Flight Frequency

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Flight Frequency on a Route

- A simple model

$$Freq = \frac{P}{C \times L}$$

  - Freq: frequency of flight between i to j.
  - P: The number of passengers between i to j.
  - L: Average load factor.
  - C: the average aircraft capacity.

Flight Frequency on a Route

- Maximizes profit

$$P = c \cdot \lambda_{ij}(c, N) - D \cdot N - L \cdot N - O \cdot \lambda_{ij}(c, N) - I$$

P : profit on a route between *i* and *j*

c : the air fare from *i* to *j*

N : the number of flights between *i* and *j* during a fixed period of time, i.e. flight frequency

$\lambda_{ij}(c, N)$: the number of passengers between *i* and *j* for air fare c and flight frequency N

D : direct operating costs per flight

L : the landing tax

O : indirect operating costs (without landing tax) per passenger

I : indirect costs

- Maximize P

$$=> \quad \frac{\partial P}{\partial N} = c \cdot \frac{\partial \lambda}{\partial N} - D - L - O \cdot \frac{\partial \lambda}{\partial N} = 0$$

$$=> \quad N = \frac{c - O}{D + L} \cdot \lambda \cdot \frac{\frac{\partial \lambda}{X}}{\frac{\partial N}{N}}$$

Let $e = \dfrac{\dfrac{\partial \lambda}{\lambda}}{\dfrac{\partial N}{N}}$

e **is the elasticity of the number of passengers compared to changers in frequency.**

=> $N = \dfrac{c - O}{D + L} \cdot \lambda \cdot e$

- Average loading factor n_p

$$n_p = \frac{\lambda}{n \cdot N} = \frac{D + L}{(c - O) \cdot e \cdot n}$$

n : the number of available seats in the airplane

- Value e must be known. Statistical data on changes in flight frequency and corresponding changes in the number of passengers