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PORT SYSTEM OF UKRAINE UNDER CONDITIONS OF GEOPOLITICAL SHOCKS

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Maritime infrastructure has historically underpinned Ukraine's export capacity, channeling the vast majority of the country's physical export volumes and sustaining significant market shares for wheat, corn, and sunflower oil. Russia's full-scale military invasion in February 2022 triggered an unprecedented reconfiguration of this system, exposing structural vulnerabilities that had accumulated over decades [1, 2]. This study examines a quarter-century of port system evolution, drawing on data from the Ukrainian Sea Ports Authority alongside materials from UNCTAD, KSE Institute, and sectoral monitoring reports [1–4].

Four structurally distinct phases emerge from longitudinal analysis. The recovery phase (2000–2008) saw aggregate throughput climb from 94.0 to 130.7 million tonnes as ports gradually regained relevance following the post-Soviet contraction. The specialization phase (2009–2013) witnessed ports evolving into the strategic backbone of an export-oriented economic model, with pronounced functional differentiation: Mykolaiv gravitating toward agricultural commodities, Mariupol anchoring metallurgical flows, and the Greater Odesa cluster operating as deep-water universal terminals. The latent degradation phase (2014–2021) followed the annexation of Crimea and partial occupation of Donbas, during which Mariupol's throughput contracted by more than half, from 15.5 to 6.5 million tonnes. The systemic rupture phase (2022–present) resulted from naval blockade conditions, collapsing total throughput to 52.7 million tonnes, merely one-third of the pre-war baseline.

Table 1. Cargo turnover of Ukrainian seaports (selected years), million tonnes.

Port	**2000**	**2005**	**2010**	**2013**	**2019**	**2021**	**2022**	**2023**	**2024**
Pivdennyi	11,2	20,5	18,2	43,4	53,9	53,5	15,3	10,1	35,5
Chornomorsk	10,1	14,9	15,1	16,5	26,2	25,6	6,5	11,4	26,0
Odesa	21,3	26,8	24,7	23,2	25,3	22,6	7,7	8,4	18,3
Mykolaiv	10,3	6,8	8,3	20,3	33,4	29,9	4,1	-	-
Mariupol	11,8	14,1	15,9	15,5	6,5	6,8	1,1	-	-
Danube (3)*	8,1	10,0	7,4	6,6	6,6	5,4	16,5	32,0	17,4
TOTAL	**94,0**	**115,9**	**144,4**	**148,2**	**160,0**	**153,3**	**52,7**	**61,9**	**97,2**

**Danube (3) = Izmail + Reni + Ust-Dunaisk.*

Source: Ukrainian Sea Ports Authority

The commodity-level impact proved markedly asymmetric. Iron ore transshipment fell by approximately 90%, metals by 80%, and containerized cargo by over 93%. Grain volumes, by contrast, declined by only 42%, a resilience attributable to the geographic distribution of grain terminals across multiple ports rather than their concentration in any single hub. This divergence illustrates a core finding: the depth of throughput loss under port closure conditions is directly proportional to the prior degree of cargo flow concentration. By 2024, the system had effectively shifted into a bulk-survival configuration, with dry bulk commodities accounting for 85.4% of throughput while containers fell to 2.2%, signaling Ukraine's practical exclusion from the seaborne market for value-added manufactured goods [7; 8].

The Danube cluster (Izmail, Reni, Ust-Dunaisk) offered the clearest empirical validation of the insurance cluster concept. Pre-war throughput across the three ports rarely exceeded 5–7 million tonnes annually, a figure long interpreted as evidence of structural inefficiency. Under blockade conditions, however, the cluster surged to a peak of 32.0 million tonnes in 2023 [6]. The subsequent retreat to 17.4 million tonnes in 2024 represents normalization following partial restoration of Black Sea navigation rather than systemic decline – and notably, this normalized level remains more than three times above pre-war volumes, reflecting irreversible infrastructural investment in the region [6; 7].

The Greater Odesa cluster absorbed over 82% of system-wide throughput in 2024, a concentration ratio that simultaneously demonstrates adaptive capacity and generates systemic exposure [1]. Intensified attacks on port and energy infrastructure have prompted the National Bank of Ukraine to project export receipt shortfalls of approximately USD 1 billion in the first quarter of 2026 alone [9].

Post-conflict reconstruction priorities crystallize around three interdependent vectors. First, restoring Mykolaiv Port represents the most immediately realistic step toward deconcentrating cargo flows away from the Odesa hub; crucially, the port's physical infrastructure remains largely intact, making reconstruction a matter of security stabilization rather than ground-up rebuilding [4; 5]. Second, reviving container shipping requires a sequenced approach: rehabilitating terminal infrastructure, securing commitments from major liner operators through state-backed risk instruments, and developing multimodal connections positioning Ukrainian ports as transit nodes along the Middle Corridor linking Central Asia to Central Europe [10; 11; 12]. Third, expanding the Danube cluster's role from emergency reserve to permanent operational function would structurally reduce the system's dependence on any single geographic node [6].

The structural foundations for Ukraine's post-war port recovery are both credible and measurable. Their realization, however, remains contingent on two exogenous variables beyond the reach of sectoral policy: the terms under which the armed conflict concludes, and the investment environment that post-war reconstruction conditions will generate.

REFERENCE:

1. Administration of Seaports of Ukraine (USPA). Available at: https://www.uspa.gov.ua (Accessed on: 20.04.2026).
2. UNCTAD. Maritime Profile: Ukraine. UNCTADStat. Available at: https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/804/index.html (Accessed on: 20.04.2026).
3. Notteboom T., Pallis A., Rodrigue J.-P. Port Economics, Management and Policy. Routledge, 2022. Available at: https://porteconomicsmanagement.org (Accessed on: 20.04.2026).
4. Kyiv School of Economics (KSE). Ukraine Damage and Losses Report: November 2024. Available at: https://kse.ua/wp-content/uploads/2025/02/KSE_Damages_Report-November-2024---ENG.pdf (Accessed on: 20.04.2026).
5. World Bank Group. Updated Ukraine Recovery and Reconstruction Needs Assessment. 2026. Available at: https://www.worldbank.org/en/news/press-release/2026/02/23/updated-ukraine-recovery-and-reconstruction-needs-assessment-released (Accessed on: 20.04.2026).

6. GMK Center. Danube Ports: How to Save an Important Logistics Route. 2025. Available at: https://gmk.center/en/posts/danube-ports-how-to-save-an-important-logistics-route (Accessed on: 20.04.2026).
7. Ukrainian Sea Ports Authority (USPA). Ukrainian Maritime Corridor – Two Years of Operation. 2026. Available at: https://marad.gov.ua/en/news/two-years-ukrainian-maritime-corridor-operation (Accessed on: 20.04.2026).
8. ForwarderLaw. Ukrainian Maritime Trade in 2024–2025. 2025. Available at: http://forwarderlaw.com/2025/04/25/ukrainian-maritime-trade-in-2024-2025 (Accessed on: 20.04.2026).
9. Latifundist. Export losses due to increased Russian attacks may reach USD 1 billion. Available at: https://latifundist.com/novosti/69422-cherez-posilennya-rosijskih-obstriliv-eksporteri-mozhut-vtratiti-do-1-mlrd--nbu (Accessed on: 20.04.2026).
10. UNCTAD. Challenges, Competition and Regulation: Port Infrastructure and Services and Maritime Transport. Available at: https://unctad.org/publication/challenges-competition-and-regulation-port-infrastructure-and-services-and-maritime (Accessed on: 20.04.2026).
11. Ferrari C., Parola F., Tei A. Governance models and port concessions in Europe: Commonalities, critical issues and policy perspectives. Transport Policy, 2015, Vol. 41, pp. 60–67. DOI: https://doi.org/10.1016/j.tranpol.2015.03.012
12. Center for Strategic and International Studies (CSIS). Ships, Trains, and Trucks: Unlocking Ukraine's Vital Trade Potential. 2024. Available at: https://www.csis.org/analysis/ships-trains-and-trucks-unlocking-ukraines-vital-trade-potential (Accessed on: 20.04.2026).