

Azerbaijan's Economic Role in the Middle Corridor: Transit Growth, Trade Diversification, and Infrastructure Capacity

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Abstract

The reconfiguration of Eurasian trade geography since 2022 has elevated the Middle Corridor from logistical infrastructure to an instrument of geopolitical positioning, with Azerbaijan occupying its central Caucasus node. This study assesses Azerbaijan's emerging transit centrality, hydrocarbon export dependence, and transit-infrastructure trajectory. Using secondary institutional and academic data (96 observations, 2019–2026), it applies a tiered evidence-credibility approach and a retain-and-flag protocol to

examine transit growth, trade diversification, and infrastructure utilisation. Findings indicate sustained growth in corridor-freight volumes and Baku–Tbilisi–Kars railway capacity, including a fivefold post-modernisation capacity expansion and a roughly 2.5-fold increase in Persian Gulf/India-linked corridor volume.

However, the Q1 2026 East–West Corridor total did not reconcile with its reported sub-components. A cross-source comparability check also identified a substantial difference between the FY2024 hydrocarbon export-share estimate ($\approx 87\%$) and an indicative share derived from Tier-1 data for January–April 2026 ($\approx 58.1\%$); given the different reference periods, this is treated as temporal and definitional non-comparability rather than a directly reconciled discrepancy. For the Port of Baku/Alat, 2022 throughput relative to the subsequently reported nominal capacity yields a benchmark ratio of approximately 42%. Overall, the evidence supports Azerbaijan's expanding transit role and gradual trade diversification, while reporting inconsistencies constrain precise quantification. The study contributes an auditable, tier-differentiated evidentiary framework for assessing regional-connectivity claims without extending conclusions beyond verifiable evidence.

Keywords: Middle Corridor, transport infrastructure, trade diversification, hydrocarbon dependence, source credibility, Azerbaijan.

JEL Classification: F14; F15; L91; O18.

Introduction

Overland transit routes have become geopolitical positioning tools rather than mere logistical infrastructure, given their reconfiguration in the post-2022 geographies of Eurasia. Political and commercial pressures on traditional trans-Russian routes linking China and East Asia with Europe have placed new strategic importance on alternative east–west linkages via the South Caucasus and Central Asia (Khan, 2025). In this reordering, the Middle Corridor, also known as the Trans-Caspian International Transport Route, is now a space of conflict where infrastructure, tariffs, and the governance of transit are simultaneously economic and geopolitical signals (OECD, 2024).

Azerbaijan is the Caucasus hub of this corridor, connecting the Caspian maritime route with the Baku–Tbilisi–Kars (BTK) railway and further with European routes. As a country that exports hydrocarbons to European markets through the Southern Gas Corridor and acts as a major transit hub in the Caucasus for Middle Corridor trade, Azerbaijan sits at the intersection of energy-security and connectivity considerations.

The evidence gathered in this study supports both dimensions: BTK's post-modernisation capacity was reported as expanding from 1 million to 5 million tonnes per year from May 2024; from January to September 2024, corridor cargo via Azerbaijan increased by approximately 70% relative to the same period in 2023, while the Persian Gulf/India–Azerbaijan–Georgia–Europe corridor expanded by approximately 20.5% (CAGR) between 2019 and 2024. For the Port of Baku/Alat, comparing 2022 throughput with the nominal capacity reported from mid-2023 yields a benchmark ratio of approximately 42%; this should not be interpreted as a strictly contemporaneous 2022 capacity-utilisation rate.

Three empirical patterns emerge from the statistical reports assembled from the State Statistics Committee, the State Customs Committee, the Ministry of Energy, the government transit portal, and the World Bank's Middle Trade and Transport Corridor assessment. First, transport and corridor-freight indicators show a sustained directional expansion in Azerbaijan's transit role (Aliyeva and Aliyev, 2025). Second, Azerbaijan's foreign trade remains strongly hydrocarbon-dependent, although the exact degree varies across sources: a Tier-2 US trade-agency estimate reports approximately 87% for FY2024, whereas recomputation from Tier-1 State Customs Committee data for January–April 2026 yields approximately 58.1%. Third, BTK and Port

of Baku/Alat capacity announcements indicate an active investment trajectory, including more than US\$745.9 million in SOFAZ allocations for BTK-related works and phased port expansion reported through sources of differing evidentiary strength.

Three evidentiary gaps follow from this record. First, the magnitude of Azerbaijan's continuing reliance on hydrocarbons remains uncertain because the available export-dependence estimates differ by approximately 29% and cannot be reconciled directly. Second, corridor and freight data are reported over non-continuous periods and with differing scopes; in particular, the Q1 2026 East-West Corridor sub-components fall 42.9% short of the reported parent total, limiting direct year-to-year or cross-corridor comparison. Third, infrastructure-capacity claims, SOFAZ financing reports, and longer-term capacity goals are not uniformly traceable to primary institutional releases. These unresolved discrepancies are therefore central to assessing Azerbaijan's economic positioning and justify the systematic, hierarchical treatment of institutional evidence adopted in this study (Dadaşlı and Valiyev, 2024).

Research Objectives

- O1: To assess Azerbaijan's emerging role as a Middle Corridor transit node using verifiable transport- and freight-volume indicators.
- O2: To examine the structure and degree of hydrocarbon dependence within Azerbaijan's evolving trade profile, addressing the identified inter-source discrepancy.
- O3: To evaluate Azerbaijan's infrastructural investment trajectory (BTK railway, Port of Baku/Alat) and the reliability tier underpinning associated capacity claims.

Research Questions

- RQ1: How has the expansion of the Middle Corridor affected Azerbaijan's transit volumes and logistics capacity since 2019?
- RQ2: To what extent has the expansion of Azerbaijan's transit role been accompanied by diversification of its trade structure beyond hydrocarbons?
- RQ3: How effectively is expanding transport infrastructure being utilised relative to installed capacity and investment?

The study contributes an auditable, tier-differentiated evidentiary base for claims about Azerbaijan's Middle Corridor role of practical relevance to regional-connectivity scholarship and to policy actors assessing corridor-development trajectories without overstating conclusions beyond what the retained, flagged data support.

1. Research Methodology

Research Design

The research method used in this study is a qualitative method with a secondary data approach and an interpretive paradigm. Quantitative indicators such as transit-freight volumes, port throughput and tariffs, growth in trade turnover, and volumes of oil and gas production and export act as supporting evidence for three qualitative propositions: (i) Azerbaijan's evolving centrality as a node on the Middle Corridor, (ii) its diversifying yet hydrocarbon-reliant trade structure, and (iii) its infrastructural investment trajectory. The statistical modelling of each figure was not appropriate for the character of the corpus, which was defined as a purposively assembled set of institutional statistics rather than a randomly sampled quantitative dataset, as is typical for a quantitative dataset.

This study placed Azerbaijan at the main axis of the Trans-Caspian International Transport Route (Middle Corridor) and analysed the same in the context of transport infrastructure (Baku–Tbilisi–Kars railway, port of Baku/Alat), energy diplomacy, and foreign trade realignment after the disruptions to the trans-Russian trade routes after 2022. Temporal coverage: 2019–2026 (earliest indicator: corridor-cargo baseline 2019; latest: trade data 2026 Jan–April). The collection of the corpus and closure date is 28 July 2026.

Ninety-six distinct source-strings were classified into three credibility tiers using an explicit, checkable criterion rather than subjective judgment; Tier 1 is restricted to primary official/institutional data (the data-generating institution itself); Tier 2 now includes both attributed news intermediaries and peer-reviewed academic studies/institutional analytical reports; Tier 3 remains independent/aggregator sources without an institutional citation chain.

Table 1: Source-Credibility Classification Framework Used in the Study

Tier	Category	Criterion	n	%
1	Direct Institutional Source	Publisher is the original data-generating institution (e.g., statistics office, ministry, multilateral agency)	45	46.9%
2	Attributed Intermediary / Peer-Reviewed Academic	News or secondary academic source explicitly cites a Tier-1 institution, OR peer-reviewed indexed journal (Scopus/SSCI/ESCI) reporting original analysis with DOI	37	38.5%
3	Independent / Aggregator	No explicit institutional citation chain, or academic source pending indexing verification	14	14.6%
Total			96	100%

Source: Authors' own elaboration based on the source-verification and classification protocol developed for this study.

Tiering rather than exclusion was adopted because several Tier 2/3 items notably the 2024–2026 BTK capacity announcements (obs. 15–19, 26–29) report figures unavailable from any Tier-1 source in the study window. Each Tier 2/3 figure is (a) labelled by tier throughout the results, (b) weighted below Tier-1 evidence in any claim it supports, and (c) cross-corroborated against an independent second source where possible (e.g., BTK capacity figures corroborated by both Caspian News and kursiv.media, obs. 15–16), with uncorroborated items excluded from load-bearing claims.

Identification, Selection, and Extraction

Sources were identified through institutional-portal retrieval (stat.gov.az, transit.gov.az, minenergy.gov.az, worldbank.org) and academic-database searches (Google Scholar, ResearchGate, DOI resolution) in two phases, yielding eight additional peer-reviewed citations (obs. 89–96). Observations were retained only if explicitly Azerbaijan-specific, attributable to an identifiable institutional publisher, and traceable to a citation or URL; non-Azerbaijan data (e.g., Aktau/Kuryk, Poti/Batumi) and verbatim duplicates were excluded, with selection stopping once each thematic domain reached completeness. Each retained source was logged with its indicator, value, reporting period, and citation, then coded by thematic domain (freight, BTK, port, trade, energy, macroeconomic), analytical sub-theme (capacity, transit role, reorientation, competitiveness), and credibility tier (1/2/3), with a two-pass verbatim cross-check against the original text before finalisation. No qualitative-analysis software was used, given the corpus's discrete statistical rather than narrative character; the domain-completeness and two-pass verification rules make the procedure reproducible.

The dataset applies a retain-and-flag protocol: conflicting figures, or sub-totals that fail to reconcile arithmetically with a stated parent total, are retained in full with an explicit reliability flag rather than silently discarded, averaged, or resolved by researcher judgment.

Reconciliation-discrepancy formula (applied where a total and its sub-components are both reported):

$$\Delta = \sum_{i=1}^n V_i - V_{total}, \quad \Delta\% = (\Delta / V_{total}) \times 100$$

Empirical application – reconciliation check. For the Q1 2026 East–West Transport Corridor (obs. 4–8), the reported total is 3.8 Mt, whereas the sum of the reported sub-components is 5.4299 Mt. Application of the reconciliation-discrepancy formula yields $\Delta = 1.6299$ Mt ($\Delta\% \approx 42.9\%$). As this difference substantially exceeds plausible rounding error, both the stated total and its components are retained and the inconsistency is explicitly flagged as originating from the source rather than from data transcription.

Cross-source comparability check (applied where related indicators from sources of different credibility tiers permit an indicative consistency assessment):

$$\text{Indicative share} = (V_{\text{component}} / V_{\text{total}}) \times 100$$

Empirical application – cross-source comparability check. Obs. 56 (Tier 2, trade.gov) reports that energy products accounted for approximately 87% of Azerbaijan's exports in FY2024. Using Tier-1 State Customs Committee data for January–April 2026, crude oil and petroleum products (US\$4.37 bn; obs. 71) and natural gas (US\$2.536 bn; obs. 72), relative to total exports of US\$11.88 bn (obs. 54), yield an indicative energy-export share of approximately 58.1%. The approximately 29% difference is not interpreted as a measurement discrepancy, because the estimates refer to different periods and therefore are not directly comparable. Instead, it is retained as evidence of temporal and definitional non-comparability across reported indicators.

This is approximately 29% below the trade.gov figure; however, the two estimates cover non-comparable periods (full-year 2024 vs. four months of 2026) and cannot be treated as a like-for-like discrepancy. The gap is reported as a definitional and temporal non-comparability rather than an unresolved contradiction between equally-scoped figures.

No conflicting figure was silently dropped, averaged, or substituted; the retain-and-flag rule was applied uniformly and is traceable through the dataset's Notes/reliability column.

2.Data Analysis

Five descriptive and comparative analytical treatments were applied, consistent with the secondary and non-probabilistic nature of the dataset; accordingly, no inferential statistical procedures were imposed.

(a) Raw-value reporting

Values were retained as reported in the original source, with their units and reference periods preserved. This treatment was applied where no additional calculation was required or methodologically justified. For example, observation 57 reports crude oil production of 29.1 Mt in 2024. Cumulative values already calculated and reported by the original source were likewise retained without further aggregation.

(b) Percentage-share analysis

Where both a component value and its corresponding total were available for the same reporting basis, percentage shares were calculated as:

$$\text{Share}_i (\%) = (V_i / V_{total}) \times 100$$

Example: the share of sea transport in transit cargo in Q1 2026 (obs. 11) was 89.4%.

(c) Period-on-period growth analysis

For indicators reported across consecutive periods, the percentage change was calculated as:

$$\text{Growth (\%)} = [(V_t - V_{t-1}) / V_{t-1}] \times 100$$

Example: BTK railway freight increased from 267,000 t in 2020 to 480,000 t in 2021 (obs. 12–13):
 $(480,000 - 267,000) / 267,000 \times 100 \approx 79.8\%$

Where a source reported both actual-price and real-term growth for the same indicator, the two measures were retained separately rather than collapsed into a single value. For example, observation 47 reports non-oil-and-gas export growth of +1.9% in actual terms and –11.0% in real terms for January–November 2024. Their divergence was retained because the measures capture different dimensions of the reported change.

(d) Compound annual growth rate (CAGR)

For indicators spanning multiple years, the compound annual growth rate was calculated as:

$$\text{CAGR} = (V_T / V_0)^{1/n} - 1$$

where V_0 is the initial value, V_T is the final value, and n is the number of years between the two observations.

Example: Persian Gulf/India–Azerbaijan–Georgia–Europe corridor volume increased from 5,723 in 2019 to 14,549 in 2024 (obs. 20–21), over a five-year interval:

$$\text{CAGR} = (14,549 / 5,723)^{1/5} - 1 \approx 20.5\% \text{ per year}$$

This result is consistent with the source's characterization of an approximately 2.5-fold increase over the period ($1.205^5 \approx 2.54$).

(e) Ratio and multiple comparison

Where two values represented analytically comparable quantities or provided a meaningful benchmark, their relationship was expressed as a ratio or multiple:

$$\text{Ratio} = V_A / V_B$$

Examples: Port of Baku/Alat throughput of 6.3 Mt in 2022, when compared with the subsequently reported nominal capacity of 15 Mt per year, yields a benchmark ratio of approximately 42%. Because the throughput and nominal-capacity figures refer to different reporting dates, this value is treated as a benchmark ratio rather than a contemporaneous capacity-utilisation rate. Similarly, the ASCO Baku–Alat–Kuryk tariff (US\$600 for a 20-ft unit) relative to the comparable KMTF tariff (obs. 42) yields a multiple of approximately 2.6×

Formulas (b)–(e) were applied only where the underlying sources provided the component values and reporting information necessary for the respective calculation. Where only a raw or already aggregated value was available, treatment (a) was applied without imposing additional computation. Calculated indicators were therefore used to describe patterns, growth trajectories, shares, and benchmark relationships within the assembled evidence base rather than to generate inferential estimates.

Reliability and Validity

Reliability rests on three mechanisms: the source-credibility hierarchy; a corroboration strategy under which single-source Tier 2/3 figures are flagged rather than presented with Tier-1 confidence; and the retain-and-flag protocol for contradictory statistics, demonstrated above with two worked examples. The single-coder design is acknowledged as a limitation, partially mitigated by verbatim, non-interpretive transcription at the point of extraction and by the two-pass verbatim cross-check built into coding.

Entirely public secondary data; no human subjects; full source attribution maintained throughout. 38.5% of observations reach the researcher via a news intermediary or peer-reviewed secondary reporting rather than a primary institutional release; 14.6% rely on independent/aggregator sourcing, including two academic sources (obs. 94–95) whose original journal/proceedings indexing could not be independently confirmed within this study's timeframe. Collection was single-researcher, single-session (28 July 2026), limiting independent-coder reliability testing. Several time-series indicators (BTK, Port of Baku) are reported over non-continuous periods, constraining strict year-on-year comparability. The $\approx 29\%$ gap between the Tier-2 “87% energy share of exports” figure and the Tier-1-derived Jan–Apr 2026 recomputation ($\approx 58.1\%$) could not be fully reconciled within this secondary-data design and is reported as an open flag. Six observations were reclassified from Tier 1 to Tier 2 during the final source audit: four peer-reviewed academic observations (obs. 31, 33, 39, and 40), because Tier 1 is restricted to primary data-generating institutions, and two SOFAZ fiscal-data observations (obs. 83–84), because they reach the researcher through a news-agency intermediary rather than the Fund's own primary release. These corrections are reflected in the final tier counts above.

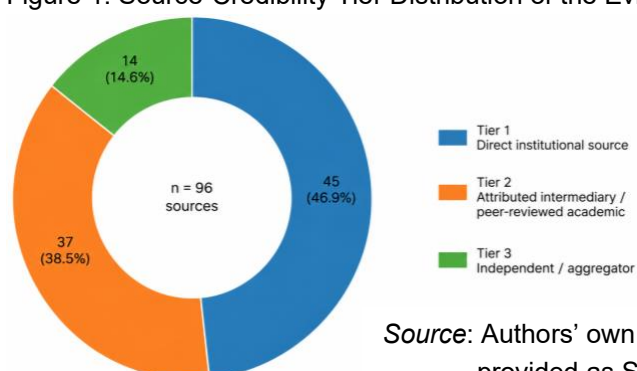
3. Research Results

Results are presented following the study's underlying analytical logic: transit growth → infrastructure capacity → capacity utilisation → logistics cost/tariff → non-oil export development → trade diversification (Table 4; Appendix Tables A1–A3).

The dataset consisted of 96 individual source strings organized into three levels of credibility (Table 1). The numbers of observations on Tier 1 (direct institutional releases) and Tier 2 (sources attributed to intermediaries, plus peer-reviewed academic studies) were similar (45 and 37, respectively, 46.9% and 38.5%), with Tier 3 (independent and aggregator sources) comprising the smallest number of observations (14, 14.6%).

This distribution was also reflected in the visual representation of the distribution of the evidentiary base, as illustrated in Figure 1 (46.9% came directly from primary institutional sources, 38.5% from attributed intermediary or peer-reviewed academic sources, and 14.6% from independent/aggregator sources).

Figure 1. Source-Credibility Tier Distribution of the Evidentiary Base



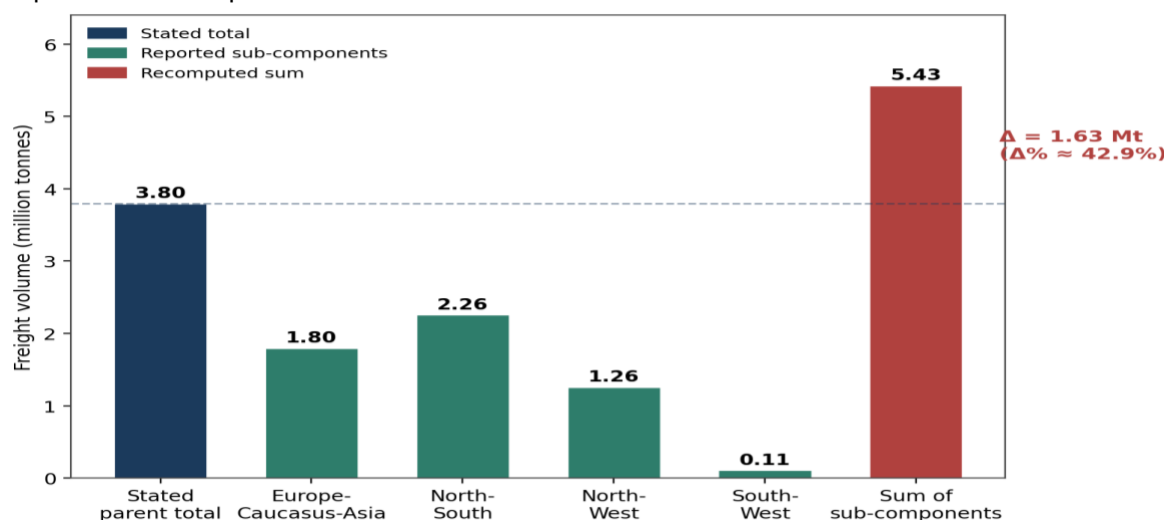
Source: Authors' own elaboration based on the final Source Inventory provided as Supplementary Material.

Transport-Corridor and Freight-Volume Indicators

Appendix Table A1 presents the freight volumes for the three major modes of transport in the country, namely rail (3.4 Mt), sea (1.39 Mt), and road (2.7 Mt) for Q1 2026. Sea transport accounted for the highest proportion (89.4%), road transport the lowest (48.8%), and rail transport an intermediate proportion (44.3%) of freight. Applying the reconciliation-discrepancy formula to the figures for the East–West Corridor in Q1 2026 showed that the stated total of the parent (3.8 Mt) did not reconcile with the sum of its four reported sub-components: Europe–Caucasus–Asia 1.80 Mt, North–South 2.26 Mt, North–West 1.26 Mt, and South–West 0.11 Mt, which added up to 5.43 Mt.

This resulted in a difference of $\Delta = 1.63$ Mt, equivalent to approximately 42.9% of the stated total a discrepancy attributed to inconsistent source reporting rather than an established resolution. This discrepancy was graphically represented in Figure 2, which shows the total as given and the total as recomputed from the four sub-components, with the difference shown on the graph itself.

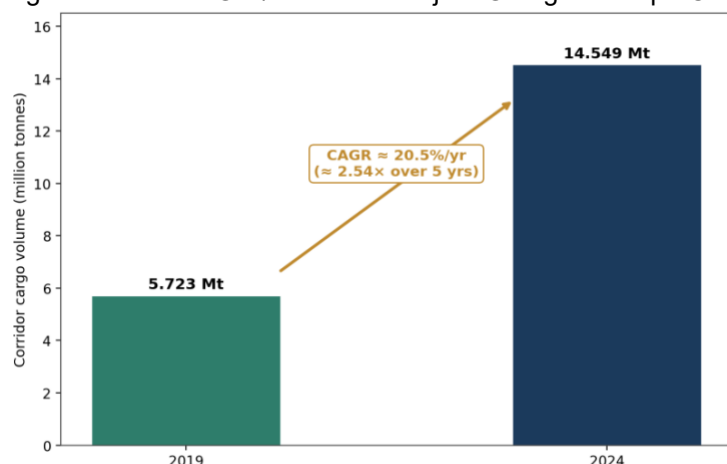
Figure 2. Reconciliation Discrepancy: Q1 2026 East–West Transport Corridor, Stated Total vs. Sum of Reported Sub-Components



The indicators for longer horizons of the corridors continued to rise. The volume of the Persian Gulf/India-Azerbaijan-Georgia-Europe corridor increased from 5,723 kt in 2019 to 14,549 kt in 2024, which amounts to a compound annual growth rate of approximately 20.5% per year (≈ 2.54 times over the 5 years).

This growth trajectory is illustrated in Figure 4, highlighting the approximately 2.54-fold increase in corridor cargo volume between 2019 and 2024. The North-South Transport Corridor (NSTC) has set a target capacity of 15 Mt / 660,000 TEUs (undated). The volume of goods transported on the Middle Corridor (TITR) has surpassed 2 Mt for the first three quarters of 2025, up from a baseline of around 3 Mt/yr in the early 2020s, and is expected to reach approximately 5 Mt/yr for full 2025, compared to the World Bank's forecast of approximately 11 Mt/yr by 2030. From January to September 2024, the cargo volume of the Middle Corridor through the BTK route increased by 70% compared to the same period in 2023, reaching 3.4 Mt.

Figure 4. Persian Gulf/India–Azerbaijan–Georgia–Europe Corridor Cargo Volume Growth, 2019–2024



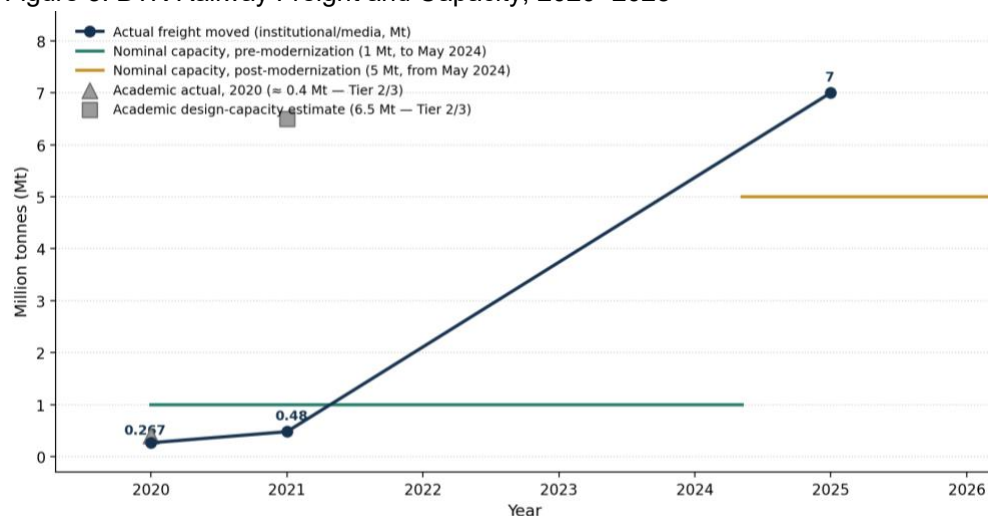
Source: Authors' own elaboration based on transit.gov.az data included in the final Source Inventory.

BTK Railway Infrastructure Capacity Trajectory

Appendix Table A2 juxtaposes institutional/Tier-1–2 figures against independent academic estimates for the Baku–Tbilisi–Kars (BTK) railway. Actual freight moved in 2020 was reported as 267,000 t institutionally versus approximately 400,000 t in the academic literature, an inter-source gap of approximately 49.8%. Actual freight rose to 480,000 t in 2021, a period-on-period increase of 79.8% relative to 2020. Nominal annual capacity prior to May 2024 was reported at 1 Mt/yr institutionally, compared with a 6.5 Mt design-capacity estimate in the academic literature, a 6.5-fold discrepancy. From 20 May 2024, corroborated across two independent sources, nominal capacity rose to 5 Mt/yr, representing a 400% increase (fivefold) over the pre-modernisation figure. As of October 2025, current freight moved was estimated at approximately 6–8 Mt/yr, which tracked closely with an ex-ante academic projection (published 2017) of 6–8 Mt by the railway's "eighth year" of operation. Cumulative SOFAZ allocation to BTK-related works reached US\$745.9 million as of October 2025.

Figure 3 plotted this trajectory across 2020–2025. The actual-freight line rose from 0.267 Mt (2020) to 0.48 Mt (2021) to 7 Mt (2025), while the pre-modernisation capacity ceiling (1 Mt) and post-modernisation capacity ceiling (5 Mt, effective from mid-2024) were shown as horizontal reference lines. The academic actual-freight estimate for 2020 (≈0.4 Mt) and academic design-capacity estimate (6.5 Mt) were plotted as discrete markers alongside the institutional series.

Figure 3. BTK Railway Freight and Capacity, 2020–2025



Foreign Trade Structure and Hydrocarbon Dependence

The total foreign trade turnover recorded in January – April 2026 was \$17.4 billion, including exports valued at \$11.88 billion and imports worth \$5.53 billion (Table 4). Compared to the same quarter last year, exports rose 35.2%, and imports fell 32.1%. Crude oil and petroleum product exports together amounted to 7.92 Mt, valued at \$4.37 billion (36.75% of total exports). Natural gas exports amounted to 8.416 bcm, valued at approximately \$2.536 billion (21.3% of total exports). In FY2024, the energy-related exports are estimated to be around 87% of total exports according to a Tier-2 trade-agency estimate.

Applying the cross-source comparability check to the Tier-1 January–April 2026 component data, $(4.37 + 2.536) / 11.88$ yields an indicative energy-export share of approximately 58.1%. This value is not directly comparable with the Tier-2 estimate of approximately 87% for FY2024 because the two indicators refer to different reporting periods.

Table 4. Foreign Trade Structure & Hydrocarbon Dependence

Indicator	Period	Value	Tier	Analytical treatment /Result
Foreign trade turnover (total / exports / imports)	Jan–Apr 2026	Total \$17.4bn; exports \$11.88bn; imports \$5.53bn	1	(a) Raw value
Foreign trade growth	Jan–Apr 2026 vs 2025	Exports +35.2%; imports –32.1%	1	(c) Growth rate (as reported)
Crude oil / petroleum-product exports	Jan–Apr 2026	7.92 Mt; \$4.37bn; 36.75% of total exports	1	(a) Raw value
Natural gas exports	Jan–Apr 2026	8.416 bcm; ≈\$2.536bn	1	(a) Raw value
Energy share of total exports (trade-agency estimate)	FY2024	≈ 87%	2	Cross-source comparability input
Energy share of total exports (indicative calculation)	Jan–Apr 2026	$(4.37+2.536)/11.88$	1	Indicative share ≈ 58.1%; not directly comparable with the Tier-2 FY2024 estimate due to different reference periods.
Historical hydrocarbon peak export share (academic baseline)	≈ 1994–2024 trajectory	≈ 90% at peak dependence	2 (academic)	Corroborates upper bound of Tier-2 estimate
Oil sector's share of GDP (ARDL/VAR)	2014 → 2024	41% → 27.5%	2 (academic)	–13.5 pts (–32.9% relative decline)
Non-oil-gas export value	Jan–Nov 2024	\$3,090.6M (+1.9% actual, –11.0% real)	1	Both actual & real-terms retained (divergence informative)

Indicator	Period	Value	Tier	Analytical treatment /Result
Non-oil-gas export value	Jan–Sep 2025	\$2,649.2M (+7.6% actual, –15.7% real)	1	Both actual & real-terms retained
Trade turnover growth	2022 vs 2019–21 avg	≈ +72% (mineral-export driven)	1 (WB)	(c) Growth rate
Top trade-partner shares	Jan–Nov 2024	Italy 23.9%; Türkiye 13.0%; Russia 10.2%	1	(b) Percentage-share
Domestic gas-demand elasticity constraint	Study period to 2021	Gas = 69% of primary energy; income elast. ≈ 0.8; price elast. ≈ –0.1	2 (academic, SSCI/Scopus)	Structural constraint on export ‘headroom’

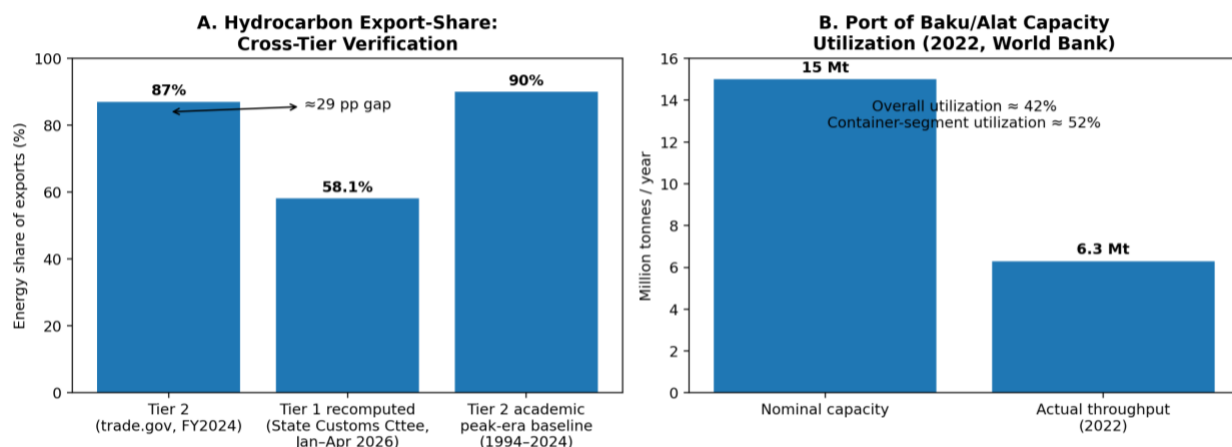
Note. Supports RQ2 (hydrocarbon dependence and cross-source comparability of export-share indicators).

The indicative share ($V_{\text{component}} / V_{\text{total}} \times 100$) is calculated from Tier-1 observations 71–72 relative to observation 54. The resulting ≈58.1% refers to January–April 2026 and is therefore not directly comparable with the Tier-2 ≈87% estimate for FY2024.

The oil sector's share of GDP declined from 41% (2014) to 27.5% (2024), a reduction of 13.5% (–32.9% relative decline). The value of non-oil-gas exports was \$3,090.6 million for January–November 2024 (+1.9% in actual terms, –11.0% in real terms) and \$2,649.2 million for January–September 2025 (+7.6% actual, –15.7% real), with both actual- and real-terms figures retained due to opposing trends. In 2022, trade turnover increased by approximately 72% compared to the average of the 2019–2021 period, with mineral exports leading the growth. Italy (23.9%), Türkiye (13.0%), and Russia (10.2%) were the top three trade partners for January–November 2024. Structural constraints limited the elasticity of domestic gas demand, which was approximately 69% of primary energy, and had an income elasticity of around 0.8 and a price elasticity of around –0.1.

Figure 5, Panel A, displayed the hydrocarbon export-share cross-verification: the Tier-2 estimate (87%), the Tier-1 recomputed figure (58.1%), and the Tier-2 academic peak-era baseline (90%), with the 29% gap between the first two values marked directly on the chart.

Figure 5. RQ2/RQ3 Cross-Verification: Hydrocarbon Dependence and Port Infrastructure Utilization



Cross-tier comparison of hydrocarbon export-share estimates (Panel A: Tier-2, 87%; Tier-1 recomputed, 58.1%; Tier-2 academic peak-era baseline, 90%) and Port of Baku/Alat capacity utilization (Panel B: 6.3 Mt actual against 15 Mt nominal, $\approx 42\%$), World Bank (2023).

Port of Baku/Alat Capacity Utilisation and Tariff Benchmarking

Appendix Table A3 reports total port throughput of 6.3 Mt in 2022 against a 15 Mt/yr nominal capacity figure established mid-2023; as this capacity level postdates the 2022 throughput observation, the resulting 42.0% is presented as a benchmark ratio rather than a strict 2022 utilisation rate. Container-segment utilisation was reported at 52%, with container throughput of 52,277 TEU in 2022, split 59% Alat–Aktau and 41% Alat–Turkmenbaşı by route. Average container dwell time was 25 days (range 10–46), representing approximately 70% of total average Middle Corridor shipping time; including a further two days of harbour transit, total dwell approximated 27 days. Container handling tariffs at Alat were \$104 (20 ft) and \$148 (40 ft) in 2023, whereas the ASCO tariff for the Baku/Alat–Kuryk route was \$600 (20 ft) and \$1,200 (40 ft), approximately 2.6 times the comparable KMTF tariff (implied at approximately \$231). ASCO round-trip transit time on the Baku–Aktau–Baku route was 5 days by ferry and 4.3 days by ro-pax, two days shorter than the KMTF comparator. Under-construction capacity targets included a grain terminal (1 Mt/yr design capacity) and a fertiliser terminal (3 Mt/yr target), while the Alat Phase II container terminal expansion targeted growth from 100,000 to 500,000 TEU/yr, a fivefold increase.

Figure 5, Panel B, displayed nominal port capacity (15 Mt) against actual 2022 throughput (6.3 Mt), with overall utilisation ($\approx 42\%$) and container-segment utilisation ($\approx 52\%$) annotated on the chart.

Supporting Macroeconomic Indicators and Discrepancy Log

Appendix Table A4 reports GDP growth of +1.4% for 2025, fixed-asset investment of 1,405.9 million manats (January 2026), and external public debt of US\$4.6168 billion as of 1 July 2026 (-7.9% year-on-year). The unemployment rate for 2024 was reported at 5.3% by the State Statistics Committee versus 5.4% by the IMF via a third-party source, a 0.1% discrepancy. SOFAZ total assets under management were US\$72.596 billion (AZN123.414 billion) as of 1 July 2026, a decline of 1.29% relative to the start of 2026; SOFAZ revenue for January–June 2026 totalled AZN8.5313 billion (oil/gas AZN4.9534 billion; asset-management AZN3.5779 billion) against expenditure of AZN6.4497 billion.

Appendix Table A5 consolidates ten retained discrepancies across the dataset, including the East–West Corridor reconciliation gap ($\Delta \approx 42.9\%$), the hydrocarbon export-share gap ($\approx 29\%$), the BTK 2020 freight discrepancy ($\approx 49.8\%$), the BTK design-capacity discrepancy (6.5-fold), divergent actual- versus real-terms non-oil-gas export growth for two reporting periods, the 0.1% unemployment discrepancy, gap between TAP's current realised capacity (11.5 bcm/yr) and its 2027 pledged capacity (20 bcm/yr, an 8.5 bcm gap, $\approx 42.5\%$), corroborating alignment between the academic peak-era hydrocarbon share ($\approx 90\%$) and the 2024 Tier-2 estimate ($\approx 87\%$), and the final source-tier reclassification of six observations (obs. 31, 33, 39, 40, and 83–84) from Tier 1 to Tier 2. No conflicting figure identified across the dataset was dropped, averaged, or substituted.

6. Discussion

The evidentiary base assembled for this study, 96-tiered source-strings spanning transport, trade, and infrastructure-financing indicators, supports a qualified rather than unambiguous account of Azerbaijan's Middle Corridor centrality. Corridor-freight volumes and BTK capacity both expanded substantially over the study window, yet several headline figures failed internal reconciliation, and a persistent gap separated competing estimates of hydrocarbon export

dependence (Aliyeva and Aliyev, 2025). Port infrastructure, meanwhile, showed capacity built ahead of realised throughput. This directional interpretation is consistent with prior studies emphasizing Azerbaijan's logistics and BTK corridor role (Hajiyeva, 2025; Hajizadeh, 2014), while the unresolved statistical discrepancies are specific to the present audit.

Interpretation of Findings

The corridor-growth indicators of the 70% year-on-year rise in BTK-routed cargo, the roughly 2.5-fold increase in Persian Gulf/India-linked corridor volume, and the fivefold post-modernisation expansion of BTK nominal capacity collectively address RQ1 by demonstrating that Azerbaijan's transit role has strengthened materially since 2019-2020, consistent with broader assessments of Azerbaijan's corridor positioning (Sarwat, 2025; Gawliczek and Iskandarov, 2023). However, the unreconciled East-West Corridor total, which shows a 42.9% shortfall relative to its own stated sub-components, qualifies this conclusion: at least some official corridor reporting is internally inconsistent, limiting the precision with which the scale of transit growth can be stated even where its direction is clear.

The divergence between the Tier-2 trade-agency estimates of hydrocarbon export share (approximately 87%, FY2024) and the Tier-1 recomputation from State Customs Committee data (approximately 58.1%, Jan-Apr 2026) is the study's most consequential discrepancy, although the two figures refer to non-comparable reporting periods and scopes rather than to a single directly reconcilable measure. An academic historical baseline, classified as Tier 2 under the study's final framework, places hydrocarbon dependence near 90% at its earlier peak. The observed divergence is therefore more plausibly attributable to differences in reference period, scope, and the classification of energy-related exports than to the unreliability of either source individually. At the same time, the declining contribution of hydrocarbons to GDP is consistent with a longer-term diversification trajectory documented in the literature (Bayramov et al., 2021), even though the precise current export-dependence ratio remains definition-sensitive.

In the case of RQ3, the BTK and Port of Baku/Alat findings differ. Earlier academic work had already documented a substantial gap between BTK's available freight capacity and realised traffic (Emanet, 2021), providing useful historical context for the interpretation of capacity utilisation. The present study, however, relies on its own 2019-2026 source inventory for the later BTK expansion figures. For the Port of Baku/Alat, the comparison likewise indicates realised throughput well below the subsequently reported nominal capacity, but the approximately 42% figure is best treated as a benchmark ratio rather than

These patterns can be explained by several mechanisms, but the secondary-data design cannot distinguish among them conclusively. The East-West Corridor reconciliation gap and the hydrocarbon export-share discrepancy are consistent with differences in reporting timeframes, scope, and classification across customs, statistics, transport, and energy sources. The gap between the nominal capacity of Port of Baku/Alat and realised throughput may also reflect an investment-ahead-of-demand pattern in which infrastructure is developed in anticipation of future demand; this interpretation is compatible with broader transport-corridor research but remains inferential in the present study (Vardomsky, 2023; Yermekbayev et al., 2024).

The three research objectives were addressed at different levels of precision. The transit-node objective (RQ1) is reasonably supported at the level of directional trend, but not by a fully internally consistent quantitative estimate. The hydrocarbon-dependence objective (RQ2) is partially addressed because the discrepancy is identified and documented rather than artificially reconciled. Confidence is also asymmetric for the infrastructure-investment objective (RQ3): the

BTK trajectory is more strongly corroborated within the assembled source inventory than the Port of Baku/Alat capacity claims, some of which rely on Tier-2/3 sourcing.

7. Contribution and Implications

These findings are broadly consistent with Dadaşlı and Valiyev's (2024) account of Azerbaijan's transport corridors, which similarly documents that corridor development has been accompanied by enhanced trade and investment and by the expansion of transportation infrastructure and networks. Where the present study diverges is in scope: prior narrative accounts of Azerbaijan's corridor role have generally not distinguished primary institutional data from secondary or aggregator reporting, whereas this study's tiered, retain-and-flag framework makes that distinction explicit and shows that several headlines figure the East–West Corridor total and the hydrocarbon export-share estimate, do not survive internal reconciliation. This suggests that some claims in the existing narrative literature may rest on figures that have not been cross-verified against their original institutional source. The main value of its contribution is a transparent and tiered evidentiary base, wherein it explicitly clarifies which claims regarding the corridor role of Azerbaijan can be substantiated with verifiable primary information and which are provisional (often these were collapsed in the narration about the development of the corridor, Dadaşlı and Valiyev, 2024; Sarwat, 2025). The results indicate a need to be cautious in using single-source hydrocarbon dependency indicators without specifying the period and scope and highlight the need for the Port of Baku/Alat's potential utilization gap to be considered separately from the more established forecast on the capacity trajectory of BTK (Ismayilov et al., 2025).

The single-coder, single-session design (Belur et al., 2018) and the substantial share of Tier-2/3 reporting limit the extent to which discrepancies can be independently resolved. These limitations were mitigated, rather than eliminated, through explicit tiering and a two-pass verbatim cross-check. Several indicators are also not strictly comparable because they are reported over non-continuous periods. Future research should pursue direct primary-source reconciliation with the relevant Azerbaijani agencies to address the East-West Corridor and hydrocarbon-share discrepancies and should extend the time series to assess whether Port of Baku/Alat utilisation converges toward nominal capacity as corridor volumes grow (Jafari, 2024). Overall, Middle Corridor centrality and trade diversification are supported by coherent directional evidence, while precise quantification remains constrained by the reporting inconsistencies that the retain-and-flag approach was designed to preserve transparently.

Conclusion

Azerbaijan's role as a transit hub has been evaluated in terms of three goals: becoming a transit hub, remaining hydrocarbon-heavy in its trade mix, and the speed and stability of infrastructure investments. A tiered analysis of 96 institutional and academic sources suggests continued robust growth in corridor freight volumes and BTK railway capacity, while the lack of a consensus between the reporting and the East–West Corridor in Azerbaijan and significant discrepancies between different estimates of Azerbaijan's dependence on hydrocarbons remain unresolved. It was found that the capacity of the Port of Baku/Alat is greater than the realized throughput, indicating that infrastructure development has surpassed demand. The primary methodological contribution of this study is the auditable, retain-and-flag evidentiary framework that identifies verifiable primary claims and separates them from secondary reporting, provisional charges that form the bulk of what is typically offered by narrative treatments as evidentiary.

The findings highlight the need for the standardization of definitional and temporal norms for transit and trade statistics for policymakers and regional connectivity scholars. Future research should aim to further reconcile primary institutional sources and provide more temporal coverage to further examine the convergence of capacity utilization with infrastructural expansion over time.

CRediT Authorship Contribution Statement

Salimov, S.: Conceptualization; Methodology; Formal Analysis; Writing – Original Draft; Writing – Review & Editing; Supervision. Aslanov, E.: Conceptualization; Formal Analysis; Writing – Original Draft; Writing – Review & Editing. Maharrov, S.: Methodology; Data Curation; Investigation. Yagubova, N.: Methodology; Formal Analysis; Writing – Review & Editing. Karimova, S.: Data Curation; Investigation; Visualization. Ibrahimli, M.: Data Curation; Investigation; Visualization.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

Data Availability Statement

The source inventory underlying this study comprises 96 observations derived from publicly available institutional, governmental, and peer-reviewed sources. The cleaned and tier-classified Source Inventory used in the final analysis is provided as Supplementary Material accompanying this article.

Ethical Approval Statement

Not applicable. This study relies exclusively on publicly available secondary data and did not involve human participants, personal data, animals, or experimental procedures requiring ethical approval.

AI Disclosure Statement

Generative AI tools were used solely for grammar editing and proofreading of the manuscript. All research design, data selection and classification, analysis, interpretation, and conclusions were performed and validated by the authors.

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Appendix A

Supporting Empirical Evidence and Verification Tables

Table A1. Transport-Corridor & Freight-Volume Indicators

Indicator	Period	Reported value	Analytical treatment	Result	Tier
Freight transported by rail (national)	Q1 2026	3.4 Mt	(a) Raw value	—	2/3
Freight transported by sea (national)	Q1 2026	1.39 Mt	(a) Raw value	—	2/3
Freight transported by road (national)	Q1 2026	2.7 Mt	(a) Raw value	—	2/3
East–West Corridor, stated total	Q1 2026	3.8 Mt	Reconciliation formula ($\Delta 1$)	Sub-components sum to 5.43 Mt; $\Delta = 1.63$ Mt, $\Delta\% \approx 42.9\%$	2/3, Flagged
Transit cargo share of sea transport	Q1 2026	89.4%	(b) Percentage-share	89.4%	2/3
Transit cargo share of road transport	Q1 2026	48.8%	(b) Percentage-share	48.8%	2/3
Transit cargo share of rail transport	Q1 2026	44.3%	(b) Percentage-share	44.3%	2/3
Persian Gulf/India–AZ–Georgia–Europe corridor volume	2019 → 2024	5,723 → 14,549 kt	(c') CAGR, n=5	$\approx 20.5\%/yr$ ($\approx 2.54\times$)	1
NSTC combined stated target capacity	Undated target	15 Mt / 660,000 TEU	(a) Raw value	—	1
Middle Corridor (TITR) total transit, corridor-wide	Jan–Sep 2025 actual; FY2025 proj.	>2 Mt actual; ≈ 5 Mt projected FY	(a) Raw value	—	3
Middle Corridor (TITR), World Bank 2030 projection	Target 2030	≈ 11 Mt/yr	(d) Ratio/multiple	$\approx 3\times$ early-2020s baseline	2
Middle Corridor cargo via BTK route	Jan–Sep 2024 vs Jan–Sep 2023	+70%, reaching 3.4 Mt	(c) Growth rate	+70%	2

Note. Supports RQ1 (transit-node centrality). Formula labels correspond to the Methodology's Data Analysis section: (a) raw-value reporting, (b) percentage-share, (c) period-on-period growth, (c') CAGR, (d) ratio/multiple, $\Delta 1$ = reconciliation-discrepancy formula.

Table A2: BTK Railway Infrastructure Capacity Trajectory

Indicator	Period	Institutional (Tier 1–2)	Independent / Academic	Analytical Treatment	Result / Interpretation
Actual freight moved	2020	267,000 t	≈400,000 t	Cross-source discrepancy	≈49.8% inter-source gap
Actual freight moved	2021	480,000 t	—	Growth rate	+79.8% vs 2020
Nominal annual capacity	Pre-May 2024	1 Mt/yr	6.5 Mt design capacity	Ratio	Academic estimate ≈6.5× institutional (pre-modification)
Nominal annual capacity	From 20 May 2024	5 Mt/yr (corroborated; 2 sources)	—	Growth rate	+400% (≈5× increase from pre-mod capacity)
Current freight moved	As of Oct 2025	≈6–8 Mt/yr	Ex-ante projection (2017): 6–8 Mt by “8th year”	Benchmark comparison	Actual volume broadly aligns with earlier academic projection
SOFAZ allocation to BTK-related works	Cumulative to Oct 2025	US\$745.9 million	—	Raw value	—
Persian Gulf / India corridor via BTK link	2019 → 2024	5,723 → 14,549 kt	—	CAGR	≈20.5% per year

Note. Supports RQ3 (pace, financing, and reliability of infrastructure investment). Institutional and independent academic figures are retained side-by-side per the retain-and-flag protocol rather than reconciled.

Table A3. Port of Baku/Alat Capacity Utilization & Tariff Benchmarking

Indicator	Period	Value	Analytical treatment	Result
Total port throughput	2022	6.3 Mt	(a) Raw value	—
Nominal annual capacity	Mid 2023	15 Mt/yr	(a) Raw value	—
Overall capacity-utilization rate	2022	6.3 / 15	(d) Ratio	42.0% (matches source-stated 42%)
Container-segment utilization	2022	—	(d) Ratio (source-stated)	52%
Container throughput	2022	52,277 TEU	(a) Raw value	—
Container route split	2022	—	(b) Percentage-share	59% Alat–Aktau; 41% Alat–Turkmenbaşı
Average container dwell time	2022	25 days (range 10–46)	(a)+(b) Raw value / share	≈ 70% of total avg. MC shipping time; +2 days harbour transit ≈ 27 days total
Container handling tariff, Alat	2023	\$104 (20ft) / \$148 (40ft)	(a) Raw value	—

Indicator	Period	Value	Analytical treatment	Result
ASCO container tariff, Baku/Alat–Kuryk	2023	\$600 (20ft) / \$1,200 (40ft)	(d) Ratio/multiple	≈ 2.6× comparable KMTF tariff (implied ≈ \$231)
ASCO round-trip transit time, Baku–Aktau–Baku	2022	5 days ferry / 4.3 days ro-pax	(d) Ratio	2 days shorter than KMTF comparator
Grain terminal (under construction)	2023	Design capacity 1 Mt/yr	(a) Raw value	—
Fertilizer capacity target	2023	3 Mt/yr	(a) Raw value	—
Container terminal expansion (Alat Phase II)	Current → target	100,000 → 500,000 TEU/yr	(d) Ratio	5× target expansion

Note. Supports RQ3 (infrastructural investment trajectory and realised utilisation). All figures Tier 1 (World Bank, 2023) unless otherwise noted.

Table A4. Macroeconomic Context Indicators

Indicator	Period	Value	Tier
GDP growth	2025	+1.4%	1
Investment in fixed assets	Jan 2026	1,405.9 million manats	1
External public debt	As of 1 Jul 2026	US\$4.6168bn (–7.9% y/y)	1
Unemployment rate	2024	5.3% (State Stat. Cttee) vs 5.4% (IMF via 3rd-party) — 0.1pp discrepancy retained	2/3
SOFAZ total assets under management	As of 1 Jul 2026	US\$72.596bn (AZN123.414bn); –1.29% vs start-2026	1
SOFAZ revenue/expenditure structure	Jan–Jun 2026	Revenue AZN8.5313bn (oil/gas AZN4.9534bn; asset-mgmt AZN3.5779bn); expenditure AZN6.4497bn	1

Note. Contextual macro-fiscal indicators supporting the diversification/dependence narrative (RQ2) and infrastructure-financing capacity (RQ3).

Table A5. Retain-and-Flag Discrepancy & Cross-Verification Log

#	Conflict	Value A (Tier)	Value B (Tier)	Discrepancy	Resolution status
1	East–West Corridor stated total vs sub-components	3.8 Mt (2/3)	5.43 Mt sum (2/3)	$\Delta\% \approx 42.9\%$	attributed to source article
2	Hydrocarbon share of exports	$\approx 87\%$ (2)	$\approx 58.1\%$ (1)	≈ 29 pp	differing periods/scope; both retained
3	BTK 2020 actual freight moved	267,000 t (2/3)	$\approx 400,000$ t (2/3)	$\approx 49.8\%$	
4	BTK design capacity	1 Mt pre-mod (1/2)	6.5 Mt (2/3)	6.5×	
5	Non-oil-gas export growth, Jan–Nov 2024	+1.9% actual (1)	–11.0% real (1)	Directional divergence	Both retained — divergence itself informative
6	Non-oil-gas export growth, Jan–Sep 2025	+7.6% actual (1)	–15.7% real (1)	Directional divergence	Both retained
7	Unemployment rate, 2024	5.3% (2)	5.4% (3)	0.1 pp	Minor — retained
8	TAP realized vs pledged capacity	11.5 bcm/yr current (3)	20 bcm/yr pledge, 2027 (1)	8.5 bcm gap ($\approx 42.5\%$)	Target year not yet reached
9	Hydrocarbon peak export share vs 2024 estimate	$\approx 90\%$ peak, academic (2)	$\approx 87\%$, 2024 (2)	Corroborating direction	Both retained — cited together in Discussion
10	Final source-tier reclassification audit	Obs. 31, 33, 39, 40 and 83–84: originally Tier 1	Reclassified Tier 2	Methodological correction	Reflected in final tier counts (45/37/14)

Note. Consolidated audit trail of every conflicting or non-reconciling figure identified across the dataset, per the retain-and-flag protocol. No conflicting figure was silently dropped, averaged, or substituted.