

## **Merger between airlines in financial distress: Does the merger save them?**

### **Abstract**

The merger in 2009 between China Eastern Airlines and Shanghai Airlines came at a time when both airlines were suffering heavy losses, and were struggling for survival during the global financial crisis. An examination of the prices on China Eastern's seven domestic Shanghai-based routes suggests that on average fares on departure days have increased by 22% in the post-merger period. It appears that the 2009 merger conferred China Eastern with significant market power owing to the parallel nature of this acquisition, thereby resulting in record profit reported in 2010. This reminds regulatory authorities to remain vigilant in handling airline mergers when numerous parallel routes are involved.

### **Key words:**

Airline merger; Market power; Lerner index; China Eastern

## 1. Introduction

China's airline industry in the past decade has been characterised by a series of merger events. In 2002 China's nine state-owned airlines merged into three airline groups: the Air China Group, the China Eastern Group and the China Southern Group. The China Eastern Group comprised China Eastern Airlines (hereafter China Eastern), China Yunnan Airlines and China Northwest Airlines. In 2009 China Eastern and Shanghai Airlines, two Shanghai-based competitors, became one under the umbrella of the China Eastern Group. Previous studies on airlines mergers have largely focused on the US market. For example, the effects of the 1980s mergers that took place in the US airline market have been well studied by Borenstein (1990), Werden et al. (1991), Kim and Singal (1993), Morrison (1996), Peters (2006), and Kwoka and Shumilkina (2010). In general, market power has been detected following the mergers, especially when the merging firms had overlapping routes or if one party provided services and the other was a potential entrant.

The decline in airline company mergers during the 1990s resulted in few empirical studies in the US for that period. The price effects of a recent merger between Delta Airlines and Northwest Airlines were examined by Luo (2014) whose findings suggest that the merger generated only small increases in fares. The author claims that the merger between legacy carriers has a weak effect on fares, while changes in low cost carriers (LCCs) have a much greater impact on fares. Studies on airline mergers outside the US are rare even though numerous mergers have occurred in the last decade. Dobson and Piga (2011) have examined the mergers between LCCs in the European market and suggest that efficiency and consumer benefits can be realised quickly and so the takeovers have a net beneficial effect for consumers, at least in price terms.

Antitrust policy towards horizontal mergers is largely prospective even in the US. Ashenfelter and Hosken (2010) have called for more retrospective studies on the price effects of consummated mergers to improve future antitrust decision-making. Studies on mergers are particularly important in China because its merger control agency was established as recently as 2008 and not only has it had little experience in dealing with airline mergers but it also needs empirical evidence to improve the quality of its decision-making.

The second section of this paper provides the background of the two Shanghai-based airlines, and reviews the financial performance of China Eastern before and after the 2009 merger. Section 3 presents the data and methodology used in detecting market power that China

Eastern may have acquired after merging with Shanghai Airlines. Section 4 discusses the findings and their implications. The last section concludes the paper.

## **2. Background**

China Eastern was one of six trunk airlines that separated from the Civil Aviation Administration of China's Shanghai Bureau in June 1988. The company's headquarters is at Shanghai Hongqiao International Airport. It was publicly listed in Hong Kong, New York and Shanghai in 1997. Shanghai Airlines was established in 1985 by the Shanghai Government and was publicly listed in 2002. Also headquartered in Shanghai, Shanghai Airlines was a longstanding rival of China Eastern. Their routes to and from Shanghai overlapped on almost all of the important domestic and some short-haul international ones. The two companies had a tension-filled relationship and price wars between them were frequent. Until the late 1990s, China Eastern did not accept tickets issued by Shanghai Airlines nor did it take passengers transferred from Shanghai Airlines in times of flight delay or cancelation.

The price effects of China's 2002 airline mergers were examined by Zhang and Round (2009) and Zhang (2012): the 2002 airline consolidation did not confer China Eastern with any significant market power in either the short or long term. These studies have found that in the years following the mergers, competition in the markets associated with Shanghai remained strong because Shanghai is China's largest commercial city and the routes in and out of Shanghai are a significant source of revenue for many domestic airlines. The airline companies continually increased flight frequencies and launched new routes to and from this city. As a result, price wars broke out regularly. This was one of the reasons for China Eastern reporting huge losses—2.8 billion yuan (US\$451 million) in 2006 and 14 billion yuan (US\$2.3 billion) in 2008. At the same time, Shanghai Airlines, a profitable carrier for many years recorded its first loss in 2007 and the amount lost in 2008 was 1.3 billion yuan (US\$210 million).

Although China Eastern has been partly privatised, its parent company, China Eastern Holdings that represents the state, has absolute control over it by holding about 60% of the equity. When China has been transitioning to a market economy from an unresponsive planned economy in the last three decades, reforms in the air transport sector were slow and limited. China Eastern performed relatively better than other airlines and enjoyed a high degree of autonomy before the 2002 consolidation. Its then parent company was in very small

scale and did not interfere much in the internal affairs. However, the 2002 consolidation created a new parent company for China Eastern, almost 10 times larger than before in terms of the number of managers and employees. The new parent company operated in an old-fashioned style and closely supervised China Eastern's day-to-day operations, insensitive to market changes and macroeconomic variables. Because of the lack of freedom and flexibility, China Eastern did not put much effort in developing new markets, improving customer services and addressing the needs of employees, which might be the fundamental reason for the financial losses.

The poor performance of China Eastern between 2003 and 2009 clearly indicates that the 2002 merger did not improve its competitiveness. In fact, most of the empirical studies have shown that horizontal mergers on average are not associated with higher profitability (see, for example, Jacquemin and Slade 1989). However, many poorly run firms still choose to be taken over to avoid bankruptcy, probably because the cost of merging is less than the cost of bankruptcy (Shrieves and Stevens 1979). For China Eastern, the merger with another weak airline was not ideal, but in the absence of finding a stronger partner, this move at least eliminated a close rival, thereby avoiding head-to-head competition on most of the routes in and out of Shanghai.

As a result of the merger, Shanghai Airlines became a wholly-owned subsidiary of China Eastern, but retained its brand name. In February 2010, the merger was completed and Shanghai Airlines was delisted from the share market. Subsequently, Shanghai Airlines withdrew from Star Alliance and joined SkyTeam. The merger gave the new China Eastern about 50% of the Shanghai market. At the end of 2010 China Eastern had total assets of 100.8 billion yuan (US\$16.3 billion) with a fleet of 355 aircraft providing services to 182 destinations.

China Eastern achieved a record profit before tax of 5.8 billion yuan in 2010 and remained profitable in 2011. The merger boosted China Eastern's passenger and cargo traffic by 47% and 55%, respectively, from 2009 to 2010. There was also an impressive improvement in both passenger and cargo load factors, the former rising from 72% to around 78% while the latter increasing from 50% to 60%. China Eastern's annual report credited the increases to strong traffic demand due to China's fast growing economy, the Shanghai World Expo and synergies gained through its merger with Shanghai Airlines. For example, the 2009 merger enabled China Eastern to optimise its network connectivity with increased capacity at

Shanghai's two airports. New routes were launched, frequencies were increased, schedules were coordinated and the right flight time concept was introduced, thereby providing more choices for international and domestic passengers.

Internal reforms were also started in an attempt to restore employees' confidence and trust in the company's leadership and to increase their sense of participation. Since 2009 China Eastern has retired 183 middle- and top-level managers and has created 103 senior management job positions for internal candidates.

Although all these moves may have contributed to China Eastern's strong performance in profit in 2010, it should be acknowledged that most benefits of the merger may take years to realise, especially the expected cost savings. Merkert and Morrell (2012) have argued that it is only long after the transaction has occurred that some of the uncertainties involved with merger activities may become clearer. Therefore, this study hypothesises that the fundamental reason for the record profit is the elimination of direct competition which allowed China Eastern to charge higher prices. The following sections will use the departure day fare data to examine this hypothesis.

### **3. Data and methodology**

The fare data were collected from the largest ticketing agency at Shanghai's two airports. More than 80% of the passengers who purchase tickets from their counters fly out on the same day according to the ticketing agency's daily sales reports. Therefore, the fare can be regarded as the departure day price. The agency's monthly statistics report the daily sales revenue excluding airport taxes and fuel surcharges, and the number of tickets sold for China Eastern.<sup>1</sup> Thus, the average price for a particular day can be calculated. Business or first class fares in the daily sales revenue are removed from the data. Therefore, the final fare data represent China Eastern's one-way daily economy class price (with or without discount). The sample used in this study contains prices from 2007 to 2011 on seven domestic routes: Shanghai-Changsha, Shanghai-Chongqing, Shanghai-Xi'an, Shanghai-Tianjin, Shanghai-Shenzhen, Shanghai-Zhengzhou and Shanghai-Chengdu. Shanghai-Shenzhen has long been the second most heavily travelled domestic route: 3.8 million passengers were carried on this route in 2011. The other six routes are among the top 20 busiest routes from Shanghai to other domestic cities in terms of passenger volume. Although more routes could not be

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<sup>1</sup> As fuel surcharge is excluded, we do not consider the fuel cost variable in our models.

included in this study because of the unavailability of data, the seven routes are important to China Eastern and the change in pricing in these markets will shed light on the effect of the 2009 merger. Table 1 shows a slight increase in the weekly frequency of flights from 2009 to 2011 on the seven routes. Table 2 reports the annual average fares for each route from 2007 to 2011. The coefficients of variation that measure price dispersion are also presented in the table. Much smaller price dispersions can be observed on almost all of the seven routes in 2010 and 2011. The low variation in prices may imply that the 2009 acquisition could have significantly lessened competition.

Table 1: Weekly frequency of flights from Shanghai before and after the 2009 merger.

Shanghai to	Flights per week before merger (2009)		Flights per week after merger (2011)
	China Eastern	Shanghai Airlines	China Eastern
Changsha	35	7	49
Chongqing	31	24	60
Xi'an	66	31	119
Tianjin	28	21	60
Shenzhen	56	42	112
Zhengzhou	35	7	55
Chengdu	35	21	77

Table 2: Average fare and coefficient of variation (CV) from 2007 to 2011.

Shanghai to	2007		2008		2009		2010		2011	
	Mean	CV	Mean	CV	Mean	CV	Mean	CV	Mean	CV

Changsha	727	0.23	810	0.16	773	0.15	851	0.13	860	0.10
Chongqing	1202	0.26	1005	0.36	1001	0.35	1325	0.21	1313	0.25
Xi'an	871	0.32	773	0.38	963	0.34	1170	0.15	1213	0.11
Tianjin	881	0.26	859	0.25	896	0.24	1012	0.09	1020	0.07
Shenzhen	1035	0.23	1077	0.19	1145	0.23	1332	0.12	1307	0.15
Zhengzhou	640	0.21	724	0.16	728	0.17	755	0.16	774	0.10
Chengdu	1389	0.20	1178	0.31	1222	0.27	1461	0.18	1412	0.24

Following previous literature such as Morrison and Winston (1995) and Morrison (2001), we use a fare equation which can be regarded as a reduced form equation derived from a structural model.<sup>2</sup> The dependent variable is the fare in logarithmic form. The independent variables, the geometric means of the population and the gross domestic product for both route endpoint cities, are assumed to influence demand in airline literature. These two variables are also in logarithmic form and the relevant data can be found in the Chinese City Yearbook (2008-2012). The market share of China Eastern on each route has experienced a substantial increase since the merger in 2009. Individual airline traffic data are not available, so the market share is calculated using the number of seats offered by each airline. This was done by checking the Timetable for Chinese Air Carriers (2007-2011) for the frequency of each airline and the type of aircraft used for each flight.

The endogeneity problem has long been recognised as being associated with the regression of price on concentration variables such as market share. However, in reality, finding good instruments is difficult. Kwoka and Shumilkina (2010) show that any possible endogeneity associated with the concentration variable does not greatly affect their results. Gayle and Wu (2013) demonstrate that the endogeneity problem associated with market structure is likely to

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<sup>2</sup> Readers can refer to Dresner and Tretheway (1992), and Schipper, et al. (2002) for a good discussion of the use of structural equations to estimate fares.

be small. Brueckner et al. (2013) also argue that bias from the potential endogeneity of the competition variables is not a major concern in their study.

Since the emergence of the hub-and-spoke system following air transport deregulation in the US, the price charged by hub airports has been much debated (Borenstein 1989; Lee and Luengo-Prado 2005). However, as part of the ‘hub premium’ debate, Tretheway and Kincaid (2005) have reported that more recent papers have found the magnitude of the hub dominance impact to be very minimal, and other factors such as the presence of LCCs are more influential on the higher fares paid at concentrated hubs. In addition, we have included the route market share variable, which is closely associated with the airport dominance variable. Therefore, the airport dominance variable will not enter into our models. The negative effect of the presence of LCCs on fares has been widely reported in the US and the European Union. It is believed that a similar effect exists in China’s airline market. Spring Airlines, China’s only LCC, operated a fleet of 30 aircraft on more than 40 routes in 2012. This Shanghai-based LCC was established in 2005 and has maintained a load factor of about 95% through offering low fares, well above the industry average load factor of 70%. It is, therefore, necessary to include a low cost carrier dummy in our models that takes the value of 1 when Spring Airlines is involved.

Two dummies are included in our model: Shanghai 2010 Expo and the 2009 merger dummy. The Shanghai Expo, which was held from 1 May 2010 to 31 October 2010, attracted many tourists. The merger dummy is of interest and takes the value of 1 for the period from January 2010 when the merger was close to being consummated. Although the merger was announced in July 2009, it was understood that it would take time for the two carriers to coordinate schedules and to redeploy aircraft.

The distance variable is included because it captures the transportation cost. It is measured by the distance in kilometres between the departure and arrival cities. The logarithmic form is used in the model. To control for the seasonal fluctuations, quarterly dummies are also included, with the first quarter being the benchmark season.

In dealing with unbalanced time series cross-sectional data for fares, it is necessary to diagnose if heteroskedasticity and serial correlation are present. A modified Wald statistic with chi-squared distribution following Greene (2000) was used to test groupwise heteroskedasticity following the use of a fixed effects model. This test revealed a strong violation of homoscedasticity for the fare data. A Wald statistic derived from Woodridge



(2002) suggested the existence of first-order serial correlation. Robust standard errors are thus reported in the estimation results to accommodate these problems. As the fare data have extremely long time periods, a Fisher-type test proposed by Choi (2001) was conducted to see if the fare data follow a unit root process. There has been strong evidence against a unit root and in favour of a stationary process for each-cross section unit.

The fixed and random effects models are commonly used when dealing with panel data. The choice between the two models is often guided by a Hausman test. Failure to reject the Hausman test implies favouring the random effects on efficiency grounds. However, Clark and Linzer (2012) have demonstrated that the Hausman test is neither a necessary nor a sufficient metric for deciding between the two models. They argue that the decision should be determined by the size of the dataset, the underlying level of correlation between the unit effects and regressor. Although the Hausman test conducted in this study prefers a fixed effects model, we present the results of both models. An alternative estimation procedure to accommodate the heteroskedasticity and serial correlation problems is to use the feasible generalised least squares (FGLS) approach (Greene 2000). The FGLS estimation is consistent and more efficient than OLS in the presence of the two problems. In addition, Zellner's (1962) seemingly unrelated regression (SUR) model is used to examine the impact of the 2009 merger on the fares on each of the seven routes. The fixed effects model is usually estimated with large cross-section units and a small number of time periods, while the SUR estimator is based on the large-sample properties of small cross-section units and large a number of time periods.

In addition to using a merger dummy in the regression model to detect market power, we also calculate the monthly Lerner index proposed by Lerner (1934) for the period 2007-2010 to see how much market power China Eastern could exercise before and after the 2009 merger. The Lerner index ( $L$ ) is defined as:

$$L = (P - MC) / P \quad (1)$$

where  $P$  is the price charged by the carrier on a given route while  $MC$  is the route-specific marginal cost.

Owing to the unavailability of the cost data, we follow the methodology proposed by Brander and Zhang (1990, 1993), and subsequently used in Zhang et al. (2013), and Zhang et al. (2014) to approximate the route-specific marginal cost:

$$MC_{kt} = cpk_t (D_k/AFL_t)^{-\theta} D_k \quad (2)$$

where  $D_k$  is the distance of route  $k$ ,  $AFL_t$  is the average distance flown by the airline,  $cpk_t$  is the cost per passenger-kilometre in period  $t$ , and  $\theta$  is an unknown parameter ranging from 0 to 1. Zhang et al. (2014) estimate the value of  $\theta$  using the data from China's airline industry and suggest that  $\theta$  is around 0.4, a value that is very close to those reported in Oum et al. (1993) and Murakami (2011). China Eastern's annual financial reports can be used to gather relevant data to calculate  $cpk_t$  and  $AFL_t$ .

#### 4. Results and discussion

Tables 3 and 4 present the estimation results from the regression models. Table 3 clearly shows that the 2009 merger has conferred China Eastern with significant market power, given that on average there was a 22% increase in fares as indicated by all three models. The random effects and FGLS approaches suggest that the prices rose by about 8% during the Shanghai World Expo period. Not surprisingly, the third quarter experiences higher fares than the first quarter as this is the holiday season for students and teachers who usually travel around with their families during this time. The fixed effects model does not show any significant effects of other variables when the robust standard errors are reported. The other two models reveal a negative relationship between market share and the fares. This is consistent with the finding by Evans and Kessides (1993) and Lee and Luengo-Prado (2005), who report a weak relationship between route concentration and fares, suggesting that route-level dominance does not confer much market power to the airlines. Unsurprisingly, long distance is associated with higher fares as operating on longer routes is more costly. Interestingly, the presence of a LCC, Spring Airlines, does not show an effect of suppressing the fares charged by China Eastern in the fixed effects model. The negative effect of the LCC reported by the FGLS model is also small in magnitude. This may be explained by the fare data used in this research: that is, the departure day prices of China Eastern would not be suppressed by the presence of a LCC.

Table 3: Regression results (dependent variable: departure day fare).

	Fixed effects		Random effects		FGLS	
	Coefficient	Robust std err.	Coefficient	Robust std err.	Coefficient	Std err.
Constant	13.507**	4.579	2.003***	0.539	1.962***	0.234
logPOPmean	-0.633	0.465	-0.015	0.025	-0.015	0.012

logGDPmean	-0.146	0.094	0.222***	0.060	0.226***	0.023
logDistance			0.511***	0.064	0.511***	0.015
China Eastern share	0.002	0.002	-0.007***	0.001	-0.007***	0.000
2010EXPO	0.029	0.034	0.084**	0.034	0.083***	0.014
2009merger	0.216***	0.045	0.229***	0.052	0.224***	0.017
Spring (LCC) dummy	0.050	0.077	-0.036	0.034	-0.035***	0.010
Q2	0.0166	0.015	0.028**	0.013	0.030***	0.011
Q3	0.081***	0.008	0.086***	0.010	0.089***	0.012
Q4	0.006	0.018	0.024	0.015	0.028**	0.012
Observations	11980		11980		11980	

\*\*\*significant at 1%, \*\*significant at 5%, \*significant at 10%.

It can be seen from Table 4 that the 2009 merger has led to an increase in fares by various amounts from 7.5% to 43% on all the routes, which might suggest that China Eastern has acquired substantial market power. The significance of the quarterly dummies indicates that prices significantly vary from one season to another and the summer season is clearly a peak season for the airline industry. Similar to the finding in Kwoka and Shumilkina (2010), the negative effect of population on fares most likely reflects the effect of larger market size and traffic density.

However, we cannot exclude the possibility that an increase in prices may reflect a substantial increase in costs rather than market power. In fact, China Eastern's annual financial reports suggest that the cost per passenger-kilometre rose substantially from 0.60 yuan in 2008 and 2009 to 0.78 in 2010. It then dropped to 0.64 in 2011. China Eastern claimed that it had to incur large costs related to the integration of Shanghai Airlines in 2010. As a result, a significant increase in marginal cost in 2010 has been observed on all the seven routes in our calculation using Equation (2).

Table 5 reports the average values of the Lerner indices. It can be seen that the Lerner indices are consistently positive on all the seven routes in 2011. For the routes from Shanghai to Chongqing, Tianjin, Shenzhen and Chengdu where there is a heavy presence of business passengers, the indices are greater than 0 for the whole period from 2007 to 2011. Despite the

significant rise in marginal cost in 2010, China Eastern still managed to exercise substantial market power on these routes. The fall in marginal cost in 2011 did not lead to a fall in the Lerner indices on the four business routes, nor on the other three routes. This may indicate that the 2009 merger has strengthened market power because of unilateral or coordinated effects. Market power in the markets from Shanghai to Changsha, Xi'an and Zhengzhou was relatively weak probably because of the introduction of the high speed rail services (Dongchezu) from Shanghai to these cities in the last few years. Despite this, it appears that in 2011 China Eastern was able to maintain some degree of market power on these routes.

Our findings are consistent with Zhang et al. (2014) who examined the market power issue in China's airline markets using completely different data sets. Their Lerner indices for the period 2010-2011 are similar to what we have calculated in magnitudes. Both studies have confirmed the existence of a certain degree of market power in China's airline markets.

In the antitrust analysis of airline consolidation, it is necessary to distinguish between complementary and parallel mergers or alliances, as identified by Oum et al. (1996) and Park (1997). Park et al. (2001) claim that a complementary alliance enables partners to attract more passengers by improving their connecting services and decreasing fares for connecting services. New demands are thus created, or are taken from the existing connecting passengers of rival airlines. In contrast, parallel alliances were likely to decrease total output and increase fares, possibly because of the changed pro-collusive market conditions. The appeal of mergers and of airline alliances is much the same for an airline. In fact, Zhang and Zhang (2006) note that strategic alliances might be viewed as a lesser form of a merger. Therefore, the concepts of complementary and parallel could be applied in merger analysis. Unlike the 2002 merger where the networks of the merging airlines were largely complementary (Zhang 2008), the merger between China Eastern and Shanghai Airlines in 2009 was a parallel merger, which was the key factor that led to substantial price increase and unprecedented profit in 2010.

Table 4: SUR results

	Shanghai-Changsha		Shanghai-Chongqing		Shanghai-Xi'an		Shanghai-Tianjin		Shanghai-Shenzhen		Shanghai-Zhengzhou		Shanghai-Chengdu	
	Coefficient	Std Err.	Coefficient	Std Err.	Coefficient	Std Err.	Coefficient	Std Err.	Coefficient	Std Err.	Coefficient	Std Err.	Coefficient	Std Err.
Constant	53.799**	23.740	125.751**	50.508	94.451***	33.784	87.106***	22.424	13.150***	3.484	9.586***	3.031	81.034***	22.874
logPOP	-5.377**	2.661	-11.932**	5.165	-9.616**	3.764	-8.770***	2.480	-0.959*	0.506	-0.676*	0.348	-7.878***	2.517
logGDP	0.333***	0.118	0.002	0.166	0.201	0.172	0.232	0.132	0.285*	0.151	0.486***	0.079	0.027	0.155
China Eastern share	-0.005**	0.001	0.005*	0.003	-0.003	0.003	0.002	0.002	0.003*	0.002	-0.001	0.001	0.005*	0.003
2010EXPO	0.037*	0.021	0.079**	0.034	-0.009	0.031	0.017	0.028	-0.068***	0.024	-0.006	0.019	0.021	0.030
2009merger	0.173***	0.035	0.305***	0.054	0.427***	0.045	0.243***	0.036	0.216***	0.031	0.075*	0.042	0.202***	0.048
Spring (LCC)	0.033	0.026	-0.171***	0.038	0.157***	0.053	-0.045	0.042	0.013	0.039				
Q2	0.003	0.016	0.013	0.024	-0.054**	0.022	-0.000	0.019	0.014	0.016	0.050***	0.015	0.077***	0.021
Q3	0.083***	0.017	0.113***	0.027	0.075***	0.023	0.059***	0.019	0.064***	0.017	0.100***	0.017	0.103***	0.023
Q4	0.069***	0.018	0.001	0.028	-0.079***	0.024	0.002	0.020	-0.017	0.018	0.049***	0.016	0.027	0.023
Observations	1519		1519		1519		1519		1519		1519		1519	

\*\*\*significant at 1%, \*\*significant at 5%, \*significant at 10%.

Table 5: Average values of the Lerner Indices

	<b>Shanghai-Changsha</b>		<b>Shanghai-Chongqing</b>		<b>Shanghai-Xi'an</b>		<b>Shanghai-Tianjin</b>		<b>Shanghai-Shenzhen</b>		<b>Shanghai-Zhengzhou</b>		<b>Shanghai-Chengdu</b>	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
2007	-0.071	0.094	0.186	0.140	-0.342	0.098	0.071	0.059	0.125	0.075	-0.086	0.087	0.213	0.085
2008	0.117	0.065	0.077	0.181	-0.381	0.249	0.089	0.145	0.226	0.082	0.110	0.096	0.106	0.142
2009	0.118	0.101	0.145	0.209	-0.107	0.335	0.207	0.109	0.302	0.159	0.169	0.060	0.240	0.093
2010	-0.066	0.054	0.138	0.077	-0.177	0.068	0.051	0.024	0.205	0.033	-0.037	0.081	0.119	0.052
2011	0.121	0.018	0.283	0.057	0.059	0.048	0.216	0.014	0.324	0.044	0.127	0.020	0.238	0.109

China's Anti-Monopoly Law was passed in 2007 and became effective from 1 August 2008. It is understood that China's new antitrust enforcement agencies have limited resources and little experience in dealing with antitrust cases at this stage. As a result, the merger between China Eastern and Shanghai Airlines was not challenged, nor were any conditions such as giving up some slots at both Shanghai airports imposed. However, as China's antitrust agencies grow and gain experience, it will be unlikely that China Eastern could duplicate the same success story without effectively improving efficiency and reducing costs. The findings of this study provide further evidence to antitrust agencies that a consideration of complementary and parallel mergers or alliances should be incorporated into their decisions on airline consolidation cases.

It is worth noting that despite the significant increase in prices, the change in social welfare after a merger is uncertain when the benefits to the airlines and to consumers are considered, especially given that the two airlines were financially unviable before the 2009 merger. These days most economists agree that the eventual goal of competition policy should be to increase efficiency, i.e., to maximise the sum of consumer surplus and producer surplus. Under this goal, the overall benefits including the interests of consumers, producers, resource owners, shareholders and other stakeholders will be considered. This might be one possible reason why China's antitrust authorities did not impose any condition on this parallel merger in 2009.

In addition, the merger may increase the merging airlines' ability to offer greater product differentiation, especially for the price-insensitive business passengers, who prefer faster connections and place high value on flight punctuality and frequency of service. Paying a higher price does not necessarily represent a loss of consumer welfare for them. We cannot exclude the possibility that China Eastern well understands that most late bookers are business travellers and the 2009 merger has increased its confidence of charging higher prices without worrying about losing customers. However, China Eastern needs to know that this is only sustainable if higher quality services are consistently delivered and customers are convinced that these services are worthwhile.

## **5. Concluding remarks**

Previous studies have suggested that the 2002 airline consolidation did not lead to China Eastern charging higher prices, largely due to the complementary nature of this consolidation. However, the fundamental reason for the failure of China Eastern before the 2009 merger

was probably the bureaucracy of its parent company which operated in a similar way to when it was part of a conventional planned economy. This hindered the autonomy of China Eastern, resulting in China Eastern being inflexible and insensitive to market changes.

There have seen some success for China Eastern since its integration with Shanghai Airlines in 2009. An examination of the prices on China Eastern's seven domestic Shanghai-based routes suggests that on average fares have increased by 22% in the post-merger period. This study has shown that the increased market power of China Eastern might be the main factor contributing to its record profit in 2010. However, it should be acknowledged that the long-term effect of the 2009 merger remains unclear. Much will depend on both China Eastern's reform and modernisation agenda, and when the Shanghai market is fully opened to private and LCCs.

This research study has extended the existing airline merger literature in several ways. First, typically when firms begin merger talks at least one firm is financially sound and the merger is expected to build a bright future for the firms. However, before beginning their negotiations both China Eastern and Shanghai Airlines were financially distressed and relied on government subsidies. This special case has not been examined before.

Second, it is well-known that most airlines use an intertemporal pricing strategy and charge higher prices for consumers (usually business travellers) who book close to their flight's departure. The use of departure day prices in this paper complements existing studies that usually use average prices. The findings will have important implications to business passengers who usually do not book their flights well in advance.

Third, although in theory an anticompetitive effect is highly possible on parallel routes where allied or merged airlines operate, most of the empirical evidence suggests that fares charged by allied or merged carriers do not significantly differ from those charged by non-aligned carriers on similar routes because the upward impact on fares due to the cooperation effect tends to be offset by the downward effect from density economies (Dresner 2011). The present research, however, has revealed significant increase in fares following a 'parallel' merger, which reminds regulatory authorities to remain vigilant in handling airline mergers when numerous parallel routes are involved. Clearly a pre-merger analysis should be conducted by the antitrust authorities and stringent conditions could be imposed on the merged parties when a proposed merger is likely to result in substantial lessening of or significant impediment to effective competition. For example, Shanghai's Hongqiao and



Pudong airports are notoriously congested and it has been extremely difficult for new airlines to obtain an ideal time slot. The regulatory authorities could have required China Eastern and Shanghai Airlines to give up some of their slots at the two airports, and released them to the private carriers that emerged in the last few years. New route licences could also be issued to encourage new operators to compete directly with China Eastern on business routes where market power is more likely to exist as suggested by this study.

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