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A comparative performance analysis of airline strategic alliances using data envelopment analysis

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ABSTRACT

As "open skies" agreements became more common among different countries and thus began to open up international routes to further competition, the global airline industry has undergone accelerated structural changes for the last two decades. These changes include the consolidation and expansion of airline strategic alliances throughout different regions of the world. Though airline strategic alliances are generally perceived to be a major driver for enhancing the operating efficiency and the subsequent competitiveness of participating member airlines, the concrete evidence supporting such a perception is still lacking in the literature. This paper is one of few attempts to evaluate the comparative efficiency of the strategic alliances among global airlines and then assess the managerial impact of airline alliances on the airline's comparative performances.

1. Introduction

In the wake of prolonged world-wide recessions and sky-rocketing oil prices, the airline industry lost $16 billion in 2008 and $9.9 billion in 2009 (Zacks Equity Research, 2011). Although there is a growing optimism for the revival of the airline industry with the recent profit gains, the global airline industry has been hit hard by rising fuel prices, instable yields, weak traffic volumes, security hassles, and increased taxation for the last few years. To make it worse, the competition in the global airline industry gets tougher after a series of deregulations and "open skies" agreements across the world that liberalized commercial aviation services and then opened up international airports and transcontinental routes to full competition. To survive in this deteriorating market condition, many international flag carriers chose to consolidate their operations and created economies of scale through mergers and acquisitions (M&A) due in part to changes in ownership laws and freedom of the air. M&A of airlines, however, can backfire because it may limit services to smaller regional routes, increase airfare, create potential strife among integrated workers, raise cost associated with increased frequent mileage rewards, and subject combined airliners to antitrust scrutiny. As illustrated by the recent mergers of Delta and Northwest in 2008, United and Continental in 2010, and Southwest and Air Tran in 2010, M&A is the continuing trend of the airline industry. Despite its popularity and potential benefits, many M&A efforts did not bring fruits to the merged companies. Defying the conventional wisdom, many M&A attempts did not go well as they were planned and might undermine the performances of the merged companies (King et al., 2003). In fact, the Weekly Corporate Growth Report reported that 70% of the M&A failed to achieve its anticipated value and 60–80% of the M&A underwent a slow and painful demise (Palmer, 2005).

Considering this high risk of M&A failures, airline strategic alliances (airline alliances hereafter) including code-sharing, equity swaps, insurance pooling, and joint governance have become a popular alternative to M&A. Generally, airline alliances refer to a distinct form of the market entry mode which provides airlines with a low-cost means of gaining access to new markets and local infrastructure such as airports (Doz et al., 1990). One of the most popular and simplest forms of airline alliances is code sharing which is a commercial agreement between two airlines (operating and marketing carriers) that allows an airline (marketing carrier) to put its two-letter identification code on the flights of another airline (operating carrier) as they appear in computer reservations systems (US General Service Administration, 2011). For example,

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Delta Airlines might have an agreement to operate flights for Korean Airlines on a route to Detroit, Michigan. This flight would be listed under Korean Airline's identification code (KE) but actually operated by Delta Airlines. This code sharing agreement allows the airline to expand its customer bases and service offerings without additional resources (e.g., crews), equipment (e.g., airplanes), and investment. Also, it helps code sharing partners improve its passenger services through one-stop booking for connecting flights and concerted service efforts (e.g., shared responsibility for handling of missing luggage between multiple partnering airlines). The prevalence of code sharing practices, however, raised some concerns among consumer protectionists. With little guidance and regulations, code sharing can be often confusing and not transparent to passengers, because passengers often do not know exactly which airline will operate their flights. The only exception is that the U.S. DOT has begun to require airlines to state which airline is flying a particular route. In addition, code sharing often forces the passengers to change their planes at different gates in connecting airports with additional security checkpoints and thus increases hassles for confused passengers. Furthermore, code sharing may increase the chance of monopoly for a certain route and leave no alternative option for passengers. For instance, all the non-stop flight services between San Francisco and Toronto are exclusively operated by Air Canada due to its code sharing agreement with other potential competitors such as United Airlines through Star Alliances. Not to mention the aforementioned adverse impacts on customer services, code sharing complicates airline branding strategy, service differentiation strategy, pricing strategy, flight scheduling/routing, baggage handling, and frequent flyer reward systems. This added complexity can be a potential source of inefficiency for airlines. Other forms of airline alliances such as equity swapping and insurance pooling require substantial financial commitments in time of financial crisis, while joint governance structures may limit independent decision making opportunities and thus constraint aligned airlines' operational flexibility. As illustrated above, there is a growing need to assess the true value of airline alliances before jumping onto the bandwagon of airline alliances. This paper responds to such a need by systematically measuring and then finding room for improvement in the comparative (relative) operating efficiencies and service ratings of airlines which are parts of key airline alliances using data envelopment analysis (DEA). This paper also compares the performances of key airline alliances to those of the non-alliance group for their competitive strengths and weaknesses, while identifying the potential sources of inefficiency. Based on the DEA and post-hoc statistical data analyses, this paper provides practical guidelines for airlines which intend to retool and refine their alliance structures and practices.

2. Research background and relevant literature

Since deregulation of the U.S. airline industry in 1978 and liberalization of the European airline industry in 1986 which gave carriers greater freedom to operate on any routes and fares whatever the market would bear, a dramatic restructuring of the global airlines industry has occurred. This restructuring led to the reformulation of airlines' business strategies that can better cope with unfettered free competition, elimination of route restrictions, flexible airfares, and subsidies to “the Essential Air Service Program” ensuring air services to small communities. The increasingly popular business strategies adopted by the global airline industry include: the focus on low-cost niche markets; discount pricing; the development of hub-and-spoke networks; M&A among competitors; and global strategic alliances. Despite the popularity and benefit potentials of these strategies, it was not clear whether these strategies actually worked well for airlines as they were intended. With this in mind, this paper first examined what have been studied in the past to assess the impacts of some of these strategies on the airline performances and competitiveness.

2.1. Strategic choices

In line with Porter's research on generic business strategies, airlines traditionally followed differentiation and (market) segmentation strategies, with little pressure to contain costs (Porter, 1980). This is especially true prior to the enactment of airline deregulation acts. Thus, cost leadership as a competitive strategy is still a new but risky concept for airlines, as illustrated by the recent business failures of notable discount carriers such as Skybus. In addition, chronic industry challenges such as mounting oil prices, labor strife, high bankruptcy rates, air safety concerns, and heightened security in the wake of 9/11 put more pressure on airlines to find a way to improve operating efficiencies by controlling costs. While some airlines such as Southwest Airlines have been able to follow differentiation strategies and cost leadership strategies simultaneously, many airlines continue to struggle with these strategic tradeoffs.

Historically, prior studies on strategy formulation in the airline industry fell into two categories: (1) strategic choices; (2) productivity measures. The first category includes the studies dealing with classical strategic management topics such as cost leadership, differentiation, deregulation, and market segmentation. For example, using Porter's generic business strategies, Cappel et al. (1996) theoretically evaluated strategy research as applied to the U.S. airline industry. At that time, these authors found that airlines pursuing a combination strategy of cost leadership and differentiation attained a competitive advantage compared with airlines adopting a singular strategic approach.

Subsequently, a number of low cost carriers (e.g., Southwest Airlines, Jet Blue, and Spirit) gained attention. Cappel et al. (2003) extended this research stream and examined the airline industry structure in post deregulation in the European Community (EC) and post 9/11 in order to determine whether the low cost strategy would result in superior performance. Their theoretical question was whether external events (deregulation and 9/11) would have a temporary or permanent effect on the relationship between financial performance and generic business strategy choices. Alamdari and Fagan (2005) also observed that adherence to pure low-cost strategy could lead to greater profitability than the adoption of hybrid low-cost and differentiation strategy.

There are additional external factors that might affect the trend toward the low-cost strategy. Customers who use the internet to purchase airline tickets find lower fares than customers who use travel agents. Research indicates the lower fares may be partially a by-product of a broader and more thorough search (O'Connell and Williams, 2005; Brunger and Perelli, 2009). Other studies have examined the relationship between the low-cost strategy of new entrants and changes in airline revenue management systems (Gorin and Belobaba, 2004). These authors found that low-fare airline entrants can lead to substantial revenue losses for the incumbent carriers. However, both incumbents and low fare new entrants alike benefit substantially from the use of revenue management systems. A comprehensive review of revenue management and its development can be found in McGill and Van Ryzin (1999).

Prince and Simon (2009) argued that much of the previous research on airline competitive behaviors focused exclusively on price and only recently researchers have begun to test non-price forms of competition, e.g., service quality. These researchers examined the relationship between multi-market contact and