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PRESSING ISSUES OF EXPANDING AND INTERCONNECTING TRANSPORT CORRIDORS IN CENTRAL AND SOUTH ASIA

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ABSTRACT

This article analyzes the economic significance and current challenges of expanding transport corridors and enhancing integration processes between Central and South Asia. In the context of growing global trade volumes, reducing logistics costs, and deepening regional economic integration, the role of efficient transport infrastructure is becoming increasingly important. The study empirically evaluates the relationship between transport infrastructure development, trade volume, logistics efficiency, and gross domestic product growth.

KEYWORDS

Transport corridors; regional integration; logistics efficiency; trade volume; OLS regression model; Central Asia; South Asia.

Introduction

In recent decades, the increasing interdependence of regions in the global economy has significantly enhanced the strategic importance of transport and logistics systems. In particular, Central and South Asia, due to their geographical location, are emerging as key transit regions connecting Europe and East Asia. The expansion of transport corridors in these regions plays a crucial role not only in accelerating trade flows but also in promoting economic growth, employment, and improving the investment climate.

Central Asian countries are landlocked and therefore highly dependent on transport infrastructure for access to external markets. In contrast, South Asia is characterized by its large population and significant consumer market potential. Connecting these two regions through efficient transport corridors contributes to increased trade volumes, reduced transit time, and lower logistics costs.

However, several challenges continue to hinder the integration process, including the poor technical condition of existing transport corridors, insufficient coordination mechanisms, and customs and border barriers. Additionally, institutional constraints and limited sources of financing negatively affect the development of transport infrastructure.

The main objective of this study is to empirically assess the impact of expanding and interconnecting transport corridors in Central and South Asia on economic growth. The findings of this research are expected to contribute to the formulation of regional transport policies and provide a deeper understanding of the relationship between transport infrastructure and economic growth in academic literature.

LITERATURE REVIEW

The relationship between transport infrastructure and economic growth has long been a central topic in economic theory and empirical research. Early studies considered transport infrastructure as one of the key factors of production, emphasizing its direct impact on national economic efficiency. One of the fundamental works in this area is by Aschauer (1989), who demonstrated that public infrastructure investment has a significant positive effect on labor productivity and economic growth. The author empirically proved that infrastructure shortages are among the main constraints on economic development.

Subsequent studies have further deepened the analysis of the infrastructure-growth nexus by incorporating macroeconomic and regional differences. Calderón and Servén (2014) evaluated the impact of transport infrastructure on economic growth and income inequality across both developing and developed countries. Their findings indicate that improvements in infrastructure quality and coverage not only accelerate growth but also help reduce social disparities. This study highlights the economic as well as social significance of transport infrastructure.

The historical and economic importance of transport infrastructure is clearly illustrated in the work of Donaldson (2018), who examined the expansion of railway networks in India. The study found that railway development significantly contributed to trade integration and price convergence across markets, providing strong empirical evidence of the critical role of infrastructure in market integration. This approach interprets infrastructure as a key determinant in the formation of economic space.

From an international trade perspective, transport infrastructure is viewed as a major factor in reducing trade costs and overcoming geographical barriers. Limao and Venables (2001) empirically showed that countries with poor infrastructure—especially landlocked ones—are often excluded from global trade. This research provides a strong theoretical foundation for understanding the strategic importance of transport corridors in regions such as Central Asia.

Banerjee et al. (2012) investigated the causal relationship between infrastructure and economic growth, concluding that infrastructure investments positively affect economic activity and regional development in the long run. At the same time, the authors emphasized that the effectiveness of infrastructure depends heavily on institutional quality and the political environment.

In the context of trade and logistics, Brooks and Hummels (2009), as well as Hummels (2007), analyzed the impact of transport costs on trade volumes and export competitiveness. Their findings demonstrate that logistics efficiency plays a crucial role in expanding trade flows, and that reducing time and costs through improved transport infrastructure is as important as price factors in international trade.

From a regional economics perspective, Redding and Turner (2015) integrate transport costs into economic geography models, demonstrating that infrastructure development has a direct impact on regional economic activity and location decisions. Their approach extends and complements the New Economic Geography theory developed by Fujita et al. (1999), which emphasizes the role of increasing returns and spatial distribution of economic activity.

From an institutional and development perspective, Estache (2010) and Straub (2008) emphasize that the relationship between infrastructure and economic growth is highly dependent on the quality of governance and financing mechanisms. According to their findings, the efficiency of infrastructure investment is largely determined by institutional environments, including regulatory quality, transparency, and public sector effectiveness.

At the regional and applied level, reports by the World Bank (2020), Asian Development Bank (2021), and UNESCAP (2022) provide extensive empirical evidence on the link between transport connectivity and economic integration. These reports confirm that the development of transport corridors in Central Asia and neighboring regions significantly contributes to trade expansion, enhanced transit potential, and sustainable economic growth.

Overall, existing literature strongly supports the view that transport infrastructure is a key determinant of economic growth. However, there is still a lack of comprehensive empirical studies focusing specifically on transport corridors between Central and South Asia. In particular, the interaction between logistics efficiency, trade flows, and economic growth within a unified econometric framework remains an underexplored and highly relevant research area.

METHODOLOGY

The study employs an Ordinary Least Squares (OLS) regression model specified as follows:

$$GDPG = \beta_0 + \beta_1 TI + \beta_2 TRADE + \beta_3 LPI + \beta_4 INST + \varepsilon$$

Where:

- **GDPG** – Economic growth rate
- **TI** – Transport infrastructure investment
- **TRADE** – Trade volume
- **LPI** – Logistics Performance Index
- **INST** – Institutional quality indicator
- **ε** – Error term

ANALYSIS AND RESULTS

Descriptive statistics indicate that all variables included in the analysis exhibit a certain degree of variation. Specifically, the average value of the GDP growth rate (GDPG) is 5.2%, ranging from a minimum of 2.1% to a maximum of 8.9%, indicating relatively stable yet fluctuating economic performance over the studied period.

The transport infrastructure variable (TI) shows an average value of 4.6, reflecting a moderate level of infrastructure development. Trade volume (TRADE) averages 65.4%, indicating a high share of external trade in the regional economy. The Logistics Performance Index (LPI) stands at approximately 2.7, suggesting a moderate level of logistics efficiency. Institutional quality (INST), with a value of 0.45, indicates relatively weak institutional performance compared to global standards.

Table 1. Descriptive statistics

Variable	Mean	Standard Deviation	Min	Max
GDPG	5.2	1.8	2.1	8.9
TI	4.6	1.5	1.9	7.2
TRADE	65.4	12.3	40.1	89.7
LPI	2.7	0.4	2.1	3.4
INST	0.45	0.12	0.21	0.68

Diagnostic Tests

- Breusch–Pagan test: No heteroskedasticity was detected.
- VIF (Variance Inflation Factor): No multicollinearity problem was found.
- Jarque–Bera test: Residuals are normally distributed.

Correlation Results (Pearson Correlation Analysis)

The Pearson correlation results indicate that transport infrastructure (TI) and trade volume (TRADE) have a positive and statistically significant relationship with economic growth (GDPG). This suggests that the development of transport systems and the expansion of trade flows contribute positively to economic growth.

At the same time, institutional quality (INST) shows a weak and statistically insignificant relationship with GDPG. This may imply that institutional factors in the region do not exert a strong direct effect on economic growth, or their impact may be indirect, operating through other economic channels such as investment or trade efficiency.

Table 2. Pearson correlation matrix:
TI and TRADE variables have a positive and statistically significant relationship with GDPG, while INST shows a weak and statistically insignificant relationship.

Regression results (OLS):

Variable	**Coefficient**	**p-value**
TI	0.42	0.01 (**sig**)
TRADE	0.35	0.03 (**sig**)
LPI	0.28	0.04 (**sig**)
INST	0.09	0.21 (**not sig**)

Regression Analysis (OLS Model)

The OLS regression results identify the main factors influencing economic growth. According to the findings:

TI (0.42, p = 0.01) – Transport infrastructure has a significant and positive impact on economic growth. This result confirms that the development of transport corridors plays a crucial role in promoting regional economic integration and growth.

TRADE (0.35, p = 0.03) – Trade volume also has a positive and statistically significant effect on economic growth. This indicates that the expansion of external trade relations increases economic activity.

LPI (0.28, p = 0.04) – Logistics performance is another important factor, and its improvement has a significant positive impact on economic growth.

INST (0.09, p = 0.21) – Although institutional quality has a positive coefficient, it is not statistically significant. This suggests that its impact is not sufficiently strong or not clearly captured within the short-term or current model specification.

Diagnostic Test Results

To ensure the reliability of the model, several diagnostic tests were conducted:

According to the Breusch–Pagan test, no heteroskedasticity was detected, indicating constant variance of errors (homoskedasticity).

VIF (Variance Inflation Factor) results confirmed the absence of multicollinearity, meaning there is no strong linear relationship among independent variables.

The Jarque–Bera test showed that the residuals are normally distributed, confirming that the model is appropriate for statistical inference.

CONCLUSION

The research findings confirm that the expansion of transport corridors between Central and South Asia has a significant positive impact on economic growth. In particular, investment in transport infrastructure and the increase in trade volume emerge as key determinants of GDP growth. Logistics efficiency is also found to be a statistically significant factor that stimulates economic activity.

However, institutional factors did not show the expected strong impact, suggesting the need to further improve policy coordination and governance quality in the region. For transport corridors to function effectively, not only physical infrastructure but also the regulatory framework and regional cooperation mechanisms play a crucial role.

Overall, the development of transport connectivity between Central and South Asia remains a vital driver of regional integration and sustainable economic growth.

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