

Uzbekistan and PRC: Economic Integration (Processes, Opportunities, Limitations)

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Abstract: The article analyzes trade and investment cooperation between Uzbekistan and China, strengthening regionalization, and implementing the Belt and Road Initiative. An assessment of the processes of economic integration between Uzbekistan and China was conducted. The theoretical foundations of international economic integration are revealed. The dynamics and structure of foreign trade between the two countries were assessed. The following indicators were calculated: Grubel-Lloyd index; comparative advantage index (RCA); trade complementarity index (TCI); commodity concentration coefficient. Investment interaction was analyzed. Opportunities and risks for deepening integration between the two countries were identified.

Keywords: Belt and Road Initiative, economic integration, Grubel-Lloyd index; comparative advantage index (RCA); trade complementarity index (TCI).

Introduction: International economic integration is a natural stage in the development of the world economy, reflecting the deepening of economic ties between states. In the context of globalization, integration processes are becoming an important factor in increasing the competitiveness of national economies, optimizing resource allocation, and forming sustainable production and sales chains.

In scientific literature, international economic integration is defined as the process of convergence and mutual adaptation of national economies, accompanied by the removal of barriers in mutual trade, the movement of capital, labor, and technology. Integration involves the formation of sustainable institutional mechanisms for coordinating economic policy [5].

LITERATURE REVIEW

The theoretical foundations of integration were laid in the mid-20th century. Significant contributions were made by B. Balassa, J. Weiner, J. Mead, and other researchers [7].

Theory of Customs Unions (J. Weiner)

The key concept is the effect of "creating trade" and

"deviating trade."

Trade creation occurs when the import of a more efficient producer within the union displaces a less efficient national producer.

Trade deviation occurs when cheaper imports from third countries are replaced by more expensive imports from partner countries.

It is precisely the ratio of these effects that determines the economic feasibility of integration [3].

The concept of integration stages (B. Balassa)

Balassa proposed a dynamic model, according to which integration develops along an ascending line - from free trade zones to an economic union. He emphasized that integration strengthens specialization and increases resource utilization efficiency [1].

Neo-functionalism. This theory argues that integration in one sphere automatically stimulates the deepening of integration in other sectors (the "overflow" effect).

Intergovernmental approach. According to this concept, states retain a leading role, and integration develops only to the extent that it meets their national interests [2].

In modern conditions, the theory of "global value-

added chains (GVC) " is gaining particular relevance, according to which countries can integrate not only through the trade of final products but also through participation in certain stages of production.

DISCUSSION AND RESULTS

For developing countries, integration often becomes a tool for accelerated industrialization, attracting technologies and investments [4].

The People's Republic of China has become one of the leading centers of the global economy in recent decades. The country is one of the largest exporters of industrial products and an investor in developing regions.

An important instrument of foreign economic expansion is the Belt and Road Initiative, aimed at developing transport, energy, and digital corridors [11].

Central Asia is considered by China as a strategically important region providing transport connectivity and access to resources [10].

Economic integration between the Republic of Uzbekistan and the People's Republic of China has the following prerequisites:

1. Geographic proximity and transport complementarity.
2. Differences in the structure of the economy (raw material potential and industrial base).

3. Uzbekistan's need for investment and technology.

4. China's interest in expanding markets and transit routes.

From the perspective of comparative advantage theory, countries have complementary production factors. Uzbekistan specializes in resource and agricultural goods, while China specializes in high value-added products [9].

Integration can contribute to:

- modernization of Uzbekistan's industry;
- inclusion in global supply chains;
- diversification of exports.

However, addiction theory warns about the risks of peripheral status consolidation when excessive focus on one partner.

The cooperation between Uzbekistan and China has objective economic prerequisites, however, it requires assessment from the standpoint of national interests and sustainable development [6].

Economic cooperation between the Republic of Uzbekistan and the People's Republic of China is characterized by the steady growth of trade turnover and the strengthening of investment cooperation. China is consistently among Uzbekistan's largest trading partners.

Table-1

Dynamics of foreign trade between Uzbekistan and China (2020-2024), billion dollars. USA [8]

Year	Uzbekistan's exports to China	Import from China	Trade turnover	Balance
2020	1,9	5,0	6,9	-3,1
2021	2,3	6,2	8,5	-3,9
2022	2,6	8,8	11,5	-6,3
2023	2,1	10,2	12,3	-8,1
2024	2,8	11,5	14,3	-8,7

Dynamics analysis:

1. Trade turnover has increased more than 2 times in 5 years.
2. Import from China significantly exceeds export.

3. A stable negative trade balance is observed.

This indicates that Uzbekistan is highly dependent on Chinese industrial products imports.

2. Export and import structure

Table 2

Structure of Uzbekistan's exports to China (2024) [8]

Goods group	Share %
Gold and precious metals	38
Gas and energy resources	22
Non-ferrous metals	14

Raw cotton	8
Others	18

Dynamics analysis:

Export has a pronounced raw material orientation.

Table 3

Import structure from China (2024) [8]

Goods group	Share %
Machines and equipment	41
Electronics	18
Chemical products	14
Construction materials	10
Others	17

Import is characterized by a high share of products with high added value.

3. Calculation of the Grubel-Lloyd index (intra-industry trade)

Formula:

$$GLi = 1 - \frac{|Xi - Mi|}{|Xi + Mi|}$$

Calculation for 2024:

$$\begin{aligned}
 X &= 2,8 \\
 M &= 11,5 \\
 GLi &= 1 - \frac{|2,8 - 11,5|}{14,3} \\
 &= 1 - \frac{8,7}{14,3} \\
 GL &= 1 - 0,61 = 0,39
 \end{aligned}$$

The indicator below 0.5 indicates the predominance of inter-industry trade, i.e., the exchange of raw materials for finished products.

This confirms the structural asymmetry of trade relations.

4. Comparative Advantage Index (RCA)

Formula:

$$RCAi = \frac{Xij/Xjt}{Xiw/Xwt}$$

Example of calculation for cotton fiber:

- The share of cotton in Uzbekistan's exports to China is 8%
- Share of cotton in world exports - 2%

$$RCA = \frac{0,08}{0,02} = 4$$

RCA > 1 → Uzbekistan has a significant comparative advantage in cotton supply.

Similar calculations show advantages for gold and non-ferrous metals, but lack of advantages in mechanical engineering.

5. Trade Complementarity Index (TCI)

Formula:

$$TCI = 100 - \sum \frac{|Mik - Xij|}{2}$$

Calculation by enlarged groups yielded the following indicator:

TCI ≈ 64

An indicator above 50 indicates an average degree of mutual complementarity.

Uzbekistan's export structure partially corresponds to China's import needs, however, its high concentration on raw materials limits its growth potential.

6. Export Concentration Index (HHI)

Formula:

$$HHI = \sum S_i^2$$

Calculation based on Table 2 data:

$$\begin{aligned}
 HHI &= 0,38^2 + 0,22^2 + 0,14^2 + 0,08^2 + 0,18^2 \\
 HHI &= 0,144 + 0,048 + 0,019 + 0,006 + 0,032 = 0,249 \\
 HHI &= 0,249
 \end{aligned}$$

An indicator above 0.18 indicates a high concentration of exports.

This means vulnerability to price fluctuations in global commodity markets.

7. Investment cooperation.

China is one of the largest investors in Uzbekistan.

Table -4

Foreign direct investment from China [12]

Year	Volume of foreign investments, billion dollars
2020	1,1
2021	1,4
2022	2,2
2023	2,7
2024	3,0

Investments are mainly directed to:

- energy
- chemical industry
- telecommunications
- infrastructure

Investment cooperation is being implemented within the framework of the Belt and Road Initiative.

8. Infrastructure and transport cooperation

The development of transport corridors, including the China-Kyrgyzstan-Uzbekistan railway project, is of particular importance.

The project will allow:

- reduce the delivery time of goods;
- strengthen transit potential;
- increase the export of processed products.

From the above, the following conclusion can be drawn.

1. There is a steady growth in trade turnover.
2. A significant trade imbalance persists.
3. The Grubel-Lloyd index (0.39) confirms the intersectoral nature of trade.
4. Uzbekistan has comparative advantages in raw material exports.
5. High export concentration increases the risks of external dependence.
6. Investment cooperation is expanding and contributing to the modernization of the economy.

The calculation of the Grubel-Lloyd index showed a low level of intra-industry trade ($GL < 0.5$), which indicates the inter-industry nature of the exchange: Uzbekistan exports mainly raw materials, while importing high value-added products. This confirms the need for structural transformation of the export model.

The Comparative Advantage Index (RCA) revealed that Uzbekistan has stable advantages in raw materials and agricultural goods, but lacks a competitive position in

technological sectors. The export concentration ratio (HHI) demonstrated a high dependence on a limited range of commodity positions, which increases the economy's vulnerability to external shocks. The Trade Complementarity Index (TCI) showed an average level of structural compatibility between the economies, indicating the presence of potential for deepening cooperation.

Analysis of investment cooperation confirmed that China is one of the key sources of direct foreign investment in the Uzbek economy. Investments are mainly directed to infrastructure, energy, industry, and telecommunications. These processes contribute to the modernization of the production base and increase labor productivity.

CONCLUSION

Thus, further deepening of cooperation should be based on the principles of economic feasibility, protection of national interests, and ensuring long-term stability. The formation of a diversified export structure, the development of the industrial base, and the enhancement of the national economy's competitiveness are key conditions for effective integration.

The conducted calculations and analytical conclusions allow us to assert that integration with China is of strategic importance for Uzbekistan's economic development, but it requires a balanced and pragmatic approach.

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