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Market power and its determinants in the Chinese airline industry

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ABSTRACT

This paper first measures the degree of Chinese airlines' market power by using Lerner index, and then investigates its determinants. Our empirical results show that a certain degree of market power exists in the Chinese airline industry. Of the three dominant carriers, Air China exhibits the strongest market power whereas China Eastern Airlines the weakest, with China Southern Airlines being in the middle. Furthermore, the extent of market power varies significantly among regional markets, with China's northeast region as the strongest, followed by the eastern and western regions, and the central area as the weakest. We also find a hub-premium effect similar to the result found in the US airline market. Our analysis shows that the existence of high-speed rail and low-cost carriers, income level, population size, seasonality, and number of competing airlines are the main determinants of competition in the Chinese airline market.

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1. Introduction

The Chinese airline industry has experienced tremendous growth. Annual air passenger traffic has grown by approximately 17% over the past 30 years.¹ Since 2005, China has become the second largest air transport market in the world (after the US). According to the forecast by the International Air Transport Association (IATA), the Chinese airline market will continue its rapid, albeit at a slower rate, growth in the next 20 years. Air transportation is also the fastest growing mode of the three most popular inter-city transport modes in China (road, railway, and air), with its proportion rising steadily every year (National Bureau of Statistics of China, 2012).

The unprecedented growth is due in large part to a series of policy reforms, which have transformed the Chinese airline market (e.g., Zhang, 1998; Zhang and Chen, 2003; Zhang and Round, 2009). In October 2002, for example, the industry witnessed a major consolidation, with the central government merging ten state-owned airlines into three airlines: Air China, China Eastern Airlines, and China Southern Airlines (so-called the "Big 3"). These three firms serve as the country's trunk carriers, whereas several local airlines and a few privately-operated airlines serve more or less as "fringe" carriers. Furthermore, a number of policy options have been enacted to promote the reform and development of the market. In 2004, for instance, the "Price of domestic air transport aviation reform program" was implemented by the National

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¹ <http://sc.stock.cnfol.com/120611/123,1764,12557319,00.shtml>.

Development and Reform Commission (NDRC) and the Civil Aviation Administration of China (CAAC), both forming as the industry's regulatory body. Under the new policy, the pricing model is changed from direct management into indirect management, with the government regulator determining the benchmark price and the floating bands while airlines determining their prices within the specified range. As a result of this and other regulatory policy changes, the Chinese airline industry has been significantly liberated.²

After the rapid development over the last three decades, the government is contemplating whether, and how, further market-oriented policy reforms should be carried out. There are two very different views on the reforms and their effectiveness in promoting airline competition in China. One view is that the Chinese airline industry has achieved a certain degree of competitive vigor as a result of a steady, in-depth marketization process and proper policy formulation and implementation. The other view is that the market-oriented reforms have not effectively weakened the market power of state-owned airlines; consequently, they have not promoted effective competition in the market.

The main objectives of the present paper are twofold: (i) it provides an empirical analysis of market power in the Chinese airline industry; and (ii) it investigates the determinants of such market power (if any). Quantitative measurements of the extent of competition in the Chinese airline industry and the market power of individual airlines will, we believe, provide a solid base for rational policy-making. However, the rapidly changing environment makes the task difficult to achieve. On the one hand, several important and highly profitable routes have been opened to private airline companies and low-cost carriers (LCCs). For example, Spring Airlines, the only recognized LCC in China, has officially received the operator qualification for flying on the Beijing–Shanghai route – the country's busiest route – since October 2011. High-speed rail service has also been opened in different city-pair markets, one after another, since 2008 (Fu et al., 2012). These developments have exposed the airlines with tremendous competitive pressure.³ On the other hand, corporate reorganization has continued its active course. For example, China Eastern Airlines (“MU”, which is the carrier's two-letter code assigned by IATA) and Shanghai Airlines (the 6th largest domestic carrier at the time) merged in January 2010, and Shenzhen Airlines (the 5th largest domestic carrier) was acquired by Air China (“CA”) in March 2010. The domestic market share of the “Big 3” has been enhanced as a result, which in turn provides the possibility for them to dominate the market and reduce competition.

More specifically, this paper first estimates the Lerner indices and uses the indices to measure the extent of airline market competition. Then in the second stage, we investigate the explanatory factors of market power so as to determine the sources of market power. We use the panel data of the “Big 3” – CA, CZ (for China Southern Airlines), and MU – and focus on the routes emanated from the country's three largest cities – namely, Beijing, Shanghai, and Guangzhou – to all the Chinese provincial capital cities (except Lhasa, the capital city of Tibet) and sub-provincial cities. The “Big 3” carriers have taken-up dominant positions in the Chinese civil aviation market since their establishment in 2002, with their joint domestic market share being approximately 80%. Furthermore, the three mega-cities (Beijing, Shanghai, and Guangzhou) have the country's top-4 hub airports, namely, Beijing Capital International Airport, Shanghai Pudong International Airport, Shanghai Hongqiao International Airport, and Guangzhou Baiyun International Airport. These three aviation centers and the other capital cities are important in terms of their dominant share of overall domestic air travel, and these cities are situated throughout the country. Competition among airlines on these routes reflects the competitive situation of almost the entire Chinese aviation market and thus determines to a large extent the welfare impact of the industry.

Our results indicate that a certain degree of market power exists in the Chinese airline industry. Among the three largest state-owned carriers, the market power of Air China is the strongest whilst the market power of China Eastern is the weakest, with China Southern positioned in between. From a geographical perspective, China's northeast region is shown to exhibit the strongest market power, whilst the central region the weakest. Furthermore, the existence of high-speed rail (HSR) and LCCs, income level, population size, seasonality, and number of competing airlines are found to be the main determinants of the industry's market power. Our analysis further reveals that the determinants of airfares are not entirely consistent with those of market power.

The paper is organized as follows. Section 2 provides a review of the literature, and Section 3 presents the theoretical model and issues related to the measurement of market power and data collection. Section 4 provides the estimation results on market power and Section 5 analyzes the explanatory factors of market power. Finally, Section 6 offers concluding remarks.

² In 2009, the “NDRC, CAAC on the Establishment of Additional Domestic Routes and Air Passenger Transport Kerosene Fuel Price Linkage Mechanism for the Issue of Notice” was issued. According to the “Notice”, airlines should be in accordance with the adjusted rate and consolidated procurement costs of the domestic aviation kerosene, fuel surcharges independently determine whether the criteria and the specific charge. The “NDRC, CAAC on Civil Aviation Domestic Routes First-class Cabin, Business-class Fares Related Issues Notice” (2010) provides a further pricing power to airlines. From 1 June 2010, carriers have determined the fares of their domestic flights (first- and business-class fares) independently. After the “Domestic Investment in the Civil Aviation Industry (Trial)” (2005) was announced, several private airlines were established. The “Provisions on the Business Licensing for Public Air Transportation Enterprises” (2004) and “Notice on the Further Strengthening Management of Public Air Transport Enterprise License” (2010) have clearly identified the requirements for establishing public air transportation enterprises and the qualifications for expanding business.

³ As shown by recent research (see, e.g., Park and Ha, 2006; Yang and Zhang, 2012; Fu et al., 2012, and the references cited therein) high-speed rail (HSR) service has, with its faster trains and more reliable service, become a significant competitor of air transport on routes of short-to-medium distance. For instance, Park and Ha (2006) showed, using the stated-preference survey method, that the opening of South Korea's first HSR line had significantly reduced airline demand in Korea's domestic market.

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