

# MUHANDISLIK

## & IQTISODIYOT

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

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# **muhandislik** **& iqtisodiyot**

ijtimoiy-iqtisodiy, innovatsion texnik,  
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- 05.01.00 – Axborot texnologiyalari, boshqaruv va kompyuter grafikasi
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- 05.01.02 – Tizimli tahlil, boshqaruv va axborotni qayta ishlash
- 05.01.03 – Informatikaning nazariy asoslari
- 05.01.04 – Hisoblash mashinalari, majmualari va kompyuter tarmoqlarining matematik va dasturiy ta'minoti
- 05.01.05 – Axborotlarni himoyalash usullari va tizimlari. Axborot xavfsizligi
- 05.01.06 – Hisoblash texnikasi va boshqaruv tizimlarining elementlari va qurilmalari
- 05.01.07 – Matematik modellashtirish
- 05.01.11 – Raqamli texnologiyalar va sun'iy intellekt
- 05.02.00 – Mashinasozlik va mashinashunoslik
- 05.02.08 – Yer usti majmualari va uchish apparatlari
- 05.03.02 – Metrologiya va metrologiya ta'minoti
- 05.04.01 – Telekommunikatsiya va kompyuter tizimlari, telekommunikatsiya tarmoqlari va qurilmalari. Axborotlarni taqsimlash
- 05.05.03 – Yorug'lik texnikasi. Maxsus yoritish texnologiyasi
- 05.05.05 – Issiqlik texnikasining nazariy asoslari
- 05.05.06 – Qayta tiklanadigan energiya turlari asosidagi energiya qurilmalari
- 05.06.01 – To'qimachilik va yengil sanoat ishlab chiqarishlari materialshunosligi
- 05.08.03 – Temir yo'l transportini ishlatish
- 05.09.01 – Qurilish konstruksiyalari, bino va inshootlar
- 05.09.04 – Suv ta'minoti. Kanalizatsiya. Suv havzalarini muhofazalovchi qurilish tizimlari
- 10.00.06 – Qiyosiy adabiyotshunoslik, chog'ishtirma tilshunoslik va tarjimashunoslik
- 10.00.04 – Yevropa, Amerika va Avstraliya xalqlari tili va adabiyoti
- 08.00.01 – Iqtisodiyot nazariyasi
- 08.00.02 – Makroiqtisodiyot
- 08.00.03 – Sanoat iqtisodiyoti
- 08.00.04 – Qishloq xo'jaligi iqtisodiyoti
- 08.00.05 – Xizmat ko'rsatish tarmoqlari iqtisodiyoti
- 08.00.06 – Ekonometrika va statistika
- 08.00.07 – Moliya, pul muomalasi va kredit
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- 08.00.09 – Jahon iqtisodiyoti
- 08.00.10 – Demografiya. Mehnat iqtisodiyoti
- 08.00.11 – Marketing
- 08.00.12 – Mintaqaviy iqtisodiyot
- 08.00.13 – Menejment
- 08.00.14 – Iqtisodiyotda axborot tizimlari va texnologiyalari
- 08.00.15 – Tadbirkorlik va kichik biznes iqtisodiyoti
- 08.00.16 – Raqamli iqtisodiyot va xalqaro raqamli integratsiya
- 08.00.17 – Turizm va mehmonxona faoliyati

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# MUNDARIJA

XIZMAT KO'RSATISH KORXONALARI FAOLİYATI SAMARADORLIGINING IJTIMOY-IQTISODIY AHAMIYATI .....	8
<i>Jumaniyazov Rashid Azamatovich, Ismailov Baxit Abdireymovich</i>	
O'ZBEKISTON QISHLOQ XO'JALIGINING TARMOQ TAHLILI.....	12
<i>Go'zal Samadova Solik qizi, Husan Normurodov</i>	
SUN'IY INTELLEKT ASOSIDA DAVLAT BOSHQARUV TIZIMLARINI RAQAMLASHTIRISH .....	17
<i>Aytmuratov Qutlimurat Jalgasovich, Aytmuratova Ulbike</i>	
O'ZBEKISTONDA MOLIYAVIY SEKTORINI RIVOJLANTIRISH OMILLARI .....	21
<i>Abdusalilov S.A., Normurodov X.E.</i>	
ФОРМИРОВАНИЕ СТРАТЕГИЧЕСКИХ ЦЕЛЕЙ ИНВЕСТИЦИОННОЙ ДЕЯТЕЛЬНОСТИ ПРЕДПРИЯТИЯ.....	27
<i>Абдужаидов Шохжахон Шухратович, Захидов Шухрат Шокирович, Насиров Дилшод Фархадович</i>	
СТЕЙБЛКОИНЫ КАК ФАКТОР ТРАНСФОРМАЦИИ ЭФФЕКТИВНОСТИ ФИНАНСОВОГО ПОСРЕДНИЧЕСТВА .....	31
<i>Бахтиярова А.Б., Алиева С.С.</i>	
TASHKILOT AXBOROT TIZIMLARINI KVANT TAHDIDLARIDAN HIMOYALASHDA POST-KVANT KRIPTOGRAFIK ALGORITMLARNI QO'LLASH.....	38
<i>G'ofurova Muxlisa G'ulom qizi, Tursunova Sadoqat Abdusalom qizi</i>	
CHORVACHILIKDA QIYMAT ZANJIRI: BARQARORLIK VA DAROMAD .....	44
<i>Saidov Muhammadali Hakimovich, Mahmatov Hoshim, Esanbekov Diyorbek</i>	
KICHIK BIZNES VA TADBIRKORLIK SUBYEKTLARIGA BERILAYOTGAN SOLIQ IMTIYOZLARINING SAMARADORLIGI .....	50
<i>Sarsengalieva Albina Askar Qizi, Sarsenbaev Baxitjan Abdulgazievich</i>	
STATISTIK TAHLILDA DASTURIY VOSITALARDAN FOYDALANISH .....	56
<i>Rizayeva Bahoroy Jahongir qizi, Daminova Barno Esanovna</i>	
QISHLOQ XO'JALIGI IQTISODIYOTINING YASHIL RIVOJLANISH XUSUSIYATLARI .....	62
<i>Dexkanova Shodiyona Kaxramon qizi, Normurodov X.E.</i>	
O'ZBEKISTON TURIZM INFRATUZILMASINI RIVOJLANTIRISHNING USTUVOR YO'NALISHLARI .....	66
<i>Abdurazakova Farangis Dilshod qizi, Normurodov X.E.</i>	
ИННОВАЦИОННЫЙ МЕНЕДЖМЕНТ В СИСТЕМЕ УПРАВЛЕНИЯ БИЗНЕС-ПРОЦЕССАМИ ОРГАНИЗАЦИИ В УСЛОВИЯХ ЦИФРОВОЙ ТРАНСФОРМАЦИИ ЭКОНОМИКИ .....	71
<i>Насиров Дилшод Фархадович, Абилова Мухлиса, Насимова Рухангиз</i>	
THE ROLE OF FOREIGN DIRECT INVESTMENT IN THE ECONOMY OF UZBEKISTAN .....	75
<i>Amanova Durdona Zoir qizi, Shodiboyeva Dilzoda Farhodjon qizi</i>	
ИНСТИТУЦИОНАЛ ISLOHOTLAR VA IQTISODIY O'SISH O'RTASIDAGI BOG'LIQLIK.....	80
<i>Yarboeva Farida Ulug'bekovna, Yoqubova Zilola Tura qizi</i>	
QURILISH YUKLARINI TASHISH JARAYONIDA LOGISTIKA MASALALARI.....	86
<i>Ne'matov Husniddin Alijon o'g'li, Maxmudov Abrorxon Axmadxonovich</i>	
RAQAMLI IQTISODIYOT: O'ZBEKISTONDA RIVOJLANISH MUAMMOLARI VA ISTIQBOLLARI .....	90
<i>Yo'ldashaliyev Muxammadaziz Xabibulla o'g'li, Yoqubova Zilola Tura qizi</i>	
RAQAMLI IQTISODIYOT SHAROITIDA KICHIK BIZNESNI MIKROMOLIYALASHTIRISH ORQALI RIVOJLANTIRISH MUAMMOLARI .....	95
<i>Tojiyev Javlonbek Rustamovich, Yuldashev Sobirjon Xaknazarovich, Abdullayev Sunnat Nurullayevich</i>	



ОПРЕДЕЛЕНИЕ И АНАЛИЗ ВЫРАЖЕНИЙ ЛИЦА НА ЦИФРОВЫХ ИЗОБРАЖЕНИЯХ С ПОМОЩЬЮ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА.....	101
Гофуржонов М.Р., Абдуллаев А.А.	
CHALLENGES AND PROSPECTS OF THE AUTOMOTIVE INDUSTRY OF UZBEKISTAN UNDER WTO ACCESSION.....	106
Olha N. Hapievva, Sukhrob Bobojonov	



# CHALLENGES AND PROSPECTS OF THE AUTOMOTIVE INDUSTRY OF UZBEKISTAN UNDER WTO ACCESSION

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**Abstract:** This article examines the transformation of the automotive industry in the Republic of Uzbekistan in the context of its integration into the World Trade Organization (WTO). Based on the analysis of statistical data, current industry conditions, and market liberalization commitments, the study systematically identifies key challenges and development opportunities. The main challenges include increased competition due to tariff reduction, the need to align production with Euro-5 Euro-6 environmental standards, and the growing pressure on transport infrastructure associated with rising motorization. The study also evaluates the role of non-tariff regulatory instruments, particularly the recycling fee, as well as the potential for implementing circular economy principles. The findings highlight the transition toward a more competitive and diversified industrial model, emphasizing the importance of technological modernization, export development, and integration into global value chains. The research underlines the significance of harmonizing state policy with WTO requirements, environmental priorities, and sustainable industrial development goals.

**Keywords:** automotive industry, WTO, liberalization, recycling fee, infrastructure.

**Annotatsiya:** Mazkur maqolada O'zbekiston Respublikasining Jahon savdo tashkilotiga (WTO) integratsiyalashuvi sharoitida avtomobil sanoatining transformatsiyasi tahlil qilinadi. Statistik ma'lumotlar, tarmoqning joriy holati hamda savdo liberallasuvi shartlari asosida sohaning asosiy muammolari va rivojlanish istiqbollari tizimli ravishda yoritilgan. Asosiy omillar qatoriga tariflarning pasayishi natijasida raqobatning kuchayishi, ishlab chiqarishni Euro-5 Euro-6 ekologik standartlariga moslashtirish zarurati hamda avtomobillashuv ortishi bilan bog'liq transport infratuzilmasiga tushayotgan yuklama kiradi. Shuningdek, qayta ishlash yig'imi kabi notarif tartibga solish mexanizmlarining roli hamda aylana iqtisodiyot tamoyillarini joriy etish imkoniyatlari baholangan. Tadqiqot natijalari sanoatning import o'rnini bosishga asoslangan modeldan raqobatbardosh va diversifikatsiyalashgan tizimga o'tishini ko'rsatadi. Shu bilan birga, texnologik modernizatsiya, eksport salohiyatini oshirish va global qiymat zanjirlariga integratsiyaning muhimligi asoslab beriladi. Davlat siyosatini WTO talablari, ekologik ustuvorliklar hamda barqaror sanoat rivoji maqsadlari bilan uyg'unlashtirish zarurligi ta'kidlanadi.

**Kalit so'zlar:** avtomobil sanoati, WTO, liberallasuv, qayta ishlash yig'imi, infratuzilma.

**Аннотация:** В данной статье рассматривается трансформация автомобильной промышленности Республики Узбекистан в условиях интеграции в Всемирную торговую организацию (WTO). На основе анализа статистических данных, текущего состояния отрасли и условий либерализации торговли системно определены ключевые вызовы и перспективы развития. К основным факторам относятся усиление конкуренции вследствие снижения тарифных барьеров, необходимость приведения производства в соответствие с экологическими стандартами Euro-5 Euro-6, а также возрастающая нагрузка на транспортную инфраструктуру в условиях роста автомобилизации. В работе также оценивается роль нетарифных механизмов регулирования, в частности утилизационного сбора, и возможности внедрения принципов циркулярной экономики. Полученные результаты свидетельствуют о переходе отрасли к более конкурентной и диверсифицированной модели развития. Подчеркивается значимость технологической модернизации, расширения экспортного потенциала и интеграции в глобальные цепочки создания стоимости. Отмечается необходимость согласования государственной политики с требованиями WTO, экологическими приоритетами и целями устойчивого промышленного развития.

**Ключевые слова:** автомобильная промышленность, WTO, либерализация, утилизационный сбор, инфраструктура.



## INTRODUCTION

The automotive industry of Uzbekistan constitutes a strategically important sector of the national industrial complex, accounting for approximately 10% of total industrial output. Over recent decades, the industry has developed as an import-substituting sector, primarily oriented toward the domestic market and supported by consistent state policies and tariff regulation mechanisms [1, 5]. In the context of Uzbekistan's accession to the World Trade Organization (WTO), the sector is entering a new stage of development that requires adaptation to open competition and international standards. In particular, the gradual reduction of tariff barriers contributes to a more competitive market environment, while also encouraging domestic producers to enhance efficiency and product quality. At the same time, the alignment of production processes with Euro-5 Euro-6 environmental standards and technical regulations creates favorable conditions for technological upgrading and environmental sustainability. The increasing number of private vehicles, together with the ongoing development of road infrastructure, highlights the importance of expanding and modernizing transport systems to ensure balanced sectoral growth [4, 5, 6]. Furthermore, existing structural features, including export concentration and the leading role of UzAuto Motors, indicate the need for further diversification and the strengthening of competitive mechanisms within the industry. Overall, these factors underline the importance of enhancing sectoral competitiveness, improving environmental performance, and supporting stable economic growth through infrastructure development [7, 15].

The aim of this study is to identify the key challenges and development opportunities for the transformation of Uzbekistan's automotive industry in the context of WTO integration, as well as to propose effective mechanisms for institutional and technological adaptation. The research approach emphasizes achieving a balance between market liberalization, sustainable urban infrastructure development, and environmental safety. In addition, the study outlines strategic directions for sectoral advancement, including production modernization, export promotion, the implementation of circular economy principles, and the development of an effective and adaptive state policy framework suited to evolving economic conditions.

The novelty of this research lies in its comprehensive and systematic analysis of the transformation processes in Uzbekistan's automotive industry associated with WTO accession. Particular attention is given to the role of infrastructural development and non-tariff regulatory instruments, such as the recycling fee, in supporting fleet renewal and promoting circular economy practices. The study also highlights the growing importance of technological modernization in response to the expansion of the electric vehicle (EV) segment and the corresponding need for infrastructure development. Moreover, the research provides additional insights into the adaptation processes of small and medium-sized enterprises (SMEs) to international standards, thereby enriching existing economic perspectives. This integrated approach contributes to a deeper understanding of current trends and future development opportunities within the automotive industry.

## LITERATURE REVIEW

Current studies on Uzbekistan's integration into the global trading system primarily emphasize the macroeconomic benefits of liberalization, the attraction of foreign direct investment, and the development of traditional export-oriented industries, including the textile and agricultural sectors [17, 21]. At the same time, analyses conducted by the Center for Economic Research and Reforms (CERR), as well as reports from the World Bank, the Asian Development Bank, and other international organizations, highlight the importance of further strengthening sectoral and infrastructural dimensions to ensure balanced economic development [5, 6, 7]. In particular, attention is drawn to the need for continued improvement in transport logistics systems, the optimization of road network efficiency, and the expansion of infrastructure capacity, all of which play a crucial role in supporting export growth and the sustainable development of the automotive industry [11, 13, 14].

In addition, environmental considerations—especially those related to the implementation of “green” technologies within the framework of WTO integration—are increasingly recognized as an important component of long-term industrial development. Reports by the European Environment Agency and the United Nations Environment Programme underline the growing significance of aligning environmental and economic objectives to ensure sustainable outcomes [15, 18]. Furthermore, the adoption of technical regulations and international standards, including Euro emission norms, requires substantial investment, while simultaneously creating opportunities for technological upgrading and increased competitiveness of small and medium-sized enterprises (SMEs) [2, 20].

A particularly important emerging direction is the development of a circular economy, which is widely regarded as a key factor in improving resource efficiency, reducing production costs, and enhancing sustainability within the automotive sector [18]. In this context, analyses by McKinsey & Company and the World Economic Forum indicate that the future of the automotive industry is closely associated with digitalization, the expanding role of electric vehicles, and deeper integration into global value chains. These perspectives further emphasize the importance of institutional reforms, infrastructure development, and innovative approaches in supporting the successful transformation of Uzbekistan's automotive industry.

## RESEARCH METHODOLOGY

The study employs an integrated methodological approach that combines comparative analysis, structural analysis, and a comprehensive review of secondary data. Comparative analysis is applied to assess the potential effects of Uzbekistan's accession to the World Trade Organization (WTO) on the automotive industry by examining changes in tariff regulation, competitive dynamics, and institutional requirements. Structural analysis enables the identification of key directions of sectoral transformation, including the transition from an import-substitution model to a more diversified and competitive industrial structure.

The research is grounded in the systematic analysis of statistical data, regulatory documents, and analytical sources related to trade liberalization, environmental standards, infrastructure development, and non-tariff regulatory instruments. This methodological framework facilitates a comprehensive understanding of the key challenges and emerging opportunities associated with WTO integration. The findings highlight the growing importance of technological modernization, export promotion, and the alignment of national policies with WTO principles and sustainable development objectives, thereby supporting the long-term competitiveness and resilience of the automotive industry.

## ANALYSIS AND RESULTS

The automotive industry of the Republic of Uzbekistan constitutes one of the most significant sectors of the national economy, accounting for approximately 10% of total industrial output [1, 5]. The formation of the sector began in the mid-1990s with the establishment of the UzDaewooAuto joint venture, which marked the foundation of the national automotive industry. Since that period, the industry has undergone several stages of institutional transformation: following the restructuring of cooperation with the South Korean company Daewoo in 2008, a new phase of development was initiated through the establishment of GM Uzbekistan in partnership with General Motors. Subsequently, in 2019, the enterprise was reorganized under the management of UzAuto Motors [1]. This evolutionary trajectory reflects a significant level of state participation, which has contributed to the preservation and development of industrial capacity while also shaping a relatively concentrated market structure. By 2024, UzAuto Motors accounted for approximately 88% of the domestic market, with a moderate decrease to 82–83% in 2025 following the entry of new manufacturers such as ADM Jizzakh, Khorezm Auto, and BYD Uzbekistan [4, 5, 6].

The current model of Uzbekistan's automotive industry has historically been oriented toward import substitution and the domestic market, supported by tariff regulation and import management mechanisms [5]. Production indicators demonstrate steady sectoral growth: passenger vehicle output increased from 306,000 units in 2022 to over 457,000 units in 2025, reflecting a growth rate of 28.5% [3, 4]. At the same time, export activities remain largely concentrated within CIS markets, indicating the importance of further expanding geographic diversification and strengthening external market integration [7].

Uzbekistan's accession to the World Trade Organization (WTO) marks a transition toward a more open and competitive economic environment, characterized by the gradual reduction of import tariffs and the liberalization of trade regimes [17, 21]. In this context, domestic manufacturers are encouraged to enhance efficiency, product quality, and innovation capacity in order to compete effectively with international producers. A notable increase in passenger vehicle imports has already been observed: by the end of 2024, import volumes exceeded 73,000 units, representing a 1.5-fold increase compared to 2022 [1]. This trend contributes to greater market dynamism, supports price competitiveness, and stimulates improvements in product quality and service infrastructure.

An important area of development is the adaptation to international technical and environmental standards, particularly Euro-5 Euro-6 requirements. The implementation of these standards, initiated in 2020, establishes a framework for improving environmental performance and technological efficiency [2]. While this process requires modernization of existing production capacities and additional investment, it simultaneously creates opportunities for technological advancement and increased competitiveness. At the same time, the continued import of high-tech components, including electronic systems and transmissions, highlights the need for further localization and the development of domestic supply chains [1]. In parallel, the electric vehicle (EV) segment is expanding rapidly: in 2024, EV imports exceeded 25,000 units, doubling compared to the previous year. This dynamic underscores the importance of developing supporting infrastructure and advancing the transition toward sustainable mobility [3, 16, 20].

The development of transport and road infrastructure plays a crucial role in supporting the sustainable growth of the automotive industry. Over the past decade, the national vehicle fleet has expanded more than 1.5-fold, exceeding 4 million units, while the motorization rate has reached 140–160 vehicles per 1,000 inhabitants. These trends highlight the importance of continued investment in infrastructure development, particularly in major urban centers. In Tashkent, which accounts for over 20% of the national vehicle fleet, increased traffic intensity has underscored the need for improved traffic management and infrastructure expansion [5, 8, 10].



Average travel speeds during peak hours range between 15–20 km/h, and travel times have increased by 1.5–2 times compared to free-flow conditions [11]. These developments emphasize the importance of enhancing transport efficiency, reducing operational costs, and improving environmental conditions.

At present, the expansion of the road network remains an important priority. The density of paved roads in Uzbekistan is approximately 0.4–0.5 km per km<sup>2</sup>, which indicates significant potential for further development [6, 13]. A considerable share of infrastructure operates under high load conditions, highlighting the need for systematic modernization and maintenance. Expert assessments suggest that increasing annual investment in transport infrastructure to 4–6% of GDP would contribute to long-term sectoral sustainability and economic growth [7, 14].

From an economic perspective, infrastructure quality directly influences consumer behavior, operational efficiency, and the overall attractiveness of vehicle ownership. In this regard, continued improvements in infrastructure will support market expansion and enhance overall sector performance [5]. Given the ongoing liberalization of foreign trade and the increasing availability of imported vehicles, further development of transport systems will play a key role in maintaining balanced growth.

The recycling fee is emerging as an effective regulatory instrument within the evolving economic framework. It serves to support fiscal stability while simultaneously encouraging the renewal of the vehicle fleet and the adoption of environmentally sustainable practices. This approach contributes to the development of a circular economy, facilitating waste reduction, material recovery, and reduced dependence on imported resources. In addition, it supports the emergence of related industries and may contribute to a reduction in production costs by 10–20% [4, 18].

Technological modernization remains a central pillar of industry development. The integration of automated production lines, digital management systems, and advanced quality standards is essential for strengthening international competitiveness [1, 19]. Enhancing labor productivity through technological upgrading and improved management practices represents a key opportunity for further growth.

Expanding export potential requires both improvements in product quality and the diversification of export destinations beyond traditional CIS markets [7]. Integration into Global Value Chains (GVCs) offers access to advanced technologies and facilitates increased export volumes, thereby contributing to overall economic development [5].

The growing adoption of electric vehicles in Uzbekistan further underscores the importance of developing charging infrastructure and supporting technological ecosystems. Continued investment in this area will accelerate the transition toward sustainable and environmentally friendly transport systems [16, 20].

Within the framework of WTO accession, the role of the state is evolving toward the implementation of flexible economic instruments that support modernization, innovation, and competitive market development while ensuring compliance with international rules [4, 17]. Strengthening competition, reducing administrative barriers, and encouraging new market participants will further enhance sectoral efficiency and resilience.

To illustrate the dynamics of passenger vehicle production in Uzbekistan alongside the share of imported vehicles, the following data for the period 2022–2025 are presented (Figure 1).

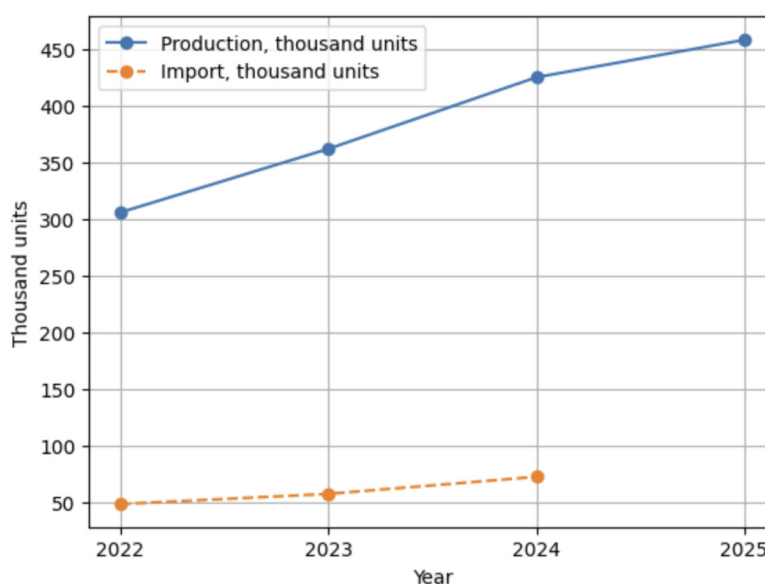


Figure 1. Production and import of passenger cars in Uzbekistan, 2022–2025.<sup>1</sup>

<sup>1</sup> Source: compiled by the authors based on statistical data [1], [3], [4]. Note: import data for 2025 are unavailable.

The figure illustrates the dynamics of passenger vehicle production and imports in Uzbekistan over the period 2022–2025. It shows a steady upward trend in domestic production, which increased from approximately 306 thousand units in 2022 to over 450 thousand units in 2025, indicating consistent industrial growth and capacity expansion. At the same time, imports also demonstrate a gradual rise, growing from around 50 thousand units in 2022 to about 70 thousand units in 2024, reflecting increasing market openness and consumer demand for foreign vehicles. Overall, the data suggest a simultaneous expansion of domestic production and import activity, highlighting intensifying competition and ongoing market development (Table 1).

Table 1. Vehicle Sales Volumes by Leading Manufacturers in Uzbekistan (2025)<sup>2</sup>

Manufacturer	Sales Volume (units)
UzAuto Motors	162 677
Khorezm Auto	116 541
ADM Jizzakh	36 650
BYD Uzbekistan	19 266

The analytical data indicate that Uzbekistan's automotive industry demonstrates stable production growth and a gradual diversification of its market structure, while maintaining a coordinated role of state policy and an evolving competitive environment. In the context of accession to the World Trade Organization (WTO), the sector is entering a new stage characterized by enhanced competition, the increasing importance of technological modernization, and the need to strengthen transport systems. Ensuring sustainable and effective development requires a comprehensive and balanced approach, including the modernization of production processes, the expansion of infrastructure, alignment with international environmental standards, the implementation of circular economy principles, and the diversification of export activities.

## CONCLUSIONS AND RECOMMENDATIONS

The automotive industry of Uzbekistan is currently undergoing a transitional phase associated with its integration into the World Trade Organization (WTO), which creates new opportunities for strengthening competitiveness and ensuring sustainable development. This transformation is characterized by increasing competitive dynamics, the growing importance of manufacturing modernization, and the need for continued improvement of transport and infrastructure systems. The rapid growth in vehicle ownership, combined with a relatively concentrated market structure, highlights the importance of further enhancing the institutional framework and accelerating infrastructure development.

At the same time, the sector demonstrates substantial potential for growth through technological modernization, the advancement of environmentally friendly transportation, and the application of circular economy principles. Effective adaptation to these evolving conditions will contribute to improved competitiveness and the sustainable development of the automotive industry in both domestic and international markets. In this context, a well-balanced state policy that integrates investment and innovation incentives with efficient regulatory mechanisms and infrastructure support plays a crucial role.

To further strengthen the sector, it is recommended to accelerate technological modernization through the adoption of automation and digital systems in order to enhance productivity and competitiveness. Increasing investment in transport infrastructure will support the reduction of congestion and facilitate sustainable industry expansion. Promoting export diversification is essential for accessing new markets and reducing reliance on limited regions. In addition, priority should be given to the development of electric vehicle infrastructure and green technologies to ensure compliance with environmental standards. The implementation of circular economy practices, including effective recycling systems, will contribute to resource efficiency and sustainability. Finally, aligning national policies with WTO requirements while supporting domestic enterprises and fostering a competitive environment will ensure balanced and long-term industrial development.

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