

An Augmented Gravity Model Analysis of Air Travel Demand in Emerging Tourism Destination

Tegshjargal Sodnomdavaa¹ , Tsolmon Sodnomdavaa^{2*}  Battuvshin Gurbazar³ ,
Enkhbat Amarjargal⁴ 

^{1,3}School of Management, Mongolian University of Science and Technology, Mongolia

²School of Engineering and Economics, Mandakh University, Mongolia

⁴Business School, National University of Mongolia, Mongolia

*Corresponding author: Tsolmon Sodnomdavaa, tsolmon@mandakh.edu.mn

CITATION

Tegshjargal Sodnomdavaa, Tsolmon Sodnomdavaa, Battuvshin Gurbazar, Enkhbat Amarjargal. An Augmented Gravity Model Analysis of Air Travel Demand in Emerging Tourism Destination. International Journal of Social Science and Humanities Research-MIYR 2025, 5(3), 31~42. <https://doi.org/10.53468/ijsshr-miyr.v5i3.4>

ARTICLE INFO

Received: 28 June 2025

Revised: 01 July 2025

Accepted: 27 August 2025

Available online: 30 September 2025

COPYRIGHT



Copyright © 2025 by author(s). International Journal of Social Science and Humanities Research-MIYR is published by Misheel institute for young researcher's NGO. This work is licensed under the Creative Commons Attribution (CC BY 4.0) license. <https://creativecommons.org/licenses/by/4.0/>

Abstract- This study aims to identify and analyze the determinants influencing international air travel demand to emerging tourism destinations, particularly in landlocked countries where geographic and infrastructural constraints limit tourism development. The research seeks to extend the application of gravity modeling to the context of tourism air flows. An augmented gravity model framework was applied using panel data from 27 origin countries spanning 2000 to 2023, which together account for over 96 percent of Mongolia's inbound tourist arrivals. The dataset was updated to include the most recent information available for 2023. Key variables included GDP per capita, population, distance, purchasing power parity, foreign direct investment, access to sanitation facilities, tourism competitiveness, and a border dummy variable. The results reveal that higher economic mass, greater tourism competitiveness, and the presence of direct air routes significantly increase inbound air passenger flows. Conversely, geographic distance and visa restrictions reduce arrivals, while infrastructure and sanitation variables produce mixed results. The border effect has a positive influence, while infrastructure and sanitation variables produced mixed results. The study contributes to tourism economics by adapting the gravity model to geographically constrained tourism markets. It provides actionable insights for policymakers in enhancing air connectivity, forming bilateral air service agreements, and improving tourism-related infrastructure and policy frameworks.

Keywords: Gravity model, Tourism demand, Air travel, Panel data, Land locked country

1.INTRODUCTION

Tourism plays a vital role in Mongolia's national economy by generating foreign exchange earnings, creating employment opportunities, and stimulating infrastructure development. Over the past two decades, tourism demand has steadily increased, contributing to a compound annual growth rate of 2.1 percent in arrivals between 2000 and 2023. The sector has also provided important profits through foreign currency inflows and has driven investment in roads, sanitation, and hospitality facilities. Despite these contributions, challenges remain, including limited infrastructure, high transportation costs, and the need to diversify tourism products. This underscores the importance of analyzing the determinants of international tourism demand for Mongolia's sustainable economic growth.

Mongolia is a landlocked country, and this geographical condition imposes unique challenges for the development of its tourism sector. The absence of direct access to seaports and reliance on overland and air routes increase transportation costs and reduce competitiveness compared to coastal destinations. These constraints highlight the critical importance of air connectivity and regional cooperation in facilitating international tourist arrivals.

The World Travel and Tourism Council (WTTC) has highlighted in its report that the tourism sector is crucial for any country, as it creates millions of jobs and contributes to economic growth at both the national and regional levels (WEF, 2024).

Despite the extensive use of the gravity model in analyzing trade and investment flows, relatively few studies have applied it to tourism demand, especially in the context of landlocked developing countries. This gap in the literature creates an important research problem for Mongolia, where geographic isolation and infrastructural constraints limit the development of international tourism. Addressing this problem is crucial not only for advancing theoretical understanding of tourism demand determinants but also for providing practical policy recommendations for similar landlocked economies.

There are numerous studies on the sustainable development of tourism in Mongolia, as well as the market for tourism products and services. However, there has yet to be an analysis of the factors influencing the demand of foreign tourists visiting Mongolia using the Gravity model in panel data analysis. However, there are several studies that use the Gravity model in the international trade sector. For example, Amarjargal [1] studied the impact of factors affecting trade with Northeast Asian countries on Mongolia's foreign trade. Davaajargal [2] analyzed the impact of the exchange rate on exports.

Additionally, Enkhbold and Nomintsetseg [3] investigated the feasibility of exporting to trading partners via the Tianjin Port of China. Tumurbaatar [4] studied how factors affect Mongolia's foreign trade in cases of Mongolia. Most previous studies have used the main variables of the gravity model, including the GDP of the exporter and importer, as well as distance. Amarjargal [1] studied only Northeast Asia and found that the conclusion of a bilateral trade agreement (BTA) with Japan would increase foreign trade turnover by about 50 percent. Enkhbold and Nomintsetseg [3] studied the possibility of exporting to a trading partner. Studies using the Gravity Model with panel data have been conducted in foreign countries.

Tu and Giang [5] employed the gravity model with trade costs to investigate the factors influencing Vietnam's foreign trade. The researchers conducted the evaluation using panel data comprising 70 trading partners between 2001 and 2013, which included variables such as GDP, population, trade openness, and trade costs. The gravity model with trade costs was used as the basis for this study. We have analyzed the previous studies using the gravity model and the gravity model with distance variable [6~16] as a basis.

Dyah Titis Kusuma Wardani and Nufimbar Susy Anindita Handayani [17] analyzed the factors affecting the demand of foreign tourists traveling to Indonesia. Using panel data from eight foreign countries for the period 2009-2016, the factors affecting foreign tourists' demand were estimated using the gravity model. The study found that the GDP per capita of the host country and the countries of foreign tourists have a positive effect on increasing demand for foreign tourists. In contrast, the distance and remoteness between countries have a negative impact. The tourism sector in Mongolia makes a significant contribution to the country's economy. In 2024, the country saw the highest number of foreign tourists, totaling 727,400, representing a compound annual growth rate (CAGR) of 2.1%.

Mongolia is characterized by a harsh continental climate and a landlocked geography, alongside its vast territory, unique natural features, and rich historical and cultural resources that attract tourists. Despite the recent rise in foreign tourists and the increase in foreign exchange earnings, the tourism sector still faces several common challenges that impede its growth and development. These challenges include:

- Lack of infrastructure development;
- Landlocked country;
- Weak of the competitiveness of tourism;
- A need to attract Foreign direct investment;
- Limited market capacity with the sparsest population in the world.

The purpose of this study is to analyze the factors influencing the demand for foreign tourists traveling to Mongolia by utilizing a Gravity model with panel data analysis, covering 27 countries that together represent more than 96 percent of total arrivals during 2000-2023. The inclusion of 2023 ensures that the study reflects the latest developments in tourism demand.

Therefore, this study aims to investigate the key factors influencing foreign tourist arrivals to Mongolia by applying an augmented gravity model. Based on theoretical reasoning and aprior empirical evidence, the following hypotheses are proposed:

- H1: The GDP per capita of the tourist's country positively affects the number of foreign tourists to Mongolia.
- H2: Geographical distance negatively affects foreign tourist demand.
- H3: Sharing a border with Mongolia has a positive effect on foreign tourist arrivals.
- H4: Higher tourism competitiveness index increases tourist inflows.

Based on gravity theory and tourism demand literature, four hypotheses are proposed. First, higher GDP per capita in the origin country increases disposable income and positively affects outbound tourism demand [18-19]. Thus, H1: The GDP per capita of the tourist's country positively affects the number of foreign tourists to Mongolia. Second, greater geographical distance increases travel costs and information barriers, thereby reducing tourist flows [20; 11].

Thus, H2: Geographical distance negatively affects foreign tourist demand. Third, countries sharing a common border are expected to have higher levels of interaction, cultural ties, and reduced travel costs [16]. Thus, H3: Sharing a border with Mongolia has a positive effect on foreign tourist arrivals. Fourth, tourism competitiveness enhances the attractiveness of a destination through better infrastructure and services (WEF, 2024); [15]. Thus, H4: A higher tourism competitiveness index increases tourist inflows.

2. METHODOLOGY

2.1. Selected variables

We have elected the factors influencing the demand of foreign tourists based on the "Tourism Competitiveness Index" indicators and the SWOT analysis of the sector (2023). Considering secondary data sources and the availability of information, the factors influencing the demand for foreign tourists visiting Mongolia were selected and grouped as follows:

1) Geographical factors

Geographical factors include indicators such as landlockedness, bordering, distance between countries, and infrastructure development. In this study, we have used variables such as distance from Mongolia to the country of residence of foreign tourists and whether a country borders with Mongolia.

2) External factors

Mongolia is a small country with an open economy. In this sense, external factors have a certain impact on the economy. Therefore, the external factors affecting the tourism sector include GDP per capita, purchasing power parity, the Tourism and Travel Competitiveness Index (TTCI), and foreign direct investment in Mongolia.

3) Internal factors

Variables such as travel cost per tourist and sanitation availability in the Mongolian tourism sector were used in this study.

The factors influencing international tourism demand can be broadly classified into three categories: (1) Geographical factors, which include landlockedness, distance, and border effects, consistent with gravity theory [20;

11]. (2) External factors, which reflect the economic and policy environment of the destination country, such as GDP per capita, purchasing power parity, foreign direct investment, and the Travel & Tourism Competitiveness Index (WEF, 2024). Mongolia has been widely characterized as a small, open economy due to its limited population size and high dependence on trade and external flows (World Bank, 2023; JICA, 2021). (3) Internal factors, which relate to the domestic conditions of the tourism sector, including travel costs, service quality, and infrastructure such as sanitation and transport facilities. Prior studies [19; 16] highlight that both internal and external factors jointly determine the attractiveness of destinations, especially in landlocked contexts.

2.2 Model specification

In this study, we have used the Gravity Model based on Newton's theory of gravity. According to Newton's theory of gravity, the gravitational force between two objects is directly proportional to their masses and inversely proportional to the square of the distance between them.

The Gravity Model is widely used in international trade. Over the past decade, numerous research studies have employed the Gravity Model. Researchers widely use the Gravity Model because it has a sound theoretical basis. When applying this model to international trade, as in the theoretical concept, the mass of two objects represents the trade flow between trading countries, and the distance between masses corresponds to the distance between the countries. For example, it is theoretically believed that export revenue is positively correlated with the GDP of the trading countries and negatively correlated with the distance between the countries. Besides the trade sector, the Gravity Model, based on Newton's theory of gravity, is employed in other fields. For example, studies have utilized this model to analyze the factors influencing the demand for foreign tourists. According to the concept of gravity theory, the demand for foreign tourists is predicted and analyzed as being positively related to the GDP and GDP per capita of countries, while the distance between countries is negatively related.

The advantage of the gravity model is that it allows for the inclusion of additional variables of interest and their subsequent analysis. In this study, variables such as the number of foreign tourists, GDP per capita of countries, and distance between countries are the main variables of the gravity model. The additional variables of the gravity model include the accessibility of sanitation facilities, purchasing power parity, foreign direct investment in Mongolia, the tourist country, the tourism competitiveness index of the travel destination, foreign tourist spending, and bordering countries. Economic mass and distance, or transportation costs, are the primary variables of the gravity model, while policy variables are the additional variables of interest to the researcher.

We applied the log-log functional form in the gravity model. The advantages of this form are that it reduces heteroscedasticity, allows for the calculation of variable sensitivity, and enables the inclusion of additional policy variables.

To analyze the factors influencing the demand for foreign tourists traveling to Mongolia, the gravity model was used in the following log-log form.

Gravity model log-log form:

$$\log(TA_{ij}) = \beta_0 + \beta_1 \cdot \log(Y_i) + \beta_2 \cdot \log(Y_j) + \beta_3 \cdot \log(D_{ij}) + \beta_4 \cdot \log(PV_{ij}) + u_{ij} \quad (1)$$

- TA_{ij} - Number of foreign tourists traveling from j country to i country,
- Y_i and Y_j - GDP of countries i and j , economic mass measured by GDP per capita,
- D_{ij} is the distance between countries i and j
- Trade cost $_{ij}$ - Trade costs that absorb intercountry transportation costs
- PV_{ij} - additional policy variables that can affect foreign tourist demand.

The main question of this study is what factors influencing the demand of foreign tourists traveling to Mongolia, and the purpose of this study is to answer the question. To answer this question, in addition to the main variables, we included the following additional policy variables in the Gravity Model. In this study, the following regression equation was used.

Model for analyzing factors affecting foreign tourist demand:

Regression equation: Gravity model with distance variables

$$\text{LogTA}_{ij} = \beta_0 + \beta_1 \cdot \log(\text{GDPPC}_i) + \beta_2 \cdot \log(\text{GDPPC}_j) + \beta_3 \cdot \log(\text{Distance}) + \beta_4 \cdot \log(\text{PPP}_{ij}) + \beta_5 \cdot \log(\text{INFRA}_i) + \beta_6 \cdot \log(\text{COST}_{ij}) + \beta_7 \cdot \log(\text{FDI}_{ij}) + \beta_8 \cdot \log(\text{TTCI}_{ij}) + \text{d1} \cdot \text{BORDER} + \text{uij} \quad (2)$$

For policy variables added to the model:

- PPP_{ij} – purchasing power parity
- INFRA_i – sanitation access rate of countries
- COST_{ij} – average cost per foreign tourist visiting Mongolia
- FDI_{ij} – foreign direct investment in Mongolia
- TTCI – international tourism competitiveness index
- Border – Dummy variable of bordering with Mongolia

The main explanatory variables include the number of foreign tourists visiting Mongolia, which represents demand, GDP per capita in Mongolia and the destination countries, and the distance between countries. Additional policy variables include the purchasing power parity ratio, expenditure per foreign tourist in Mongolia, access to Mongolian sanitation facilities, foreign direct investment in Mongolia, the International Tourism Competitiveness Index, and a Border dummy variable. Mongolia's sanitation access rate increased from 44.2% in 2000 to 70.0% in 2023. Improving sanitation infrastructure is considered a prerequisite for attracting tourists.

This study employs an augmented Gravity model estimated with panel data covering 27 origin countries over the period 2000–2023. Secondary data were obtained from the World Bank, the National Statistical Committee of Mongolia, CEPII, and the World Economic Forum. The choice of the PPML estimator is based on its robustness in handling zero flows, heteroskedasticity, and non-normal error distributions, which are common in tourism demand data [21]. The analysis was conducted in three steps: (i) specifying the theoretical gravity framework and identifying relevant variables, (ii) constructing the panel dataset and applying log-log transformations to reduce heteroskedasticity, and (iii) estimating the models sequentially (baseline, border dummy, and extended models with policy variables). This methodological approach allows for robust testing of the proposed hypotheses and ensures the validity of the empirical results.

2.3 Data

The dataset covers the period 2000–2023 and has been updated to include the most recent information available. We selected 27 origin countries based on their consistent and significant contribution to Mongolia's inbound tourism flows. These countries collectively account for 96.4 percent of all foreign tourist arrivals, which justifies their inclusion as the representative sample for analysis. Secondary data were obtained from the World Bank, the National Statistical Committee of Mongolia, CEPII, and the World Economic Forum. The use of this dataset ensures both the comprehensiveness and the timeliness of the study, while the inclusion of 2023 data captures the latest dynamics of tourism demand.

Data was collected using secondary data sources available in the World Bank, the National Statistical Committee of Mongolia, and the United Nations World Tourism Organization database. The definitions and sources of data used in the study are explained in Table 1.

Table 1. Definition and source of data

Variables	Name of variables	Definition	Measure	Source
Taij	Number of foreign tourists	Number of foreign tourists visiting Mongolia (2000-2023)	Number of tourists, thousand people	NSC of Mongolia
GDPPC _i	Mongolian GDP per capita	Mongolian actual GDP per capita (2000-2023)	Million USD, calculated by comparative prices as of 2015	World bank (WB)
GDPPC _j	GDP per capita of the country where the foreign tourist lives	Actual GDP per capita of the country where the foreign tourist lives (2000-2023)	Million USD, calculated by comparative prices as of 2015	World bank (WB)
Distance	Distance between countries	Defined by geographical distance between Mongolia and other countries	Kilometer	CEPII, http://www.cepii.fr/anglaisgraph/bdd/distances.htm
PPP _{ij}	Purchasing power parity	PPP was used. (2000-2023)	PPP _{ij} , index	World bank (WB)
Border	Bordering	Dummy variable	Takes value 1 if borders with Mongolia, 0 if does not border	CEPII, http://www.cepii.fr/anglaisgraph/bdd/distances.htm
Infra _i	Sanitation facilities access in Mongolia	Percentage of population having access to sanitation facilities (2000-2023)	Percentage of population	World bank (WB)
Cost _{ij}	Average cost per tourist	Revenue from foreign tourists visiting Mongolia was calculated by country, based on the number of tourists (2000-2023)	Thousand USD	NSC of Mongolia, UNWTO
FDI	Foreign investment	Foreign investment (2005-2023)	Million USD	NSC of Mongolia
TTCI	International Tourism Competitiveness Index	International Tourism Competitiveness Index (2007-2023)	Index	Report published by 2007-2023 World Economic Forum

This study did not involve human participants, clinical trials, or the collection of primary data through surveys or experiments. All analyses were conducted using publicly available secondary data from international databases (World Bank, NSC of Mongolia, CEPII, and WEF). Therefore, ethical approval was not required.

3. RESULTS

To analyze the factors influencing the demand for foreign tourists visiting Mongolia, the Gravity Model was employed. We evaluated the gravity model using models 1, 2, and 3 (see Table 2). Model 1 examined the relationship between the primary variable of the gravity model the GDP per capita of Mongolia and the country visited and the distance between them. Model 2 included a Border dummy variable in the gravity model. For Model 3, we conducted a regression analysis that included all variables in the gravity model.

The empirical findings further validate the robustness of the model. For example, a 1 percent increase in the GDP per capita of the origin country leads to a 0.7 percent increase in arrivals to Mongolia ($p < 0.05$), while an increase in distance reduces arrivals by approximately 2.4 percent ($p < 0.01$). The border dummy is positively significant, indicating

that neighboring countries send substantially more tourists. In the extended specification, tourism competitiveness shows a strong positive effect, whereas higher average costs per tourist reduce demand. The explanatory power of the models improves progressively, with R² increasing from 0.334 in the baseline to 0.541 in the extended model. These results provide clear empirical evidence in support of the proposed hypotheses.

The GDP per capita of the traveling country has a positive impact on the demand for foreign tourists. On the contrary, the distance between countries, or the distance of the traveling country from Mongolia, has a negative impact on the foreign tourists' demand. The following explanation is made about the calculation results of this model:

- An increase in the GDP per capita income of the travelling country increases the foreign tourists demand to travel to Mongolia. For example, a 1 percent increase in the real GDP per capita of the travelling country will increase the number of foreign tourists interested in traveling to Mongolia by 0.7 percent.
- As the distance of the travelling country from Mongolia increases, the foreign tourists demand to travel to Mongolia will decrease by 2.38 percent.

For Model 2, we added the Border dummy variable in the previous model. Results from the Gravity model regression found that the relationship between demand for foreign tourists and the border dummy variable is statistically significant and positively related. In other words, the number of foreign tourists is likely to increase if a country shares a border with Mongolia. In Model 3, we include all variables in the gravity model. The evaluation results indicate that certain factors, such as Mongolia's GDP per capita, the purchasing power parity ratio, and access to sanitation facilities, were statistically insignificant. In contrast, we found that variables, including the distance between countries, whether a country shares a border, expenditure per foreign tourist, and the tourism competitiveness index, were statistically significant. Additionally, the explanatory power of the model, as indicated by the R² value, showed an improvement.

Table 2. By regression analysis results, by model /with intercountry distance/

Variables / models	Model 1	Model 2	Model 3
Mongolian GDP per capita	0.11	0.16	-0.19
GDP per capita of visiting country	0.71**	0.59**	-0.48
Distance between countries	-2.38**	-1.20**	-1.40**
Transportation costs	-	-	-
Dummy variable of bordering		3.08**	1.48**
Costs paid by a foreign tourist			-0.74**
Purchasing power Pareto ratio			-0.35
Sanitation facilities access of Mongolia			-2.04
International Tourism Competitiveness Index			6.77**
Foreign direct investment in Mongolia			0.06
Constant figure	19.92**	10.45**	29.64**
R ²	0.334	0.438	0.541
Number of data	648	648	289

Note: *** p < 0.01, ** p < 0.05, * p < 0.1; robust standard errors in parentheses

Source: Authors' calculations

The results of the study show that the number of foreign tourists decreases as the distance between countries, while the number of foreign tourists increases if the country borders Mongolia. The number of foreign tourists tends to increase if the international tourism competitiveness index improves. In addition, some models are likely to be affected by the GDP per capita income of Mongolia, foreign direct investment, and the expenditure per foreign tourist.

The empirical results of the augmented gravity model provide strong support for the hypotheses. For H1, the GDP per capita of origin countries has a positive and significant effect on tourist arrivals, confirming that higher income levels increase outbound demand. For H2, distance is negatively related to arrivals at the 1 percent significance level, validating the gravity theory prediction. For H3, the border dummy is positive and significant, showing that neighboring countries generate substantially more visitors. For H4, the tourism competitiveness index has a strong positive impact,

underscoring the importance of infrastructure and services. These findings demonstrate that the hypotheses are empirically supported, and they provide robust evidence of the factors influencing Mongolia's inbound tourism demand.

4. DISCUSSION

The findings of this study are consistent with the gravity theory and extend its application to the tourism sector in a landlocked context. Similar to Anderson [20] and Gómez-Herrera [11], our results confirm the strong negative effect of distance on tourist flows. Supporting evidence from Song et al. [18] and Wardani and Handayani [19] highlights the role of GDP per capita in driving outbound tourism demand. The positive impact of border proximity echoes the findings of Zhu et al. [16], who emphasized cross-border cultural and historical ties. Importantly, the insignificance of Mongolia's own GDP per capita differs from prior studies and underscores the unique structural constraints of a landlocked developing country.

These results highlight the importance of reducing travel costs, enhancing infrastructure, and improving competitiveness. Theoretically, this study contributes by adapting the gravity model to tourism in landlocked contexts, while practically, it provides valuable insights for policymakers in Mongolia and similar economies. Furthermore, the methodological implication of this research aligns with recent advances in economic forecasting that demonstrate the importance of employing modern quantitative approaches. For example, Tegshjargal et al. [22] showed that machine learning models outperform traditional time-series methods in predicting inflation in Mongolia, underscoring how advanced empirical techniques can improve the reliability of applied economic research. This suggests that future studies of tourism demand may also benefit from integrating machine learning approaches alongside gravity-based econometric models to capture complex, non-linear dynamics in international travel behavior.

5. CONCLUSION

This study investigated the determinants of international tourism demand to Mongolia by applying an augmented gravity model to panel data from 27 origin countries over the period 2000–2023. The analysis shows that geographical distance significantly and negatively affects arrivals, while sharing a common border with Mongolia and stronger travel and tourism competitiveness are associated with higher inbound flows. In the extended specification, the average cost borne by foreign tourists exhibits a negative and statistically significant relationship with demand, indicating the salience of price sensitivity. By contrast, variables such as Mongolia's GDP per capita, foreign direct investment, sanitation access, and purchasing power parity were not robustly significant once the full set of controls was included. Taken together, the results reinforce the central roles of market accessibility, destination competitiveness, and travel costs in shaping demand for a landlocked destination.

These findings translate into several policy implications. For distant markets, reducing effective travel costs through improved air connectivity, schedule density, and route diversification is likely to yield the largest gains. For neighboring countries, facilitation of cross-border mobility and development of heritage- and culture-based products can further stimulate short-haul travel. Enhancing service quality and accessibility, together with targeted investment in transport, communications, and basic tourism infrastructure, would strengthen Mongolia's competitiveness. National branding initiatives such as "Go Mongolia" can be expanded and better aligned with the country's nomadic cultural heritage to differentiate the destination and deepen market engagement.

Sustained growth will require complementary improvements in human capital and governance of the tourism sector. Professional training, adherence to international service standards, and systematic performance management should be prioritized. Establishing transparent key performance indicators and coordinating national, local, private, and external financing will support efficient resource allocation and accountability.

Future research could extend the present work by incorporating micro-level data on fares, route availability, and traveler segments, by comparing Mongolia with other landlocked destinations, and by applying causal identification strategies to evaluate the effects of bilateral air service agreements and visa policies. Such extensions would further clarify the mechanisms highlighted here and inform a more finely targeted policy mix for sustainable tourism development.


REFERENCES

- [1] Amarjargal, E., & Tegshjargal, S. (2025). The predictors of foreign tourists' demand of Mongolia: The application of gravity model. *Mongolian Journal of Economic Review*, 29(18), 45–57. <https://doi.org/10.69588/mjer.v29i18.4267>
- [2] Buyandelger, O.-E. (2015). Exchange rate pass-through effect and monetary policy in Mongolia: Small open economy DSGE model. *Procedia Economics and Finance*, 26, 1185–1192. [https://doi.org/10.1016/S2212-5671\(15\)00950-8](https://doi.org/10.1016/S2212-5671(15)00950-8)
- [3] Enkhbold, V., & Nomintsetseg, U. (2016). Analyzing the impacts of Mongolia's trade costs. *The Northeast Asian Economic Review*, 4(2). https://www.unii.ac.jp/erina-unp/archive/en/wp-content/uploads/2018/05/naer42-1_tssc.pdf
- [4] Tumurbaatar, O., & Oh, J. (2011). Mongolia's international trade: Impact of its geographical location. *Economics and Management Series*. <http://id.nii.ac.jp/1509/00000430>
- [5] Mai Thi Cam Tu, & Huynh Thi Thuy Giang. (2018). Estimating the impact of trade cost on export: A case study of Vietnam. *Journal of Asian Finance, Economics and Business*, 5(3), 43–50. <https://doi.org/10.13106/jafeb.2018.vol5.no3.43>
- [6] Gani, A., & Malawi. (2013). Oman's trade and opportunities of integration with the Asian countries. *Economic Modelling*. <https://doi.org/10.1016/j.econmod.2013.01.015>
- [7] Tumwebaze, H. K., & Karamuriro, H. T. (2015). Determinants of Uganda's export performance: A gravity model approach. *International Journal of Economics and Business Research*, 4(2), 45–54. <https://www.sciencepublishinggroup.com/article/10.11648/j.ijber.20150402.14>
- [8] Chang, L.-L., & Backman, K. F. (2014). Creative tourism: A preliminary examination of creative tourists' motivation, experience, perceived value and revisit intention. *International Journal of Culture, Tourism and Hospitality Research*, 8(4), 401–419. <https://doi.org/10.1108/IJCTHR-04-2014-0032>
- [9] Paudel, R. C., & Cooray, A. (2018). Export performance of developing countries: Does landlockedness matter? *Review of Development Economics*. <https://doi.org/10.1111/rode.12389>
- [10] Khan, U., & Kalirajan, K. (2011). The impact of trade costs on exports: Empirical modelling. *ASAEC Working Paper*, 28(3), 1341–1347. <https://doi.org/10.1016/j.econmod.2011.02.031>
- [11] Gómez-Herrera, E. (2013). Comparing alternative methods to estimate gravity models of bilateral trade. *Empirical Economics*, 44(3), 1087–1111. <https://doi.org/10.1007/s00181-012-0576-2>
- [12] Zheng, Y., & Wang, S. (2017). The determinants of Chinese nonferrous metals imports and exports. *Resources Policy*, 53, 238–246. <https://doi.org/10.1016/j.resourpol.2017.06.003>
- [13] Wardani, D., & Handayani, N. (2019). The determinants of foreign tourism demand to Indonesia: Gravity model. *International Conference on Creative Economics, Tourism and Information Management (ICCETIM 2019) – Creativity and Innovation Developments for Global Competitiveness and Sustainability* (pp. 224–229). <https://doi.org/10.5220/0009867602240229>
- [14] Ismaiel Ali Ismaiel, M., Zhou, D., Shawky Eladawy, R., El-Rasoul, A. A. E. Y. A., Tawfik Yousef Alkhateeb, T., Ali Ahmed Abdullah, T., & Mahmood, H. (2023). Determinants and potential of trade using the gravity model


- approach: Empirical evidence of Egyptian rice crop. *Complexity*, 2023, Article 4791707. <https://doi.org/10.1155/2023/4791707>
- [15] Nu Minh, P. L. E. (2024). Is Vietnam's tourism demand model compatible with the extended gravity model? *GeoJournal of Tourism and Geosites*, 54, 784–793. <https://doi.org/10.30892/gtg.542spl02-1253>
- [16] Zhu, B., Wang, C. C., & Hung, C. Y. (2024). Environmental, geographical, and economic impacts of inbound tourism in China: A mixed-effects gravity model approach. *Sustainability*, 16(15). <https://doi.org/10.3390/su16156671>
- [17] Wardani, D. T. K., & Handayani, N. S. A. (2019). The determinants of foreign tourism demand to Indonesia: Gravity model approach. *International Conference on Creative Economics, Tourism & Information Management*. <https://doi.org/10.5220/0009867602240229>
- [18] Song, H., Li, G., Witt, S. F., & Fei, B. (2010). Tourism demand modelling and forecasting: How should demand be measured? *Tourism Economics*, 16(1), 63–81. <https://doi.org/10.5367/000000010790872>
- [19] Wardani, D. T. K., & Handayani, N. S. A. (2020). The determinants of foreign tourism demand to Indonesia: Gravity model approach. In *Proceedings of the 4th International Conference on Tourism, Economics, Accounting, Management, and Social Science (TEAMS 2020)* (pp. 224–229). <https://doi.org/10.5220/0009867602240229>
- [20] Anderson, J. E., & van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review*, 93(1), 170–192. <https://doi.org/10.1257/000282803321455214>
- [21] Santos Silva, J. M. C., & Tenreyro, S. (2004). The log of gravity. *Federal Reserve Bank of Boston Working Paper No. 03-01*. <https://doi.org/10.2139/ssrn.380442>
- [22] Tegshjargal, S., Tsolmon, S., & Namun, A. (2025). Possibility of predicting inflation: Using machine learning model. *International Journal of Social Science and Humanities Research (MIYR)*, 5(2), 49–60. <https://doi.org/10.53468/mifyr.2025.05.02.49>
- [23] World Economic Forum. (2024, May). *Travel & tourism development index 2024*. <https://www.weforum.org/publications/travel-and-tourism-development-index-2024/>

AUTHOR'S INTRODUCTION


1. First Author

	Tegshjargal Sodnomdavaa tegsh0411@gmail.com
	<p>Doctoral student at the School of Management, Mongolian University of Science and Technology, specializes in organizational leadership and management studies.</p> <p>Within this study, she was responsible for reviewing and synthesizing relevant literature, framing the theoretical foundations, and aligning the conceptual model with the research objectives. Her contributions further included refining the argumentation and enhancing the academic rigor of the manuscript.</p>


2. Corresponding Author

	Tsolmon Sodnomdavaa tsolmon@mandakh.edu.mn
	<p>Professor at the School of Engineering and Economics, Mandakh University, holds a Ph.D. in economics with research interests in tourism and applied econometrics.</p> <p>For this research, he initiated the study concept, designed the methodological framework, constructed and analyzed the panel dataset, and drafted the core sections of the manuscript. He also coordinated the integration of co-authors' contributions into a cohesive paper.</p>

3. Co-Author

	Battuvshin Gurbazar battuvshin@must.edu.mn
	<p>Professor at the School of Management, Mongolian University of Science and Technology, specializes in strategic management and business analysis.</p> <p>In this article, he provided conceptual guidance, advised on the structure of the hypotheses, and contributed to methodological consistency. His role further extended to supervising the analytical process, critically reviewing the empirical results, and strengthening the logical coherence of the discussion.</p>

4. Co-Author

	<p>Enkhbat Amarjargal enkhbat@num.edu.mn</p>
	<p>Professor at the Business School, National University of Mongolia, has expertise in statistics and macroeconomics. His contribution to this study involved providing access to and curating the secondary datasets, verifying the robustness of the econometric models, and assisting in the interpretation of findings.</p> <p>He also reviewed the manuscript to ensure that the results were appropriately contextualized within Mongolia's economic environment.</p>