

Analyzing airlines potential cost savings when reducing delays in international air traffic

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Abstract

Delays in international air traffic have garnered great attention over the past few years. Passengers, airports as well as airlines are hit by the impacts of delays and suffer from their financial burden. In order to cut costs and keep competitiveness in the global market, strategies of managing delays are of prime importance for aircraft operators. Especially in times of consolidations or airlines merger attempts, evaluating the performance and optimizing operations are the keys to success in the global aviation market.

This paper focuses on airlines most important cost drivers being influenced by changes in delay. It does not deal with any passenger or national economy related costs arising if flight operations are delayed. Actual delay statistics of Europe's leading hub airports offer the basis for the calculation of the potential benefit that may arise if delays could be reduced marginally. Depending on the airport and accordingly its aircraft mix, movements per year and further characteristics, intervals of potential savings can be assessed respectively.

Methodology

In the first step a taxonomy of delays for a time-dependent system such as the air traffic is presented in order to distinguish the various causes and consequences.

Furthermore it is inevitable to define the respective flight phase in which delay has occurred when calculating marginal delay costs. Depending on ground or airborne delay, additional costs can be allocated for airlines (i.e. it is essential to consider that additional fuel costs vary if the aircraft is airborne or taxiing to the runway).

In a second step an overview of typical network airline's cost structure is established. Concerning this matter the main focus is laid on analyzing delay-related direct operating costs such as maintenance costs, fuel burn as well as flight and cabin crew expenses. Comprehensive analyses of specific airlines policies of remuneration are necessary to estimate potential cost changes when delays occur. Maintenance costs are derived by a method consisting of total maintenance expenses per year (incl. burden costs), number of aircrafts (divided in wide-bodies, small and large narrow-bodies) as well as monetary and temporal weighting coefficients. Since aviation fuel (Jet A-1) is closely linked to oil prices, the impact of climbing oil prices in past years needs to be considered when calculating fuel costs. Between 2001 and 2008 oil price rose more than 330 % and achieved a peak of more than \$120 per barrel in 2008. Moreover additional air navigation charges due to delays (and possible re-routes) are also taken into account as well as additional terminal charges.

Typical indirect cost elements such as "Advertising & Promotion" or negligible costs (percentage of total operating expenses) like aircraft insurance are not in the context of this paper due to the fact that changes in delay are in no direct connection to the financial burden of airlines. The whole method implies different scenarios for different aircraft types as their effect on changes in additional total costs will be different.

Summary

This paper underlines the importance of dealing with economic analyses and the necessity to optimize current operations. Furthermore it offers an approach to estimate possible savings for network carriers and well founded basis for more in-depth analyses of total economic impact of flight delays.