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GLOBAL TRADE IN DRINKING WATERS (HS 2201) AND BEVERAGES DERIVED THEREFROM: MARKET CONCENTRATION, UNIT VALUES, AND ARMENIA'S EXPORT PROSPECTS THROUGH 2031

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Abstract

This article evaluates the scale, geographic structure, unit values and Armenian export potential of international trade in unsweetened waters classified under HS 2201. A country-

year panel and an Armenia partner-year panel are constructed from UN Comtrade data for 2010-2025. In 2023, the latest broadly comparable global year, reported exports amounted to USD 5.77 billion. Reporting-coverage adjustments are applied to 2024-2025 because the number of reporting exporters falls to 130 and 88, respectively. The export market is concentrated: in 2023 the five-country concentration ratio was 68.9%, while the Herfindahl-Hirschman index was 0.164. France, Italy and China formed the leading export group, whereas the United States, Hong Kong SAR, France, Germany and the United Kingdom were major import centres. Armenian exports increased from USD 5.32 million in 2010 to USD 19.42 million in 2024 and USD 23.40 million in 2025, while remaining strongly concentrated in the Russian market. A Poisson pseudo-maximum-likelihood model with partner and year fixed effects and rolling-origin forecast validation are employed. The preferred Holt linear model projects Armenian exports at USD 34.48 million in 2031, with a 95% prediction interval of USD 16.35-72.71 million. The findings suggest that Armenia's defensible opportunity lies in certified, branded and higher-value natural and mineral water rather than bulk low-value exports.

Keywords: freshwater trade, mineral water, HS 2201, PPML, unit value, Armenia, forecasting.

Introduction

Freshwater is simultaneously a vital resource, a public good, a factor of production, and a tradable commodity with important physical constraints. International merchandise statistics capture only a specific segment of it: packaged water that crosses a customs frontier [1].

HS heading 2201 covers unsweetened waters, including natural or artificial mineral and aerated waters, as well as other water, ice, and snow. The term "freshwater market" is therefore used operationally in this article and does not include cross-border transfers through pipelines or the full flow of water-supply infrastructure [2].

The scientific difficulty of the subject arises from the interaction of three distinct mechanisms. First is the geography of the natural resource: water abundance or scarcity may affect both supply and demand. Second is the high cost of transport: water is bulky and relatively low in value, so packaging and logistics often cost more than the raw resource itself. Third is product differentiation: provenance, mineral composition, brand, packaging, and safety certification generate very different values for the same physical weight.

Comparable product-level international trade databases make these differences measurable, but their use requires careful treatment of mirror flows, classification revisions, and the quality of quantity data [3].

The objective of this article is to assess the development and country structure of the HS 2201 market, identify the principal destinations of Armenian exports, and forecast exports through 2031. Five tasks follow from this objective: measuring market size and concentration; identifying leading countries; analysing unit values; estimating structural shifts in Armenia's partner composition; and developing explicitly uncertain forecast scenarios.

The contribution is threefold. First, it integrates global market concentration, exporter and importer rankings, unit values, and Armenia's bilateral export structure within a single

HS 2201 framework. Second, it explicitly corrects the decline in reporting coverage in 2024–2025 and evaluates that correction through historical coverage-profile backtesting. Third, it combines a zero-preserving PPML specification with rolling-origin forecast comparison and reports prediction intervals rather than point forecasts alone.

Conflict Setting

The gravity approach and trade costs

In modern applications of the trade gravity model, the PPML estimator is preferred to log-linear OLS because it retains zero trade flows and is more robust under heteroskedasticity [4]. Practical structural-gravity guidance recommends controlling for multilateral resistance with exporter-year and importer-year fixed effects, and for time-invariant bilateral costs with pair fixed effects [5]. The broader gravity literature shows that distance remains one of the most stable determinants of merchandise flows, even under technological progress and trade liberalisation [6]. Relative market access and multilateral resistance matter because bilateral trade depends not only on the cost between two countries but also on their positions relative to alternative markets [7].

The role of distance should be especially strong for water. The product has a low value-to-weight ratio, packaging adds considerable weight, and returnable-container options are limited. A landlocked exporter also faces trans-shipment costs. Armenia therefore cannot compete with the same strategy in nearby EAEU markets and in distant high-income destinations.

Physical and virtual water trade

The water-footprint literature treats a large share of international trade as the transfer of virtual water embodied in products, predominantly agricultural goods [8].

The concept of virtual water implies that a water-scarce country can ease its resource constraint by importing water-intensive products without transporting large physical volumes of water [9].

The global virtual-water network has become denser over time, although dependence on central countries has persisted [10].

Regional studies also warn that physical and virtual transfers may alleviate scarcity in the importing region while increasing water pressure in the exporting region [11].

This article does not equate trade in HS 2201 with virtual-water trade. Under HS 2201, water itself crosses the border in a container or another customs form; in virtual-water trade, water is embodied in food, textiles, or manufactured products. The distinction is essential for both measurement and policy interpretation.

The value and environmental cost of packaged water

Energy assessments of bottled water show that plastic production, bottling, cooling, and transport may greatly exceed the direct energy required to abstract water at the source [12].

Consumers' willingness to pay reflects perceived safety, taste, provenance, mineral composition, brand, and packaging. Consequently, international value differences for an identical physical quantity cannot be explained by water quality alone [13].

The value-to-quantity ratio observed in customs data is a unit value rather than a pure price. It may change because of product mix, contract terms, packaging, and reporting error [14].

Materials and Methods

Data structure and definitions

The main source is UN Comtrade. Annual export and import flows for HS 2201, HS 220110, and HS 220190 were retrieved for 2010–2025. The country-year database contains observations for 195 reporting economies over the study period. For Armenia, an initial balanced grid was constructed for 251 potential partners and 16 years (4,016 partner-year cells). The PPML estimation sample then retained the 59 partners with at least one positive export flow during 2010–2025, producing 944 observations; within this sample, 402 flows are positive and 542 are zero. This restriction avoids all-zero partner fixed effects while preserving intermittent zero trade for active destinations.

The aggregate HS 2201 heading already includes both subheadings and they are therefore not added when calculating total market value. The subheadings are used only for structural decomposition. The principal monetary variable is primaryValue, generally recorded on an FOB basis for exports and a CIF basis for imports. This valuation difference also explains part of the discrepancy between global export and import totals.

The external water-scarcity context is defined by the WDI/FAO SDG 6.4.2 indicator: total freshwater withdrawals as a share of available renewable freshwater resources after environmental flow requirements [15].

FAO AQUASTAT's country profile is used for the institutional interpretation of Armenia's water resources and abstraction structure [16].

Progress in water governance and drinking-water quality reform is cross-checked against UNECE National Policy Dialogue materials [17].

Armenia's customs outcomes are also compared with the logic of Armstat's four-digit external-trade database [18].

Market measurement indicators

Country i's market share in year t is calculated as its export value divided by world exports:

$$s_{it} = \frac{X_{it}}{\sum_{j=1}^{N} X_{jt}} \quad (1)$$

Market concentration is measured by the Herfindahl–Hirschman Index and by the shares of the five and ten largest exporters:

$$HHI_t = \sum_{i=1}^{N_t} {s_{it}}^2 , CR_{kt} = \sum_{i=1}^{k} s_{(i)t} \quad (2)$$

The export unit value is calculated as value divided by net weight. Zero or missing weights are not imputed, and physically implausible observations are excluded from aggregate price interpretation:

$$UV_{ijt} = \frac{V_{ijt}}{W_{ijt}} \quad (3)$$

Water density of approximately one kilogram per litre permits only an approximate reading of USD/kg as USD/litre. Packaging weight, supplementary-quantity reporting, and product mix prevent an exact conversion.

Adjustment for incomplete reporting in 2024–2025

Recent global totals decline mechanically when some reporters have not yet published their data. Missing country values for 2024 and 2025 are therefore imputed from the previous-year value multiplied by the median growth factor among countries reporting in both consecutive years. Growth observations below the 5th or above the 95th percentile are trimmed.

$$X_{it}^{*} = X_{i,t-1} \times median_{j \in R_t}\left(\frac{X_{jt}}{X_{j,t-1}}\right) \quad (4)$$

The adjusted series is a nowcast and is not presented as a final official total. Observed, preliminary, and forecast values are distinguished in the figures and accompanying text. A coverage-profile backtest was conducted for 2018–2023 by reproducing the sets of countries reporting in 2024 (130 reporters) and 2025 (88 reporters), applying the same imputation rule, and comparing the estimates with the complete historical totals. The resulting mean absolute percentage errors were 0.27% and 1.96%, respectively, with mean biases of 0.13% and 0.67%. These results support the mechanical adjustment as a short-run coverage correction, while the larger error under the 88-country profile justifies treating the 2025 estimate as exploratory and preliminary.

PPML partner model for Armenia

PPML is employed to retain zero flows and avoid the bias associated with log-linear transformation under heteroskedasticity [19].

$$E\left[X_{jt}|Z_{jt}\right] = \exp\left(\alpha_j + \lambda_t + \beta_1 D_{jt}^{EAEU} + \beta_2 D_{jt}^{RUS} + \beta_3 D_{jt}^{USA}\right) \quad (5)$$

The dependent variable is the value of Armenia's HS 2201 exports. The indicators D^{EAEU}_{jt}, D^{RUs}_{jt}, and D^{UsA}_{jt} denote, respectively, EAEU-partner × Post-2015, Russia × Post-2022, and USA × Post-2020 interactions. Partner fixed effects α_j absorb distance, common borders, language, and other time-invariant factors; year fixed effects λ_t absorb common annual shocks. Standard errors are clustered by partner. Because the interactions are not generated by a policy experiment, coefficients are interpreted as conditional structural shifts rather than unambiguous causal effects.

The theoretical basis for measuring bilateral distance is provided by the CEPII Gravity and GeoDist databases. In a single-exporter model with partner fixed effects, however, time-invariant distance cannot be identified separately [20].

Population-weighted geographic distance generally represents trade costs between economic centres more accurately than simple capital-to-capital distance [21].

Forecasting strategy

Forecast models are estimated on logarithmic series to preserve positivity and stabilise the variance of relative changes. Candidate models are compared through rolling-origin one-step-ahead validation, using RMSE as the primary selection criterion and MAE and MAPE as supplementary measures [22]. Holt linear, damped Holt, and log-linear trend specifications are evaluated for both the global and Armenian series.

$$\mathrm{RMSE} = \sqrt{\frac{1}{H}\sum_{h=1}^{H}(y_{t+h} - \widehat{y_{t+h}})^2} \quad (6)$$

$$\mathrm{MAPE} = \frac{100}{H}\sum_{h=1}^{H}\left|\frac{y_{t+h} - \widehat{y_{t+h}}}{y_{t+h}}\right| \quad (7)$$

Holt's level-trend model separates the current level of the series from its local growth trend [23].

Exponential-smoothing models are advantageous in small samples because they respond to recent observations with a limited number of parameters [24].

The global forecast is estimated on the final 2010–2023 series; the 2024–2025 nowcasts serve only as external comparative benchmarks. Armenia's forecast uses the reported national series for 2010–2025. The 95% intervals expand the log-model residual standard deviation by the square root of the forecast horizon. They capture residual innovation uncertainty but not the full uncertainty associated with model selection, parameter estimation, future reporting revisions, inflation, exchange rates, or structural breaks; they should therefore be interpreted as conditional model-based prediction intervals.

Research Results

Dynamics of the global market

The global HS 2201 export series reveals a clear long-term expansion accompanied by increasing uncertainty in the most recent reporting years. To distinguish genuine market dynamics from changes caused by incomplete country reporting,

Table 1

Global HS 2201 Export Values and Reporter Coverage, Selected Years, 2010–2025

Year	Reported, USD bn	Adjusted, USD bn	Reporting countries	Status
2010	2.77	2.77	159	observed
2015	3.35	3.35	154	observed
2020	4.47	4.47	154	observed
2021	4.97	4.97	157	observed
2022	5.04	5.04	157	observed
2023	5.77	5.77	152	observed
2024	5.80	5.87	130	nowcast/preliminary
2025	5.07	6.33	88	nowcast/preliminary

Source: Authors' calculations based on UN Comtrade.

Table 1 presents both reported and coverage-adjusted export values. This distinction is particularly important for 2024–2025, when the number of reporting countries declined substantially and the raw totals ceased to be directly comparable with the more complete observations for 2010–2023.

Between 2010 and 2023, global exports more than doubled, rising from USD 2.77 billion to USD 5.77 billion. Following a temporary decline in 2015, growth accelerated. In 2020, the export total did not replicate the full contraction observed in imports because exporter and importer declarations differ in timing and valuation.

The raw total for 2024 is USD 5.80 billion and the coverage-adjusted estimate is USD 5.87 billion. In 2025, the difference is substantial: USD 5.07 billion reported and USD 6.33 billion adjusted. It would therefore be misleading to infer a market contraction from the raw 2025 total.

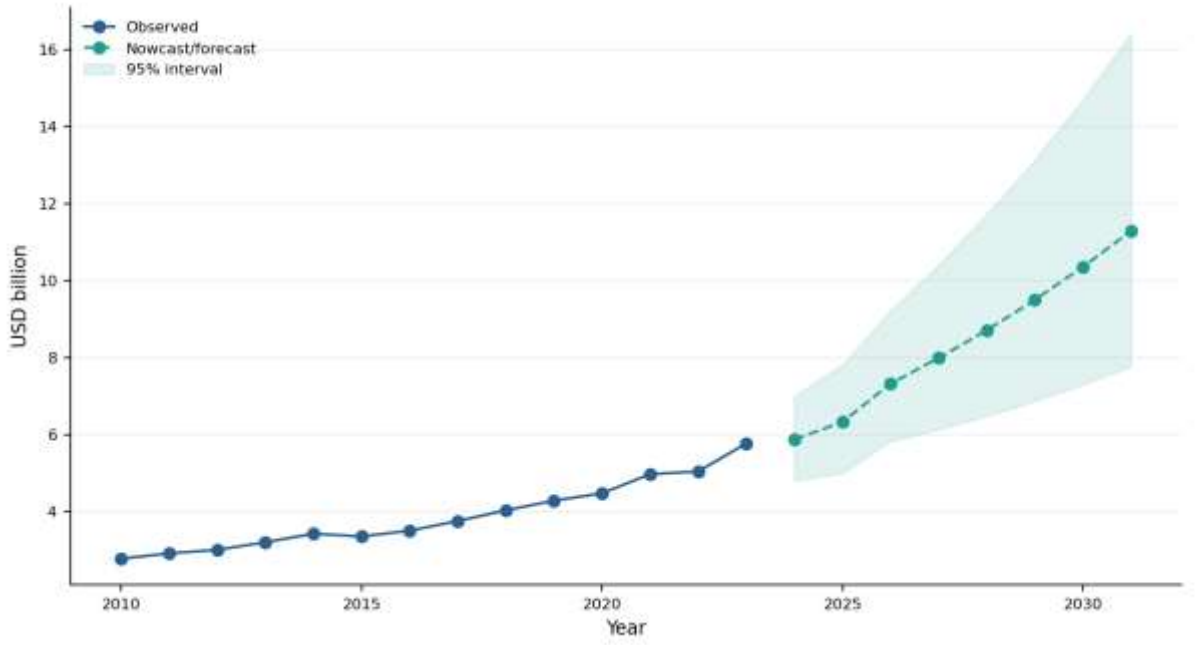

Fig. 1. Global HS 2201 exports and forecast. Source: Authors' calculations.

Fig. 1 confirms that the market's long-run expansion has not followed a uniform path: the temporary stagnation in the mid-2010s was followed by a visibly steeper nominal trajectory after 2020. At the same time, the widening forecast band shows that the projected increase should be treated as a conditional range rather than a deterministic continuation of recent growth. This distinction is especially important because the series combines changes in physical volumes, prices, exchange rates, and product composition.

Leading exporting and importing countries

The country structure of HS 2201 exports provides insight into the competitive foundations of the global packaged-water market. Export leadership may reflect not only the availability of water resources but also internationally recognised brands, certified mineral-water sources, bottling capacity, access to integrated markets, and established distribution networks. Table 2 presents the ten leading exporters in 2023 and their relative shares within this group.

The results reveal a highly asymmetric export structure. France alone accounted for 42.8% of the trade value generated by the displayed ten exporters, while France, Italy, and China jointly represented 78.0%. The remaining exporters each held shares below 5%, indicating a substantial gap between the three market leaders and the second tier. Georgia's inclusion among the leading exporters is particularly relevant for Armenia, as it demonstrates that a South Caucasian country can establish an internationally competitive position through recognised origin, product differentiation, and market-specific branding.

Table 2

Leading Exporters of HS 2201 Products by Trade Value and Market Share, 2023

Exporters	**Value, USD mn**	**Share of displayed top ten, %**
France	1983.0	42.8
Italy	885.1	19.1
China	748.6	16.1
Belgium	186.7	4.0
USA	170.4	3.7
Fiji	158.5	3.4
Germany	145.1	3.1
Mexico	144.0	3.1
Georgia	131.5	2.8
Spain	84.0	1.8

Source: Authors' calculations based on UN Comtrade. Shares refer to the displayed top ten.

The import side of the HS 2201 market reflects the combined influence of market size, household income, consumer preferences, tourism, urban concentration, and the availability of domestic alternatives. Leading importing economies are not necessarily water-scarce countries; several are high-income markets where demand is driven by differentiated natural and mineral waters.

Table 3 presents the ten principal importers in 2023 and their shares within the displayed group.

Table 3

Leading Importers of HS 2201 Products by Trade Value and Market Share, 2023

Importers	**Value, USD mn**	**Share of displayed top ten, %**
USA	1078.9	31.0
China, Hong Kong SAR	680.8	19.6
France	351.1	10.1
Germany	267.2	7.7
United Kingdom	265.0	7.6
Belgium	240.4	6.9
Netherlands	212.9	6.1

Importers	**Value, USD mn**	**Share of displayed top ten, %**
China	146.7	4.2
State of Palestine	120.0	3.4
Switzerland	115.4	3.3

Source: Authors' calculations based on UN Comtrade. Shares refer to the displayed top ten.

Import demand is also concentrated, although less strongly than exports. The United States and Hong Kong SAR jointly accounted for 50.6% of the import value represented by the ten leading markets, confirming the importance of large, affluent and import-intensive consumer centres. The presence of France, Germany, Belgium and the Netherlands among both major exporters and importers points to extensive intra-industry trade, in which differentiated waters are exchanged across markets rather than imported solely to address physical scarcity. The import structure therefore suggests that Armenia's opportunities depend more on premium positioning and reliable distribution than on targeting water scarcity alone.

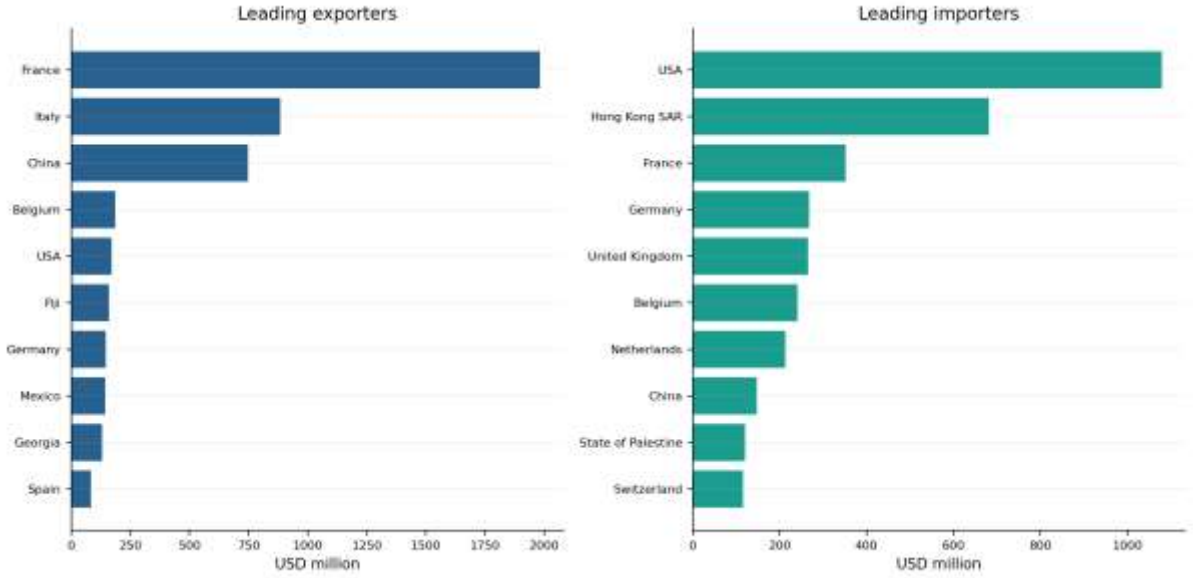

Fig. 2. Leading countries in the HS 2201 market, 2023.

The leading positions of France and Italy show that the market is shaped not only by water-resource abundance, but also by long-standing branding, recognised mineral-water origins, mature bottling capacity, and access to the European single market. China's reported value is accompanied by an evident net-weight anomaly, so its unit value is excluded from the calculation of a global average price.

On the import side, the United States leads because of the combined effects of market size, high income, and demand for differentiated premium water. Hong Kong SAR and Macao operate as import-intensive urban hubs. Simultaneous exports and imports by France, Germany, Belgium, and the Netherlands reflect intra-industry trade.

Market concentration

The evolution of export concentration provides a more systematic view of whether the expansion of the HS 2201 market has broadened competitive participation or reinforced the

position of established suppliers. Table 4 combines the Herfindahl–Hirschman Index (HHI), the shares of the five and ten largest exporters (CR5 and CR10), and the number of countries recording positive exports. These indicators jointly capture both the distribution of market shares among leading suppliers and the extent of exporter participation over time.

The 2024 concentration indicators are preliminary because only 130 exporters had reported, compared with 152 in 2023. The apparent changes in HHI, CR5, and CR10 may therefore reflect both market reallocation and incomplete reporting coverage and should not be interpreted as a fully comparable structural shift.

Table 4

Concentration of Global HS 2201 Exports: HHI, CR5, and CR10, 2010–2024 (2024 Preliminary)

Year	HHI	CR5, %	CR10, %	Positive exporters
2010	0.141	66.2	78.5	159
2015	0.133	67.8	79.9	154
2020	0.172	71.3	81.8	154
2023	0.164	68.9	80.4	152
2024	0.162	69.8	82.4	130

Source: Authors' calculations.

An HHI of 0.164 and CR5 of 68.9% in 2023 indicate substantial export concentration. This has a dual implication for a new small exporter: brand-entry costs are high and competition is intense, but high-value niches permit entry at limited scale without matching the volume of mass-market leaders.

Changes in prices and unit values

The distribution of unit values is strongly right-skewed. Large cross-border flows may be recorded at only a few cents per kilogram, whereas small consignments of high-value branded water exceed one dollar. A simple world value-to-weight ratio is therefore highly sensitive to a single large weight-reporting error. For leading exporters with available and plausible weight data, 2024 unit values were approximately USD 0.14/kg for the United States, 0.21 for Türkiye, 0.31 for France, 0.44 for Belgium, 0.50 for Norway, 0.51 for Italy, 0.64 for Georgia, and 0.72 for Lesotho. These are not identical products and must not be interpreted as pure quality-adjusted prices.

Armenia in the international market. Long-term export dynamics

Armenia's long-term export performance can be assessed more accurately by examining trade value, physical volume, and unit value jointly.

Export value alone does not reveal whether growth results from larger quantities, improved product positioning, or changes in the destination mix. Table 5 therefore presents the evolution of Armenia's HS 2201 exports between 2010 and 2025 using three complementary indicators.

The results show that Armenia's export expansion occurred in two distinct phases. Between 2010 and 2020, export value increased moderately, while the unit value declined from USD 0.418/kg to USD 0.383/kg, indicating predominantly volume-driven growth. After 2020, exports accelerated markedly: trade value reached USD 23.40 million in 2025,

approximately 4.4 times its 2010 level. Notably, net weight remained broadly unchanged between 2024 and 2025, whereas export value rose by about 20.5% and the unit value increased from USD 0.506/kg to USD 0.614/kg.

Table 5

Armenia's HS 2201 Exports: Trade Value, Net Weight, and Unit Value, 2010–2025

Year	Exports, USD mn	Net weight, mn kg	USD/kg
2010	5.32	12.71	0.418
2012	7.02	15.63	0.449
2015	5.77	14.02	0.412
2018	7.40	18.30	0.404
2020	8.60	22.45	0.383
2021	13.22	30.75	0.430
2022	16.45	28.10	0.585
2023	18.65	35.76	0.522
2024	19.42	38.41	0.506
2025	23.40	38.09	0.614

Source: Authors' calculations based on UN Comtrade.

This divergence suggests that the latest growth was driven primarily by higher realised values and changes in product or destination composition rather than by additional physical volume.

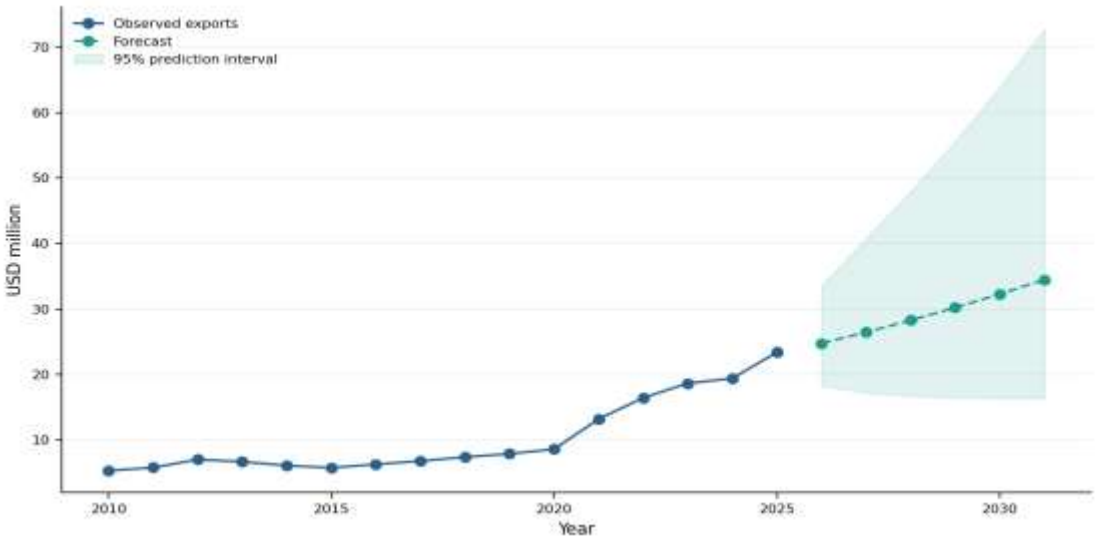

Fig. 3. Armenia's HS 2201 exports and forecast.

Fig. 3 reveals a marked acceleration in Armenia's exports after 2020, but the forecast path is smoother than the most recent observed increase. The model therefore does not mechanically extrapolate the exceptional post-2021 surge. Instead, it implies gradual growth accompanied by rapidly widening uncertainty, which is consistent with Armenia's small

export base, high partner concentration, and sensitivity to a limited number of distribution contracts.

Export geography

Armenia's export geography is examined by combining destination-specific trade values, market shares, and unit values. This approach makes it possible to distinguish large-volume core markets from smaller destinations that may offer higher-value opportunities. Table 6 presents the principal destinations of Armenia's HS 2201 exports in 2024 and highlights the degree of market concentration and variation in realised unit values across partners.

Table 6

Destination Structure of Armenia's HS 2201 Exports by Trade Value and Unit Value, 2024

Partner	Value, USD thousand	Share, %	USD/kg
Russian Federation	15059.3	77.5	0.470
USA	2927.7	15.1	0.747
Kazakhstan	401.8	2.1	0.545
Saudi Arabia	281.7	1.5	0.936
Curaçao	268.5	1.4	1.086
Belarus	140.0	0.7	0.367
Latvia	87.4	0.5	0.346
Belgium	37.3	0.2	0.843
United Arab Emirates	36.1	0.2	0.587
Bulgaria	25.6	0.1	0.416
France	23.7	0.1	0.469
Ukraine	19.9	0.1	0.385

Source: Authors' calculations based on UN Comtrade.

In 2024, the Russian Federation absorbed about 77.5% of Armenia's HS 2201 exports and the United States about 15.1%. Kazakhstan, Saudi Arabia, Curaçao, Belarus, Latvia, and Belgium formed the next group. In 2025, exports to Russia reached about USD 19.70 million, exports to Kazakhstan USD 0.96 million, while exports to the United States fell to USD 1.39 million.

Concentration generates scale advantages through established distribution networks in Russia, but it also raises exposure to exchange-rate, demand, regulatory, and logistics shocks. Diversification should not mean shipping the same low-value product over a greater distance; it requires different product positioning.

PPML results for Armenia

The PPML specification evaluates whether Armenia's bilateral HS 2201 exports experienced systematic changes following selected market and institutional shifts. Partner fixed effects control for time-invariant bilateral characteristics, while year fixed effects absorb

common annual shocks. Table 7 reports the estimated coefficients, partner-clustered standard errors, p-values, and percentage semi-elasticities for the three interaction terms.

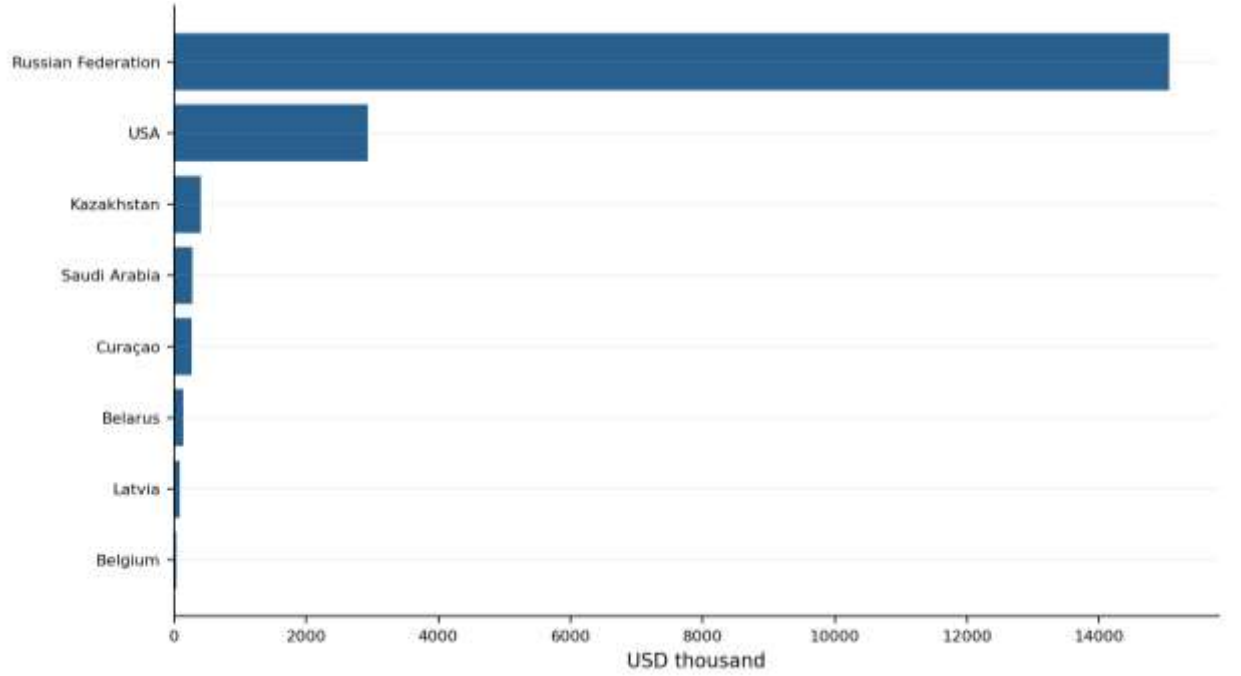

Fig. 4. Main markets for Armenian exports, 2024

Table 7

PPML Estimates for Armenia's Bilateral HS 2201 Exports, 2010–2025

Variable	Coefficient	Clustered SE	p-value	Semi-elasticity, %
EAEU × Post-2015	-0.416	0.590	0.480	-34.0
Russia × Post-2022	0.178	0.240	0.459	19.5
USA × Post-2020	0.559	0.274	0.041	74.9

Source: Authors' estimates. N = 944; 59 partner clusters; 402 positive and 542 zero flows; partner and year fixed effects; deviance explained = 0.984.

The results provide evidence of a statistically significant structural shift only for the US market. The USA × Post-2020 coefficient implies an estimated 74.9% increase relative to its preceding conditional level and is significant at the 5% level. By contrast, the EAEU × Post-2015 and Russia × Post-2022 coefficients are statistically insignificant, as reflected in their large clustered standard errors and p-values of 0.480 and 0.459. These estimates should not be interpreted as evidence that EAEU integration reduced exports or that post-2022 conditions produced no change. Rather, the model cannot identify stable average effects distinct from partner-specific characteristics, common annual shocks, and the already dominant position of the Russian market.

Partner-clustered standard errors allow arbitrary dependence across years for the same partner, provided that the number of clusters is sufficiently large [25].

Coefficient interpretation in a nonlinear fixed-effects panel requires caution, especially for destinations with few positive flows [26].

The EAEU × Post-2015 coefficient is negative but statistically insignificant (p = 0.480). This does not imply that the EAEU reduced exports. Russia's high initial level, partner fixed effects, and concurrent growth in other markets prevent identification of a stable additional average effect. Russia × Post-2022 is positive but also insignificant. USA × Post-2020 is positive and significant at 5%, but should be read as a structural shift rather than a causal policy effect.

Forecasts through 2031

Before producing the 2026–2031 projections, the three candidate specifications are evaluated through rolling-origin one-step-ahead forecasts. Table 8 reports the resulting RMSE, MAE, and MAPE values. Holt's linear trend has the lowest error under all three metrics for both series, providing a transparent empirical basis for its selection.

Table 8

Rolling-Origin One-Step-Ahead Forecast Accuracy by Series and Model

Series	Model	RMSE, USD mn	MAE, USD mn	MAPE, %
Global	Holt linear	227.89	219.44	4.51
Global	Holt damped	316.85	261.74	5.22
Global	Log-linear trend	368.19	306.42	5.96
Armenia	Holt linear	3.283	2.765	16.76
Armenia	Holt damped	3.824	3.139	19.31
Armenia	Log-linear trend	5.541	5.487	30.89

Source: Authors' rolling-origin calculations. Errors are evaluated in levels after forecasts are generated from log-transformed series.

The error ranking is stable across the three criteria. For the global series, Holt linear reduces RMSE by about 28% relative to damped Holt and by about 38% relative to the log-linear trend. For Armenia, the corresponding reductions are about 14% and 41%. Armenia's MAPE remains substantially higher than the global-market MAPE, confirming that forecasts for a small and concentrated exporter are intrinsically less stable.

Having selected Holt's linear trend through rolling-origin validation, the forecasting exercise evaluates the prospective trajectories of global and Armenian HS 2201 exports while explicitly accounting for increasing uncertainty over the projection horizon. Point estimates are reported together with conditional 95% prediction intervals in Table 9.

Table 9

Baseline Forecasts and 95% Prediction Intervals for Global and Armenian HS 2201 Exports, 2026–2031

Year	World, USD bn	World, 95% PI	Armenia, USD mn	Armenia, 95% PI
2026	7.32	5.82–9.21	24.77	18.26–33.58
2027	7.99	6.13–10.41	26.46	17.20–40.71
2028	8.71	6.48–11.71	28.28	16.69–47.92
2029	9.50	6.87–13.13	30.21	16.43–55.55
2030	10.36	7.30–14.70	32.28	16.34–63.78
2031	11.29	7.77–16.42	34.48	16.35–72.71

Source: Authors' forecasts.

The point forecasts indicate sustained nominal growth in both series. Global exports are projected to increase from USD 7.32 billion in 2026 to USD 11.29 billion in 2031, while Armenia's exports rise from USD 24.77 million to USD 34.48 million. This corresponds to an average annual increase of approximately 9.1% globally and 6.8% for Armenia.

The widening prediction intervals are equally important. By 2031, the global range reaches USD 7.77–16.42 billion, while Armenia's interval expands to USD 16.35–72.71 million. Armenia's substantially wider relative range reflects its smaller export base, high destination concentration, and sensitivity to individual contracts and market shocks. Accordingly, the point estimates should be interpreted as conditional planning benchmarks rather than fixed export targets.

Scenario interpretation

The downside scenario is close to the logic of the lower 95% bound and could materialise if Russian demand weakens, borders are disrupted, packaging costs rise, or source-use regulation tightens. The baseline assumes gradual capacity expansion and retention of the Russian market. The upside scenario additionally requires distribution contracts, certification, and higher unit values in the United States, Gulf, and European niches.

Discussion

What the HS 2201 market actually measures

The first major implication is that the term "international water market" is often used too broadly. HS 2201 does not measure the entire cross-border governance of rivers, reservoirs, or pipelines. It measures customs-declared water as merchandise. The results cannot therefore be used to infer the total size of the geopolitical water market.

Second, natural mineral water is economically similar to a differentiated food product, whereas "other water" may resemble a low-value bulk commodity in some flows. The large dispersion of unit values reflects this mixture. Aggregate HS 2201 is appropriate for total market value, but strategic recommendations require additional subheading- and firm-level evidence.

Water abundance is not a sufficient competitive advantage

Natural abundance is necessary but not sufficient for export success. France and Italy lead because of recognised origin, quality regulation, distribution, tourism imagery, and brand equity. Georgia's strong position demonstrates that South Caucasian water can attract international demand, but replication in Armenia requires long-term market investment.

Water-scarce importing countries appear attractive in theory, but large drinking-water deficits are generally addressed through domestic supply, desalination, reuse, and infrastructure rather than mass imports of distant bottled water. Opportunities in Gulf markets are primarily in differentiated consumer segments.

The cost of Armenia's landlockedness

The efficiency of maritime and inland logistics hubs is especially important for products with a low value-to-weight ratio [27].

International logistics performance is determined by customs, infrastructure, shipment organisation, tracking, and timeliness [28].

For landlocked countries, the number of borders and dependence on transit create a persistent structural cost [29].

Bulk water exports from Armenia to Europe or the Gulf require road transport, at least one transit border, and often maritime trans-shipment. When unit value is low, this chain can absorb the margin. Target-market selection should therefore be based on contribution margin per delivered kilogram, not only on gross export value.

Domestic water security and the export boundary

The sustainable-development agenda requires joint consideration of water access, quality, ecosystems, and efficient use [30].

Drinking-water safety requires risk-based management from source to consumer, rather than a one-off laboratory test of the final product [31].

Armenia's export policy should distinguish between the sustainable yield of a renewable source and physical abundance in an individual year. Export permits or abstraction charges should reflect long-run recharge, local-community supply, environmental flows, and climate scenarios.

The preferred performance measure is therefore not exported volume, but domestic value added per cubic metre abstracted—net taxes, wages, local services, and environmental restoration costs included. A small volume generating high value may dominate low-value bulk exports.

Quality, certification, and market trust

The international standard for natural mineral water defines source, treatment, hygiene, and labelling requirements that distinguish it from ordinary packaged water [32].

The EAEU technical regulation on packaged drinking water establishes the mandatory safety and labelling framework in Armenia's principal market [33].

ISO 22000 food-safety management can complement mandatory rules through supply-chain-wide risk management [34].

Certification does not create exports by itself, but it reduces the buyer's information risk. Entry into high-value markets requires source traceability, documentation of stable chemical composition, multilingual labelling, compliant bottle material, periodic independent testing, and a recall plan.

Limits of the econometric results

The model explains 98.4% of the null deviance, largely because partner and year fixed effects absorb persistent destination heterogeneity and common shocks. This high in-sample fit does not establish causality for the interaction terms. The EAEU coefficient is insignificant because Russian dominance predates 2015 and subsequent changes coincide with numerous macroeconomic and firm-level developments.

The positive USA × Post-2020 coefficient is an informative market signal, but the fall in 2025 exports shows that a short period of growth may depend on a limited number of distribution contracts. Future research should use firm-product-partner customs microdata and contract entry/exit events.

Economic interpretation and robustness of the findings

Taken together, the descriptive, concentration, PPML, and forecasting results support a coherent interpretation rather than four independent findings. The global market is expanding

in nominal terms, but entry is mediated by brand capital and distribution networks; Armenia is growing from a small base, but partner concentration remains high; and the forecast trajectory is positive, but its widening interval confirms that market access is contract-dependent. The results therefore favour a portfolio strategy in which a stable core market finances gradual experimentation in smaller, higher-margin destinations.

Unit values require particular caution in that portfolio. A higher customs unit value can signal premium positioning, but it can also reflect shipment size, packaging, route, or reporting conventions. Policy evaluation should consequently combine FOB value per kilogram with delivered margin, repeat-purchase rates, and value added per cubic metre abstracted. This triangulation prevents a statistical increase in unit value from being mistaken for a durable productivity or branding gain.

The nowcasting and forecasting exercises also address different uncertainties. The reporting-coverage adjustment estimates the current but incompletely observed market, whereas the Holt model extrapolates the future path of the completed series. Treating the 2024–2025 adjusted values as observations in model selection would understate measurement uncertainty. Their separation in the empirical design is therefore a methodological strength, although the resulting forecasts remain conditional on the persistence of recent nominal trends.

Strategic market priorities and implementation framework

The Government's agrifood-equipment leasing programme records that Armenia's 2011 export-oriented industrial strategy identified mineral waters among the priority sectors [35]. This establishes a policy precedent, but it does not by itself demonstrate the commercial viability of any specific destination or support instrument.

Implementation should follow a sequenced logic. The first stage is to protect source integrity and achieve full compliance with domestic, EAEU, Codex, and buyer-specific requirements. The second is to improve firm-level cost accounting and logistics consolidation. The third is selective market development through specialised importers rather than broad subsidisation of freight. Public support is most defensible when it finances shared testing, traceability, market intelligence, and export-readiness infrastructure that several producers can use.

Table 10

Market-Specific Export Strategies for Armenian Natural and Mineral Water

Direction	**Proposed strategy**
Russia and the EAEU	Maintain the baseline volume while reducing dependence on a single distributor; develop regional warehousing and monitor delivery time.
United States and diaspora markets	Use diaspora demand as an entry platform, then position the product in premium natural-origin and culinary-use segments.
Gulf countries	Target hotels, restaurants, and premium retail with small glass containers and Arabic labelling.
Europe	Do not compete with mass supermarket water; select specialist importers, Armenian restaurants, and a clearly documented natural-mineral-water story.
Georgia and transit cooperation	Combine market access with logistics and port consolidation, even though Georgia is also a strong competitor.

Source: Authors' elaboration.

Tab. 10 demonstrates that diversification cannot be implemented through a single uniform market-entry model. Russia and the EAEU remain scale markets, whereas the United States, Gulf countries, and Europe require premium positioning, smaller consignments, specialised distributors, and market-specific labelling. Georgia has a dual role as both competitor and potential logistics partner. These are proposed strategic options derived from the observed market structure rather than causal estimates of market-entry profitability.

Performance monitoring and adaptive policy

Effective export policy requires a monitoring system that evaluates not only growth in trade value but also market resilience, domestic value creation, logistics performance, and environmental sustainability. Reliance on a single indicator could conceal rising destination concentration, declining profitability, or excessive pressure on water sources. Table 11 therefore proposes an integrated set of key performance indicators for assessing Armenia's HS 2201 export strategy.

Table 11

Monitoring Framework and Key Performance Indicators for Armenia's HS 2201 Export Strategy

Direction	**Proposed measure**
Export concentration	Russia's share, HHI, and share of the three largest buyers
Value creation	FOB USD/kg, gross margin/kg, value added/m³ of water abstracted
Market stability	share of repeat buyers, average contract duration, frequency of export interruptions
Logistics	average delivery days, border-delay variance, transport cost/kg
Water security	source abstraction/sustainable yield, open level and quality data, restoration charge
Environmental footprint	packaging weight/litre, recycled-material share, CO_2e/litre delivered

Source: Authors' elaboration.

Tab. 11 converts the proposed strategy into a balanced monitoring framework. Export value alone would provide an incomplete signal because it could increase while concentration, logistics costs, or pressure on water sources also rise. Joint monitoring of market concentration, delivered margins, repeat buyers, transport performance, source sustainability, and packaging emissions would allow policymakers to distinguish durable export upgrading from short-lived nominal growth and to revise support instruments when trade and environmental objectives diverge.

Limitations, robustness, and research agenda

The first limitation concerns product coverage: HS 2201 excludes sweetened or flavoured water classified elsewhere and does not measure all physical cross-border water transfers. Second, customs mirror data differ because of FOB/CIF valuation, re-exports, timing, and confidentiality. Third, quantity fields have uneven quality.

Fourth, the global series for 2024–2025 are incomplete. The nowcast is a transparent mechanical adjustment, but it cannot recover the true shock for every missing reporter. Fifth, the current-dollar forecast combines real quantity, prices, inflation, and product mix. Sixth, Armenia's PPML model omits firm capacity, tariffs, route-specific freight costs, and branding expenditure.

Future work should assemble a complete global bilateral matrix at the HS six-digit level together with CEPII distances, importer water stress, GDP per capita, population, tariffs, and trade agreements. These data would permit a structural PPML model with exporter-year, importer-year, and pair fixed effects and a counterfactual estimate of Armenia's unrealised potential.

These limitations do not overturn the central qualitative result, because it is supported by several independent patterns: the dominance of branded European exporters, the high concentration of Armenia's destinations, the premium observed in selected small markets, and the wide forecast intervals. They do, however, limit causal interpretation and the precision of numerical targets. The 2031 estimate should therefore be used as a periodically updated planning benchmark rather than as a fixed policy commitment.

Data and reproducibility statement

The reproducibility package contains the cleaned country-year trade data, the full 251-partner balanced grid, the 59-partner PPML estimation sample, concentration and unit-value calculations, 2024–2025 coverage adjustments, rolling-origin model-comparison results, and forecast intervals. Missing net weights are not imputed. The package should accompany the manuscript so that the reported tables and figures can be independently reconstructed.

Conclusions

The international HS 2201 market more than doubled in nominal value between 2010 and 2023, reaching approximately USD 5.77 billion. Exports are concentrated, and the position of leading countries reflects not only water resources but also branding, reputation of origin, bottling capacity, access to integrated markets, and logistics.

Armenia recorded rapid export growth, reaching USD 23.40 million in 2025. Russia remains dominant, while the United States, Kazakhstan, Gulf, and European destinations are still small or volatile. The PPML estimates do not identify a separate persistent average stimulus after EAEU accession, but they do indicate a positive post-2020 shift in the US market.

The baseline projection places Armenia's exports at USD 34.48 million in 2031, but uncertainty is substantial. A realistic strategy should combine retention of the Russian market with diversification, higher unit values, sustainable source management, quality certification, and transparent logistics-cost accounting. The evidence suggests that Armenia's most plausible export opportunity lies in limited-volume, higher-value natural and mineral water with certified quality and credible origin, rather than in large-scale exports of low-value water.

References

1. United Nations Statistics Division. (2026). UN Comtrade Database. https://comtradeplus.un.org/ (accessed August 9, 2026).
2. United Nations Statistics Division. (2022). Harmonized System classification, heading 2201. https://unstats.un.org/unsd/classifications/Econ

3. Gaulier, G., & Zignago, S. (2010). BACI: International Trade Database at the Product-Level. CEPII Working Paper No. 2010-23.
4. Santos Silva, J. M. C., & Tenreyro, S. (2006). The log of gravity. The Review of Economics and Statistics, 88(4), 641–658. https://doi.org/10.1162/rest.88.4.641
5. Yotov, Y. V., Piermartini, R., Monteiro, J.-A., & Larch, M. (2016). An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model. WTO and UNCTAD.
6. Head, K., & Mayer, T. (2014). Gravity equations: Workhorse, toolkit, and cookbook. In G. Gopinath, E. Helpman, & K. Rogoff (Eds.), Handbook of International Economics (Vol. 4, pp. 131–195). Elsevier.
7. Anderson, J. E., & van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. American Economic Review, 93(1), 170–192. https://doi.org/10.1257/000282803321455214
8. Hoekstra, A. Y., & Mekonnen, M. M. (2012). The water footprint of humanity. Proceedings of the National Academy of Sciences, 109(9), 3232–3237. https://doi.org/10.1073/pnas.1109936109
9. Allan, J. A. (1998). Virtual water: A strategic resource. Ground Water, 36(4), 545–546.
10. Dalin, C., Konar, M., Hanasaki, N., Rinaldo, A., & Rodriguez-Iturbe, I. (2012). Evolution of the global virtual water trade network. Proceedings of the National Academy of Sciences, 109(16), 5989–5994. https://doi.org/10.1073/pnas.1203176109
11. Zhao, X., Liu, J., Liu, Q., Tillotson, M. R., Guan, D., & Hubacek, K. (2015). Physical and virtual water transfers for regional water stress alleviation in China. Proceedings of the National Academy of Sciences, 112(4), 1031–1035. https://doi.org/10.1073/pnas.1404130112
12. Gleick, P. H., & Cooley, H. S. (2009). Energy implications of bottled water. Environmental Research Letters, 4(1), 014009. https://doi.org/10.1088/1748-9326/4/1/014009
13. Carlucci, D., De Gennaro, B., & Roselli, L. (2016). What is the value of bottled water? Empirical evidence from a conjoint choice experiment. Water Resources and Economics, 16, 1–14.
14. Berthou, A., & Emlinger, C. (2011). The Trade Unit Values Database. CEPII Working Paper No. 2011-10.
15. World Bank. (2026). World Development Indicators: Level of water stress (ER.H2O.FWST.ZS). https://databank.worldbank.org/metadataglossary/world-development-indicators/series/ER.H2O.FWST.ZS
16. Food and Agriculture Organization. (2026). AQUASTAT Country Profile: Armenia. https://www.fao.org/aquastat/en/countries-and-basins/country-profiles/country/ARM/
17. United Nations Economic Commission for Europe. (2026). National Policy Dialogue on Water in Armenia. https://unece.org/environment-policy/water/areas-work-convention_protocol/country-dialogues/armenia
18. Statistical Committee of the Republic of Armenia. (2026). External trade database according to the Commodity Nomenclature at 4-digit level. https://armstat.am/en/?nid=148

19. World Trade Organization & United Nations Conference on Trade and Development. (2012). A Practical Guide to Trade Policy Analysis. WTO Publications.
20. Conte, M., Cotterlaz, P., & Mayer, T. (2022). The CEPII Gravity Database. CEPII Working Paper No. 2022-05.
21. Mayer, T., & Zignago, S. (2011). Notes on CEPII's distances measures: The GeoDist database. CEPII Working Paper No. 2011-25.
22. Hyndman, R. J., & Athanasopoulos, G. (2021). Forecasting: Principles and Practice (3rd ed.). OTexts.
23. Hyndman, R. J., Koehler, A. B., Snyder, R. D., & Grose, S. (2002). A state space framework for automatic forecasting using exponential smoothing methods. International Journal of Forecasting, 18(3), 439–454.
24. Gardner, E. S. (1985). Exponential smoothing: The state of the art. Journal of Forecasting, 4(1), 1–28.
25. Cameron, A. C., & Miller, D. L. (2015). A practitioner's guide to cluster-robust inference. Journal of Human Resources, 50(2), 317–372.
26. Wooldridge, J. M. (2010). Econometric Analysis of Cross Section and Panel Data (2nd ed.). MIT Press.
27. United Nations Conference on Trade and Development. (2024). Review of Maritime Transport 2024. United Nations.
28. World Bank. (2023). Connecting to Compete 2023: Trade Logistics in an Uncertain Global Economy. World Bank.
29. United Nations. (2014). Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024. United Nations.
30. United Nations. (2024). The Sustainable Development Goals Report 2024. United Nations.
31. World Health Organization. (2022). Guidelines for Drinking-water Quality: Fourth Edition Incorporating the First and Second Addenda. WHO.
32. Codex Alimentarius Commission. (2019). Standard for Natural Mineral Waters (CXS 108-1981, amended 2019). FAO/WHO.
33. Eurasian Economic Commission. (2017). Technical Regulation of the Eurasian Economic Union TR EAEU 044/2017 on the Safety of Packaged Drinking Water, Including Natural Mineral Water.
34. International Organization for Standardization. (2018). ISO 22000:2018 Food safety management systems — Requirements for any organization in the food chain. ISO.
35. Government of the Republic of Armenia. (2018, amended 2022). Decision No. 893-L of 19 July 2018 on approving the Support Programme for leasing of agrifood equipment in the Republic of Armenia [official English translation]. ARLIS. https://www.arlis.am/hy/acts/193644

A.Kh. Markosyan, V.G. Khachaturyan, M.A. Markosyan, E.N. Matevosyan, H.V. Tokmajyan
GLOBAL TRADE IN DRINKING WATERS (HS 2201) AND BEVERAGES DERIVED THEREFROM: MARKET CONCENTRATION, UNIT VALUES, AND ARMENIA'S EXPORT PROSPECTS THROUGH 2031

ԽՄԵԼՈՒ ՋՐԵՐԻ (HS 2201) ԵՎ ԴՐԱՆՑ ՀԻՄԱՆ ՎՐԱ ՍՏԱՑՎԱԾ ԸՄՊԵԼԻՔՆԵՐԻ ՀԱՄԱՇԽԱՐՀԱՅԻՆ ԱՌԵՎՏՈՒՐԸ. ՇՈՒԿԱՅԻ ԿԵՆՏՐՈՆԱՑՎԱԾՈՒԹՅՈՒՆԸ, ՄԻԱՎՈՐ ԱՐԺԵՔՆԵՐԸ ԵՎ ՀԱՅԱՍՏԱՆԻ ԱՐՏԱՀԱՆՄԱՆ ՀԵՌԱՆԿԱՐՆԵՐԸ ՄԻՆՉԵՎ 2031 ԹՎԱԿԱՆԸ

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Հոդվածում գնահատվում են HS 2201 ապրանքախմբին դասվող չքաղցրացված ջրերի միջազգային առևտրի ծավալը, աշխարհագրական կառուցվածքը, պայմանական միավոր արժեքները և Հայաստանի արտահանման ներուժը: UN Comtrade-ի 2010–2025 թթ. տվյալների հիման վրա կառուցվել են երկիր–տարի և Հայաստանի գործընկեր–տարի պանելներ: 2023 թ.՝ վերջին առավել համադրելի համաշխարհային տարում, արտահանման հայտարարագրված արժեքը կազմել է 5.77 մլրդ ԱՄՆ դոլար: 2024–2025 թթ. համար կիրառվել է հաշվետվությունների ծածկույթի ճշգրտում: 2023 թ. արտահանման CR5 ցուցանիշը կազմել է 68.9%, իսկ Հերֆինդալ–Հիրշմանի ինդեքսը՝ 0.164: Հայաստանի արտահանումը 2010 թ. 5.32 մլն դոլարից աճել է մինչև 19.42 մլն դոլար 2024 թ. և 23.40 մլն դոլար 2025 թ.՝ պահպանելով ռուսական շուկայի գերակշռող կշիռը: Գործընկերային և ժամանակային հաստատուն ազդեցություններով PPML գնահատումը լրացվել է rolling-origin կանխատեսման ստուգմամբ: Holt-ի գծային մոդելով Հայաստանի արտահանումը 2031 թ. գնահատվում է 34.48 մլն դոլար՝ 95% կանխատեսման 16.35–72.71 մլն դոլար միջակայքով: Արդյունքները ցույց են տալիս, որ Հայաստանի պաշտպանելի մրցակցային հնարավորությունը կապված է հավաստագրված, բրենդավորված և բարձրարժեք բնական ու հանքային ջրի հետ, ոչ թե ցածրարժեք զանգվածային արտահանման:

Բանալի բառեր. քաղցրահամ ջուր, հանքային ջուր, HS 2201, միջազգային առևտուր, PPML, միավոր արժեք, Հայաստան, կանխատեսում:

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GLOBAL TRADE IN DRINKING WATERS (HS 2201) AND BEVERAGES DERIVED THEREFROM: MARKET CONCENTRATION, UNIT VALUES, AND ARMENIA'S EXPORT PROSPECTS THROUGH 2031

МИРОВАЯ ТОРГОВЛЯ ПИТЬЕВЫМИ ВОДАМИ (HS 2201) И НАПИТКАМИ НА ИХ ОСНОВЕ: КОНЦЕНТРАЦИЯ РЫНКА, УДЕЛЬНАЯ СТОИМОСТЬ И ПЕРСПЕКТИВЫ ЭКСПОРТА АРМЕНИИ ДО 2031 ГОДА

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В статье оцениваются объем, географическая структура, условная удельная стоимость и экспортный потенциал Армении на международном рынке несладких вод товарной группы HS 2201. На основе данных UN Comtrade за 2010–2025 гг. сформированы панели «страна–год» и «партнер Армении–год». В 2023 г., последнем наиболее сопоставимом глобальном году, заявленная стоимость экспорта составила 5,77 млрд долл. США. Для 2024–2025 гг. применена корректировка охвата отчетности. В 2023 г. коэффициент концентрации пяти крупнейших экспортеров составил 68,9%, а индекс Херфиндаля–Хиршмана — 0,164. Экспорт Армении увеличился с 5,32 млн долл. в 2010 г. до 19,42 млн долл. в 2024 г. и 23,40 млн долл. в 2025 г., сохраняя высокую зависимость от российского рынка. Оценивание PPML проведено с фиксированными эффектами партнеров и лет и дополнено rolling-origin проверкой прогнозов. Линейная модель Холта прогнозирует экспорт Армении на уровне 34,48 млн долл. в 2031 г. при 95%-ном прогнозном интервале 16,35–72,71 млн долл. Результаты показывают, что конкурентная возможность Армении связана с сертифицированной, брендированной и более дорогой природной и минеральной водой, а не с массовым экспортом дешевой воды.

Ключевые слова: пресная вода, минеральная вода, HS 2201, международная торговля, PPML, удельная стоимость, Армения, прогнозирование.

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