European Transport \ Trasporti Europei n. 34 (2006): 54-74

Measuring airline hub timetable co-ordination and connectivity: definition of a new index and application to a sample of European hubs

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Abstract

In this paper a new index for measuring the timetable co-ordination of an airline hub is proposed, with application to a sample of European hubs. This index is both quite accurate and easy to use, so that it may prove a useful schedule analysis tool for airline managers. In section 1 of this paper, the definition of "wave-system structure" and "ideal wave" are given. In section 2 the problem of measuring hub connectivity and hub timetable co-ordination is discussed. Then, both the so-called "weighted indirect connection number", which is an index for measuring hub connectivity, and the "connectivity ratio", which is an index for measuring hub timetable co-ordination, are described, in section 3 and 4 respectively. In section 5, a new index for measuring hub timetable co-ordination is illustrated: the "weighted connectivity ratio". Some examples of hub timetable co-ordination measures performed with the new index are reported in section 6.

Keywords: Airline hub; Wave-system; Connectivity; Schedule co-ordination; Weighted connectivity ratio.

Introduction

Following deregulation of the airline industry, "hubbing" was soon developed by most of the major companies as a crucial schedule-based product feature (Doganis, 2002).

Federal Express first developed effective hubbing in the aviation industry in the 1970s, using its airport base at Memphis for the carriage of overnight express parcels throughout the United States. Effective hubbing requires that flights from different airports, which are at the "spokes" of a network, arrive at the "hub" airport at approximately the same time. The aircraft then wait on the ground simultaneously, in

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