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Competitive Dynamics of BRICS Ocean-Based Exports: Sequential Constant Market Share and Revealed Comparative Advantage Evidence, 2013-2024

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ABSTRACT

Ocean-based trade now forms a significant part of economic competition among the BRICS nations: Brazil, Russia, India, China and South Africa. Yet the sector-level forces behind their shifting global market shares have not been examined systematically. This paper applies a sequential Constant Market Share (CMS) analysis, combined with Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) indices, to annual bilateral ocean trade data from UNCTADstat across five commodity categories, 2013 to 2024. The sequential approach chains consecutive year-pair decompositions, splitting total market share change into competitiveness, commodity composition and commodity adaptation effects. China recorded the largest cumulative gain, at 4.30 percentage points, driven almost entirely by the market share effect (+4.47). A commodity composition drag partly offset this, pointing to early over-specialisation in slower-growing ocean segments. India and Russia each gained close to a quarter of a percentage point through competitiveness alone. Russia's advantage sat in marine fisheries, where RCA rose from 3.29 to 4.43, while India's centred on ships and port equipment, where RCA has stayed above 1.0 since 2014. Russia's ocean trade data stopped appearing after 2021, alongside international sanctions, and this gap carries weight of its own. Brazil's position turned marginally positive across the extended window, while South Africa recorded a small cumulative decline. These findings speak to maritime policy, South-South shipping value chains and how BRICS nations are repositioning themselves in global ocean commerce.

1. Introduction.

The ocean-based economy includes fisheries, seafood processing, sea minerals, shipbuilding, port operations and high technology marine manufactures. The United Nations Conference on Trade and Development estimates that ocean goods trade exceeded USD 800 billion annually by 2021, with the five BRICS nations (Brazil, Russia, India, China and South Africa) accounting for a substantial and rising proportion of that total (Trade and Development, 2024).

The BRICS grouping was conceptualised as a cluster of large emerging economies with the combined scale to reshape global trade patterns (O'Neill et al., 2001). Maritime economists have documented China's extraordinary shipbuilding expansion and port infrastructure investment (Stopford, 2008), but the competitiveness dynamics of the full BRICS partners across ocean-specific commodity categories remain without systematic annual treatment. Most comparative analyses either focus on merchandise trade in aggregate, use two-point comparisons that conflate cyclical and structural shifts, or stop at the onset of the COVID-19 disruption.

This paper addresses that gap through two methods. The first is a sequential CMS decomposition, applied to annual UNCTADstat bilateral ocean trade data for 2013 to 2024, with year-pair results chained into cumulative effects. The sequen-

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tial approach, following Fagerberg and Sollie (1987), decomposes total market share change into: a market share effect (MSE) attributable to pure competitiveness, a commodity composition effect (CCE) reflecting initial specialisation in fast or slow-growing segments, and a commodity adaptation effect (CAE) capturing structural adjustment over time. The second method computes RCA (Balassa, 1965) and Revealed Symmetric Comparative Advantage (RSCA) (Laursen, 2015) indices annually for all five BRICS reporters across all five ocean commodity categories, showing where each nation holds, builds or loses comparative advantage. Three research questions guide the analysis and are as follows:

First, which BRICS nations gained or lost global ocean export share over 2013 to 2024, and through which CMS effect? Second, in which ocean commodity categories do BRICS nations hold revealed comparative advantage, and how has that pattern evolved? Third, what does the post-2021 data gap for Russia reveal about the interaction between geopolitical disruption and maritime trade transparency?

The paper makes three contributions. It provides the first sequential CMS decomposition of BRICS ocean trade using the UNCTADstat ocean goods dataset, updated and extended to 2024. It introduces annual RCA and RSCA tracking across all five BRICS-relevant ocean commodity categories over a twelve-year horizon. It documents and contextualises Russia's statistical disappearance from global ocean trade reporting as an analytically significant outcome of the post-2022 sanctions regime. The remainder of the paper is organised as follows. Section 2 reviews the literature. Section 3 describes the data and methodology. Section 4 presents results. Section 5 discusses the findings. Section 6 concludes.

2. Literature Review.

2.1. Constant Market Share Analysis.

The CMS framework originated with Tyszynski (1951), who decomposed changes in a country's export share into a structural effect and a competitive effect. Richardson (1970) formalised the two-effect CMS and highlighted its sensitivity to the choice of base period. Fagerberg and Sollie (1987) extended the framework to a five-effect decomposition that adds regional composition and regional adaptation terms alongside commodity - level effects, providing a richer account of the sources of export growth.

Applications span manufactured goods exports from the European Union, agricultural competitiveness in Asia, and the post-1990 merchandise trade trajectories of transition economies. However, applications to ocean-specific trade categories remain sparse. Existing maritime CMS work tends to focus on individual commodity streams, and few studies apply sequential, annual-chaining approaches that separate short-run competitive shocks from medium-run structural adjustments.

The sequential approach adopted here addresses a methodological limitation of two-endpoint CMS. When only two years are compared, the cross-product residual term grows with the distance between endpoints, and structural changes within the interval are invisible. Year-by-year chaining suppresses the residual per period to near zero and reveals the timing of competitiveness shifts, permitting a richer interpretation of the role of specific events such as the 2015 - 2016 commodity price cycle, the US - China trade dispute of 2018 - 2019 and the post-COVID maritime boom of 2020 - 2021.

2.2. Revealed Comparative Advantage.

The RCA index, introduced by Balassa (1965), compares a country's share in a specific commodity's world exports with its share in total world exports. A value above unity signals that the country is relatively more specialised in that commodity than the world average. The index has been criticised for its asymmetric distribution and sensitivity to the level of aggregation (Laursen, 2015). Laursen proposed the RSCA transformation, which rescales the Balassa index to the interval $[-1, +1]$ and follows a more symmetric distribution, facilitating cross-country and cross-commodity comparison.

Both measures have been applied in maritime economics to analyse comparative advantage in shipbuilding, particularly in East Asian economies (Stopford, 2008), and to evaluate the impact of fisheries agreements on national specialisation patterns. The contribution of this paper is to apply annual RCA and RSCA tracking across all five BRICS reporters simultaneously and across all five UNCTADstat ocean commodity categories, providing a panel view of evolving comparative advantage over a twelve-year horizon.

2.3. BRICS Trade Competitiveness.

The BRICS concept, originally coined by O'Neill et al. (2001) for Brazil, Russia, India and China and later extended to include South Africa, attracted considerable attention during the commodity boom of the 2000s. Studies from that period documented the group's rising share of global merchandise exports, but each economy followed a different structural path. China's growth was manufacturing-led. Russia's rested on resources. India combined a services base with an expanding manufactures component. Brazil's exports were commodity-led, and South Africa's centred on minerals alongside a diversified secondary sector.

The ocean economy dimension of BRICS competitiveness has received less systematic treatment. The blue economy literature has documented the strategic significance of ocean resources across these economies (Koondee et al., 2022), but sectoral competitiveness analysis at the commodity level has been largely absent. Post-2022 geopolitical disruption adds a further dimension: Russia's exclusion from international financial and logistics systems following the 2022 invasion of Ukraine has reshaped BRICS maritime trade flows in ways that are only partially visible in available data.

3. Data and Methodology.

3.1. Data.

The primary data source is the UNCTADstat ocean trade dataset (UNCTAD, 2026), accessed in June 2026. The dataset provides bilateral ocean goods exports in USD at current

prices, disaggregated by economy, partner economy, product category and year. The product taxonomy distinguishes five top-level ocean commodity categories: marine fisheries, aquaculture and hatcheries (O_A); seafood processing (O_C); sea minerals (O_D); ships, port equipment and parts thereof (O_E); and high-technology and other manufactures not elsewhere classified (O_F).

The analysis covers five reporters: Brazil, China, India, the Russian Federation and South Africa. The partner dimension is the world total, ensuring that reported values represent each economy's total ocean exports consistent with global aggregates. Russia's data are available from 2013 to 2021. Data for 2022, 2023 and 2024 are absent for Russia in the UNCTADstat ocean trade module, coinciding with the comprehensive trade sanctions imposed following the February 2022 invasion of Ukraine. The analysis therefore covers 2013 to 2024 for Brazil, China, India and South Africa, and 2013 to 2021 for Russia. The year 2012 is excluded because India lacks commodity-level values for that year. The year 2025 is excluded for China and India due to incomplete data at the time of access.

Cross-validation against published totals confirms that world-partner export totals match to within 0.9% for all five reporters in both 2013 and 2021, consistent with minor data revisions. Values are converted from the thousands-USD units of the bulk download to current USD throughout. Supplementary shipbuilding gross tonnage data are drawn from the UNCTADstat shipbuilding dataset (US.ShipBuilding), covering 2014 - 2025, and are used for contextual interpretation only.

Table 1: BRICS ocean-based total exports to the world (USD billion, current prices).

Country	2013	2016	2019	2021	2024
Brazil	2.5	2.1	2.4	2.6	3.8
China	103.2	96.3	113.4	150.4	185.1
India	12.1	11.5	16.1	16.2	19.3
Russia	6.6	6.1	7.3	9.7	n.a.
South Africa	2.2	2.1	2.2	2.6	2.5
World total	682.5	643.0	716.4	817.2	953.3

Note: Russia's 2024 value is not available owing to sanctions-related reporting cessation from 2022 onwards.

Source: UNCTADstat.

Table 1 illustrates the scale of BRICS ocean exports over selected benchmark years. China's total grew from USD 103 billion in 2013 to USD 185 billion in 2024, consistently exceeding the combined total of the other four BRICS nations. India roughly doubled over the period. Russia grew from USD 6.6 to USD 9.7 billion before reporting ceased. World total ocean exports grew from USD 683 billion to USD 953 billion, a compound annual growth rate of approximately 3.0%. China's share of world total rose from 15.1% in 2013 to 18.4% in 2021 and an estimated 19.4% in 2024.

3.2. Constant Market Share Methodology.

The CMS decomposition follows Fagerberg and Sollie (1987). Define: $\theta_r(t)$ as reporter r's share of total world ocean exports in year t; $\theta_{ir}(t)$ as r's share of world exports in commodity i in year t; and $q_i(t)$ as commodity i's share of total world ocean exports in year t. The change in r's global export share from t_0 to t_1 decomposes as:

The change in r's global export share from t_0 to t_1 decomposes as:

$$\Delta\theta_r = \text{MSE} + \text{CCE} + \text{CAE} + \text{RSD} \tag{1}$$

where

$$\text{MSE} = \sum_i q_i(t_0)\,[\theta_{ir}(t_1) - \theta_{ir}(t_0)] \tag{2}$$

$$\text{CCE} = \sum_i [\theta_{ir}(t_0) - \theta_r(t_0)]\,[q_i(t_1) - q_i(t_0)] \tag{3}$$

$$\text{CAE} = \sum_i [(\theta_{ir}(t_1) - \theta_r(t_1)) - (\theta_{ir}(t_0) - \theta_r(t_0))]\,[q_i(t_1) - q_i(t_0)] \tag{4}$$

The market share effect (MSE) captures pure competitiveness: whether the reporter gained or lost share within each commodity, holding commodity weights at their base-period values. A positive MSE means genuine competitiveness improvement.

The CCE captures a structural legacy: whether the reporter started out concentrated in fast or slow-growing segments. Where CCE is negative, the reporter was initially over-specialised in categories growing more slowly than the ocean trade aggregate.

The CAE captures structural adjustment, that is, whether the reporter moved its specialisation profile toward faster - growing segments over the period studied. World is used here as the single partner dimension, so the regional effects in the five-effect Fagerberg and Sollie (1987) formulation drop out by construction, and the residual (RSD) is simply the numerical complement needed to close the identity. With annual year-pairs, this residual comes out at zero to machine precision in every period, which confirms the decomposition was implemented correctly.

The sequential approach applies the decomposition to each consecutive year-pair (2013 to 2014, 2014 to 2015, and so on) and sums the period-level effects to produce cumulative totals. This suppresses the cross-product residual that accumulates in two-point CMS and reveals the year-by-year timing of competitiveness shifts.

3.3. Revealed Comparative Advantage.

The Balassa (1965) RCA index is:

$$\text{RCA}_{ri} = \frac{X_{ri}/X_r}{X_{Wi}/X_{WW}} \tag{5}$$

where X_{ri} is reporter r's exports of commodity i, X_r is r's total ocean exports, X_{Wi} is world exports of commodity i, and X_{WW} is total world ocean exports. Values above unity indicate relative specialisation in commodity i above the world benchmark.

The Revealed Symmetric Comparative Advantage index - (Laursen, 2015) rescales the Balassa index:

$$\mathrm{RSCA}_{ri} = \frac{\mathrm{RCA}_{ri} - 1}{\mathrm{RCA}_{ri} + 1} \tag{6}$$

RSCA ranges from −1 to +1, with zero as the threshold. Both indices are computed for all five BRICS reporters, all five commodity groups, and every year in the study period ocean commodity categories and all available years. All computations were performed in R (R Core Team, 2026) using `data.table`, `dplyr`, `tidyr` and `ggplot2` packages. The complete replication pipeline is provided in the Annexure.

4. Results.

4.1. Sequential CMS Decomposition.

Table 2: Cumulative CMS decomposition results by country, 2013-2024 (percentage points).

Effect	Brazil	China	India	Russia	S. Africa
MSE	0.030	4.470	0.248	0.235	−0.053
CCE	−0.001	−0.230	−0.023	−0.024	−0.005
CAE	0.000	0.064	0.025	0.004	−0.003
Total	0.030	4.300	0.249	0.215	−0.059

Note: MSE = market share effect, CCE = commodity composition effect, CAE = commodity adaptation effect. Positive MSE indicates competitiveness gain. Negative CCE indicates initial over-specialisation in ocean commodity categories growing more slowly than the world average.

Source: Author.

Table 2 presents the main CMS results. China recorded the largest cumulative gain in global ocean export share (+4.30 percentage points). The MSE accounts for virtually the entire change (+4.47), while the CCE exerts a compensating drag (−0.23). The negative CCE indicates that China was initially concentrated in ocean commodity categories that grew more slowly than the world ocean trade aggregate. Despite this structural handicap, China's competitiveness gains offset the composition drag by a factor of approximately nineteen. The CAE is modestly positive (+0.06), suggesting partial reorientation toward faster-growing ocean segments over the period.

India and Russia each gained approximately 0.22–0.25 percentage points, with MSE as the near-exclusive driver in both cases. India's CCE (−0.023) and CAE (+0.025) broadly offset each other, suggesting competitiveness gain accompanied by gradual structural adjustment. Russia's results cover 2013 to 2021 only, and its similarly negative CCE reflects an ocean export profile concentrated in slower-growing commodity categories.

Brazil's cumulative total is marginally positive (+0.030 percentage points), a reversal from a slightly negative position in the 2013 to 2021 sub-period, driven by MSE gains in 2021–2022 and 2022–2023. South Africa recorded a small cumulative decline (−0.059 percentage points) with a negative MSE (−0.053), indicating lost competitiveness within ocean commodity categories over the extended period.

Table 3 reveals substantial year-to-year volatility in China's total, reflecting sensitivity to global ocean commodity price cycles and shipping market conditions. China's largest single-year gains occurred in 2014–2015 (+1.20), 2020–2021 (+1.89), and 2023–2024 (+2.07), the last of these being the largest gain for any country in any period. China's sharpest retreats were 2015–2016 (−1.10), coinciding with the broad commodity price downturn, and 2022–2023 (−1.21), reflecting the unwinding of the post-COVID freight rate spike.

Table 3: Period-by-period market share effect (MSE) and total CMS change in global ocean export share (percentage points).

Period	Brazil	China	India	Russia	S. Africa
2013 - 2014	−0.006	−0.237	−0.038	−0.164	+0.001
2014 - 2015	−0.017	+1.200	+0.071	+0.065	+0.008
2015 - 2016	−0.015	−1.100	−0.015	+0.077	+0.000
2016 - 2017	+0.005	+0.001	+0.194	+0.115	−0.012
2017 - 2018	−0.001	+0.866	−0.140	−0.035	+0.010
2018 - 2019	+0.001	−0.052	+0.404	−0.008	−0.015
2019 - 2020	−0.031	+0.636	−0.182	−0.027	−0.016
2020 - 2021	+0.016	+1.890	−0.091	+0.191	+0.016
2021 - 2022	+0.025	+0.245	−0.007	n.a.	−0.011
2022 - 2023	+0.052	−1.210	+0.108	n.a.	−0.021
2023 - 2024	+0.002	+2.070	−0.054	n.a.	−0.019

Note: Values are the period total (MSE + CCE + CAE). n.a. indicates Russia's data are unavailable from 2022 onwards.

Source: Authors.

India's results display a rising trend from 2016 onwards. The most pronounced single - period gain was 2018 – 2019 (+0.404), corresponding to a period of strong Indian vessel exports and port capital goods contracts. Russia's eight - period trajectory shows gains concentrated in 2014 – 2015, 2016 – 2017 and 2020 – 2021, consistent with its dominant fisheries competitiveness surging in those years.

4.2. Revealed Comparative Advantage.

Table 4: RCA index in ships, port equipment and parts thereof (O_E), selected years. RCA > 1 indicates comparative advantage.

Country	2013	2015	2017	2019	2021	2023
Brazil	0.96	0.89	0.90	0.91	0.91	1.22
China	1.27	1.24	1.24	1.29	1.32	1.34
India	0.98	1.07	1.11	1.24	1.09	1.03
Russia	0.90	0.79	0.82	0.53	0.62	n.a.
South Africa	0.94	0.90	0.90	0.93	1.05	1.01

Note: Russia's series ends in 2021.

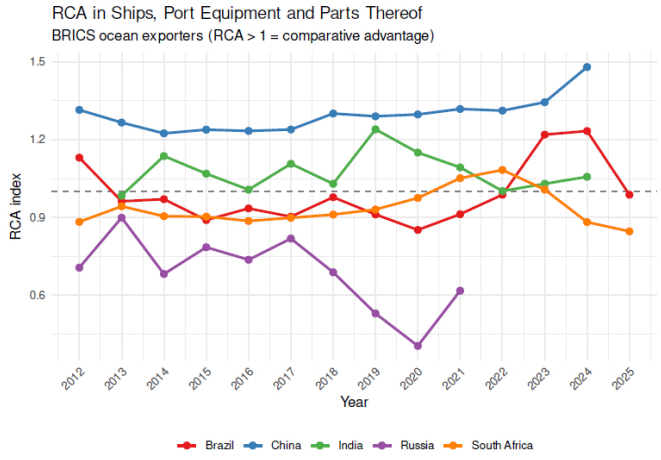
Source: Authors.

Table 4 presents the RCA index for ships and port equipment (O-E), the ocean commodity category most directly relevant to maritime economics. China is the only BRICS nation with unbroken comparative advantage throughout, with RCA values ranging between 1.22 and 1.34 for 2013 to 2021 and

rising to 1.48 by 2024 (Figure 1). India's ships RCA crossed the 1.0 threshold in 2014, at 1.14, and stayed above unity in most years since, at 1.09 in 2021 and 1.03 in 2023. Russia's ships RCA fell steadily, from 0.90 in 2013 to 0.62 in 2021, a decline that predates the 2022 sanctions and points to a longer withdrawal from internationally traded commercial shipbuilding. Brazil showed no lasting advantage until 2023, when RCA reached 1.22, likely reflecting growth in offshore vessel and port equipment exports. South Africa crossed the threshold in 2021 (RCA = 1.05) but without consolidation.

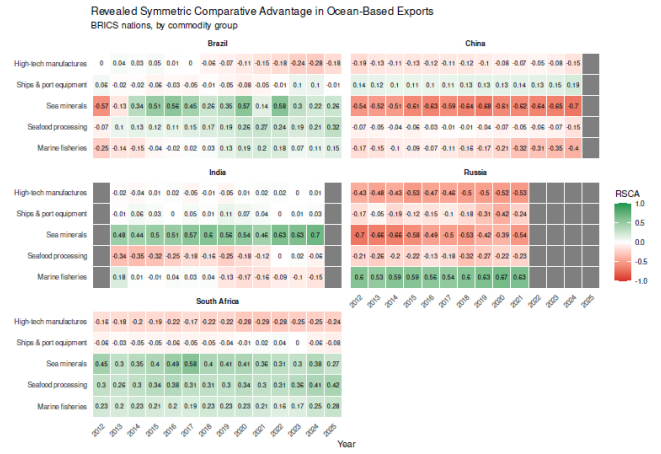
Figure 1 plots the full annual RCA trajectory in O-E for all five BRICS reporters. The dashed line at RCA = 1.0 marks the comparative advantage threshold.

Figure 1: RCA in ships, port equipment and parts thereof (O_E) for BRICS nations, 2012 - 2024. Dashed line at RCA = 1.0 marks the comparative advantage threshold. Russia's series ends in 2021.



Source: Authors.

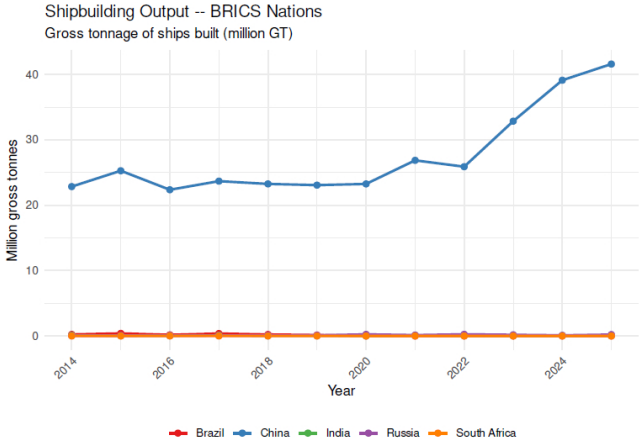
Figure 2: Revealed Symmetric Comparative Advantage (RSCA) across five ocean commodity categories and five BRICS nations. Green indicates RSCA > 0 (comparative advantage); red indicates RSCA < 0. Values printed in each cell. Russia's column is blank from 2022.



Source: Authors.

Figure 2 presents the RSCA heat map across all five ocean commodity categories and all five BRICS nations for the full panel. Green cells indicate comparative advantage (RSCA > 0), red cells disadvantage (RSCA < 0). Several patterns are notable. Russia's marine fisheries RSCA rose from 0.53 in 2013 to 0.63 in 2021, confirming dominant and growing advantage anchored in Russia's vast exclusive economic zone and distant-water fishing fleet. South Africa maintained consistent advantage in marine fisheries, seafood processing and sea minerals throughout the panel. India's sea minerals RSCA climbed from 0.48 in 2013 to 0.70 in 2024, driven by growing exports of natural sea sand and sea salt. No BRICS nation holds persistent comparative advantage in high-technology marine manufactures (O-F), with RSCA values clustering between −0.5 and +0.1 across all countries and years.

Figure 3: Shipbuilding gross tonnage output for BRICS nations, 2014 - 2025 (million GT).



Source: UNCTADstat US.ShipBuilding dataset.

4.3. Shipbuilding Capacity as Contextual Evidence.

Figure 3 plots shipbuilding gross tonnage output for BRICS nations, 2014–2025, drawn from the UNCTADstat shipbuilding dataset. China's share of world shipbuilding output rose from 35.9% in 2014 to 44.2% in 2021 and 54.6% in 2024, reaching an absolute majority of global commercial vessel production. India's annual output remained below 100,000 gross tonnes throughout, confirming that India's ships RCA above 1.0 reflects specialisation in specific vessel types relative to its own ocean export basket, not large-scale production volume. Russia's domestic shipbuilding tonnage grew from 45,000 GT in 2014 to 252,000 GT in 2022, yet this growth did not translate into international market share, consistent with the declining ships RCA. Brazil's output collapsed from a peak near 400,000 GT in 2015 to near zero by 2020–2021 following the contraction of the Petrobras-linked offshore construction programme.

5. Discussion.

5.1. China: Competitiveness Dominance with Structural Drag.

China's cumulative CMS gain of 4.30 percentage points over 2013 to 2024 dwarfs the result for any other BRICS na-

tion, by an order of magnitude. Because the MSE component (+4.47) accounts for almost all of it, the gain reflects genuine competitiveness improvement within ocean commodity categories, not a structural windfall from starting out in fast-growing sectors. The negative CCE (−0.23) tells the opposite story: China's initial specialisation in ocean goods leaned toward categories growing more slowly than the world average. China overcame that drag by capturing market share within those same categories.

China's CMS results swing sharply from year to year, ranging from −1.21 to +2.07 across the periods studied, which reflects both real shifts in market position and the price-driven nature of ocean goods trade. The 2015 to 2016 retreat lines up with the sharp fall in the Baltic Dry Index, and the 2022 to 2023 reversal follows the unwinding of the post-COVID freight rate spike. The 2023 to 2024 MSE points to a renewed competitiveness advantage in the most recent data, driven by growth in vessel exports and maritime capital goods.

5.2. Russia: A Fisheries Story, Not a Shipping Story.

Russia's cumulative gain of 0.215 percentage points over 2013 to 2021 comes almost entirely from the MSE component, and it sits squarely in marine fisheries. RCA in marine fisheries rose from 3.29 in 2013 to 4.43 in 2021, among the largest absolute RCA values anywhere in the dataset. Russia's large exclusive economic zone, its established distant-water fishing fleet and its bilateral fisheries access agreements sustained and built on this advantage.

The contrast with shipping is stark. Russia's RCA in ships and port equipment fell from 0.90 in 2013 to 0.62 in 2021, a decline that predates the 2022 sanctions and points to a real structural split: resource competitiveness growing while maritime capital goods competitiveness fades. This fits an investment pattern that favoured extraction capacity over shipbuilding, repair and port equipment.

Russia's disappearance from the UNCTADstat ocean trade module after 2022 matters in its own right. The years when sanctions were expected to bite hardest are exactly the years for which international trade data stopped being available. There is no way to tell from public data whether Russia's ocean exports were redirected to non-reporting partners or simply fell. That gap in the record is itself a finding, one that says something about how geopolitical shocks affect maritime trade transparency.

5.3. India: Structural Ascent in Maritime Capital Goods.

India's cumulative gain of +0.249 percentage points (2013 to 2024) is modest in absolute terms but analytically significant in its structure. The sustained ships RCA above 1.0 from 2014 onwards, the strong and growing sea minerals advantage (RSCA rising to 0.70 in 2024), and the volatile but upward MSE trajectory together describe an ocean export profile in structural transition.

The ships and port equipment finding is the most policy relevant for maritime economics. India has historically been a net importer of vessels and a port infrastructure recipient rather than provider. A sustained RCA above 1.0 from 2014 suggests that India's investment in ship repair yards, specialised vessel manufacturing and port equipment exports has begun to shift its comparative position in international ocean goods markets.

The volatility of India's period-by-period results is consistent with a developing economy pattern of episodic competitiveness in capital intensive ocean goods: strong performance in 2016 – 2017 and 2018 – 2019, followed by weakness in 2019 – 2020 and 2020 – 2021, with recovery in 2022 – 2023. This suggests that India's ships advantage is concentrated in specific contract-driven export programmes rather than a continuous large-scale production base, and that further policy investment in maritime industrial capacity would be required to stabilise and deepen the comparative advantage.

5.4. Brazil and South Africa: Divergent Trajectories at the Margins.

Brazil's trajectory illustrates the complexity of marginal competitiveness positions. The extension to 2024 turns the cumulative slightly positive (+0.030 percentage points), reflecting the country's position in specialised offshore and fisheries vessel exports following the partial recovery from the near collapse of its domestic shipbuilding programme. Brazil's growing RCA in marine fisheries (0.76 in 2013 to 1.50 in 2021) and sea minerals represents a structural shift toward resource based ocean exports, which carries different policy implications that differ from those of the capital intensive maritime manufacturing profile that an extended ocean economy strategy would prioritise.

South Africa's small cumulative decline (−0.059 percentage points) is consistent with an ocean export profile that is well diversified within resource processing categories (persistent high RCA in marine fisheries, seafood processing and sea minerals) but has not expanded its global market share. The negative MSE (−0.053) indicates that South Africa lost competitiveness within its existing ocean commodity categories over the extended period, even as its specialisation profile remained relatively stable.

Conclusions.

This paper has applied sequential Constant Market Share analysis and Revealed Comparative Advantage indices to annual UNCTADstat ocean trade data for the five BRICS nations over 2013 to 2024, contributing the first systematic annual decomposition of BRICS ocean export competitiveness at the commodity level.

Three conclusions follow. First, competitiveness, rather than commodity composition, drives BRICS ocean export dynamics. The market share effect is the dominant component of cumulative CMS change for every BRICS reporter. Policies targeting within sector productivity, technology upgrading and market access will therefore be more effective than structural diversification initiatives.

Second, China's ocean export dominance is deep, growing and concentrated in ships and port equipment, the largest and most strategically significant ocean commodity category.

China's sustained comparative advantage (RCA between 1.22 and 1.48 across the period) is reinforced by physical capacity that reached 55% of world gross tonnage output in 2024. The concentration of this advantage within a single BRICS economy poses structural questions for maritime value chain governance and shipping cost dynamics.

Third, the post-2021 disappearance of Russia's ocean trade data from the UNCTADstat reporting framework constitutes an analytically significant event. Russia's pre-2022 profile was characterised by dominant and growing fisheries advantage alongside a declining ships sector. Whether this profile was maintained, disrupted or redirected after 2022 is unknown from publicly available data.

Several limitations qualify the findings. The three effect CMS variant employed omits the regional decomposition, necessitated by the inconsistent construction of the pre built BRICS partner aggregate in UNCTADstat. Additionally, RCA indices are sensitive to the level of commodity aggregation, and the five top level UNCTADstat categories conceal heterogeneity that sub category analysis could reveal. Finally, USD denominated values at current prices absorb both volume and price changes; deflation by an appropriate ocean goods price index would be required to isolate volume based competitiveness.

Future research should extend the analysis to the post-2024 period as new UNCTADstat data become available, integrate ocean services data to provide a broader competitiveness picture, and apply the sequential CMS framework to intra BRICS ocean trade dynamics as the BRICS grouping expands.

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The author declares no competing interests. Data were accessed from UNCTADstat in June 2026. All analysis was conducted in R. The full replication pipeline is provided in the Annexure.

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