Journal of Air Transport Management 46 (2015) 3–11

Contents lists available at ScienceDirect

Journal of Air Transport Management

journal homepage: www.elsevier.com/locate/jairtraman

An empirical analysis of airline business model convergence

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ARTICLE INFO

Article history:
Available online 8 April 2015

Keywords:
Airline business models
Airline strategy
Convergence
Similarity measurement

ABSTRACT

Based on a sample of 26 European passenger airlines, this study analyzes the development of airline business models over time. We used various distance measures to calculate concrete differentiation levels among these airlines between 2004 and 2012. The results indicate increasing similarity among these airlines, which lends support to the generally assumed convergence trend. The present paper complements the mostly qualitative and anecdotal literature on convergence in the airline industry, empirically shows actual adaptations in airlines' business models, and provides a platform for further research in the fields of empirical convergence analysis and corresponding strategic airline management.

1. Introduction

Air Berlin, a self-proclaimed hybrid carrier, recently joined the Oneworld alliance. The Spanish budget carrier Vueling has started to offer interlining, and easyJet has agreed to publish its fares in a global distribution system. Such adjustments in strategic postures are traditionally seen as atypical of low-cost carriers (LCCs), but have become increasingly common in recent years. Full-service carriers (FSCs) have also taken steps outside their traditional maneuvering space: Germany's former premium FSC Lufthansa axed its business class on decentral (non-hub) European flights by handing over the network to its low-cost subsidiary Germanwings. KLM announced it would charge for checked baggage on its European routes, and Air France is continuously cutting its air cargo segment down to an aircraft belly-only business.

Such observations have led to a convergence trend among airline business models to the “mainstream middle” being occasionally hypothesized (see for example Bell and Lindenau, 2009). The phenomenon of airline business model convergence, along with increasing similarity among airlines, has been subject to discussion among both researchers and airline managers, since growing similarity among airlines can potentially risk a disruptive market development and erode profitability (Dunn, 2012; Lohmann and Koo, 2012; Thornhill and White, 2007). Leading LCC and FSC airline managers met twice recently to discuss the transition of airline business models and its implications for the future management of their airlines (e.g. “Airlines in Transition” Summit 2013 in Dublin). Overall, the significance of business model similarity and its impact on airline performance in the highly competitive and notoriously unprofitable airline industry is substantial and warrants analysis.

However, the potential change of airline business models over time has not been subject to intensive discussion in research. Most of the extant contributions on airline business model components are based on anecdotal accounts rather than being rooted in systematic empirical studies or have a limited scope (e.g. mostly covering the product features or network characteristics of an airline but neglecting further elements of the value architecture). First approaches to more comprehensive and quantitative research settings have been made by Mason and Morrison (2008) and Klophaus et al. (2012). The focus on conceptual and qualitative research designs can, to some extent, be related to the lack of an established, systematic business model concept (e.g. Al-Debei and Avison, 2010; Morris et al., 2005) that enables researchers and analysts to precisely describe and quantify the business model components in the airline industry.

However, Daft and Albers (2013) recently proposed a business model framework that is suitable for empirical analysis and makes it possible to conduct reliable analyses of airline business models and their changes over time. Such reliable and comparable analyses can be seen as key for deriving recommendations to airline

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http://dx.doi.org/10.1016/j.jairtraman.2015.03.008
0969-6997/

managers in a highly competitive environment that emphasizes the decision to find a well-balanced strategy of differentiation and imitation (Norman et al., 2007).

The aim of the present paper is to empirically assess the changes in business models among European airlines by building on Daft and Albers' (2013) framework. The framework (explained in the next section) will be applied to a sample of 26 European passenger airlines between 2004 and 2012. Initial results from calculations of the similarities among airlines indicate a considerable trend of convergence. Even though detailed results are subject to further analyses, our empirical study indicates a movement towards a hybrid model that combines business model characteristics from both the former LCC as well as the established FSC.

Our argumentation proceeds as follows. After introducing the airline business model framework and its underlying method of convergence calculation, we describe our data sample and present the empirical results of our analysis. The paper ends with management implications and an outlook for further research.

2. The airline business model framework

The term “business model” has become one of the most frequently used expressions in the management-oriented literature (Zott et al., 2011). Irrespective of the industry context, the business model approach is used to systematically describe and assess a particular set of a company's strategic and organizational design parameters at a given point in time by evaluating a number of constitutional components and sub-dimensions (Morris et al., 2005; Shafer et al., 2005; zu Knyphausen-Aufseß and Zollenkop, 2007). The business model concept aims to enable a precise description of a company's value generation system while keeping the framework and the data necessary for its dedicated measurement items manageable.

Following this logic, Daft and Albers (2013) proposed an industry-specific framework for assessing passenger airline business models. Their framework consists of 36 measurement items that are subdivided into the three major components: (1) “Corporate core logic”, (2) “Configuration of value chain activities”, and (3) “Assets”. In order to enhance the structure and clarity of the framework, the three components are subdivided into eight dimensions, each of which consists of either two or three elements. Each of the resulting 18 elements within the three components are then measured by two items.

The framework is suited to the evaluation of airline business models and to ensure a consistent benchmark among different airlines (see also Mason and Morrison, 2008). As multiple airlines, potentially with different business models, can operate within one airline group (for example, quality-oriented Lufthansa Passage (LH) and budget-oriented Germanwings (4U) under the roof of Deutsche Lufthansa AG) the airlines must be assessed individually at the business unit level. Accordingly, the framework is used to individually assess each airline that holds its own air operator's certificate (AOC).

Generally, the proposed airline business model framework uses one of three different types of scale for measuring the items. Where applicable, continuous scales are used (such as traffic numbers). Such data are aggregated for a respective observation period. However, for some items (such as “bundling concept”), continuous scales are either not available or not applicable. For these items, the framework proposes an ordinal scale with given preset values. Finally, the framework also considers items that are expressed by discrete values that cannot be sorted (such as the type of flight operations for the “basic operations design” item). Changes of all discrete item values within one observation period are considered in total, regardless of the exact date of the change within the observation period. The entire framework is illustrated in Fig. 1 (item operationalization is displayed in Tables A-1–3 in the Appendix).

3. Methodology for calculating convergence

The proposed framework can be used to describe an airline business model at a given point in time. According to our research aim of analyzing the development of airline business models over time, we follow a longitudinal research design setting and compare the status quo of such business models in four different years to identify their changes.

For each observation point, we consider one calendar year. Therefore, continuous data are aggregated on a yearly basis (January to December). However, due to different fiscal years of airlines, we have extended the length of the observation periods from October of the previous year to March of the following year, which results in a time windows of 18 months for each observation point.

Because the business model framework we used is based on items with mixed scales, we need to find a similarity measure that can cope with mixed data. Commonly used similarity measures (like the well-known Euclidean distance) are only suitable for data with one single scale type. One of the few available approaches that are applicable to mixed scaled data is the extended similarity coefficient by Gower (Gower, 1971; Podani, 1999). This so called Gower coefficient is based on elementary and commonly used distance measures (in particular in the field of cluster analysis) depending on the item scale in question and is mostly suitable for calculating pairwise (object-to-object) similarities (Podani, 1999). The distance between two objects can be interpreted as a measure of their (spatial) closeness or similarity. Here the value range of the Gower coefficient is [0,1] where 0 denotes maximum similarity among two airlines while 1 would mean that the two considered airlines are completely different regarding the covered business model items.

For continuous items, the Gower coefficient is represented by the City Block Distance. This metric (also called Manhattan Metric) calculates the distance between two objects based on the sum of the absolute difference of the item values (thus it is based on the two sides of a right triangle instead of the hypotenuses as used for the Euclidean distance). In case of ordinal items, the Gower coefficient is represented by the City Block Distance scaled to the item value range. Finally, for nominal scaled items, the Gower coefficient is represented by the Simple Matching Metric, which just counts the cases in which the two compared objects have the same value for the particular nominal item (e.g. airline one and airline two both have the basic operations of a charter carrier).

For our calculation of the combined Gower coefficient, each of the 36 items is assigned equal weight. Even though equal weighting of all items could lead to strongly correlated items being overrated, a common weighting of all items reflects the intended power relation of the initial framework layout without systematic or random bias (Kaufmann and Pape, 1996).

For each given year, the similarity calculation for n airlines in the data sample provides $\binom{n}{2}$ pairwise similarity measures. The overall similarity of the considered airline sample for the given observation point can be captured by calculating the average value among the pairwise similarity measures. Comparing these average similarity measures in our four measurement years enables us to indicate the change of the similarity.

Considering the recent dynamics in the airline market and the booming phase of new LCC entrants, we chose the period from