Abstract

Route planning forms an important aspect of airline operations for them to sustain the effects of deregulation and fierce competition. The Indian economic liberalization in 1991 has seen diminishing monopoly of Air India and dynamic demand splits amongst the service providers.

Our research focuses on developing an aggregate route traffic demand forecasting (RTDF) model specifically for international carriers operating from India. The model is an econometric model that combines concepts of the traditional Gravity model of Physics and the Micro-economic theoretic model that links demand to price. In other words, the RTDF model is a fusion of the behavioral and gravity models. While developing the model, Becker’s approach of utility maximization has been made use of, thereby combining time and other inputs required to produce travel.

The model is developed for the existing international routes from India with 2005 aggregative data provided by International Civil Aviation Organization (ICAO), which spanned 15 countries in Europe, Asia, Canada, and North America. The model has been validated and tested for its predictive power on a few intentionally left out routes from the original sample. The model explains about 70% of the variance, which is well above the acceptable zone for cross-sectional data. The model is then estimated for 2007 data on a few randomly selected high demand routes; the prediction error ranging from a
minimum of 3.5% to a maximum of 13%, a range well within the acceptable error limits.

We derive a sector-cost-model (SCM) by applying the concept of break-even analysis on the RTDF model. The SCM provides cost estimates on a particular route at various levels of airfare. The SCM helps us gain further insights into the business nature prevailing in the airline sector.

On the viability of operations, we propose the sector-operation-fare (SOF) to be charged on a respective route, given the load factor, if the airline wishes to continue operations. For arriving at the SOF, we follow a demand oriented framework that comprises of two demand curves: the airline curve and the traffic curve. The numerical analyses provide room for policy formulations that help airlines in refining, redefining, and revitalizing the decision-making process in their operations. Airlines can use this model to forecast demand for a newly contemplated route and obtain a fair idea of the price they can charge the customer. In other words, airlines can estimate the economic viability of operations on a respective route.