



Research Article

PORT CONCESSION AS A CATALYST OF LABOUR PRODUCTIVITY AND WORKFORCE PERFORMANCE AT THE EASTERN NIGERIA SEAPORTS

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Abstract

This study examined the pre and post-concession effects of port reform on labour productivity and workforce conditions in the Eastern Nigeria Seaports. A descriptive survey research design was adopted, with a study population of 2,840 port workers. Using the Taro Yamane formula at a 5% margin of error, a sample size of 399 respondents was selected through a random sampling technique. Data were collected using a structured questionnaire and presented using frequency counts, percentages, weighted mean scores, and standard deviation. On the other hand, Mann-Whitney U, and Kruskal-Wallis H test statistics were employed for the analyses. The findings revealed that port concessioning significantly improved perceived labour productivity with 84. 6% of respondents agreeing that productivity was lower before concessioning compared with the post-concession period (weighted mean = 4. 28). Similarly, 82. 5% of respondents indicated that cargo handling was slower before concessioning, while 86. 1% agreed that post-concession operations improved vessel turnaround time (weighted mean = 4. 33). The Mann-Whitney U test confirmed significant differences between pre and post-concession productivity indicators ($p < 0. 05$). The Kruskal-Wallis test statistics revealed significant differences in perceptions across employment categories regarding labour restructuring and welfare conditions ($p < 0. 05$). The study concludes that port concessioning has enhanced operational productivity through improved management, technology adoption, and performance monitoring. Therefore, it recommended a balanced concession framework that promotes efficiency and appropriate work support systems.

Keywords: Seaports, Labour Productivity, Concession, Workforce Performance, Efficiency.

INTRODUCTION

Seaports constitute critical nodes in global trade and national economic development, serving as gateways for imports and exports and facilitating the movement of goods, services, and people across international borders. The efficiency and productivity of seaports are closely tied to broader economic performance, influencing trade competitiveness, industrial growth, and revenue generation. Nigerian ports have played a strategic role in supporting the country's oil-dependent economy as well as non-oil trade, particularly through major port complexes located in Lagos, Port Harcourt, Calabar, and Warri. In developing countries such as Nigeria, labour productivity in seaports has historically been constrained by structural inefficiencies, inadequate training, and outdated equipment. Before major reforms, many port workers operated under manual systems that required high physical labour and extended cargo handling times. This resulted in low output per worker and significant congestion at port terminals. Even after modernization efforts, challenges such as irregular power supply, inadequate mechanization, and bureaucratic delays continue to affect productivity outcomes. According to Olayiwola & Adeyemi (2020), labour productivity in Nigerian maritime logistics is strongly influenced by institutional inefficiencies and weak coordination among port stakeholders, which often lead to duplication of efforts and operational bottlenecks. This suggests that productivity is not only a technical issue but also an organizational and governance challenge.

Port concessioning refers to a reform mechanism in which the management, operation, and sometimes development of port facilities are transferred from public authorities to private entities under contractual agreements, while ownership of the port infrastructure typically remains with the government. This model is widely associated with the landlord port system, where the public sector retains regulatory and supervisory roles, and private operators are responsible for cargo handling, terminal management, and operational efficiency. In recent decades, port concessioning has gained global acceptance as a strategic approach to improving port performance, enhancing service delivery, and attracting private investment into the maritime sector. According to Brooks & Pallis (2020), port concessioning is fundamentally aimed at introducing market-oriented practices into port operations, thereby addressing inefficiencies commonly associated with state-owned enterprises. The model has been particularly relevant in developing countries, where public ports have historically suffered from inadequate funding, poor management, and limited technological advancement. Labour productivity is a fundamental concept in industrial, economic, and organizational studies, referring to the efficiency with which human labour converts inputs into outputs within a production system. In the context of port operations, labour productivity is commonly measured as the volume of cargo handled per worker, per gang, or per hour worked, and it serves as a key indicator of operational efficiency and competitiveness. Over the past decade, scholars have increasingly emphasized that labour productivity in port environments is not solely determined by the number of workers or hours worked but is also influenced by technological capacity, management practices, institutional frameworks, and workforce motivation. According to Zheng & Lowe (2018), labour productivity in

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logistics-intensive industries such as ports is shaped by the interaction between human capital quality and capital-intensive infrastructure, meaning that even highly skilled workers may underperform if they are not supported by adequate equipment and systems. In modern port economics, productivity is therefore understood as a multidimensional outcome rather than a simple ratio of output to labour input. In global maritime discourse, labour productivity has become central to evaluating port performance, especially as ports transition from labour-intensive to capital-intensive operations. The introduction of containerization, automation, and digital port management systems has significantly altered the nature of work in ports worldwide. These technological shifts have reduced reliance on manual labour while increasing the demand for technical skills and coordination efficiency. According to Notteboom *et al.* (2019), modern ports that integrate advanced handling equipment and digital tracking systems tend to achieve higher productivity levels because they minimize delays, reduce human error, and optimize workflow coordination. However, they also argue that productivity gains are unevenly distributed across regions, with developing economies often lagging behind due to infrastructural deficits and limited workforce training.

Prior to the port concession reforms of the mid-2000s, port operations were managed solely by the Nigerian Ports Authority (NPA), which functioned as both regulator and operator. This dual role led to administrative inefficiencies, lack of competition, and weak accountability mechanisms. Labour at the ports during this period was characterized by overstaffing, low motivation, outdated work practices, and limited technological integration. These conditions contributed to prolonged cargo dwell time, vessel delays, and increased transaction costs, ultimately reducing the competitiveness of Nigerian ports in the global maritime industry. The need for reform became imperative as globalization intensified competition among ports worldwide and as Nigeria sought to reposition its maritime sector to attract foreign investment and enhance trade facilitation. In response, the Federal Government of Nigeria initiated a comprehensive port reform programme, culminating in the concessioning of port terminals to private operators between 2005 and 2006. This reform was guided by the landlord port model, whereby the NPA retained ownership of port infrastructure and regulatory oversight, while private terminal operators assumed responsibility for cargo handling and operational management (World Bank, 2007). The primary objectives of the concession policy included improving operational efficiency, enhancing service delivery, reducing government financial burden, and increasing labour productivity. The concessioning process marked a significant structural transformation in the management of Nigerian ports, particularly in the Eastern seaports, which had previously suffered from underutilization and infrastructural neglect. Private sector participation introduced new technologies, modern equipment, and performance-driven management practices, all of which were expected to enhance labour productivity. Labour productivity, in this context, refers to the efficiency with which port workers utilize available resources to handle cargo, often measured in terms of output per worker or per unit of time (Cullinane *et al.*, 2010). The introduction of mechanized cargo handling systems, computerized documentation processes, and streamlined operational procedures was anticipated to reduce reliance on manual labour and improve overall efficiency.

Furthermore, the assessment of labour productivity in Nigerian ports cannot be isolated from broader institutional and policy frameworks. Factors such as regulatory effectiveness, labour laws, training and capacity development, and industrial relations play a crucial role in shaping workforce performance. The extent to which private terminal operators invest in human capital development, adopt fair labour practices, and maintain safe working environments significantly influences productivity outcomes. In many cases, productivity gains achieved through technological advancements may be undermined by poor workforce conditions, leading to diminished morale and reduced efficiency over time. In the Eastern seaports, these changes were particularly significant due to the region's socio-economic context, where port employment constitutes a major source of livelihood. The shift from public sector employment to private sector-driven operations altered traditional labour relations, leading to new dynamics between employers, employees, and labour unions. While some studies suggest that concessioning has led to increased efficiency and improved service delivery, others argue that it has exacerbated precarious employment conditions and weakened collective bargaining power among port workers (Iroegbu, 2015). These contrasting perspectives highlight the need for a comprehensive analysis that examines both the positive and negative impacts of port concessioning on labour productivity and workforce conditions. Therefore, this study seeks to conduct a pre- and post-concession analysis of labour productivity and workforce conditions at Eastern Nigeria seaports comprising Port Harcourt, Onne, Calabar, and Warri seaports.

MATERIALS AND METHODS

The study covers the Eastern Nigeria Seaports, comprising Port Harcourt, Onne, Warri and Calabar Port Complexes, which are key maritime gateways in the Eastern corridor of Nigeria. (Figures 1). The population of this study comprises employees and key stakeholders involved in port operations across the Eastern seaports. These ports collectively represent the major maritime operational hubs in the eastern corridor of Nigeria and are central to cargo handling, logistics coordination, and maritime trade facilitation within the region. The target population includes Nigerian Ports Authority (NPA) staff, terminal operators' employees, stevedoring companies, dockworkers, as well as logistics and cargo handling personnel who are directly engaged in day-to-day port activities. The selection of these categories of respondents is informed by their direct involvement in port operations and their ability to provide relevant information on changes in labour productivity and workforce conditions before and after port concessioning. Based on operational staffing records and estimated workforce distributions across the ports, the total population of the study is approximately 2,840 respondents. The data for this study was obtained through questionnaire administered to Ports Authority staff, terminal operators, dockworkers, stevedoring companies, and logistics personnel across Port Harcourt, Onne, Calabar and Warri port complexes. was obtain relevant pre- and post-concession information on labour productivity and workforce conditions in the Eastern seaports particularly perceptions, experiences, assessments of changes in labour productivity, and workforce conditions. In this study, the proportionate stratified random sampling technique was adopted and the technique is considered suitable because the population is not homogeneous; rather, it is distributed across different port complexes with varying workforce sizes and

operational structures. By using proportionate stratification, each port complex was fairly represented in the sample based on its share of the total population as reflected in Table 1 using Taro Yamane's formula: The Likert-scale responses were computed to determine the level of agreement or disagreement with each statement in the questionnaire. The data collected were presented in tables and descriptive statistics used to summarize respondents' views, whereas the Mann-Whitney U and Kruskal-Wallis test statistics were employed for the analyses to establish whether observed differences are statistically significant or due to chance and whether the perceived effect of port concessioning on labour productivity in Nigerian seaports is statistically significant respectively. The analysis was conducted in the Statistical Package for Social Sciences (SPSS) environment at a 0.05 level of significance.

$$n = \frac{N}{1 + N(e)^2} \dots\dots\dots (1)$$

Where,
n = Sample size
N = Population of the Study (2,840)
e = margin of error (0.05)

By substituting,

$$n = \frac{2840}{1 + 2,840 (0.05)^2} = \frac{2,840}{1 + 2,840(0.0025)}$$

$$n = \frac{2840}{7.125} = 398.59 \approx 399$$

Table 1. Proportional Sampling Distribution

Port Complex	Population	Proportion (%)	Sample Size
Port Harcourt Port	900	36.7	126
Onne Port Complex	1,100	44.9	155
Calabar Port Complex	450	18.4	63
Warri Port Complex	390	13.73	55
Total	2,840	100	399

Source: Researchers Computation (2025)

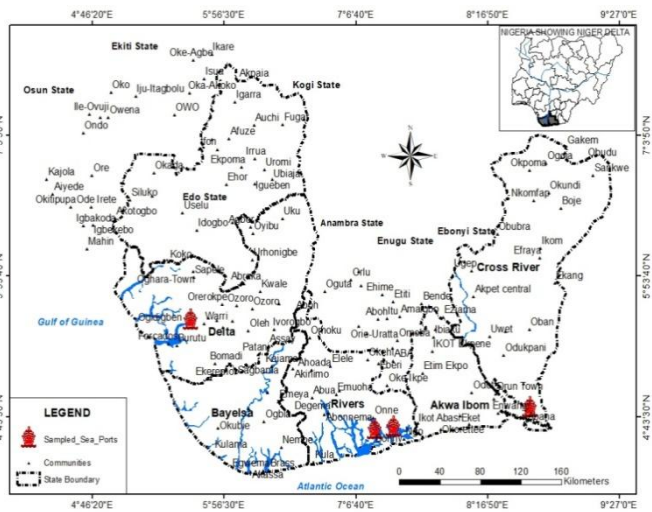


Figure 1. Eastern Nigeria Showing Seaports

RESULTS

Table 2 presents the socio-demographic characteristics of the respondents, and the gender distribution reveals that the majority of respondents were male, accounting for 78.5%,

while females constituted 21.5% of the respondents. This indicates that the port workforce remains predominantly male, reflecting the physically demanding nature of many port operations such as cargo handling, stevedoring, equipment operation, and other logistics-related activities. Although female participation is evident, their representation remains comparatively low. With respect to age, the largest proportion of respondents fell within the 26 to 35 years age bracket 36.4%. This was followed by those aged 36 to 45 years constituting 31.8%. Respondents aged 46 years and above accounted for 17.2%, while those between 18 and 25 years was 14.6%. The age distribution suggests that the workforce is largely composed of individuals within their economically active and productive years. The relatively high proportion of respondents between 26 and 45 years indicates a workforce with sufficient physical capacity, experience, and adaptability to the operational demands of modern port activities.

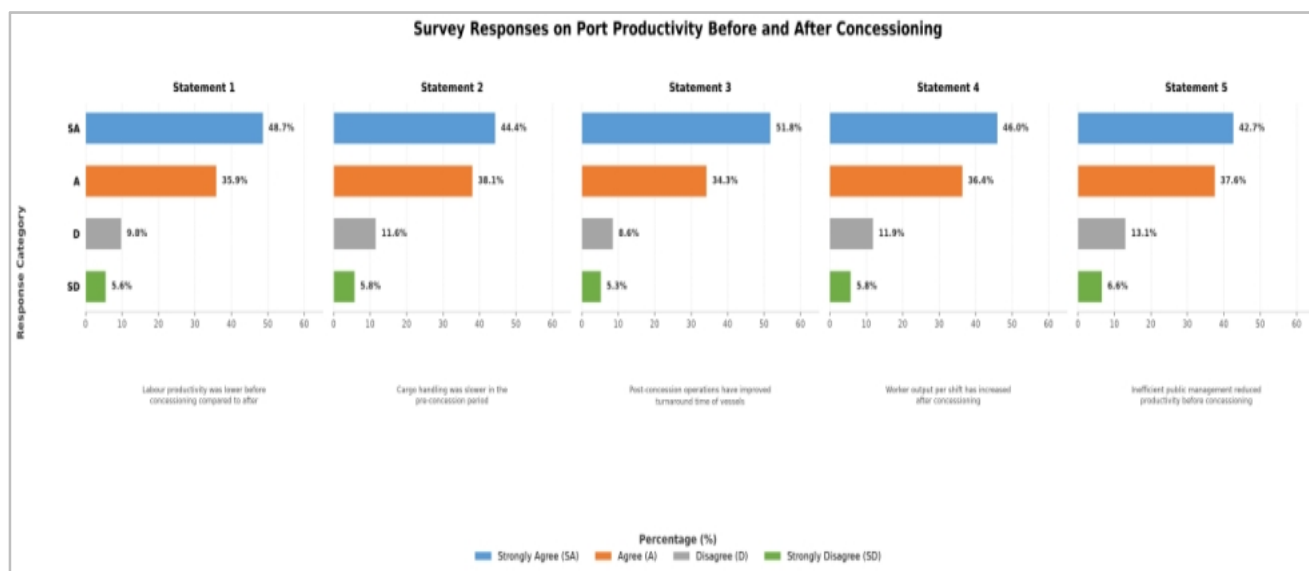
Table 2. Socio-demographic Characteristics of Respondents in the study area

Variables	Frequency (n)	Percentage (%)
Gender		
Male	311	78.5
Female	85	21.5
Total	396	100
Age (Years)		
18–25	58	14.6
26–35	144	36.4
36–45	126	31.8
46 and above	68	17.2
Total	396	100
Educational Qualification		
Primary	19	4.8
Secondary	73	18.4
OND/NCE	101	25.5
HND/BSc	154	38.9
Postgraduate	49	12.4
Total	396	100
Employment Category		
NPA Staff	79	19.9
Terminal Operator Staff	112	28.3
Dockworker	88	22.2
Stevedore	56	14.1
Logistics Personnel	61	15.4
Total	396	100
Years of Experience in Port Work		
1–5 years	124	31.3
6–10 years	118	29.8
11–15 years	83	21
16 years and above	71	17.9
Total	396	100

The educational qualifications of respondents indicate that the workforce is generally well educated as respondents with HND/BSc qualifications constituted the highest proportion 38.9%. This was followed by those holding OND/NCE certificates forming 25.5%. Secondary school certificate holders accounted for 18.4%, while 12.4% of the respondents had postgraduate degrees. Only 4.8% possessed primary education as their highest qualification. This distribution demonstrates that a substantial proportion of the workforce possesses tertiary education, which is consistent with the increasing technological sophistication and operational requirements associated with concessioned ports. The presence of a relatively educated workforce suggests an enhanced capacity to adapt to modern equipment, digital technologies, and contemporary management systems introduced through concessioning. The distribution of respondents by employment category shows that Terminal Operator Staff constituted the largest group with 28.3%.

Table 3. Perceived level of labour productivity in the Eastern seaports before and after concessioning

Statements	SA n (%)	A n (%)	D n (%)	SD n (%)	Total n (%)	SD	WM	Decision
Labour productivity was lower before concessioning compared to after concessioning	193 (48.7)	142 (35.9)	39 (9.8)	22 (5.6)	396 (100)	0.88	4.28	Agree
Cargo handling was slower in the pre-concession period	176 (44.4)	151 (38.1)	46 (11.6)	23 (5.8)	396 (100)	0.89	4.21	Agree
Post-concession operations have improved turnaround time of vessels	205 (51.8)	136 (34.3)	34 (8.6)	21 (5.3)	396 (100)	0.86	4.33	Agree
Worker output per shift has increased after concessioning	182 (46.0)	144 (36.4)	47 (11.9)	23 (5.8)	396 (100)	0.9	4.22	Agree
Inefficient public management reduced productivity before concessioning	169 (42.7)	149 (37.6)	52 (13.1)	26 (6.6)	396 (100)	0.93	4.16	Agree

**Figure 2. Level of Labour productivity in the Eastern seaports before and after concessioning**

Dockworkers followed with 22. 2%, while NPA Staff accounted for 19. 9%. Logistics Personnel represented had 15. 4%, and Stevedores constituted the smallest category with 14. 1%. This spread indicates that the study captured perspectives from the major occupational groups operating within the port environment. The relatively larger representation of terminal operator staff reflects the increased role of private terminal operators following port concessioning, while the inclusion of other categories ensures that views from both regulatory and operational personnel were adequately represented. Regarding years of experience in port work, respondents with 1 to 5 years of experience constituted the largest proportion with 31. 3%, closely followed by those with 6 to 10 years of experience covered 29. 8%. Respondents with 11 to 15 years of experience accounted for 21. 0%, while those with 16 years and above was 17. 9%. The distribution indicates a balanced mix of relatively new and experienced workers. More than two-thirds of the respondents had worked in the port industry for at least six years, suggesting that the majority possessed adequate practical knowledge and firsthand experience of post-concession port operations. At the same time, the presence of respondents with fewer years of experience reflects the gradual entry of new workers into the concessioned port system.

Table 3 and Figure 2 present respondents' perceptions regarding the level of labour productivity in the Eastern Seaports before and after the introduction of port concessioning. The results indicate a general perception that labour productivity improved after concessioning, as all the assessed statements recorded weighted mean scores above the decision benchmark, with values ranging from 4. 16 to 4. 33, indicating agreement among respondents.

The statement that labour productivity was lower before concessioning compared to after concessioning recorded a weighted mean score of 4. 28 and a standard deviation of 0. 88. Specifically, 48. 7% of the respondents strongly agreed with the statement, while 35. 9% agreed. Only 9. 8% disagreed and 5. 6% strongly disagreed. This suggests that a substantial proportion of respondents perceived concessioning as a turning point that enhanced labour productivity through improved operational practices, increased accountability, and better management approaches. Similarly, respondents agreed that cargo handling was slower during the pre-concession period, with a weighted mean score of 4. 21 and a standard deviation of 0. 89. About 327 respondents, representing 82. 5%, either strongly agreed or agreed with the statement, while a smaller proportion expressed disagreement. This indicates that respondents generally perceived the pre-concession era as being associated with slower cargo processing and operational delays. The result reflects the view that previous management structures were less efficient in achieving the speed and responsiveness required in contemporary port operations. On the other hand, 51. 8% strongly agreed, while 34. 3% agreed, only 13. 9% disagreed with the fact that post-concession operations have improved turnaround time of vessels which recorded the highest weighted mean score of 4. 33 with a standard deviation of 0. 86. This represents the strongest indication of perceived improvement following concessioning. Improved vessel turnaround time suggests that respondents associated concessioning with enhanced operational coordination, better resource utilization, and improved efficiency in port activities. Furthermore, respondents agreed that worker output per shift has increased after concessioning, recording a weighted mean score of 4. 22 and a standard deviation of 0. 90.

Table 4. Mann Whitney U test showing results difference in the level of labour productivity in the Eastern seaports before and after concessioning'

Statements	n	Wilcoxon (W)	Z	Asymp. Sig. (2-tailed)	Decision
Labour productivity was lower before concessioning compared to after concessioning	396	1045.5	-16.28	.000	Significant
Cargo handling was slower in the pre-concession period	396	1182	-15.64	.000	Significant
Post-concession operations have improved turnaround time of vessels	396	892.5	-17.41	.000	Significant
Worker output per shift has increased after concessioning	396	1098	-16.03	.000	Significant
Inefficient public management reduced productivity before concessioning	396	1264.5	-14.92	.000	Significant

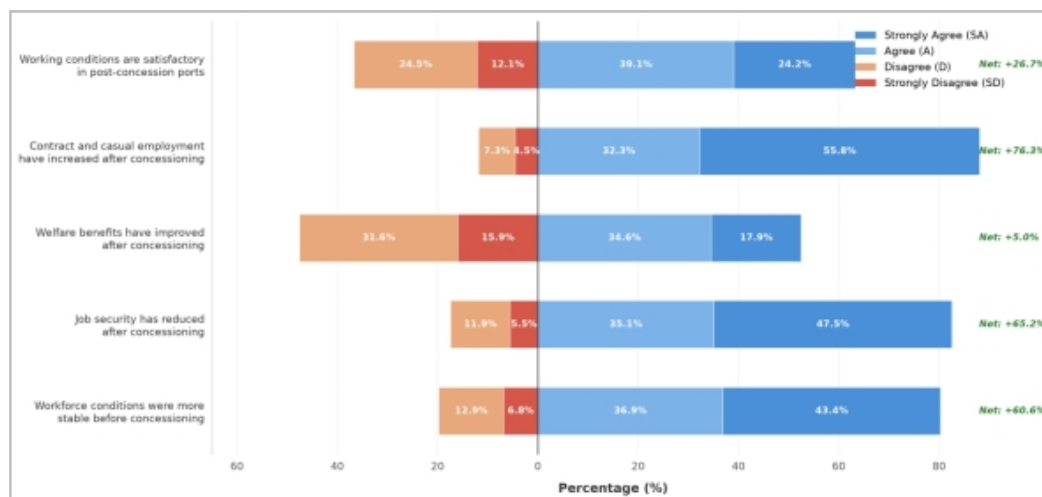
The distribution shows that 46. 0% of the respondents strongly agreed and 36. 4% agreed, while only 17. 7% expressed disagreement. This implies that respondents perceived the post-concession environment as one that encouraged higher productivity among workers. The improvement may be linked to increased performance monitoring, adoption of modern operational practices, and pressure to meet productivity targets established by private operators. The assertion that inefficient public management reduced productivity before concessioning also received considerable support, with a weighted mean score of 4. 16 and a standard deviation of 0. 93. Accordingly, 80. 3% of the respondents agreed or strongly agreed with the statement, while 19. 7% disagreed. This indicates that many respondents associated the lower productivity levels of the pre-concession period with administrative inefficiencies, weak operational control, and limited incentives for improved performance. The findings demonstrate that respondents generally perceived port concessioning as having a positive influence on labour productivity in the Nigerian Eastern Seaports. The results suggest that improvements were particularly evident in vessel turnaround time, cargo handling efficiency, and worker output. However, the findings should also be interpreted within the broader context of concessioning, where productivity improvements may be associated with stricter performance expectations, workforce restructuring, and increased pressure on employees to deliver higher outputs. The general perception indicates that concessioning has contributed to operational efficiency, although its implications for workforce welfare require further examination.

Table 4 presents the results of the statistical test conducted to examine whether there is a significant difference in the perceived level of labour productivity in the Eastern Seaports before and after concessioning. The results show that all the assessed indicators recorded statistically significant differences at $p < 0. 05$. The statement that labour productivity was lower before concessioning compared to after concessioning produced a Wilcoxon value of 1045. 50, a Z-value of -16. 28, and an asymptotic significance value of 0. 000. Since the probability value is below the 0. 05 significance level, the difference is statistically significant. This indicates that respondents perceived a substantial improvement in labour productivity following concessioning. Similarly, the assertion that cargo handling was slower in the pre-concession period recorded a Wilcoxon value of 1182. 00, with a Z-value of -15. 64 and a significance value of 0. 000. The significant result suggests that respondents observed noticeable improvements in cargo handling efficiency after concessioning. This implies that the post-concession period was associated with faster and more efficient cargo movement compared with the earlier period. The statement that post-concession operations have improved turnaround time of vessels recorded the strongest statistical difference, with a Wilcoxon value of 892. 50, Z-value of -17. 41, and significance level of 0. 000.

The highly significant result demonstrates that respondents strongly perceived improvements in vessel handling efficiency after concessioning. This suggests that concessioning brought operational changes that enhanced the ability of ports to process vessels more effectively. The test result for worker output per shift has increased after concessioning showed a Wilcoxon value of 1098. 00, Z-value of -16. 03, and significance value of 0. 000. The significant outcome indicates that respondents perceived an increase in individual worker productivity after concessioning. This may be associated with increased performance monitoring, improved operational procedures, and greater emphasis on efficiency by private terminal operators. Furthermore, the statement that inefficient public management reduced productivity before concessioning recorded a Wilcoxon value of 1264. 50, a Z-value of -14. 92, and a significance value of 0. 000. The significant result indicates that respondents largely associated lower productivity in the pre-concession era with challenges related to public sector management practices, including operational inefficiencies and weaker performance control mechanisms. Overall, the statistical results demonstrate that there is a significant difference in perceived labour productivity between the pre-concession and post-concession periods in the Eastern Seaports. All indicators tested produced significant outcomes, confirming that respondents perceived meaningful improvements in productivity after concessioning. Therefore, the null hypothesis, which states that there is no statistically significant difference in the level of labour productivity before and after concessioning, is rejected. The findings suggest that port concessioning has contributed significantly to improved operational productivity, particularly in cargo handling, vessel turnaround time, and worker output. Table 5 and Figure 3 presents respondents' perceptions regarding changes in workforce conditions following the implementation of port concessioning in the Eastern Seaports. The results reveal a mixed perception of the effects of concessioning on workers, with respondents acknowledging improvements in some aspects of port operations while also identifying concerns relating to employment stability, job security, and welfare conditions. The weighted mean scores ranged from 2. 54 to 4. 39, indicating variations in respondents' experiences and perceptions of the concession reform. The statement that workforce conditions were more stable before concessioning recorded a weighted mean score of 4. 17 with a standard deviation of 0. 92, indicating agreement among respondents. In clear terms 43. 4%strongly agreed, while 36. 9%agreed that workforce conditions were more stable before concessioning. Only 19. 7% disagreed with the view. This finding suggests that many workers perceived the pre-concession period as offering greater employment stability, possibly due to stronger attachment to permanent employment structures and more predictable workforce arrangements. Similarly, the fact that job security has reduced after concessioning, has a weighted mean score of 4. 25 and a standard deviation of 0. 88 with 82. 6% of the people who either strongly agreed or agreed, while only 17. 4% disagreed.

Table 5. Perceived changes in workforce conditions following the concession reform

Statements	SA n (%)	A n (%)	D n (%)	SD n (%)	Total n (%)	SD	WM	Decision
Workforce conditions were more stable before concessioning	172 (43.4)	146 (36.9)	51 (12.9)	27 (6.8)	396 (100)	0.92	4.17	Agree
Job security has reduced after concessioning	188 (47.5)	139 (35.1)	47 (11.9)	22 (5.5)	396 (100)	0.88	4.25	Agree
Welfare benefits have improved after concessioning	71 (17.9)	137 (34.6)	125 (31.6)	63 (15.9)	396 (100)	1.03	2.54	Disagree
Contract and casual employment have increased after concessioning	221 (55.8)	128 (32.3)	29 (7.3)	18 (4.5)	396 (100)	0.82	4.39	Agree
Working conditions are satisfactory in post-concession ports	96 (24.2)	155 (39.1)	97 (24.5)	48 (12.1)	396 (100)	0.99	3.75	Agree

**Figure 3. Changes in workforce conditions following the concession reform****Table 6 :Kruskal Wallis test summary for difference on the changes in workforce conditions following the concession reform***

Statements	n	χ^2 (H)	df	Asymp. Sig.	Decision
Workforce conditions were more stable before concessioning	360	14.82	3	0.005	Significant
Job security has reduced after concessioning	360	19.47	3	0.001	Significant
Welfare benefits have improved after concessioning	360	6.24	3	0.182	Not Significant
Contract and casual employment have increased after concessioning	360	23.61	3	0.000	Significant
Working conditions are satisfactory in post-concession ports	360	10.38	3	0.034	Significant

This result indicates that the transition to private sector management introduced concerns regarding employment security among workers. The perception may be associated with workforce restructuring, increased reliance on performance-based employment systems, and the preference of concessionaires for leaner operational structures. The assertion that welfare benefits have improved after concessioning received a different response pattern, recording a weighted mean score of 2.54 and a standard deviation of 1.03, resulting in a disagreement decision. Only 52.5% agreed or strongly agreed that welfare benefits had improved, while 47.5% disagreed or strongly disagreed. Although the responses were relatively divided, the overall mean indicates that respondents did not generally perceive substantial improvement in welfare benefits following concessioning. This suggests that efficiency improvements achieved by concessionaires may not have translated proportionately into enhanced employee welfare packages. The statement that contract and casual employment have increased after concessioning recorded the highest weighted mean score of 4.39 with a standard deviation of 0.82. A significant majority of respondents, representing 88.1%, agreed or strongly agreed with the statement, while meagre 11.8% of the respondents disagreed. This finding highlights workforce restructuring as one of the most visible consequences of concessioning. The increased use of contract and casual employment reflects the drive by private operators to maintain operational flexibility and control labour costs.

Regarding the statement that working conditions are satisfactory in post-concession ports, respondents agreed, with a weighted mean score of 3.75 and a standard deviation of 0.99. About 63.3% agreed or strongly agreed with the statement, while 36.6% disagreed. This indicates that despite concerns about job security and employment structure, some workers perceived improvements in their immediate working environment. Such improvements may be linked to better operational procedures, modern equipment, improved safety practices, and more structured management systems introduced under private sector administration. The findings demonstrate that port concessioning has produced a dual effect on workforce conditions in the Eastern Seaports. While respondents acknowledged improvements in working conditions and operational arrangements, they also identified significant challenges relating to job security, employment stability, and the increasing use of casual and contract labour. The results suggest that the concession reform achieved greater operational flexibility but created concerns regarding the long-term welfare and security of port workers. Table 6 presents the results of the Kruskal-Wallis H test conducted to determine whether significant differences exist in respondents' perceptions of changes in workforce conditions following port concessioning. The decision criterion was based on a significance level of 0.05. The result for the statement that workforce conditions were more stable before concessioning produced a Kruskal-Wallis statistic of $\chi^2(H) = 14.82$, with $df = 3$ and an asymptotic significance value of 0.005. Since the p-

value is below 0.05, the result is statistically significant. This indicates that respondents from the different groups had varying perceptions regarding the stability of workforce conditions before concessioning. The variation suggests that experiences of employment stability differed among categories of workers, possibly due to differences in employment status, responsibilities, and attachment to the former public-sector port structure.

Similarly, the statement that job security has reduced after concessioning recorded a significant result with $\chi^2(H) = 19.47$, $df = 3$, and $p = 0.001$. This indicates that perceptions of job security reduction differed significantly among respondents. The result suggests that workers did not experience the effects of concessioning uniformly, with some categories of employees likely experiencing greater uncertainty due to workforce restructuring, changes in employment arrangements, and increased reliance on flexible labour systems. The analysis of the statement that welfare benefits have improved after concessioning produced a $\chi^2(H)$ value of 6.24, with $df = 3$ and $p = 0.182$. Since the significance value is greater than 0.05, the result is not statistically significant. This implies that respondents across the different groups had relatively similar perceptions regarding welfare benefits after concessioning. The finding suggests a general consensus among workers that welfare improvements have not differed substantially across employment categories, and perceptions of welfare changes remain relatively consistent. The statement that contract and casual employment have increased after concessioning recorded the highest test statistic, with $\chi^2(H) = 23.61$, $df = 3$, and $p = 0.000$, indicating a statistically significant difference among respondent groups. This suggests that perceptions of increased contract and casual employment varied significantly across worker categories. The difference may be attributed to the varying levels of exposure of different employment groups to labour restructuring practices introduced by concessionaires. Furthermore, the statement that working conditions are satisfactory in post-concession ports produced a statistically significant result, with $\chi^2(H) = 10.38$, $df = 3$, and $p = 0.034$. This indicates that respondents differed significantly in their assessment of post-concession working conditions. The variation suggests that while some workers experienced improvements in workplace facilities, safety practices, and operational arrangements, others may have continued to face challenges associated with workload, employment insecurity, or unequal access to workplace benefits. The Kruskal-Wallis analysis reveals that significant differences exist in respondents' perceptions of most aspects of workforce conditions following the concession reform. Significant variations were observed in workforce stability, job security, contract employment, and working conditions, while welfare benefits showed no significant difference across respondent groups. The findings demonstrate that the effects of port concessioning on workers have not been uniform, with different categories of employees experiencing varying outcomes in terms of employment conditions and workplace experiences.

DISCUSSION

The findings of this study demonstrate that port concessioning has significantly improved labour productivity in the Eastern Seaports. Respondents generally agreed that productivity was considerably lower before concessioning than after its implementation, with all the assessed indicators recording high weighted mean scores ranging from 4.16 to 4.33. The

subsequent Wilcoxon Signed-Rank test further established that the observed differences were statistically significant ($p < 0.05$), indicating that the improvements in labour productivity were not due to chance. This finding suggests that concessioning has transformed port operations by introducing more efficient management practices, improved accountability, stronger operational control, and greater emphasis on performance. The finding that labour productivity improved after concessioning aligns with the broad objective of port concession reforms, which seek to transfer terminal operations from public management to private operators in order to improve efficiency and competitiveness. Under private sector management, operators are generally driven by commercial objectives, resulting in stricter supervision, better utilization of resources, faster decision-making processes, and performance-based management systems. These changes collectively contribute to higher labour productivity by reducing operational inefficiencies and improving employee output.

One of the most notable findings of this study is the perceived improvement in vessel turnaround time, recorded the highest weighted mean score ($WM = 4.33$) and the strongest statistical significance. This suggests that respondents viewed reduced turnaround time as the most visible productivity gain associated with concessioning. Vessel turnaround time remains one of the most important indicators of port performance because it directly influences shipping costs, berth utilization, and overall supply chain efficiency. Recent studies have similarly reported that concessioning and private terminal management contribute to shorter vessel waiting times through improved infrastructure utilization, modern equipment deployment, and enhanced operational planning (Notteboom et al., 2022; UNCTAD, 2024). The findings therefore reinforce the position that efficient terminal management has become a major driver of improved port productivity. The respondents also agreed that cargo handling was slower during the pre-concession era but improved significantly after concessioning. This perception reflects the operational changes introduced following the transfer of terminal management to private operators. Cargo handling efficiency is closely associated with the availability of modern cargo handling equipment, improved maintenance practices, computerized cargo management systems, and better workforce supervision. The World Bank (2023) noted that private participation in port operations often leads to improved cargo handling efficiency because operators invest in modern technologies and adopt internationally accepted operational standards. Similarly, the World Bank and S&P Global Market Intelligence (2023), through the *Container Port Performance Index*, emphasized that ports with stronger operational management systems generally record higher efficiency levels and faster cargo movement. The study further revealed that worker output per shift increased significantly after concessioning. This finding indicates that respondents associated private sector management with greater employee productivity. Increased worker output may be attributed to stricter performance monitoring, clearly defined productivity targets, improved work organization, and greater managerial accountability. Private operators often implement key performance indicators and continuous monitoring systems that encourage employees to maintain higher levels of efficiency. Such performance-oriented management practices have been identified as important factors influencing productivity improvements in concessioned ports (IAPH, 2023). Another important finding is that respondents largely attributed lower productivity before concessioning to

inefficient public management. This perception reflects long-standing concerns regarding bureaucratic decision-making, inadequate maintenance of port infrastructure, limited managerial autonomy, and weaker accountability mechanisms that characterized many publicly managed ports before concession reforms. Publicly operated ports often faced challenges associated with administrative delays, inadequate investment, equipment shortages, and inefficient resource allocation, all of which negatively affected labour productivity. Recent global port performance assessments continue to emphasize that governance reforms, commercialization, and increased managerial autonomy are critical determinants of operational efficiency (OECD, 2023).

The Wilcoxon Signed-Rank test showed statistically significant differences across all productivity indicators, including labour productivity, cargo handling efficiency, vessel turnaround time, worker output, and public management efficiency. These findings provide robust empirical evidence that respondents consistently perceived meaningful improvements following concessioning. The rejection of the null hypothesis therefore confirms that concessioning has significantly altered labour productivity in the Nigerian Eastern Seaports. Although the findings clearly indicate improvements in productivity, they also suggest that these gains have been achieved within a more demanding work environment. Increased productivity under private management is frequently associated with stricter performance standards, workforce rationalization, lean staffing structures, and higher productivity expectations. Consequently, while operational efficiency has improved, workers may experience increased workload, stronger performance pressures, and greater job insecurity. This observation reflects the dual nature of concessioning, where operational gains are often accompanied by adjustments in labour management practices. The findings demonstrate that concessioning has achieved one of its principal objectives of improving labour productivity within the Eastern Seaports. Improvements in vessel turnaround time, cargo handling efficiency, worker output, and overall operational performance indicate that private sector participation has enhanced port efficiency. However, sustaining these productivity gains will require continued investment in modern equipment, workforce training, technological innovation, and employee welfare. Productivity improvements are likely to be more sustainable when operational efficiency is complemented by policies that promote workforce motivation, job security, and continuous skills development.

Conclusion and Recommendations

The study concludes that port concessioning has brought significant transformation to labour productivity, workforce conditions, employment structures, and employee welfare in the Eastern Seaports. The reform has produced measurable improvements in operational performance while simultaneously creating new challenges that require effective management interventions. It is also clear from the study that concessioning has enhanced productivity within the Eastern Nigeria Seaports particularly evident in cargo handling efficiency, vessel turnaround time, worker output, and operational coordination. The transition from public sector management to private sector administration introduced stronger accountability mechanisms, improved supervision, better resource utilization, and increased emphasis on

performance outcomes. However, the productivity gains achieved have also been associated with increased performance expectations and greater pressure on workers. Therefore, concessionaires are required to prioritize investment in modern equipment, appropriate workforce support systems, efficient management systems, and improved supervision and performance monitoring mechanisms.

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