

## Why Uzbekistan pays premium prices for sugar: Institutional and market analysis

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### Abstract

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**Introduction.** Among the fifteen largest global sugar importers by value, only three countries pay average prices exceeding \$700 per ton: the United States (\$761), Italy (\$709), and Uzbekistan (\$706). The first two countries implement extensive programs to protect domestic production. Uzbekistan produces virtually no sugar. This study examines how a country with nothing to protect pays prices comparable to protectionist economies.

**Materials and methods.** This study analyses data on sugar imports classified under the Harmonised System code HS1701 for the period 2017–2024, obtained from two main sources: the United Nations Commodity Trade Statistics Database (UN Comtrade) and the International Trade Centre Trade Map (ITC Trade Map). The study employs comparative price analysis across three dimensions – time, cross-country, and supplier-specific – in combination with natural experiment designs and a counterfactual welfare estimator.

**Results and discussion.** Using HS1701 import data from 2017 to 2024 for Central Asian and Commonwealth of Independent States (CIS) countries, we identify systemic procurement inefficiencies. Uzbekistan pays 17.4% more than Kazakhstan, 8.8% more than Tajikistan, and 7.9% more than Kyrgyzstan, despite importing more sugar than all regional competitors combined. Natural experiment comparisons separate institutional from geographic factors: Kyrgyzstan (EAEU member, similar geography) and Tajikistan (non-member, worse geography) both achieve better prices, ruling out location as the cause. For Brazilian sugar – where no preferential agreements apply – Uzbekistan pays a 39.6% premium over Kazakhstan, confirming procurement inefficiency independent of EAEU effects. Estimated welfare losses reach \$67–117 million annually (0.06–0.10% of GDP), totalling \$362 million in 2021–2024.

**Conclusions.** The study makes three contributions. First, it shows that institutions can outweigh geography: Tajikistan's lower prices despite worse location challenge the idea that landlockedness alone drives trade costs. Second, it quantifies the EAEU exclusion penalty (12.1%) while proving domestic factors matter – non-members like Tajikistan and Azerbaijan match EAEU prices. Third, it overturns bargaining theory: despite importing more sugar than all neighbours combined, Uzbekistan pays the highest prices. This inverse volume-price relationship reveals that institutional weaknesses can erase the benefits of scale.

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## Introduction

In 2024, Uzbekistan ranked fifteenth among the world's largest sugar importers by value and third by average import price, behind only the United States and Italy (Workman, 2025). This ranking requires explanation. The United States maintains a complex regime of tariff quotas and price supports to protect domestic sugar beet and cane producers. Prices in Italy reflect the protection of its sugar industry under the European Union's Common Agricultural Policy. Both countries accept higher import costs as the price of maintaining domestic production.

Uzbekistan has no such justification. Its continental climate, summer temperatures exceeding 40°C and annual precipitation of 100–400 mm, make commercial sugar production unprofitable (FAO, 2025). The country produces virtually no sugar, has no domestic industry requiring protection, and does not support an agricultural lobby demanding import barriers. Yet, it pays prices comparable to the world's most protectionist markets. Why?

The literature on landlocked developing countries documents significant trade cost penalties. Raballand (2003) found that transport costs are approximately 50% higher than those of coastal countries. UN-OHRLLS (2024) reports that landlocked countries spend almost twice as much of their export earnings on transport and insurance. For Central Asia, Carrere and Grigoriou (2011) estimate that improving infrastructure could increase exports by almost 50%, while Akbarov (2025) characterises the region as facing "some of the highest trade costs in the world" – 1.4 times higher than those of coastal developing economies.

A parallel literature examines the effects of regional integration. Tarr (2016) estimates that EAEU membership reduces trade costs by 15–30% due to harmonised standards and simplified customs procedures. Vinokurov (2017) documents preferential pricing of goods for EAEU members beyond formal tariff structures. Recent studies by Cieřlik and Gurshev (2022) apply gravity models to Central Asian trade integration.

However, the aforementioned literature remains disconnected from product-level procurement analysis. Studies of landlocked countries' trade costs focus on aggregate indicators; studies of the EAEU examine trade flows rather than price efficiency; and the procurement literature focuses on government contracts in advanced economies. No existing research examines whether Central Asian countries facing similar geographic constraints achieve comparable import prices for specific goods. This gap is significant: if landlocked countries with identical locations pay systematically different prices for the same products from the same suppliers, geography cannot explain the difference. Something else must be at play.

This paper fills a gap by analysing commodity-level prices for sugar imports in Central Asia. Sugar provides an ideal test case: a standardised commodity (HS1701) with internationally defined purity requirements, traded globally in sufficient volumes to obtain reliable price data, and important enough to imply welfare effects.

The analysis utilises two natural experiments. First, the comparison of Uzbekistan and Kyrgyzstan holds geography roughly constant while varying EAEU membership. Both countries do not border dominant regional exporter, are located at similar latitudes, face comparable distances to suppliers, and must transit imports through Kazakhstan. Kyrgyzstan joined the EAEU in 2015; Uzbekistan remains outside it. If membership provides price advantages, Kyrgyzstan should outperform Uzbekistan despite its smaller import volumes, which, according to standard theory, should provide worse terms.

Second, the Brazilian sugar market isolates the efficiency of domestic procurement from the effects of regional trade agreements. Brazil does not have preferential agreements with any Central Asian country and exports a standardised commodity. Price differentials among Central

Asian importers of Brazilian sugar cannot reflect membership in the Eurasian Economic Union or bilateral political relations, but only differences in procurement institutions.

To test the robustness of our findings, we compare Uzbekistan not only with Kazakhstan (the region's largest economy with excellent infrastructure and access to Caspian ports), but also with Tajikistan – Central Asia's smallest economy with the region's most complex geography, weakest infrastructure, and longest transit routes. Even if Tajikistan achieves better prices than Uzbekistan, explanations based on scale, infrastructure, or geography become untenable.

### **Literature review**

Three distinct strands of literature inform this study: trade costs in landlocked countries, the effects of regional trade agreements, and procurement efficiency in developing countries. While each offers important insights, none examines comparisons of product-level price efficiencies among countries with similar geographic constraints – a gap that this paper addresses. This part synthesises the relevant findings and develops the theoretical framework motivating our empirical analysis.

**Trade costs and institutional quality.** Research on landlocked developing countries has evolved from documenting geographic penalties to emphasising the institutional determinants of trade costs. Limão and Venables (2001) provided fundamental evidence that infrastructure quality explains significant variation in trade costs: poor infrastructure explains 40% of the predicted transport costs for coastal countries and 60% for landlocked countries. Improving infrastructure from the 75th to the 50th percentile increases trade by 50%.

However, subsequent research has found that geography alone cannot explain variation among landlocked countries. Anderson and Marcouiller (2002) demonstrated that institutional quality, levels of corruption, contract enforcement, and regulatory transparency affect trade costs regardless of distance. Their analysis finds that inadequate institutions restrict trade in the same way tariffs do, acting as a "hidden tax" on international exchange. Arvis et al. (2016) extended this framework to 178 countries, finding that logistical efficiency explains 20–60% of the variation in delivered prices, significantly exceeding pure transport differentials.

The Central Asian context has received particular attention. Carrere and Grigoriou (2011) estimate that improving transit country infrastructure to median levels among landlocked countries would increase Central Asian exports by 49%, emphasising that the region's trade costs reflect removable institutional failures rather than unchangeable geography. Shepherd and Wilson (2009) identify customs modernisation and regulatory harmonisation as the main sources of potential trade cost reductions of 25–40% in the region.

**Regional trade agreements and preferential pricing.** The literature on the EAEU documents the benefits of membership, but rarely quantifies the costs for non-members. Tarr (2016) provides basic estimates: membership reduces trade costs by 15–30% due to harmonised standards, simplified customs procedures, and tariff elimination. Vinokurov (2017) extends this beyond formal mechanisms, documenting preferential pricing of regional energy and goods for EAEU members, reflecting informal bargaining advantages and integrated supply chains.

The distribution of benefits remains controversial. Knobel (2015) finds significant trade creation among members, while Isakova et al. (2016) document uneven benefits, with smaller economies facing adjustment costs. A recent paper by Cieřlik and Gurshev (2022) applies gravity models to Central Asian trade integration, finding that EAEU membership significantly influences trade patterns.

**Volume-price relationship and procurement efficiency.** Standard trade theory predicts that larger import volumes yield lower unit prices through economies of scale and increased

bargaining power. Harrigan (1993) formalises this relationship for product markets, while Goldberg and Knetter (1997) document volume discounts of 10–25% for large buyers of homogeneous products. If these mechanisms are effective, Uzbekistan, the largest sugar importer in Central Asia, should achieve the lowest prices in the region.

The purchasing literature identifies conditions under which this relationship breaks down. Bandiera et al. (2009) demonstrate that Italian state-owned organisations paid at least 22% more than semi-autonomous agencies for standardised goods, with the variation explained by management quality rather than procurement scale. Their distinction between "active waste" (corruption) and "passive waste" (inefficiency) suggests that institutional design determines whether scale advantages are realised.

For the post-Soviet context, Evenett and Hoekman (2005) document that state-owned trading firms often fail to utilise bargaining power due to capture by intermediaries, fragmented powers, and weak competitive pressures. Murrell (2002) attributes persistent inefficiencies to institutional path dependence, which isolates decision makers from market signals. In commodity markets, Pirrong (2014) shows that intermediaries can extract significant margins when buyers lack market information or face limited sourcing options, while Gilbert (2010) documents import price premiums of 15–35% in countries with concentrated import channels and limited procurement transparency.

**Theoretical framework and value added.** The preceding literature converges on a central finding: trade costs for landlocked countries reflect institutional quality as much as geography, and procurement efficiency depends on governance structures, not just on purchasing scale. Three mechanisms potentially explain why a large importer may pay premium prices despite the volume that should warrant discounts:

First, exclusion from regional trade arrangements may impose costs beyond formal tariff disadvantages. While EAEU membership provides informal price advantages through integrated supply chains and negotiating networks, non-members face a systematic disadvantage regardless of import volumes.

Second, inefficient domestic procurement may hinder the transformation of purchasing power into bargaining leverage. Capture by intermediaries, fragmented power, or weak competitive pressures may explain why larger buyers pay higher prices.

Third, supply-side factors can create price differentials through geopolitical preferences or bilateral relationship effects independent of buyer characteristics.

The Brazilian sugar market provides a critical test for distinguishing this third mechanism from the first two. Brazil has no preferential arrangements with any Central Asian country and exports a standardised commodity with identical commercial terms for all buyers. Price differentials among Central Asian importers of Brazilian sugar cannot reflect EAEU membership or supplier preferences – only differences in the efficiency of domestic procurement.

## **Materials and methods**

### **Materials**

**Source Identification.** This study analyses data on sugar imports classified under the Harmonised System code HS1701 for the period 2017–2024, obtained from two main sources: the United Nations Commodity Trade Statistics Database (UN Comtrade) and the International Trade Centre Trade Map (ITC Trade Map).

**Description of Sources.** UN Comtrade compiles official international trade statistics reported by national statistical offices, covering bilateral trade flows for over 170 countries. ITC Trade Map provides processed trade statistics with user-friendly interfaces for analysing trade patterns. Both databases report import values in US dollars and quantities in metric tons, allowing for the calculation of unit prices. All prices are quoted on a CIF (Cost, Insurance, and Freight) basis, including transportation and insurance costs to the destination border.

**Data Limitations.** Three limitations should be noted. First, CIF prices exclude domestic distribution costs, customs processing delays, and domestic distribution markups. Observed price differentials thus represent conservative lower estimates of actual price differentials. Second, confidential terms of bilateral contracts – payment terms, credit arrangements, volume commitments, and quality specifications – remain unobservable in aggregate trade data. Third, Turkmenistan's trade data are subject to partial reporting limitations, limiting certain comparisons.

### **Hypotheses**

Based on the theoretical framework developed, this study tests four hypotheses:

H1: Uzbekistan faces systematic price differentials in sugar imports that persist across suppliers and cannot be explained by economies of scale or geography.

H2: Institutional factors dominate geographic constraints in determining import price differentials among Central Asian countries.

H3: Membership in the EAEU provides systematic price advantages for sugar supplied by the dominant regional exporter imports that exceed volume-based bargaining power.

H4: Uzbekistan's price disadvantages impose significant and persistent welfare costs that reflect structural institutional failures rather than temporary market conditions.

### **Analytical methods**

The study employs comparative price analysis across three dimensions – time, cross-country, and supplier-specific – in combination with natural experiment designs and a counterfactual welfare estimator.

The analytical framework proceeds in three stages:

*Stage 1:* Documenting price patterns. The time analysis tracks Uzbekistan's import prices by supplier for 2017–2024 to identify structural breaks and shifts in market composition. The cross-country analysis compares average CIF prices for Central Asian importers, establishing regional benchmarks. The supplier-specific analysis compares prices paid for imports from identical suppliers (dominant regional exporter, Brazil) by different importing countries.

*Stage 2:* Institutional effect isolation. Two natural experiments separate institutional and geographic determinants:

The Uzbekistan-Kyrgyzstan comparison exploits variation in EAEU membership while holding geography roughly constant. Neither country borders dominant regional exporter, are located at similar latitudes (Tashkent 41.3° N, Bishkek 42.9° N), are at comparable distances from regional suppliers, and are forced to transit imports through Kazakhstan. Kyrgyzstan joined the EAEU in 2015; Uzbekistan remains outside. The price differential between these generally similar countries isolates the impact of EAEU membership from geographic factors.

A test of the Brazilian sugar market allows us to isolate the effectiveness of domestic procurement from the impact of regional trade agreements. Brazil does not have preferential

agreements with any Central Asian country and exports a standardised commodity with identical commercial terms for all buyers. The difference in Brazilian sugar import prices cannot reflect EAEU membership or supplier preferences, but rather reflects differences in domestic procurement institutions.

To ensure that the observed differences reflect institutional factors rather than quality differences within the 4-digit HS1701 classification, the comparison of Uzbekistan and Tajikistan examines pricing at the more detailed 6-digit level (HS170112 raw sugar; HS170199 refined sugar).

Step 3: Welfare quantification. The economic losses from unfavourable prices are estimated using counterfactual analysis:

Aggregate welfare loss:

$$WL_{total} = Q_{UZ} \times (P_{UZ} - P_{benchmark})$$

Supplier-specific welfare loss:

$$WL_{supplier} = Q_{UZ,supplier} \times (P_{UZ,supplier} - P_{benchmark,supplier})$$

where WL denotes the welfare loss in US dollars, Q represents the import volume in tons, P denotes the average CIF price per ton, and the subscripts indicate the respective country (UZ for Uzbekistan) and the origin of the supplier.

Rationale for the choice of method. Comparative price analysis is appropriate because sugar is a standardised commodity with minimal quality differences, and price differences primarily reflect procurement efficiency and trade costs. The natural experiment design exploits institutional differences (EAEU membership) and supplier neutrality (Brazil), which provide identification unavailable in studies of total trade costs. The counterfactual welfare valuation follows standard methods in trade economics for quantifying efficiency losses.

### Benchmark selection

Three baseline scenarios provide estimates under different performance assumptions:

| Benchmark                           | Description                                                                                                                                             | Rationale                                                           |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Kazakhstan                          | Region's lowest average import price                                                                                                                    | Optimistic scenario: Uzbekistan achieves best regional performance  |
| Regional average (excl. Uzbekistan) | Mean price across Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan                                                                                      | Moderate scenario: Uzbekistan achieves typical regional performance |
| Supplier-specific                   | For Brazilian sugar: Kazakhstan-Tajikistan average; For sugar supplied by the dominant regional exporter: post-Soviet regional average excl. Uzbekistan | Isolates inefficiency within dominant supply relationships          |

The average price for Brazilian sugar between Kazakhstan and Tajikistan combines excellent logistics (Kazakhstan's connection to the Caspian Sea) with unfavourable conditions (Tajikistan's disadvantageous geographic location), providing a balanced benchmark for efficiency. The post-Soviet regional average for sugar supplied by the dominant regional exporter accounts for different conditions for regional importers, EAEU members with institutional advantages, non-EAEU countries with different geographic locations, and countries of varying sizes.

Multi-year welfare tracking (2021–2024) allows us to distinguish temporary market failures from chronic institutional failures. Losses are scaled relative to GDP to assess macroeconomic significance.

Methodological limitations. Several caveats should be considered. First, the welfare assessment assumes that benchmark prices represent achievable alternatives for Uzbekistan, which may overstate potential savings if Uzbekistan faces unique constraints not observed in the data. Second, comparisons within a natural experiment suggest that unobserved country characteristics are not systematically correlated with either EAEU membership or import prices. Third, the analysis fails to distinguish alternative institutional mechanisms (intermediary capture, power fragmentation, weak competition) that could explain the observed inefficiencies.

## Results and discussion

This section addresses the central question underlying this paper: why does Uzbekistan, a country without its own sugar industry to protect, pay import prices comparable to those of the world's most protectionist economies? Two caveats special attention: CIF prices do not include domestic distribution costs, so the observed differences represent conservative lower-bound estimates; and confidential contract terms remain unobserved in aggregate trade data. Given these limitations, the analysis tests four hypotheses: Uzbekistan faces a systematic pricing disadvantage vis-à-vis suppliers (H1); institutional factors dominate geographic constraints (H2); membership in the Eurasian Economic Union (EAEU) provides price advantages (H3); and, consequently, welfare losses reflect persistent institutional failures (H4).

### Market structure and price dynamics

We begin by analysing the dynamics of Uzbekistan's import prices over the study period. Table 1 presents the average prices at which Uzbekistan imported sugar from major suppliers between 2017 and 2024.

**Table 1**  
**Uzbekistan import prices (\$/t) of HS1701 from selected major suppliers**

| Countries                        | 2017 | 2018  | 2019  | 2020 | 2021 | 2022 | 2023 | 2024 |
|----------------------------------|------|-------|-------|------|------|------|------|------|
| World                            | 615  | 421   | 422   | 425  | 1369 | 633  | 756  | 705  |
| Primary regional supplier (EAEU) | 475  | 482   | 397   | 411  | 598  | 1335 | 706  | 702  |
| Brazil                           | 631  | 389.3 | 415   | 431  | 1450 | 628  | 780  | 784  |
| Ukraine                          | 502  | 471   | 488   | 516  | 591  | 470  | n/a  | n/a  |
| Pakistan                         | 400  | 302   | 326   | 520  | 591  | 444  | 556  | n/a  |
| Kazakhstan                       | 467  | 473   | 456   | 489  | 591  | n/a  | 622  | 411  |
| Mexico                           | n/a  | n/a   | 423   | n/a  | n/a  | 614  | n/a  | n/a  |
| secondary EAEU producer          | 427  | 467   | 460   | 439  | n/a  | n/a  | 755  | 713  |
| India                            | n/a  | 383   | 23352 | 381  | n/a  | 667  | 483  | 836  |

Source: Own elaboration based on ITC & UN Comtrade 2025 Database, n/a – not available/not applicable

Table 1 reveals two distinct periods. Between 2017 and 2020, prices remained relatively stable, falling from US\$615.7 per ton in 2017 to approximately US\$422–426 per ton in 2018–2020. 2021 saw a sharp price spike, with average import prices jumping to US\$1,369.6 per ton, more than triple the 2020 level. This jump likely reflects pandemic-related supply chain disruptions and global commodity inflation. The price of Brazilian sugar reached US\$1,450.6 per ton in 2021, while the price of sugar supplied by the dominant regional exporter jumped to US\$1,335.9 per ton in 2022. However, what happened after the crisis is noteworthy. Although prices declined, they did not return to pre-crisis levels. By 2024, Uzbekistan's average import price stabilised at \$705.8/t, still 65.7% higher than the 2020 level (\$425.9/t). This steady increase raises several questions: did price changes reflect changes in Uzbekistan's sugar supply sources? Perhaps the 2021 crisis forced a switch to more expensive suppliers. Or did geopolitical events, particularly the post-2022 geopolitical shock and dominant regional exporter's subsequent reorientation toward Central Asian markets, alter regional commodity flows, affecting pricing?

For analysis, Table 2 presents the value structure of sugar imports to Uzbekistan by supplier for the same period.

**Table 2**

**Uzbekistan's import values (millions \$) of HS1701 from selected suppliers**

| <b>Countries</b>                 | <b>2017</b> | <b>2018</b> | <b>2019</b> | <b>2020</b> | <b>2021</b> | <b>2022</b> | <b>2023</b> | <b>2024</b> |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| World                            | 330.2       | 336.6       | 265.7       | 240.0       | 333.4       | 520.9       | 471.9       | 790.8       |
| Primary regional supplier (EAEU) | 14.3        | 93.3        | 29.1        | 154.7       | 3.0         | 0.3         | 68.2        | 342.0       |
| Brazil                           | 304.2       | 30.7        | 91.7        | 42.7        | 291.9       | 460.1       | 376.2       | 336.2       |
| Ukraine                          | 1.2         | 106.3       | 33.6        | 6.6         | 2.3         | 0.0         | n/a         | n/a         |
| Pakistan                         | 0.0         | 44.8        | 0.1         | 0.4         | 0.1         | 5.4         | 12.4        | n/a         |
| Kazakhstan                       | 10.2        | 27.3        | 2.0         | 7.6         | 0.8         | n/a         | 5.2         | 57.0        |
| Mexico                           | n/a         | n/a         | 89.5        | n/a         | n/a         | 4.3         | n/a         | n/a         |
| secondary EAEU producer          | 0.2         | 11.1        | 4.6         | 18.1        | n/a         | n/a         | 0.6         | 7.5         |
| India                            | n/a         | 0.1         | 0.0         | 0.0         | n/a         | 34.6        | 3.9         | 3.9         |

Source: Own elaboration based on ITC & UN Comtrade 2025 Database | n/a – not available/not applicable

Table 2 demonstrates the radical transformation of suppliers. In 2017, Brazil dominated sugar imports to Uzbekistan with a volume of US\$304.2 million (92.1% of the total of US\$330.2 million). dominant regional exporter was a minor player, supplying only US\$14.3 million (4.3%). By 2024, the picture had completely reversed: dominant regional exporter supplied US\$342.0 million (43.2% of imports), while Brazil supplied US\$336.2 million (42.5%), virtually equaling parity between the two.

The growth in regional imports is particularly striking. In 2022, sugar imports from dominant regional exporter fell to just US\$0.3 million (0.06% of imports). By 2024, they reached US\$342.0 million, a 1,140-fold increase in just two years. This radical shift coincided with the conflict in Ukraine (note Ukraine's complete disappearance from Table 2 after 2022) and dominant regional exporter's intensified economic engagement with Central Asian countries during this period. Whether this supplier reorientation reflects Uzbekistan's strategic diversification, the aggressive entry of regional exporters seeking new markets, or a combination of both is impossible to determine from trade data alone.

Returning to the question of price: did this supplier shift explain the price increase? Analysing Tables 1 and 2 together, the answer appears to be no. sugar supplied by the dominant regional exporter costs \$702.8/t in 2024, while Brazilian sugar costs \$784.6/t; both suppliers are setting higher prices. Moreover, Brazilian sugar prices actually increased from \$628.0/t (2022) to \$784.6/t (2024), despite Uzbekistan remaining Brazil's largest regional consumer (Table 1). Standard bargaining theory predicts that large buyers should negotiate better, not worse, terms over time. Comparing the two tables reveals another pattern: total import volumes rose sharply from 243,400 tons in 2021 to 1,120,424 tons in 2024. However, average prices remained high rather than declining with increasing scale. The increase in volumes did not translate into price improvements.

These patterns raise a central question for subsequent sections: are Uzbekistan's high prices typical of landlocked Central Asian countries, or is Uzbekistan worse off than its neighbours, facing similar geographic constraints?

### **Systematic price disadvantage in Central Asian countries (H1)**

To determine whether Uzbekistan's prices are competitive in the region, we compare them with those of other Central Asian importing countries. If all landlocked countries in the region pay similar prices, Uzbekistan's higher costs may simply reflect unavoidable geographic realities. If its neighbours achieve higher prices, this difference must be explained by something specific to Uzbekistan.

H1 predicted that Uzbekistan faces a systematic price disadvantage that persists across suppliers and cannot be explained by economies of scale or geography. Table 3 presents import data for 2024 for all Central Asian countries.

**Table 3**

**Central Asian Countries' HS1701 import patterns (2024)**

| <b>Country</b> | <b>Total imports<br/>(million \$)</b> | <b>Avg. price<br/>(\$/t)</b> | <b>Main supplier</b> | <b>Import value from main supplier<br/>(million \$ (%))</b> | <b>Price from main supplier<br/>(\$/t)</b> |
|----------------|---------------------------------------|------------------------------|----------------------|-------------------------------------------------------------|--------------------------------------------|
| Uzbekistan     | 790.8                                 | 705.8                        | DRE                  | 341.6 (43.2)                                                | 702.8                                      |
| Kazakhstan     | 345.8                                 | 601.4                        | DRE                  | 277.0 (80.1)                                                | 609.1                                      |
| Kyrgyzstan     | 28.9                                  | 646.3                        | DRE                  | 27.6 (95.4)                                                 | 651.5                                      |
| Tajikistan     | 130.2                                 | 648.7                        | DRE                  | 59.7 (46.4)                                                 | 639.8                                      |
| Turkmenistan   | 21.3                                  | 688.7                        | Azerbaijan           | 21.0 (98.6)                                                 | 691.7                                      |

\* DRE - Dominant Regional Exporter

Source: Own elaboration based on ITC & UN Comtrade 2025 Database

The comparison reveals a striking anomaly: Uzbekistan, the region's largest importer, pays the highest prices. Uzbekistan imported \$790.8 million worth of sugar, more than double the value of the next-largest importer (Kazakhstan, at \$345.8 million) and all other Central Asian countries combined. However, Uzbekistan's average price of \$705.8 per ton exceeds every regional competitor.

Kazakhstan, which imports less than half of Uzbekistan's value, purchased sugar at \$601.4 per ton, a \$104.4 per ton advantage (17.4%). Even the region's smallest importers

achieved higher prices: Kyrgyzstan at \$646.3 per ton (8.4% less than Uzbekistan), Tajikistan at \$648.7 per ton (8.8% less), and Turkmenistan at \$688.7 per ton (2.4% less). The expected relationship between volume and price is not only absent, but inverse. The largest buyer pays the most. Table 3 also shows that dominant regional exporter is the primary supplier for four of the five countries (Turkmenistan relies primarily on Azerbaijan). This allows for a direct comparison of prices for the same product from the same supplier. Uzbekistan paid \$702.8/t for sugar supplied by the dominant regional exporter, the highest price among all buyers. Kazakhstan paid \$609.1/t (15.4% less), Tajikistan \$639.8/t (9.8% less), and Kyrgyzstan \$651.5/t (7.9% less).

Could Uzbekistan's disadvantage be limited to sugar supplied by the dominant regional exporter, reflecting bilateral political factors? To determine whether this trend applies to all suppliers, Table 4 provides detailed information on each country's supplier portfolio.

**Table 4**

**Central Asian countries' HS1701 import patterns (2024) extended**

| <b>Uzbekistan</b>             |           |                  |            | <b>Kyrgyzstan</b>         |           |                  |            |
|-------------------------------|-----------|------------------|------------|---------------------------|-----------|------------------|------------|
| Exporters                     | Share (%) | Quantity (1000t) | Price \$/t | Exporters                 | Share (%) | Quantity (1000t) | Price \$/t |
| DRE                           | 43.2      | 486.5            | 702.8      | DRE                       | 95.4      | 42.3             | 651.5      |
| Brazil                        | 42.5      | 428.6            | 784.6      | SP                        | 3.9       | 2.2              | 525.1      |
| Kazakhstan                    | 7.2       | 138.5            | 411.3      | Iran, Islamic Republic of | 0.3       | 0.1              | 776.8      |
| Azerbaijan                    | 1.8       | 16.7             | 833.2      | Kazakhstan                | 0.2       | 0.1              | 865.7      |
| Morocco                       | 1.4       | 12.2             | 933.3      | <b>Turkmenistan</b>       |           |                  |            |
| Thailand                      | 1.4       | 12.0             | 893.9      | Azerbaijan                | 98.6      | 30.4             | 691.7      |
| SP                            | 0.9       | 10.5             | 714.0      | Pakistan                  | 1.3       | 0.6              | 520.0      |
| Kyrgyzstan                    | 0.9       | 9.8              | 756.2      | <b>Tajikistan</b>         |           |                  |            |
| India                         | 0.5       | 4.7              | 836.1      | DRE                       | 46.4      | 93.2             | 639.8      |
| <b>Kazakhstan</b>             |           |                  |            | SP                        | 16.6      | 33.3             | 847.1      |
| DRE                           | 80.1      | 454.9            | 609.1      | India                     | 15.1      | 30.4             | 557.0      |
| Brazil                        | 14.5      | 89.0             | 561.9      | Pakistan                  | 8.8       | 17.7             | 538.4      |
| SP                            | 5.3       | 30.8             | 593.0      | Kazakhstan                | 4.9       | 9.8              | 580.7      |
| Central Asia excl. Uzbekistan |           | 852.0            | 646.0      | Brazil                    | 0.2       | 0.5              | 551.1      |

\* DRE - Dominant Regional Exporter; SP – secondary EAEU producer

Source: Own elaboration based on ITC & UN Comtrade 2025 Database

These results support hypothesis H1: Uzbekistan faces a systematic price disadvantage that persists across all major suppliers and cannot be explained by economies of scale or geography. Uzbekistan pays 17.4% more than Kazakhstan and 8.8% more than Tajikistan, despite the latter facing greater geographic barriers. This trend holds for both sugar supplied by the dominant regional exporter (+15.4% compared to Kazakhstan) and Brazilian sugar (+39.6% compared to Kazakhstan), confirming a systemic disadvantage rather than a supplier-specific one.

### **Institutional and geographical determinants (H2, H3)**

The price disadvantages described above could theoretically be due to geographic location. Uzbekistan's unique landlocked location may impose costs that its neighbours avoid. H2 predicts that institutional factors, not geography, determine price differences. H3 predicts that membership in the EAEU, in particular, provides price advantages.

Central Asia provides an ideal setting for testing these hypotheses, as all five countries are landlocked. If geography determines prices, countries with similar locations should pay similar prices. If institutions matter, countries with different institutional arrangements should pay different prices regardless of geographic similarity.

Comparison with Kyrgyzstan. The Uzbekistan-Kyrgyzstan pair represents a natural experiment, particularly for sugar supplied by the dominant regional exporter imports. Both countries have remarkably similar geographic characteristics: neither directly borders dominant regional exporter (their main supplier), both are located at similar latitudes (Tashkent 41.3° N, Bishkek 42.9° N), both are comparable distances from regional suppliers, and both must transit imports through Kazakhstan.

This comparison is motivated by an important institutional context. All post-Soviet regional member states, including Uzbekistan and Kyrgyzstan, participate in the Commonwealth of Independent States Free Trade Area, established by the 2011 post-Soviet regional Free Trade Area Agreement, which eliminates import duties on most goods, including sugar, between signatory states (WTO, n.d.-a). Uzbekistan joined this agreement in 2013. Thus, both countries benefit from duty-free sugar imports from dominant regional exporter under the post-Soviet regional agreements. The key institutional difference lies elsewhere: Kyrgyzstan joined the EAEU in 2015, gaining access to deeper integration benefits, including harmonised customs procedures, simplified border controls, and preferential supply chain agreements that go beyond tariff waivers. Uzbekistan remains outside the EAEU.

If prices were determined by geography, both countries should pay roughly the same amount for sugar supplied by the dominant regional exporter, given their comparable positions. If EAEU membership provides additional benefits beyond the post-Soviet regional FTA, Kyrgyzstan should pay less, despite its smaller import volumes.

Returning to Table 3, the data support the institutional explanation. Kyrgyzstan pays \$651.5 per ton for sugar supplied by the dominant regional exporter, while Uzbekistan pays \$702.8 per ton, giving Kyrgyzstan an advantage of \$51.3 per ton (7.9%). This advantage is achieved despite the fact that Kyrgyzstan imports only 42,300 tons compared to Uzbekistan's 486,500 tons (Table 4). Standard bargaining theory predicts that larger volumes should yield more favourable terms. Instead, the smaller EAEU member outperforms the larger non-member. A similar geographic factor leads to different results depending on institutional membership.

Tajikistan's stress test. Kyrgyzstan's advantage may be due precisely to its EAEU membership. But what about countries that, like Uzbekistan, are not members? Tajikistan presents a complex challenge. Among the Central Asian countries, Tajikistan faces the most challenging circumstances: the smallest economy, the weakest infrastructure, and the most isolated geography, requiring transit through two countries to reach regional suppliers. Many believe that if any country should pay higher prices due to its geographic disadvantage, it is Tajikistan. However, as shown in Table 3, Tajikistan pays \$639.8 per ton for sugar supplied by the dominant regional exporter, which is \$63.0 per ton (9.8%) less than Uzbek sugar at \$702.8 per ton. Neither country is a member of the EAEU and operates under the same post-Soviet regional FTA system, so this difference cannot reflect the benefits of membership.

The country in the region, which is most geographically disadvantaged, achieves better prices than Uzbekistan, which is located in the centre of the country. Geographic factors cannot explain this pattern.

Could the price difference in Tajikistan reflect differences in quality? Perhaps Tajikistan imports lower-quality sugar, which is sold at lower prices. To test this hypothesis, Table 5 compares prices at a more detailed six-digit code level.

**Table 5**

**Uzbekistan-Tajikistan HS6-level sugar price comparison (2024)**

| <b>HS code</b> | <b>Tajikistan import price \$/t</b> | <b>Uzbekistan import price \$/t</b> | <b>Tajikistan quantity (1000t)</b> | <b>Uzbekistan quantity (1000t)</b> |
|----------------|-------------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| 170112         | 616.4                               | 720.8                               | 12.5                               | 264.6                              |
| 170199         | 643.4                               | 680.9                               | 80.7                               | 221.9                              |

Source: Own elaboration based on UN Comtrade 2025 Database

Table 5 rules out the quality explanation. For both raw sugar (HS170112) and refined sugar (HS170199), Tajikistan achieves better pricing despite smaller volumes. The differential is particularly large for raw sugar: Tajikistan pays \$616.4/t while Uzbekistan pays \$720.8/t, a 16.9% premium for Uzbekistan. For refined sugar, Tajikistan pays \$643.4/t versus Uzbekistan's \$680.9/t, a 5.8% premium. Quality variation within the HS1701 classification does not explain Uzbekistan's disadvantage.

Post-Soviet regional-wide patterns. Having established that both EAEU membership (Kyrgyzstan comparison) and domestic factors (Tajikistan comparison) matter, we now examine the full pattern across all post-Soviet regional sugar supplied by the dominant regional exporter importers. Table 6 presents the complete picture.

**Table 6**

**Post-Soviet regional Countries' regional HS1701 import prices (2024)**

| <b>Rank</b> | <b>Country</b>                                  | <b>Import value (millions \$)</b> | <b>Quantity (1000 t)</b> | <b>Price \$/t</b> | <b>EAEU member</b>    |
|-------------|-------------------------------------------------|-----------------------------------|--------------------------|-------------------|-----------------------|
| 1           | Uzbekistan                                      | 342.0                             | 486.5                    | 702.8             | No                    |
| 2           | Kazakhstan                                      | 277.1                             | 454.9                    | 609.1             | Yes (founding member) |
| 3           | Tajikistan                                      | 59.6                              | 93.2                     | 639.8             | No                    |
| 4           | Azerbaijan                                      | 31.4                              | 49.2                     | 638.0             | No                    |
| 5           | Kyrgyzstan                                      | 27.6                              | 42.3                     | 651.5             | Yes (since 2015)      |
| 6           | Armenia                                         | 24.4                              | 38.6                     | 631.6             | Yes (since 2015)      |
| 7           | Turkmenistan                                    | 0.0                               | 0.0                      | n/a               | No                    |
| 8           | secondary EAEU producer                         | 0.0                               | 0.0                      | n/a               | Yes (founding member) |
|             | post-Soviet regional aggregate excl. Uzbekistan | 420.1                             | 678.2                    | 634.0             |                       |
|             | EAEU countries                                  | 329.0                             | 535.8                    | 614.1             |                       |
|             | Non-EAEU countries                              | 433.0                             | 628.9                    | 688.4             |                       |

Source: Own elaboration based on UN Comtrade 2025 Database; Eurasian Economic Commission (2024); Ministry of Foreign Affairs of Armenia (2024)

Table 6 includes data for all post-Soviet regional countries for a complete picture. Turkmenistan and secondary EAEU producer did not import sugar supplied by the dominant regional exporter in 2024. Turkmenistan purchases it almost exclusively from neighbouring Azerbaijan (Table 4), while secondary EAEU producer, a founding member of the EAEU and with its own significant sugar production capacity, does not import sugar supplied by the dominant regional exporter.

Aggregate data for active importers demonstrates the systematic effect of membership. In EAEU countries (Kazakhstan, Kyrgyzstan, Armenia), the average price of sugar supplied by the dominant regional exporter is \$614.1/t. In non-EAEU countries (Uzbekistan, Tajikistan, Azerbaijan), the average price is \$688.4/t. This gap of \$74.3/t represents a membership premium of 12.1%, consistent with Tarr's (2016) estimate that EAEU membership reduces trade costs by 15–30%. In support of H3, membership status provides systematic price advantages that appear to extend beyond the duty-free access already available under the post-Soviet regional FTA.

The table also demonstrates that membership trumps volume. Armenia imports only 38,600 tons, but achieves a price of \$631.6 per ton, higher than Uzbekistan (\$702.8 per ton), despite Uzbekistan importing 12.6 times more. Kazakhstan imports slightly less than Uzbekistan (454,900 versus 486,500 tons), but pays 15.4% less. Volume advantages are not realised for non-EAEU countries.

However, one important trend complicates the situation for the EAEU: among non-EAEU countries, Uzbekistan performs the worst. Tajikistan (\$639.8 per ton) and Azerbaijan (\$638.0 per ton) achieve prices closer to those of EAEU member countries than to those of Uzbekistan (\$702.8 per ton). Uzbekistan pays \$63.0 per ton (9.8%) more than Tajikistan and \$64.8 per ton (10.2%) more than Azerbaijan, which are also non-EAEU members but operate under the same post-Soviet regional FTA structure. If exclusion from the EAEU explained Uzbekistan's premium, all non-EAEU countries would have to pay similar prices. However, this is not the case. Something specific to Uzbekistan, beyond its geographic location and trade agreement status, is driving additional costs.

These results support hypotheses H2 and H3. A comparison with Tajikistan shows that geography cannot explain the difference: the country in the most disadvantaged position achieves more favourable prices. A comparison with Kyrgyzstan and an analysis of the post-Soviet regional confirm that EAEU membership provides systematic benefits (on average 12.1%) compared to those available solely through the post-Soviet regional Free Trade Agreement. However, Uzbekistan also performs worse than other non-EAEU countries, suggesting internal institutional factors that exacerbate the penalty for non-membership.

### **Procurement inefficiency in neutral markets**

The previous analysis established that EAEU membership matters, but it cannot fully explain Uzbekistan's premium, despite other non-EAEU countries offering higher prices. To isolate domestic procurement efficiency from the impact of trade agreements, we need a market in which neither EAEU membership nor post-Soviet regional free trade agreements provides any advantage. Brazilian sugar provides such a criterion.

Brazil does not have preferential agreements with any Central Asian country. It exports a standardised commodity traded commercially worldwide. Brazil has no geopolitical interest in offering differential pricing to Central Asian buyers. Therefore, price differences between Central Asian importers of Brazilian sugar reflect only buyer-side factors, primarily procurement efficiency, and not supplier preferences or the impact of trade agreements.

Table 7 presents the import prices of Brazilian sugar for three Central Asian countries importing from Brazil in 2024.

**Table 7**

**Brazilian sugar HS1701 import prices (2024)**

| Country    | Import value (million \$) | Quantity (1,000t) | Price (\$/t) |
|------------|---------------------------|-------------------|--------------|
| Uzbekistan | 336.2                     | 428.6             | 784.6        |
| Kazakhstan | 50.0                      | 89.0              | 561.9        |
| Tajikistan | 0.2                       | 0.5               | 551.1        |

Source: Own elaboration based on UN Comtrade 2025 Database

The results are striking. Uzbekistan pays \$784.6/t, while Kazakhstan pays \$561.9/t, representing a premium of \$222.7/t (39.6%) for Uzbekistan. Tajikistan, despite importing only 450 tons (952 times less than Uzbekistan), pays \$551.1/t, the lowest price in the region and \$233.5/t (42.4%) less than Uzbekistan.

A comparison of Brazilian and regional premiums demonstrates the relative importance of the EAEU's influence compared to domestic purchases. For sugar supplied by the dominant regional exporter (Table 6), Uzbekistan pays 15.4% more than Kazakhstan. For Brazilian sugar, Uzbekistan pays 39.6% more than Kazakhstan. The Brazilian premium is 2.6 times higher than the regional one.

This comparison has important implications. sugar supplied by the dominant regional exporter prices partially reflect the impact of EAEU membership; Kazakhstan enjoys preferential access that Uzbekistan does not. However, Brazilian sugar prices cannot reflect the influence of the EAEU, as Brazil does not offer preferential treatment to anyone. The Brazilian premium of 39.6% reflects the pure inefficiency of domestic procurement. Since this premium exceeds the regional premium of 15.4%, domestic factors lead to higher costs than non-membership in the EAEU.

The results for Tajikistan confirm this conclusion. Tajikistan, with the weakest infrastructure and the longest transit times, achieves the best price in the region for Brazilian sugar – \$551.1/t. Geographical disadvantage does not lead to higher prices; rather, the relationship is inverse. The only explanation consistent with all the observed patterns is differences in domestic procurement efficiency. The specific mechanisms underlying this inefficiency cannot be determined from trade data alone: intermediary markups, internal rents, fragmented procurement authority, weak competitive bidding, or information asymmetries remain unobservable. However, this pattern strongly suggests that achieving competitive prices will require institutional reform of procurement processes, not just EAEU membership. This finding further supports hypothesis H2: institutional factors, particularly domestic procurement institutions, dominate over geographic constraints.

### **Welfare implications**

Having established that Uzbekistan faces systematic price declines driven primarily by domestic institutional factors, we now quantify the resulting welfare losses. H4 predicts that these losses will lead to substantial and persistent losses, reflecting structural failures rather than temporary conditions.

Table 8 presents welfare loss estimates for 2024 under alternative benchmark scenarios.

Table 8

**Welfare loss estimates under alternative benchmark scenarios (2024)**

| Benchmark                                                                                                        | Benchmark price (\$/t) | Price premium (\$/t) | Total welfare loss (million \$) | % of total sugar import value | % of Uzbekistan's GDP* | Scenario type |
|------------------------------------------------------------------------------------------------------------------|------------------------|----------------------|---------------------------------|-------------------------------|------------------------|---------------|
| Kazakhstan                                                                                                       | 601.4                  | 104.4                | 117.0                           | 14.8%                         | 0.10%                  | Optimistic    |
| Regional average**                                                                                               | 646.0                  | 59.8                 | 67.0                            | 8.5%                          | 0.06%                  | Moderate      |
| <b>Welfare loss on Brazilian sugar only: Uzbekistan imports of 428 552 tons</b>                                  |                        |                      |                                 |                               |                        |               |
| Kazakhstan-Tajikistan average***                                                                                 | 556.5                  | 149.3                | 64.0                            | 14.9%                         | 0.06%                  | Moderate      |
| <b>Welfare loss on sugar supplied by the dominant regional exporter only: Uzbekistan imports of 486 544 tons</b> |                        |                      |                                 |                               |                        |               |
| Post-Soviet regional average excl. Uzbekistan                                                                    | 634.0                  | 71.8                 | 34.9                            | 7.2%                          | 0.03%                  | Moderate      |

Source: Own elaboration based on ITC & UN Comtrade 2025 Database. \* Uzbekistan GDP (2024) estimated at \$114.97 billion (World Bank, 2025). \*\*Regional average – average import prices of Central Asian countries excluding Uzbekistan. \*\*\* Average import price for the Brazilian sugar of Kazakhstan and Tajikistan combined

Annual welfare losses range from US\$67.0 million (moderate scenario) to US\$117.0 million (optimistic scenario), representing 0.06–0.10% of GDP. For comparison, the US\$67.0 million loss under the moderate scenario exceeds the combined sugar import costs of Kyrgyzstan (\$28.9 million) and Turkmenistan (\$21.3 million), as shown in Table 3. Purchasing inefficiencies in Uzbekistan are more costly than the combined sugar import costs of the two neighbouring countries.

A breakdown by supplier reveals where the inefficiencies are concentrated and confirms previous findings. Losses from Brazilian sugar reach US\$64.0 million, almost double the US\$34.9 million lost from sugar supplied by the dominant regional exporter. Total supplier-related losses of \$98.9 million exceed those under the moderate scenario (\$67.0 million), reflecting the concentration of inefficiencies in dominant supply relationships. Brazilian sugar prices reflect pure procurement inefficiencies (excluding the EAEU effect), while sugar supplied by the dominant regional exporter prices partially reflect the disadvantages of membership. The welfare distribution confirms the same pattern: disruptions in domestic procurement lead to greater costs than non-membership in the EAEU. Even if Uzbekistan were to join the EAEU tomorrow, significant losses from inefficient procurement of Brazilian sugar would persist.

Temporal Sustainability. The magnitude of the losses matters, but so does their sustainability. Temporary disruptions can resolve themselves; structural disruptions require policy intervention. Table 9 tracks welfare losses over 2021–2024 to distinguish between these options.

Table 9

**Cumulative welfare losses (Regional average benchmark)**

| Year         | Uzb. import value (millions \$) | Uzb. price (\$/t) | Regional average* price (\$/t) | Premium (\$/t) | Quantity (1,000t) | Welfare loss (millions \$) |
|--------------|---------------------------------|-------------------|--------------------------------|----------------|-------------------|----------------------------|
| 2021         | 333.4                           | 1369.6            | 517.8                          | 851.7          | 243.4             | 207.3                      |
| 2022         | 520.9                           | 633.2             | 598.3                          | 34.9           | 822.6             | 28.7                       |
| 2023         | 471.9                           | 756.8             | 662.9                          | 93.9           | 623.5             | 58.5                       |
| 2024         | 790.8                           | 705.8             | 646.0                          | 59.8           | 1120.4            | 67.0                       |
| <b>Total</b> | 2117.0                          | n/a               | n/a                            | n/a            | n/a               | <b>361.6</b>               |

Source: Own elaboration based on ITC & UN Comtrade 2025 Database | n/a – not available/not applicable

\*Regional average – average import prices of Central Asian countries excluding Uzbekistan

The sharp price spike in 2021 (losses of US\$207.3 million) reflects the effects of the pandemic and can reasonably be considered temporary. However, subsequent events cannot be considered temporary. Losses persisted even after market normalisation: US\$28.7 million (2022), US\$58.5 million (2023), and US\$67.0 million (2024).

Two trends point to structural rather than temporary causes. First, losses more than doubled from 2022 to 2024 (from US\$28.7 million to US\$67.0 million), despite the stabilisation of global sugar markets. If Uzbekistan's disadvantage were due to temporary supply chain disruptions, losses should have declined as conditions returned to normal. Instead, they continued to grow.

Secondly, losses increased despite a 4.6-fold increase in import volumes – from 243,400 tons (2021) to 1,120,424 tons (2024). Increasing volumes should promote economies of scale and strengthen bargaining power. Instead, Uzbekistan's losses increased as its market share expanded. The procurement system is unable to translate increased purchasing power into better prices.

Cumulative losses for 2021–2024 amounted to US\$361.6 million, accounting for 17.1% of total import expenditures for this period. This amount represents a significant transfer of resources from Uzbek consumers and businesses to foreign suppliers and intermediaries, which could otherwise support domestic consumption or investment.

These results support hypothesis H4. The persistence of premiums through 2022–2024, the increase in losses despite the growth in volumes, and the concentration of losses in the politically neutral Brazilian market all point to structural institutional failures that require political intervention rather than patience.

## Conclusions

This study examines a striking anomaly: why does Uzbekistan, a country without its own sugar industry requiring protection, pay import prices comparable to those of the world's most protectionist economies? Among the fifteen largest global sugar importers, only the United States (\$761/t), Italy (\$709/t), and Uzbekistan (\$706/t) pay average prices exceeding \$700 per ton. The first two countries employ extensive domestic protection regimes. Uzbekistan has no such justification, as it produces virtually no sugar and has no industries requiring protection.

The analysis tested four hypotheses using HS1701 sugar import data (2017–2024) to Central Asian and post-Soviet regional countries. All were confirmed (Table 10).

**Table 10**

**Summary of hypothesis tests**

| <b>Hypothesis</b>                                        | <b>Prediction</b>                                                                                                              | <b>Key Evidence</b>                                                                                                                                                                                     | <b>Verdict</b> |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| H1: Systematic price disadvantages                       | Uzbekistan pays more to suppliers regardless of size                                                                           | 17.4% of the total premium compared to Kazakhstan; 15.4% (dominant regional exporter), 39.6% (Brazil), 25–40% (minor suppliers); the largest regional importer pays the highest prices (Tables 3, 4, 7) | Supported      |
| H2: Institutional factors dominate geography             | Prices vary between countries with similar geographic locations; a poorer geographic location does not mean the highest prices | Tajikistan (the worst geography) pays 9.8% less than Uzbekistan; the Brazilian premium (39.6%) in the neutral market exceeds the regional premium (15.4%) (Tables 3, 5, 6, 7)                           | Supported      |
| H3: EAEU membership confers price advantages             | Member countries pay less than non-member countries                                                                            | The difference between members and non-members is 12.1%; Armenia (38,648 t) is ahead of Uzbekistan (486,544 t) (Table 6)                                                                                | Supported      |
| H4: Persistent welfare costs from institutional failures | Losses continue after market normalisation; losses increase despite volume growth                                              | Cumulative losses amounted to US\$361.6 million (2021–2024); losses increased from US\$28.7 million (2022) to US\$67.0 million (2024), and volumes increased by 4.6 times (Tables 8, 9)                 | Supported      |

**H1 (Systematic price disadvantages):** Uzbekistan pays 17.4% more than Kazakhstan, 8.8% more than Tajikistan, and 7.9% more than Kyrgyzstan, despite importing more than all regional competitors combined. The disadvantage persists for all suppliers: +15.4% for sugar supplied by the dominant regional exporter, +39.6% for Brazilian sugar, and 25–40% for small suppliers. The expected volume-price relationship is inverse; the largest buyer pays more.

**H2 (Institutional factors dominate geography):** Tajikistan, the smallest economy in the region with the worst geographic location and weakest infrastructure, achieves prices 9.8% more favorable than geographically central Uzbekistan. The premium on Brazilian sugar (39.6%) significantly exceeds the regional one (15.4%), confirming that domestic procurement inefficiencies entail higher costs than non-membership in the EAEU.

**H3 (EAEU membership provides price advantages):** EAEU countries pay an average of \$614.1/t for sugar supplied by the dominant regional exporter; for non-EU countries, the

average price is \$688.4/t – a 12.1% premium for membership. Even Armenia (38,600 tons) achieves better prices than Uzbekistan (486,500 tons).

**H4 (Persistent welfare costs):** Annual losses range from \$67 million to \$117 million (0.06–0.10% of GDP). Cumulative losses for 2021–2024 amount to \$361.6 million. Losses increased from \$28.7 million to \$117 million. US (2022) to US\$67.0 million (2024), despite a 4.6-fold increase in volumes, which confirms structural rather than temporary reasons.

**Contributions.** The study advances three lines of research. First, it demonstrates that institutional factors can dominate geography among landlocked countries: higher prices in Tajikistan, despite its poorer geographic location, challenge the assumption that landlockedness alone determines trade costs. Second, it quantifies the costs of excluding the EAEU (a 12.1% premium), while simultaneously showing that domestic factors matter independently: non-EAEU members such as Tajikistan and Azerbaijan achieve prices comparable to those of EAEU members. Third, it challenges conventional bargaining theory: economics textbooks predict that large buyers obtain higher prices through economies of scale and bargaining power, yet Uzbekistan, which imports more sugar than all its neighbors combined, pays the highest prices in the region. This inverse relationship between volume and price suggests that institutional weaknesses can completely offset the benefits that market power should provide.

### **Policy implications**

**The "Tajikistan question".** Before introducing reforms, Uzbek policymakers should study what Tajikistan is doing differently. Tajikistan – smaller, poorer, and more remote – has achieved more favorable prices within existing regional structures, without membership in the EAEU. Understanding the specific mechanisms (the structure of import channels, intermediaries, and contractual practices) will allow for targeted replication of this experience.

**Information transparency.** Intermediaries profit when buyers lack market information. A practical option would be to require quarterly publication of Uzbekistan's import price data, comparing them with regional benchmark prices. Ensuring accountability, explaining why Uzbekistan paid 17.4% more than Kazakhstan, would help reduce information asymmetry.

**Competitive discipline.** Uzbekistan pays premiums to nine suppliers, suggesting systemic problems rather than supplier-specific ones. The introduction of competitive pressure, mandatory tenders for large contracts, direct relationships with suppliers, and transparent evaluation criteria could undermine arrangements in which relationships prevail over price competition. Several specific measures should be considered:

- **Granting the State Competition Committee** authority to monitor import prices of essential goods, with the authority to investigate cases of persistently exceeding regional premiums.
- **Establishing a commodity exchange** in Tashkent, ensuring transparent pricing and reducing the opacity of intermediaries, based on Uzbekistan's existing commodity exchange infrastructure.
- **Requiring import license** holders to demonstrate competitive sourcing through documented quotations from multiple suppliers for contracts exceeding thresholds.
- **Leveraging bilateral relations** between Uzbekistan and Kazakhstan to explore joint procurement mechanisms that combine Kazakhstan's access to the EAEU with Uzbekistan's advantages in procurement volume.

**Regional integration: beyond EAEU.** While the 12.1% EAEU premium represents real costs, joining the customs union may not serve Uzbekistan's interests. As the world's only doubly-landlocked country, Uzbekistan's prosperity depends on connectivity with all neighbors, not alignment with a single bloc. EAEU membership would surrender tariff autonomy to dominant regional exporter's industrial priorities precisely when flexibility matters most.

A more promising vision: Uzbekistan leading deeper Central Asian integration, 80 million consumers with complementary economies, that preserves sovereignty over external tariffs while reducing regional barriers. The procurement inefficiencies documented here are domestic problems requiring domestic solutions; solving them independently strengthens Uzbekistan's position for shaping future regional arrangements.

**Limitations.** CIF prices do not include internal distribution costs, so the observed differences represent conservative estimates. The analysis does not allow us to identify the specific mechanisms underlying Uzbekistan's disadvantage, such as intermediary markups, internal rents, fragmented government, or information asymmetries. Importantly, trade statistics do not reveal the composition of buyers: whether sugar is imported by state-owned organizations, private traders, or producers. This distinction is important because reforms aimed at public procurement are fundamentally different from competition policy for private channels. Natural experiment comparisons suggest that unobserved characteristics are not correlated with EAEU membership, and the data for Turkmenistan are based on mirror statistics due to reporting limitations.

**Future research.** Supply chain analysis that identifies intermediaries and institutional bottlenecks can help develop targeted interventions. A comparative analysis of commodities (wheat, vegetable oil, fuel) will allow us to determine whether sugar reflects broader inefficiencies. Most importantly, customs-level data, which distinguishes between public and private procurement, can reveal efficiency gaps between the public and private sectors in Central Asian markets, directly determining whether public procurement, private competition, or intermediary structures require reform.

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