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Key determinants of airline pricing and air travel demand in China and India: Policy, ownership, and LCC competition

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ABSTRACT

As two of the fastest-growing economies, China and India share many similarities. However, the air transport sector of the two countries exhibits substantial differences 30 years after deregulation. Private and low-cost airlines have become dominant players in the Indian airline market while the state-owned airlines still enjoy a dominant status in the Chinese market. The econometric analysis of this research suggests that the presence of a low-cost carrier (LCC) on a route has the effect of reducing the airfare and stimulating the demand for air travel in India, no matter the LCC presence is measured by market shares or dummies. Chinese LCCs have similar competitive effects only when the LCC entry is measured by dummy variables. Airport concentration in India could lead to cost savings and thus lower airfares, but this did not occur in China due largely to the lack of a culture of antitrust compliance. In both countries, airport concentration is positively associated with traffic demand. In India this may imply an increase in consumer welfare as airport concentration increases while in China this could mean that consumers would not be able to explore their welfare benefits to the full potential since concentration is positively associated with airfares. We also find that the absolute value of the price elasticity of the Indian market is much larger than that in the Chinese market, probably due to the high LCC penetration rates in India.

1. Introduction

China and India are two of the fastest-growing economies in the world. Since 2007 China has been the second largest aviation market in the world in terms of passenger and freight traffic volumes in the domestic market. In 2016 the whole industry handled 488 million passengers and 6.7 million tons of air cargo, an increase of 10.7% and 6.2% from the previous year, respectively (CAAC, 2017). It is expected that in 2017 the number of air passengers handled will reach 536 million, and around 7 million tons of cargo traffic will be carried. India's civil aviation industry has also been growing at a frenetic pace of over 7% in this new century. In the 2015–16 financial year, the passenger traffic increased to 104 million from the previous year's 87 million, an increase of 19.5%. It is expected that India will become the third largest aviation market by 2020 after the United States (US) and China.

Both countries commenced airline deregulation in the 1980s (the development background of the two countries will be discussed in Section 2). In the process of formulating new aviation policies, state-owned airlines in both countries could exercise a significant influence on the aviation authorities' decisions, which led to checkered deregulation processes and inconsistent policies at times (Hooper, 1998; Zhang, 1998; Saraswati, 2001; Taneja, 2004; Findlay and Goldstein, 2004; Zhang and Round, 2008; Zhang and Findlay, 2010). However, since the beginning of the new century, the two airline markets have moved in very different directions. More specifically, the air transport sector of the two countries now exhibits very different results in industry structure and airline ownership: In China, four state-owned airline groups dominated the domestic market with an aggregate market share of 90% in 2016 whilst in India, the private airlines commanded a market share of around 80% in recent years, with low-cost carriers (LCCs) gaining a share of about 65%.

Comparative studies between China and India are voluminous in academic research and even more popular in public media, given that they are the two most populated countries in the world (Liu and Jayakar,

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2012). However, comparative analyses into the development of air transport policies, market structure, airline competition behavior and performance in China and India remain relatively sparse. The original structure–conduct–performance (SCP) paradigm proposed by Mason (1939, 1949) and Bain (1951, 1956) suggests that the structure of a market influences the conduct of the firms that operate in it, and in turn this conduct influences the performance of those firms. However, later SCP contributors believe that feedback effects exist: the performance variables may also affect conduct and structure, and conduct variables can influence structure. In addition, government policy and technological progress can change the conditions of supply and demand, which, in turn, can shape market structure and eventually have an impact on conduct and performance (Phillips, 1976; Lipczynski et al., 2005). In the airline industry, the structure variables usually include the number of competitors, market concentration, product differentiation (e.g., full-service carriers (FSCs) versus LCCs), and the entry and exit conditions; the conduct mainly refers to airline pricing and non-price competition strategies; the performance indicators can be efficiency, profitability or the overall industry performance such as the potential benefits or welfare implications to passengers.

There is no doubt that deregulation, competition and privatization policies have played a key role in shaping the Chinese and Indian airline markets, in terms of changing the market structure, the airline conduct, and the overall performance of the industry. In particular, deregulation in market access in both countries was the key driver for the emergence of dozens of new airlines in the last three decades (Zhang and Zhang, 2016, 2017). The policy of allowing private capital into the airline industry has greatly improved the efficiency of this sector (Al-Jazzaf, 1999; Zhang and Zhang, 2017). Zhang and Zhang (2017) show that Indian carriers tend to be more efficient than their Chinese counterparts. Most of the former are privately owned while most of the latter are majority government-owned. It is expected that the different policy environments in the two countries have had an impact on the market structure, which influences airline pricing and eventually consumer welfare. Therefore, the main objectives of this research include an examination of the key determinants of airline pricing behavior in both countries based on a review of the development of air transport policies and airline markets. The study will further employ demand equations to estimate the price elasticity for the two markets and the determinant factors for traffic demand.

Numerous theoretical and empirical studies have attempted to examine the pattern of airline pricing and price variation. In the airline economic literature, price discrimination has long been regarded as one of the sources of price variation (Borenstein, 1985). Most airline routes are oligopoly markets. Oligopolistic strategies used by the airlines on a typical oligopoly route is another source of price variation. Bilotkach et al. (2010) reported noticeably different pricing strategies used by competitors in the same market. Game theorists have illustrated that a change in demand conditions can lead to price wars and price collusion between competitors (Green and Porter, 1984; Rotemberg and Saloner, 1986), which is consistent with the empirical evidence from the US and Chinese airline markets (Brander and Zhang, 1993; Zhang and Round, 2011). Numerous literature has shown that demand attributes such as population, income and the share of business passengers, and product differentiation such as the services offered by FSCs and LCCs have significant effects on airline price competition (e.g., Mantin and Koo, 2009; Zhang, 2015a; Fu et al., 2015).

Airline pricing and market power issues in China's airline market have been studied in Zhang and Round (2009a, 2009b, 2011) and Zhang (2012). The general conclusion is that airline consolidations in the early 2000s did not confer China's three airline groups (China Eastern, China Southern and Air China) with any significant market power in both the short and longer terms, largely owing to the implementation of other forms of deregulation in the last two decades – including the relaxation of entry to and exit from markets, inviting private capital into the aviation sector and the emergence of LCCs (Zhang and Zhang, 2016). However, after examining the merger case between China Eastern and Shanghai Airlines in 2009, which resulted in a rise in departure-day prices by 22%, Zhang (2015b) warned that China's antitrust authorities should remain vigilant in handling airline mergers when numerous parallel routes are involved. The market power issue was also noted in Zhang et al. (2014), whose Lerner indices for the period 2010–11 confirmed the existence of a certain degree of market power in China's airline market. Compared with the case of China, studies into the pricing behavior of Indian airlines are rare. To the best of our knowledge, Dutta and Santra (2016) is probably the only one that analyzes the dynamic price dispersion of the Indian domestic airline industry based on a small number routes. The authors found that route characteristics affect airfare movement as well as airfare dispersion. As departure date nears, airlines tend to charge higher prices.

In the next section, we will briefly discuss the evolution of the air transport sector in China and India. Section 3 will present the methodology and data, followed by a discussion of the results in Section 4. The last section concludes.

2. Background-air transport in China and India

2.1. China

Before the mid-1980s, Chinese airline operations were under the name of CAAC (the abbreviation of the Civil Aviation Administration of China) that also acted as a government department and a regulator of the civil aviation. In the late 1980s, the CAAC's governmental, administrative and regulatory role was separated from the direct management of the day-to-day operations of commercial airlines and airports (Le, 1997; Zhang, 1998; Zhang and Round, 2008). Between 1987 and 1991, six trunk airlines based in the regional capital cities were established: Air China (based in Beijing), China Eastern (Shanghai), China Northwest (Xi'an), China Northern (Shenyang), China Southwest (Chengdu), and China Southern (Guangzhou). Some local airlines were also established in that period by local governments such as Xiamen Airlines and Shanghai Airlines.

Until the 1990s, the airline industry was regulated in every aspect of air services provision, including market entry and exit, frequency, pricing, aircraft purchase, and international services (Zhang, 1998; Zhang and Chen, 2003). Controls on airfares were gradually relaxed from 1997 (Zhang and Round, 2008). As a result, airfares became cheaper and more flexible in the domestic market. Price wars became prevalent between airlines, resulting in heavy financial losses to the whole industry. This was not something that the regulator, CAAC, wanted to see. Then came the decision of consolidating the state-owned airlines in 2002, i.e., merging CAAC-controlled nine airlines into three airline groups: the Air China Group, the China Eastern Group, and the China Southern Group.

China's first LCC, Spring Airlines, was launched by private investors in 2005 after the CAAC allowed private sector to participate in the civil aviation industry, and increased the limit on foreign ownership participation in Chinese airlines from 35% to 49% in 2004. By 2007 some 20 new private airlines had been approved in China including Shanghai-based Spring Airlines and Juneyao Airlines. Although most of the private airlines established around 2005 quickly failed due to the lack of experienced pilots and skilled personnel, along with the high costs and taxes associated with aircraft purchases, jet fuel and airport charges (Zhang et al., 2008; Zhang and Lu, 2013), they brought intense competitive pressure to the domestic aviation market. In 2007 the CAAC decided to suspend the approval of new domestic entrants until 2010. In fact, the suspension policy was not repealed until 2013. From 2013 to 2016, another wave of private airlines entry emerged including Ruili Airlines, Zhejiang Loong Airlines, Qingdao Airlines, and Jiuyuan Airlines. During this period, the four major airline groups also established their own subsidiaries, largely with the local governments that recognized the economic benefits of having a local carrier. For example, Hainan Airlines launched several subsidiaries together with the local governments including Urumqi Airlines, Fuzhou Airlines, Beibuwan