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Article

Assessment of The Development of Cooperation Activities of Industrial Enterprises and Their Impact on The Development of Automotive Production Activities in Uzbekistan

Xomidov Mirodiljon Xasanboy o'g'li[1]

1. Fergana Polytechnic Institute, PhD student

* Correspondence: murod98.xm@gmail.com

Abstract: This article examines the development trends of cooperative activities among industrial enterprises in Uzbekistan and evaluates their impact on the growth of the automotive industry. Special attention is given to the formation of industrial clusters through partnerships among local manufacturers of automotive components, and how these cooperative links contribute to technological integration and increased export potential. Based on statistical data from 2012 to 2023, the study analyzes how industrial cooperation has influenced innovation-driven growth, the expansion of production capacities, and integration into global markets within the automotive sector. The article also presents policy recommendations and practical measures to enhance the efficiency and sustainability of industrial cooperation mechanisms in Uzbekistan.

Keywords: industrial cooperation, automotive industry, clustering, spare parts, export potential, industrial enterprises, Uzbekistan, innovation, production integration, technological chains

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1. Introduction

Today, industrial cooperation is not only one of the ways of organizing production, but also an important socio-economic institution. The institutionalization of industrial cooperation occurs when cooperative relations acquire a widespread, stable character, when various norms regulating industrial cooperative relations and its individual types are adopted at all levels of the legislative system, and when qualitative changes occur when entering into industrial cooperative relations. Improves the content of economic activity of business entities.

The institutionalization of industrial cooperation can have a long-term positive economic effect not only for the participants of the cooperation process themselves, but also for the whole state in the form of an increase in the tax base, as well as for society as a whole. Industrial cooperation allows for the creation of new jobs, additional tax benefits, and the achievement of a social effect manifested in increasing production volumes[1].

Having studied the process of industrial cooperation from the point of view of game theory, we can conclude that the total income from cooperation consists of the achievements of all participants in the process. If one of the participants in industrial cooperation does not benefit from interaction with other participants, then the overall result of the value chain will also be unsatisfactory. Such a value chain cannot exist for a long time. Game theory, which is the mathematical basis of the industrial cooperation process, proves that to achieve the effect of industrial cooperation, it is necessary to take into account the interests of all participants in this process.

2. Materials and Methods

The development of industrial cooperation has increasingly become a focal point in the academic and policy-related discourse on sustainable industrialization and sectoral modernization. Scholars worldwide recognize like Porter and Gereffi that industrial cooperation, especially in complex sectors such as automotive production, plays a pivotal role in ensuring supply chain stability, promoting technological transfer, and enhancing competitive advantage[2].

In global contexts, countries like Germany, Japan, and South Korea have demonstrated that strong inter-firm collaboration networks among component suppliers, assembly plants, and innovation centers are crucial for creating competitive automotive industries said Sturgeon These cooperative models emphasize vertical and horizontal integration, joint innovation platforms, and shared logistics systems. In the case of post-Soviet economies, including Uzbekistan, the transition from centrally planned production to market-oriented industrial systems has led to the reconfiguration of industrial relationships. Uzbekistan's industrial development policies have actively promoted localization and cluster-based development models, especially in strategic sectors like automobile manufacturing[3]. Recent empirical studies underline that cooperation between domestic automotive component manufacturers, such as Uz Dong Yang, UzSungwoo, and Avtooyna, has significantly contributed to import substitution and increased export potential. The interaction between these firms and global partners, particularly from South Korea and China, has also driven improvements in quality standards and technological upgrading[4]. Moreover, international experiences show that policy-driven cooperation, when paired with performance-based incentives, accelerates sectoral transformation (OECD, 2021)[5]. In this regard, Uzbekistan's policy shift toward encouraging public-private partnerships, co-financed innovation programs, and export-oriented clustering is a promising strategy but requires more empirical assessment and institutional support.

3. Results and Discussion

Currently, there are problems related to the development of cooperation between industrial sectors and enterprises, which can be divided into three groups (Fig. 1.1).

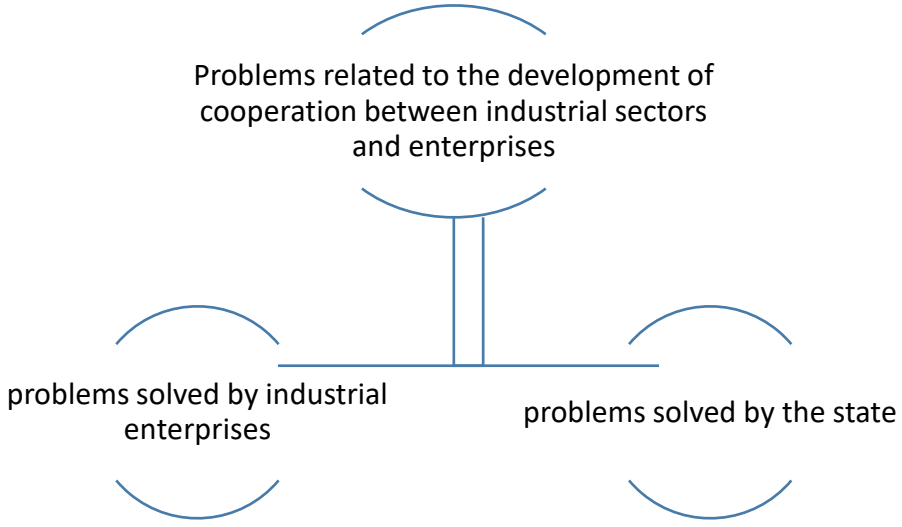

Figure 1.1. Problems related to the development of cooperation of industrial enterprises.

Examples of problems related to the development of cooperation between industrial sectors and enterprises, which are solved by the state, are:

- creation of a regulatory framework for the implementation of reforms for the development of industrial sectors, creating conditions corresponding to the activities of farms and dehkan farms;

- implementation of measures to prevent the formation of a monopolistic situation in the sphere of material and technical supply and provision of services;
- development of processes for attracting foreign equipment and technologies and other investments in the development of the industrial sector;
- it is required to provide the industry with the achievements of agricultural science and introduce mechanisms for managing and financing the organization of scientific support for the industry [6].

If the state's contribution to solving the above-mentioned problems is high, then the problems we want to highlight below are those that industrial enterprises must solve directly themselves. Organization of production based on the problems solved by industrial enterprises, organization of efficient use of material, technical, financial, and labor resources; effective planning of production and sales of products; increasing the competitiveness of production by reducing costs and improving product quality; organization of product processing; introduction of resource-saving technologies using scientific achievements, etc. However, solving these issues is quite difficult for industrial enterprises. In production, the concept of "cooperation" is used in relation to the interaction of several industrial enterprises, the specifics of production, and high-tech products [7].

When the concept of "cooperation" in production is used in relation to the interaction of several industrial enterprises, the specifics of production and the characteristics of high-tech products arise differently, unlike traditional production (Fig. 1.2).

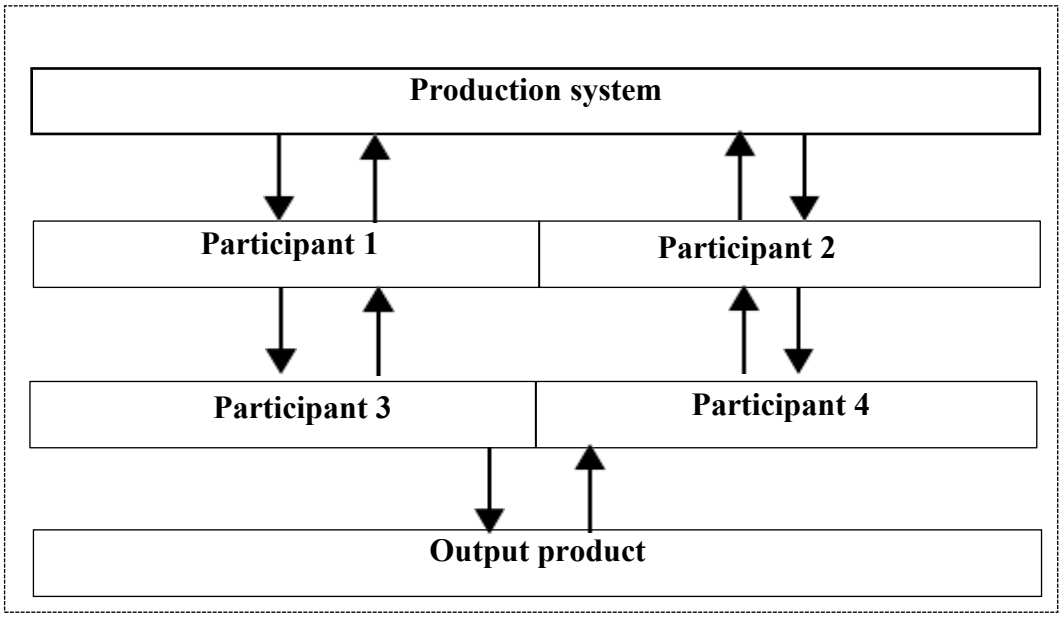

Figure 1.2. Inequitable distribution at several stages of production interaction.

The features that form a mutual cooperation of participants within the framework of the system for the production of high-tech products include:

1) active participation-the participant is required not only to use financial resources, but also to provide information, equipment, knowledge and skills of employees in order to solve the total `1 together;
2) the duration of production ties-cooperation is not the only act or the only consequence of the fulfillment of the contractual obligations of an industrial enterprise, on the contrary, participation in cooperation is repeatedly involved in the sequential solution of one problem within the framework of repeated technological operation;
3) stability of the role in the production process-the participant takes its place in the production system and performs the same operations in several production cycles;
4) cooperative cooperation-participation, participation in the joint solution of problems-nik organizes a cooperative of its units and employees in its production subsystem;

5) organizational framework-all participants in the cooperation clearly understand the responsibility for their roles, tasks, powers and deadlines, the quality and size of the results;
6) the scope of the problem to be solved – the task to be solved by the participants of the cooperative has a higher level than each participant, and it cannot be solved individually without interaction with other industrial enterprises [8].

The work shows that within the framework of cooperation, the logistics component of the production chain is complicated, since different manufacturers are required to coordinate the supply not only at the price, but also at deadlines. One of the innovations of the production distributed technological chain is the organizational scheme, in which the redistribution of production networks is necessary in several stages, and there are no stable production trajectories.

This approach makes it possible to generalize the competitive advantages produced by the production cooperative to the list of factors for the development of the production cooperative.

Table 1.1. Factors affecting the development of the activities of the cooperative of industrial enterprises and their description

Factors	Subfactors
Economic factors	macroeconomic stability
	effective cost and income management:
	investment environment
Technological factors	level of technological development
	innovation and collaborative research and development (r&d) technological progress
	compliance with technological indicators: compliance of the product with quality standards and constant quality improvement
Social and cultural factors	staff qualification
	corporate culture
	social relations
Infrastructure factors	transport infrastructure
	communications infrastructure
	production infrastructure
Political and legal factors	legislative base
	state support
	political stability
Competition factors	level of competition
	market segmentation
	competitive advantage
International factors	globalization
	international standards
	trade agreements
Environmental factors	environmental law
	environmental responsibility
	sustainable development

When analyzing the behavior of enterprises in a cooperative, industrial enterprises have an important role in the development of motives related to technological development, such as providing a financial and resource base for the implementation of

cooperative projects, reducing costs and increasing profits, working together to develop and introduce new technologies, and saving the costs of R & D, and the exchange of complementary technologies often [9].

Another important aspect of the factors affecting the development of cooperative activities in production by various enterprises of industrial sectors is the reduction of the risk of adverse effects of the external environment. To analyze the technological factors affecting the development of the cooperative activities of industrial enterprises, it is necessary to consider the following main aspects, which are important for enterprises to adopt new technologies and introduce modern technologies.

Modern equipment and production systems for industrial cooperation to be successful, it is necessary to have modern equipment and production systems. This will help automate and optimize production processes. Economic factors, technological factors, social and cultural factors , infrastructure factors , political and legal factors, international factors , state support of the network within the group of environmental factors and the development of the activities of the automotive industry are the main factors affecting the development of the enterprise cooperative development activities in the automotive industry [10].

We carry out a SWOT analysis based on the intersection of the above factors with each other. (Table 1.1). To the dominant part of the intersection matrix we place the strengths and weaknesses of cooperative activities at enterprises of the automotive industry in Uzbekistan, and to the row part the existing opportunities and risks and threats that can negatively affect the development of the market.

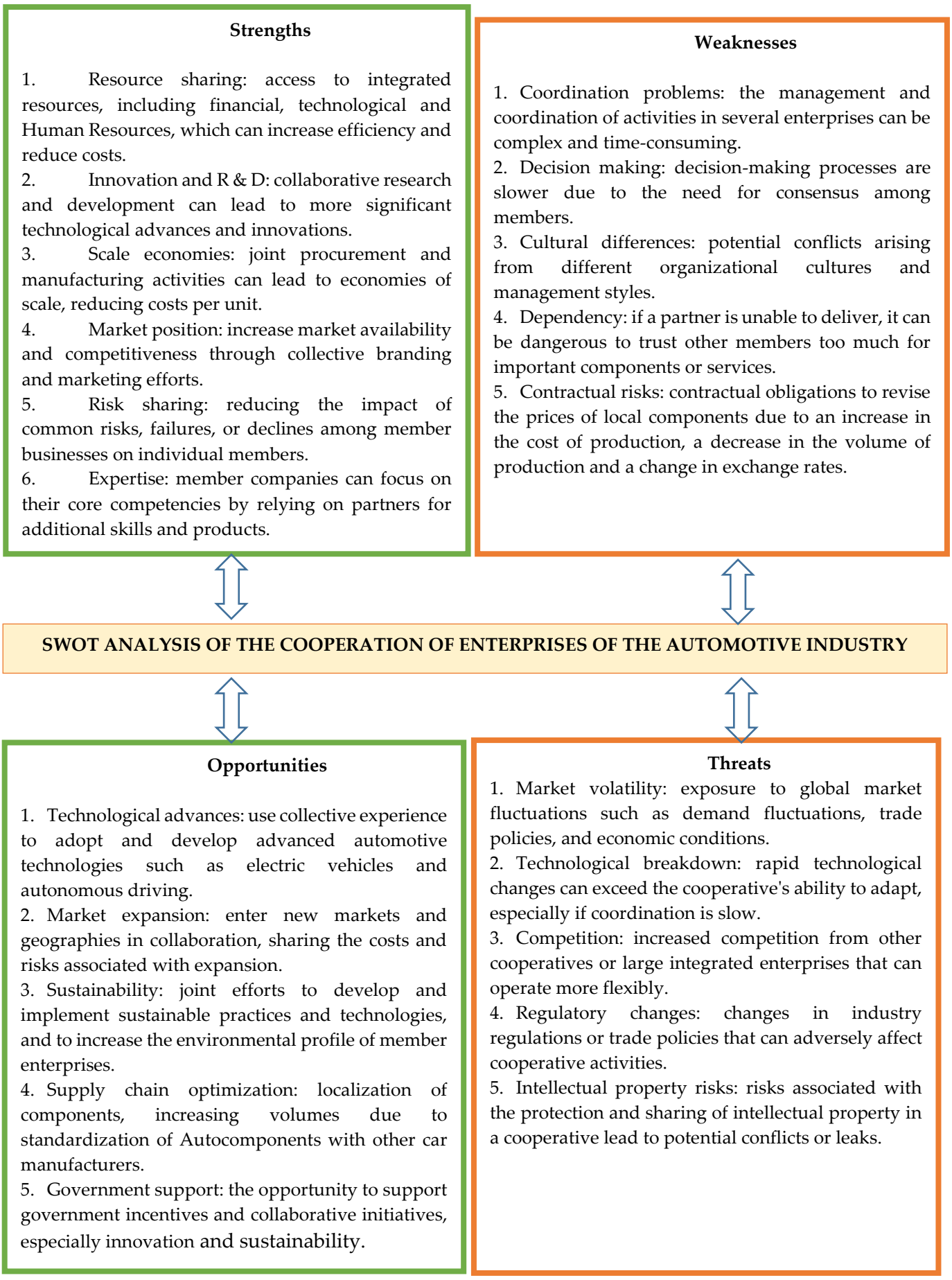

Figure 1.3. SWOT analysis of the cooperation of enterprises of the automotive industry

The analysis of technological factors affecting the development of the cooperative activities of industrial enterprises shows that the adoption of modern technologies, innovative activities, technological infrastructure, the use of Information Technology and communication tools, compliance with standardization and technical regulations, the exchange of personnel qualifications and technological knowledge, and technological investments are necessary conditions for the success of the cooperative. Given these factors, effective cooperative strategies can be developed and implemented [11].

Based on the above factor SWOT analysis and the analysis of the results of a survey of business entities operating in the automotive industry, we consider it advisable to carry out activities in the direction of organizing the activities of the automotive industry in our country and improving the efficiency of network development processes in the following areas:

-step-by-step development of the necessary infrastructure systems for the development of the industry based on a factor analysis of the potential of the automotive industry in the regions;

- to accelerate innovation, automotive enterprises in Uzbekistan must jointly carry out research and development projects. For example, new technologies produced in cooperation between the state of the art and the South Korean company Hyundai;

- expand international cooperation to import technological knowledge from developed countries and adapt it to local conditions. This process can be carried out, for example, through cars produced in Uzbekistan together with Volkswagen;

- the government can accelerate the process of attracting investments by providing tax incentives and government loans to investors. For example, a partnership with China'S SAIC Motor Corporation;

To enter new markets, it is necessary to develop joint marketing and export strategies. For example, expanding export opportunities to Central Asian and European markets.[12]

Thus, as a result of the production and technological cooperation of enterprises, to increase economic efficiency, reduce risks, accumulate knowledge and technologies, distribute responsibility among specialists in solving technologically complex problems and carry out R & D work as factors for the development of production cooperation encourages automotive enterprises to develop inter-company cooperation to ensure competitive advantages. The desire to achieve these advantages and the high production capacity of the automotive industry leads to an increase in production cooperation in it.

The cooperative network of automotive industry enterprises can use common resources, innovation and economies of scale to strengthen its position in the market and increase competitiveness. However, problems such as coordination, decision making and cultural differences need to be managed effectively.

The cooperative has great potential for technological progress, market expansion and sustainability, but it must also be alert to threats such as market volatility, technological disruptions and regulatory changes. Through strategic management of these factors, the cooperative can achieve sustainable growth and stability in the dynamic automotive industry.

The government's introduction of a number of industrial development policies and incentives supported the automotive industry. In 2023, the Government of Uzbekistan continued to provide tax incentives and loans aimed at developing the automotive industry. In 2023, a presidential decree reduced customs tariffs on imported cars in two stages, significantly increasing car imports. In 2023, the economy of Uzbekistan grew by 5%, which positively affected the car market. Car production during the year exceeded 418,000, which is 25.9% more than last year [13].

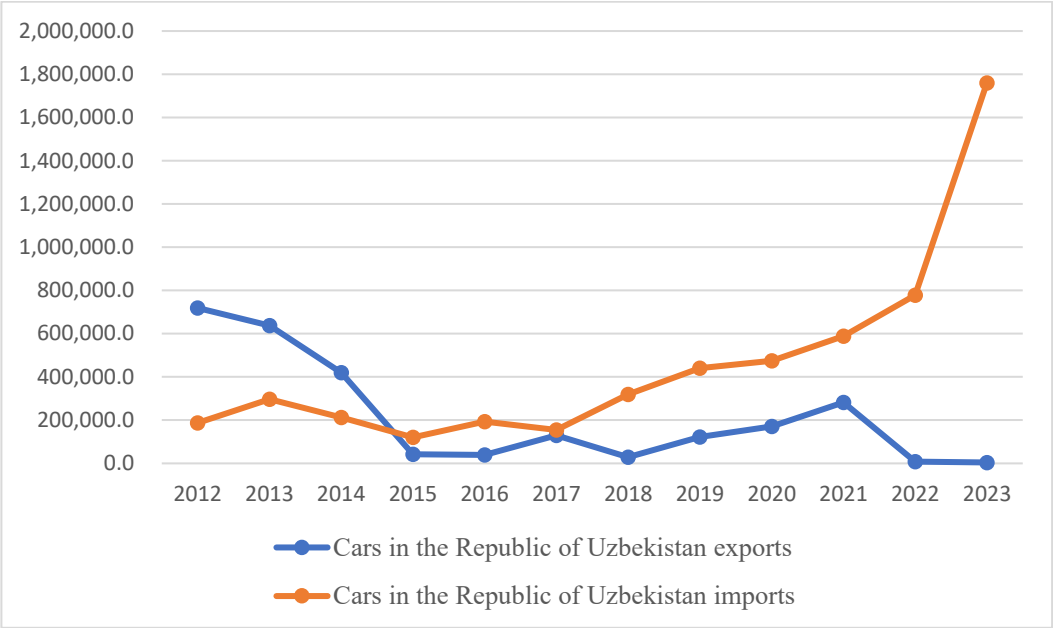

Figure. 1.4. Exports and imports cars in the Republic of Uzbekistan.

Exports dropped dramatically from $718,933.8 in 2012 to just $4,322.4 in 2023. Imports, on the other hand, increased significantly from $187,559.3 in 2012 to $1,759,687.1 in 2023 – nearly a tenfold growth. Industrial cooperation refers to collaboration among enterprises in production processes, including component supply, assembly, R&D, and shared infrastructure. These figures suggest weaknesses in Uzbekistan's industrial cooperation within the automotive sector [14].

Possible causes for the export decline are that lack of domestic component manufacturers (cooperative suppliers) limits the ability to produce fully localized vehicles for export. Also, low level of localization – dependence on imported parts makes domestic vehicles less competitive internationally. Insufficient technological cooperation – lack of joint ventures or technology partnerships limits access to innovation. On the other hand, reasons behind the sharp rise in imports are analysed that domestic production does not fully meet consumer demand in terms of volume, variety, or quality and weak supply chain and cooperation infrastructure – reliance on imported components results in more complete vehicles being imported.Moreover, consumer preference for foreign vehicles due to better features, designs, and performance [15].

The government can utilize industrial cooperation as a strategic solution to reverse current negative trends and strengthen the domestic automotive industry. This can be achieved by developing cooperative supply chains, encouraging partnerships between local firms for parts manufacturing and assembly, and fostering technological collaboration. Attracting foreign investment through joint ventures can help bring in advanced technologies. Supporting local component production by offering tax incentives and subsidies can further boost the role of domestic suppliers. Additionally, the establishment of automotive clusters and industrial parks can promote both vertical and horizontal integration. Finally, promoting export-oriented production by aligning with international design models and standards is essential to ensure competitiveness in foreign markets.

Between 2012 and 2023, Uzbekistan saw a sharp decline in light vehicle exports and a rapid rise in imports. This trend indicates weak industrial cooperation, limited integration among local producers, and overreliance on foreign-made vehicles. Strengthening industrial cooperation can help increase export potential, reduce import dependency, and build a more self-sufficient and competitive automotive sector [16].

4. Conclusion

By implementing these proposals and recommendations, it is possible to develop a cooperative of enterprises of the automotive industry sector in the Republic of Uzbekistan. This makes it possible to increase the competitiveness of enterprises, stimulate innovation and strengthen the national economy, and coordinate factors affecting the development of their existing processes and the efficiency of activities, reducing the level of possible risks.

Among the factors that stop the development of the automotive industry, in the strategy for the development of the automotive industry of the Republic of Uzbekistan for the period up to 2030, the following are noted:

- technological backwardness inherent in a number of branches of the automotive industry, deterioration of basic funds, insufficient investment activity;
- limited access of domestic products to foreign markets, increased competition;
- insufficient development rates of innovative activities and introduced innovative technologies using chemical products in the automotive industry. The above-mentioned forecast provides for an innovative development scenario for the development of the automotive industry;

The automotive industry is one of the priorities of the economy and the local industry, contributing to the positive structural changes that continue to increase the competitiveness of other segments by offering necessary and high-quality automotive products. To achieve a "sustainable growth trajectory" and an average world indicator in the near future, a strict policy is required to ensure sustainable development in economic and financial security conditions in all sectors of the automotive industry and its individual organizations. This position requires a theoretical analysis of the main factors and conditions of sustainable development in the current system of the country's economy and instrumental methods of managing certain sectors and sub-sectors. The most important rules of such analysis, in our opinion, are as follows:

- an effective system of sustainable development cannot be formed without the actions of state institutions and society, without appropriate laws, state and regional programs. This explains the government's choice of the main areas of innovation development, the digital economy, to create conditions for a "break", transition to a new technological structure. Given the motivation for innovative development, from 2020 to 2030, investments in the country's Automotive complex will increase by 3.6 times, which will increase the production of automotive products for each product group. However, the economic incentive to actively develop innovation and attract investments in the organization of the automotive industry is still at a weak level, the economy is being transformed from an export-oriented raw material model to an innovative and technologically competitive one;

-the conditions for the sustainable development of the automotive industry in the regions largely depend on the effective activities of the state authorities of the subjects of the Republic of Uzbekistan, the features of industrial and socio-cultural development of the regions. The effectiveness of regional authorities in ensuring sustainable development is determined by the level of information supply with complete and reliable information about the state of the industry of the region as a socio-economic system.

The future full-fledged implementation of the proposed priorities in the field will make it possible to develop management processes in the clusters of the automotive industry and effectively manage and coordinate the factors affecting it, reducing the level of possible risks..

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