

ECONOSCITECH INTEGRATION

ISSUE
9

INTERNATIONAL SCIENTIFIC
ELECTRONIC JOURNAL



**TASHKENT STATE
UNIVERSITY OF ECONOMICS**



**American University
of Technology**

Powered by Arizona State University®

ISSN: 3060-5075



Acceptance of articles

PUBLISHED EVERY MONTHLY



ARTICLE CONTRIBUTORS

**PROFESSORS-TEACHERS, SPECIALISTS
AND SCIENTIFIC RESEARCHERS.**



Google
scholar

OpenAIRE

ISSN

INTERNATIONAL
STANDARD
SERIAL
NUMBER
DENMARK

CONTACT:



+998 94 3540880



<https://econoscitech-integration-journal.uz>



2026

**EDITOR-IN-CHIEF:**

Zufarova Nozima Gulamiddinovna
DSc., Dean of Tourism Faculty, TSUE

DEPUTY EDITOR-IN-CHIEF:

Makhmudov Nosir Makhmudovich
DSc., Prof., Academician

DEPUTY EDITOR-IN-CHIEF:

Suyunov Dilmurod Xolmurodovich
Doctor of Economics (DSc), Professor,

DEPUTY EDITOR-IN-CHIEF:

Allayarov Shamsiddin Amanullayevich
doctor of economics (DSC), professor

RESPONSIBLE SECRETARY:

Otaboyev Axmed Maxsudbek o'g'li
TSUE independent researcher

THE SCIENTIFIC-POPULAR
ELECTRONIC JOURNAL
"ECONOSCITECH-INTEGRATION"
HAS BEEN REGISTERED UNDER
THE NUMBER C-5669651 BY THE
AGENCY FOR INFORMATION AND
MASS COMMUNICATIONS (AOKA)
OF THE REPUBLIC OF UZBEKISTAN,
EFFECTIVE FROM OCTOBER 9, 2024.

In accordance with Resolution No. 384/6 dated April 10, 2026, issued by the Presidium of the Supreme Attestation Commission under the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan, this journal is included in the list of recommended international scientific publications for publishing the primary research findings of doctoral dissertations in the field of Economic Sciences.

Partners: Tashkent State University of Economics / American University of Technology in Tashkent (AUT)

Electronic publication. Issue 9. 500 pages.
Approved for publication in September 2026.

Editorial Board Members:

Sharipov Kongratbay Avezimbetovich,
Doctor of Technical Sciences (DSc), Professor



Teshabayev To'liqin Zakirovich,
Doctor of Economic Sciences (DSc), Professor



Said Irandoust,
Doctor of Chemical Engineering Sciences,
Professor



Abdurakhmanova Gulnora Kalandarovna,
Doctor of Economic Sciences (DSc), Professor



Khudoykulov Sadirdin Karimovich,
Doctor of Economics, (DSc), Professor



Tokunaga Masahiro,
professor, PhD of Economics of the Faculty of
Business and Commerce



Debasis Das,
professor Department of Computer Science



Nitin Goje,
professor and Program Lead - Computer Science



Nargizakhon Shamshieva
Doctor of Economic Sciences, Professor



Rakhmonov Norim Razzakovich,
Doctor of Economic Sciences (DSc), Professor

Bayxonov Bahodirjon Tursunbayevich
Doctor of Science (DSc), Professor



Shomurodov Ravshan Tursunkulovich,
PhD, Associate Professor



Boymuratov Abduraxmat Djumayevich
Doctor of Philosophy (PhD) in Economics



Sharopova Nafosat Radjabovna
DSc, Associate Professor



Sultanova Kamila Mukhtorali Kizi
Master of Science

CONTENTS

GROWTH TRENDS IN ELECTRICITY CONSUMPTION IN UZBEKISTAN AND PROBLEMS OF MODERNIZING THE GRID INFRASTRUCTURE.....	20
Bobobekov Ergash Abdumalikovich	
DETERMINANTS OF THE INTENTION TO PARTICIPATE IN FAMILY TAKAFUL IN A PREMARKET SETTING: A STRUCTURED REVIEW OF THE EVIDENCE AND A CONCEPTUAL FRAMEWORK FOR UZBEKISTAN.....	24
Usmanov Nematjon Gulomovich	
TOURISM RESOURCE EFFICIENCY AND SUSTAINABLE REGIONAL SERVICE SECTOR DEVELOPMENT: AN EMPIRICAL ASSESSMENT OF UZBEKISTAN	40
Safarov Bahadirkhon Shaxriyrovich	
Toshkhujaev Mustafokhon Abduvosi ugli	
TERRITORIAL DISPARITIES IN EMPLOYMENT EFFICIENCY IN KHOREZM REGION: ASSESSMENT AND POLICY DIRECTIONS	47
Azadova Gulnoza Sardorbekovna	
ЦИФРОВАЯ ЭКОНОМИКА КАК ДРАЙВЕР ЭКОНОМИЧЕСКОГО РОСТА.....	55
Динара Ташевна Гафарова	
DIGITAL PLATFORM-BASED TRANSFORMATION OF ENTERPRISE E-COMMERCE SYSTEMS: FACTORS, EFFICIENCY AND DEVELOPMENT PROSPECTS	59
Tuychiyev Shavkatjon Shokirali o'g'li	
WAYS TO OPTIMALLY ORGANIZE AND IMPROVE DIRECT TAXATION IN UZBEKISTAN	68
Kadyrov Bahodir Kudratovich	
EFFICIENCY OF SMALL AND MEDIUMSIZED BUSINESS FINANCING BASED ON MUSHARAKAH: AN ANALYSIS OF OPPORTUNITIES AND RISKS.....	73
Kenjaeva Durdona Ravshan qizi	
СОВЕРШЕНСТВОВАНИЕ БЮДЖЕТНОГО УЧЕТА В РЕСПУБЛИКЕ УЗБЕКИСТАН В УСЛОВИЯХ ЦИФРОВИЗАЦИИ И УСИЛЕНИЯ ГОСУДАРСТВЕННОГО ФИНАНСОВОГО КОНТРОЛЯ	79
Джамбакиева Гулнора Сайфутдиновна	
ANALYSIS OF INDICATORS OF HUMAN CAPITAL UTILIZATION AND LABOR RELATIONS EFFICIENCY IN THE SMALL BUSINESS SECTOR	89
Ulugmuradova Nodira Berdimuradovna	
THE EFFECT OF MANDATORY IFRS ADOPTION ON EQUITY GROWTH OF UZBEK PUBLIC INTEREST ENTITIES (PIEs).....	96
Mokhirjon Shavkatov Omon o'g'li	
METHODS FOR ASSESSING THE IMPACT OF SMALL BUSINESS DEVELOPMENT ON NATIONAL ECONOMIC GROWTH.....	103
Akmaljon Adkhamovich Ermatov	
LEGISLATION AS AN ENABLER OF MARKET FORMATION: THE SIGNIFICANCE OF ADOPTING ISLAMIC BANKING PRINCIPLES FOR THE DEVELOPMENT OF ISLAMIC FINANCE IN UZBEKISTAN.....	111
Sultanov Bakhtiyor Bakhodirovich	
ANALYSIS OF REGIONAL INTEGRATION PROCESSES INTO FOREIGN MARKETS.....	117
Ozodova Farida Zarif kizi	
FINANCIAL INTENSITY AND YOUTH ENTREPRENEURSHIP IN UZBEKISTAN: EVIDENCE FROM A TWO-WAY FIXED-EFFECTS REGIONAL PANEL MODEL	122
Isakjanova Saboxat	

ENHANCING BIG DATA SOLUTIONS IN THE TOURISM INDUSTRY ECONOMIC EFFICIENCY AND FORECASTS INDICATORS.....	131
Temirov E.I.	
DEVELOPING AN AI-BASED CONTINUING MEDICAL EDUCATION SYSTEM: A COMPARATIVE ANALYSIS OF NATIONAL AND INTERNATIONAL SCHOLARLY APPROACHES	141
Nazarov Bakhrom Mustafayevich	
ADAPTIVE MANAGEMENT MECHANISM BASED ON A RESILIENT VALUE CHAIN FOR THE STRATEGIC SUSTAINABLE DEVELOPMENT OF AGROCLUSTER ACTIVITIES	147
Abdumalik Hakimovich Berdiyev	
INTERNATIONAL PRACTICE: TAX INCENTIVES FOR INVESTMENT	153
Fazliev Farrukh Fakhridinovich	
AN ANALYSIS OF LEADING FOREIGN BANKS' PRACTICES IN APPLYING ARTIFICIAL-INTELLIGENCE-BASED MANAGEMENT SYSTEMS FOR CREDIT RISK ASSESSMENT AND THE EARLY DETECTION OF PROBLEM LOANS.....	160
Alovuddin Jamolov	
DIGITAL FINANCIAL INCLUSION AS A DRIVER OF WOMEN'S ENTREPRENEURSHIP AND POVERTY REDUCTION: EVIDENCE FROM UZBEKISTAN	164
Ulashova Zarnigor Botirali qizi	
INDUSTRIAL DEVELOPMENT AND ENVIRONMENTAL SECURITY: THEORETICAL AND METHODOLOGICAL FOUNDATIONS FOR A REGIONAL ANALYSIS OF UZBEKISTAN.....	168
Erkaeva Bibirobiya Kamoladdin kizi	
PROSPECTS FOR THE USE OF GREEN FINANCE INSTRUMENTS IN FINANCING THE EXPORT ACTIVITIES OF ENTERPRISES	175
Turaeva Yulduz Shamsiddin qizi	
IMPROVING THE MANAGEMENT SYSTEM OF PRIVATE SCHOOLS BASED ON INNOVATIVE TECHNOLOGIES. METHODS USED: SEM, AHP.....	184
Shohida Esanova	
IMPROVING THE INTERNAL AUDIT OF FINANCIAL ERRORS AND IRREGULARITIES IN BUDGET ORGANIZATIONS THROUGH A RISK-BASED APPROACH	194
Mulayev Farkhod Alisherovich	
MODELS FOR ATTRACTING INVESTMENT TO THE INDUSTRIAL SECTOR AND ENSURING ITS EFFICIENT USE.....	200
Choriev Tolib Azamovich	
DIGITAL TECHNOLOGIES AND INNOVATIVE APPROACHES TO INSURING FOREIGN ECONOMIC ACTIVITY RISKS.....	208
Raximov Timur Furqatovich	
RELATIONS BETWEEN THE CENTRAL BANK AND COMMERCIAL BANKS IN UZBEKISTAN: INDEPENDENCE, POLICY TRANSMISSION AND COMPETITION	215
Abdulazizova Ugiloy	
ACCOUNTING IN THE INFORMATION SUPPORT SYSTEM OF ENTERPRISE FINANCIAL CONTROL	223
Rano Abrorovna Mannapova	
NATIONAL FASHION ELEMENTS AS A MEDIATOR BETWEEN TOURISM EXPERIENCE AND DESTINATION BRAND EQUITY: THE NF-DBE MODEL AND A FIELD RESEARCH PROTOCOL.....	228
Yusupova Mokhinur Farkhod qizi	
THE CONCEPT, CLASSIFICATION, AND THEORIES OF THE USE OF ECONOMIC RESOURCES.....	238
Alimov Muxammadbobur Ibragimjonovich	

ECONOMETRIC ASSESSMENT OF THE RELATIONSHIP BETWEEN THE SHADOW ECONOMY AND HOUSEHOLD WELFARE IN UZBEKISTAN	242
Afenov Nursultan Nugmatillaevich	
МАСТЕР-ПЛАН, ОРИЕНТИРОВАННЫЙ НА СОКРАЩЕНИЕ БЕДНОСТИ: КОНЦЕПЦИЯ ТЕРРИТОРИАЛЬНОГО ПЛАНИРОВАНИЯ ТРЕТЬЕГО ПОКОЛЕНИЯ	247
Мухамедова Мадинабону Мехридиновна	
THE CURRENT STATE AND DYNAMICS OF WOMEN'S PARTICIPATION IN THE STATE CIVIL SERVICE	257
Abduraxmonova Feruzabonu Abduraxmon qizi	
ASSESSING THE IMPACT OF AGRICULTURAL PRODUCT ASSORTMENT DIVERSIFICATION ON MARKET STABILITY	265
Xudayberganov Jasur Baxodirovich	
ИННОВАЦИОННЫЕ ПОДХОДЫ К ПОВЫШЕНИЮ ЭФФЕКТИВНОСТИ РАЗВИТИЯ МСБЕ-ТУРИЗМА	273
Нарзуллаева Фариза Акмалевна	
DEVELOPMENT FACTORS AND CONTEMPORARY TRENDS OF THE FOOD INDUSTRY IN UZBEKISTAN: AN ECONOMIC AND STATISTICAL ANALYSIS	278
Gulira'no Abasova	
PROSPECTS FOR THE DEVELOPMENT OF ISLAMIC BANKS AND FINANCE IN UZBEKISTAN	285
Khamdam Atabaevich Babajanov	
WTO ACCESSION AND ECONOMIC GROWTH: SECTORAL EVIDENCE FROM CHINA AND IMPLICATIONS FOR UZBEKISTAN	291
Abdullayev Axrorjon	

WTO ACCESSION AND ECONOMIC GROWTH: SECTORAL EVIDENCE FROM CHINA AND IMPLICATIONS FOR UZBEKISTAN

Abdullayev Axrorjon
Kokand University,
Department of International Tourism and Economy
E-mail: aaabdullayev@kokanduni.uz
ORCID: 0009-0006-3762-1427

Abstract. Uzbekistan is in the final stages of WTO accession. This study analyses China's post-accession sectoral data (2001–2024) using an OLS growth-rate model. Industrial and services growth are the dominant drivers of GDP growth (coefficients 0.426 and 0.398; $p < 0.001$), while transport is statistically insignificant ($p = 0.334$). A comparison of Central Asian WTO members shows mixed outcomes shaped by institutional readiness and commodity cycles. A SWOT analysis identifies reform momentum as Uzbekistan's principal asset and institutional capacity as the binding constraint.

Keywords: WTO accession; trade liberalisation; economic growth; Central Asia; OLS regression

Аннотация. Узбекистан находится на завершающем этапе вступления во Всемирную торговую организацию (ВТО). В данном исследовании анализируются отраслевые данные Китая за поствступительный период (2001–2024 гг.) с использованием модели темпов роста OLS. Рост промышленности и сферы услуг является основным фактором роста ВВП: соответствующие коэффициенты составляют 0,426 и 0,398 ($p < 0,001$). При этом транспортный сектор статистически незначим ($p = 0,334$). Сравнение стран Центральной Азии, являющихся членами ВТО, показывает неоднородные результаты, сформировавшиеся под влиянием институциональной готовности и циклов на сырьевых рынках. SWOT-анализ определяет динамику реформ как основное преимущество Узбекистана, а институциональный потенциал — как ключевое ограничивающее условие.

Ключевые слова: вступление в ВТО; либерализация торговли; экономический рост; Центральная Азия; OLS-регрессия

INTRODUCTION

Trade integration has been a key component of development strategies since the mid-twentieth century. The World Trade Organization (WTO) currently regulates approximately 98% of global trade among its 166 members (WTO, 2024). Uzbekistan has held observer status since 1994 and formally intensified its WTO accession process in 2020 (Ministry of Investment, Industry and Trade, 2023).

The relationship between WTO membership and economic growth has been extensively debated in the literature. Rose (2004) found no robust evidence of a direct trade effect, while subsequent studies reported stronger positive associations after addressing endogeneity and methodological considerations through improved analytical approaches (Subramanian and Wei, 2007; Tomz, Goldstein and Rivers, 2007). Evidence concerning transition economies remains heterogeneous, reflecting differences in institutional development, economic structure, and the implementation of trade-related reforms (Deb and Biswas, 2020; Goldstein, Rivers and Tomz, 2007).

Uzbekistan provides a particularly relevant case for analysis. Since 2016, the country has implemented a broad range of economic reforms, including measures aimed at strengthening currency convertibility, reducing tariffs, and promoting foreign direct investment (FDI). At the same time, further opportunities remain for enhancing institutional capacity, the rule-of-law framework, and customs administration in comparison with regional peers (World Bank, 2024). These developments provide an important basis for examining whether WTO accession could further strengthen Uzbekistan's integration into the global economy and support sustainable economic growth.

This paper estimates an ordinary least squares (OLS) growth-rate model using China's sectoral economic data, benchmarks economic outcomes before and after WTO accession across Central Asian WTO members,

and synthesises a SWOT analysis of Uzbekistan's accession strategy (Pomfret, 2019; Normatov, 2018). Section 2 reviews the relevant literature; Section 3 presents the data and methodology; Section 4 discusses the empirical results; Section 5 presents the key findings and policy implications; and Section 6 concludes the study.

LITERATURE REVIEW

The potential gains from trade liberalisation are grounded in the principles of comparative advantage and the scale effects associated with new trade theory, with these benefits further reinforced by technological diffusion and knowledge transfer. WTO membership provides an institutional framework for these processes through binding tariff commitments and formal dispute-settlement mechanisms, thereby contributing to greater predictability and lower transaction costs in international trade.

However, the benefits of trade integration may vary across sectors and stages of economic development. Industrial upgrading is generally considered an important channel for economies at intermediate stages of development (Rodrik, 2016), while services liberalisation has become increasingly significant as improvements in services contribute to higher productivity and competitiveness in manufacturing (Arnold et al., 2011).

Rose (2004) found no statistically significant trade effect of WTO membership across 178 countries, highlighting the importance of addressing endogeneity in empirical analysis. Subsequent studies employing improved gravity-model specifications reported positive but heterogeneous effects of WTO membership on trade flows (Subramanian and Wei, 2007; Tomz et al., 2007). Goldstein et al. (2007) further demonstrated that the commitment mechanism associated with WTO accession can itself contribute to subsequent trade expansion.

Some studies have suggested that the principal effect of WTO membership may occur through an expansion of the extensive margin of trade rather than a substantial increase in the intensive margin (Felbermayr and Kohler, 2010). In China, post-WTO gains were particularly concentrated in export-oriented manufacturing, while the expansion of services was comparatively more gradual (Liu, 2009). These findings provide a rationale for examining sector-specific growth patterns rather than relying exclusively on aggregate trade indicators.

Empirical evidence concerning post-Soviet economies indicates that the economic outcomes associated with WTO accession depend partly on institutional capacity and the effectiveness of complementary economic reforms (Deb and Biswas, 2020). Economic diversification has also been identified as an important factor in maximising the benefits of greater international trade integration (Pomfret, 2019). In Tajikistan, the outcomes of trade integration have been influenced by the pace of customs modernisation and broader institutional development (Normatov, 2018), providing a relevant regional reference point for Uzbekistan.

This study uses three Central Asian benchmarks: Kyrgyzstan, which joined the WTO in 1998; Tajikistan, which acceded in 2013; and Kazakhstan, which became a WTO member in 2015. These cases represent different commodity-price environments, economic structures, and institutional contexts, allowing for a broader comparative assessment of accession-related outcomes.

RESEARCH METHODOLOGY

OLS-based estimations of the relationship between trade and economic growth may face methodological challenges associated with non-stationarity and multicollinearity. Regressions based on non-stationary aggregate-level variables may produce potentially misleading statistical relationships (Granger and Newbold, 1974). To address this issue, growth-rate specifications are widely used as an appropriate approach for analysing changes in macroeconomic variables over time (Dickey and Fuller, 1979; Phillips and Perron, 1988). Accordingly, this study adopts a growth-rate specification to reduce the potential effects of non-stationarity and to provide a more consistent basis for evaluating the relationship between sectoral performance and overall economic growth.

ANALYSIS AND RESULTS

China's annual national accounts data for 2001–2024 ($N = 24$), including GDP and sectoral value added, are sourced from the National Bureau of Statistics of China (NBS, 2024) and the Ministry of Commerce of the People's Republic of China (MOFCOM, 2024). China is selected as the primary case because it represents one of the largest economies to have joined the WTO after 1995 and provides a sufficiently long time series for econometric analysis. The estimated coefficients are interpreted as indicative rather than as directly transferable to other economies.

Macroeconomic indicators for Kyrgyzstan, Tajikistan, and Kazakhstan are obtained from the World Bank's World Development Indicators (WDI, 2024). Data are compiled for five-year windows surrounding each country's WTO accession year, subject to data availability.

Third, Uzbekistan's current macroeconomic profile and trade-related indicators are obtained from the State Statistics Committee of the Republic of Uzbekistan (2024), the International Monetary Fund (IMF, 2024), and the Asian Development Bank (ADB, 2024). These data provide the empirical basis for the SWOT analysis of Uzbekistan's WTO accession strategy.

To reduce the potential for spurious regression, the dependent variable and explanatory variables are transformed into year-on-year growth rates (%). The baseline model is specified as follows:

$$g_GDP,t = a + b1*g_AGR,t + b2*g_IND,t + b3*g_TRN,t + b4*g_SRV,t + e_t$$

where g_GDP,t is annual GDP growth in year t ; g_AGR,t , g_IND,t , g_TRN,t and g_SRV,t are sectoral growth rates; e_t is white noise. $N = 23$ (2002–2024). OLS is estimated with diagnostics per Section 3.3.

Stationarity is assessed using the Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) and the Phillips-Perron test (Phillips and Perron, 1988). Multicollinearity is evaluated using the variance inflation factor (VIF), with values above 10 treated as an indication of potentially high multicollinearity (Hair et al., 2019). Serial correlation is assessed using the Durbin-Watson statistic, with values in the approximate range of 1.5–2.5 considered broadly acceptable for the purposes of this analysis.

As an additional methodological reference point, the initial levels-based OLS specification produced an R^2 of 0.9999 and VIF values exceeding 2,700. These results indicated an exceptionally high degree of linear association among the explanatory variables and provided a strong rationale for adopting the growth-rate specification. The transformation is therefore used to improve the statistical reliability of the model and reduce the potential influence of non-stationary relationships.

For each selected WTO member, GDP, export, and foreign direct investment (FDI) indicators are compiled for five-year periods before and after WTO accession. Given the small number of countries and the presence of country-specific economic conditions and external shocks, the comparative analysis is explicitly descriptive. The purpose is to identify broad patterns and differences in economic performance rather than to establish causal effects of WTO accession.

A SWOT framework, following the methodological approach discussed by Helms and Nixon (2010), is applied to Uzbekistan. The analysis draws on WTO documentation (2024), institutional and macroeconomic assessments from the World Bank, IMF, and ADB (2024), as well as the regression findings presented in Section 4.3. The SWOT framework is used to identify Uzbekistan's internal strengths and areas for further development, together with external opportunities and factors that may require strategic consideration in the context of WTO accession.

Table 1 presents the descriptive statistics for China's sectoral growth rates over the period 2002–2024. All series exhibit positive mean growth rates, with industry and services recording the highest average growth rates, at approximately 9% and 10%, respectively. Transport displays the greatest degree of volatility, with a standard deviation of approximately 5.1 percentage points (pp) (Table 1).

Table 1
Descriptive Statistics: China Sectoral Growth Rates, 2002–2024 (%)

Variable	Mean	Std. Dev.	Min	Max	N
g_GDP	9.03	2.84	2.24	14.23	23
g_AGR	4.71	1.85	2.51	9.49	23
g_IND	8.95	4.02	2.69	16.79	23
g_TRN	9.18	5.11	1.91	20.14	23
g_SRV	10.18	3.67	2.12	19.22	23

Note: g_X denotes the year-on-year growth rate of variable X . Source: NBS (2024); authors' calculations.

Table 2 reports the correlation matrix, with correlation coefficients ranging from 0.76 to 0.98, indicating moderate-to-high co-movement among the sectoral growth rates. These correlations remain substantially below the near-unity correlations observed in the levels-based model (>0.999), providing evidence that the growth-rate transformation helps reduce multicollinearity (Table 2).

Table 2
Pearson Correlation Matrix: Sectoral Growth Rates, 2002-2024

	g_GDP	g_AGR	g_IND	g_TRN	g_SRV
g_GDP	1.00	0.91	0.99	0.88	0.97
g_AGR	0.91	1.00	0.89	0.76	0.86
g_IND	0.99	0.89	1.00	0.91	0.98
g_TRN	0.88	0.76	0.91	1.00	0.92
g_SRV	0.97	0.86	0.98	0.92	1.00

Note: All values computed on growth-rate series. Source: authors' calculations.

Table 3 reports the ADF and PP test statistics, which generally provide evidence of stationarity at the 5%–10% significance levels. The ($g_{\{TRN\}}$) and ($g_{\{SRV\}}$) series are comparatively close to the significance thresholds, reflecting the increased variability observed during 2020–2021. However, excluding these years from the estimation sample leaves the coefficient estimates materially unchanged (results not reported) (Table 3).

Table 3
ADF and Phillips-Perron Unit Root Test Results

Series	ADF stat.	ADF p-val.	PP stat.	PP p-val.	Conclusion
g_GDP	-3.82	0.008	-4.12	0.003	$I(0)$ ***
g_AGR	-4.15	0.003	-4.39	0.002	$I(0)$ ***
g_IND	-3.41	0.018	-3.65	0.011	$I(0)$ **
g_TRN	-2.71	0.084	-2.88	0.058	$I(0)$ * (borderline)
g_SRV	-2.64	0.096	-2.79	0.072	$I(0)$ * (borderline)

Note: Constant, no trend. Lag order by AIC (ADF) and Newey-West (PP). Critical values: -3.75 (1%), -3.00 (5%), -2.63 (10%). Source: authors' calculations.

Table 4 presents the OLS estimation results. The model reports an adjusted (R^2) of 0.999 and an F-statistic of 5,352 ($p < 0.001$), indicating a high overall explanatory power and statistical significance of the model. The Durbin–Watson statistic is 1.791, suggesting no substantial evidence of serial correlation in the residuals (Table 4).

Table 4
OLS Regression Results: Growth Rate Model, China 2002-2024

Variable	Coeff.	Std. Err.	t-stat.	p-value	Signif.
Intercept	0.171	0.133	1.288	0.214	
g_AGR	0.115	0.011	10.078	<0.001	***
g_IND	0.426	0.020	21.808	<0.001	***
g_TRN	0.048	0.049	0.990	0.334	n.s.
g_SRV	0.398	0.027	14.552	<0.001	***

Note: N=23; $R^2=0.9992$; Adj. $R^2=0.9990$; $F(4,18)=5,352$ ($p<0.001$); DW=1.791. Dependent variable: g_{GDP} (%). *** $p<0.001$. Source: authors' calculations.

Industry (g_{IND} , 0.426) is the largest driver, closely followed by services (g_{SRV} , 0.398); agriculture is significant but modest (0.115); transport is insignificant ($p = 0.334$) once industry and services are controlled for — read with caution given GDP's near-accounting-identity link to its components.

Table 5 VIFs — g_{AGR} (4.04), g_{IND} (11.45), g_{SRV} (13.77) — are far below the levels model (>480), though g_{TRN} remains elevated (43.16), explaining its imprecise coefficient; the three significant regressors are reliable (Table 5).

Table 5
Variance Inflation Factors: Growth Rate Model

Variable	VIF	Tolerance	Assessment
g_AGR	4.04	0.248	Acceptable
g_IND	11.45	0.087	Moderate
g_TRN	43.16	0.023	High (interpret with caution)
g_SRV	13.77	0.073	Moderate

Note: VIF > 10 flagged following Hair et al. (2019). Source: authors' calculations.

Table 6 presents the pre- and post-accession indicators as five-year averages centred on each country's WTO accession year, with the accession year itself excluded from both periods (Table 6).

Table 6
Macroeconomic Indicators: Central Asian WTO Members, Pre- vs. Post-Accession

Country	Acc. yr.	GDP pre (USD bn)	GDP post (USD bn)	Exports pre (USD bn)	Exports post (USD bn)	FDI pre (USD bn)	FDI post (USD bn)
Kyrgyzstan	1998	1.8	2.4	0.61	0.65	0.04	0.04
Tajikistan	2013	7.6	9.2	1.10	1.35	0.27	0.32
Kazakhstan	2015	211.9	178.3	79.5	54.3	10.1	9.4

'Pre'/'Post' = five-year averages before/after accession. Kazakhstan's figures are depressed by the 2015-2016 oil slump; by 2022-2024 GDP recovered to USD 244-285bn, exports to USD 73-84bn (1999 exports ~USD 5.9bn; World Bank, 2024).

Kyrgyzstan's post-accession gains remain relatively modest, reflecting the influence of structural and economic conditions. Tajikistan demonstrates gradual improvement in its post-accession indicators (Normatov, 2018), while Kazakhstan's near-term performance was influenced by the economic slowdown observed during 2015–2016, followed by a recovery during 2019–2024. FDI responses remained relatively modest across all three countries in the immediate post-accession period, plausibly reflecting the fact that institutional commitments and investment-related adjustments may require several years to generate their full effects.

Table 7 presents the SWOT matrix. The regression findings inform its sector-specific components, with industry and services, which have estimated coefficients of 0.426 and 0.398, respectively, identified as key priority sectors (Table 7).

Table 7
SWOT Matrix: Uzbekistan WTO Accession

INTERNAL FACTORS	EXTERNAL FACTORS
STRENGTHS	OPPORTUNITIES
- Committed reform agenda (Action Strategy 2022-2026) - Expanding manufacturing/agro-processing capacity (g_IND: 0.426)	- MFN tariff access to 166 WTO member markets - Services liberalisation attracts FDI (g_SRV: 0.398)
WEAKNESSES	THREATS
- Customs administration and standards-compliance gaps - Concentrated export base (gold, energy > 50%)	- Commodity-price volatility can mask WTO-related gains (cf. Kazakhstan post-2015) - Import competition threatening domestic SMEs

Note: Sector priorities in parentheses reference regression coefficients in Table 4. Source: Authors' analysis based on WTO (2024), World Bank (2024), IMF (2024), ADB (2024), and Helms and Nixon (2010).

CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between WTO accession and economic growth using an OLS growth-rate model based on China's sectoral data and a comparative analysis of Central Asian WTO members. The results indicate that industry and services are the dominant contributors to overall growth, with estimated coefficients of 0.426 and 0.398, respectively. Transport is statistically insignificant once the effects of industry and services are controlled for.

The Central Asian comparison demonstrates that post-accession outcomes are influenced by country-specific economic and institutional conditions. Kazakhstan illustrates the role of commodity-price cycles in shaping short-term economic performance, while Tajikistan highlights the importance of institutional capacity. Kyrgyzstan demonstrates the significance of complementary economic reforms in strengthening the benefits of WTO membership. For Uzbekistan, WTO accession has the potential to support economic growth when accompanied by industrial diversification, services liberalisation, and continued customs modernisation. Accordingly, tariff-related measures should be considered as part of a broader package of complementary economic and institutional reforms.

From a methodological perspective, the growth-rate specification provides a more appropriate basis for the analysis than the levels-based model by reducing the potential influence of non-stationarity, spurious relationships, and multicollinearity. Future research could expand the accession panel to include a larger number of countries and apply instrumental-variable approaches to address potential endogeneity and strengthen causal inference.

REFERENCES

1. Arnold, J., Javorcik, B., Lipscomb, M. and Mattoo, A. (2011) 'Services reform and manufacturing performance: Evidence from India', World Bank Policy Research Working Paper No. 5948.
2. Asian Development Bank (ADB) (2024) *Asian Development Outlook 2024: Uzbekistan Country Report*. Manila: Asian Development Bank.
3. Deb, S. and Biswas, B. (2020) 'WTO membership and economic growth: A panel data analysis', *Journal of International Trade and Economic Development*, 29(5), pp. 543–561. <https://doi.org/10.1080/09638199.2020.1723572>
4. Dickey, D.A. and Fuller, W.A. (1979) 'Distribution of the estimators for autoregressive time series with a unit root', *Journal of the American Statistical Association*, 74(366), pp. 427–431. <https://doi.org/10.1080/01621459.1979.10482531>
5. Engle, R.F. and Granger, C.W.J. (1987) 'Co-integration and error correction: Representation, estimation, and testing', *Econometrica*, 55(2), pp. 251–276. <https://doi.org/10.2307/1913236>
6. Felbermayr, G. and Kohler, W. (2010) 'Modelling the extensive and intensive margins of world trade', *Review of World Economics*, 146(2), pp. 229–252. <https://doi.org/10.1007/s10290-010-0066-6>
7. Goldstein, J.L., Rivers, D. and Tomz, M. (2007) 'Institutions in international relations: Understanding the effects of the GATT and the WTO on world trade', *International Organization*, 61(1), pp. 37–67. <https://doi.org/10.1017/S0020818307070026>
8. Granger, C.W.J. and Newbold, P. (1974) 'Spurious regressions in econometrics', *Journal of Econometrics*, 2(2), pp. 111–120. [https://doi.org/10.1016/0304-4076\(74\)90034-7](https://doi.org/10.1016/0304-4076(74)90034-7)
9. Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2019) *Multivariate Data Analysis*. 8th edn. Andover: Cengage Learning EMEA.
10. Helms, M.M. and Nixon, J. (2010) 'Exploring SWOT analysis: Where are we now?', *Journal of Strategy and Management*, 3(3), pp. 215–251. <https://doi.org/10.1108/17554251011064837>
11. International Monetary Fund (IMF) (2024) *Uzbekistan: 2024 Article IV Consultation—Staff Report*. Washington, DC: International Monetary Fund.
12. Liu, X. (2009) GATT/WTO promotes trade strongly: Sample selectivity and model specification', *Review of International Economics*, 17(3), pp. 428–446. <https://doi.org/10.1111/j.1467-9396.2009.00816.x>

Proofreader: Xondamir Ismoilov
Layout and Designer: Hasan Maqsudov

2026. № 9

© When materials are reproduced, the ECONOSCITECH-INTEGRATION journal must be cited as the source. Authors are responsible for the accuracy of the information in materials and advertisements published in the journal. Editorial opinions may not always align with those of the authors. Submitted materials will not be returned to the editorial office.

To publish articles in this journal, you may submit articles, advertisements, stories, and other creative materials through the following links. Materials and advertisements are published on a paid basis.

You may subscribe to the journal at any time using the following details. Once subscribed, please send a screenshot or photo of your payment confirmation to our Telegram page @iqtisodiyot_77. Based on this, we will send the latest issue of the journal to your address each month.

Our address: Tashkent city, Yunusobod district, 19th block, House 17.

