

# Patterns and Dynamics of Containerized Trade in Nigerian Western Seaports, 1968–2014

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**Abstract**

This paper examines the long-term patterns and dynamics of containerized trade in Nigerian Western Seaports between 1968 and 2014. Using secondary port statistics obtained from the Nigerian Ports Authority (NPA), complemented with archival records. The study analyses trends in container throughput, trade composition, port traffic concentration, and structural changes associated with the adoption and diffusion of containerization. The analysis reveals a gradual but uneven growth of containerized trade characterized by periods of rapid expansion, stagnation, and recovery, largely shaped by infrastructural investment, institutional reforms, and hinterland connectivity constraints. Lagos Ports Complex and Tin Can Island Port emerged as dominant container gateways, reflecting a strong concentration of container traffic within the Western Ports system. To sustain the gains of container technology, government and stakeholders must continue to foster deliberate investment in requisite infrastructure to cope with ever increasing demands of containerization. The paper contributes to the literature on port development in developing economies by providing a historical and empirical account of containerization dynamics in Nigeria, with implications for port planning and maritime policy in West Africa.

**Keywords:** Containerization, Port Development, Container Throughput, Nigerian Seaports, Maritime Transport, Lagos Ports.

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## Introduction

Containerization is widely regarded as one of the most transformative innovations in the history of maritime transport and global trade [1,2]. By standardizing cargo into intermodal units, containerization has also contributed to the spatial fragmentation of the core port functions both by shifting the land-maritime interface away from city centres and by eliminating the costly port-side mechanical break of loading and offloading goods, thereby creating a high-speed ‘pass-through’ system [1]. In terms of efficiency of cargo handling, containerization radically altered cargo handling processes, reduced loading and unloading times, lowered transport costs, and facilitated seamless door-to-door movement of goods across maritime and inland transport networks.

Since its emergence in the late 1950s and subsequent global diffusion, containerization has reshaped port infrastructure requirements, shipping operations, hinterland logistics, and the spatial organization of ports within national and regional transport systems [3-5].

Globally, the spread of containerization has been associated with profound structural changes in port systems, including traffic concentration, the emergence of load centres, intensified inter-port competition, and the reconfiguration of port–city relationships [6-8]. In advanced maritime economies, these changes have often been accompanied by sustained investment in port infrastructure, technological upgrading, and integrated hinterland transport systems. In contrast, the experience of many developing economies

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has been marked by uneven adaptation to containerization, with benefits constrained by infrastructural deficits, institutional bottlenecks, and weak logistics integration.

In Nigeria, containerized trade was formally introduced into the Western Seaports in 1968, shortly after the end of the Nigerian Civil War, at a time when the country was embarking on post-war reconstruction and expanding its participation in international trade [9]. The Western Seaports—principally Lagos Ports Complex and Tin Can Island Port—were strategically positioned to serve as the primary gateways for containerized cargo due to their coastal location, proximity to major consumption and production centres, and early access to container-handling facilities. Over subsequent decades, these ports became the dominant nodes in Nigeria’s maritime transport system, handling the bulk of the nation’s containerized imports and exports.

The period between 1968 and 2014 represents a critical epoch in the evolution of containerized trade in Nigerian Western Seaports [10,11]. This era encompasses the initial adoption of container technology, phases of gradual diffusion and expansion, periods of stagnation associated with economic downturns and infrastructural constraints, and a phase of renewed growth following major institutional reforms, notably the port concessioning programme implemented in the mid-2000s. These phases reflect broader macroeconomic conditions, shifts in trade policy, and changing governance arrangements within Nigeria’s port sector.

Despite the centrality of containerization to Nigeria’s external trade and port development, empirical research examining its long-term patterns and dynamics remains limited. Much of the existing literature on Nigerian ports focuses on short-term efficiency assessments, port reform outcomes, or descriptive accounts of congestion and operational challenges. While these studies provide valuable insights, they often lack a historical perspective capable of capturing structural changes and long-term trajectories in containerized trade. Consequently, there is limited understanding of how containerization has evolved over time in Nigerian Western Seaports and how this evolution has shaped port development outcomes.

From a theoretical standpoint, long-term analysis of containerization provides an opportunity to test and contextualize established models of port evolution within a developing country setting. Classical frameworks such as Bird’s Anyport Model and the load centre concept advanced by Hayuth emphasize sequential stages of port growth, spatial reorganization, and traffic concentration driven by technological change [12]. However, the applicability of these models to African port systems, where institutional and infrastructural conditions differ markedly from those in advanced economies, remains underexplored. Nigerian Western seaports offer a valuable case for examining the extent to which containerization-induced transformations conform to, or diverge from, these theoretical expectations [13].

Against this backdrop, this paper examines the patterns and dynamics of containerized trade in Nigerian Western Seaports over the period 1968–2014. The study adopts a long-term empirical approach to analyse trends in container throughput,

phases of growth and stagnation, and the spatial concentration of container traffic within the Western Ports system. By situating empirical findings within established theories of port development, the paper seeks to contribute to the literature on maritime transport and port geography, particularly in the context of developing economies by: analysing the temporal evolution of containerized trade in Nigerian Western Seaports especially considering container throughput as a significant factor in determining competitive strength of any port; identify major phases and turning points in container traffic growth; and assessing the implications of containerization for port development and maritime policy in Nigeria. The paper is structured as follows: Section 2 reviews relevant literature; section 3 describes the study area; and outlines the data collection and analysis techniques; sections 4 and 5 presents results discussion of results; and section 6 concludes with policy implications.

## Literature Review

The study is anchored on theories of port evolution and transport development, particularly Bird’s Anyport Model [14] and the container port development framework advanced by Hayuth (Hayuth, 1982). Bird’s model conceptualizes port development as a sequence of spatial and functional transformations driven by technological change, while Hayuth’s containerization model emphasizes traffic concentration, the emergence of load centres, and hinterland integration [15]. These frameworks provide a useful lens for understanding the evolution of Nigerian Western Seaports under containerization.

A substantial body of literature has documented the global impacts of containerization on port efficiency, trade growth, and spatial restructuring [16]. Studies in developed regions highlight improved productivity, reduced ship turnaround time, and the emergence of hub-and-spoke systems. In contrast, studies from developing regions emphasize persistent challenges, including inadequate infrastructure, weak hinterland connections, and institutional inefficiencies. In Nigeria, earlier studies focused on the initial diffusion of containerization and descriptive trends but did not systematically analyse long-term dynamics or their implications for port development. This study builds on and extends existing research by providing a comprehensive temporal analysis.

## Study Methods

### Study Area

The study focuses on Nigerian Western Seaports, comprising Lagos Ports Complex and Tin Can Island Port (Figure 1). The Western ports are of four types which presently have been fused into two major complexes. These are the Lagos port complex (Container terminal and Apapa port) and Tin-Can Island port complex (Tin-Can Island port and the Ro-Ro terminal). Of the four, the Lagos port complex is Nigeria’s largest and perhaps the most important port in the West African Sub-region. However, Lagos Ports and Tin Can Island Ports Complexes are responsible for more than 65 per cent and 90 per cent of the nation’s dry cargoes and liquid (petroleum) products respectively (Nigerian Ports Today, 2015). These ports account for the majority of Nigeria’s containerized cargo and serve as the primary interface between the national economy and international maritime

trade. Their strategic location, extensive terminal facilities, and concentration of shipping services make them suitable for examining containerization dynamics in Nigeria.

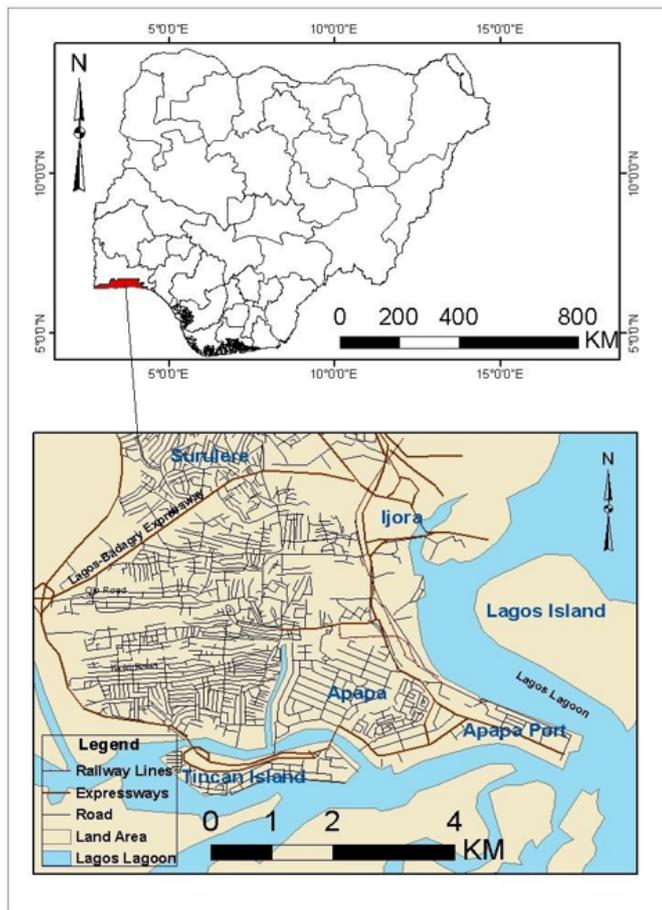


Figure 1: Study Area

### Data Collection and Analysis

The study utilized secondary data obtained from the Nigerian Ports Authority, including annual container throughput statistics, cargo traffic records, and port operational reports covering the period 1968–2014. The study does not cover Lekki Deep Sea Ports because of the recency of development and operation. Analytical techniques include descriptive statistics, trend analysis, and graphical visualization to examine temporal patterns, growth phases, and traffic concentration. The long-term approach allows for the identification of structural shifts associated with policy reforms and infrastructural developments.

## Results

### Trends in Containerized Trade

Generally, result showed that containerized trade in Nigerian Western Seaports exhibited three major phases over the study period. These phases included the initial adoption phase (1968–1980) which was characterized by slow growth due to limited infrastructure and technological adaptation. This was followed by the expansion phase (1981–2005) which witnessed significant growth in container throughput as a result of increased trade volumes and terminal expansion. The post-concessioning phase (2006–2014) followed with expanded growth Figure 2. A disaggregated analysis using linear trend

technique (Figure. 3) revealed the inward (INW) and outward (OUT) components of container throughput in Nigeria. Both throughput components display positive linear trends, indicating sustained growth in port activity and increasing engagement of Nigerian ports in regional and international trade. The steep positive slope signifies a rapid and sustained increase in import-related cargo volumes handled at Nigerian ports. This reflects Nigeria’s long-standing import dependence, driven by industrial inputs, consumer goods demand, and energy-related imports. The strength of the correlation confirms a strong association between time (or the underlying growth driver) and inward cargo flows, underscoring the structural dominance of imports in the country’s port throughput profile.

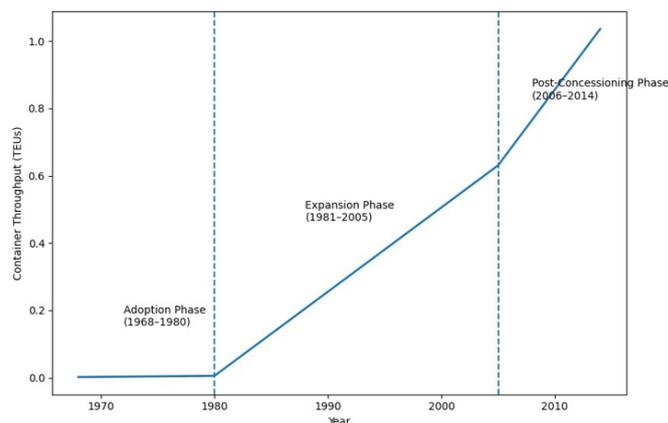


Figure 2: Containerization growth curve in Nigerian Western Ports

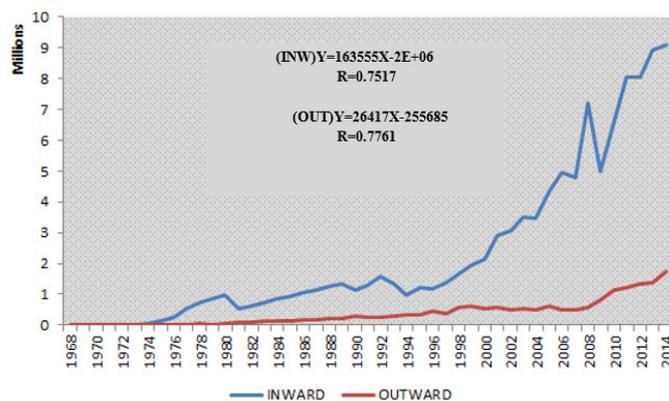
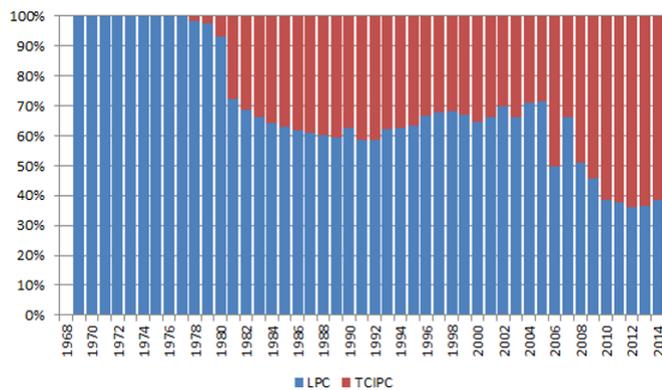


Figure 3: Inward and Outward container trend in Western Ports

### Traffic Concentration between Lagos Port and Tin Can Island Port Complexes

Result from the analysis showed that Lagos Ports Complex recorded container throughput of 67239570 tons between 1968 and 2014. This consisted of inward traffic of 57377412 tons (85.33%) and outward traffic of 9862158 tons (14.67%). The mean and standard deviation were 1430629 tons and 1256957 tons respectively. However, minimum throughput recorded was 0 ton in 1968 while the maximum container throughput was 4167351 tons in 2014. Minimum inward traffic of 0 ton was recorded in 1968 while maximum inward record of 3729258 tons was recorded in 2008. Minimum outward traffic of 0 ton was recorded between 1968 and 1974; while maximum output traffic

was 706701 tons in 2014. On the other hand, Tin Can Island Ports Complex had a total traffic of 58342389 tons between 1977 and 2014. This is made up of 50423330 tons inward traffic which was 86.42% of the total container traffic and 7919086 tons outward traffic which was 13.57% of the total container traffic. The mean and standard deviation were 1535326 tons and 1933667 tons, respectively. The minimum and maximum traffic for the entire period of study were 0 ton in 1977 and 6629753 tons in 2014. Minimum inward traffic of 0 ton was recorded in 1977 while maximum inward traffic of 5852821 tons was recorded in 2013. On the other hand, minimum outward traffic of 0 ton was recorded between 1977 and 1979 while maximum outward traffic of 1016405 tons was recorded in 2014



## Discussion

The results demonstrate that containerized trade in Nigerian Western Seaports followed a clearly phased trajectory over the study period, reflecting both global shipping trends and domestic structural conditions. The initial adoption phase (1968–1980) which was characterized by slow and uneven growth in container throughput is consistent with early containerization experiences in many developing economies, where limited terminal infrastructure, low technological capacity, and institutional unfamiliarity constrained rapid uptake [1].

From a theoretical standpoint, the findings provide partial support for classical port evolution models while also highlighting their limitations in a developing country context. The sequential phases observed in Nigerian Western Seaports broadly align with Bird's Anyport Model, particularly in terms of expansion and specialization driven by technological change.

Further findings from the study, revealing the intensification of the concentration of container traffic within Lagos Ports Complex and Tin Can Island Port particularly during the expansion and post-concessioning phases, confirms the emergence of Nigerian Western Seaports as national container load centres. This pattern closely reflects Hayuth's load centre concept, which predicts traffic concentration in ports with superior infrastructure, market access, and service frequency [12].

The results further indicate that containerization contributed positively to increases in cargo throughput and handling capacity in Nigerian Western Seaports [17]. This may be attributed to the concessioning efforts birthed by the government at improving port operations and efficiency [18]. However, to sustain these efficiency gains, there may be need to strengthen institutional

responsibilities and regulate port operations. Also, investment in superior, state-of-the-art infrastructure may be needed especially to offset operational drawbacks such as severe congestion, long cargo dwell times, and high logistics costs, which have been the bane of Nigerian seaports, especially Western ports.

## Conclusion and Policy Implications

The study demonstrates that containerization has been a major driver of port development in Nigerian Western Seaports, shaping trade patterns and reinforcing port concentration over time. The findings provide valuable insights for maritime policy formulation and port planning in Nigeria and by extension, other developing economies [19-25]. However, policy efforts should be prioritized to deepen trade gains from containerization by increasing export performance of the country which is tied to manufacture goods, integrating hinterland transport development for seamless transfer of container units between the ports and their hinterlands, sustaining infrastructure investment, and institutional reforms to enhance port competitiveness [26-36].

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