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RECONFIGURING THE REGIONAL HINTERLAND OF THE PORT OF DAR ES SALAAM A Market Concentration and Structural Change Analysis of Transit Cargo, 2016/17–2025/26

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ABSTRACT

This study examines the structural reconfiguration of the Port of Dar es Salaam's regional hinterland between 2016/17 and 2025/26 financial years, using ten consecutive years of country-level transit cargo data (in metric tons). Applying market concentration metrics, the Herfindahl-Hirschman Index (HHI) and the two-firm concentration ratio (CR2), alongside share and compound annual growth rate (CAGR) analysis, the paper tests whether the port's hinterland has become more or less concentrated as total transit throughput roughly tripled from 4.71 million to 14.75 million tons. The findings reveal a pronounced structural shift: the Democratic Republic of the Congo (DRC) displaced Zambia as the port's dominant transit client, its share rising from 24.2% to 52.6% while Zambia's fell from 36.2% to 23.1%. HHI values rose steadily from 2,467 to 3,565 and CR2 from 60.4% to 75.8%, indicating that Dar es Salaam's hinterland is transforming from a moderately concentrated to a highly concentrated market dominated by two copper-corridor economies. The paper links this reconfiguration to mining-led demand from the Congolese and Zambian Copperbelt, rail and road corridor investments, and intensifying competition with the Mombasa-based Northern Corridor. It argues that rising concentration, while evidence of Dar es Salaam's competitive success, creates vulnerabilities that warrant deliberate diversification of transit clients and corridor capacity. The paper discusses implications for port governance, corridor policy, and regional integration.

KEYWORDS: Dar es Salaam port, hinterland, market concentration, Herfindahl–Hirschman Index, Central Corridor, transit cargo, structural change, East Africa

1. INTRODUCTION

Seaports are not merely maritime interfaces; they are the organizing nodes of the landside territories they serve. The concept of the port hinterland, the inland territory from which a port draws and to which it distributes cargo, has become central to understanding competition among gateways, particularly in regions where a small number of coastal ports serve large, landlocked catchments [1] - [2]. In East Africa, this dynamic is acute. The Port of Dar es Salaam, Tanzania's principal gateway, serves as the maritime outlet for an extensive regional hinterland that includes Tanzania itself and six non-coastal economies: the Democratic Republic of the Congo (DRC), Zambia, Rwanda, Burundi, Malawi, and Uganda [3]. This hinterland puts Dar es Salaam in direct, sustained competition with Mombasa-based Northern Corridor for the same landlocked markets, a rivalry that has shaped regional logistics for decades [4]

Between the 2016/17 and 2025/26 financial years, transit cargo handled at Dar es Salaam rose from about 4.71 million to 14.75 million metric tons, a compound annual growth rate of about 13.5% [5]. This expansion is not solely quantitative. It coincides with significant institutional and infrastructural changes, including the entry of DP World into a thirty-year concession for the Dar es Salaam terminal, the extension of the Central Corridor southward following Zambia's accession in 2024, renewed investment in the Tanzania-Zambia (TAZARA) and Standard Gauge railways, and continued digitalization of corridor processes [6] - [7]. In this context, the composition of the hinterland - specifically, which countries account for transit volumes and how their relative positions change-becomes as important as the aggregate throughput figure

This paper addresses two related questions. First, has the regional hinterland of the Port of Dar es Salaam become more concentrated over the past decade, and to what extent? Second, what structural changes in the composition of transit cargo underlie any such concentration, and what are the implications for the port's strategy and resilience? To investigate these questions, the analysis applies market concentration metrics to ten years of country-level transit tonnage, utilizing the Herfindahl-Hirschman Index (HHI) and the two-firm concentration ratio (CR2), along with market-share and growth-rate decomposition. This approach conceptualizes the port's hinterland as a market in which each client country represents a share, thereby enabling the use of standard industrial organization tools to examine hinterland dynamics. Such applications are increasingly common in maritime literature [8]

The Study contributes to the literature in three primary ways. Empirically, it offers a decade-long, fine-grained account of hinterland recomposition at one of Africa's most strategically contested gateways, providing a level of detail rarely available in published research. Theoretically, it shows that concentration indices can serve as diagnostic instruments for assessing port-hinterland resilience, linking the maritime economics of gateway competition with the policy concerns of corridor governance. Practically, it

identifies implications for port authorities and corridor agencies managing both rapid growth and a shifting client base. The remainder of the paper is structured as follows: Section 2 reviews the relevant literature; Section 3 describes the data and methods; Section 4 presents the results; Section 5 discusses their significance; and Section 6 concludes with implications and directions for further research.

2. LITERATURE REVIEW

2.1 Port Hinterlands and Inter-Port Competition

The hinterland is the landside complement to the maritime foreland, and its definition has evolved from the rigid, distance-based models of the mid-twentieth century to the contemporary understanding of hinterlands as fluid, contestable, and institutionally constructed territories [9]-[11]. Containerization and intermodal corridor development extended port reach deep inland, converting formerly captive hinterlands into shared or contested ones and intensifying competition among gateways [12]. In this framing, a port's market is not fixed by geography alone but is continuously renegotiated through infrastructure, price, service quality, and institutional facilitation [13]

A central insight from this literature is the distinction between hubs and gateways. Hubs concentrate transshipment flows on major trunk lines, benefiting from service density and economies of scale, whereas gateways depend on the robustness of their hinterlands and their ability to maintain reliable links to end markets [14]-15]. Dar es Salaam functions primarily as a gateway, with its fortunes closely tied to the economic conditions of the landlocked economies it serves [16]. This makes the composition of its hinterland, and changes within it, a direct determinant of port performance and strategic risk [17].

Recent work has begun to quantify hinterland structure at a continental scale Verschuur, J., et al. (2026) analyze port-hinterland redundancies across Africa and find that the continent's landlocked countries typically exhibit low port accessibility but high redundancy because they rely on different port ranges. This redundancy, the availability of alternative routing options, is a form of resilience, but it also exposes gateway ports to competitive diversion [2]. For Dar es Salaam, this means its hinterland shares are not guaranteed; they result from ongoing competition with Mombasa and other gateways serving overlapping inland markets [17]

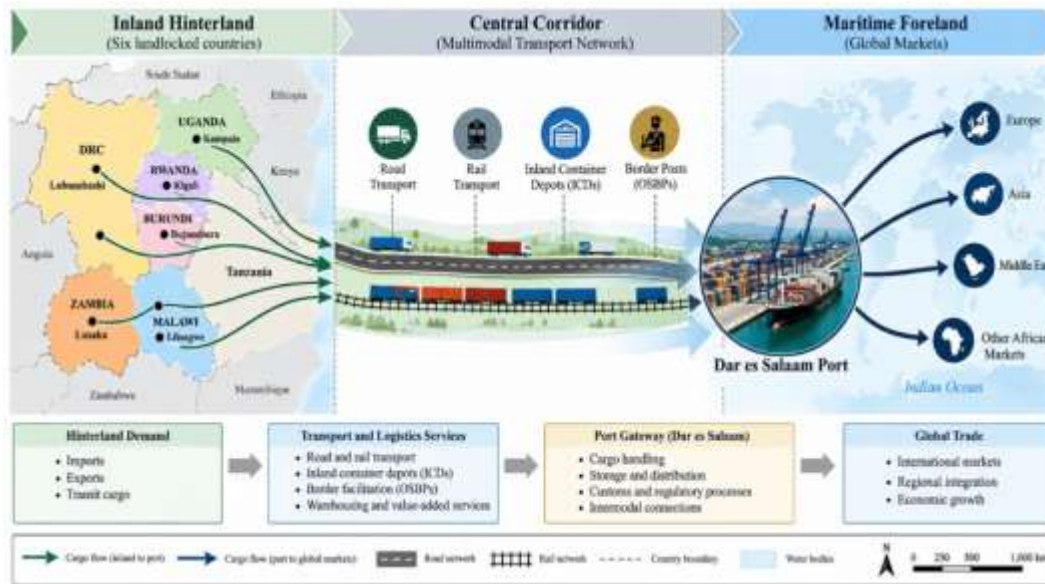


Figure 1. Port Hinterland Connectivity and Cargo Flow through the Central Corridor

2.2 Corridor Competition in East Africa

East Africa's transit-trade architecture centers on two rival gateway systems: the Northern Corridor, centered on the Port of Mombasa, and the Central Corridor, centered on the Port of Dar es Salaam. Both extend into the same landlocked and semi-landlocked markets in the Great Lakes and Central African region, so what is nominally competition between two ports is, in practice, competition between two multimodal transport systems [18]. This distinction matters analytically, as shippers evaluate the total cost of inland haulage, border clearance, and maritime freight across the full transport chain from origin to destination [19].

Port regionalization theory frames this as a natural extension of inland port competition, as gateway ports increasingly compete not on berth capacity but on the reach, cost, and reliability of the corridors and inland load centers that connect them to contested hinterlands[20] spatial duopoly extension of the Hotelling model formalizes this logic quantitatively: a corridor's ability to capture hinterland cargo from a rival gateway depends jointly on cross-border land transport costs and the differential in maritime freight rates between the two ports, such that high cross-border costs erode any advantage a corridor's land network might otherwise offer, while a large maritime cost disadvantage can offset even a shorter inland route[19]. Applied to East Africa, this framework helps explain why corridor competitiveness has proved changeable rather than fixed: it depends on several jointly moving cost components, not geography alone [19]

The historical pattern bears this out. Rwanda, Burundi, Uganda, and eastern DRC have long accessed both corridors, with routing decisions shifting in response to changes in infrastructure quality, congestion, and border efficiency rather than remaining fixed [18]. Recent data highlight the extent of this shift in favor of Dar es Salaam: the Northern Corridor's own strategic planning documents indicate that Dar es Salaam now handles 99 percent of Burundi's transit volumes, 78 percent of Rwanda's, and 84 percent of DRC's [21]. This represents a significant acknowledgment from the rival corridor's institutional records of the Central Corridor's market capture beyond its immediate geographic reach. Trade-press sources confirm this trend in detail: Burundi's container imports via Mombasa declined from approximately 21,000 tonnes to 1,000 tonnes year-on-year in the first seven months of 2019, as shippers shifted to Dar es Salaam [22]. Cost data further elucidate this mechanism: the Shippers Council of East Africa's 2021 logistics survey reported a Dar es Salaam-Kampala rate of USD 1.17 per tonne, compared to USD 2.17 per tonne for the Mombasa-Kampala route [22]. This cost differential, as described in the [19] model, is sufficient to shift the market-clearing point well within what would otherwise be considered Mombasa's natural hinterland. This market capture has been further supported by ongoing infrastructure investments along the Central Corridor. The commissioning of the Kwana Dry Port and the gradual extension of the Standard Gauge Railway have begun diverting DRC-bound container traffic away from the previously dominant Mombasa-Kampala-Kasere route [23]. Additionally, South Sudan's 2026 designation of Dar es Salaam and Tanga as its primary gateways, formalized through a bilateral revenue-integration agreement between the Tanzanian and South Sudanese Revenue Authorities, extends the Central Corridor's competitive reach into markets traditionally associated with the Northern Corridor [24]. Comparative port-performance rankings indicate that this shift is not solely attributable to pricing incentives: Dar es Salaam's position on the World Bank's Global Container Port Performance Index improved from 361st to 312th, while Mombasa's ranking declined from 296th to 326th over the same period [22]. This suggests that operational efficiency improvements at Dar es Salaam, in addition to corridor-level cost advantages, are contributing to increased cargo volumes [1]. Kunambi, M. & Zheng, H., (2025) used an integrated Markov-process and max-flow analysis of Dar es Salaam's hinterland network and find that, while road and rail capacity generally meets demand, specific bottlenecks-such as a capacity shortfall to Lubumbashi of approximately 500 tonnes per day-limit the port's ability to fully translate improved sea-side performance into inland market share. Thus, Dar es Salaam's competitive position is currently constrained more by residual weaknesses in the corridor's distribution network than by limitations at the port itself, underscoring the analytical importance of distinguishing between port and corridor factors [1]-[16].

The Central Corridor's institutional geography has expanded independently of operational developments. The CCTFA, established in 2006 by Burundi, the DRC, Rwanda, Tanzania, and Uganda, admitted Malawi as its sixth member on 1 December 2023 and Zambia as its seventh on 8 October 2024[4]. This expansion is particularly significant for Dar es Salaam, as it formally connects the port's institutional

catchment to the TAZARA railway corridor and Zambia's Copperbelt, thereby positioning the port in direct competition with southern African gateways such as Beira, Durban, and the Lobito Corridor, which have historically served this traffic [25]. This southward extension parallels patterns observed in Southern Africa, where Durban, Maputo, and the Walvis Bay/Trans-Kalahari corridor system compete for the Gauteng-centered hinterland based on combined port and corridor resources and capabilities, rather than port throughput alone. Dar es Salaam's integration into Zambia and Malawi via CCTTFA introduces a northern competitor into this contested hinterland [4].

However, the relationship between the two East African corridors can no longer be characterized solely as rivalry. On 21 January 2026, the CCTTFA and NCTTCA signed a Memorandum of Cooperation encompassing inland waterways transport, green corridor development, multimodal infrastructure integration, digitalization and data-sharing, and the harmonization of transport and trade procedures [4]-[19]. The decision by both corridor authorities-whose institutional interests are typically competitive to formalize cooperation on shared infrastructure, such as Lake Victoria transport, indicates that competition and coordination can coexist, particularly where non-tariff barriers and underdeveloped multimodal links impose costs on both systems [19].

For Dar es Salaam, these dynamics underscore a key implication: the port's competitiveness should not be evaluated solely as a port-level characteristic, but rather through the integrated perspectives of port regionalization and corridor-cost theory [19]-[20]. This evidence shows that Dar es Salaam's competitive gains over Mombasa result from improved port efficiency, favorable cross-border cost differentials, and corridor infrastructure investments such as the Standard Gauge Railway and Kwala Dry Port. These are precisely the factors that the spatial duopoly model identifies as jointly determining market share in land-sea corridor competition. Sustained capture of contested hinterland markets-including the DRC, Rwanda, and the newly acceded southern markets of Malawi and Zambia will depend on the Central Corridor's ability to address residual capacity constraints, as identified by Kunambi, M., & Zheng, H. (2025). on Dar es Salaam's performance relative to Southern African competitors, as described by Fraser, D., & Notteboom, T. (2014). A strategic rather than on port-side improvements alone.

2.3 Market Concentration Analysis in Maritime and Port Economics

Market concentration analysis, rooted in industrial organization, measures how concentrated activity is among a small number of participants. The Herfindahl-Hirschman Index (HHI), defined as the sum of squared market shares, is the most widely used summary measure, with a range from near zero (perfectly fragmented) to 10,000 (a single firm) and conventional thresholds of below 1,500 for unconcentrated, 1,500-2,500 for moderately concentrated, and above 2,500 for highly concentrated markets [26]. The two-firm concentration ratio (CR2) complements the HHI by focusing directly on the largest participants.

Researchers have adapted these metrics to port systems.[27] developed a modified Herfindahl-Hirschman Index for measuring the concentration of container port systems at the national level, establishing a standardized approach that has since informed comparative work on port hierarchies. More recently, Borggreve, R., et al. (2025). applied concentration analysis to container alliance strategies, demonstrating structural relationships between alliance behaviour and market concentration dynamics within specific trade regions. An analysis of market concentration and efficiency in major container ports traced structural changes in port hierarchy and market share over 2014-2023, confirming the analytical value of concentration metrics for understanding port-system evolution [28].

This literature does not yet apply concentration analysis to the composition of a single port's regional hinterland over time; that is, treating client territories rather than competing ports as the units of the market. This paper fills that gap by applying HHI and CR2 to the country-level transit cargo of the Port of Dar es Salaam, positioning hinterland composition as a measurable dimension of gateway resilience and strategic dependence.

3. MATERIALS AND METHODS

3.1 Data Source and Scope

This analysis utilizes a ten-year dataset of transit cargo handled at the Port of Dar es Salaam, disaggregated by country of destination and measured in metric tons, spanning the financial years 2016/17 to 2025/26. The dataset includes seven client categories: the DRC, Zambia, Rwanda, Burundi, Malawi, Uganda, and a residual "Others" category. Total annual transit tonnage serves as the port-level denominator. Data are organized by the Tanzanian fiscal year (July to June), aligned with Tanzania Ports Authority reporting standards.

3.2 Measures

Three categories of measures are employed. First, direct market shares quantify each client country's proportion of total transit tonnage annually, offering a clear representation of hinterland composition. Second, the Herfindahl–Hirschman Index (HHI) is calculated as the sum of the squared percentage shares of all seven client categories, where higher values indicate greater concentration. Third, the two-firm concentration ratio (CR2) measures the combined share of the two largest clients, specifically the DRC and Zambia, both classified as copper-corridor economies. Compound annual growth rates (CAGR) are also calculated to describe growth over the nine-year period from 2016/17 to 2025/26.

Two interpretive conventions are adopted. HHI values are classified according to standard thresholds (below 1,500 as unconcentrated; 1,500-2,500 as moderately concentrated; above 2,500 as highly

concentrated), which, although originally developed for product markets, provide a transparent and widely recognized benchmark for comparative analysis [26]

3.3 Analytical Approach

The analysis follows a three-step process. First, it profiles total transit cargo and the growth of each client country over the decade. Annual growth is measured using:

$$AGR_{it} = \left(\frac{V_{it} - V_{i,t-1}}{V_{i,t-1}} \right) \times 100 \quad (1)$$

where V_{it} denotes transit cargo to destination country i in year t , and $V_{i,t-1}$ denotes transit cargo to the same destination in the preceding year.

The compound annual growth rate (CAGR) is calculated as:

$$CAGR_i = \left[\left(\frac{V_{i,T}}{V_{i,0}} \right)^{\frac{1}{T}} - 1 \right] \times 100 \quad (2)$$

where $V_{i,0}$ and $V_{i,T}$ represent the initial and final transit cargo volumes, respectively, and T is the number of years in the study period.

Second, the analysis calculates the annual market share of each destination country as:

$$MS_{it} = \frac{V_{it}}{\sum_{j=1}^n V_{jt}} \times 100 \quad (3)$$

where MS_{it} is the market share of destination i in year t , V_{it} is its transit cargo volume, and $\sum_{j=1}^n V_{jt}$ represents total regional transit cargo in year t .

Market concentration is then measured using the Herfindahl-Hirschman Index (HHI):

$$HHI_t = \sum_{i=1}^n s_{it}^2 \quad (4)$$

where s_{it} represents the market share of destination i in year t , expressed as a proportion rather than a percentage.

The concentration of the two largest destination markets is measured using the CR2:

$$CR2_t = s_{(1)t} + s_{(2)t} \quad (5)$$

where $s_{(1)t}$ and $s_{(2)t}$ denote the market shares of the two largest destination markets in year t .

Third, the analysis examines changes in destination shares and cargo volumes to identify the countries that contributed most to the reconfiguration of Dar es Salaam's regional hinterland, distinguishing between the dominant Copperbelt economies and the smaller corridor states. This sequence progresses from aggregate growth to market-share dynamics and concentration measurement, allowing the study to identify changes in the structure and dominance of the regional transit market.

4. RESULTS

4.1 Aggregate Growth in Transit Cargo

Total transit cargo at Dar es Salaam increased from 4.71 million to 14.75 million metric tons between 2016/17 and 2025/26, representing a compound annual growth rate of approximately 13.5% (see the growth decomposition below). Growth was uneven throughout the decade. From 2016/17 to 2019/20, volumes remained near 5.5 million tons and declined in 2019/20. The year 2020/21 marked the lowest point, followed by a sharp acceleration from 2021/22 (7.80 million tons) onward. In the two most recent years, volumes surpassed 12.6 and then 14.75 million tons. This trend suggests a structural break around 2021/22, coinciding with the recovery in global commodity demand, the operational expansion of new terminal capacity, and increased copper-corridor trade.

Table 1: Transit Cargo Trends and Market Concentration at the Port of Dar es Salaam

Metric	2016/17	2020/21	2021/22	2023/24	2024/25	2025/26
Total transit (t)	4,709,732	5,579,590	7,801,495	9,187,061	12,616,786	14,752,249
DRC (t)	1,141,611	1,986,512	2,956,368	4,180,902	5,995,293	7,766,271
Zambia (t)	1,704,235	1,141,444	2,036,748	2,248,505	3,510,706	3,412,821
HHI	2467	2381	2568	3059	3262	3565
CR2 (%)	60.4	56.1	64.0	70.0	75.3	75.8

Table 2 presents the annual data series for each client country. The scale of reconfiguration is substantial. The Democratic Republic of the Congo (DRC) increased from 1.14 million to 7.77 million tons, indicating significant growth. This change represents an increase of about 6.6 million tons and a compound annual growth rate (CAGR) of 23.7 percent. In contrast, Zambia expanded only modestly, from 1.70 million to 3.41 million tons, with a CAGR of approximately 8.0 percent. Zambia's growth trajectory was volatile, experiencing a significant decline in 2020/21 and only a partial recovery thereafter. Rwanda exhibited steady growth from 1.01 million to 2.18 million tons (CAGR of approximately 8.9 percent). In contrast, Burundi, Malawi, and Uganda demonstrated smaller and less consistent changes. Uganda's decline from 239,953 tons in 2016/17 to 15,359 tons in 2025/26 represents a notable case of hinterland loss, likely due to diversion to the Northern Corridor.

Table 2: Dar es Salaam Transit Cargo by Destination Country (metric tons)., 2016/17–2025/26

D.C	2016 /17	2017 /18	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26
D.R. Congo	1,14 1,61 1	1,37 0,07 8	1,95 4,62 6	1,89 0,73 2	1,98 6,51 2	2,95 6,36 8	3,49 5,19 5	4,18 0,90 2	5,99 5,29 3	7,76 6,27 1
Zambia	1,70 4,23 5	2,05 3,17 4	1,66 3,49 9	1,39 3,89 3	1,14 1,44 4	2,03 6,74 8	1,96 8,71 7	2,24 8,50 5	3,51 0,70 6	3,41 2,82 1
Rwanda	1,01 2,88 9	922, 134 9	1,06 0,80 9	1,25 2,33 8	1,29 3,53 4	1,48 7,27 7	1,55 0,84 3	1,67 2,43 1	1,72 4,37 0	2,18 2,37 6
Burundi	363, 060	425, 300	378, 874	477, 788	504, 273	493, 078	487, 811	349, 591	425, 774	408, 830
Malawi	217, 852	258, 271	320, 399	376, 054	460, 869	470, 475	610, 506	594, 281	675, 200	821, 131
Uganda	239, 953	215, 878	167, 270	140, 269	138, 263	209, 975	183, 280	60,6 82	185, 625	15,3 59
Others	30,1 32	359, 770	30,8 89	35,1 69	54,6 96	147, 574	62,7 68	80,6 69	99,8 18	145, 461
Transit Total	4,70 9,73 2	5,60 4,60 5	5,57 6,36 7	5,56 6,24 2	5,57 9,59 0	7,80 1,49 5	8,35 9,12 0	9,18 7,06 1	12,6 16,7 86	14,7 52,2 49

Source: Author, 2026

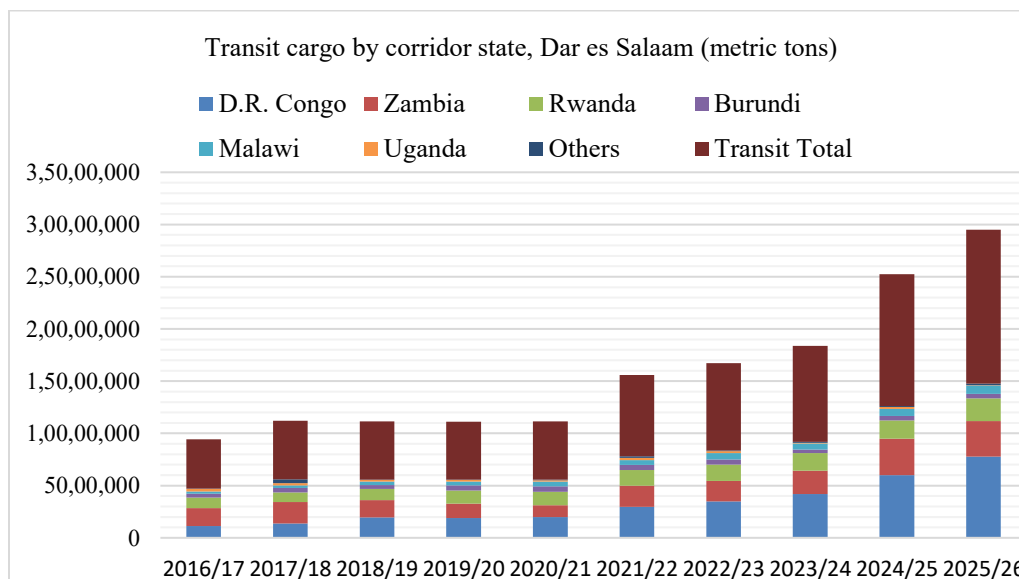


Figure 2. Stacked transit cargo by corridor state, 2016/17–2025/26.

4.2 Market Share Dynamics across Regional Hinterlands

Table 3 presents the market-share dynamics underlying aggregate growth. The Democratic Republic of the Congo's (DRC) share of transit cargo increased steadily from 24.2% in 2016/17 to 52.6% in 2025/26, surpassing the 50% threshold in the final year. In contrast, Zambia's share declined from 36.2% to 23.1%. Notably, Zambia briefly exceeded the DRC in 2016/17 and 2017/18 but relinquished its leading position from 2018/19 onward. Rwanda's share remained relatively stable, fluctuating between 13.7% and 23.2% and ending at 14.8%. Together, the two Copperbelt economies accounted for 75% of transit cargo by 2025/26, up from about 60% a decade earlier.

The structural break observed in 2018/19 is particularly significant. During this period, the DRC's share rose from 24.4% to 35.1%, while Zambia's fell from 36.6% to 29.8%, reversing their relative positions in a single year. This discontinuity indicates that the reconfiguration was driven less by gradual divergence in growth rates and more by a discrete shift in routing or demand. This pattern aligns with the maturation of Congolese copper and cobalt exports and, plausibly, with improvements in infrastructure and facilitation along the Central Corridor's western approaches.

Table 3: Changing Destination Shares of Regional Transit Cargo through the Port of Dar es Salaam

Year	D.R. Congo (%)	Zambia (%)	Rwanda (%)	Burundi, Malawi, Uganda & Others (%)	Total (%)
2016/17	24.2	36.2	21.5	18.1	100.0
2017/18	24.4	36.6	16.5	22.5	100.0
2018/19	35.1	29.8	19.0	16.1	100.0
2019/20	34.0	25.0	22.5	18.5	100.0
2020/21	35.6	20.5	23.2	20.8	100.0
2021/22	37.9	26.1	19.1	16.9	100.0
2022/23	41.8	23.6	18.6	16.1	100.0
2023/24	45.5	24.5	18.2	11.8	100.0
2024/25	47.5	27.8	13.7	11.0	100.0
2025/26	52.6	23.1	14.8	9.4	100.0

4.3 Market Concentration: Herfindahl-Hirschman Index (HHI) and Concentration Ratio (CR2)

The concentration indices demonstrate that the hinterland has become significantly more concentrated (Table 3, Figure 3). The Herfindahl-Hirschman Index (HHI) increased from 2,467 in 2016/17 to 3,565 in 2025/26, representing a rise of approximately 44.5%. By standard thresholds, the port's hinterland shifted from the upper range of moderate concentration to a distinctly high concentration, surpassing the 2,500 benchmarks in 2018/19 and remaining above it thereafter. Nearly half of the total increase occurred in the last three years, during which the HHI rose from 2,740 (2022/23) to 3,565 (2025/26), paralleling the Democratic Republic of the Congo's (DRC) share, which exceeded 50%. The Concentration Ratio (CR2) series reflects a similar trend, increasing from 60.4% to 75.8%.

The progression of concentration was not linear. After a modest decline in the initial years (HHI fell from 2,467 to 2,345 between 2016/17 and 2017/18), concentration increased through 2018/19, then eased slightly in 2019/20 and 2020/21, as pandemic-related disruptions unevenly reduced volumes. A decisive upward trend began in 2021/22 and continued without interruption. This pattern suggests that the pandemic represented a temporary disruption to a longer-term consolidation trend, rather than a structural turning point. The underlying drivers, specifically mining-led demand from the Copperbelt and improvements in corridor capacity, became prominent again once conditions stabilized.

Table 4: Hinterland market shares and CR2 concentration, 2016/17–2025/26 (%)

Year	HHI	CR2 (%)	DRC Share (%)	Zambia Share (%)	Rwanda Share (%)
2016/17	2,467	60.4	24.2	36.2	21.5
2017/18	2,345	61.1	24.4	36.6	16.5
2018/19	2,569	64.9	35.1	29.8	19.0
2019/20	2,413	59.0	34.0	25.0	22.5
2020/21	2,381	56.1	35.6	20.5	23.2
2021/22	2,568	64.0	37.9	26.1	19.1
2022/23	2,740	65.4	41.8	23.6	18.6
2023/24	3,059	70.0	45.5	24.5	18.2
2024/25	3,262	75.3	47.5	27.8	13.7
2025/26	3,565	75.8	52.6	23.1	14.8

Source: Author, 2026

Hinterland market shares and CR2 concentration, 2016/17–2025/26 (%)

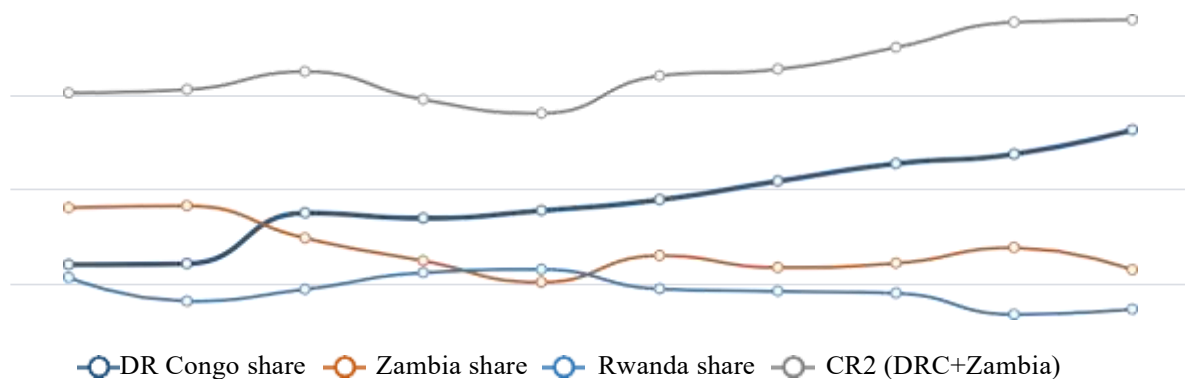


Figure 3. Market shares of principal clients and the CR2 concentration ratio, 2016/17–2025/26.

4.4 Growth Decomposition

Decomposing growth clarifies which clients drove the reconfiguration (Table 5). Over the decade, the DRC contributed the largest absolute increment - approximately 6.62 million tons followed by Zambia (1.71 million tons), Rwanda (1.17 million tons), and Malawi (0.60 million tons). In growth-rate terms, however, the ranking differs: the DRC's 23.7% CAGR far outpaced the corridor average, while Zambia's 8.0% and Rwanda's 8.9% lagged the 13.5% pace of total transit cargo. This divergence - above-average growth for one dominant client, below-average growth for others is precisely the mechanism that generates

rising concentration. Uganda's negative trajectory (CAGR of about -26.6%) compounded the effect by shrinking a formerly significant client to near-negligible size.

Table 5: Decomposition of Growth

Country	2016/17 (t)	2025/26 (t)	Δ (t)	CAGR (%)
DR Congo	1,141,611	7,766,271	6,624,660	23.7
Zambia	1,704,235	3,412,821	1,708,586	8.0
Rwanda	1,012,889	2,182,376	1,169,487	8.9
Burundi	363,060	408,830	45,770	1.3
Malawi	217,852	821,131	603,279	15.9
Uganda	239,953	15,359	-224,594	-26.3
Transit total	4,709,732	14,752,249	10,042,517	13.5

Source: Author, 2026

5. DISCUSSION

5.1 A Hinterland Reconcentrated around the Copperbelt

The primary finding indicates that Dar es Salaam's regional hinterland has been reoriented toward the Copperbelt economies of the Democratic Republic of Congo (DRC) and Zambia, with an increasing emphasis on the DRC. Over the past decade, the port's client base has shifted from a relatively balanced group of corridor states to a market in which two countries account for three-quarters of transit cargo and one country provides more than half. The sustained increase in both the Herfindahl-Hirschman Index (HHI) and the two-firm concentration ratio (CR2) is not attributable to a single anomalous year; rather, it represents a decade-long trend marked by a clear structural break in 2018/19 and an accelerating shift from 2021/22. This pain industrial-organization terms capacity challenges documented in the port's hinterland network during the period [3]. In terms of industrial organization, a moderately concentrated hinterland has become highly concentrated.

This reconfiguration can be interpreted in two distinct ways. From an optimistic perspective, it demonstrates Dar es Salaam's effectiveness in capturing and maintaining the high-value, rapidly expanding copper and cobalt trade of Central Africa. This trade has grown significantly in response to global demand for battery minerals [29], providing the port with substantial and reliable cargo volumes.

The 23.7% compound annual growth rate of Congolese cargo highlights the port's competitiveness relative to the Northern Corridor and the improvements in the Central Corridor's service, even as the region attracts competing investments through the Lobito Corridor and the TAZARA route [30]. Conversely, this trend also increases the port's dependence on a limited range of commodities and two economies, both vulnerable to mineral price fluctuations, political instability, and periodic border and security disruptions. The DRC has faced recurrent conflict in its eastern regions [31] and ongoing disputes over export routes and taxation, most notably the cobalt export restrictions implemented from February 2025 and the subsequent quota regime any of which could rapidly alter cargo flows [32]

5.2 Corridor Competition and the Uganda Counter-Example

The collapse of Uganda's cargo volumes from nearly 240,000 tons to just over 15,000 tons contrasts sharply with the Democratic Republic of Congo's (DRC) growth. As a natural Northern Corridor market, Uganda's near-total disappearance from Dar es Salaam's transit records demonstrates how rapidly a hinterland client can shift to a competing gateway. This asymmetry, characterized by rapid gains in the west and rapid losses in the north, indicates that Dar es Salaam's hinterland is genuinely contestable rather than captive, consistent with the broader literature on hinterland fluidity [2]-[9]. The observed concentration should therefore be interpreted as the net result of competitive gains and losses, rather than the consolidation of a stable monopoly.

This analysis suggests that concentration and competitiveness are closely linked. Dar es Salaam's recent successes in the Copperbelt are attributable to the Central Corridor's increased attractiveness, driven by rail investment, digitalization, and Zambia's inclusion as a corridor member [6]-[7]. However, the same competitive dynamics that have driven these gains could also lead to losses if the Northern Corridor or alternative routes, such as those via the Atlantic or the Lobito corridor, improve their services. As concentration increases, the stakes of corridor competition rise, with a larger share of the port's transit business now reliant on a narrower client base.

5.3 Concentration as a Risk to Gateway Resilience

Concentration indices are conventionally read as measures of market power, but in the port-hinterland context, they also measure exposure. A hinterland that draws three-quarters of its transit cargo from two economies is more exposed to shocks affecting those economies than one spread evenly across six. Verschuur et al. (2026) emphasize redundancy. Access to multiple routing options is fundamental to the resilience of landlocked hinterlands. Conversely, for the gateway, a narrowing client base enhances resilience for its clients but increases vulnerability for the port itself. The rising Herfindahl-Hirschman Index (HHI) at Dar es Salaam should therefore be regarded as a strategic warning rather than merely descriptive statistics.

However, concentration is not inherently undesirable. Serving a large, focused client base can generate significant economies of scale and scope, and strong relationships with copper-corridor economies can facilitate dedicated rail and terminal infrastructure, reducing costs for all users. The primary concern is asymmetric exposure: when a substantial portion of growth and revenue depends on a single country's mineral exports, the port's risk profile becomes closely linked to that country's stability, trade policy, and infrastructure constraints. An effective gateway strategy would leverage its strong position in the Copperbelt to develop a durable, diversified hinterland, using revenues and capacity from copper-corridor trade to attract additional clients.

6. CONCLUSION AND IMPLICATIONS

This study shows that the Port of Dar es Salaam's regional hinterland has undergone significant structural transformation over the past decade, shifting from a moderately concentrated market to a highly concentrated one dominated by the Democratic Republic of Congo (DRC) and Zambia. Although transit throughput tripled, growth was uneven: the DRC's share increased from 24.2% to 52.6%, while Zambia's declined from 36.2% to 23.1%. The Herfindahl-Hirschman Index (HHI) rose from 2,467 to 3,565, and the top two countries' combined market share (CR2) increased from 60.4% to 75.8%. These developments reflect the increasing significance of Copperbelt mineral trade in the port's hinterland, the Central Corridor's improving competitiveness, and Uganda's diversion of traffic to the Northern Corridor. This reconfiguration is substantial, sustained over a decade, and continues to accelerate.

Several limitations warrant consideration. The "Others" category combines diverse clients whose individual trends cannot be analyzed separately, making the HHI a conservative estimate. This analysis is descriptive and structural, focusing on concentration and growth decomposition without isolating the effects of tariff changes, rail capacity, or commodity prices. Future research should incorporate commodity-level breakdowns of transit cargo, examine the relationship between hinterland concentration and measurable outcomes such as dwell time and corridor costs, and apply the concentration framework to comparative contexts, such as contrasting Dar es Salaam's hinterland dynamics with those of Mombasa, Djibouti, or the emerging Lobito Corridor. Such studies would further establish concentration analysis as a practical tool for assessing gateway resilience in a region where corridor choices have long-term developmental impacts.

The implications of these findings span three key domains. First, for port strategy, a dual approach is recommended: consolidating the established position in the Copperbelt while actively diversifying the transit client base to mitigate risks associated with dependence on a limited set of commodities and countries. Second, the corridor policy results highlight the importance of institutional and infrastructural investments, including digitalization, rail capacity, and trade facilitation, that have enabled the Central

Corridor to remain competitive. Sustained, coordinated investment among Central Corridor Transit Transport Facilitation Agency (CCTTFA) member states is crucial to maintain these gains and avoid abrupt traffic diversions, as Uganda's shift shows. Third, regarding regional integration, the analysis underscores the growing interdependence between Tanzania and its landlocked neighbors. Dar es Salaam's prosperity is increasingly linked to that of the DRC and Zambia, making collaborative corridor governance a shared strategic priority rather than a competitive struggle for cargo.

REFERENCES

1. Amani Africa. (2025). *Briefing on the situation in eastern DRC*.
2. African Development Bank. (n.d.). *Regional integration and corridor development in Eastern and Southern Africa*.
3. Bankable. (2026, March 26). *DRC, Zambia, Tanzania plan digital upgrades to secure Central Corridor trade*.
4. Borggreve, R., et al. (2025). Container alliance strategies, market concentration and equality: A dynamic time warping clustering approach. *Journal of Transport Geography*, 118, 104201. <https://doi.org/10.1016/j.jtrangeo.2025.104201>
5. Central Corridor Transit Transport Facilitation Agency. (2026). *Projects and corridor development*. <https://centralcorridor-ttfa.org/>
6. Deshmukh, A., & Song, D.-W. (2023). A new wine in new wineskins: Unfolding dimension of port-hinterland connectivity and market shares. *Maritime Policy & Management*.
7. Digest.tz. (2025). *Kwala Dry Port and the shifting patterns of DRC-bound cargo*.
8. Fraser, D., & Notteboom, T. (2014). A strategic appraisal of the attractiveness of seaport-based transport corridors: The Southern African case. *Journal of Transport Geography*, 36, 53–68.
9. Goedhals-Gerber, L., & van Eeden, J. (2026). Dry ports research on African countries: A systematic literature review and bibliometric analysis. *Case Studies on Transport Policy*.
10. Guerrero, D., Itoh, H., Jung, P. H., & Thill, J. (2026). Transnational hubs and domestic hinterlands: Busan and the limits of port consolidation policies in Japan. *Journal of Transport Geography*.
11. Humphreys, M., Stokenberga, A., Herrera Dappe, M., Iimi, A., & Hartmann, O. (2019). *Port development and competition in East and Southern Africa: Prospects and challenges*. World Bank Publications.
12. International Energy Agency. (2025). *Global critical minerals outlook 2025*.
13. International Energy Agency. (2026). *Global critical minerals outlook 2026*.
14. Karashani, B. (2024, October 15). Central Corridor extends south as Zambia joins. *The EastAfrican*. <https://www.theeastafrican.co.ke/tea/business-tech/central-corridor-extends-south-as-zambia-joins-4794532>

15. Kunambi, M. M., & Zheng, H. (2025). Optimizing African port hinterland connectivity using Markov processes, max-flow, and traffic flow models: A case study of Dar es Salaam Port. *Applied Sciences*, 15(4), 1966. <https://doi.org/10.3390/app15041966>
16. Le, Y., & Ieda, H. (2010). Modified Herfindahl–Hirschman index for measuring the concentration degree of container port systems. *Transportation Research Record*, 2166(1), 44–53.
17. Liu, C., Fan, H., Miao, H., Fan, H., & Zhang, X. (2024). Impact of the new international land–sea transport corridor on port competition between neighboring countries based on a spatial duopoly model. *Applied Sciences*, 14(5), 1857.
18. Logistics Middle East. (2026, February 27). *Tanzania ports challenge Mombasa supremacy as costs rise*.
19. Macheel, W. (2024, June 24). An explainer on how market concentration is measured. *ProMarket*. <https://www.promarket.org/2024/06/24/an-explainer-on-how-market-concentration-is-measured/>
20. Mashariki Research and Policy Centre. (2026). *Corridor competition and hinterland trade in East Africa*.
21. Nha, N. P. (2026). An analysis of market concentration and efficiency in Vietnam’s container ports. *Maritime Business Review*, 1–21.
22. Notteboom, T. (2025). Port hinterlands, regionalization and corridors. In *Port Economics, Management and Policy*.
23. Notteboom, T. E., & Rodrigue, J.-P. (2005). Port regionalization: Towards a new phase in port development. *Maritime Policy & Management*, 32(3), 297–313.
24. Rodrigue, J.-P., & Notteboom, T. (2010). Foreland-based regionalization: Integrating intermediate hubs with port hinterlands. *Research in Transportation Economics*.
25. Sdoukopoulos, E., & Boilé, M. (2020). Port-hinterland concept evolution: A critical review. *Journal of Transport Geography*.
26. *Sustainable Market Access for African Road Transport—SMART: Final Report*. (2021).
27. Tanzania Port Authority. (2026). *[Publication/information on ports]*.
28. The Africa Report. (2026, July 6). *Lobito or Tazara? The battle of the corridors intensifies*.
29. Verschuur, J., et al. (2026). Redundancies of African port hinterlands and their implications for new container port investments. *Transport Policy*, 165, 103806. <https://doi.org/10.1016/j.tranpol.2026.103806>
30. Zhang, H., Poo, M., Lau, Y.-Y., & Fan, S. (2026). Integration mechanisms and performance in port–hinterland supply chains: A systematic review. *Journal of Marine Science and Engineering*.