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Airport Distribution Models Formulas

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List of 21 Airport Distribution Models Formulas

Airport Distribution Models

Air Trip Distribution Models

1) Constant of Proportionality for greater Air Trip Distances

Open Calculator

fx $$K_o = \frac{T_{ij}}{(T_j \cdot T_i)^P}$$

ex $$1.558631 = \frac{5}{(20 \cdot 10)^{0.22}}$$

2) Constant of Proportionality given Travel by Air Passengers between Cities

Open Calculator

fx $$K_o = \frac{T_{ij} \cdot C_{ij}^x}{T_j \cdot T_i}$$

ex $$1.501562 = \frac{5 \cdot (7.75)^2}{20 \cdot 10}$$

3) Cost of Travel between i and j given Travel by Air Passengers between Cities

Open Calculator

fx $$C_{ij} = \left(\frac{K_o \cdot T_j \cdot T_i}{T_{ij}}\right)^{\frac{1}{x}}$$

ex $$7.745967 = \left(\frac{1.5 \cdot 20 \cdot 10}{5}\right)^{\frac{1}{2}}$$

4) Distance between i and j given Travel by Air Passengers between Cities i and j

Open Calculator

$$d_{ij} = \left(\frac{K_o \cdot P_i \cdot P_j}{T_{ij}} \right)^{\frac{1}{x}}$$

$$16.97056 = \left(\frac{1.5 \cdot 60 \cdot 16}{5} \right)^{\frac{1}{2}}$$

5) Population of destination city given travel by air passengers between cities

Open Calculator

$$P_j = \frac{T_{ij} \cdot \left(d_{ij}^{x} \right)}{K_o \cdot P_i}$$

$$16.05556 = \frac{5 \cdot \left((17)^2 \right)}{1.5 \cdot 60}$$

6) Population of origin city given travel by air passengers between cities

Open Calculator

$$P_i = \frac{T_{ij} \cdot \left(d_{ij}^{x} \right)}{K_o \cdot P_j}$$

$$60.20833 = \frac{5 \cdot \left((17)^2 \right)}{1.5 \cdot 16}$$

7) Total Air Trips generated in City i for greater Air Trip Distances

Open Calculator

$$T_i = \frac{\left(\frac{T_{ij}}{K_o} \right)^{\frac{1}{P}}}{T_j}$$

$$11.90396 = \frac{\left(\frac{5}{1.5} \right)^{\frac{1}{0.22}}}{20}$$

8) Total Air Trips generated in City i given Travel by Air Passengers between Cities

Open Calculator

$$T_i = \frac{T_{ij} \cdot C_{ij}^x}{K_o \cdot T_j}$$

$$10.01042 = \frac{5 \cdot (7.75)^2}{1.5 \cdot 20}$$

9) Total Air Trips generated in City j for greater Air Trip Distances

Open Calculator

$$T_j = \frac{\left(\frac{T_{ij}}{K_o}\right)^{\frac{1}{P}}}{T_i}$$

$$23.80793 = \frac{\left(\frac{5}{1.5}\right)^{\frac{1}{0.22}}}{10}$$

10) Total Air Trips generated in City j given Travel by Air Passengers between Cities

Open Calculator

$$T_j = \frac{T_{ij} \cdot C_{ij}^x}{K_o \cdot T_i}$$

$$20.02083 = \frac{5 \cdot (7.75)^2}{1.5 \cdot 10}$$

11) Travel by Air Passengers between Cities i and j

Open Calculator

$$T_{ij} = \frac{K_o \cdot P_i \cdot P_j}{d_{ij}^x}$$

$$4.982699 = \frac{1.5 \cdot 60 \cdot 16}{(17)^2}$$

12) Travel by Air Passengers between Cities i and j for greater Air Trip Distances

Open Calculator

fx $$T_{ij} = K_o \cdot (T_i \cdot T_j)^P$$

ex $$4.811914 = 1.5 \cdot (10 \cdot 20)^{0.22}$$

13) Travel by Air Passengers between Cities i and j given Travel Cost

Open Calculator

fx $$T_{ij} = \frac{K_o \cdot T_i \cdot T_j}{C_{ij}^x}$$

ex $$4.994797 = \frac{1.5 \cdot 10 \cdot 20}{(7.75)^2}$$

Generation-Distribution Models

14) Air Trips between i and j

Open Calculator

fx $$F_{ij} = (P_i \cdot P_j) \cdot \left(x + (\beta \cdot t) + \left(Q_{ij}\right)\right)$$

ex $$12105.6 = (60 \cdot 16) \cdot (2 + (0.1 \cdot 5.1) + (10.1))$$

15) Air Trips in Year y for Stated Purpose under Leisure Category

Open Calculator

fx $$II = P_i \cdot \left(a + (b \cdot f_{yl}) \cdot \left(\frac{1}{1 + \left(K \cdot \left(\frac{F}{I}\right)^q\right)}\right)\right)$$

ex $$323.8708 = 60 \cdot \left(0.6 + (0.8 \cdot 6) \cdot \left(\frac{1}{1 + \left(0.98 \cdot \left(\frac{32}{68}\right)^{10.2}\right)}\right)\right)$$

16) Country Pair Relation Index given Air Traffic between Stations i and j

Open Calculator

$$\beta = \left(\frac{P_{ij}}{a_0 \cdot (\alpha \cdot GNP)^{b} \_ \{0\} \cdot (\alpha \cdot GNP)^{C} \cdot \left(F_e + A + \left(\frac{B}{F_e - C} \right) \right)} \right)^{\frac{1}{d}}$$

ex

$$0.487892 = \left(\frac{500}{10.5 \cdot (5.5 \cdot 460)^{0.01} \cdot (5.5 \cdot 460)^{0.2} \cdot \left(10.15 + 0.5 + \left(\frac{0.3}{10.15 - 0.2} \right) \right)} \right)^{\frac{1}{0.21}}$$

17) Factor to adjust for Quantum Effects given Air Trips between i and j

Open Calculator

$$Q_{ij} = \left(\frac{F_{ij}}{P_i \cdot P_j} \right) - x - (\beta \cdot t)$$

ex

$$9.99 = \left(\frac{12000}{60 \cdot 16} \right) - 2 - (0.1 \cdot 5.1)$$

18) Income for Leisure given Air Trips for Stated Purpose under Leisure Category

Open Calculator

$$f_{yl} = \frac{\left(\frac{II}{P_i} \right) - a}{b \cdot \left(\frac{1}{1 + \left(K \cdot \left(\frac{F}{I} \right)^{q} \right)} \right)}$$

ex

$$6.023536 = \frac{\left(\frac{325}{60} \right) - 0.6}{0.8 \cdot \left(\frac{1}{1 + \left(0.98 \cdot \left(\frac{32}{68} \right)^{10.2} \right)} \right)}$$

19) Population at i given Air Trips between i and j

Open Calculator

$$P_i = \frac{F_{ij}}{\left(x + (\beta \cdot t) + \left(Q_{ij}\right)\right) \cdot P_j}$$

$$59.47661 = \frac{12000}{(2 + (0.1 \cdot 5.1) + (10.1)) \cdot 16}$$

20) Population at Origin given Air Trips in Year y for Stated Purpose under Leisure Category

Open Calculator

$$P_i = \frac{II}{a + (b \cdot f_{yl}) \cdot \left(\frac{1}{1+\left(K \cdot \left(\frac{F}{I}\right)^{q}\right)}\right)}$$

$$60.2092 = \frac{325}{0.6 + (0.8 \cdot 6) \cdot \left(\frac{1}{1+\left(0.98 \cdot \left(\frac{32}{68}\right)^{10.2}\right)}\right)}$$

21) Time in Years given Air Trips between i and j

Open Calculator

$$t = \frac{\left(\frac{F_{ij}}{P_i \cdot P_j}\right) - x - Q_{ij}}{\beta}$$

$$4 = \frac{\left(\frac{12000}{60 \cdot 16}\right) - 2 - 10.1}{0.1}$$

Variables Used

- **a** Regression Contant a
- **A** Currency Scale Constant a
- a_0 Regression Coefficient a
- **b** Regression Contant b
- **B** Currency Scale Constant b
- b_0 Regression Coefficient b
- **C** Currency Scale Constant c
- C_{ij} Cost of Travel between Cities
- **d** Regression Coefficient d
- d_{ij} Distance between Cities
- **F** Mean Total Effective Fair
- F_e Economy Fare
- F_{ij} Air Trips between i and j
- f_{yl} Income
- **GNP** Real Gross National Product
- **I** Mean Income of Households
- **II** Air Trips in Year y for stated Purpose
- **K** Constant Reflection Surface Route Saturation
- K_o Proportionality Constant
- **P** Calibrated Parameter
- P_i Population of Origin City
- P_{ij} Air Passengers between Cities i and j
- P_j Population of Destination City
- **q** Constant q
- Q_{ij} Factor to Adjust for Quantum Effects
- **t** Number of Years

- T_i Total Air Trips generated in City i
- T_{ij} Travel by Air Passengers between Cities i and j
- T_j Total Air Trips generated in City j
- x Calibrated Constant
- α Station Share of GNP
- β Country Pair Relation Index

Constants, Functions, Measurements used

Check other formula lists

- **Aircraft Runway Length Estimation Formulas**
- **Airport Distribution Models Formulas**
- **Airport Forecast Methods Formulas**
- **Engine-Out Takeoff Case under Estimation of Runway Length Formulas**

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