

20120722 - Prediction of Skytrax airport rankings, short formula (2011) (2e)

[Data] [[<Normal page](#)] [**PEREZGONZALEZ Jose D (2011)**. *Prediction of Skytrax airport rankings, short formula (2011) (2e)*⁴. Journal of Knowledge Advancement & Integration ([ISSN 1177-4576](#)), 2012, pages 204-208.]

Prediction of airport rankings for 2011

Perezgonzalez continued a previous study by Perezgonzalez and Gilbey (2010²), attempting to predict Skytrax's 2011 Official World Airport Star rankings from average ratings that passengers had given to those airports, independently, on Skytrax's website. The regression formula was based on a single variable, the average 'Customer review scoring', which is a cumulative average of past ratings, including those given during 2011.

The short regression formula for predicting Skytrax's 2011 ranking was:

$$\text{Predicted Skytrax Ranking} = 0.711 + (0.410 * \text{Customer review scoring})$$

(F = 27.264, p = 0.00; R = 0.715; R² = 0.512; Adj.R = 0.702; Adj.R² = 0.493)

Table 1 shows the actual ranking given by Skytrax, the predicted 'ranking' obtained from above formula, the customer average rating used as predictor and the same customer average rating adjusted to a scale ranging between 1 and 5 in order to facilitate comparisons with the other scores. Overall, 72% of the airports could be ranked in approximately the same hierarchy than the one provided by Skytrax. Furthermore, it may be possible to also rank correctly 70% of the remaining airports not ranked by Skytrax (adj.R).

Table 1. Predicted and actual scores

Airport	Customer	Customer (adj)	Predicted	Skytrax
Seoul Incheon	9.20	4.68	4.48	5.00
Hong Kong	8.70	4.48	4.28	5.00
Munich	8.30	4.32	4.11	4.00
Singapore Changi	8.20	4.28	4.07	5.00
Zurich	8.10	4.24	4.03	4.00
London Heathrow	7.70	4.08	3.87	3.00
Helsinki	7.60	4.04	3.83	4.00
Doha	7.60	4.04	3.83	3.00
Beijing	7.50	4.00	3.79	4.00
Copenhagen	7.40	3.96	3.75	4.00
Dusseldorf	7.30	3.92	3.70	4.00

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Amsterdam	7.10	3.84	3.62	4.00
Bahrain	7.00	3.80	3.58	3.00
Johannesburg	7.00	3.80	3.58	3.00
Kuala Lumpur International	6.60	3.64	3.42	4.00
Guangzhou	6.60	3.64	3.42	3.00
Houston	6.60	3.64	3.42	3.00
Brussels Zaventem	6.50	3.60	3.38	3.00
Madrid Barajas	6.50	3.60	3.38	3.00
Atlanta	6.30	3.52	3.29	3.00
Bangkok Suvarnabhumi	6.30	3.52	3.29	3.00
Frankfurt Main	5.80	3.32	3.09	4.00
Amman	5.80	3.32	3.09	2.00
Abu Dhabi	5.60	3.24	3.01	3.00
Dubai	4.70	2.88	2.64	3.00
Kuwait	4.50	2.80	2.56	3.00
Paris CDG	3.70	2.48	2.23	3.00
Moscow Sheremetyevo	3.70	2.48	2.23	2.00

(The 'Customer (adj)' column shows customer scores on a 1-5 scale, thus facilitating comparisons with the other variables)

The regression formula obtained in this study is relatively similar to that obtained in 2010. In order to ascertain how fit these formulas may be to predict future Skytrax airport rankings, a simulation was carried out in order to predict the 2011 ranking using the 2010 formula. A good correlation between the results of the simulation and the 2011 prediction could then be taken as evidence in support of such fit. A low correlation could be taken as evidence against such fit.

Table 2 collates the predictions made for 2010 (using the [2010 formula](#), see [Perezgonzalez, 2010](#)¹), for 2011 (using the 2011 formula), and the results of the simulation predicting 2011 ranking using the 2010 formula. The correlation between the 2010 ranking and the simulation ranking was 98% ($r=0.98$), while there was a perfect positive correlation between the 2011 ranking and the simulation ranking ($r=1.00$).

Airport	2010 prediction	Simulation	2011 prediction
Seoul Incheon	4.52	4.52	4.48
Hong Kong	4.31	4.31	4.28
Munich	---	4.15	4.11
Singapore Changi	4.15	4.11	4.07
Zurich	4.06	4.06	4.03
London Heathrow	3.90	3.90	3.87
Helsinki	---	3.86	3.83
Doha	3.81	3.86	3.83
Beijing	3.90	3.81	3.79
Copenhagen	---	3.77	3.75

Dusseldorf	---	3.73	3.70
Amsterdam	3.65	3.65	3.62
Johannesburg	3.69	3.61	3.58
Bahrain	3.61	3.61	3.58
Guangzhou	---	3.44	3.42
Houston	---	3.44	3.42
Kuala Lumpur International	3.52	3.44	3.42
Brussels Zaventem	---	3.40	3.38
Madrid Barajas	3.48	3.40	3.38
Atlanta	---	3.31	3.29
Bangkok Suvarnabhumi	3.73	3.31	3.29
Amman	---	3.10	3.09
Frankfurt Main	3.27	3.10	3.09
Abu Dhabi	3.06	3.02	3.01
Dubai	2.77	2.65	2.64
Kuwait	2.56	2.56	2.56
Moscow Sheremetyevo	---	2.23	2.23
Paris CDG	---	2.23	2.23

(The simulation column shows the predicted ranking for 2011 when using the [2010 formula](#))

Methods

Research approach

Partly exploratory and partly replication. The exploratory end of the study was to predict Skytrax's 2011 airport ranking using the same approach than Perezgonzalez and Gilbey (2010²) did. That is, a 'short' regression formula which uses a readily available average as single predictor.

The replication end of the study attempted to seek support (or otherwise) for the usability of such formula to predict Skytrax airport ranking in the future.

Population

The 28 airports which obtained a Skytrax ranking in 2011 and ten or more customer reviews during that year.

Variables

Criterion (dependent) variable: Skytrax's Official World Airport Star ranking.

- 'Official' rankings are given by Skytrax after auditing airports that pertain to the Star ranking program. Because of the need for airports to join the program, the auditing involved, and other variables, Skytrax rankings are applied to a rather limited number of, possibly, self-selected airports (ie, those that can afford the costs, value Skytrax's ranking system, and expect a good ranking).
- This variable is measured on an ordinal scale ranging from 1 star (very poor quality performance) to 5 stars (highest quality standards).

Predictor (independent) variable: average 'Customer review scoring'.

- The average customer review scoring is calculated by Skytrax, possibly based on averaging customer ratings given by passengers when independently reviewing those airports on Skytrax's website on an ad-hoc basis. This variable may, in principle, be of low reliability as a source of information, as passengers are self-selected (ie, reviews are given by those who know about the website and are motivated to provide a review), it is not known whether Skytrax 'filters' reviews, and the average rating seems to cover all reviews, not just those of discrete years. Notwithstanding this, Skytrax assures on its website that customer reviews are not used for and are independent of 'star rankings'. In any case, the variable did not show any abnormal tendency towards negative or positive values, extreme responses or other statistical biases.
- This variable is measured on an interval scale ranging from 0 to 10 points, a higher value representing a greater level of customer overall satisfaction with the airport over the years (thus, not limited to 2011).

Procedure

The corresponding data was mined from information readily available online on Skytrax's website at the end of 2011.

Data analysis

The data matrix was assessed as per normality and linearity. The criterion variable was normal, while the predictor variable had a kurtosis departing significantly from normality ($\text{sig} < 0.05$). Linearity between both variables was adequate.

Given that only one variable had a non-normal kurtosis but that linearity was adequate, and that the previous research also used parametric tools, a parametric approach was also adopted for this study.

The main analysis carried out was a regression analysis with its corresponding statistical significance assessed following ([Fisher-Perez's approach](#)) with threshold at $\text{sig} \leq 0.05$ (ie, results with 5% or more extreme probabilities), 2-tailed.

Generalization potential

Airports with independent customer reviews in Skytrax's website but not "officially" ranked by it. It is estimated that 70% of those airports (adj.R) could be ranked correctly (thus, implying that the remaining 30% of airports would be erroneously ranked).

References

1. **PEREZGONZALEZ Jose D (2010)**. [Prediction of Skytrax airport rankings, short formula](#). Journal of Knowledge Advancement & Integration ([ISSN 1177-4576](#)), 2011, pages 133-135.
2. **PEREZGONZALEZ Jose D & Andrew GILBEY (2010)**. *A convenient regression formula for predicting Skytrax's Official World Airport Star ratings*. [Aviation Education and Research Proceedings \(ISSN 1176-0729\), 2011](#), pages 45-47.
3. **PEREZGONZALEZ Jose D (2011)**. [Prediction of Skytrax airport rankings, short formula \(2011\)](#). Journal of Knowledge Advancement & Integration ([ISSN 1177-4576](#)), 2012, pages 157-161.
+++ **Notes** +++
4. This second edition updates the previous edition³ by re-editing both tables and making them more reader-friendly.

Want to know more?

[Journal of Airport Management - Perezgonzalez et al's \(2010\) article](#)

This article describes an alternative regression formula which predicts Skytrax's airport

ranking using three 2010-based variables as predictors. The article is, PEREZGONZALEZ Jose D & Andrew GILBEY (2010). *Predicting Skytrax's airport rankings from customer reviews*. Journal of Airport Management (ISSN 1750-1938), 2011, volume 5, number 4, pages 335-339.

[Skytrax's website](#)

Skytrax offers the latest rankings for airports and airlines, as well as independent reviews of those by passengers.

[Wiki of Science - Skytrax's 2010 airport rankings](#)

Perezgonzalez et al's (2010) article expanded with actual data and predicted scores per airport.

Outdated versions

PEREZGONZALEZ Jose D (2011). [Prediction of Skytrax airport rankings, short formula \(2011\)](#). Journal of Knowledge Advancement & Integration ([ISSN 1177-4576](#)), 2012, pages 157-161.

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