

Effects of the Coronavirus Pandemic on Port's Revenues - Applied Study on Sudanese Ports

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ABSTRACT

This study aims to investigate the effects of the coronavirus pandemic on the revenues of Sudanese ports and calculate revenue lost considering the procedures and restrictions of the Corona pandemic. It was conducted to evaluate the measurement of the lost revenues based on Baxter's approach (1995). The analysis was carried out using the comparative method for Sudanese port activities between two periods, before and during the pandemic epidemic. Data was collected from the annual reports for the period 2013 to 2021 from port authorities and shipping companies. The study revealed a decrease in port activities, despite the importance of Port Sudan port, which serves many landlocked countries, as the number of ships visiting the Sudanese ports decreased by 9.85%. In comparison, the number of containers handled decreased by 21.64%. Income lost from maritime activities was calculated for the arrival of ships at 1, 1,482,630.5 €, and commodity services at 43,125,524 €.

KEYWORDS: Revenues, Coronavirus, Sudanese ports, Ships visiting, and Containers

JEL Classification Code: F13, R4, R41

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1. INTRODUCTION

In December 2019, authorities in Wuhan City, China, made the first official reports of COVID-19 instances in humans. COVID-19 is a sickness brought on by the coronavirus. In March 2020, it was classified as a pandemic with an enormous impact on the global economy. The economic impact of COVID-19 is greater than the sum of all earlier internal and significant occurrences, like the 2008 financial crisis. The pandemic has substantially impacted international trade and financial markets in numerous nations. China's manufacturing output decreased by a record-breaking 40.3 percent in a year. Economies of the Asia Pacific, such as Vietnam, Singapore, and South Korea, have been harmed by a decline in Chinese manufacturing. More than 1.5 million employees have lost their employment because of the COVID-19 Pandemic, according to the Indonesian Ministry of Finance. Over 12,703 flights were

cancelled between January and February. Losses in the aviation service industry revenues have reached about Rp 207 billion (Aljawaheri et al., 2021).

The Corona pandemic has affected the global marine sector because ships pass through a variety of ports and the virus may be prevalent. The first outbreak of the disease appeared on ships in February 2020, with the Japan Diamond Princess cruise ship under quarantine. All 3711 passengers were tested. There were other challenges, including separating traffic lanes for passengers, locating hospitals and transportation companies that would accept these patients, transporting people, overcoming language obstacles, and sustaining daily life (Yamahata & Shibata, 2020). In China, labour shortage caused a reduction in port traffic, and 46% of ship departures on Asia-to-northern Europe were routes cancelled.

This indicates that container ship tonnage was idler than during the global financial crisis of 2008 (Pepe, 2020). According to UNCTAD (2021), various Asian ports have implemented emergency measures aimed at maritime activities with Wuhan, such as delaying port clearance cargo, forbidding ships from docking, and coordination between national health agencies and port and maritime entities. Shipments of gas, refined petroleum products, and crude oil collectively decreased by 7.7 % in 2020, and only 1.5% of the world's dry bulk commerce decreased overall. African nations rely largely on foreign trade to support and strengthen their home economy, and commodities and provide fundamental needs and they experienced a health crisis along with the rest of the world. Ghana, recorded its first active case a day after the March declaration by WHO, and authorities decided to lockdown two major regions including the largest seaport Tema Port (Sackey et al., 2021). As for Sudan, the first case appeared on March 13, 2020, in Khartoum. Then, other cases infected with COVID-19 were revealed, so the authorities decided to impose a total closure all over Sudan. This lockdown included Port Sudan, which is the only seaport of Sudan, and used by some landlocked East African countries such as Ethiopia, South Sudan, and Chad. Port Sudan contains several specialized ports, namely the southern port, which is dedicated to containers; the northern port, which is used as a main port for importing strategic commodities such as fuel, wheat, and sugar; and Bashayer port for South Sudan's oil export operations; in addition to Suakin port, which is dedicated to transporting travellers and livestock exports.

Although the mainstream media has extensively highlighted the effects of the Corona pandemic on the maritime transportation industry, particularly on port traffic and shipping operations, there has been little research on such effects, on African countries in general and Sudan in particular. This study seeks to fill the gap. It aims to measure and calculate the lost revenues of Sudanese ports during the pandemic in the years 2020-2021. This study focuses on the impact of the Corona pandemic on revenues and activities of fleet services and commodity services in Sudanese ports.

2. Literature Review and Hypothesis Development

➤ The Ports Sector:

Inland rivers have served as significant routes for transportation throughout the world, and as time went on, new technologies emerged, and canals were built. In addition, an intricate system of waterway networks was created to provide a waterway network that could be used to convey agricultural and energy resources.

Significant ancient civilizations rose along the banks of important rivers like the Indus, Nile, and Euphrates (Nze, 2019). Ships are a critical component of maritime transport when compared to other modes of transportation like road transport. Shipping has a much cheaper transport cost due to its high transport capacity and low energy consumption. When shipping, the shipper always takes transport time, cost, and service quality into account. (Liu et al., 2020).

According to Takele & Tolcha (2021), the main goal of a seaport is to ensure that both products and people can move quickly and safely through its facilities to reduce overall costs for both shippers and passengers (fare + time). Since ports act as the interface between marine and inland means of transportation, some large seaports also play the role of hubs for connection and transshipment, enabling goods on various long-haul routes to be served more effectively by several ships (roads, railways, or inland navigation system).

A port's economic activity has many different aspects including the marine services that the Port Authority offers to ships, such as pilotage, towing, the provision of utilities like water and power, cargo processing, catering, ship repairs, and other services. Providing port infrastructure and processing cargo in ports are multi-output activities since cargo occurs in a variety of forms, such as containers and bulk, which make up more than 80% of a vessel's cost when it docks at a port (Giamouzi, 2008). The relative costs, speed, and dependability of ports' services change when they implement internal actions like price increases or handling procedures like changes to environmental or security policies. These factors then affect how long it takes a ship to be serviced at a port, how much it costs to use a port, the schedule, as well as the economic benefits (Anderson et al., 2009).

Ports inevitably become a crucial facility in economic activities, to connect various islands and vast seas. The shipping industry has grown to be crucial in supporting other social, economic, governmental, defence, security, and cultural sectors (Hutapea et al., 2021). The expansion of containerization and supply chain globalization has aided the expansion of trade and increased demand for transportation services and infrastructure. The area for cost savings through marine transportation has also progressively shrunk with the growth in the size of container ships. All aspects of the port's operations have moved from the sea to inland due to the requirements of inland regional economic development to serve as freight warehousing and customs clearance centres (Liu et al., 2021).

Countries are interested in developing seaports to increase their important role in global foreign trade, and therefore they are interested in measuring the performance of ports in terms of efficiency indicators, which are according to (Lirn & Ariyana, 2021)

- Fleet service: technical-navigational services (pilotage, mooring, towage);
- Commodity services: Cargo handling services (stevedoring, storage, transshipment and other intra-terminal transport, storage. (Pallis & Tsiotsis, 2007).

➤ **The Effects of Coronavirus in the Ports Sector:**

The pandemic has hurt employment in the port sector; quarantine procedures for employees led to a shortage of workers, adding to scheduling pressures while vessels are moored. Some cargo ports have laid off workers due to lower volumes, and young workers have been particularly vulnerable to job loss and reduced work during the pandemic (ILO, 2020). The maritime fishing industry employs tens of millions of fishermen. The fishing industry, which is a significant source of food, was plagued by several issues common to both fishermen and fishing vessel owners. Examples of these issues are the inability to change the crew, the expiration of medical and competency certificates, the absence of the necessary PPE, travel restrictions, inadequate medical attention on board the ship, and limited access to medical treatment near the coast. Due to the physically demanding and exhausting nature of fishing, the inability to switch personnel can cause lengthy amounts of time spent on board (UN ILO, 2020).

Landlocked countries are countries that do not have any access to the sea. They face problems such as delivery of goods and high transport costs because of weak infrastructure and functioning through borders is difficult. Thus, they hurdle in access production to the world market and have rivalry with other countries (Sharapiyeva et al., 2019). These nations are also impacted by port and border restrictions put in place by the transit nations, which hurt both cargo and passenger traffic and lead to a decline in the demand for container and break-bulk cargo ships. Truck crossing border delays were reported to have increased by 33% and 20% in Paraguay and Bolivia, respectively (Rivera, 2020).

The year 2020 witnessed a 4.0% reduction in shipping container trade year-over-year in ports in Latin America and the Caribbean, a 0.2% decline in port trade activity on South America's east coast, and a decline in trade on the continent's west coast of 3.1%, and in the Caribbean, a fall of 4.9%. The COVID-19 pandemic had a severe impact on Latin America and the Caribbean, bringing to light issues

such as a lack of infrastructure, insufficient regulation, high administrative costs, lack of value-added logistics services, and high logistics costs (Barleta & Sánchez, 2021).

Throughout 2020, fewer seagoing vessels called on African nations. Total vessel calls to ports in Africa decreased by 5.25%. When cargo-only vessels are considered, the decline moderates to 4.3%. Travel by passengers was severely impacted; in 2020, passenger vessel calls to Africa decreased by 48.7%. According to UNCTAD, Africa's exports have decreased by 35%, and its imports have decreased by 25%. From the conclusion of Q2, there had been modest improvements, but double-digit decreases of 17% for imports and 21% for exports persisted (Mahardhika, M., & Arintowati, 2021). The International Chamber of Shipping and United Nations organizations have provided unified advice. During the COVID-19 pandemic, the stakeholders in the marine industry created a list of suggestions on how to ease marine trade for governments and relevant national authorities on how to facilitate maritime trade while protecting sailors' health, maintaining open supply chains, and promoting maritime trade (Dombia-Henry, 2020). The Coronavirus on the Indonesian maritime industry had a clear impact. This is due to the role played by Chinese imports of 20% chemicals, 18% gas, and 16% crude oil in 2019. (Danil, 2020)

➤ **Hypotheses**

Many researchers are interested in the relationship between the Corona pandemic and revenues for various economic sectors. (Håkansson, 2020) assessed changes in the online- and land-based gambling markets in Sweden during the first months affected by the societal impact of COVID-19. The study concluded that revenue-based taxations in licensed gambling decreased markedly from February to March but stabilized into a modest decrease through June

(McDonald & Larson, (2020) examined the effects of the local government's ability to function with decreased sales, and use tax revenue because of changes in individual behaviour, in counties of North Carolina. The study demonstrates that any effect of COVID-19 on the number of sales and tax income collected by North Carolina counties has a serious effect on the counties' ability to maintain a sound financial position. Even if the effects are limited to the remaining months of the fiscal year 2020, the typical North Carolina County will suffer a loss of \$8 million.

(Naik & Haldankar, (2021) aimed to investigate the effects of the COVID-19 first wave on the collection and distribution of Goods and Service Tax (GST)

revenue in India, as well as the effect of COVID-19's first wave on the national GST revenue by state. It was concluded that GST revenue significantly decreased in the months after the announcement of the lockdown. The COVID-19 pandemic had no appreciable effect on GST collection in the big states.

(Gordon, (2021) focused on simulating price and revenue outcomes for the Canadian fishing industry under an alternative policy, which uses estimated demand equations, due to the coronavirus. The study found major types of production price declines in 2020, Which caused shortfalls in revenue compared to 2018. Projections suggest a decline in average revenue between 18% to 57%.

Also,(Carlson et al., (2021) investigated the monetary impact of COVID-19 on radiology departments and described the structure of revenue recovery, in the first 33 weeks of 2020. The study found that early radiology practices could anticipate 50% to 70% losses in imaging volume lasting at least 3 to 4 months, depending on the timing and severity of the outbreak throughout the United States.

In light of the Corona pandemic situation in Indonesia (Christanto, (2021) discussed analyzing companies' revenue growth in the hotel, restaurant, and tourism sub-sector before and after the coronavirus. Based on the results, it was shown that there is a negative difference in revenue growth in the sub-sector of hotels, restaurants, and tourism after the coronavirus. This decline is indicated by a decrease in the number of tourists due to the coronavirus.

(Singh, (2021) aimed to estimate the effect of the coronavirus pandemic on the gaming revenue of the Las Vegas Strip casinos, forecast gaming revenue, and predict the time to recovery. The results of this analysis show that the impact of coronavirus has been drastic, but the economic recovery has been fast.

Deuverden (2022) investigated the effects of tax revenue during the pandemic in Germany. The study found differences in tax revenue growth during the two crises are partially due to reasons of the global financial crisis brought on by years of unfavourable financial sector trends, which required a lot of time to reverse. On the other hand, the coronavirus pandemic had an abrupt, external impact on the economy. Economic recovery phases that start as soon as the pandemic containment measures are implemented

provide evidence that economic growth can resume right away.

The literature review results identified the primary hypothesis: There is an effect of the Corona pandemic on the revenue of Sudanese ports. To verify the primary hypothesis, the following sub-hypotheses were formulated:

H1: There is an effect of the Corona pandemic on the revenue of fleet services Activities in Sudanese ports.

H2: There is an effect of the Corona pandemic on the revenue of commodity services in Sudanese ports.

3. Research Methods and Material

To study the impact of the pandemic on the income of Sudanese ports, measures are used to compare the port's traffic before and after the pandemic outbreak. The data were collected from annual reports for the Sudan Ports Authority and Shipping companies. The dataset covers the period before the pandemic from 2014 to 2019, and the period after the pandemic from 2020- 2021.

This study used the comparative method of Sudanese port activities between these two periods. The study followed these steps:

- The port provides its basic services to the fleet and commodity.
- Fleet service: includes all the costs associated with providing tugs, pilots, anchorage, launch, radio/radar, services, dockage, oil, and water.
- Commodity services: include all the costs associated with loading/discharge, stevedoring, Clerking/checking, equipment rental, and Inland Movement like short/ long-distance truck, transport, and rail transport (Nze, 2019).

Revenue is revenue generated from the provision of services, which is the point of delivery to the other party and is recognized at the time of delivery. Revenue is one of the most essential elements among the components of accounting profit, which is a measure of enterprise performance. (Kim, 2018)

- lost revenue occurs when actual sales are less than the sales level used to set the price (Baxter, 1995).d

$$\text{Lost Revenue} = (\text{Sales}_N - \text{Sales}_{TV}) \times P$$

where Sales N are the actual sales in year N . Sales_{TV} are the sales recorded for historical test years. P. price

4. Results and Discussion

Fleet services:

Table1. annual number of visiting ships from 2014- to 2019

Month	containers	General cargo	Dry bulk	Petroleum	Liquid bulk	Car carriers	Rolling	others	total
2014	320	132	81	80	30	50	41	21	755
2015	304	169	61	75	38	49	47	7	750
2016	283	147	61	54	36	53	37	0	671
2017	229	133	87	83	33	40	21	12	638
2018	206	109	86	99	26	43	16	9	594
2019	179	98	78	100	24	34	29	10	552
Total	1521	788	454	491	187	269	191	59	3960

From Table 1 we find the following:

- The total shipping which arrived in Sudanese ports from 2014 to 2019 (six years) was 3960 ships
- the average is 660 ships

Table2. annual number of visiting ships from 2020- to 2021

Month	containers	البضائع العامة	Dry bulk	Petroleum	Liquid bulk	Car carriers	Rolling	others	total
2020	156	151	76	77	25	41	28	16	570
2021	128	204	55	108	25	38	51	11	620
Total									1190

From Table 2 we find the following:

- The number of visiting ships in 2020 -2021 was 1190 ships
- the average is 595 ships.
- By comparing the number of ships for the period before Corona pandemic, which averaged 660 ships, while during the Corona period (2020-2021) it reached 590 ships
- The shortage was 65 ships

Table2. revenues received by the port authority on a ship 660 feet from the shipping agent

Serv Name	value
Pilotage charges	1120
Tug and line attendance	3696
Accostage of berth	12811.86
Port dues	4626.51
Fees of papers inspection of a vessel	300
Security@ policy charges	170.22
Garbage collection	85.11
	22,809.70

From Table3 we find the following:

lost revenue $65 \times 22809.22 = \underline{1,482,599.3 \text{ €}}$

Commodity services:

Table4. Number of containers according to imports and exports in Sudanese ports period 2014 -2019

Item	2014	2015	2016	2017	2018	2019	total
Import	218,108	242,680	234,589	252,383	229,908	212,710	1,390,378
Export	216,337	239,135	230,766	234,953	221,804	209,887	1,352,882
Total	434,445	481,815	465,355	487,336	451,712	422,597	2,743,260

From Table 4 we find the following:

- Average annual equals 457,210 containers

Table5. Number of containers according to imports and exports in Sudanese ports 2020-2021

Item	2020	2021	total
import	204,210	159,412	363,622
Export	192,057	160,862	352,919
total	396,267	320,274	716,541

From Table 5 we find the following:

- Average in 2020- 2021 equals 358,271 containers
- When comparing the average number of containers handled in Sudanese ports during the period from 2014-2019, it is 457,210, while the average during the years 2020-2021 is 358,271. Therefore, there is a decrease of 98,939 containers

The port authorities provide handling and loading services from/to the ship, and land services, and charge fees for each container according to the following:

Table6. revenues of Loading or discharging operating containers in Sudanese ports

Basic charges	20 feet		40 feet	
Loading or discharging the operating full container	108	81	163	118
Transport container to/ from Salom	40	33	60	47
Lifting or uplifting to truck or chassis or rail wagon	79	56	81	58
Transport from the quay to the marshalling area	147		157	
Transport from the marshalling yard to a customs inspection area	90		98	
total	464	170	559	223

From Table 6 we find the following:

- Port authorities charge fees for container services that vary according to size and empty/full container.
- The service charge for full containers is higher than for empty containers.

According to data from the southern part, which is the port specialized in containers, most containers are handled in it

Table7. Classification of containers by type

	20 feet		40 feet	
full	967,087	%41	851,100	%36
empty	311,783	%13	243,059	%10

From Table 7 we find the following:

- Most of the containers handled in Port Sudan are 20 feet, full representing 41% and 13% empty. As for 40-foot containers, they are 36% full and 10% empty.
- The number of lost containers due to the Corona pandemic is 98,939, the number of containers for each type can be calculated according to the above ratios.
- 20 feet full is 41%, equivalent to 40,565 lost containers.
- 20 feet empty is 13%, which is equal to 12,862 lost containers.
- 40 feet full 36%, which is equal to 35,618 lost containers.
- 40 feet empty is 10%, which is equal to 9,894 lost containers

Table8. lost revenues for commodity services

	Ratio	Number of containers	Revenue by container	Total by €
20 feet full	41%	40,565	464	18,822,160
20 feet empty	13%	12,862	170	2,186,540
40 feet full	36%	35,618	559	19,910,462
40 feet empty	10%	9,894	223	2,206,362
total		98,939		43,125,524

- Lost revenue for commodity services = 43,125,524 €
- Lost revenue for visiting ships services = 1,482,599.3 €

Total Lost revenue = 44,608,123.3

The study found an impact of the Corona pandemic on revenues for Sudanese ports, and this is consistent with (Håkansson, 2020), and (Singh, 2021) which found that overall revenue-based taxations in licensed gambling decreased markedly in Sweden, and Las Vegas Strip casinos during the first months. It agrees with the study (Gordon, 2021) which searches for effects on the Canadian fishing industry, and (Carlson et al., 2021) focusing on radiology departments in the United States, whose projections suggest a decline in average revenue between 18% to 57%, and 50% to 70%.

Also, it agrees with (McDonald & Larson, 2020), (Naik & Haldankar, 2021), and (Deuverden, 2022) who searched the effects of the coronavirus pandemic on Tax revenue in the USA, India, and Germany and found that tax revenue significantly decreases in the months after lockdown.

5. Conclusions

The study aimed to analyze and measure the impact of the COVID-19 pandemic on revenues in Sudanese ports. Data was gathered both before and during the crisis breakout for the analysis. It was found that Covid-19 had missed revenues during the lockdown period. The ports were influenced by a lack of shipping traffic from an average of 660 ships per year to an average of 595 during the outbreak, resulting in a decrease of 9.85% in shipping traffic. Also, marine operations were influenced. The average number of containers handled in Sudanese ports was 457,210, while the average during the years 2020–2021 was 358,271. Therefore, there is a decrease of 98,939 containers and, as a result, a decrease of 21.64% in ground operations.

The results of the analysis mentioned above are beneficial for Sudanese port authorities and shipping company agents to coordinate and manage their post-pandemic operations. Also, increased service frequency for sailing or even expanding ships' capacity via new regional hubs with high economic potential, could take advantage of the geographical location of Port Sudan on the Red Sea coast. Port Sudan provides services to countries such as South Sudan, Chad, and Ethiopia. Other Central African countries also need Port Sudan services to extend the network and look for new potential destinations with lower risk to satisfy the expectations of good service in the new normal situation.

This study has added to the literature in three ways. First, it is the first study to evaluate the impact of the COVID-19 pandemic on Sudanese ports. Second, it conducted a comparative analysis to measure lost revenues for ports during the pandemic. Third, the study made use of the data for activities both before and after the pandemic outbreak. The study is also subject to limitations. The main limitation of this research is that the activities of the Sudanese ports were carried out overall, and did not consider in detail the extent of the port's machinery and equipment's ability to meet modern economic and technical developments so that the port is attractive to transiting ships, in comparison with the neighbouring Red Sea ports. Also, the data did not distinguish traffic and amount between Sudan's foreign trade movement and transiting goods of locked countries. Therefore, more research is needed to reveal the impact of various crises on Red Sea ports to help port authorities develop competitive strategies, that take advantage of opportunities such as the location and length of the

Sudanese Red Sea coast. This helps in creating job opportunities, improving the level of income, and improving the social role of the port for the local community.

Future research should continue to examine the effects of unexpected health and financial crises on all African ports at a more detailed level. It should examine the ability of African ports to continue to adjust their policy program in the marine service sector with more economically diverse activities, like improving cruise shipping networks and management, to support the tourism sector in Africa. This would make it easier to translate scholarly findings into policy recommendations.

References

- [1] Aljawaheri, B. A. W., Ojah, H. K., Machi, A. H., & Almagtome, A. H. (2021). COVID-19 Lockdown, Earnings Manipulation and Stock Market Sensitivity: An Empirical Study in Iraq. *Journal of Asian Finance Economics and Business*, 8(5), 707–715. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0707>
- [2] Anderson, C. M., Opaluch, J. J., & Grigalunas, T. A. (2009). The demand for import services at US container ports. *Maritime Economics and Logistics*, 11(2), 156–185. <https://doi.org/10.1057/mel.2009.4>
- [3] Barleta, E. P., & Sánchez, R. J. (2021). 2020 Port Report: the impact of the coronavirus disease (COVID-19) pandemic on the shipping trade, trans-shipment and throughput of container ports in Latin ... 2. <https://repositorio.cepal.org/handle/11362/47017>
- [4] Baxter, L. W. (1995). Understanding net lost revenue adjustment mechanisms and their effects on utility finances. *Utilities Policy*, 5(3–4), 175–184. [https://doi.org/10.1016/0957-1787\(96\)00001-X](https://doi.org/10.1016/0957-1787(96)00001-X)
- [5] Carlon, T., Finkelstein, M., Maron, S. Z., Goldman, D., Kihira, S., Marinelli, B., Dayan, E., Sullivan, N., Hart, J., Doshi, A. H., Delman, B. N., Lookstein, R., & Drayer, B. P. (2021). Sources of Revenue Loss and Recovery in Radiology Practices During the Coronavirus Disease 2019 (COVID-19) Pandemic. *Academic Radiology*, 28(4), 447–456. <https://doi.org/10.1016/j.acra.2021.01.015>

- [6] Christanto, J., & Setiawati, L. (2021). Dampak Coronavirus Terhadap Revenue Growth Perusahaan Sub. Sektor Hotel, Restoran, dan Pariwisata. *Jurnal Indonesia Sosial Teknologi*, 2(2), 186-192. <https://doi.org/10.36418/jist.v2i2.85>
- [7] Danil, M. A. (2020). Impacts of Coronavirus COVID-19 on the Global Shipping and Maritime Industry in Indonesia and How to Overcome the Coronavirus Outbreak Based on WHO and IMO Recommendations. *Artikel*, 1-22.
- [8] Deuverden, B. K. Van. (2022). Tax revenue : swifter recovery during the coronavirus pandemic than during the global financial crisis. 2(2021), 78-85.
- [9] Doumbia-Henry, C. (2020). Shipping and COVID-19: protecting seafarers as frontline workers. *WMU Journal of Maritime Affairs*, 19(3), 279-293. <https://doi.org/10.1007/s13437-020-00217-9>
- [10] Giamouzi, M. (2008). City, University of London Institutional Repository. 34(2019), 51-79. <http://openaccess.city.ac.uk/1189/>
- [11] Gordon, D. V. (2021). Price and revenue projections under alternative policy shocks due to the coronavirus: Canadian lobster and snow crab. *Marine Policy*, 130(May), 104556. <https://doi.org/10.1016/j.marpol.2021.104556>
- [12] Håkansson, A. (2020). Effects on Gambling Activity From Coronavirus Disease 2019—An Analysis of Revenue-Based Taxation of Online- and Land-Based Gambling Operators During the Pandemic. *Frontiers in Psychiatry*, 11(December), 1-8. <https://doi.org/10.3389/fpsy.2020.611939>
- [13] Hayu, R. S., Sulistiyawan, E., & Salim, M. (2021). The Changes of Consumption Behavior in Bengkulu, Indonesia: Case of Purchasing Corona Prevention Products Through Indirect Distribution Channel. *Journal of Distribution Science*, 19(11), 27-36. <https://doi.org/10.15722/jds.19.11.202111.27>
- [14] Kim, J. H. (2018). The impact of sales revenue on value relevance in the distribution corporate. *Journal of Distribution Science*, 16(2), 83-88. <https://doi.org/10.15722/jds.16.2.201802.83>
- [15] ILO. (2020). ILO Sectoral Brief. International Labour Organization Journal on the Impact of Covid-19 on the Health Sector, 2019(April 2020), 2-3.
- [16] Lirn, T.-C., & Ariyana, A. R. (2021). Potential for Transport in Asia Pacific Region. *KnE Social Sciences*, 2020(Iwpospa), 249-259. <https://doi.org/10.18502/kss.v5i1.8287>
- [17] Liu, F., Wang, J., Liu, J., & Kong, Y. (2020). Coordination of port service chain with an integrated contract. *Soft Computing*, 24(9), 6245-6258. <https://doi.org/10.1007/s00500-019-03839-1>
- [18] Liu, Y. F., Lee, C. B., Qi, G. Q., Yuen, K. F., & Su, M. (2021). Relationship Between Dry Ports and Regional Economy: Evidence from Yangtze River Economic Belt. *Journal of Asian Finance Economics and Business*, 8(5), 345-354. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0345>
- [19] Mahardhika, M., & Arintowati, D. (2021). Crisis, N. T. H. E., & Learned, Jurnal Nusantara Aplikasi Manajemen Bisnis. *Jurnal Nusantara Aplikasi Manajemen Bisnis*, 6(2), 138-148.
- [20] McDonald, B., & Larson, S. (2020). Implications of the coronavirus on sales tax revenue and local government fiscal health. *Journal of Public and Nonprofit Affairs*, 6(3), 377-400. <http://dx.doi.org/10.2139/ssrn.3571827>
- [21] Naik, M., & Haldankar, G. B. (2021). Impact Assessment of First Wave of Covid-19 Pandemic on Goods and Services Tax (GST) Revenue Collection & Distribution in India*. *Journal of Distribution Science*, 19(10), 43-54. <https://doi.org/10.15722/jds.19.10.202110.43>
- [22] Nze, I. (2019). Modelling the Relationship between Demand for River Port Services and Vessel Supply Costs : Empirical Evidence from Nigeria Global Journal of Social Sciences Studies Modelling the Relationship between Demand for River Port. 2(January 2016), 144-149. <https://doi.org/10.20448/807.2.3.144.149>
- [23] Rivera, A. (2020). The impact of COVID-19 on transport and logistics connectivity in the landlocked countries of South America. *United Nations Publication*, 1-56. https://repositorio.cepal.org/bitstream/handle/11362/46528/1/S2000768_en.pdf
- [24] Singh, A. K. (2021). Impact of the Coronavirus Pandemic on Las Vegas Strip Gaming Revenue. *The Journal of Gambling Business and Economics*, 14(2), 49-62. <https://doi.org/10.5750/jgbe.v14i2.1965>

- [25] Sackey, A. D., Tchouangeup, B., Lamptey, B. L., van der Merwe, B., Lee, R. O. D., Mensah, R., Fuseini, M. C., & Sackey, A. D. (2021). Outlining the challenges of COVID-19 health crises in Africa's maritime industry: the case of maritime operations in marine warranty surveying practice. *Maritime Studies*, 20(2), 207–223. <https://doi.org/10.1007/s40152-021-00220-7>
- [26] Sharapiyeva, M. D., Antoni, A., & Yessenzhigitova, R. (2019). The impact of port transport-logistics infrastructure and lpi for economic growth: On the example of landlocked countries. *Pomorstvo*, 33(1), 63–75. <https://doi.org/10.31217/p.33.1.7>
- [27] Takele, T. B., & Tolcha, T. D. (2021). Optimal transit corridors for Ethiopia. *Journal of Transport and Supply Chain Management*, 15, 1–12. <https://doi.org/10.4102/jtscm.v15i0.567>
- [28] UN ILO. (2020). ILO Sectoral Brief: COVID-19 and maritime shipping & and fishing. April, 1–8.
- [29] UNCTAD. (2021). Review of Maritime Report 2021. In United Nations Publications. http://unctad.org/en/PublicationsLibrary/rmt2015_en.pdf
- [30] Yamahata, Y., & Shibata, A. (2020). Preparation for quarantine on the cruise ship Diamond Princess in Japan due to COVID-19. *JMIR Public Health and Surveillance*, 6(2), 1–8. <https://doi.org/10.2196/18821>

