

Using Porter Diamond model to assess the impact of Public Private Partnerships on the competitiveness of Aden container terminal

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Abstract:

Public private partnerships (PPPs) in ports have become a means to manage port operations more effectively, and to develop new port infrastructure. In fact, they are both traditionally exclusively government functions. PPPs take more than one shape and each type is used to tackle one or more issue. This wide range of the solutions provided by the PPP makes it a desirable tool that governments are to adopt in order to overcome the shortage of resources. This research attempts to measure the impact of PPPs on enhancing the competitiveness of Aden container terminal. In addition, the research attempts to identify the present status, suggest solutions for elimination of drawbacks, and identifying

reasons of inefficiency; using Diamond model for Porter during the year 2022.

Keywords: Public Private Partnership, Porter Diamond, Aden Container Terminal.

إستخدام نموذج الماسة لبورتر لتقييم تأثير الشراكات بين القطاعين العام والخاص على قدرة محطة حاويات عدن التنافسية

المستخلص:

أصبحت الشراكة بين القطاعين العام والخاص (PPPs) في الموانئ وسيلة أكثر فعالية لإدارة عمليات الموانئ، فضلاً عن تطوير بنية تحتية جديدة للموانئ، وعادةً ما تكون وظائف حكومية حصرية. تأخذ الشراكة بين القطاعين العام والخاص أكثر من شكل وكل نوع يستخدم لمعالجة مشكلة واحدة أو أكثر. هذه المجموعة الواسعة من الحلول التي يوفرها الشراكة بين القطاعين العام والخاص تجعلها أداة مرغوبة يجب أن تتبناها الحكومات للتغلب على نقص الموارد. يحاول البحث قياس تأثير الشراكة بين القطاعين العام والخاص في تعزيز القدرة التنافسية لمحطة حاويات عدن. بالإضافة إلى ذلك، تحديد الوضع الحالي واقتراح حلول لإزالة العيوب، وتحديد أسباب عدم الكفاءة؛ باستخدام نموذج الماسة لبورتر لعام ٢٠٢٢.

الكلمات الدالة: شراكة القطاع العام والخاص، نموذج الماسة لبورتر، محطة عدن للحاويات.

1. Introduction

Ports had a critical role in the national economic development as well as in international trade since the majority of goods in transit between countries have been transported via ocean vessels. However, seaports have also faced intense competition, which is evidenced by the increasing number of acquisitions and mergers

in the seaport industry. Intensified competition has mainly driven by such factors as increases in globalization trends, containerization, market integration, and global reallocation of capital and labor forces. As a result, these trends have profoundly changed the tactic seaports, particularly the container ports which are governed, operated and competed (Ismail, 2019).

The shipping industry has become a highly competitive industry. In fact, the combination of fierce competition, high capital intensity and complete dependability on the global economy and oil price have resulted in three major trends within the container shipping industry. These are the increase in demand for larger container ships, the establishment of container shipping alliances and the emergence of slow steaming.

Container ship sizes have significantly increased in the last two decades (UNCTAD, 2018). They have come a long way in their development since the beginning of containerization in the mid-1950s, with the world's largest containership that currently reaching a staggering 24,000 TEUs such as Evergreen container ship. Therefore, ports should increase their competitive position by attracting larger ships.

Port competition has dramatically increased in recent years, due to the dynamic environment in which ports operation has been shaped by numerous and interrelated forces. In order to achieve survival and success, strategic planning has become of paramount importance. Indeed, among the most relevant aspects of strategic planning is

competitiveness analysis (Qardash et al., 2021).

Many countries have resorted to the partnerships with the private sector to support port activities in order to ensure adequate financial support for development and improvement activities in container ports in particular. This is in addition to ensuring the improvement of efficiency and performance of container terminals, raising their competitiveness and ensuring the sustainability of their competitiveness.

There are a plenty of advantages of being involved in PPPs. There are benefits bluntly in cooperating with private sector, such as Improving quality, improving customer service, improving management standards, investing in research and development, developing new services and market-based systems of rationing (Shadik, 2019)

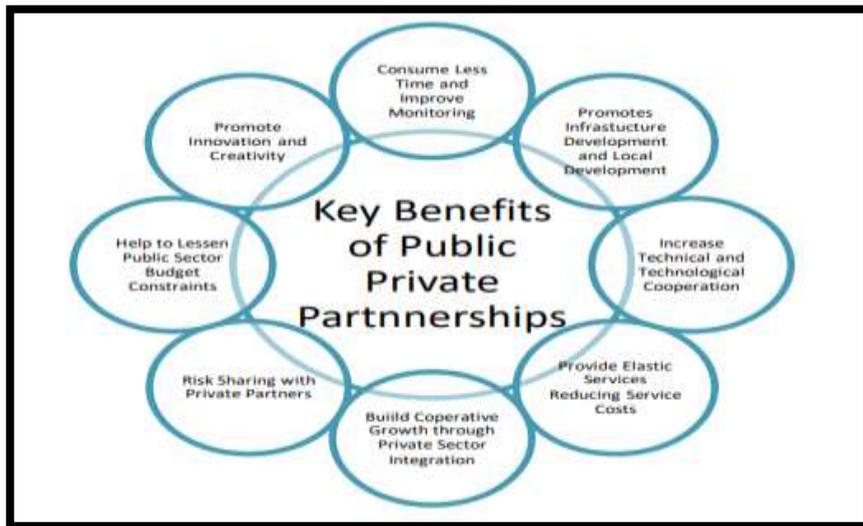


Figure: Key Benefits of Public Private Partnerships.

Source: Shadik, 2019.

2. Literature Review:

Public-private partnerships (“PPPs”) in ports have become a means to manage port operations more effectively, as well as to develop new port infrastructure, traditionally both exclusively governmental functions. There are different types of partnerships that have emerged with the private sector, which differ from one country to another according to the nature and requirements of the country. Perhaps the most widespread and extensive type is Landlord PPPs.

Types of PPP contracts (Semaan, 2020)

Public Private Partnerships vary in types, conditions and forms according to projects' constraints, parameters, the degree of contribution required from each partner, context, the level of risk transfer investment, and desired outcomes: as follows:

1. Management contract: the awarding authority hires the contractor to manage a range of activities for a relatively short period, from three to five years. Management contracts tend to be task specific, and input rather than output focused. Operation and maintenance agreements usually have more performance requirements - output focused.
2. Leasing contract: the private operator is responsible for operating and maintaining the utility but not for financing the investment, from eight to fifteen years.
3. Rehabilitate, Operate and Transfer: the private party is responsible for rehabilitating, upgrading, or extending existing assets.
4. Rehabilitate, Lease/Rent and Transfer: a private sponsor rehabilitates an existing facility at his own risk, leases or rents the facility from the government, then operates and maintains the facility at his own risk for the contract period.
5. Merchant: a private sponsor builds a new facility in a liberalized market, in which the government provides no revenue or payment

guarantees. The private developer assumes construction, operating, and market risk for the project.

6. Build Rehabilitate Operate and Transfer: a private developer builds an add-on to an existing facility or completes a partially built facility and rehabilitates existing assets, then operates and maintains the facility at his own risk for the contract period.
7. Build Operate and Transfer: a private sponsor builds a new facility at his own risk, owns and operates the facility at his own risk, then transfers it to the government at the end of the contract period.
8. Build Own Operate and Transfer: a private sponsor builds a new facility at his own risk, owns and operates the facility at his own risk, then transfers it to the government at the end of the contract period.
9. Build, Lease and Own: a private sponsor builds a new facility, largely at his own risk, transfers ownership to the government, leases the facility from the government and operates it at his own risk, then receives full ownership of the facility at the end of the concession period.
10. Build, Own and Operate: a private sponsor builds a new facility at his own risk, then owns and operates it at his own risk.

11. Partial Privatization: it requires a continuing, active role for the government, which retains responsibility for the function while delegating the actual production activity to the private sector.
12. Privatization: all or substantially all the interests of a government in a utility asset or a sector are transferred to the private sector. Full privatization is often considered a final form of private sector involvement in a utility than a concession.

Table No. (1) PPP models main features

Types of PPPs	Mode of Entry	Operation and Maintenance	Investment	Ultimate Ownership	Duration (years)
Management Contract	Contract	Private	Public	Public	3-5
Leasing	Contract	Private	Public	Public	8-15
Rehabilitate, Operate and Transfer (ROT)	Concession	Private	Private	Public	20-30
Rehabilitate, Lease/Rent and Transfer (RLRT)	Concession	Private	Private	Public	20-30
Merchant	Greenfield	Private	Private	Public	20-30
Build, Rehabilitate, Operate and Transfer	Concession	Private	Private	Public	20-30
Build, Operate and Transfer (BOT)	Greenfield	Private	Private	Semi-private	20-30
Build, Own, Operate and Transfer (BOOT)	Greenfield	Private	Private	Semi-private	30+
Build, Lease and Own (BLO)	Greenfield	Private	Private	Private	30+
Build, Own and Operate (BOO)	Greenfield	Private	Private	Private	30+
Partial Privatization	Divesture	Private	Private	Private	30+
Privatization	Divesture	Private	Private	Private	Indefinite

Source: (Semaan, 2020)

Sayadat, (2021) aims to answer the question of "how far actors' interaction, consensus building and complex decision making in PPP policy implementation can explain policy performance?". This study was based on the case study of two Ports in Bangladesh through interviewing the port authority top officials, and reviewing the published paper and available documents. Purposive and snowball sampling procedure are adopted for key respondent selection. This study was conducted with qualitative research approach. Considering research question and PPP as study interest, the case study strategy is adopted here as the most appropriate option.

However, the simplest form of multiple-case design with two cases is selected for this study. This study investigates different policy performance in different PPPs based on the interaction among the actors, and upholds the view that consensus building between private and public partner is vital for PPP success. Therefore, this study contributes to the knowledge and existing literature by confirming that the theoretical idea of network management approach and complex decision making is useful in explaining the PPP policy performance.

The research issues formulated to be assessed are as follows:

1. What are the laws and regulations on Public Private Partnership (PPP) in Timor-Leste?
2. What are the factors that influence the success of PPP in Timor Leste?

3. How is PPP applied to the Tibar Bay Port Infrastructure project in Timor-Leste? Primary Data: open interviews (Private contractors and Acting Government in Timor-Leste. Secondary Data: Contract documents for Public and Private cooperation in Timor-Leste. In this study, questionnaires also were distributed to the selected respondents who were relevant to this research material. Data was processed by using Miles, Huberman & Yin Theory. The Government of Timor-Leste has a high level of readiness for the implementation of Public Private Partnership scheme. PPP is an attractive solution for the government; however, Timor-Leste is not ready to open social work for the private sector if the government does not have the capacity to manage good companies.

Panades-Estruch (2021) this article critically analyzes the extent to which selected Public-Private Partnerships (PPPs) transportation projects in the Caribbean subregion embrace good practices and how they benefit the public sector. Research is conducted, supported by both international and local sources, to convey a uniquely local perspective in this under-researched area of scholarship. This research has critically evaluated the samples according to five variables: the type of arrangement used, the regulatory framework, the financial implications of PPPs, the accountability mechanisms and miscellaneous data. PPP frameworks in the Caribbean are improving quickly but remain a work in progress. Jamaica leads the region. Bermuda trails behind. Problems of legal compliance with

frameworks and limited market engagement persist, leading to risk management problems.

Chechurina, and Grin (2020) the research has been conducted based on the Landlord model investigation which is recommended by the World Bank, UNACTD and other organizations. Hence, the collected data was a comparative data with different models e.g. state and private service model and port instrument model. The data was collected from the published reports of the UNACTD and World Bank and other sources. The identifying feature of the developed countries is the active participation of public private partnership (PPP) in all spheres of financing and operating activities. In Russia this form of cooperation between the state and the business is underutilized. That is why it is important to analyze and generalize the positive world. The research is a quantitative and qualitative research. The research used tables of comparisons. Experience connecting with participation of PPP in the development of ports which should be used in Russia. World experience of PPP investments' attraction and their participation in port manage can be used in Russian practice especially for development.

Subramanian and Thill, (2019) the study objective is to analyze how the privatization of India Ports is altering the market share of containerized shipments. The study shows that the private port of Mundra has non-trivial effects on the hinterlands of other state-owned ports. It specifies four successive models with estimates, the first model is the basic binary logit regression model, the second is

the random-intercept model, the third model introduces regional fixed effects into consideration, the last model is the fourth iteration of this modeling process. We also specify random slopes in the regional fixed effects. In this study, we see that the private port of Mundra has systematic and non-trivial effects on the hinterlands held by other state-owned ports in the primary industrial zone served by the GQ western corridor. Shipments belonging to specific commodities, shipments bound to the East Coast of the U.S., and shipments originating in the highly contestable parts of the hinterland appear to prefer the private port.

Schroeder, (2019) the overall objective of this research is to critically analyze the adequacy of Namibia's current PPP framework as well as to highlight and make recommendations for Namibia based on the said analysis in order to maximize successful PPP outcomes under the port development leg of the Namibian blue economy. The research was solely based on the analysis of secondary data obtained from journals, published research, text books, internet materials, media reports, existing literature and papers. This dissertation utilizes the legal normative method of research, which is deemed appropriate for this dissertation. Observed from the research herein is that PPPs are not suitable for all types of projects, however one of the most important purpose of PPPs is "to provide better infrastructure and services to the population in a way that creates value for money"

as part of closing infrastructure gaps due to budgetary controls and deficits.

Ravi (2019) the role of private sector has at all times been significant in port development and delivery; however, the conflict that can arise in private participation of public entities are also touched upon. The development and current trends focusing on the growth of smart ports are outlined in reports published by the UN organizations, World Trade, Maritime News Publishers. The research has been based on the comparisons of the data; therefore, it is considered a qualitative and quantitative research. The research used tables of comparisons. It focused on drawing comparisons between the Port Management Models. Private investment in the Global Transport sector almost doubled in the year (2017-2018) with China and Indonesia having a record in private investments percentage share as compared to previous years. The port sector is believed to be in a dynamic flux where the traditional Port functions are being redefined by technology, and PPI is undoubtedly the driver of the change. Asian countries have immense potential for growth, and it is expected that Asian Ports will ride the wave of growth, and will emerge as future hubs of shipping and trade.

Galvao, et al., (2016): This investigation aims to analyze three questions. First, what is the nature of the conflicts generated by port devolution and reform process between public and private interests in a port? Second, currently how are the conflict issues being examined by academics? Third, how does the academic literature

capture the current industry practices and/or debates? Online database (JOC, Tradewinds, Seatrade, Fairplay and World Cargo News), the Journal of Commerce are based on the high number of hits found in each keyword, search, and its relevance to the maritime industry on international basis. The search has focused on the Port of New York/New Jersey and the Port of Santos, relevant databases, using the individual port's name, the main databases used are Science Direct and Web of Science because they concentrate on the top ranked transportation journals.

Papers published about each port are categorized according to the discussed topics. In order to narrow the scope of the research, the subject of this study is to conduct a thorough qualitative and comparative study of major ports and their conflicts between various stakeholders in different institutional frameworks. The differences in conflict and port reform between the New York/New Jersey Port Authority and the Port of Santos Port Authority are dramatic. Research has identified some interesting similarities that relate to efficiency. In both cases, the specialized media noted that truck congestions and dredging works constrain current port daily business and future expansion and sustainability. Thus, good or bad stakeholder interactions and good or non-existent port reforms may not have any impact on the efficiency of ports.

Research gap analysis and contribution will be extracted from that table as shown in figure (2):

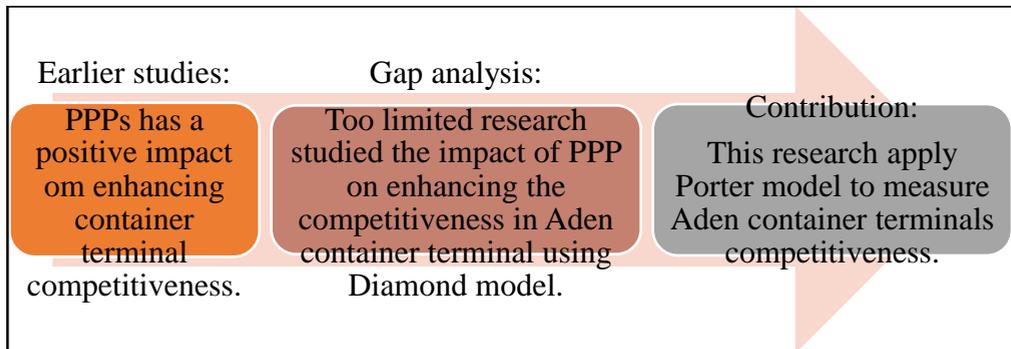


Figure (2) Gap analysis and contribution.

Source: by the researcher.

3. Research problem

The launch of the Aden container terminal is one of the first and most important models of the partnerships with the private sector, as the task of building and operating Aden container terminal was entrusted to the partnership with the private sector in BOT model. However, this partnership did not last for long. It was terminated three years after the commencement of this experiment. Despite the fact that the first partnership with the private sector has ended, the terminal since then, has referred to a different cooperation with the private sector using the landlord model for operating and managing the terminal.

The failure of the first attempts of Yemen partnerships in the maritime transport sector comes at a time when many partnerships attempts have succeeded around the world and in the region, including the ports of the neighboring countries.

Therefore, the following questions emerged, which in themselves

are a research problem that requires an answer, as follows:

- What are the shortcomings of the partnership with private sector in the first attempts of Aden container terminal?

4. Research objectives

This research will help decision makers to make the right decision when resorting to partnership with the private sector and benefit from the successful experiences of other ports. Research objectives are:

- a. To identify the strengths, weaknesses, opportunities and threats that could face applying private sector participation in Aden container port.
- b. To define the impact of the private sector participation on Aden container terminal competitiveness.

6. Research design and methodology:

This research follows an analytical and non-experimental qualitative design (Kothari, 2004); to enhance the competitiveness of Aden container terminal; based on primary data collected from an interview with managers in Aden container terminal and experts in the field of port competitiveness to define determinants of competitiveness directions of Aden container terminal by applying Porter's Diamond model for competitiveness. This research is limited to Aden container terminal for the year 2022.

7. Empirical Analysis:

Applying Porters Model on Aden Container Terminal

Porter's model was considered as an appropriate model for analyzing the competitiveness of Aden container terminal compared to its competitors. This is in addition to the role of the partnership with the private sector in enhancing the competitiveness of the container terminals in terms of supporting the activities of the container terminal and providing the financial support, required to implement the developmental plans of container terminals in line with market requirements.

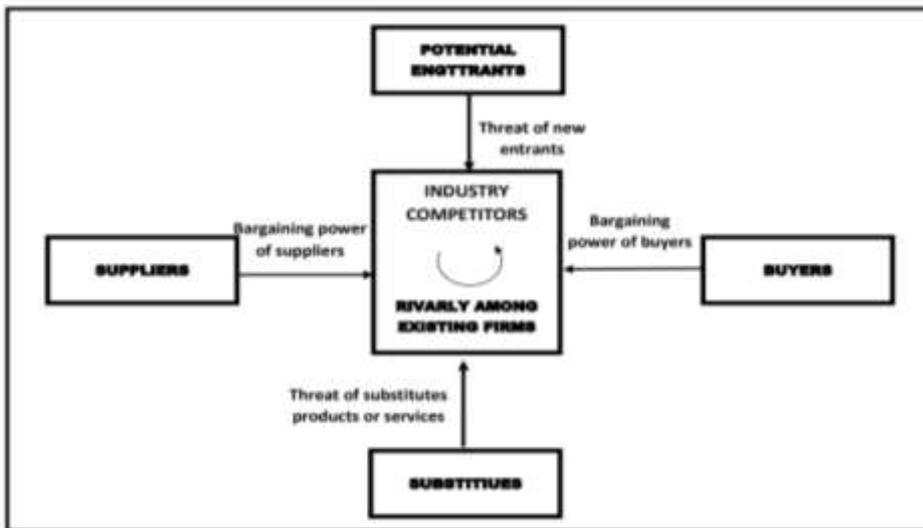


Figure (3): Porters Five Forces

Source: Competitive Strategy: Techniques for Analyzing Industries and Competitors 1980.

Industry Competitors:

Aden container terminal (ACT) is characterized with its important geographical location at the northern part of the ancient port of Aden, the nearest Port to the shipping routes connecting the Gulf of Aden with the Red Sea. Four nautical miles is the only distance that separates the Port of Aden from the shipping lines routes.

Despite ACT important natural harbor and geographical location, ACT is ranked the last container terminal in the region due to many reasons underlying ACT competitiveness decline. Perhaps, the major reason behind ACT competitiveness decline has been the shortage of the infrastructure and superstructure investments and country war state since 2015.

The infrastructure and superstructure constitute a distinguishing mark that widens the gap between the Aden Container Terminal and its counterparts in the region, whereas the investments granted to the Aden Container Terminal are the lowest when compared to the rest of the neighboring container terminals. Table No. (2), provides a comprehensive comparison between the capabilities of Aden Container Terminal and its competitors in the region:

Table (2): A Comparison between ACT and its competitive container terminals in the region.

Terminal	Operating Year	Storage capacity (Teu)	Quay depth	Quay length	No. of Gantry Cranes
Aden Container Terminal	1999	1	16	700	6
Salalah container Terminal	1998	6	18	2400	25
Container terminal at Jeddah Islamic Port	1999	8	15 – 18	4645	36
Doraleh Container Terminal (Djibouti)	2009	1.5	18	1050	8

Source: ACT Commercial Reports for 2021

ACT lacks strategic back-end projects, which should have a significant impact on activating the commercial and service movement and the extent of its repercussions in reducing the cost of maritime transport. This will depend on the carrier shipping line and will also reduce the expenses of renting containers on the Yemeni supplier, which incur higher transportation costs by calculating the carrier shipping line for the turnover time of containers in the port of Aden. Around 95% of the total activities at Aden container terminal are imported shipments, while around 5% are only for the exported shipments.

Looking at the competing container terminals in the region, we will find that the advanced and rapid capabilities in the container terminal services have enhanced the role of these terminals and made them highlighted as the top of service providers in the

region. The rapid development of the competing container terminals has widened the size of the gap between Aden Container Terminal and its competitors in the region.

Partnerships with the private sector have played an important and prominent role in enhancing the competitiveness of the competing container terminals in the region, through the capital that was pumped to finance container terminal projects. The role of the private sector is not limited to modernizing and developing the infrastructure and superstructure of the giant container terminal in the region, but also extended to upraising the operational efficiency of the terminals' workers through specialized and intensive training, qualifying workforce to meet the requirements of the international maritime services.

Table (3): Regional container terminal operators

Port	Terminal	Operator	Management structure
Port of Aden	Aden container terminal (ACT)	APDC	Government since 2012
Port of Salalah	Salalah container terminal	AP Mollar	PPP since 1998
Jeddah Islamic Port	Jeddah North Container Terminal	RSGW	PPP since 1999
	South container terminal	DPW	PPP since 1999
	Red Sea Gateway	RSGW	Private 2009
Port of Djibouti	Doraleh Container Terminal (DCT)	SDGT	Government since 2004

Source: ACT Commercial report for the Competitors Performance 2022.

The above table shows the competitive terminals in the region with their operators. Private sector participation in the regional container terminals situated in the Red Sea and Gulf of Aden region has played a major role in enhancing the competitiveness of the container terminal, which can be seen in the investment of the infrastructure of the competitive container terminal,

Therefore, ACT comes at the end of the container terminal ranking list due to shortages of the investments and the non-stability of the country caused by the unrest of 2011, the Arab Spring, followed with the civil war of 2015.

Potential Entrance:

The maritime transport sector is witnessing a steady growth with the changing patterns of transport and multimodal transport. Container terminals are witnessing as well unprecedented development to keep pace with the increase in container transport activities and the sizes of container ships.

The Red Sea and Gulf of Aden region have witnessed the emergence of many competitors. The most important of these is King Abdullah Port, which started its operations in December 2013. It is considered the most modern port in the region, as it was established to be a pivotal port serving the transit trade, which was built entirely with private sector investments on the basis of BOT.

Many coastal countries along the Red Sea and the Gulf of Aden depend on the involvement of the private sector in bringing about sustainable development, as we find that the most important and active container terminals in the region are managed entirely by the specialized private sector.

The private sector had a prominent role in enhancing the competitiveness of container terminals. This sector witnessed the emergence of many container terminals that were built in the last decade and have become the most important hubs for transshipment containers and the most attractive terminals for many shipping carriers due to their efficiency and capability.

Table No. (4): A Comparison of the container terminals operational commencement and volume handled in 2021.

Port	Container terminal	Abbreviation	Year	Volume
King Abdulla Port	KA container terminal	KACT	2013	2,800,000
Jeddah Islamic Port	Red Sea Gateway terminal	RSGW	2009	1,600,000
Port of Djibouti	Doraleh container terminal	DCT	2009	645,000
Port of Aden	Aden container terminal	ACT	1999	419,000
Jeddah Islamic Port	North container terminal	JNCT	2000	1,450,000
Jeddah Islamic Port	South container terminal	JSCT	1999	1,700,000
Port of Salalah	Salalah container terminal	SCT	1998	4,500,000

Source: Researcher.

The above table shows the container terminals established during the last decade, which, despite of their modernity, witnessed a qualitative leap in the number of handled containers. In addition, they had a share of containers handled in the region by approximately 38%, which changed the competitiveness map in the region.

Aden Container Terminal used to be one of the first container terminals established in the region, but today ACT is ranked at the bottom of the list in terms of the handled containers volume.

The largest competing container terminals in the region depended on partnership with the private sector, which worked to support and develop the competitiveness of the container terminals. This is unlike what happened in Aden Container Terminal, which was built on the basis of partnership with the private sector with BOT system, but the partnership lasted only four years until it ended by terminating this partnership.

The political and security instability in Yemen have played a prominent role in undermining Aden Container Terminal and freezing the development and expansion plans for the Port of Aden's container terminal since 2002. Hence, potential entrance are expected to be established at Saudi north coast with the new project of NEOM city being built in Tabuk Province in northwestern Saudi Arabia. It is planned to incorporate smart city technologies and function as a tourist destination, whereas the planned sea port is considered one of the giant project in Middle East. (wikipedia, 2021)

Bargaining power of suppliers:

The suppliers at Aden Container Terminal are represented by the shipping lines and the factors affecting the shipping lines business at the Port of Aden, as well as the entire service community at the port of Aden. The political and security instability in the Republic of Yemen has played a prominent role in influencing the prices of maritime transport on the one hand, and the suspension of the shipping lines (Ship Operators) direct ships calls on the other hand.

The main shipping lines using ACT have stopped sending their own ships from the main Hub ports to the port of Aden, and replacing that by sending the Yemeni market shipments to the ports of the neighboring countries and then re-sending the Yemeni local market shipments via feeder ships. This change in the maritime business cycle had a great impact on raising the cost of freight charges. Maybe the insurance surcharge was one of the reasons why shipping lines' direct ships call for suspension. The cost of insurance was multiplied for all ships called Yemen due to the country's security instability. The cost of maritime transport to the port of Aden became the highest when compared to the container terminals of neighboring countries, which prompted many local importers to import shipments from the Yemeni local market and send them to the ports of neighboring countries and then transport them by land to the Yemeni market.

The table below shows a comparison of freight charges between the port of Aden and the ports of neighboring countries.

Table (5): Maritime Freight charges comparison for 2021.

<u>Port of Origin</u>	<u>Port of Destination</u>	<u>20ft</u> <u>USD</u>	<u>40ft</u> <u>USD</u>	<u>45ft</u> <u>USD</u>
China - Ningbo Port	Yemen - Port of Aden	7,500	12,000	12,000
China - Ningbo Port	KSA - Jeddah Islamic Port	5,000	8,800	8,800
China - Ningbo Port	Djibouti - Doraleh	5,800	9,500	9,900
China - Ningbo Port	Oman - Port of Salalah	4,500	7,800	8,600

Source: Commercial reports of the Aden container terminal.

The above table shows that the Port of Aden is the highest compared to the other container ports of the neighboring countries in respect to the freight charges and maritime transport cost. This is in addition to the land transport cost in the Republic of Yemen which exceeds in many occasions the maritime transport cost, especially for the goods transported from the Port of Aden to the northern part of Yemen. This high cost is due to the closure of most of the main roads connecting south to the north governorates as a result of the civil war since 2015 and the increasing land transport obstacles and risk.

The absence of real partnership with a specialized private sector has also a negative impact, due to absence of the funds and global operator's name to convince the shipping lines and insurance companies as well.

Participation of specialized global private partner will distribute the risk between the government “the public sector” and the private sector, rather than keeping all the business risk on the public sector. However, the government will not be able to burden the cost of the development and expansion projects at Aden container terminal.

Bargaining power of Buyers:

The demand for Aden Container Terminal has increased since 2016, coinciding with the civil war and the control of the coup groups over the port of Hodeidah. However, the Hodeidah port is out of readiness to serve container ships. All these factors had direct consequences of enhancing the Aden Container Terminal's position as the favorable choice for the Yemeni importers and united nation relief organization to become the Yemen's sea pipeline.

The consequences of events, the continuation of security and political instability in the areas under the control of the legitimate government, the interruptions and closures of land transport lines, the imposition of royalties by some entities, and the Houthi group imposition of additional customs duties outside the framework of the state had a great impact on the reluctance of many suppliers to use the Port of Aden and find alternative solutions represented in shipping their goods through neighboring countries and send them into Yemeni territory by land.

Undoubtedly, the increase in the rate of handling domestic market shipments constitutes the cornerstone of developing the

Aden container terminal and encouraging carrier lines to exploit the terminal's services in transit trade activities (transshipment). However, the situation differed in Aden container terminal. These expectations have dissipated due to the imposition of war risk fees on the ships calling the Port of Aden and the obligation of carriers to obtain permits to call and berth at the port of Aden as new post-war measures imposed by the Arab force coalition. Consequently, the direct trips of ships from the supply lines and regional hub ports to the port of Aden were stopped, and the Saudi port of Jeddah and the Djibouti port of Doraleh have become collection centers for Yemeni local market shipments and containers.

The demand is still based on Aden container terminal as the only option available to the shipping lines, but not for sending mother ships to the Port of Aden. The Feeder ships have been replaced to take over the mission of transporting the Yemen domestic cargo from Jeddah to Aden only.

Table No. (6) shows shipping carriers ships calling ACT during 2014 in compare to 2021.

2021	2014
Singaporean shipping line (PIL)	Singaporean shipping line (PIL)
Switzerland shipping line (MSC)	Singaporean shipping line (APL)
Other shipping carriers (Not a container operators)	Switzerland shipping line (MSC)
	French shipping line (CMA CGM)
	Taiwan shipping line (Evergreen)
	China shipping line (COSCO)
	Other shipping carriers (Not a container operators)

Source: ACT commercial report 2021.

From the above table, it is evident that the shipping lines before the civil war of 2015 had used their own ships to transport containers to the Yemeni local market via direct calls from the international hub ports to the Red Sea markets. However, after the war, all the lines have stopped using their own ships to call the port of Aden except the PIL and MSC lines, which they have also redeployed their own feeder ships to serve Jeddah Aden routes only, The transportation strategy of the two mentioned shipping lines has also been changed by loading containers of other shipping lines from Jeddah to Aden on their ships, in order to reduce transportation costs and ensure that their ships sail with full load.

All the above-mentioned had a financial repercussion in raising the costs of maritime transport to the port of Aden compared to the ports of the neighboring countries, which in turn strengthened its position and the role of land transportation from the ports of neighboring countries to the Republic of Yemen through the land border linking Yemen with the Sultanate of Oman and Yemen with the Saudi Arabia.

Substitutes:

Aden container terminal activities mainly depends on the imported domestic cargoes, whereas the exports vary between 3-5% of the total containerized volume at ACT due to the lack of local industries that may activate the terminal business. Export activities at the terminal back zone will support the terminal

business and subsequently will contribute to the reduction of freight cost. However, Yemen primarily depends on the imports due to the lack and absence of strategic plans to fulfill country needs through the local manufactures.

Despite Aden container terminal uniqueness in serving the imported domestic goods transported by sea, the surrounding environment to the Port of Aden, within the city of Aden or the roads connecting the city to the population assemble centers in the north governorates, has led to weaken Aden container terminal ability into attracting more domestic imports. In contrast, the land ports have emerged as a competitor that attracts huge business of the import domestic goods share.

Table (7) shows the imported cargo through Yemen Land ports.

<u>Land Port</u>	<u>From</u>	<u>To</u>	<u>QTY (Tones)</u>
Wadiya	KSA - Saudi	Yemen	2,375,000
Shehn	Oman	Yemen	1,298,000

Source: Yemen customs authority reports 2021

The above statistical table shows the growth of the land ports. Whereas the land ports have become a less costly way for the imported cargoes flow to the local markets, the total tonnage of the entering cargoes and commercial goods are almost equivalent to 50% of the cargoes volume imported through the port of Aden. Converting the total imported cargoes tonnage to containers has resulted in around 180,000 TEUs to be the total imported

containers through the land ports, which are almost 40% of the volume of containers entering through Aden container terminal, whereas, Aden container terminal handled 204,000 TEUs as import containers in 2021.

Therefore, land ports have become the current and potential substitutes to Aden container terminal in future. These have led to the increase in the transshipment volumes at the neighboring countries Sea Ports, which have subsequently guided governments of the neighboring countries to encourage Yemeni businessmen to settle down and open their business offices at the boundary cities to Yemen. Other facilities were extended to Yemeni traders and businessmen like; taxes exemption, long terms residence visas, providing them with wide investment chances to encourage the neighboring countries sea ports activities and commercial cycle. Yemen's has become a wide market for neighboring countries to activate their business cycle and revitalize their economy.

8. Conclusion and recommendation:

From Porter's Diamond Model; we extracted many important results for Aden container terminal, which are as follows:

- Aden Port's Container Terminal is characterized by its strategic and outstanding location; it is located at one of the most important international shipping line routes, whereas the distance between the port of Aden and international shipping lines crossing Bab-Elmandeb does not exceed four nautical miles.

- Aden Port's Container Terminal is the only container terminal in the Republic of Yemen as it is the only container terminal that uses gantry cranes (ship to shore cranes) which are capable of serving container ships.
- Despite the strategic location of Aden container terminal, it is ranked the last in the container terminals list in the region of the Red Sea and Gulf of Aden, due to several internal and external reasons. The most important of which lies in the lack of security and political stability and the state of civil war that has been going on in the country since 2015.
- Aden Port's container terminal is characterized by its reliance on the local cadre in operating and managing the container terminal, who are characterized as skill and low-cost workforce. However, there is still a lack of qualifications and specialized professional training courses, in addition to the absence of an administrative discipline as a result of the current turmoil in the country since 2015.
- Aden Container Terminal suffers from a lack of strategic projects at the terminal back zone (Industrial zone). However, Aden Container Terminal has not enjoyed the presence of investments aiming at consolidating its competitive terminal position and making use of its strategic location.
- Security and political instability in the country under the control of the legitimate government, the interruptions and

closures of land transport lanes, the imposition of royalties by some entities, and the imposition of additional customs duties by the Hothies (rebels), outside the framework of the legitimate government, had a significant impact on the reluctance of many suppliers to use the Aden Container Terminal and look for an alternative way to import their shipments to the Yemen market.

- There is no strategic study nor a long-term vision for Aden container terminal to enhance its long-term competitiveness, and manage its current operations towards achieving the objectives of its future vision and its medium and long-term strategic plans.
- The successive Yemeni governments did not provide legislation related to the port and container activity in particular, because container transport represents the future of maritime transport due to its reliability and low costs. So far, the container terminal is using the free zone law in order to ensure the liberation of its transactions, activities and projects from direct customs interventions and the bureaucracy of the public sector.
- The interference and conflicts of the government agencies, which hinders Aden container terminal, as well as the weak government role in enhancing the competitiveness of the terminal at the local level.

For further research, there should be research to develop a model that can be used to improve the competitiveness position of Aden

container terminal using Fuzzy Analytic Hierocracy Process (FAHP). In addition, the research should target identifying strength, weakness, opportunities and threats that could face applying private sector privatization in Aden port using SWOT analysis.

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