Analyzing the feasibility for the application of Public private partnership (PPPs) at the Port of Aden

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Abstract:

Seaports are critical to the economic development of Yemen due to the country's strategic location at the southern tip of the Arabian Peninsula, providing access to important shipping lanes for the transportation of goods and resources between Asia, Europe, and Africa. The country's economy relies heavily on the import and export of goods through its ports, particularly crude oil and natural gas, which are the country's primary exports.

Port of Aden faces several challenges, including the ongoing conflict in Yemen, inadequate infrastructure, and insufficient financial resources. These challenges have hindered the port's growth and development, and as a result, the port's potential has not been fully realized.

This research aims to define challenges and problems facing the application of public-private partnerships (PPPs), however studying the feasibility for applying the partnership with the private sector. This research follows qualitative approach using SWOT analysis to identify strength; weaknesses; threats and opportunities of applying Public-private partnerships (PPPs) in ports; during the year 2023.

Keywords: public private partnership (PPPs), Yemen, port of Aden, SWOT.

تحليل إمكانية تطبيق الشراكة مع القطاع الخاص في ميناء عدن

المستخلص:

تعد الموانئ البحرية حاسمة للتنمية الاقتصادية في اليمن بسبب الموقع الاستراتيجي للبلد في الطرف الجنوبي من شبه الجزيرة العربية، مما يوفر الوصول إلى ممرات الشحن الهامة لنقل البضائع والموارد بين آسيا وأوروبا وأفريقيا. يعتمد اقتصاد البلد بشكل كبير على استيراد وتصدير البضائع من خلال موانئه، وخاصة النفط الخام والغاز الطبيعي، واللذان يعتبران صادرات البلد الرئيسية.

يواجه ميناء عدن العديد من التحديات، بما في ذلك الصراع المستمر في اليمن، وعدم كفاية البنية التحتية، وعدم توافر الموارد المالية الكافية. هذه التحديات عوقبت نمو الميناء وتطوره، ونتيجة لذلك، لم تتم استغلال الإمكانات الكاملة للميناء.

تهدف هذه الدراسة إلى تحديد التحديات والمشاكل التي تواجه تطبيق الشراكات بين القطاعين العام والخاص(PPP) ، ودراسة جدوى تطبيق الشراكة مع القطاع الخاص. تتبع هذه الدراسة المنهج النوعي باستخدام تحليل SWOT لتحديد النقاط القوية والضعف والتهديدات والفرص لتطبيق الشراكات العامة والخاصة (PPP)في الموانئ خلال عام 2023.

الكلمات الدالة: الشراكة بين القطاع العام والخاص، اليمن، ميناء عدن، نموذج التحليل الرباعي.

1. Introduction:

Port of Aden is the major seaport in Yemen and plays a significant role in the country's economy. It is located in the southern part of Yemen, close to the Bab-el-Mandeb Strait, which connects the Red Sea with the Gulf of Aden and the Indian Ocean. The port serves as a gateway for Yemen's international trade, facilitating the import and export of goods.

The importance of the port of Aden is evident in the following ways:

- Economic impact: Port of Aden is a major source of revenue for the Yemeni government and contributes significantly to the country's economy. The port handles a large volume of cargo, including oil, gas, and other goods, which generate income for the government.
- Strategic location: Port of Aden is strategically located on the shipping route between Asia and Europe, making it a crucial transit point for international trade. Its location at the entrance of the Red Sea also makes it an important hub for ships traveling to and from the Middle East.
- Employment opportunities: Port of Aden provides employment opportunities for a significant number of people in the region, both directly and indirectly. The port employs thousands of workers, and the goods and services provided by the port also create jobs in related industries.

- Infrastructure development: The development of Port of Aden infrastructure is essential for the growth of the Yemeni economy. The port's expansion and modernization will enhance its capacity and efficiency, making it more attractive to international trade partners.

Public-private partnerships (PPPs) play a crucial role in the development and operation of ports. Ports are critical infrastructure for international trade, and they require significant investment in infrastructure, technology, and human capital to remain competitive. Public-private partnerships bring together the strengths of both the public and private sectors to create a sustainable, efficient, and cost-effective port infrastructure. One of the primary benefits of PPPs in ports is the sharing of risk and responsibilities. The public sector provides the regulatory framework and infrastructure investments, while the private sector contributes to the development of commercial activities and operational expertise. This partnership allows for the sharing of risk and reduces the financial burden on the public sector.

Public-private partnerships (PPPs) in ports refer to collaborations between the government or public sector and private sector entities in developing, managing, and operating port facilities. These partnerships can take many different forms, including concession agreements, build-operate-transfer (BOT) arrangements, joint ventures, and management contracts. The rationale for PPPs in ports is that they can bring together the strengths of both the public

and private sectors to achieve better outcomes than either could achieve alone. For example, the public sector may have access to funding and regulatory powers, while the private sector may have expertise in port management and operations, as well as the ability to raise capital (Yescombe, 2011).

PPPs in ports can involve a wide range of activities, such as developing new port facilities, upgrading existing infrastructure, improving port efficiency and productivity, and enhancing security and environmental performance. These activities can be funded through a variety of sources, including government grants, private equity, bank loans, and user fees. Successful PPPs in ports require careful planning and management to ensure that the interests of both parties are aligned and that the partnership is structured in a way that enables both parties to share in the risks and rewards of the venture. Key factors to consider include the allocation of responsibilities and risks, the sharing of profits and losses, and the establishment of performance indicators and targets.

2. Research problem:

Port of Aden, like other ports in Yemen, faces several challenges that impact its efficiency and productivity. Some of the major challenges include:

- Conflict and political instability: The ongoing conflict and political instability in Yemen have severely impacted the operations of Port of Aden. The conflict has caused damage

to the port's infrastructure, reduced the volume of cargo, and increased the cost of imports and exports.

- Security concerns: The security situation in Yemen is volatile, and Port of Aden is not immune to security threats. There have been several incidents of piracy, theft, and smuggling that have affected the port's operations.
- Limited resources and capacity: Port of Aden suffers from limited resources and capacity, which hinders its ability to handle larger volumes of cargo. The port's infrastructure is outdated and in need of modernization to improve efficiency and productivity.
- Lack of investment: Due to the conflict and political instability, Port of Aden has not received the necessary investments to upgrade its infrastructure and expand its operations. This has resulted in a lack of modern equipment and technology, which has impacted the port's competitiveness.
- Bureaucracy and corruption: The bureaucracy and corruption in Yemen have affected the operations of Port of Aden. The clearance of cargo can be a lengthy and complicated process, which adds to the cost and time of importing and exporting goods.
- Environmental challenges: Port of Aden is located in a sensitive environmental area, and pollution is a significant concern. The port needs to implement measures to minimize

the impact of its operations on the environment and ensure sustainable development.

These challenges need to be addressed to improve the efficiency and productivity of Port of Aden and ensure that it plays a vital role in the development of Yemen's economy.

3. Theoretical background:

3.1 Types of Public-private partnerships (PPPs):

There are different types of public-private partnerships (PPPs) that can be applied in the context of port development and management (Hodge, and Greve, 2017; Joshi, and Bhatnagar, 2014; Roy, and Williams, 2017). Some of the common types are:

- Concession agreements: In this type of PPP, the private sector partner is granted the right to operate and manage the port facility for a specific period of time, typically between 20 to 30 years. The private partner is responsible for financing, operating, and maintaining the port, and is entitled to collect revenue from the port operations.
- Joint ventures: In a joint venture, the public and private partners form a new entity to jointly develop and operate the port facility. Both parties share the costs and risks of the project, and also share in the profits.
- Management contracts: In a management contract, the private partner is contracted to manage and operate the port facility on behalf of the public sector partner. The private

partner may be responsible for various aspects of port management, such as marketing, planning, and operations.

- Design-Build-Finance-Operate (DBFO): In this type of PPP, the private partner is responsible for designing, building, financing, and operating a specific asset, such as a road or bridge. The private partner collects revenue from the asset over a period of time, often through tolls or user fees.
- Management Buy-Out (MBO): In an MBO, the management of a public asset purchases the asset from the public sector and operates it as a private business. This type of PPP is often used for small or medium-sized public assets, such as community centers or sports facilities.
- Lease: In a lease PPP, the private partner leases a public asset from the public sector for a specified period of time and operates it as a private business. The private partner is responsible for maintaining and operating the asset during the lease period, and may be entitled to collect revenue from the asset.
- Shared Savings: In a shared savings PPP, the private partner invests in energy-efficient upgrades to a public asset, such as a government building or school, and shares the cost savings achieved from the upgrades with the public sector.
- Blended Finance: In a blended finance PPP, the public and private sectors collaborate to finance a project, often by combining public funds with private investment. This type

of PPP is often used for large infrastructure projects, such as transportation or water treatment facilities.

- Build-Own-Operate-Transfer (BOOT): In a BOOT PPP, the private partner designs, builds, finances, and operates a specific asset, such as a power plant or water treatment facility, for a defined period of time. At the end of the period, ownership of the asset is transferred to the public sector.
- Service Contracts: In a service contract PPP, the private partner is contracted to deliver a specific service or set of services, such as waste collection or facility maintenance, for a defined period of time. The private partner is paid based on the services delivered, and may be responsible for providing equipment and staff.
- Infrastructure Trusts: In an infrastructure trust PPP, the public and private sectors establish a trust to finance and manage a specific infrastructure project, such as a transportation network or energy grid. The trust is responsible for raising capital and managing the project, and may be structured as a public or private entity.

3.2 Importance of Public-private partnerships (PPPs):

Public-private partnerships (PPPs) are important for several reasons:

- Bridging funding gaps: PPPs enable private sector investment in public sector projects, allowing governments

to bridge funding gaps and complete necessary infrastructure and services.

- Risk sharing: PPPs can allow for risk sharing between the public and private sectors, with the private sector taking on some of the financial and operational risks associated with delivering a project or service.
- Innovation and efficiency: The private sector often bring innovation and efficiency to public sector projects, which can result in cost savings, improved service delivery, and higher quality outcomes.
- Increased accountability: PPPs can result in increased accountability for both public and private sector partners, as the private sector is responsible for delivering the project or service according to defined performance metrics and benchmarks.
- Public sector capacity building: PPPs can help build the capacity of the public sector by providing opportunities for government officials to work alongside private sector partners and learn about innovative approaches and technologies.

Overall, PPPs are important because they can help governments deliver public goods and services more efficiently and effectively, while also enabling private sector investment and innovation. However, it is important to carefully design and implement PPPs to ensure that they are in the public interest and

deliver long-term benefits (United Nations Economic Commission for Europe (UNECE); (2016); World Bank. (2018); European Commission (2019).

33 Previous studies on Public-private partnerships (PPPs):

Liu, et al., (2014) aims to review and synthesize the literature on performance measurement in public-private partnerships (PPPs) and identify the challenges and limitations in the current practices. The problem addressed in the paper is that while performance measurement is crucial for evaluating the success of PPPs, there is a lack of consensus on the appropriate measures and methods to assess PPP performance. Additionally, there is a need to understand the different contexts and factors that affect PPP performance measurement. The methodology of the paper involves a systematic review of the literature on PPP performance measurement from various sources, including academic journals, conference proceedings, and government reports. The review focuses on PPPs in different sectors, including transportation, water, energy, and healthcare, and considers both developed and developing countries. The findings of the paper highlight the challenges and limitations in current PPP performance measurement practices, such as the lack of standardization and consistency in performance measures, the difficulty in attributing performance outcomes to specific partners, and the limited use of outcome-based measures. The paper also identifies the contextual factors that influence PPP performance, such as the type of PPP, the regulatory environment, and the

political and economic context. Based on the findings, the paper provides several recommendations for improving PPP performance measurement practices, such as developing standardized and consistent measures, using outcome-based measures, improving data collection and analysis, and considering contextual factors in performance measurement.

Usman, and Javokhir, (2021). aims to provide a comprehensive definition of public-private partnerships (PPPs) and to clarify the misunderstandings and ambiguities surrounding PPPs. The authors identify several problems with the definition and understanding of PPPs, including the lack of a universally accepted definition, confusion with other forms of public-private collaboration, and misunderstanding of PPPs as a panacea for all public infrastructure problems. The authors conduct a literature review of existing PPP definitions and frameworks, analyze the differences and similarities among them, and propose a comprehensive definition of PPPs based on their findings. Based on their analysis, the authors propose a comprehensive definition of PPPs that emphasizes the sharing of risks, responsibilities, and benefits between public and private partners in the delivery of public infrastructure and services. They also identify several key features of PPPs, including long-term contracts, performance-based payments, and shared governance. The authors recommend that policymakers, practitioners, and researchers adopt the proposed definition of PPPs to enhance clarity and consistency in

the use of the term. They also suggest that future research should focus on improving the effectiveness and efficiency of PPPs through better risk allocation, contract design, and governance mechanisms.

3.4 Ports applied Public-private partnerships (PPPs):

There are many examples of ports around the world that have applied public-private partnership (PPP) models to develop, manage, and operate their facilities. Here are a few examples:

- Port of Rotterdam, Netherlands: The Port of Rotterdam is one of the largest ports in the world and has been involved in several PPPs to develop and manage its facilities. For example, in 2018, the port entered into a 30-year concession agreement with a private consortium to operate and develop the Maasvlakte 2 container terminal (Van der Lugt, & de Langen, 2018; de Langen, & Van der Lugt, 2019).
- Port of Brisbane, Australia: The Port of Brisbane has implemented several PPPs to develop its facilities, including a 99-year lease of its container terminal to a private consortium in 2010. The consortium was responsible for funding and managing the development and operations of the terminal, while the port retained ownership of the land and infrastructure (Xiao, et al., 2019).
- Port of Singapore: The Port of Singapore has been involved in several PPPs to develop its facilities and improve its operations. For example, in 2019, the port signed a

memorandum of understanding with a private consortium to develop and test a fully automated container terminal (Leung, 2017).

- Port of Los Angeles, United States: The Port of Los Angeles has implemented several PPPs to improve its operations and environmental performance. For example, the port has entered into agreements with private entities to develop and operate shore power infrastructure and to install emissions reduction technologies on ships (Ho, 2015).
- The port of Salalah, The Government of Oman, Maersk Line, Sealand, and private institutions, agree to invest in the development of the Raysut Port jointly. As a result, the Port of Salalah Container Terminal was inaugurated in November 1998 and won the Best Investment Project in Oman Award. The Salalah Port is one of the largest ports in the Middle East and has become a major transshipment hub for container shipping in the region. The partnership has also contributed to the economic development of Oman, creating jobs and attracting investment to the region. (SalalahPort, 2023)
- Port of Antwerp, Belgium: The Port of Antwerp has implemented several PPPs to develop and manage its facilities. For example, in 2018, the port entered into a 50-year concession agreement with a private consortium to operate and develop the Deurganckdok container terminal (Macharis, & Sys, 2015; Meersman, et al., 2017).

- Port of Santos, Brazil: The Port of Santos has implemented several PPPs to improve its infrastructure and operations. For example, the port has entered into agreements with private entities to develop and operate a new grain terminal and to modernize its navigation and traffic control systems (de Castro, et al., 2017).
- Port of Hamburg, Germany: The Port of Hamburg has implemented several PPPs to develop and operate its facilities. For example, in 2018, the port entered into a joint venture agreement with a private company to develop and operate a new rail terminal (Storck, 2014).
- Port of Qingdao, China: The Port of Qingdao has implemented several PPPs to develop and operate its facilities. For example, the port has entered into agreements with private entities to develop and operate a new container terminal and to provide value-added services such as customs clearance and inspection (Zhao, & Liu, 2018).
- Port of Jebel Ali, United Arab Emirates: The Port of Jebel Ali has implemented several PPPs to develop and operate its facilities. For example, the port has entered into agreements with private entities to develop and operate a new container terminal and to provide port-related services such as logistics and warehousing (Abdallah, T., & Alkhaldi, 2019).
- Port of Valencia, Spain: The Port of Valencia has implemented several PPPs to develop and operate its facilities. For example,

the port has entered into agreements with private entities to develop and operate a new container terminal and to provide port-related services such as logistics and transportation (Sánchez, & García-Álvarez, 2016).

- Sohar Port and Freezone is an example of a public-private partnership in a port in Oman. The port is operated by the Omani government and a consortium of companies including the Port of Rotterdam, Port of Antwerp, and the Omani logistics company, Asyad Group. The partnership has led to significant investment in the port, including the construction of new berths and the acquisition of new cranes and other equipment. The improvements have increased the port's capacity and efficiency, making it a major hub for trade in the region. The partnership has also contributed to the economic development of the region, creating jobs and attracting investment to the area (Al-Hinai er al., 2017).

4. Empirical analysis:

SWOT analysis used to determine strength; weaknesses; threats and opportunities of applying Public-private partnerships (PPPs) generally in ports round the world.

4.1 Strength of Public-private partnerships (PPPs)

Public-private partnerships (PPPs) in ports can provide several benefits to both the public and private sectors (Tovar, & Barros, 2018; De Langen, & Pallis, 2016. Li, et al., 2019; Wang, & Yeo, 2018). Here are some additional details:

- Increased investment: PPPs can attract greater investment in port infrastructure and development than the public sector could finance alone. Private sector entities can bring in their own capital and financing options to help fund port projects and expansions.
- Long-term planning and commitment: PPPs enable long-term planning and commitment to port development and operations, as they typically involve long-term contracts that span decades. This can provide greater certainty and stability for both the public and private sectors.
- Improved service quality: PPPs can lead to improvements in the quality of services provided by ports, as private sector entities are incentivized to deliver high-quality services to customers in order to maintain their reputation and profitability.
- Enhanced governance: PPPs can help to improve governance and transparency in port operations, as they typically involve clear performance targets and monitoring mechanisms that are agreed upon by both parties.
- Flexibility and adaptability: PPPs allow for greater flexibility in project design, implementation, and management, as the private sector partners can bring in their own expertise and resources to adapt to changing circumstances.

- Improved risk management: PPPs can improve risk management by allowing risks to be allocated to the party best able to manage them, whether that is the public or private sector partner.
- Long-term sustainability: PPPs can lead to more sustainable infrastructure development, as private sector partners have a financial incentive to ensure the long-term sustainability of the project.
- Job creation and economic growth: PPPs can stimulate job creation and economic growth, as they often require significant investment in local communities and can lead to the development of new industries and services.
- Improved service quality: PPPs can lead to improved service quality, as private sector partners are often more incentivized to deliver high-quality services in order to maximize profits and maintain their reputation.
- Increased innovation: PPPs allow the private sector to bring in innovative technologies, management practices.
- Better value for money: PPPs can lead to better value for money in the long term, as they encourage private sector investment and competition, which can drive down costs and improve service quality.
- Faster project delivery: PPPs can often result in faster project delivery, as private sector partners have more flexibility in project design, procurement, and implementation.

4.2 Weaknesses of Public-private partnerships (PPPs)

- Private sector may prioritize profit over public interest: Private sector partners may focus solely on maximizing profits, which could result in neglect of public interests and priorities.
- Complexity of negotiations: Negotiating PPP agreements between public and private sectors can be complex and time-consuming, especially when it comes to defining roles, responsibilities, and risk allocation.
- Limited public sector control: In PPPs, the public sector often has limited control over the private partner's operations, which can make it difficult to ensure the partner's compliance with regulations and performance standards.
- Financial risk: PPPs typically require significant up-front investment from the private sector, which can expose them to significant financial risks, especially if the expected revenues do not materialize.
- Limited competition: PPPs may limit competition in the market, which can negatively affect consumers and other businesses.

One potential weakness of PPPs in ports is that they can sometimes result in private companies prioritizing profits over public interests, which can lead to conflicts of interest and decreased accountability. Additionally, PPPs may not always

result in cost savings or more efficient operations, particularly if the private sector partner is more focused on short-term profits rather than long-term sustainability. Finally, there may be concerns about transparency and public participation in PPP decision-making processes, particularly if there is limited public oversight or involvement in the partnership (Ng, & Tongzon, 2010; Pallis, 2010; Notteboom, 2014; Tovar, & Bergqvist, 2015; Panayides, 2016).

4.3 Threats of Public-private partnerships (PPPs)

- Unbalanced risk allocation: The risk allocation between the public and private sectors may not be balanced, which can lead to disputes and legal challenges.
- Political interference: Political interference can affect the stability and continuity of public-private partnerships, particularly if there is a change in government or policy direction.
- Limited accountability: Public-private partnerships may operate outside the scope of public procurement and oversight, which can limit the accountability of the private partner.
- Uncertain financial returns: There is always a risk that public-private partnerships may not achieve the desired financial returns, particularly if market conditions change or unforeseen events occur.

- Environmental and social impact: Public-private partnerships may be perceived as prioritizing economic interests over environmental and social concerns, which can lead to opposition and protest.
- Regulatory changes: Changes in regulations or policies can affect the viability and profitability of public-private partnerships, particularly if they increase costs or limit operational flexibility (Song, & Yeo, 2017; Wang, et al., 2018; Zheng, & Song, 2019).

4.4 opportunities of Public-private partnerships (PPPs)

- Increased efficiency and productivity: PPPs can lead to improved efficiency and productivity in port operations through the sharing of resources, knowledge, and expertise.
- Access to funding: PPPs can provide access to additional funding sources, including private capital, which can be used to finance port infrastructure and expansion projects.
- Improved risk management: PPPs can help to better manage risks associated with port development and operations by sharing risks between the public and private sectors.
- Innovation: PPPs can bring new ideas and technologies to port operations and management, driving innovation and improving competitiveness.
- Stakeholder engagement: PPPs can help to engage a broader range of stakeholders, including local communities and private sector partners, in the development and operation of ports.

- Long-term partnerships: PPPs can create long-term partnerships between the public and private sectors, promoting stability and sustainability in port development and operations.
- Improved efficiency and productivity: The collaboration between the public and private sectors can lead to increased efficiency and productivity in port operations, resulting in cost savings and higher revenues.
- Access to private sector expertise: The private sector partner can bring valuable expertise and innovation to the port, leading to improved performance and competitiveness.
- Risk sharing: Public-private partnerships can help distribute risks and responsibilities between the public and private sectors, reducing the overall risk exposure for both parties.
- Access to financing: Private sector partners may have access to financing options that are not available to the public sector, allowing for greater investment in port infrastructure and operations.
- Enhanced stakeholder engagement: Public-private partnerships can encourage greater stakeholder engagement and collaboration among government agencies, port authorities, and private sector partners, leading to more effective decision-making and problem-solving (Abadie, & Baumol, 2012; Slack, & Comtois, (2013); Ng, & Yip, 2019; Zampino, M., Ferrari, C., & Gattuso, D. (2019).

4.5 Challenges the application of public-private partnerships (PPPs) in Yemen:

The Port of Aden had one of the newest container terminals in the region since its foundation, whereas, less competition was existed in this important shipping routes, however, Aden was acquiring 12% business share in the Red Sea region in compare to the container terminals in the region at the time.

Salalah was the highest ranked container terminal in the region with 44% boniness share, Salalah container terminal was mainly acquiring the transshipment volume of its terminal operator AP Mollar the owner of the largest global container terminal Maersk line.

The below table show the throughput of the most competing terminals in the region which can be used as an indicator for the PPPs contribution into the rise of the terminal's productivity:

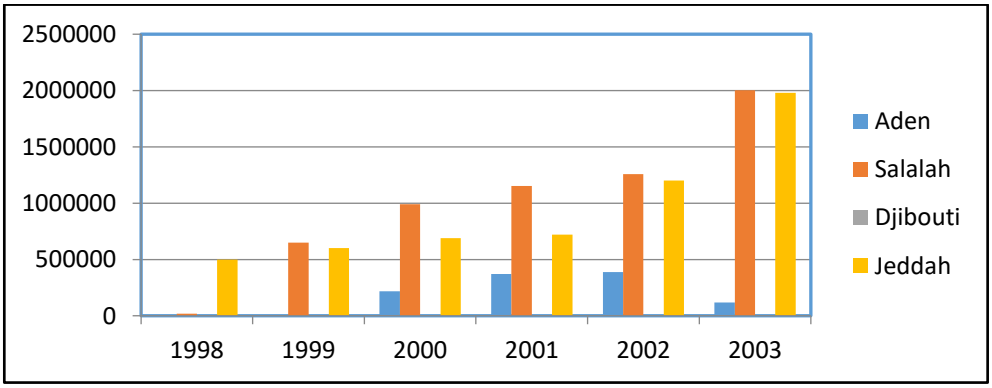

Figure 1: Throughput Comparison for the period (1998-2003). Reference: by author.

From the above table we can see that ACT was the third container terminal in the Red Sea and Gulf of Aden region, whereas there were only three container ports exist in this region. While, before the foundation of the most container terminals in the region, such as: Doraleh (Djibouti), New Sudan (Sudan) and Sokhna Port (Egypt).

However, 2003 has witnessed hug drop in Act business due to the terrorist attacks for the USS Code followed by the attack on the oil tanker Limburg.

The following table will show the period of the first PPPs contribution failure at the Port of Aden by the agreement cancellation with the first container terminal operator PSA on 2003. (UNCTAD, 2004)

The table below shows the period successor the departure of the first terminal operator in Aden, and taking over of the new operator OPM the management of the Port of Aden's container terminal;

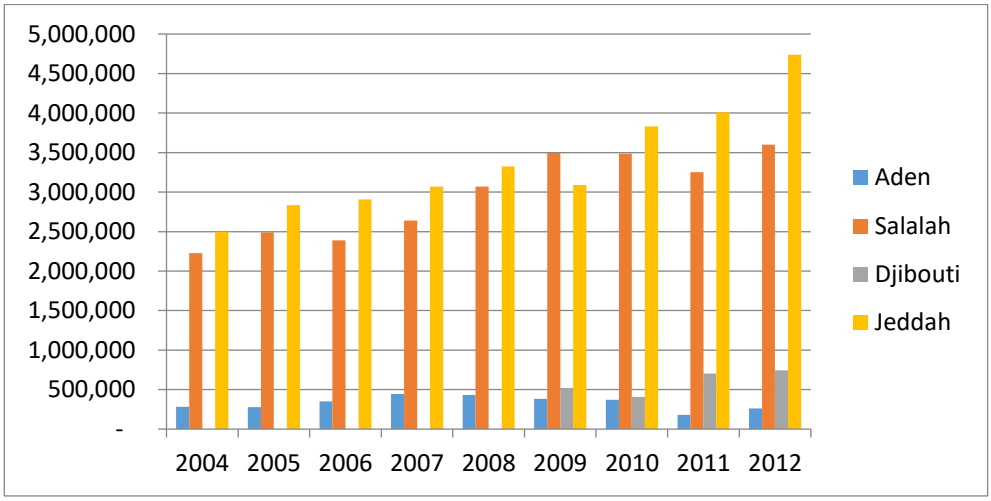

Figure 2: Throughput Comparison for the period (2004-2012)>
Reference: by author.

From the above graph, it is clear that during a period of eight years, many changes and developments occurred, but no for Aden Container Terminal, despite the succession of two different companies to operate and manage it, started with the Singaporean company OPM for the period from 2003 until 2008 (OPM, 2023), followed by DP World for the period from 2009 until 2012 (REUTERS, 2012) However, the terminal's performance remained in place and did not change. On the contrary, there were hug development of other container terminals in the region which has accelerated, and new competing container terminals have emerged to crowd out Aden Container Terminal on its position.

Thus, the lack of stability in partnership with the private sector specialized in the port of Aden had a negative impact, especially the weakness of partnership contracts that did not include substantial transfers of the infrastructure and superstructure of the container terminal.

Since 2012 until now, the Aden Container Terminal has been managed by the government, while preserving the character and privacy of managing the container terminal on the basis of the private sector system, in order to ensure higher efficiency in providing services and discipline.

However, the successive events in Yemen and the political and security instability and its direct impact on the economic situation in the country, especially the Yemeni ports, specifically the port of Aden, shed light on freezing the partnership with the specialized private sector in light of the instability in the Republic of Yemen.

From the figure below, it is clear that the Aden Container Terminal has remained at the same level since its establishment until now in terms of the number of handled containers, as it is limited to serving goods imported for the local market only.

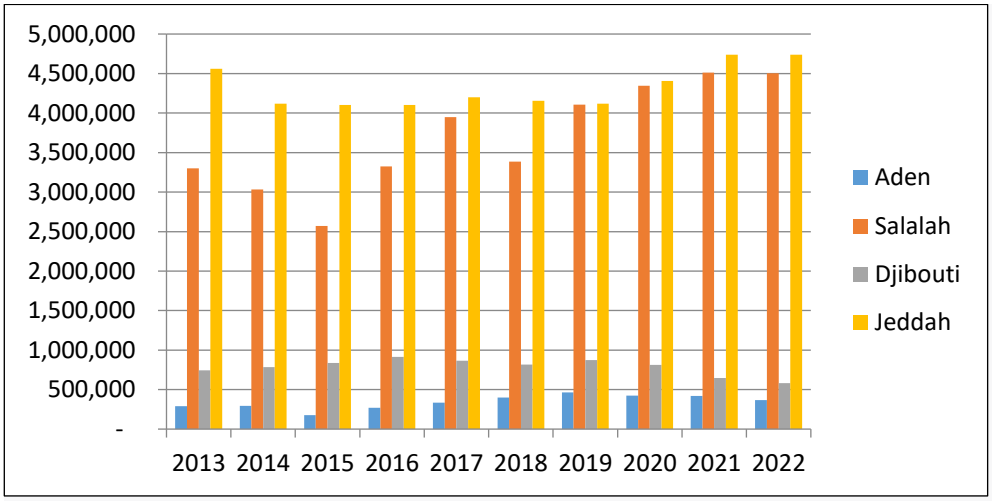

Figure 3: Throughput Comparison for the period (2013-2022). Reference: by author.

There are several challenges and problems facing the application of public-private partnerships (PPPs) in Yemen (El Mahgary & Al-Sabbagh, 2021). Some of these include:

- Political and security instability: Yemen has experienced political instability in recent years, which has made it difficult to attract private sector investment. Investors are often reluctant to invest in countries with unstable political environments.
- Lack of transparency: There is a lack of transparency in the procurement process, which can lead to corruption and favoritism.

- Lack of technical expertise: The government may not have the technical expertise necessary to manage PPP projects effectively. This can lead to delays and cost overruns.
- Financing challenges: PPPs require significant upfront capital investment, which can be a challenge for the government and private sector partners. There may also be challenges in securing financing from banks and other financial institutions.
- Resistance to change: There may be resistance to change from government officials who are used to traditional procurement methods.
- Lack of legal and regulatory framework: The absence of a clear and comprehensive legal and regulatory framework for PPPs in Yemen may create uncertainty and increase the risk of disputes and conflicts between the public and private sectors.
- Limited institutional capacity: Yemen's public sector institutions may lack the necessary capacity and expertise to effectively manage PPP projects, including the preparation, procurement, and monitoring of contracts.
- Political and social instability: Yemen has faced significant political and social instability in recent years, which may affect investor confidence and make it difficult to secure financing for PPP projects.

- Financial sustainability: PPP projects may require significant upfront investments and may not generate sufficient revenue to cover costs in the long run, leading to financial sustainability issues.
- Legal disputes and contract enforcement: The legal system in Yemen may face challenges in enforcing contracts and resolving disputes, leading to delays and increased costs for PPP projects.

Overall, addressing these challenges will require a concerted effort from both the public and private sectors in Yemen. Improving the legal and regulatory framework, promoting transparency, building technical expertise, and addressing financing challenges are all important steps that can help to facilitate the successful implementation of PPPs in Yemen.

5. Conclusion and recommendations:

It is worth noting that PPPs in ports also face challenges and risks, such as contractual and regulatory complexities, political and social opposition, and financial risks. Therefore, careful planning, management, and evaluation are critical to ensure the success of such partnerships.

Some recommendations for applying PPPs in Port of Aden include:

- Establishing a legal framework: The Yemeni government can create a legal framework that encourages private sector investment in the port sector. This framework should

provide clear guidelines on the roles and responsibilities of each party, risk allocation, and dispute resolution mechanisms.

- Engaging private sector partners: The government can engage private sector partners with experience in port management and operation to bring in the necessary expertise and resources to develop the port infrastructure.
- Conducting feasibility studies: Conducting feasibility studies to assess the viability of the proposed PPP projects can help the government to identify potential risks, opportunities, and challenges associated with the project.
- Providing incentives: The government can provide incentives such as tax breaks or subsidies to private sector partners to encourage them to invest in the port sector.
- Monitoring and evaluation: The government should establish a monitoring and evaluation mechanism to track the progress of PPP projects and ensure that they are delivering the desired outcomes. This will help to identify any issues early on and take corrective action to address them.

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