further encouraged the use of the "single window" concept under Recommended Practice 1.3quin, to "Enable all the information required by public authorities in connection with the arrival, stay and departure of ships, passengers, crew and cargo, to be submitted via a single portal without duplication."

5.10.2.2 National "Single Window System" (Nafeza)

The National Single Window "Nafeza" is an integrated information platform. It aims at achieving coordination between all national parties involved in trading across borders. This system is said to "Integrate and coordinate procedures and information exchange, whilst allowing the trade community to submit all documents and transactions (ports / control authorities / customs) once through a logistics services center (or via Online "e-portal") to fulfill the related regulatory requirements for cargo release."

The platform operates in accordance with the "International standards of trade related procedures and customs requirements for clearance of goods" (NAFEZA, 2021). The platform was developed based on the following national regulatory framework:

- The decree of the Minister of Finance no. 74 of the year 2019 has been issued to appoint the Egyptian Company for E-Commerce Technology to implement, manage and

operate the single window system. The Logistical center in Cairo Airport has been operated in March 2019, the Logistical Center in the port of Port-Said in May 2019 and the port of Alexandria is in Q2 2021.

- The decree of the Minister of Finance no. 155 of the year 2019 has been issued to establish a mutual committee, headed by the Minister of Finance. The members of the committee are the ECA competent officials and the implementing company. They are assigned with the development of the strategic plans, the tasks of the logistical centers project as well as the supervision of the implementation.
- Triple cooperation protocol(s) have been signed among the ECA, the implementing company, some of the agencies in the port community and the concerned control authorities for the release of the goods. These protocols aim to implement electronic connections with SWS system and to simplify the procedures related to customs clearance.

5.10.3 Advance Cargo Information System (ACI) for imported and exported goods from and to Egypt

In 2018 the "World Customs Organization" (WCO) issued "Advance Cargo Information" (ACI) Implementation Guidelines (Rukavina & Panjako, 2020). The ACI requires "Submitting detailed cargo data before the cargo is brought into or shipped across borders via air, rail, vessel or truck" (Closs & McGarrell, 2004). The national initiative to adopt the ACI started in Q4 2020 and involves the following:

- The importer / exporter fills in the required data in the Egyptian Customs Declaration electronically on the ECA website.
- The importer / exporter receives a unique reference number for the submitted declaration
- The importer / exporter notifies the carrier (land / maritime/ air) with the reference number of the declaration and the carrier inserts this number in the notify party field in the manifest.

5.10.4 Projects undertaken by the ECA: Joining the AEO program

Another "Trade Facilitation measure" is the introduction of "Simplified procedures for traders" who have acquired a special status, such as the "Authorized Economic Operator" (AEO).

According to the world customs journal (2008), the world Authorized Economic Operators (AEO) status is seen, in international trade, as an indication of quality business, whereby it eliminates the risk of unreliability to an extent (Tweddle, 2008). Granting such status depends on the outcome of a risk analysis or on one's compliance record in the past.

In Egypt, decree **No.810** of the year **2019 -** Minister of Finance, laid out a set of recommendations. These recommendations concerning the criteria for the full implementation of the AEO and the eligibility criteria as per the international best practices, which are composed of four elements:

- The compliance of the AEO members with the tax and customs legislations
- The compliance of the AEO members with establishing internal control systems for the administration of the records and accounting records
- The financial solvency where the company must have a good financial status to be able to fulfill its obligations.
- Implement safety and security criteria to ensure the safety of the supply chain.
- Number of AEO in Egypt reaches 80 imports + 49 exports with total ***129*** **AEO** (Egyptian Ministry of Finance, 2020).

5.11 The economic impacts of the customs development initiatives

Customs administrations in the Egyptian ports are undergoing a transformation period, which is said to cause a paradigmatic shift in customs operation. However, it will need few years to yield the desired economic returns from these ongoing developments, due to the novelty of these initiatives; whereby many of which are still in the construction phase; meanwhile the industry is yet to recover from the disruptions caused by COVID-19 Pandemic.

Henceforth, the feedbacks from public and private stakeholders, upon the completion of the aforementioned reforms, should be fruitful for assessing the plausible impacts of the "Trade Facilitation measures" on trade flows through freight movement between Egyptian ports and world's ports. However measuring the exact yields of trade facilitation on trade flows can be difficult to quantify (Wilson et al., 2005).

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study recommends some structural policies to stimulate the usage of administrative procedures and regulatory power to channel trade flows at ports as a way of stimulating and attracting global trade. Furthermore, it highlights the importance of procedural and regulatory mechanisms for global trade facilitation.

In this chapter we will be concluding the contributions of the research through answering the last research question. It will summarize the empirical findings and identify the required future improvements in the Egyptian maritime transport sector as a whole and the Port of Alexandria in particular. Finally, it will briefly highlight the Policy implications and the limitations of the study while giving some recommendations for future studies.

6.2 Answering research questions and Summary of Empirical findings

According to WTO-World Trade Statistical Review (2019) the African countries' participation in the global trade in goods is very low (2.7% in 2018) despite being resources abundant continent with large young population. The African Development Bank (AfDB) (2019) reported that “Africa’s share in the global exports flow fall from 3.5% in 2008 to 2.5% in 2018”. Moreover, the African continent continuously suffers from high trade transaction costs, corruption and difficulty of “doing business” (Odularu and Alege 2019).

The World Bank's “Ease of Doing business” yearly reports clearly show how the Complex customs procedures, overstated fees and formalities; when accompanied by poor awareness and transparency of trading regulations; negatively affect the African and Middle East's trading regimes. The “World Bank’s Trading across Borders” (2020) depicts that “It takes more days than in other regions to import and export goods in Africa and Middle East due to the complex trade procedures and numerous documentation requirements”.

Similarly, the World Bank’s “Logistics Performance Index” (2018) shows that “Africa is lagging (among other regions) in customs, infrastructure, competence in trade-related logistics and timeliness of exports and imports”.

To answer the question regarding the implications of complex customs procedures at ports, the OECD stated in its 2018 report that "there is a high potential of 15% Trade cost reduction for lower middle-income countries, including Egypt, if the full implementation of the Trade Facilitation Agreement measures at ports and borderlines were Speeded-up" (figure 21).

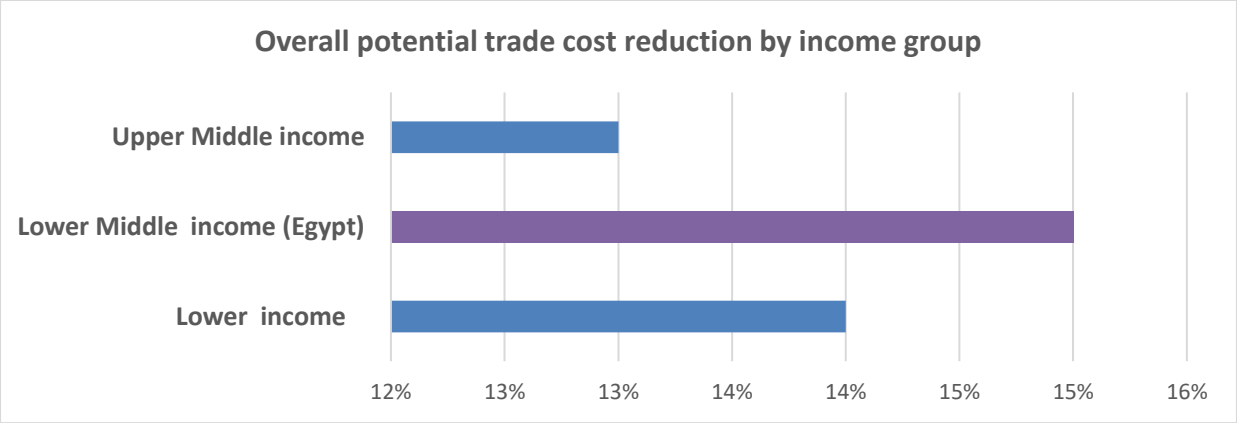


Figure 21:Potential Trade-cost-reduction by income group.
Source: OECD,2018

Maritime transport carries more than 80% of the global trade in volume (UNCTAD, 2018) making the efficient and cost effectiveness of maritime activities an important requirement for facilitating trade.

According to OECD (2018) "The developing countries, particularly in Africa and Middle East, pay, on average, 40 to 70% more for the international transport of their imports than developed countries". Figure (22) shows that exports and import procedures are "3-5 times more expensive in the Middle East and North African countries than in OECD countries". Additionally, exports and import procedures take "5-9 days longer in Middle east &North Africa than in OECD countries", illustrated in Figure (23) (OECD, 2018).

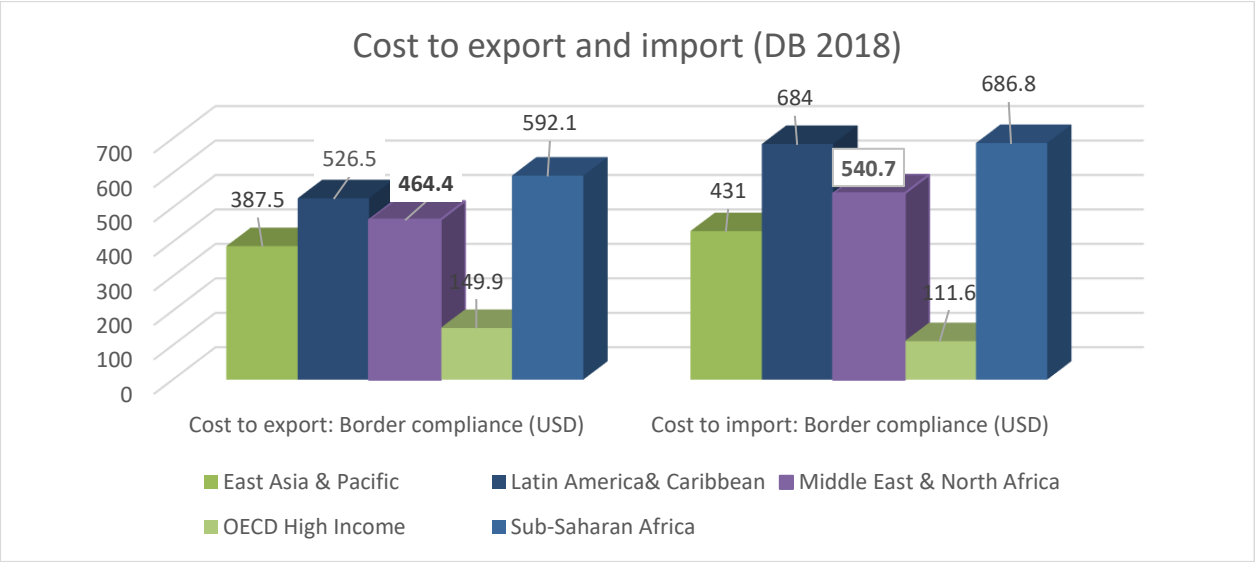


Figure 22: More Expensive Exports &Import procedures in the middle east &North Africa than in OECD.
Source:OECD, 2018.

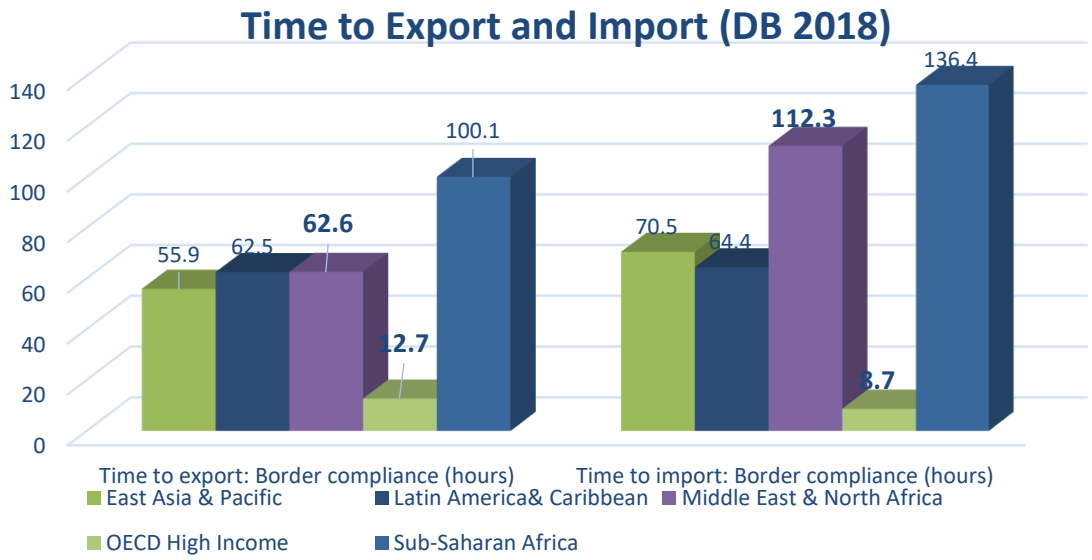


Figure 23:Longer days to Exports &Import procedures in Middle east &North Africa than in OECD.
Source:OECD, 2018.

The above figures illustrate the magnitude of red-tape, complex customs and prolonged documentary requirements and their impact on operations. As a result, it is expected that by the year 2030, when Egypt reaches the full 100% implementation status of TFA, the Egyptian maritime transport cost will be automatically reduced through:

- simplified administrative procedures,
- more transparent procedures,
- reduced times to import and export,

- decreased logistics costs,
- And improved connectivity**.**

Consequently, both public and private sectors will fully utilize the aforementioned benefits, under enhanced transparency, accuracy and governance of operations.

As is evident from the empirical results, our model provides rich predictions about trade flows under tight vrs loose customs/borders procedures, and non- tariff trade barriers in terms of costs and time to compliance. Our findings prove that timeliness border procedures enhances exports flows, moreover countries may tend to use border procedures to protect their local industries. The model further tests the assumptions of the gravity model in relation to trade flows.

The macro-economic variables of GDP and Population held their significance to trade flows in both models (exports and imports). However, the gravity model variables turned insignificant to exports flow while held their significance to imports flows.

Since we laid out the empirical motivation for this study in the introduction, it suffices to point out in these concluding comments that our approach helps to better appreciate the complexity of non-tariff trade barriers in the maritime world, particularly with big shipping-lines favoring ports based on timeliness, speed deliveries, standardized, clear, easy procedures, and strong shipping networks (McCalla, 2003; Steven and Corsi, 2012). It also should help in designing empirical studies of the ever-evolving maritime industry.

Finally, our empirical evidence indicates that channels other than the normal productivity improvements and economies of scale, might impact future global trade patterns through maritime freight movement. The incorporation of speedy procedures, congestion and environmental impacts at ports while including macro–economic indicator variables for regional or preferential trade agreements RTAs/PTAs, should be a fruitful area for the future theoretical work on attracting trade.

6.3 Identifying areas of improvements

6.3.1 Egyptian maritime sector improvements

The pressure caused by the ever-evolving maritime industry, forces port authorities to continuously improve their management techniques, in order to maintain competitive performance levels. Mediterranean ports are no exception, they found themselves forced to

cope with the increasing power of the public/private partnerships (PPP), and the increasingly active role of the private global operators. In order to face these challenges, most Mediterranean ports had to undergo statutory-reforms, as well as privatizing certain port activities and adopting similar operating mechanisms as of those used in the North European harbours (Fedi & Pignatel, 2011).

To overcome the challenges facing the Egyptian maritime transports sector, mentioned in chapter one, the following reforms are needed:

#	Current challenges	Suggested Reforms based on global best practices
1	Unclear roles of multiple decision makers delay the decision –making process, confuse private investors and stakeholders, which negatively impacts the sector's competitiveness	Assign national port leadership role to one designated ministry and appoint one focal point for the private sector with requisite maritime/port sector commercial and technical skills. Reform the private sector engagement process and role of supreme/high ports council to reduce decision making time, improve quality of discussions and get market soundings on policy and investment decisions.
2	Multiple layers of policy and investment decisions across port Authorities and various ministries, is leading to uncoordinated and unjustified investments, resulting in unutilized ports capacity.	Develop a port sector reform roadmap and port sector master plan. Develop rigorous investment project appraisal guidelines.
3	"Taxing port" for short-term revenue to maximize fiscal revenues is negatively impacting port sector's and the country's competitiveness and raising costs for exporters and consumers.	Liberalize ports/maritime sector dues/ fees, allowing port authorities to set their own dues/ fees based on cost recovery requirements and commercial/ competitiveness factors. Eliminate the practices of price setting decrees.
4	Regulating the sector through issuing decrees is leading to a complex regulatory and operational environment that support short term benefits and creating unlevelled playing field.	Enshrine the above liberalization of the sector into law, leading to long-term sector stability and increasing private sector confidence to invest in the sector, repeal decrees regulating pricing and licensing barriers to entry.
5	Not applying competitive and transparent tendering processes in resulting in sub-optimal deals for the government and people of Egypt.	Develop model contracts, leases and concession agreements and require international competitive tendering as a standard practice.

Table 19: Overcoming the Challenges Facing the Maritime sector In Egypt
source: Developed by author based on Egyptian Maritime Transport Sector-Ministry of Transport

Cognizant of the importance of the port/ maritime sector in improving Egypt's international competiveness, implementing the above reforms will attract private sector financing and enhance operations in this promising sector.

In this context, there is an increasing need in the Egyptian maritime sector for a network of ports sharing experiences of best sustainable development practices that utilize time and cost-effective operations while integrating a master plan that enhances ports performance.

6.3.2 Egyptian Customs improvements

According to the world customs journal (2008) “The legal framework in each country is different, however we share these same goals. For instance, the Provisional Standards agreed at the WCO are major attempts to establish common standards to address the common issues that every customs administration is facing today” (Aoyama, 2008). Moreover, national customs administrations spare no efforts in order to fulfill excellency in their mission and the Egyptian customs authorities (ECA) is no exception, as they are committed to making the utmost efforts to endeavor their purpose.

Henceforth, the suggested areas for improving customs practices will be illustrated through depicting a best practice example that accommodates both national specifications and simplified international standardization. National best practice would be port of Damietta, where the import agents can clear cargo at an Import Logistics Service Center, Meanwhile GOEIC and customs are working door to door. In a waiting hall the agents can follow the public display of clearing process progress refreshing every 30 minutes. When the clearance process is completed, the import agent can receive paperwork and pay import duties shortly after fulfilment is reported. If no problems occur, the customs clearance process should take 2 hours or more (port of Damietta, 2020).

Another optimal solution would be the implementation of a XML format-based process (Extensible Markup Language) that will provide for complete XML integration between customs, GOEIC, port authority and all other stakeholders involved. This integration is said to allow one e-payment through using integrated single e-invoice. According to Rosenberg, J. (2007) data stored in XML Language format can be directly accessed online by all stakeholders through HTTP. Thus, the new customs system structure should be redesigned based on the actual applications.

6.4 Policy implications

Recall that; the findings of our OLS regression analysis pointed out that Non-tariff trade barriers, measured in terms of time and cost to border and documentary compliance, cause difficult trading environment, less-economic cooperation; henceforth sedately affect the trade flows through maritime freight movement. From this result, we recommend that policymakers should consider these relations while reforming customs procedures given the fact that ports are the key connectivity nodes at the global trade. Meanwhile, excess customs at ports and borderlines would add significant hurdles against the role of ports in the global connectivity (Wilson et al., 2005).

6.5 Limitations of the study and recommendations for future studies

Practical importance of this study is in its attempt to describe a case of a port performance measurement, particularly in terms of customs procedures costs and timeliness. However, the study is limited by only one case study. Therefore, one of the directions for future research is a further extended analysis of various case studies, added by historical comparative analysis of port performance measurement systems. Furthermore, including macro–economic indicator variables for regional or preferential trade agreements RTAs/PTAs, should be a fruitful area for the future theoretical work on attracting trade through freight movement.

Many important issues on regulatory-design choices, shipping and supply-chain services improvements remain for future research. However, the proposed framework offers a rallying point for future discussion seeking to utilize the lessons learnt from best practices.

References

Advance Cargo Information (ACI) Implementation Guidelines, http://www.wcoomd.org.

African Development Bank (AfDB) Group (2019) African Economic Outlook 2018, African Development Bank Group. Available online at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African_Economic_Outlook_2018_-_EN.pdf

Almansa-Sáez, C., Calatrava-Requena, J. (2007), Reconciling sustainability and discounting in cost-benefit analysis: A methodological proposal. Ecological Economics 60, 712-725.

Aminatou, M., Jaqi, Y., & Okyere, S. (2018). Evaluating the impact of long cargo dwell time on port performance: An evaluation model of Douala International Terminal in Cameroon. Archives of Transport, 46.

Amiti, Mary, and Donald R. Davis. 2012. "Trade, Firms, and Wages: Theory and Evidence." Review of Economic Studies 79 (1): 1–36.

Amiti, Mary, and Jozef Konings. 2007. "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia." American Economic Review 97 (5): 1611–38.

Amiti, Mary, Oleg Itskhoki, and Jozef Konings. 2014. "Importers, Exporters, and Exchange Rate Disconnect: Dataset." American Economic Review. http://dx.doi.org/10.1257/aer.104.7.1942.

Aoyama, Y. (2008). Perspectives of Customs in the 21st century: from the experiences of Japan Customs. World Customs Journal, 2(1), 95-100.

Arvis, J.-F., Ojala, L., Wiederer, C., Shepherd, B., Raj, A., Dairabayeva, K., & Kiiski, T. (2018). Trade Logistics in the Global Economy: The Logistics Performance Index and Its Indicators. Washington, USA: The International Bank for Reconstruction and Development/The World Bank. Retrieved from www.worldbank.org

Arvis, Jean-François, Gael Raballand, and Jean-François Marteau. 2010. The Cost of Being Landlocked. Washington, DC: World Bank.

Asteris, M., Collins, A. (2007), Developing Britain's port infrastructure: markets, policy, and location. Environment and Planning A, 39, 2271-2286.

Aya El-Garhy, (2016), "Policy Making for Dry Port Location and Capacity: A Case study on Alexandria". AAST&MT, EGYPT.

Badawi, Somaia, (2003), "Economics of establishing, developing and operating ports in light of global competition, Competitive World " AAST&MT, EGYPT.

Baker, Susan, (2006), Sustainable Development (Routledge Introductions to Environment) Routledge.

Barr, R.F., Mourato, S. (2009), Investigating the potential for marine resource protection through environmental service markets: An exploratory study from La Paz, Mexico. Ocean and Coastal Management, 52, 568-577.

Bateman, I.J., Day, B.H., Georgiou, S., Lake, I. (2006), The aggregation of environmental values: welfare measures, distance decay and total WTP. Ecol Econ. 60, 450–60.

Berthou, A., & Ehrhart, H. (2013). Colonial Trade Spillovers.

Biel, A., Johansson-Stenman, O., Nilsson, A. (2011), The willingness to pay–willingness to accept gap revisited: The role of emotions and moral satisfaction. Journal of Economic Psychology, 32, 908917.

Blanco ML, Rosales A (2020) "Global governance and COVID-19: The implications of fragmentation and inequality", E-International Relations, 6 May 2020.

Blewitt, John (2014). Understanding sustainable development. Routledge.

Brereton, F., Clinch, P., Ferreira, S., (2008), Happiness, geography and the environment, Ecological Economics, Vol. 65, pp. 386-396

Brooks, C. (2019), Introductory Econometrics for Finance, 4th Edition. Cambridge University Press.

Brooks, M. R., & Faust, P. (2018). 50 Years of Review of Maritime Transport, 1968-2018: Reflecting on the Past, Exploring the Future (No. UNCTAD/DTL/2018/1).

Brooks, Mary R. and Thanos Pallis (2013). Advances in Port Performance and Strategy, Research in Transportation Business & Management, 8, 1-6. Research in Transportation Business and Management

Burns, M. G. (2018). Port management and operations. CRC press.

Business, D. (2012). Trading across borders. [cited 2021 July 29]. Available from: https://www.doingbusiness.org/en/data/exploreeconomies/egypt#DB_tab

Cariou, P. (2020), "Changing Demand for Maritime Trade", International Transport Forum Discussion Papers, No. 2020/04, OECD Publishing, Paris.

Carson, R.T. (2000), Contingent valuation: a user's guide. Environmental Science and Technology, 34, 1413–1418.

Carson, R.T. (2011), Contingent valuation: a comprehensive bibliography and history Edward Elgar, Northampton.

Cartenì, A., & De Luca, S. (2012). Tactical and strategic planning for a container terminal: Modelling issues within a discrete event simulation approach. Simulation Modelling Practice and Theory, 21(1), 123-145.

Chang, H. H., & Huang, W. C. (2006). Application of a quantification SWOT analytical method. Mathematical and computer modelling, 43(1-2), 158-169

Cheon, S. 2009. Impact of global terminal operators on port efficiency: A tiered data envelopment analysis approach. International Journal of Logistics: Research and Applications 12 (2): 85–101.

Cheon, S., Song, D. W., & Park, S. (2018). Does more competition result in better port performance?. Maritime Economics & Logistics, 20(3), 433-455.

Chow, G., Heaver, T. D., & Henriksson, L. E. (1994). Logistics performance: definition and measurement. International journal of physical distribution & logistics management.

Clark, X., D. Dollar, and A. Micco. 2004. Port efficiency, maritime transport costs, and bilateral trade. Journal of Development Economics 75 (2): 417–450.

Closs, D. J., & McGarrell, E. F. (2004). Enhancing security throughout the supply chain (pp. 10-12). Washington, DC: IBM Center for the Business of Government.

Convention on Facilitation of International Maritime Traffic, International Agreements,

CST (Center for Sustainable Transport) (2002), "Sustainable Transport Performance Indicators (STPI) – A Synopsys Report", CST. Available at: http://cst.uwinnipeg.ca/.

Cullinane, K. and Song, D.W. (2003) A Stochastic Frontier Model of the Productive Efficiency of Korean Container Terminals. Applied Economics, 35, 251-267. http://dx.doi.org/10.1080/00036840210139355

Cullinane, K., Song, D-W. and Wang, T. (2005) 'The application of mathematical programming approaches to estimating container port production efficiency', Journal of Productivity Analysis, Vol. 24, No. 1, pp.73–92.

Darbra Roman, R. M., Wooldridge, C., & Puig Duran, M. (2020). ESPO Environmental report 2020-EcoPortsinsights 2020.

De Langen, P., Turró Calvet, M., Fontanet, M., & Caballé, J. (2018). The infrastructure investment needs and financing challenge of European ports.

De Sousa, J., & Lochard, J. (2012). Trade and colonial status. Journal of African Economies, 21(3), 409-439.

De Wulf, L., & Sokol, J. B. (Eds.). (2005). Customs modernization handbook. World Bank Publications.

Dee, P. S., & Ferrantino, M. J. (2005). Quantitative methods for assessing the effects of non-tariff measures and trade facilitation. World Scientific.

Dekker, S. (2005) Port investment: towards an integrated planning of port capacity

Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011), "The social dimension of sustainable development: Defining urban social sustainability. Sustainable Development", 19(5), 289-300.

Doing Business. (2017). Economy Profile: Doing Business 2017. World Bank Group.

Doing Business. (2018). Economy Profile: Doing Business 2018. World Bank Group.

Doing Business. (2019). Economy Profile: Doing Business 2019. World Bank Group.

Doing Business. (2020). Economy Profile: Doing Business 2020. World Bank Group.

Doumbia-Henry, C. (2020). Shipping and COVID-19: Protecting seafarers as frontline workers. WMU Journal of Maritime Affairs, , 1-15.

Drewry Shipping Consultants (London). (2014). Container Terminal Capacity and Performance Benchmark.

Eberts, R. (2000). Understanding the impact of transportation on economic development. Transportation in the New Millennium, 8.

Echebarria Fernández, J. (2020). The maritime impact of Coronavirus. Marine & Océans, 37.

Elliott, Jennifer (2012), An introduction to sustainable development. Routledge.

El-Nakib and S. Elzarka, (2014), "Measuring Supply Chain Efficiency in MENA Countries: A Green Perspective", The Annual Logistics Research Network Conference (LRN) Huddersfield, UK.

EU, (European Union), Council of Ministers, (2001): April Resolution, Luxembourg, available at: http://europa.eu/

Evans J., Marlow P (1990). Quantitative Methods in Maritime Economics, Fairplay Publication Ltd. London

Fedi, L., & Pignatel, I. (2011, December). The Reforms of Mediterranean Port Administration Models: Stakes and Limits of a New Port Governance. In International Conference on Maritime Transport and Logistics: Ports and Logistics."A Vision For Future Integration". Alexandria, Egypt, December (pp. 18-20).

Ferrier, W. 2001. Navigating the competitive landscape: The drivers and consequences of competitive aggressiveness. Academy of Management Journal 44 (4): 858–877.

Fisher, M. J., & Marshall, A. P. (2009). Understanding descriptive statistics. Australian Critical Care, 22(2), 93-97. https://https://doi.org/10.1016/j.aucc.2008.11.003

Gani, A. (2017). The logistics performance effect in international trade. The Asian Journal of Shipping and Logistics, 33(4), 279-288.

Gattuso, J.-P., Magnan, A. K., Bopp, L., Cheung, W. W. L., Duarte, C. M., Hinkel, J., et al. (2018). Ocean Solutions to address climate change and its effects on marine ecosystems. Front. Mar. Sci. 5:337.

Gencler, F., & Artukoglu, M. M. (2010). Food Production; Can it be Used as a Tool in Empowerment of Rural Women? A Case Study from Turkey.

Ghoneim, A. F., & Ahmed, O. A. H. (2007). An Assessment of Maritime Transport and Related Logistics Services in Egypt. Egyptian Center for Economics Studies, Working Paper Series, September.

Goldberg, L. S., & Tille, C. (2013). A bargaining theory of trade invoicing and pricing (No. w18985). National Bureau of Economic Research.

Good Practices around the Globe on Single Window and Related Matters. [cited 2020 Dec 20]. Available from: http://reports.weforum.org/enabling-trade-catalysing-trade-facilitation agreementimplementation-in-brazil/good-practices-around-the-globe-on-single-window-and relatedmatters/?doing_wp_cron=1476448821.7495648860931396484375#view/fn-20>

Gourieroux, C. and Jasiak, J (2001), Financial Econometrics: Problems, Models and Methods, Princeton Series in Finance, Princeton University Press.

Grainger, A. (2008). Customs and trade facilitation: from concepts to implementation. World customs journal, 2(1), 17-30.

Grammenos, C. T. (2002). The Handbook of Maritime Economics and Business. London: LLP.

Grammenos. C. Th (2010). The Handbook of Maritime Economics and Business, 2nd Edition, London, Lloyd's List Publication

Grieco, J. M. (1990). Cooperation among nations: Europe, America, and non-tariff barriers to trade. Cornell University Press.

Groves, D. G., Molina-Perez, E., Bloom, E., and Fischbach, J. R. (2019). "Robust decision making (RDM): application to water planning and climate policy," in Decision Making Under Deep Uncertainty: From Theory to Practice, eds V. A. W. J. Marchau, W. E. Walker, P. J. T. M. Bloemen, and S. W. Popper (Cham: Springer International Publishing), 135–163.

Gudehus, T., & & Kotzab, H. (2012). Comprehensive logistics. Springer Science & Business Media.

Guner, S., & Coskun, E. (2012). Comparison of impacts of economic and social factors on countries' logistics performances: a study with 26 OECD countries. Research in Logistics & Production, 2, 330-343.

Hall, Jeremy & Vredenburg, Harrie (2012), The challenges of innovating for sustainable development. MIT Sloan Management Review.

Halpern, László, Miklós Koren, and Adam Szeidl. 2011. "Imported Inputs and Productivity." Unpublished.

Hanemann, W. M. (1989), Welfare evaluations in contingent valuation experiments with discrete response. data: reply. Ame J Agri Econ. 71, 1057–1061.

Hanemann, W. M., (1994), Valuing the Environment through Contingent Valuation. J Econ Perspect. 8,19–43.

Hany M. Abdelall and Dr.Hesham M. Helal, (2017), The Competitive advantage of seaports - application on the east port said - PORT SAID. " AAST&MT, EGYPT.

Hassan, M. (2020). Africa and the WTO Trade Facilitation Agreement: State of Play, Implementation Challenges, and Policy Recommendations in the Digital Era. In Fostering Trade in Africa (pp. 5-38). Springer, Cham.

Hausman, W. H., Lee, H. L., & Subramanian, U. (2013). The impact of logistics performance on trade. Production and Operations Management, 22(2), 236-252.

HE, Y., CHOI, B. R., WU, R., & WANG, Y. (2021). International Logistics: Does It Matter in Foreign Trade?. The Journal of Asian Finance, Economics, and Business, 8(2), 453-463

Hoyle, B. (1994), A rediscovered resource: comparative Canadian perceptions of waterfront redevelopment. Journal of Transport Geography, 2, 19–29.

Hoyle, B. (2000), Revitalizing the port-city waterfront: retrospect and prospect. Geographical Review, 90, 395–417.

http://apa.gov.eg/ar/page/alexandria-port-details/

http://mts.gov.eg/en/content/275/1-83-The-Egyptian-Ports-Capacity

https://www.customs.gov.eg/Legislations

ICA/ISF (2019) Annual Review 2019 (e-copy)

IMO (2020c) Circular Letter No. 4204/Add. 3, "Operational considerations for managing COVID-19 cases/ outbreak on board ships", 2 March 2020c.

IMO Circular Letter No.4204/Add.15, “Personal protective equipment”, 6 May 2020g IMO, Circular Letter No. 4204/Add. 19, “Guidance for flag States regarding surveys and renewals of certificates during the COVID-19 pandemic”, 2 June 2020h.

IMO, Circular Letter No. 4204/Add. 22, “Singapore Crew Change Guidebook”, 25 June 2020i.

IMO, Circular Letter No.4204/Add. 18, “Joint Statement IMO-ICAO-ILO on designation of seafarers, marine personnel, fishing vessel personnel, offshore energy sector personnel, aviation personnel, air cargo supply chain personnel and service provider personnel at airports and ports as key workers, and on facilitation of crew changes in ports and airports in the context of the COVID-19 pandemic”, 26 May 2020e.

Indicators, E. P. P. Selection and Measurement. Project Executive report (PPRISM WP4 D4. 2). Coordinator: European Sea Ports Organization (ESPO). January, 2012. pprism. espo. be/LinkClick. aspx. https://www.espo.be/media/pages/12-01-25_-_PPRISM_WP4_Deliverable_4.2_Website.pdf

International Finance Corporation. (2012). Doing business 2013: Smarter regulations for small and medium-size enterprises. World Bank Publications.

ITF Roundtable Report. (2015). Logistics Development Strategies and Performance Measurement. Mexico: International Transport Forum.

Kapidani, N. &Kočan, E. (2015). Implementation of National Maritime Single Window in Montenegro. 2015 23rd Telecommunications Forum Telfor (TELFOR) Telecommunications Forum Telfor (TELFOR), 2015 23rd.:17-20 Nov, 2015.

Kennedy, P. (2004), Guide to Econometrics, 5th Edition, Blackwell Publishers.

Kia, M., Shayan, E., & Ghotb, F. (2002). Investigation of port capacity under a new approach by computer simulation. Computers & Industrial Engineering, 42(2), 533-540. https://https://doi.org/10.1016/S0360-8352(02)00051-7

Koivurova, Timo, (2012), Integrated Maritime Policy of the European Union: Challenges, Successes, and Lessons to Learn.

Kress, G. J. and Snyder, J. (1994), Forecasting and Market Analysis Techniques: A Practical Approach. London: Quorum Books.

Kyung Park & Prabir De (2004) An alternative approach to efficiency measurement of seaports, Journal Maritime Economics & Logistics, Palgrave Macmillan, ISSN 1479-2931, ZDB-ID 2108520-1. - Vol. 6.2004, 1, p. 53-69

Lam, Jasmine Siu Lee, and Dong-Wook Song. "Seaport network performance measurement in the context of global freight supply chains." Polish maritime research (2013).

Law, A. M., Kelton, W. D., & Kelton, W. D. (2000). Simulation modeling and analysis (Vol. 3). New York: McGraw-Hill.

Lawer, E. T., Herbeck, J., & Flitner, M. (2019). Selective adoption: How port authorities in Europe and West Africa Engage with the globalizing ‘Green Port’idea. Sustainability, 11(18), 5119.

Lipsey, R. (1995). An Introduction to Positive Economics. London: Weidenfeld Paperbacks.

Logistics development strategies and performance measurement. (2016). OECD/ITF, Roundtable Reports. doi:10.1787/bcb574b1-en. https://www.itf-oecd.org/sites/default/files/docs/logistics-strategy-performance-management.pdf

Long, A. (2009). Port community systems. World customs journal, 3(1), 63-67.

Lucy Robert Syrob, (2008), Ocean Carrier Network Design Problem and Port Sustainability: A Mathematical and Sustainable Maritime Balanced Scorecard Perspectives.

Lupi, M., Pratelli, A., Falleni, M., & Farina, A. (2019). An analysis of short sea shipping container routes in the Mediterranean and in the black sea. WSEAS Trans. Environ. Dev, 15, 1201-1238.

M. Tadini (2019) A Geographical Overview of the Suez Canal Freight Flows: an Impact on the Mediterranean Sea and the Genoa port. Bollettino della Società Geografica Italiana serie 14, 2(1): 15-30. doi: 10.13128/bsgi.v2i1.220

M. Tarek and K. EL-Sakty, (2014), "Transportation Sustainable Development in Egypt". New Suez Canal Project. AAST&MT, EGYPT.

Ma S (2019). Maritime Economics, WMU textbook.

Ma S. (2020) Economics of Maritime Business, Routledge, London and New York, ISBN: 978-1-138-99964-0

Mammadov, F. A. O. (2020). Customs system and using advanced technologies in customs (Doctoral dissertation, Wien).

McCalla, R. (2003) Transport and connectivity: Problems faced by small island developing states. Presented at the United Nations Conference on Trade and Development's Expert Meeting on the Development of Multimodal Transport and Logistics Services, Geneva, September 24–26.

Messerlin, P. A., & Zarrouk, J. (2000). Trade Facilitation: Technical regulations and customs procedures. World Economy, 23(4), 577-593.

Michail, N. A., & Melas, K. D. (2020). Shipping markets in turmoil: An analysis of the Covid-19 outbreak and its implications. Transportation Research Interdisciplinary Perspectives, 7. https://doi.org/10.1016/j.trip.2020.100178

Millefiori, L. M., Braca, P., Zissis, D., Spiliopoulos, G., Marano, S., Willett, P. K., & Carniel, S. (2020). COVID-19 Impact on Global Maritime Mobility. DOI:10.21203/rs.3.rs-100286/v1

Mills, T. C. (1999), The Econometric Modelling of Financial Time Series, Cambridge University Press.

Milner, C., Morrissey, O., & Zgovu, E. (2008). Trade facilitation in developing countries (No. 08/05). CREDIT Research Pape

Ministry of Transport Statistical Yearbook 2019: Egyptian Maritime Data Bank. Maritime Transport Sector. Alexandria. Egypt (2019).

Ministry of Transport: Maritime Ports Guide (Commercial and Specialized). Egyptian Maritime Data Bank. Maritime Transport Sector. Alexandria. Egypt (2015b).

Ministry of Transport: Statistical Yearbook. Egyptian Maritime Data Bank. Maritime Transport Sector. Ministry of Transport. Alexandria. Egypt (2020).

Morgan, S. P., & Teachman, J. D. (1988). Logistic regression: Description, examples, and comparisons. Journal of Marriage and Family, 50(4), 929-936.

Morris, R.K.A., Gibson, G. (2007), Port development and nature conservation –experiences in England between 1994 and 2005. Ocean and Coastal Management, 50, 443-462.

Mounime, E., Lotfi, M., & Hajbi, A. (2014). Maritime transport and international trade: a study of transshipment opportunities and their impacts on The Mediterranean region growth. The Business & Management Review, 4(4), 252.

Muller-Karger, F. E., Miloslavich, P., Bax, N. J., Simmons, S., Costello, M. J., Pinto, I. S., et al. (2018). Advancing marine biological observations and data requirements of the complementary essential ocean variables (EOVs) and essential biodiversity variables (EBVs) Frameworks. Front. Mar. Sci. 5:211.

Musso, E., & Parola, F. (2017). Mediterranean ports in the Global Network: how to make the Hub and Spoke paradigm sustainable?. In Ports, Cities, and Global Supply Chains (pp. 105-120). Routledge.

National Democratic Party: Policies of Transport Services and Citizens' Safety. The Fourth Annual Conference. National Democratic Party. Cairo. Egypt (2014).

Ng, Koi-Yu Adolf (2009) Port competition: the case of North Europe. Saarbrücken, VDM, Verlag Dr. Müller, ISBN 9783639167665, p. 103.

Notteboom, T. E., & Haralambides, H. E. (2020). Port management and governance in a post-COVID-19 era: quo vadis?

Notteboom, T. E., Parola, F., & Satta, G. (2019). The relationship between transhipment incidence and throughput volatility in North European and Mediterranean container ports. Journal of transport geography, 74, 371-381.

Notteboom, T. E., Parola, F., Vonck I., & Satta, G. (2013). State of the EU port system – market trends and structure update. Data availability, comparability and disaggregation. PORTOPIA, European commission.

Odularu G, Alege P (ed) (2019) Trade facilitation capacity needs: policy directions for national and regional development in West Africa. Palgrave Macmillan, USA. Available online at https:// www.palgrave.com/br/book/9783030059453

OECD (2009), Overcoming Border Bottlenecks: The Costs and Benefits of Trade Facilitation, OECD Trade Policy Studies, OECD Publishing, Paris, https://doi.org/10.1787/9789264056954-en.

Olivier, D., Slack, B., (2006), Rethinking the port. Environment and Planning A, 38, 1409-1427.

Raballand, G., Refas, S., Beuran, M., & Isik, G. (2012). Why Cargo Dwell Time Matters in Trade. Economic Premise; No. 81. World Bank, Washington, DC.World Bank. https://openknowledge.worldbank.org/handle/10986/10039 License: CC BY 3.0 IGO."

Rietveld, P. (1996). Files en prijsbeleid (Traffic-jams and price policy). ESB, Vol. 81, No. 4073, September 18, pp. 776-778.

Rodrigue, J. P. (2010, May) Maritime transportation: drivers for the shipping and port industries. In International Transport Forum.

Rosenberg, J. (2007). The extensible markup language (XML) configuration access protocol (XCAP). RFC 4825, May.

Rukavina, B., & Panjako, A. (2020). Legal regulations for ships arriving in and/or departing from ports–Achievements and open issues. Pomorstvo, 34(1), 121-128.

S.Elzarka and S. Elgazzar, (2014), "Green Port Performance Index for Sustainable Ports in Egypt: a Fuzzy AHP Approach", The 7th International Forum on Shipping, Ports, and Airports (IFSPA), Hong Kong, China.

Saleh, S., Jahr, T., Jentzsch, G., Saleh, A., & Abou Ashour, N. M. (2006). Crustal evaluation of the northern Red Sea rift and Gulf of Suez, Egypt from geophysical data: 3-dimensional modeling. Journal of African Earth Sciences, 45(3), 257-278.

Sanchez, H., & Robert, B. (2010). Measuring portfolio strategic performance using key performance indicators. Project Management Journal, 41(5), 64-73

Saz-Salazar, S. del, García-Menéndez, L. (2003), The nonmarket benefits of redeveloping dockland areas for recreation purposes: the case of Castellón, Spain. Environment and Planning A, 35, 2115-2129.

Saz-Salazar, S. del, García-Menéndez, L. (2012), Meeting the environmental challenge of port growth: A critical appraisal of the contingent valuation method and an application to Valencia Port, Spain. Ocean and Coastal Management, 59, 31-39.

Small, K.A. (1995). Urban Transportation Economics. Second printing. Harwood Academic Publishers, Luxemburg.

Sorgenfrei, J. (2018). Port Business: Second Edition. Berlin, Boston, p. 40f.: De Gruyter. https://doi.org/10.1515/9781547400874

Steven, A. B., & Corsi, T. M. (2012) Choosing a port: An analysis of containerized imports into the US. Transportation Research Part E: Logistics and Transportation Review, 48(4), 881-895.

Stopford, M. (2009). Maritime Economics (3rd ed.). London: Routledge.

Taylor, S. (1999), Modeling Financial Time Series, 2nd Edition, Wiley and Sons, New York, NY.

Turner, H., R. Windle, and M. Dresner. 2004. North American containerport productivity: 1984–1997. Transportation Research Part E 40 (4): 339–356.

Turró, M., Fontanet, M., & Caballé, J. THE INFRASTRUCTURE INVESTMENT NEEDS AND FINANCING CHALLENGE OF EUROPEAN PORTS. https://www.espo.be/media/ Port%20Investment%20Study%202018_FINAL_1.pdf

Tweddle, D. (2008). Logistics, security and compliance: The part to be played by authorized economic operators (AEOs) and data management. World Customs Journal, 2(1), 101-105.

UNCTAD (2016). Port Management Series, Volume 4, Port Performance Linking Performance Indicators to Strategic Objectives, p. 27-28.

UNCTAD (2019) Review of Maritime Transport 2019 (e-copy)

UNCTAD: Negotiations on Transport and Logistics Services: Issues to Consider. Document No. UNCTAD/SDTE/TLB/2014/3. UNCTAD. Geneva. Switzerland (2014a).

UNCTAD: Review of Maritime Transport 2014. UNCTAD. Geneva. Switzerland (2014b).

Van Hooydonk, E. (2007), Soft values of seaports. A strategy for the restoration of public support for seaports. Garant, Antwerp, Belgium.

Verschuur, J., Koks, E., & Hall, J. (2020). The implications of large-scale containment policies on global maritime trade during the COVID-19 pandemic

Vierros, M. (2017). Communities and blue carbon: the role of traditional management systems in providing benefits for carbon storage, biodiversity conservation and livelihoods. Clim. Change 140, 89–100

Waddell, D., Devine, J., Jones, G. R., & George, J. M. (2007). Contemporary management. Mc Graw Hill Irwin

Wang, T.F. & Cullinane, K. (2006) The efficiency of European container ports: A cross-sectional data envelopment analysis, Journal of Logistics Research and Applications, Volume 9, 2006 - Issue 1..

Wilson, J. S., Mann, C. L., & Otsuki, T. (2004). Assessing the Potential Benefit of Trade Facilitation: A Global Perspective' Policy Research Working Papers, World Bank, Washington, DC.

Wilson, J. S., Mann, C. L., & Otsuki, T. (2005). Assessing the benefits of trade facilitation: A global perspective. World Economy, 28(6), 841-871.

Wilson, J. S., Mann, C. L., & Otsuki, T. (2005). Assessing the potential benefit of trade facilitation: A global perspective. Quantitative methods for assessing the effects of non-tariff measures and trade facilitation, 121-160

Wooldridge, JM. (2019) Introductory econometrics: A modern approach, 7 th Edition, Nelson Education

World Bank LPI. (2020, May 19). International Scorecard. Retrieved from World Bank: https://lpi.worldbank.org/international/scorecard/radar/254/C/BGD/2018/C/IND/2018/C/DEU/2018

World Bank LPI. (2020, May 19). International Scorecard. Retrieved from World Bank: https://lpi.worldbank.org/international/scorecard/radar/254/C/BGD/2018/C/IND/2018/C/DEU/2018

World Bank. (2020, May 19). International and Domestic LPI Parameters. Retrieved from World Bank: https://lpi.worldbank.org/international

World Bank. (2020, May 19). International and Domestic LPI Parameters. Retrieved from World Bank: https://lpi.worldbank.org/international

World Trade Statistical Review, 2019. https://www.wto.org/english/res_e/statis_e/wts2019_e/wts2019_e.pdf.

WTO (2020) World Trade Summary 2019 (e-copy)

WTO Web site, available online at http://www.wto.org/english/tratop_e/tradfa_e/tradfa_intro_e. htm.

Appendix

World Bank's Doing Business- Trading Across Border 2020 Data (Exporting countries)

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
Algeria	Spain	HS 28 : Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	Alger port	80	593	149	374	172	38.4
Angola	China	HS 72 : Iron and steel	Luanda port	164	825	96	240	174	36.2
Antigua and Barbuda	Canada	HS 22 : Beverages, spirits and vinegar	St. John's port	61	546	51	121	112	68.7
Australia	Japan	HS 02 : Meat and edible meat offal	Sydney port	36	766	7	264	106	70.3
Bahamas, The	United States	HS 39 : Plastics and articles thereof	Arawak Cay port	36	512	12	550	161	53.1
Bangladesh	Germany	HS 61 : Articles of apparel and clothing accessories, knitted or crocheted	Chittagong port	168	408	147	225	176	31.8
Barbados	United States	HS 22 : Beverages, spirits and vinegar	Bridgetown port	41	486	48	117	132	62.8
Belize	United Kingdom	HS 08 : Edible fruit and nuts; peel of citrus fruit or melons	Belize City port	96	710	38	50	114	68.2
Benin	China	HS 52 : Cotton	Cotonou port	78	354	48	80	110	68.9
Brunei Darussalam	Japan	HS 29 : Organic chemicals	Muara port	117	340	155	90	149	58.7
Cabo Verde	Spain	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Praia port	72	641	24	125	109	69.1
Cameroon	Netherlands	HS 18 : Cocoa and cocoa preparations	Douala port	202	983	66	306	186	16
Chile	China	HS 74 : Copper and articles thereof	San Antonio port	60	290	24	50	73	80.6
China	Hong Kong, China	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image	Shanghai port	21	256	9	74	56	86.5

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
		and sound recorders and reproducers, and parts and accessories of such articles							
Colombia	United States	HS 61 : Articles of apparel and clothing accessories, knitted or crocheted	Sihanoukville port	112	630	48	90	133	62.7
Comoros	France	HS 09 : Coffee, tea, matï and spices	Moroni port	51	651	50	124	120	66.9
Congo, Dem. Rep.	China	HS 74 : Copper and articles thereof	Matadi port	296	2223	192	500	187	3.5
Congo, Rep.	Angola	HS 84 : Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	Pointe-Noire port	276	1975	120	165	183	19.7
Costa Rica	United States	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Limón port	20	450	24	80	80	77.6
Côte d'Ivoire	Netherlands	HS 18 : Cocoa and cocoa preparations	Abidjan port	239	423	84	136	163	52.4
Cyprus	Germany	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Limassol port	18	300	2	50	50	88.4
Djibouti	Egypt	HS 09 : Coffee, tea, matï and spices	Djibouti port	72	605	60	95	147	59.4

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
Dominica	Jamaica	HS 34 : Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modelling pastes, "dental waxes" and dental preparations with a basis of plaster	Roseau port	36	625	12	50	91	74.3
Dominican Republic	United States	HS 90 : Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof	Caucedo port	16	488	10	15	66	83.5
Egypt, Arab Rep.	France	HS 31 : Fertilisers	Alexandria port	48	258	88	100	171	42.2
Equatorial Guinea	France	HS 29 : Organic chemicals	Malabo port	132	760	154	85	175	32
Fiji	United Kingdom	HS 17 : Sugars and sugar confectionery	Suva port	56	317	56	76	79	77.9
Gabon	Japan	HS 44 : Wood and articles of wood; wood charcoal	Owendo port	96	1633	60	200	170	43.9
Gambia, The	France	HS 15 : Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	Banjul port	109	381	48	133	115	67.8
Ghana	India	HS 08: Edible fruit and nuts; peel of citrus fruit or melons	Tema port	108	490	89	155	158	54.8
Grenada	United States	HS 08 : Edible fruit and nuts; peel of citrus fruit or melons	St. George port	101	1034	13	40	137	61.5

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
Guatemala	United States	HS 09 : Coffee, tea, matï and spices	Santo Tomás de Castilla port	36	310	48	105	82	77.2
Guinea	Spain	HS 09 : Coffee, tea, matï and spices	Conakry port	72	778	139	128	167	47.8
Guinea-Bissau	India	HS 08 : Edible fruit and nuts; peel of citrus fruit or melons	Bissau port	118	585	60	160	146	59.6
Guyana	United Kingdom	HS 10 : Cereals	Georgetown port	72	468	200	78	151	58.3
Haiti	United States	HS 61 : Articles of apparel and clothing accessories, knitted or crocheted	Port-au-Prince port	28	368	22	48	85	76.9
Honduras	Germany	HS 09 : Coffee, tea, matï and spices	Puerto Cortés port	108	601	48	80	130	64.3
Iceland	Netherlands	HS 76 : Aluminium and articles thereof	Reykjavik port	36	365	2	40	53	86.7
India	United States	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Nhava Sheva port	52	212	12	58	68	82.5
Indonesia	India	HS 15 : Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	Jakarta port	56	211	61	139	116	67.5
Iran, Islamic Rep.	China	HS 29 : Organic chemicals	Bandar Abbas port	101	415	33	60	123	66.2
Ireland	United States	HS 29 : Organic chemicals	Dublin port	24	305	1	75	52	87.2
Israel	United States	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound	Haifa port	36	150	10	60	67	83.4

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
		recorders and reproducers, and parts and accessories of such articles							
Jamaica	Canada	HS 28 : Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	Kingston port	58	876	47	90	136	61.5
Japan	China	HS 84 : Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	Yokohama port	27	272	2	54	57	85.9
Jordan	India	HS 31 : Fertilisers	Aqaba port	53	131	6	100	75	79
Kiribati	Thailand	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Betio port	72	420	24	310	135	62.1
Korea, Rep.	China	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Incheon port	13	185	1	11	36	92.5
Kuwait	India	HS 29 : Organic chemicals	Shuwaikh port	84	665	72	227	162	52.6
Lebanon	United Arab Emirates	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Beirut port	96	480	48	100	153	57.9
Liberia	China	HS 40: Rubber and articles thereof	Monrovia port	193	1113	144	330	184	19.2

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
Libya	Italy	HS 38 : Miscellaneous chemical products	Tripoli port	72	575	72	50	129	64.7
Madagascar	Germany	HS 61 : Articles of apparel and clothing accessories, knitted or crocheted	Toamasina port	70	868	49	117	140	61
Malaysia	China	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Klang port	28	213	10	35	49	88.5
Maldives	Thailand	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Male port	42	596	48	300	157	55.9
Marshall Islands	Korea, Rep.	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Majuro port	60	298	24	20	76	78.9
Mauritania	Japan	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Nouakchott port	62	749	51	92	144	60.3
Mauritius	United Kingdom	HS 61 : Articles of apparel and clothing accessories, knitted or crocheted	Port Louis port	24	303	9	128	72	81
Micronesia, Fed. Sts.	Japan	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Colonia (Tomil Harbor)	36	168	26	60	65	84
Myanmar	India	HS 07 : Edible vegetables and certain roots and tubers	Yangon port	142	432	144	140	168	47.7
New Zealand	China	HS 04 : Dairy prod; birds' eggs; natural honey	Auckland port	37	337	3	67	63	84.6
Nicaragua	United States	HS 09 : Coffee, tea, matï and spices	Puerto Corinto	72	240	48	47	84	77

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
Nigeria	United Kingdom	HS 40: Rubber and articles thereof	Apapa port	128	786	74	250	179	29.2
Oman	China	HS 29 : Organic chemicals	Sohar port	28	279	7	107	64	84.1
Pakistan	China	HS 52 : Cotton	Qasim port	58	288	55	118	111	68.8
Palau	Japan	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Koror port	102	505	72	100	139	61
Panama	United States	HS 29 : Organic chemicals	Manzanillo port	24	270	6	60	59	85.5
Papua New Guinea	Netherlands	HS 15 : Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	Moresby port	42	700	48	75	125	65.8
Peru	China	HS 74 : Copper and articles thereof	Callao port	48	630	24	50	102	71.3
Philippines	Hong Kong, China	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Manila port	42	456	36	53	113	68.4
Qatar	China	HS 39 : Plastics and articles thereof	Hamad port	25	382	10	150	101	71.5
Russian Federation - Saint Petersburg	Italy	HS 72 : Iron and steel	St Petersburg Port	66	580	24	120	..	66.5
Samoa	Australia	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Apia port	51	1400	24	180	154	57.8

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
São Tomé and Príncipe	Netherlands	HS 18 : Cocoa and cocoa preparations	São Tomé port	83	426	46	194	124	66
Saudi Arabia	China	HS 39 : Plastics and articles thereof	Jeddah port	37	319	11	73	86	76
Senegal	Italy	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Dakar port	61	547	26	96	142	60.9
Seychelles	France	HS 16 : Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	Victoria port	82	332	44	115	98	71.8
Sierra Leone	China	HS 18 : Cocoa and cocoa preparations	Freetown port	55	552	72	227	165	51.9
Singapore	Hong Kong, China	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Singapore port	10	335	2	37	47	89.6
Solomon Islands	China	HS 44 : Wood and articles of wood; wood charcoal	Honiara port	110	630	60	257	160	53.4
Somalia	India	HS 12: Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	Mogadishu port	44	495	73	350	166	51.6
South Africa	United States	HS 87 : Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	Durban port	92	1257	68	55	145	59.6
Sri Lanka	United States	HS 61 : Articles of apparel and clothing accessories, knitted or crocheted	Colombo port	43	366	48	58	96	73.3

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
St. Kitts and Nevis	United States	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Basseterre port	27	335	24	100	71	81
St. Lucia	United Kingdom	HS 08 : Edible fruit and nuts; peel of citrus fruit or melons	Castries port	27	718	19	63	93	73.9
St. Vincent and the Grenadines	St. Lucia	HS 11 : Products of the milling industry; malt; starches; inulin; wheat gluten	Campden Park port	28	340	48	80	81	77.4
Sudan	China	HS 12 : Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	Sudan port	180	967	190	428	185	19
Suriname	Jamaica	HS 10 : Cereals	Paramaribo port	84	468	12	40	87	75
Syrian Arab Republic	Egypt	HS 08 : Edible fruit and nuts; peel of citrus fruit or melons	Lattakia port	84	1113	48	725	178	29.8
Taiwan, China	China	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Kaohsiung port	17	335	5	84	61	84.9
Tanzania	Japan	HS 09 : Coffee, tea, matï and spices	Dar es Salaam port	96	1175	96	275	182	20.2
Thailand	China	HS 84 : Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	Laem Chabang port	44	223	11	97	62	84.6

Exporter	Partner country	Products	Export border Port	Time to export: Border comp.	Cost to export: Border comp.	Time to export: Doc. Comp.	Cost to export: Doc. comp.	TAB rank	TAB score
Timor-Leste	Germany	HS 09 : Coffee, tea, matï and spices	Dili port	96	350	33	100	107	69.9
Tonga	Hong Kong, China	HS 03 : Fish & crustacean, mollusc & other aquatic invertebrate	Nuku'alofa port	52	201	108	70	97	72.6
Trinidad and Tobago	United States	HS 28 : Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	Point Lisas port	60	499	32	250	134	62.6
Tunisia	France	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Rades port	12	375	3	200	90	74.6
United Arab Emirates	India	HS 39 : Plastics and articles thereof	Jebel Ali port	27	462	5	140	92	74.1
Vanuatu	Malaysia	HS 15 : Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	Port Vila port	38	709	72	190	148	59.1
Vietnam	Japan	HS 85 : Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	Cat Lai port	55	290	50	139	104	70.8

World Bank's Doing Business- Trading Across Border 2020 Data (Importing countries)

Importer	Partner country	Product	Importer Border Port	Time to import: Border comp.	Cost to import: Border comp.	Time to import: Doc. comp.	Cost to import: Doc. comp.	TAB rank	TAB score
Algeria	France	HS 8708: Parts and accessories of motor vehicles	Alger port	210	409	96	400	172	38.4
Angola	China	HS 8708: Parts and accessories of motor vehicles	Luanda port	72	1030	96	460	174	36.2
Antigua and Barbuda	United States	HS 8708: Parts and accessories of motor vehicles	St. John's port	61	546	48	100	112	68.7
Australia	United States	HS 8708: Parts and accessories of motor vehicles	Sydney port	39	539	4	100	106	70.3
Bahamas, The	United States	HS 8708: Parts and accessories of motor vehicles	Arawak Cay port	51	1385	6	550	161	53.1
Bangladesh	India	HS 8708: Parts and accessories of motor vehicles	Chittagong port	216	900	144	370	176	31.8
Barbados	United States	HS 8708: Parts and accessories of motor vehicles	Bridgetown port	81	1776	46	150	132	62.8
Belize	United States	HS 8708: Parts and accessories of motor vehicles	Belize City port	30	688	36	75	114	68.2
Benin	France	HS 8708: Parts and accessories of motor vehicles	Cotonou port	82	599	59	110	110	68.9
Brunei Darussalam	Japan	HS 8708: Parts and accessories of motor vehicles	Muara port	48	395	132	50	149	58.7
Cabo Verde	Portugal	HS 8708: Parts and accessories of motor vehicles	Praia port	60	588	24	125	109	69.1
Cameroon	France	HS 8708: Parts and accessories of motor vehicles	Douala port	271	1407	163	849	186	16
Chile	United States	HS 8708: Parts and accessories of motor vehicles	San Antonio port	54	290	36	50	73	80.6
China	Japan	HS 8708: Parts and accessories of motor vehicles	Shanghai port	36	241	13	77	56	86.5
Colombia	Thailand	HS 8708: Parts and accessories of motor vehicles	Poipet border crossing	112	545	64	50	133	62.7
Comoros	France	HS 8708: Parts and accessories of motor vehicles	Moroni port	70	765	26	93	120	66.9
Congo, Dem. Rep.	South Africa	HS 8708: Parts and accessories of motor vehicles	Matadi port	336	3039	174	765	187	3.5

Importer	Partner country	Product	Importer Border Port	Time to import: Border comp.	Cost to import: Border comp.	Time to import: Doc. comp.	Cost to import: Doc. comp.	TAB rank	TAB score
Congo, Rep.	France	HS 8708: Parts and accessories of motor vehicles	Pointe-Noire port	397	1581	208	310	183	19.7
Costa Rica	Japan	HS 8708: Parts and accessories of motor vehicles	Limón port	80	500	26	75	80	77.6
Côte d'Ivoire	France	HS 8708: Parts and accessories of motor vehicles	Abidjan port	125	456	89	267	163	52.4
Cyprus	Germany	HS 8708: Parts and accessories of motor vehicles	Limassol port	15	335	2	50	50	88.4
Djibouti	United Arab Emirates	HS 8708: Parts and accessories of motor vehicles	Djibouti port	118	1055	50	100	147	59.4
Dominica	United States	HS 8708: Parts and accessories of motor vehicles	Roseau port	39	906	24	50	91	74.3
Dominican Republic	United States	HS 8708: Parts and accessories of motor vehicles	Caucedo port	24	579	14	40	66	83.5
Egypt, Arab Rep.	South Korea	HS 8708: Parts and accessories of motor vehicles	Alexandria port	240	554	265	1000	171	42.2
Equatorial Guinea	China	HS 8708: Parts and accessories of motor vehicles	Malabo port	240	985	240	70	175	32
Fiji	Australia	HS 8708: Parts and accessories of motor vehicles	Suva port	35	320	34	58	79	77.9
Gabon	France	HS 8708: Parts and accessories of motor vehicles	Owendo port	84	1320	120	170	170	43.9
Gambia, The	United Kingdom	HS 8708: Parts and accessories of motor vehicles	Banjul port	87	326	32	152	115	67.8
Ghana	Belgium	HS 8708: Parts and accessories of motor vehicles	Tema port	80	553	36	474	158	54.8
Grenada	United States	HS 8708: Parts and accessories of motor vehicles	St. George port	37	1256	24	50	137	61.5
Guatemala	United States	HS 8708: Parts and accessories of motor vehicles	Santo Tomás de Castilla port	72	405	32	37	82	77.2
Guinea	China	HS 8708: Parts and accessories of motor vehicles	Conakry port	79	809	156	180	167	47.8
Guinea-Bissau	Portugal	HS 8708: Parts and accessories of motor vehicles	Bissau port	84	550	36	205	146	59.6
Guyana	United States	HS 8708: Parts and accessories of motor vehicles	Georgetown port	84	265	156	63	151	58.3

Importer	Partner country	Product	Importer Border Port	Time to import: Border comp.	Cost to import: Border comp.	Time to import: Doc. comp.	Cost to import: Doc. comp.	TAB rank	TAB score
Haiti	United States	HS 8708: Parts and accessories of motor vehicles	Port-au-Prince port	83	563	28	150	85	76.9
Honduras	United States	HS 8708: Parts and accessories of motor vehicles	Puerto Cortés port	96	483	72	70	130	64.3
Iceland	Japan	HS 8708: Parts and accessories of motor vehicles	Reykjavik port	24	365	3	0	53	86.7
India	Korea, Rep.	HS 8708: Parts and accessories of motor vehicles	Nhava Sheva port	65	266	20	100	68	82.5
Indonesia	Japan	HS 8708: Parts and accessories of motor vehicles	Jakarta port	99	383	106	164	116	67.5
Iran, Islamic Rep.	Korea, Rep.	HS 8708: Parts and accessories of motor vehicles	Bandar Abbas port	141	660	40	90	123	66.2
Ireland	United Kingdom	HS 8708: Parts and accessories of motor vehicles	Dublin port	24	253	1	75	52	87.2
Israel	Germany	HS 8708: Parts and accessories of motor vehicles	Haifa port	64	307	44	70	67	83.4
Jamaica	United States	HS 8708: Parts and accessories of motor vehicles	Kingston port	80	906	56	90	136	61.5
Japan	China	HS 8708: Parts and accessories of motor vehicles	Yokohama port	40	315	3	107	57	85.9
Jordan	Germany	HS 8708: Parts and accessories of motor vehicles	Aqaba port	79	206	55	190	75	79
Kiribati	Australia	HS 8708: Parts and accessories of motor vehicles	Betio port	96	685	48	120	135	62.1
Korea, Rep.	Japan	HS 8708: Parts and accessories of motor vehicles	Busan port	6	315	1	27	36	92.5
Kuwait	Japan	HS 8708: Parts and accessories of motor vehicles	Shuwaikh port	72	634	96	332	162	52.6
Lebanon	Germany	HS 8708: Parts and accessories of motor vehicles	Beirut port	180	790	72	135	153	57.9
Liberia	Korea, Rep.	HS 8708: Parts and accessories of motor vehicles	Monrovia port	217	1013	144	405	184	19.2
Libya	Italy	HS 8708: Parts and accessories of motor vehicles	Tripoli port	79	637	96	60	129	64.7
Madagascar	China	HS 8708: Parts and accessories of motor vehicles	Toamasina port	99	595	58	150	140	61

Importer	Partner country	Product	Importer Border Port	Time to import: Border comp.	Cost to import: Border comp.	Time to import: Doc. comp.	Cost to import: Doc. comp.	TAB rank	TAB score
Malaysia	Thailand	HS 8708: Parts and accessories of motor vehicles	Klang port	36	213	7	60	49	88.5
Maldives	Singapore	HS 8708: Parts and accessories of motor vehicles	Male port	100	981	61	180	157	55.9
Marshall Islands	Korea, Rep.	HS 8708: Parts and accessories of motor vehicles	Majuro port	84	298	60	43	76	78.9
Mauritania	Belgium	HS 8708: Parts and accessories of motor vehicles	Nouakchott port	69	580	64	400	144	60.3
Mauritius	Japan	HS 8708: Parts and accessories of motor vehicles	Port Louis port	41	372	9	166	72	81
Micronesia, Fed. Sts.	Japan	HS 8708: Parts and accessories of motor vehicles	Colonia (Tomil Harbor)	56	180	35	80	65	84
Myanmar	China	HS 8708: Parts and accessories of motor vehicles	Yangon port	230	457	48	210	168	47.7
New Zealand	Australia	HS 8708: Parts and accessories of motor vehicles	Auckland port	25	367	1	80	63	84.6
Nicaragua	Japan	HS 8708: Parts and accessories of motor vehicles	Corinto port	72	400	16	86	84	77
Nigeria	Japan	HS 8708: Parts and accessories of motor vehicles	Apapa port	242	1077	120	564	179	29.2
Oman	Japan	HS 8708: Parts and accessories of motor vehicles	Sohar port	39	244	7	124	64	84.1
Pakistan	Thailand	HS 8708: Parts and accessories of motor vehicles	Qasim port	120	287	96	130	111	68.8
Palau	Japan	HS 8708: Parts and accessories of motor vehicles	Koror port	84	605	96	100	139	61
Panama	China	HS 8708: Parts and accessories of motor vehicles	Manzanillo port	24	490	6	50	59	85.5
Papua New Guinea	Australia	HS 8708: Parts and accessories of motor vehicles	Moresby port	72	940	48	85	125	65.8
Peru	China	HS 8708: Parts and accessories of motor vehicles	Callao port	72	700	48	80	102	71.3
Philippines	Japan	HS 8708: Parts and accessories of motor vehicles	Manila port	120	690	96	68	113	68.4
Qatar	Japan	HS 8708: Parts and accessories of motor vehicles	Hamad port	48	558	72	290	101	71.5

Importer	Partner country	Product	Importer Border Port	Time to import: Border comp.	Cost to import: Border comp.	Time to import: Doc. comp.	Cost to import: Doc. comp.	TAB rank	TAB score
Russian Federation - Saint Petersburg	Germany	HS 8708: Parts and accessories of motor vehicles	Krasnaya gorka, Smolenskaya oblast.	72	800	43	135	..	66.5
Samoa	New Zealand	HS 8708: Parts and accessories of motor vehicles	Apia port	84	900	25	230	154	57.8
São Tomé and Príncipe	Portugal	HS 8708: Parts and accessories of motor vehicles	São Tomé port	150	406	17	75	124	66
Saudi Arabia	Japan	HS 8708: Parts and accessories of motor vehicles	Jeddah port	72	464	32	267	86	76
Senegal	France	HS 8708: Parts and accessories of motor vehicles	Dakar port	53	702	72	545	142	60.9
Seychelles	France	HS 8708: Parts and accessories of motor vehicles	Victoria port	97	341	33	93	98	71.8
Sierra Leone	China	HS 8708: Parts and accessories of motor vehicles	Freetown port	120	821	82	387	165	51.9
Singapore	Germany	HS 8708: Parts and accessories of motor vehicles	Singapore port	33	220	3	40	47	89.6
Solomon Islands	Australia	HS 8708: Parts and accessories of motor vehicles	Honiara port	108	740	37	215	160	53.4
Somalia	India	HS 8708: Parts and accessories of motor vehicles	Mogadishu port	85	952	76	300	166	51.6
South Africa	Germany	HS 8708: Parts and accessories of motor vehicles	Durban port	87	676	36	73	145	59.6
Sri Lanka	Japan	HS 8708: Parts and accessories of motor vehicles	Colombo port	72	300	48	283	96	73.3
St. Kitts and Nevis	United States	HS 8708: Parts and accessories of motor vehicles	Basseterre port	37	311	33	90	71	81
St. Lucia	Brazil	HS 8708: Parts and accessories of motor vehicles	Castries port	27	842	14	98	93	73.9
St. Vincent and the Grenadines	United States	HS 8708: Parts and accessories of motor vehicles	Campden Park port	48	540	24	90	81	77.4
Sudan	United Kingdom	HS 8708: Parts and accessories of motor vehicles	Sudan port	144	1093	132	420	185	19
Suriname	United States	HS 8708: Parts and accessories of motor vehicles	Paramaribo port	48	658	24	40	87	75

Importer	Partner country	Product	Importer Border Port	Time to import: Border comp.	Cost to import: Border comp.	Time to import: Doc. comp.	Cost to import: Doc. comp.	TAB rank	TAB score
Syrian Arab Republic	Iran, Islamic Rep.	HS 8708: Parts and accessories of motor vehicles	Lattakia port	141	828	149	742	178	29.8
Taiwan, China	Germany	HS 8708: Parts and accessories of motor vehicles	Kaohsiung port	47	340	4	65	61	84.9
Tanzania	China	HS 8708: Parts and accessories of motor vehicles	Dar es Salaam port	402	1350	240	375	182	20.2
Thailand	Japan	HS 8708: Parts and accessories of motor vehicles	Laem Chabang port	50	233	4	43	62	84.6
Timor-Leste	New Zealand	HS 8708: Parts and accessories of motor vehicles	Dili port	100	410	44	115	107	69.9
Tonga	Japan	HS 8708: Parts and accessories of motor vehicles	Nuku'alofa port	26	330	72	148	97	72.6
Trinidad and Tobago	Japan	HS 8708: Parts and accessories of motor vehicles	Point Lisas port	78	635	44	250	134	62.6
Tunisia	France	HS 8708: Parts and accessories of motor vehicles	Rades port	80	596	27	144	90	74.6
United Arab Emirates	Japan	HS 8708: Parts and accessories of motor vehicles	Jebel Ali port	54	553	12	283	92	74.1
Vanuatu	Australia	HS 8708: Parts and accessories of motor vehicles	Port Vila port	126	681	48	183	148	59.1
Vietnam	Japan	HS 8708: Parts and accessories of motor vehicles	Cat Lai port	56	373	76	183	104	70.8