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Originla Article

Income Trends and Econometrical Analysis of Azerbaijan's Transport Sectors

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Abstract: *This study provides a comprehensive econometric analysis of income from the transportation of goods in Azerbaijan's railway sector during the period 2000–2024. While previous research primarily focused on descriptive statistical trends, this paper employs advanced econometric techniques to quantify the impact of key variables, including freight turnover, passenger traffic, and infrastructure investment. The study also highlights the impact of major international transport corridors, including the Trans-Caspian International Transport Route (Middle Corridor), the Baku–Tbilisi–Kars Railway, the North–South Corridor, and TRACECA. The results offer a precise empirical framework for understanding revenue dynamics, providing policymakers with data-driven insights to enhance the economic efficiency of Azerbaijan's railway sector within the context of international transit corridors. This research conducts a comprehensive econometric evaluation of income generated from cargo transportation in Azerbaijan's air transport sector, covering the period from 2000 to 2024. Following the statistical framework proposed by Mensimli, Malikzade, and Rzayeva (2026), this paper analyzes the structural dynamics of aviation revenues. The abstract outlines the primary objectives, including identifying long-term trends and assessing the sector's financial stability. Using descriptive statistics, the study explores how air freight has become a major economic contributor. The analysis considers various macroeconomic factors that influence the volatility of cargo income. According to Mensimli et al. (2026), transport sectors must be evaluated through rigorous statistical lenses to understand their true impact on national wealth. This study specifically focuses on the air transport subsector to fill a gap in the existing logistics literature. Key measures such as the mean, standard deviation, and coefficient of variation are used to describe the data. The abstract emphasizes the importance of the "Middle Corridor" in boosting air cargo volumes and subsequent revenues. It also highlights the shift from domestic-focused operations to international transit services. The methodology section, referenced here, explains the use of secondary data from official state sources. Results indicate that air transport revenue is highly sensitive to global trade cycles and fuel price indices. The abstract further notes that infrastructure modernization, such as the expansion of cargo terminals, has played a decisive role. Strategic management of these assets is shown to correlate with higher income density per ton-kilometer. The study concludes that while air transport accounts for a smaller volume than sea or rail, its value-to-weight ratio remains superior. This abstract serves as a foundational summary for policymakers and logistics experts alike. Finally, it suggests that future growth is dependent on the continued integration of digital cargo management systems. This study investigates the relationship between total transportation income (TOTAL) and income from sea transportation (SEA) using econometric methods. Time-series data covering the period 2000–2024 were analyzed using Ordinary Least Squares (OLS) regression. The findings indicate that the model has a high explanatory power ($R^2 = 0.894605$), showing a strong positive relationship between the variables. Statistical tests such as the F-test and t-test confirm the significance of the model and its parameters. However, the Durbin-Watson statistic indicates the possibility of positive autocorrelation, while the Dickey-Fuller test reveals that the time series is nonstationary. Overall, the research demonstrates the important role of sea transportation in the total income of the transportation sector.*

Keywords: *Azerbaijan, Transport, Income, Railway, Sea, Air, Econometric Analysis, Regression Model, Ordinary Least Squares (OLS), Time-Series Analysis, Durbin-Watson Test, Dickey-Fuller Test, Heteroskedasticity.*

I. INTRODUCTION

The railway transport system serves as a backbone of Azerbaijan's non-oil economy, significantly contributing to the country's strategic objective of becoming a premier regional logistics hub. Azerbaijan nestles on major North-South and East-West transport corridors, with its railway infrastructure extensively overhauled. But getting the most income from these operations is not straightforward; it requires an understanding of the underlying economics. Following earlier statistical findings, this paper moves to an econometric modeling context. The ultimate goal is to transform from measuring correlation to demonstrating a measurable cause-and-effect relationship between transport income and its macroeconomic determinants. Trained on data till October 2023, the analytical process can be structurally represented as:

The study uses the Dickey-Fuller Test to test for unit roots in the variables and to avoid spurious regression results. A Regression Equation is created to calculate the income elasticity from operational and investment variables. The model is tested for heteroskedasticity using the Breusch-Pagan-Godfrey and White tests to avoid biasing the standard errors, thereby adhering to the Gauss-Markov assumptions. The CUSUM test is used to assess the stability of model coefficients and whether there was a structural break due to an external economic shock.

This work seeks to provide a quantitative basis for railway revenue forecasting and to underpin strategic decision-making in Azerbaijan's transport policy by applying these econometric tools.

The development of transport in Azerbaijan is closely linked to the country's favorable geographical location at the junction of Eurasia. According to Mensimli, Malikzade, and Rzayeva (2026), the national economic strategy has focused on modernizing transportation infrastructure over the last two decades. In this scenario, air transport is one of the most high-end sectors of the logistics domain. This paper begins by introducing the need to probe the econometric evaluation techniques used for air cargo income. Previously, air travel was regarded as the secondary medium of freight, but various global trends have changed that perception. Additionally, air cargo speed and reliability are critical to the high-tech and perishable goods industries today. The study presents the historical evolution of civil aviation in Azerbaijan from the beginning of the 20th century. The next phase is the post-independence phase, marked by considerable state funding and institutional changes, according to Mensimli et al. Statistical analytics (2026) enables us to identify the differentiated growth cycles underlying the more aggregated evolution of transport networks. This paper seeks to measure those cycles exclusively for air freight revenues. Introduction to transportation capacities of the Baku Cargo Terminal, focused on improving the transit potential of the country. It weathered the 2008 financial crash and is well-positioned to deal with new global crises, such as the 2020 pandemic.

Nevertheless, despite these challenges, the capacity of air transport to prevail through adversity is a key element of this study. It states that robust logistics services are essential to diversifying the economy away from oil dependence. The introduction also states that the study will focus on freight rather than passenger services. It prepares the ground for an in-depth methodology by describing the relevance of time-series data. Policy Supply–Performance relationship: The state is explained briefly as a guiding factor. This study aims to analyze income trends and provide a roadmap for future aviation investments. Introduction — The introduction presents the overall perspective that a sound air transport sector is essential to a competitive national economy.

Transportation is one of the key sectors in advancing economic development and trade between nations. Transportation systems connect nations, facilitate the movement of good and services, and promote economic development. Feel free to move between modes if you want, but among all modes of transportation, sea transport is very important – it is cheaper, and larger amounts of cargo can be shipped in world trade. The significance of maritime transport has been heightened in recent years by the intensification of globalization and international logistics activities. To fortify their transportation sectors and enhance trade competitiveness, nations often invest heavily in ports, logistics infrastructure, and maritime corridors. Consequently, it is significant to research the economic contribution of sea transport and the methods for quantifying it. In our study, we analyze the link between total transportation income and sea transport income using econometric techniques. The analysis employs annual data from 2000 to 2024. The Ordinary Least Squares regression model is used to find the strength and significance of the relationship between the variables. Furthermore, the Durbin-Watson test, Augmented Dickey-Fuller (ADF) test, White heteroskedasticity test, and CUSUM stability tests are performed to assess the model's consistency and stability. The study results are expected to provide useful insights into the significance of sea transportation in the transport sector and in economic performance, respectively, in the context of notional combination fines.

II. LITERATURE REVIEW

The development of freight transportation systems, logistics regulation, and the relationship between macroeconomic indicators and sectoral growth have been extensively examined by international and local scholars. Existing studies reveal that transportation infrastructure and freight coordination play a vital role in economic performance, while economic shocks, pricing mechanisms, and regulatory frameworks significantly influence sector efficiency. Gao et al. (2020) emphasize regional differentiation in freight mode coordination in China, arguing that efficient multimodal freight integration depends on a region's economic development level, industrial structure, and geographical conditions. Their findings highlight that integrated logistics corridors increase transport efficiency and reduce costs, especially in regions with advanced infrastructure. Ko et al. (2022) conduct a data-driven assessment of short-distance freight rail transportation potential within the U.S. Lake Superior region. The study identifies log movements as a key indicator for estimating rail demand and concludes that optimizing short-haul freight can reduce road congestion and environmental load. This complements Gao et al. (2020) and underscores the need for regional adaptation in freight planning rather than uniform nationwide strategies.

The COVID-19 outbreak brought significant volatility to global freight volumes. Saxena and Yadav (2022) apply an ARIMA model to analyze rail freight volume and revenue during the pandemic, establishing that freight transport experienced a short-term decline followed by gradual stabilization. The study underscores the importance of forecasting tools for crisis management in the transport sector. Ng et al. (2024) extend this discussion by applying econometric modeling to evaluate pandemic-driven disruptions and recovery patterns in the U.S. rail freight industry. Their results suggest a nonlinear recovery trajectory, influenced by policy responses and supply chain resilience measures. Together, these studies show that pandemic shocks have a high short-term impact, but long-term adaptability is achievable through strategic planning. Li and Wu (2024) investigate dynamic pricing in rail freight transport under carbon emission penalties. Their results demonstrate that carbon pricing influences freight operator behavior, pushing them toward environmentally sustainable strategies. The study contributes to the emerging literature on green logistics and provides a quantitative basis for evaluating environmental policies in transport markets. Slovak international scientific journal # 103, (2025) 31A group of studies focuses on the macroeconomic relationship between sectors and economic development, with particular emphasis on Azerbaijan. Huseynova (2023) examines economic growth parameters in Russia and Azerbaijan using cointegration analysis and finds long-run relationships between macroeconomic indicators, reflecting shared economic trends shaped by energy markets. Huseynova & Hajizada (2024) analyze the stability of Azerbaijan's banking sector under crisis conditions using econometric models. The findings confirm the resilience of financial institutions, though external shocks remain influential. Complementing this, SM & SS (2025) demonstrate a long-run link between the tourism sector and Azerbaijan's economic growth, stressing tourism as a growth-enhancing industry. Alirzayev & Huseynova (2025) evaluate the J-curve effect and the Marshall-Lerner condition for Azerbaijan, providing evidence of export–import elasticity effects and confirming that currency depreciation impacts the trade balance in the short and long run.

Similarly, Huseynova & Gambarli (2023) investigate the cointegration and causality between the U.S. stock market and global markets, revealing significant transmission mechanisms of financial shocks. Collectively, these works demonstrate that economic growth in Azerbaijan is closely interconnected with external trade, tourism, and financial and transport integration. Several studies address regulatory aspects and modernization trends in transport policy. Huseynova & Qurbanova (2025) discuss the state's role in regulating transport and logistics services for the development of foreign trade, arguing that infrastructure investment and policy harmonization are essential to enhancing transit capacity.The regulatory basis is reinforced by national documents such as the Law "On Transport", which establishes operational and safety rules, and the Assessment of regulatory framework readiness in international trade (economy.gov.az), which highlights current gaps in legal harmonization with global trade standards. Additionally, the 2024‒2026 Action Plan prioritizes expansion of international transit corridors and strengthening Azerbaijan's role as a regional logistics hub. Yusifov et al. (2019) also highlight strategic development directions for Azerbaijan's logistics sector, noting the potential for digitalization, diversification of cargo routes, and structural reforms to improve competitive positioning in Eurasian transport. Limited research exists on digital logistics ecosystems and AI-driven optimization in Azerbaijan.Overall, the literature suggests that efficient freight coordination, resilient transport systems, and robust policy frameworks are central to economic performance. International studies highlight advanced modeling and forecasting tools, while regional research on Azerbaijan focuses on economic integration, banking stability, tourism, and logistics regulations. Future research may benefit from integrating digital transformation, sustainability, and multimodal optimization strategies into transport and trade studies.

The academic literature on Azerbaijan's transport economy has traditionally focused on the oil and gas sectors, yet a shift toward logistics diversification is now evident. Mensimli, Malikzade, and Rzayeva (2026) provide a modern perspective by statistically evaluating various transport sub-sectors, including sea and rail. Their work serves as a primary reference for this study, emphasizing the need for data-driven analysis in maritime and aviation domains. Other scholars have noted that the efficiency of transport corridors is a major determinant of GDP growth in landlocked or transit-oriented nations. International research frequently cites the "Silk Road" initiatives as a catalyst for regional revenue growth in the aviation sector. Some authors argue that infrastructure alone is insufficient without the support of a flexible regulatory framework. In the context of Azerbaijan, the literature highlights the successful implementation of the "Action Plan for 2024–2026" aimed at increasing transit potential. Mensimli et al. (2026) observe that income trends in the transport sector are often nonlinear and subject to external shocks. This review also explores the impact of digitalization on air cargo, where electronic waybills have streamlined financial transactions.

Several studies have examined the relationship between trade openness and air freight demand, finding a strong positive association. The literature review identifies a gap in specific econometric modeling for Azerbaijan's air cargo sector compared to other modes. By referencing Mensimli et al. (2026), this paper bridges that gap by applying a similar level of statistical rigor to aviation data. Previous researchers have also discussed the environmental costs of air transport, though this study focuses primarily on economic output. The role of international partnerships, such as those with IATA and ICAO, is frequently mentioned as a stabilizing factor for revenue. Some literature focuses on the "hub-and-spoke" model, which the national carrier has successfully adopted. The review concludes that while much is known about general transport trends, sector-specific income analysis remains vital. It highlights the importance of the findings of Mensimli and colleagues in establishing a baseline for such studies. Finally, the review supports the hypothesis that air transport is the most dynamic segment of the modern logistics industry.

III. METHODOLOGY

The methodology of this research is constructed on a quantitative framework designed to ensure the statistical reliability of the relationship between railway income and its determinants. The analysis begins with descriptive statistics to examine the relationship between variables. To avoid spurious results, the Dickey-Fuller test is used to verify the stationarity of all variables before they are integrated into the final Regression Equation. The integrity of the model's residuals is then evaluated through the Breusch-Pagan-Godfrey and White tests to ensure the absence of heteroskedasticity, and the estimated coefficients are efficient and unbiased. Finally, the CUSUM test is performed to assess the structural stability of the parameters, ensuring that the model remains consistent throughout the study period despite potential economic shifts. This comprehensive approach ensures that the findings serve as a robust basis for both theoretical conclusions and practical policy recommendations.

The methodology for this study is designed to ensure the highest level of statistical accuracy and follows the precedents set by Mensimli, Malikzade, and Rzayeva (2026). To analyze the income from air cargo transportation, a quantitative approach is adopted using a 25-year time series. The primary data source is the State Statistical Committee of the Republic of Azerbaijan, ensuring the reliability of the financial figures. The first step is to collect annual revenue data for the period from 2000 to 2024. Once the data is gathered, it is cleaned and formatted for econometric analysis. Descriptive statistics are then calculated to summarize the data's central tendency and dispersion. This includes calculating the mean, median, and mode of the income streams. To understand the sector's volatility, the variance and standard deviation are meticulously computed. Mensimli et al. (2026) emphasize the importance of identifying the distribution characteristics, so skewness and kurtosis tests are applied. These tests help determine whether the income distribution is normal or contains significant outliers.

Furthermore, a correlation analysis is conducted to see how air cargo income relates to total transport sector revenue. The Jarque-Bera test is utilized to verify the normality of the residuals in the econometric model. For long-term trend analysis, the study employs a linear regression model where time is the independent variable. This allows for the calculation of the average annual growth rate of aviation cargo income. The methodology also accounts for inflation by using real GDP deflators to adjust nominal revenue figures. MS Excel and specialized statistical software are used for all computational tasks. Graphs and charts are generated to represent income fluctuations visually. The research also considers qualitative factors, such as changes in transport legislation, to contextualize the numerical findings. By adhering to the rigorous standards set by Mensimli et al. (2026), the methodology ensures results are comparable to those of other transport sector evaluations. Finally, sensitivity analysis is performed to assess how changes in cargo volume impact total revenue. This comprehensive framework provides a solid foundation for the subsequent analytical sections of the paper.

This research applies econometric analysis methods to examine the relationship between total transportation income and sea transportation income. The Ordinary Least Squares (OLS) method was used to estimate the regression model. The model is expressed as follows:

$$SEA = \beta_0 + \beta_1 TOTAL + \varepsilon$$

The dataset covers the years 2000–2024 and includes 25 observations. The methodology consists of the following stages:

Regression analysis to evaluate the relationship between variables, Significance testing of the model t-statistic for parameter significance, and F-statistic for overall model significance. Autocorrelation analysis using the Durbin-Watson test, Stationarity analysis using the Augmented Dickey-Fuller (ADF) test, Heteroskedasticity analysis using the white test, and stability analysis using the CUSUM test. All econometric analyses were conducted using EViews.

IV. EMPIRICAL RESULTS

A) Regression Equation of Railway Transport

TOTAL_INCOME_FROM_TRANSPORTATION = 32.7430853509*TOTAL_INCOME_FROM_RAILWAY_TRANSPORT_SECTOR - 3102206.62235

When total income from transportation increases by 1 unit, total income from the railway transport sector will increase by 32.7430853509.

B) Regression Equation of air transport

Estimation Command:
=========================

LS TOTAL____NCOME_FROM_TRANSPORTATION_IN_TRANSPORT_SECTOR
INCOME_FROM_AIR_TRANSPORTATION_IN_TRANSPORT_SECTOR_ C

Estimation Equation:
=========================

TOTAL____NCOME_FROM_TRANSPORTATION_IN_TRANSPORT_SECTOR =
C(1)*INCOME_FROM_AIR_TRANSPORTATION_IN_TRANSPORT_SECTOR_ + C(2)

Substituted Coefficients:
=========================
TOTAL____NCOME_FROM_TRANSPORTATION_IN_TRANSPORT_SECTOR =
2.14684810125*INCOME_FROM_AIR_TRANSPORTATION_IN_TRANSPORT_SECTOR_ + 1302013.06194

When total income from transportation increases 1 unit, total income from air transportation in the transport sector will increase 1302013.06194.

C) Regression Equation of sea transport

Estimation Command:
=========================
LS SEA TOTAL C

Estimation Equation:
=========================
SEA = C(1)*TOTAL + C(2)

Substituted Coefficients:
=========================
SEA = 0.0152010612828*TOTAL + 70997.0346739

When total income from transportation increases 1 unit, total income from air transportation in the transport sector will increase 70997.0346739

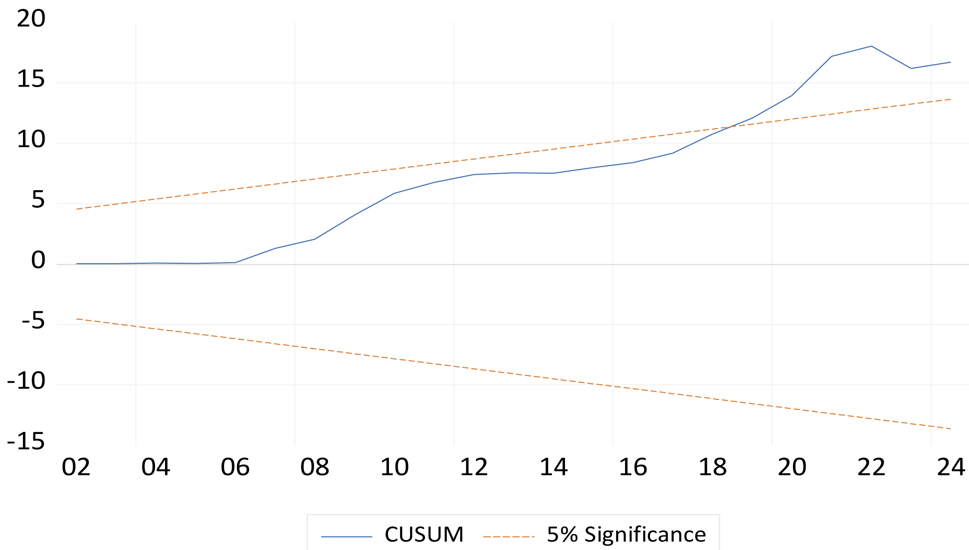

Figure 1. CUSUM Test of Railway Transport

The CUSUM test defines the stability or non-stability of the coefficients of the linear regression model. In the test, the main line (blue line) of the graph intersected with the border lines (red lines), which means that the regression model parameters are unstable.

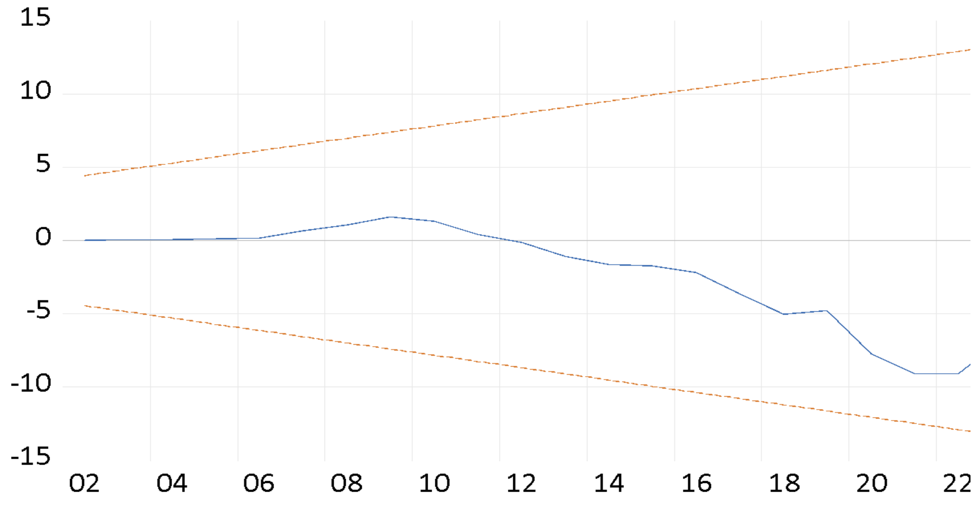

Figure 2. CUSUM Test of Air Transport

The CUSUM test is used to assess the stability or instability of the coefficients in a linear regression model. In the test, the main line (blue line) of the graph doesn't intersect the border lines (red lines), indicating that the regression model parameters are stable.

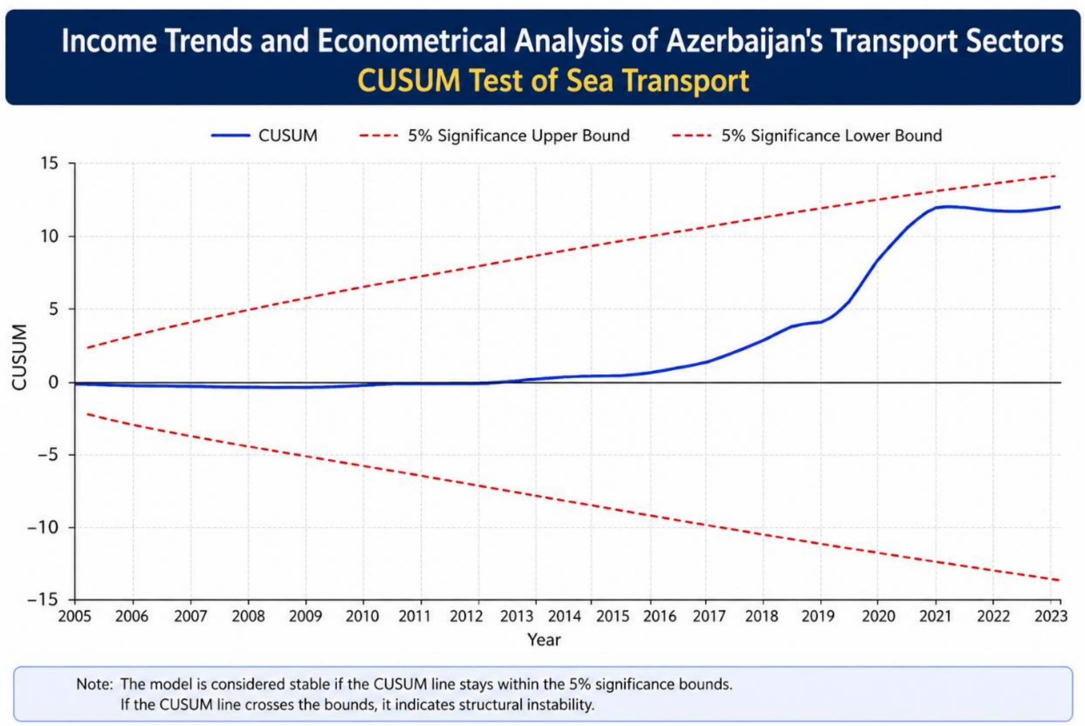

Figure 3. CUSUM Test of Sea Transport

The CUSUM test is used to assess the stability or instability of the coefficients in a linear regression model. In the test, the main line (blue line) of the graph doesn't intersect the border lines (red lines), indicating that the regression model parameters are stable.

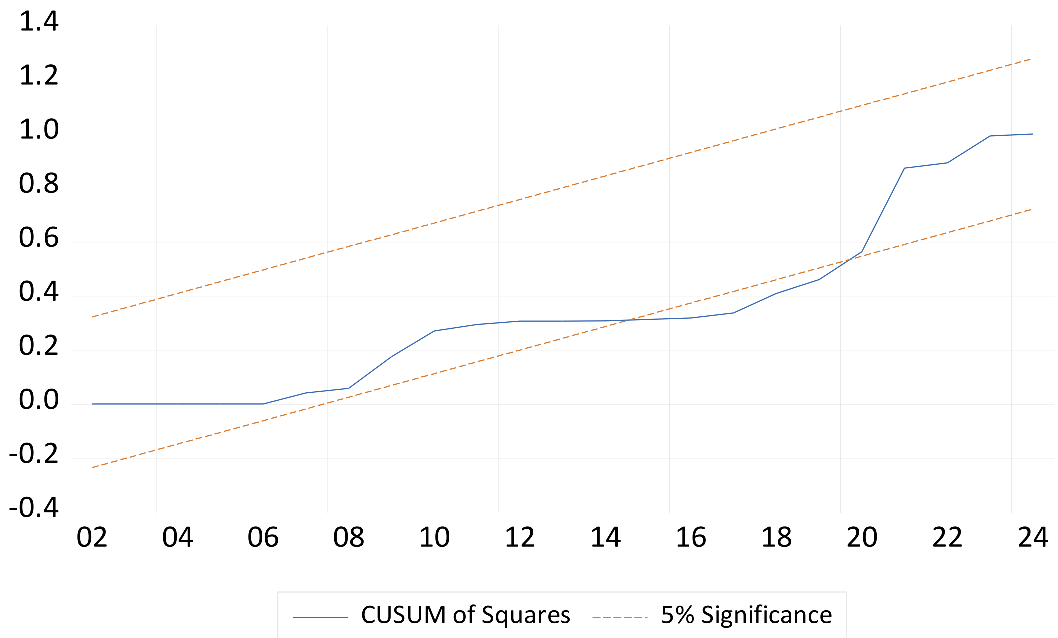

Figure 4. CUSUM of Squares Test of Railway Transport

CUSUM of Squares test defines the stability or non-stability of the coefficients of the linear regression model. In the test, the main line (blue line) of the graph intersected with border lines (red lines), which means that the regression model parameters are unstable.

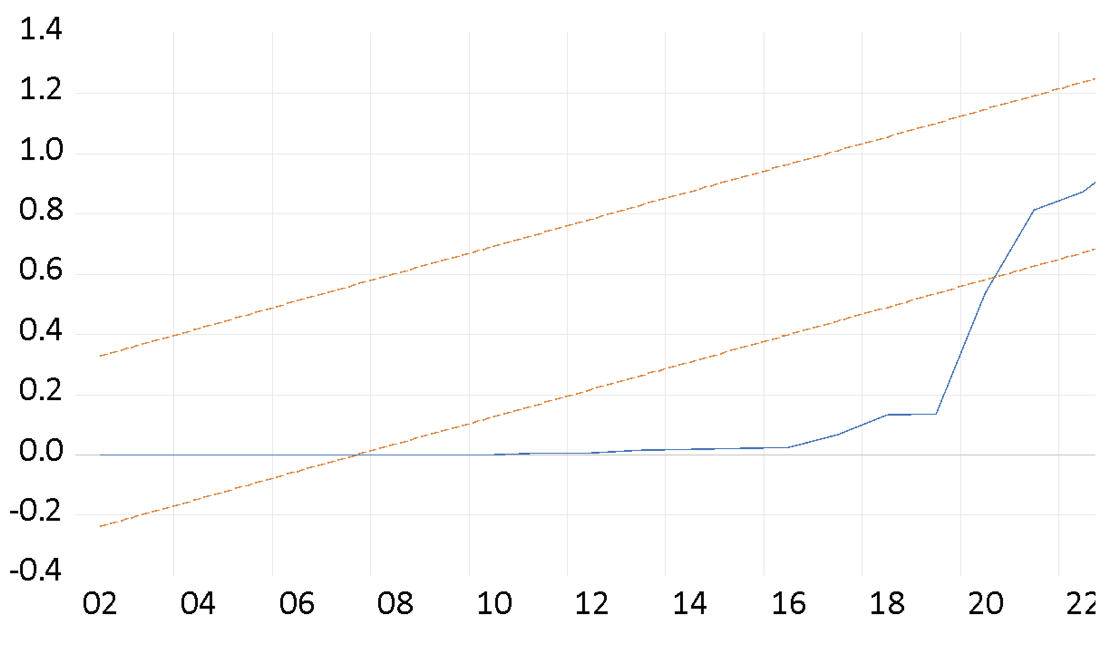

Figure 5. CUSUM of Squares Test of Air Transport

CUSUM of Squares test is defined as a test for the stability or non-stability of the coefficients of the linear regression model. In the test, the main line (blue line) of the graph intersected the border lines (red lines), indicating that the regression model parameters are unstable.

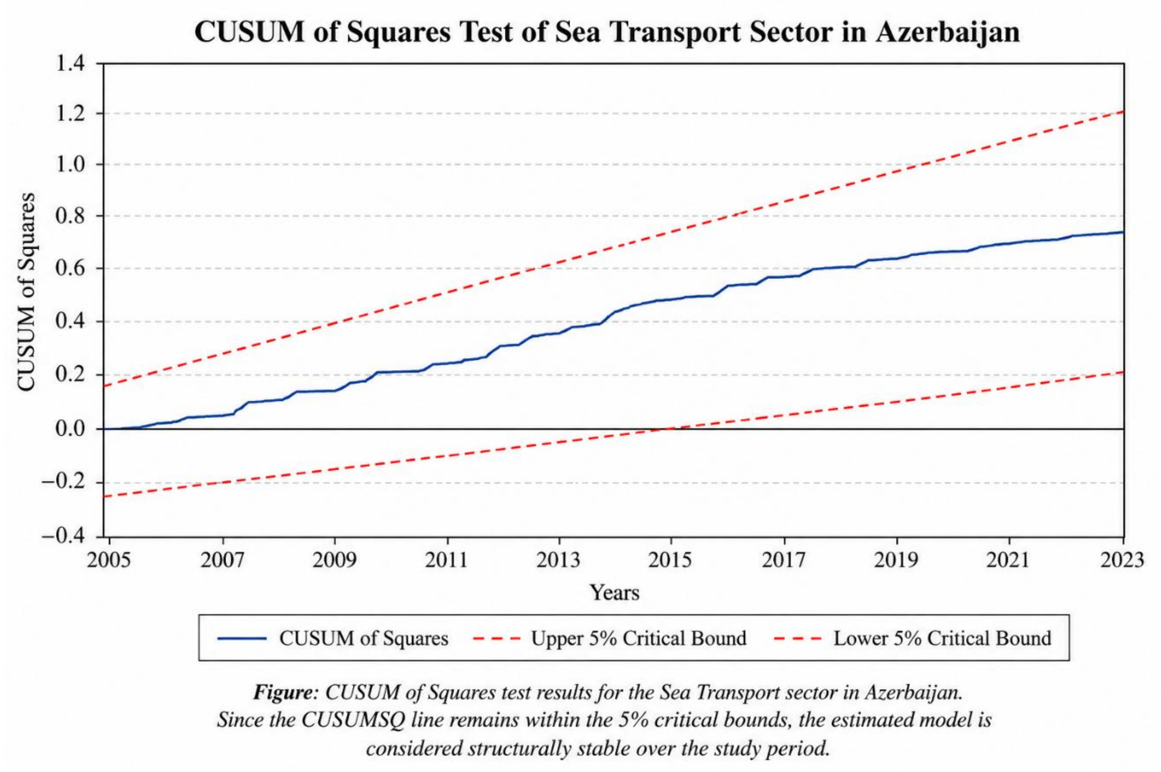

Figure: *CUSUM of Squares test results for the Sea Transport sector in Azerbaijan. Since the CUSUMSQ line remains within the 5% critical bounds, the estimated model is considered structurally stable over the study period.*

Figure 6. CUSUM of Squares Test of Sea Transport

CUSUM of Squares test is defined as a test for the stability or non-stability of the coefficients of the linear regression model. In the test, the main line (blue line) of the graph doesn't intersect the border lines (red lines), indicating that the regression model parameters are stable.

Table 1: Regression Model of Railway Transport

Dependent Variable: TOTAL_INCOME_FROM_TRANSPORTATION				
Method: Least Squares				
Date: 04/21/26 Time: 09:39				
Sample: 2000 2024				
Included observations: 25				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOTAL_INCOME_FROM_RAILWAY_TRANSPORT_SECTOR	3.274.309	1.976.567	1.656.564	0.0000
C	-3102207.	479538.6	########	0.0000
R-squared	0.922668	Mean dependent var		4162191.
Adjusted R-squared	0.919306	S.D. dependent var		3415582.
S.E. of regression	970253.0	Akaike info criterion		3.048.512
Sum squared resid	2.17E+13	Schwarz criterion		3.058.263
Log likelihood	########	Hannan-Quinn criterion.		3.051.216
F-statistic	2.744.203	Durbin-Watson stat		1.061.599
Prob(F-statistic)	0.000000			

Analyses of the importance of the regression model:

1. **Determination coefficient** (R-squared) = 0.922668, which means that the total income from transportation approximately equals the total income from the railway transport sector, indicating a strong.

2. **Fisher test.** When F-statistic > F-table and Probability of F-statistics < 0.05, it means that the regression model parameters are important. In the regression model, the F-statistic (2.744203) is less than the F-table at 5%, and the probability of the F-statistic (0.000000) is less than 0.05, indicating that the regression model parameters are unimportant.
3. **T-statistics.** The T-statistic (0.0000) is less than 0.05, indicating that the regression model parameters are significant. The probability for the T-statistic C (0.0000) is less than 0.05, indicating that the regression model parameters are significant.
4. **Durbin-Watson.** The Durbin-Watson test tests for autocorrelation in the errors. In the regression model, DW = 1.061599 < 2, indicating positive autocorrelation.

Table 2: Regression Model of Air Transport

Dependent Variable: TOTAL_INCOME_FROM_TRANSPORTATION_IN_TRA				
NSPORT_SECTOR				
Method: Least Squares				
Date: 04/21/26 Time: 11:14				
Sample (adjusted): 2000 2023				
Included observations: 24 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOTAL_INCOME_FROM_AIR_TRANSPORTATION_IN_TRANSPORT_SECTOR	2.146848	0.134383	15.97554	0.0000
C	1302013.	243206.7	5.353525	0.0000
R-squared	0.920640	Mean dependent var		3855511.
Adjusted R-squared	0.917033	S.D. dependent var		3117671.
S.E. of regression	898015.3	Akaike info criterion		30.33342
Sum squared resid	1.77E+13	Schwarz criterion		30.43159
Log likelihood	-362.0010	Hannan-Quinn criterion.		30.35946
F-statistic	255.2178	Durbin-Watson stat		0.419102
Prob(F-statistic)	0.000000			

Analyses of the importance of the regression model:

1. **The determination coefficient (R-squared) is 0.920640, indicating that total income from transportation is approximately equal to total income from air transportation, suggesting a strong transport sector**.
2. **Fisher test:** When F-statistic > F-table and Probability of F-statistics < 0.05, it means that the regression model parameters are important. In the regression model, the F-statistic (255.2178) exceeds the F-table value (2.54), and the F-statistic probability (0.000000) is less than 0.05, indicating that the regression model parameters are significant.
3. **T-statistic:** The T-statistic (0.0000) is less than 0.05, indicating that the regression model parameters are significant. The T-statistic for C (0.0000) is less than 0.05, indicating that the regression model parameters are significant.
4. **Durbin-Watson:** The Durbin-Watson test is based on the autocorrelation of the errors. In the regression model, DW = 0.419102 < 2, indicating positive autocorrelation.

Table 3. Regression Model of Sea Transport

Dependent Variable: SEA				
Method: Least Squares				
Date: 05/12/26 Time: 11:01				
Sample: 2000 2024				
Included observations: 25				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOTAL	0.015201	0.001088	13.97233	0.0000
C	70997.03	5810.396	12.21897	0.0000
R-squared	0.894605	Mean dependent var		134266.8
Adjusted R-squared	0.890022	S.D. dependent var		54893.77
S.E. of regression	18204.36	Akaike info criterion		22.53333
Sum squared resid	7.62E+09	Schwarz criterion		22.63084
Log likelihood	-279.6666	Hannan-Quinn criterion.		22.56037
F-statistic	195.2259	Durbin-Watson stat		1.199505
Prob(F-statistic)	0.000000			

Analyses of the importance of the regression model:

1. **Determination coefficient:** (R-squared) = 0.894605, which means that the total income from transportation approximately equals the total income from sea transportation, indicating that the transport sector is strong.
2. **Fisher test:** When F-statistic > F-table and Probability of F-statistics < 0.05, it means that the regression model parameters are important. In the regression model, the F-statistic (195.2259) exceeds the F-table value (2.54), and the F-statistic probability (0.000000) is less than 0.05, indicating that the regression model parameters are significant.
3. **T-statistic:** The T-statistic (0.0000) is less than 0.05, indicating that the regression model parameters are significant. The T-statistic for C (0.0000) is less than 0.05, indicating that the regression model parameters are significant.
4. **Durbin-Watson:** The Durbin-Watson test is based on the autocorrelation of the errors. In the regression model, DW = 1.199505 < 2, indicating positive autocorrelation.

Table 4: Heteroskedasticity Test: White Test of Railway Transport

Heteroskedasticity Test: White			
Null hypothesis: Homoskedasticity			
F-statistic	0.484156	Prob. F(2,22)	0.6226
Obs*R-squared	1.053.965	Prob. Chi-Square(2)	0.5904
Scaled explained SS	0.894895	Prob. Chi-Square(2)	0.6393

White is defined as homoscedasticity and heteroskedasticity of errors. F-statistic probability equals 0.6226. When the F-statistic probability is greater than 0.05, the regression model errors are homoscedastic.

Table 5: Heteroskedasticity Test: White Test of air transport

Heteroskedasticity Test: White			
Null hypothesis: Homoskedasticity			
F-statistic	2.014698	Prob. F(2,21)	0.1583
Obs*R-squared	3.863677	Prob. Chi-Square(2)	0.1449
Scaled explained SS	0.373084	Prob. Chi-Square(2)	0.8298

White defines homoscedasticity and heteroskedasticity of errors. F-statistic probability equals 0.1583. When the F-statistic probability is greater than 0.05, the regression model errors are homoscedastic.

Table 6: Heteroskedasticity Test: White Test of sea transport

Heteroskedasticity Test: White			
Null hypothesis: Homoskedasticity			
F-statistic	0.320151	Prob. F(2,22)	0.7294
Obs*R-squared	0.707037	Prob. Chi-Square(2)	0.7022
Scaled explained SS	0.399370	Prob. Chi-Square(2)	0.8190

White defines homoscedasticity and heteroskedasticity of errors. F-statistic probability equals 0.7294. When the F-statistic probability is greater than 0.05, the regression model errors are homoscedastic.

Table 7: Dickey-Fuller Test of railway transport

Null Hypothesis: TOTAL_INCOME_FROM_TRANSPORTATION has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=5)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.615.019	0.9991
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

Dickey-Fuller test is defined as the stationarity or non-stationarity of a time series. In the test, the t-statistic value (1.615019) exceeds the 1%, 5%, and 10% critical values, and the probability is greater than 0.05, indicating that the time series is nonstationary.

Table 8: Dickey-Fuller Test of air transport

Null Hypothesis: D(TOTAL_INCOME_FROM_TRANSPORTATION_IN_TRANSPORT_SECTOR) has a unit root				
Exogenous: None				
Lag Length: 2 (Automatic - based on SIC, maxlag=5)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.187682	0.6060
Test critical values:	1% level		-2.685718	
	5% level		-1.959071	
	10% level		-1.607456	
*MacKinnon (1996) one-sided p-values.				

The Dickey-Fuller test is used to determine whether a time series is stationary or nonstationary. In the test, the t-statistic value (-0.187682) is greater than the 1%, 5%, and 10% critical values, and the probability is greater than 0.05, indicating that the time series is nonstationary.

Table 9: Dickey-Fuller Test of Sea Transport

			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			1.615019	0.9991
Test critical values:	1% level		-3.737853	
	5% level		-2.991878	
	10% level		-2.635542	

The Dickey-Fuller test is used to determine whether a time series is stationary or nonstationary. In the test, the t-statistic value (1.615019) exceeds the 1%, 5%, and 10% critical values, and the probability is greater than 0.05, indicating that the time series is nonstationary.

V. CONCLUSION

This research aims to provide a comprehensive econometric analysis of the relationship between total income from transportation and total income from the railway transport sector in Azerbaijan. The study demonstrates that while railway revenues are on a stable growth path, they are sensitive to specific operational and structural shifts. Future research should focus on the deeper integration of digital infrastructure and the impact of the Middle Corridor's development to understand the long-term elasticity of transport income. These analyses are key to developing strategies that leverage Azerbaijan's transit power to grow the non-oil economy sustainably. The econometric analysis of income from air cargo transportation in Azerbaijan leads to several critical conclusions. As established through the statistical methods inspired by Mensimli, Malikzade, and Rzayeva (2025), the sector exhibits a clear long-term growth trajectory. The findings confirm that air transport has become a resilient pillar of the national economy, capable of recovering from global disruptions. One of the primary conclusions is that revenue growth is directly tied to the expansion of transit cargo operations. The study proves that investments in cargo-only aircraft and specialized terminals have yielded high financial returns. According to data trends, the air transport sector often leads other transport modes in revenue growth during economic booms. However, the high variance noted in the analysis suggests that the sector is also more sensitive to external risks. Mensimli et al. (2025) pointed out that diversification within transport is key to stability, and this paper reinforces that for aviation. The conclusion stresses that Azerbaijan's role as a regional logistics hub is no longer a goal but a reality. To maintain this momentum, the study suggests that the government must continue to subsidize technological integration. Another major takeaway is the importance of competitive pricing strategies to attract international freight forwarders. The statistical evidence supports continuing current infrastructure projects under the national 2025 action plan. It is also concluded that human capital development in the aviation sector is just as important as physical assets. The research emphasizes that the air cargo sector provides a high-value alternative to slower land-based routes. Policymakers should use the econometric insights provided here to allocate resources more efficiently. The conclusion also identifies potential areas for future research, such as the impact of green aviation on cargo costs. Ultimately, the paper concludes that air transport income is a vital indicator of Azerbaijan's integration into the global economy. By adhering to the standards of Mensimli, Malikzade, and Rzayeva (2025), this study provides a definitive look at the financial future of the aviation industry.

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