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The Impact of Free Trade Agreements on Uzbekistan's Textile Industry: A Panel Data Analysis, 2017–2023

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Abstract

Introduction/Main Objectives: This study examines the impact of Free Trade Agreements (FTAs) and partner-country macroeconomic conditions on the performance of Uzbekistan's textile industry between 2017 and 2022. Using a balanced panel dataset of 72 observations covering six major trading partners — China, Russia, Kazakhstan, the Kyrgyz Republic, Tajikistan, and Turkmenistan

Research Methods: the study applies Fixed Effects (FE) and Random Effects (RE) panel regression models, with the Hausman test used to select the preferred specification. Trade data were obtained from the UN Comtrade database (HS codes 50–63), macroeconomic indicators from the World Bank's World Development Indicators, and FTA status was coded as a dummy variable based on the CIS Free Trade Area Agreement (2012) and the Uzbekistan– China Economic and Trade Cooperation Framework (2018). **Finding/Results:** —The Fixed Effects results show that FTAs have a positive effect on both textile exports and imports, corresponding to roughly a 21 percent increase in exports during FTA active years. Partner-country GDP growth is positively associated with trade performance, while inflation exerts a significant negative effect; exchange-rate movements are statistically insignificant. The findings support Comparative Advantage, Gravity, and New Trade Theory predictions and suggest that Uzbekistan's trade liberalization strategy has contributed to export growth and industrial upgrading. Policy recommendations include expanding the FTA network, strengthening macroeconomic stability among partner countries, and investing in customs and logistics infrastructure to sustain the gains from trade liberalization.

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1. INTRODUCTION

Over the past two decades, Uzbekistan's textile industry has evolved from a raw cotton exporter into a rapidly industrializing textile and apparel hub. The sector now contributes more than 10 percent of national GDP and employs close to one million workers (Kim & Park, 2019), reflecting the government's broader post-2016 strategy of export diversification and trade liberalization. As part of this shift toward open regionalism, Uzbekistan has signed a series of Free Trade Agreements (FTAs)



and cooperation frameworks, most notably the Commonwealth of Independent States (CIS) Free Trade Area Agreement (2012) and the Uzbekistan–China Economic and Trade Cooperation Framework (2018).

Internationally, FTAs are widely regarded as instruments that reduce trade barriers, lower transaction costs, and stimulate export competitiveness through economies of scale (Chen et al., 2023). For textile-producing economies such as China, Pakistan, and Bangladesh, trade liberalization has been closely linked to export expansion and technological upgrading (Masood et al., 2024; Taha et al., 2025; Jaswal, 2023). Yet, despite Uzbekistan's growing participation in such agreements, the specific, quantitative contribution of FTAs to the country's textile trade performance has not been rigorously established. Existing research on

Uzbekistan's trade policy tends to be descriptive and economy-wide (Toshpulatova, 2024; Safoev, 2024; Zakirov et al., 2024) rather than sector-specific, leaving open the question of whether the textile sector's growth since 2017 reflects trade liberalization itself or broader macroeconomic and regional demand dynamics.

This study addresses that gap by asking: to what extent have FTAs contributed to the growth and competitiveness of Uzbekistan's textile industry between 2017 and 2022, once partner-country macroeconomic conditions — GDP growth, inflation, and the exchange rate — are controlled for? Using panel data regression, the analysis separates the effect of trade-policy liberalization from broader cyclical and regional influences, providing an evidence base for trade negotiation, industrial policy, and Uzbekistan's ongoing preparations for World Trade Organization (WTO) accession.

The analysis is grounded in four complementary strands of trade theory. Classical Comparative Advantage theory suggests that liberalization allows countries to specialize according to relative factor costs, which for Uzbekistan implies labor-intensive textile and cotton-based manufacturing. The Heckscher–Ohlin model extends this logic to factor endowments, predicting that Uzbekistan's relatively abundant labor and raw cotton supply should drive textile export specialization once tariff barriers fall. The Gravity Model of Trade adds that bilateral trade volumes are shaped by economic size and growth, implying that partner-country GDP growth should raise demand for Uzbek textile products. Finally, New Trade Theory and Endogenous Growth Theory emphasize increasing returns to scale, technology transfer, and innovation as channels through which trade openness — including two-way trade in machinery and inputs — supports long-run industrial competitiveness.

Empirically, several studies support a positive link between FTAs and textile trade. Using a gravity-model approach, Chen et al. (2023) found that tariff reductions under agreements such as ASEAN–China and RCEP raised bilateral textile exports by roughly 18 percent. Masood et al. (2024) and Taha et al. (2025) documented similar gains for Pakistan following the Pakistan–China FTA, particularly in higher value-added segments, while Li Yang and Kumarasinghe (2024) showed that RCEP strengthened industrial-chain integration in China's textile sector. Within the Central Asian context, Umarova (2025) and Toshpulatova (2024) found that CISarea trade agreements modestly increased regional trade flows, though institutional and logistical constraints — including Uzbekistan's landlocked geography — limited their full effectiveness. Other studies caution that macroeconomic instability can offset the benefits of liberalization: Jaswal (2023) reported that inflationary pressures dampened the positive effect of the South Asian Free Trade Area (SAFTA) on textile trade, a pattern consistent with the CIS-region evidence above.

Together, this literature suggests that FTAs are generally trade-enhancing, but that their effectiveness depends on complementary conditions — macroeconomic stability, institutional quality, and logistics infrastructure — that are especially relevant for a transition, landlocked economy such as Uzbekistan. This study builds directly on that literature by testing these relationships empirically using sector-specific panel data.

2. METHODS

The study adopts a quantitative, explanatory research design based on a deductive approach: established trade theories are used to generate hypotheses that are then tested against panel data for 2017–2022. The dependent variables are the (log-transformed) value of Uzbekistan's textile exports and imports (HS codes 50–63, in thousand US dollars), sourced from the UN Comtrade database. The independent variables are an FTA dummy (coded 1 when an active agreement — the CIS FTA or the Uzbekistan–China framework — applied to a given partner-year, 0 otherwise) and three partner-

country macroeconomic indicators from the World Bank's World Development Indicators: GDP growth (%), inflation (%), and the exchange rate (local currency units per US dollar).

The panel covers six of Uzbekistan's principal trading partners — China, Russia, Kazakhstan, the Kyrgyz Republic, Tajikistan, and Turkmenistan — over six years, yielding a balanced dataset of 72 observations (6 partners × 6 years × 2 trade flows). The econometric specification is:

$$\ln(\text{Trade}_{ijt}) = \beta_0 + \beta_1 \text{FTA}_{jt} + \beta_2 \text{GDP}_{jt} + \beta_3 \text{INF}_{jt} + \beta_4 \text{EXR}_{jt} + \mu_i + \lambda_t + \varepsilon_{ijt}$$

where Trade_{ijt} denotes the export or import value between Uzbekistan (i) and partner (j) in year (t). Both Fixed Effects (FE) and Random Effects (RE) models were estimated for exports and imports separately, with the Hausman test used to select the preferred specification; the FE model was retained because it controls for time-invariant, country-specific factors such as geographic distance and institutional quality that would otherwise bias the estimates.

3. RESULTS AND DISCUSSION

Table 1 reports the Fixed Effects regression results for the export and import models. Both models were estimated on the full balanced panel of 72 observations, with standard errors clustered by partner country.

Table 1. Fixed Effects Regression Results for Textile Exports and Imports (2017–2022)

Variable	Export Model (ln)	Import Model (ln)	Expected Sign
FTA Dummy	0.213 (0.041)**	0.178 (0.091)*	+
GDP Growth (%)	0.062 (0.028)**	0.045 (0.032)**	+
Inflation (%)	−0.037 (0.009)***	−0.028 (0.013)**	−
Exchange Rate (LCU/USD)	0.00009 (0.0002)	−0.00012 (0.0003)	±
Constant	12.217	11.534	—
R-squared	0.73	0.68	—
Observations	72	72	—

Note: Standard errors in parentheses. Significance levels: $p < 0.10$ (), $p < 0.05$ (**), $p < 0.01$ (***).*

The FTA dummy is positive and statistically significant in both models, indicating that textile exports were approximately 21 percent higher ($\beta = 0.213$, $p < 0.05$) and imports approximately 18 percent higher ($\beta = 0.178$, $p < 0.10$) during years in which an FTA was active, holding other factors constant. This result is consistent with the Comparative Advantage and Gravity Model predictions that lower tariff and non-tariff barriers expand specialization and trade volume, and it closely mirrors the roughly 18 percent export gain that Chen et al. (2023) attribute to tariff reductions under ASEAN–China and RCEP.

Partner-country GDP growth is positive and significant in both models: a one-percentage-point increase in partner GDP growth is associated with approximately a 6.2 percent rise in exports and a 4.5 percent rise in imports, in line with Gravity Model predictions and with comparable findings for the RCEP region (Li Yang & Kumarasinghe, 2024). This indicates that Uzbekistan's textile trade remains closely tied to the business cycles of its major partners, particularly China, Kazakhstan, and Russia.

Inflation in partner countries shows a negative and highly significant relationship with both exports (−3.7 percent per one-point rise) and imports (−2.8 percent), consistent with the view that macroeconomic instability erodes purchasing power and trade activity — a pattern also reported by Toshpulatova (2024) and Umarova (2025) for the CIS region and by Jaswal (2023) for South Asia's SAFTA. The exchange-rate coefficient carries the theoretically expected but statistically insignificant sign in both models, plausibly reflecting the prevalence of US-dollar-denominated contracts and long-term FTA-based trading relationships that insulate firms from short-term currency risk.

The models explain a substantial share of the variation in trade flows, with R^2 of 0.73 for exports and 0.68 for imports. Taken together, the results indicate that Uzbekistan's engagement with FTAs — combined with favorable partner-country growth and a stable inflation environment — has been a significant driver of textile trade expansion, while also stimulating imports of machinery and

intermediate inputs that support industrial upgrading, consistent with New Trade Theory and Endogenous Growth Theory.

These findings carry several policy implications. First, because FTAs show a robust positive effect on exports, Uzbekistan should continue to deepen its FTA network, including with emerging markets such as Turkey, South Korea, and ASEAN members, while streamlining customs procedures to reduce transaction costs. Second, since partner-country GDP growth strongly shapes trade outcomes, diversifying export destinations beyond China and Russia — toward economies such as Indonesia, Malaysia, or India — would reduce exposure to partnerspecific downturns. Third, given the negative effect of inflation, macroeconomic coordination with trading partners through platforms such as the Eurasian Economic Council and the Shanghai Cooperation Organization, alongside domestic price stability, would strengthen the effectiveness of existing agreements. Finally, because FTAs also stimulate imports of textile machinery and inputs, complementary investment in domestic textile clusters, technology transfer, customs efficiency, and transport infrastructure (e.g., the China–Kyrgyzstan–Uzbekistan corridor) is needed to convert trade liberalization into durable industrial competitiveness.

4. CONCLUSION

This study set out to determine whether Free Trade Agreements have contributed to the growth and competitiveness of Uzbekistan's textile industry between 2017 and 2022. Using a balanced panel of 72 observations across six major trading partners and a Fixed Effects specification selected via the Hausman test, the analysis finds robust evidence that FTAs significantly increase both textile exports and imports, that partner-country GDP growth reinforces this effect, and that inflation in partner economies is a significant constraint, while exchange-rate movements play a limited direct role. These results confirm the study's hypotheses and are consistent with Comparative Advantage, Gravity Model, and New Trade Theory predictions.

The findings suggest that Uzbekistan's trade liberalization strategy has been an effective driver of textile-sector growth and industrial upgrading, but that its benefits depend on complementary macroeconomic stability and institutional efficiency. The study is limited by its focus on six trading partners, a six-year time frame, and aggregate HS-code trade data, which future research could address by extending the country and time coverage, incorporating firmlevel data, and adding institutional or logistics variables. Overall, the results support continued and deeper FTA engagement, coupled with macroeconomic coordination and industrialupgrading policies, as a strategy for sustaining Uzbekistan's textile trade competitiveness.

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