

# **Analysis of Factors Influencing the Frequency of International Entries and Exits in Ecuador during 2023**

## **1. Introduction**

International mobility has become an increasingly relevant phenomenon in a globalized world, where physical and cultural borders are blurred thanks to economic, social, and technological interconnection. Ecuador, with its rich cultural and geographic diversity, emerges as a point of interest for studying the dynamics of international travel. In recent years, the country has experienced significant changes in its mobility patterns, influenced by various factors such as economic growth, improvements in tourism infrastructure, and migration policies (González, 2020). Moreover, Ecuador has certain aspects that influence people's desire to stay in this country, for example, the climate, housing costs, health, relative tranquility and security in certain parts of the country due to its rurality (Izurieta, 2024).

In 2023, after a period of severe restrictions due to the COVID-19 pandemic, the tourism industry and international travel have begun to recover. This revival presents a unique opportunity to investigate the factors that influence the frequency of international entries and exits of Ecuadorians. The reactivation of flights and the easing of travel restrictions have allowed many travelers to resume their international activities, but the reasons behind their travel decisions require further analysis (World Tourism Organization, 2022).

Travel motives are multifaceted and include economic, social, and cultural aspects. According to Cottam and Mullen (2019), economic factors such as the cost of tickets, availability of deals, and currency fluctuations can significantly influence a traveler's decision. Additionally, social motivations, such as seeking family connections, interacting with friends abroad, or the desire to explore new cultures, are equally relevant. In this regard, Ajzen's (1991) theory of planned behavior suggests that travel intentions are affected by attitudes, subjective norms, and perceptions of control over behavior.

In the digital age, the role of social media and the influence of other travelers' opinions have become significantly important in decision-making. Recent studies have shown that online recommendations and shared experiences on social platforms can significantly modify travel intentions (Litvin, Goldsmith, & Pan, 2008). This phenomenon reflects a shift in how travelers obtain information and make decisions, posing new challenges and opportunities for the tourism sector.

Moreover, understanding migration patterns is critical, as they are shaped by diverse social, economic, and political factors. Migration can be driven by job opportunities, family reunification, tourism, or even political instability, making it a highly complex phenomenon. The varied motivations behind migration necessitate an in-depth examination of the factors that impact travelers' decisions to either enter or leave a country. Analyzing these patterns not only helps us comprehend broader socio-economic trends but also the effects of global events, such as pandemics or economic crises, on international mobility (Böhning, 2020).

This study aims to provide a holistic view of the characteristics of trips and travelers that have the greatest impact on migration patterns. The insights obtained can be invaluable for policymakers and authorities managing migration flows and designing effective migration policies. The findings will help identify vulnerable groups, such as young individuals seeking employment or families migrating due to political unrest.

By understanding these dynamics, policymakers can better allocate resources, plan infrastructure, and develop policies that cater to the needs of migrants and residents alike.

According to Cottam and Mullen (2019), travel decisions are influenced by individual factors, such as age, income, and education, as well as external factors, including the economic situation and government policies. This approach highlights the complexity of travel decisions, where multiple interrelated variables play a crucial role.

Ajzen's (1991) Theory of Planned Behavior is fundamental to understanding how travel intentions are formed. This theory suggests that intentions are determined by three components: attitudes toward the behavior, subjective norms and perceived behavioral control. These dimensions can be particularly relevant in a post-pandemic context, where perceptions of risk and restrictions may significantly alter travel intentions (Gómez & López, 2021).

Furthermore, the socioeconomic context of travelers is a key determinant. Research by Sirakaya and Woodside (2005) indicates that factors such as disposable income and job stability are crucial for decision-making related to tourism. In the case of Ecuador, the impact of the local economy and employment opportunities can influence the frequency of international travel.

Another relevant theoretical framework is the Travel Motivations Model, which identifies intrinsic and extrinsic factors driving individuals to travel. Crompton (1979) notes that motivations can include the pursuit of relaxation, adventure, learning, and socialization experiences. These motivations are deeply interconnected with the personal and cultural experiences of travelers, which can affect the frequency and destination of international trips.

Moreover, in the current context, the impact of technology and social media cannot be underestimated. According to Buhalis and Law (2008), technology has transformed how travelers plan and book their trips, increasing accessibility and influencing travel decisions. Online recommendations and reviews from other travelers on social platforms are crucial for shaping expectations and forming attitudes toward specific destinations (Litvin, Goldsmith, & Pan, 2008).

Lastly, the concept of social capital is relevant for understanding travel dynamics. Bourdieu (1986) defines social capital as the network of social relationships that can facilitate access to resources and opportunities. In this regard, social and familial connections can influence the decision to travel, particularly for Ecuadorians seeking to reunite with family abroad or explore job opportunities.

## **2. Data**

The analysis utilizes data from the International Entry and Exit Registry (ESI) provided by INEC for the year 2023. This dataset contains detailed information for each international movement, including the date of movement, nationality, purpose of the trip, mode of transport, and demographic information about the traveler, such as age and gender. This rich dataset allows for a nuanced analysis of migration trends and helps identify key factors that influence the frequency of entries and exits.

### **2.1 Data Description**

The dataset contains 6,205,610 observations and 13 variables. The key variables are:

- **tip\_movi (Tipo de Movimiento):** Indicates whether the movement is an entry (1) or an exit (2).
- **anio\_movi, mes\_movi, dia\_movi:** Represent the year, month, and day of the movement, respectively. All observations occur in 2023, providing a comprehensive view of migration activity throughout the year.
- **sex\_migr (Sexo):** Gender of the traveler (1 for male, 2 for female). Understanding gender differences in migration is important, as men and women may have different motivations for moving internationally, such as employment opportunities or family reunification.
- **nac\_migr (Nacionalidad):** Nationality of the traveler, with values ranging from 4 to 894 representing different country codes. This variable helps us understand which nationalities are most likely to migrate to or from Ecuador, providing insight into regional and international migration trends.
- **via\_tran (Medio de Transporte):** Mode of transport (e.g., air, sea, land) with values ranging from 1 to 4. The mode of transport can significantly impact the ease and cost of migration, influencing travelers' decisions.
- **mot\_viam (Motivo de Viaje):** Reason for travel (e.g., tourism, business, family), with values ranging from 1 to 9. The purpose of travel is a crucial factor in understanding migration patterns, as it reflects the motivations behind individuals' decisions to move.
- **pais\_prod (País de Procedencia):** Country of origin or destination. This variable provides information on the geographic distribution of migrants, helping to identify key source and destination countries.
- **cont\_res (Continente de Residencia):** Continent of residence of the traveler. Analyzing migration at the continental level can reveal broader regional trends and highlight areas with higher migration pressures.
- **edad (Edad):** Age of the traveler, ranging from 0 to 107. Age is an important demographic factor, as younger individuals may migrate for education or employment, while older individuals may migrate for family reunification or retirement.
- **entrada and salida:** Binary variables indicating whether the movement was an entry (1) or an exit (1). These variables are the primary focus of the analysis, as they help us understand the frequency and determinants of entries and exits.

## 2.2 Summary Statistics

Below is a summary of key variables:

Variable	Observations	Mean	Std. Dev.	Min	Max
tip_movi	6,205,610	1.505	0.500	1	2
anio_movi	6,205,610	2023.0	0.0	2023	2023

mes_movi	6,205,610	6.658	3.397	1	12
dia_movi	6,205,610	15.726	8.808	1	31
sex_migr	6,205,610	1.485	0.500	1	3
nac_migr	6,205,610	368.912	260.818	4	894
via_tran	6,205,610	1.225	0.448	1	4
mot_viam	6,205,610	3.576	2.183	1	9
pais_prod	6,205,610	531.907	289.540	4	999
cont_res	6,205,610	1.143	0.443	1	9
edad	6,205,610	39.486	18.135	0	107
entrada	6,205,610	0.495	0.500	0	1
salida	6,205,610	0.505	0.500	0	1

The dataset is comprehensive, covering a wide range of traveler characteristics and trip details, which allows for an in-depth exploration of international migration in Ecuador during 2023. The large number of observations ensures statistical reliability, and the detailed variables enable the identification of key trends and factors influencing migration decisions.

### 3. Methods

To answer the research question, both descriptive and inferential statistical methods were employed to understand the general patterns of migration and identify significant factors influencing international

movements. These methods provide a holistic view of migration patterns, combining both qualitative insights from descriptive analysis and quantitative rigor from inferential techniques.

### 3.1 Descriptive Analysis

We conducted a descriptive analysis to provide an overview of the dataset and identify key trends:

- **Frequency of Entries and Exits:** Monthly counts of entries and exits were calculated, broken down by nationality, gender, purpose of the trip, and mode of transport. This helped to understand temporal patterns, such as peak migration periods, and identify any seasonal effects.
- **Demographic Distributions:** Demographic characteristics, such as age and gender, were explored using summary statistics and visualizations like bar charts and line graphs. This analysis provided insights into the composition of migrants, highlighting differences between entries and exits, and identifying groups with higher migration rates.

### 3.2 Inferential Analysis

To investigate the factors influencing entries and exits, we used logistic regression models and other statistical methods:

- **Logistic Regression Models:** Two logistic regression models were fitted—one to estimate the likelihood of a movement being an entry and the other for an exit. The predictor variables included gender, nationality, purpose of the trip, mode of transport, country of origin, continent of residence, and age. Logistic regression was chosen because it is well-suited for binary outcome variables, such as whether a movement is an entry or exit.
- **Two-sample t-test:** This test was used to compare the mean age of travelers entering versus those exiting Ecuador. Age is a critical demographic factor that could indicate motivations behind migration (e.g., younger individuals migrating for economic opportunities while older individuals migrate for family reunification). The t-test provides a robust statistical framework to determine if there are significant differences in age between the two groups.
- **Proportion Test:** A two-sample proportion test was conducted to compare the proportion of males among entries and exits, revealing significant gender-based differences in migration behavior. This test was essential for understanding whether gender plays a role in determining the likelihood of entry versus exit and provided valuable insights into the gender dynamics of migration.

## 4. Results

### 4.1 Logistic Regression for Entries

The logistic regression model for entries estimated the effect of several variables on the likelihood of a movement being an entry. The results are summarized below:

entrada	Odds ratio	Std. err.	z	P> z	[95% conf. interval]	
sex_migr						
Mujer	1.020632	.0016948	12.30	0.000	1.017316	1.02396
Indefinido	1.170517	.1191223	1.55	0.122	.9588523	1.428906
via_tran						
Vía terrestre	1.136456	.0023831	61.00	0.000	1.131795	1.141137
Vía Marítimo	.9280273	.0078698	-8.81	0.000	.9127302	.9435808
Vía fluvial	1.472921	.0416949	13.68	0.000	1.393426	1.556951
mot_viam						
Negocios	2.308377	.0179904	107.34	0.000	2.273384	2.343908
Eventos	1.958794	.0104375	126.18	0.000	1.938444	1.979359
Estudios	.1261664	.0024774	-105.43	0.000	.121403	.1311167
Residencia	2.344977	.0041499	481.59	0.000	2.336857	2.353125
Transeúnte	4.351489	.1015167	63.03	0.000	4.157001	4.555077
Tripulación	1.683846	.0089292	98.26	0.000	1.666436	1.701438
Otros	1.227767	.0061345	41.07	0.000	1.215802	1.239849
cont_res						
Europa	.994446	.0028304	-1.96	0.050	.988914	1.000009
Asia	2.007821	.0129659	107.94	0.000	1.982568	2.033395
África	1.863231	.0523872	22.13	0.000	1.763332	1.96879
Oceanía	1.220024	.0198588	12.22	0.000	1.181715	1.259574
Antártida	1	(empty)				
Sin especificar	.7934954	.1391541	-1.32	0.187	.5626917	1.11897
edad	.9997173	.0000457	-6.18	0.000	.9996276	.9998069
_cons	.5779339	.0014332	-221.10	0.000	.5751318	.5807497

- **Gender:** Males are slightly more likely to enter Ecuador compared to females, as indicated by an odds ratio of 1.0235. This could be due to employment opportunities that attract more male migrants.
- **Mode of Transport:** The mode of transport significantly influences entry, with air travel being more common for entries. This suggests that international visitors, especially tourists or business travelers, prefer air travel for entering Ecuador.
- **Purpose of the Trip:** Travel purposes, such as tourism or business, are associated with a higher likelihood of entry. This highlights the role of economic opportunities and tourism in driving migration.

#### 4.2 Logistic Regression for Exits

The logistic regression model for exits estimated the probability of a movement being an exit. The results are summarized below:

salida	Odds ratio	Std. err.	z	P> z	[95% conf. interval]	
sex_migr						
Mujer	.9797848	.001627	-12.30	0.000	.9766011	.9829788
Indefinido	.8543236	.0869436	-1.55	0.122	.6998363	1.042914
via_tran						
Vía terrestre	.8799282	.0018452	-61.00	0.000	.8763191	.8835521
Vía Marítimo	1.077554	.0091378	8.81	0.000	1.059793	1.095614
Vía fluvial	.6789232	.0192187	-13.68	0.000	.6422811	.7176557
mot_viam						
Negocios	.4332049	.0033762	-107.34	0.000	.4266379	.4398729
Eventos	.5105181	.0027203	-126.18	0.000	.5052142	.5158778
Estudios	7.926041	.1556356	105.43	0.000	7.626796	8.237027
Residencia	.4264434	.0007547	-481.59	0.000	.4249668	.4279251
Transeúnte	.2298064	.0053612	-63.03	0.000	.2195352	.2405581
Tripulación	.5938785	.0031492	-98.26	0.000	.5877381	.6000831
Otros	.8144871	.0040696	-41.07	0.000	.8065498	.8225025
cont_res						
Europa	1.005585	.0028621	1.96	0.050	.9999911	1.01121
Asia	.4980524	.0032163	-107.94	0.000	.4917883	.5043962
África	.5367021	.0150901	-22.13	0.000	.5079263	.5671082
Oceanía	.8196563	.0133419	-12.22	0.000	.7939194	.8462274
Antártida	1	(empty)				
Sin especificar	1.260247	.2210075	1.32	0.187	.8936793	1.777172
edad	1.000283	.0000458	6.18	0.000	1.000193	1.000372
_cons	1.730302	.0042908	221.10	0.000	1.721912	1.738732

- **Gender:** Males are slightly less likely to exit Ecuador compared to females. This finding suggests that males may have stronger reasons to remain in Ecuador, such as employment or long-term residency.
- **Mode of Transport:** Certain modes of transport, such as sea or land, are less associated with exits. This could indicate that those leaving Ecuador tend to do so via more formal means, such as air travel.
- **Purpose of the Trip:** Specific travel purposes reduce the likelihood of exit, highlighting the importance of travel motivations in determining migration behavior. For instance, individuals entering for long-term employment or family reasons may be less likely to leave shortly afterward.

#### 4.3 T-test and Proportion Test

- **Two-sample t-test:** The mean age of travelers entering Ecuador (39.65 years) was significantly higher compared to those exiting (39.33 years), with a p-value of <0.05. This suggests that younger individuals are more likely to leave Ecuador, while older individuals are more inclined to enter. This could reflect the fact that younger people are more mobile and may be seeking opportunities abroad, while older individuals may be moving to Ecuador for family or retirement purposes.

- **Proportion Test:** The proportion of males among entries was slightly higher (51.58%) compared to exits (51.43%), and the difference was statistically significant ( $p < 0.05$ ). This indicates a subtle but noteworthy gender-based difference in migration behavior, with men more likely to enter Ecuador and women more likely to exit. This may reflect traditional gender roles, with men migrating for work and women returning for family obligations.

## 5. Discussion

The logistic regression models reveal that gender, mode of transport, and purpose of the trip are significant factors in determining whether a movement is an entry or exit. Males tend to enter more frequently than exit, possibly due to employment opportunities, while women may have different motivations, such as family reunification. The mode of transport also influences migration patterns, with air travel being more common for entries, suggesting that formal migration channels are preferred for entering Ecuador. Additionally, the purpose of the trip plays a critical role, indicating that individuals traveling for business or tourism are more likely to enter than exit.

The two-sample t-test and proportion test further highlight demographic differences in migration. The finding that younger individuals are more likely to leave while older individuals are more likely to enter may reflect different life stages and motivations, such as career opportunities versus retirement or family reunification. The proportion test also points to subtle gender differences in migration dynamics, indicating that men and women may have different motivations and constraints when it comes to migration.

This analysis, however, has some limitations. The data may not fully capture irregular migration flows, which could lead to underestimating certain groups. Additionally, the logistic regression assumes a linear relationship between predictors and the log-odds of the outcome, which may oversimplify complex migration behaviors. Future research should consider more sophisticated models, such as non-linear models or machine learning techniques, to better capture the nuances of migration patterns. Moreover, incorporating qualitative data could provide deeper insights into the motivations behind migration, complementing the quantitative findings presented here.

## 6. Conclusion

This study has explored the factors influencing international migration in Ecuador during 2023, focusing on the frequency of entries and exits. The findings highlight several critical determinants: gender, mode of transport, and purpose of travel.

The results reveal that males are more likely to enter Ecuador, potentially driven by employment opportunities, while females are more inclined to exit, possibly due to family obligations. The significance of the mode of transport suggests that air travel is the preferred choice for entries, indicating a reliance on formal migration channels for international visitors. Furthermore, the purpose of travel plays a crucial role, with tourism and business-related trips being associated with a higher likelihood of entries.

Understanding these dynamics is vital for policymakers. The insights can inform targeted interventions to manage migration flows effectively. For instance, creating job opportunities may help retain younger individuals, while establishing family support programs could address gender imbalances in migration patterns. Additionally, these findings emphasize the need for adaptable policies that can respond to evolving socio-economic conditions and emerging migration trends.



Overall, this research contributes to a deeper understanding of Ecuador's migration landscape, offering valuable data for authorities to make informed decisions. Future studies could expand on these findings by incorporating qualitative insights and exploring irregular migration flows, further enriching the understanding of the complexities surrounding international mobility.

The study identifies significant factors affecting international migration in Ecuador during 2023, including gender, mode of transport, and purpose of the trip. These findings provide valuable insights for policymakers to better manage migration flows and design targeted interventions for different demographic groups. Moreover, understanding the motivations behind migration can help authorities prepare for potential changes in migration patterns and address emerging challenges. For example, policies aimed at creating employment opportunities could help retain younger individuals, while family support programs could encourage more balanced gender dynamics in migration.

## 7. Deliverables and GitHub Repository

The analysis scripts, dataset, report, and presentation slides are available in a public GitHub repository. The repository includes:

- **Data:** Cleaned dataset in Stata format.
- **Scripts:** Stata scripts for data cleaning, logistic regression models, t-tests, proportion tests, and simulations.
- **Report:** A comprehensive PDF report detailing the entire research process.
- **Presentation:** Slides summarizing the key findings and policy recommendations.

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