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2 **DRIVERS AND EFFECTS OF MERGER AND ACQUISITIONS IN THE AIRLINE**
3 **INDUSTRY: A CASE STUDY OF HONG KONG**
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ABSTRACT

The present study aims to figure out the drivers and motives behind merger and acquisitions (M&As) and their effects in the post-M&As scenarios, considering the case study of the acquisition of HK Express by Cathay Pacific in 2019. First, commercial situational analysis of four Hong Kong-based airlines has been done to understand the current and future scenarios. To identify the drivers behind M&As, several quantitative and qualitative research methods and techniques have been used such as interviews, collection, and analysis of market share data, on-time performance data, etc. These data are analyzed through linear regression, paired T-test, etc. We analyzed the case of Cathay Pacific acquisition in three steps: pre-acquisition stage, peri-acquisition stage, and post-acquisition stage. A total of 8 drivers of airline acquisition have been identified. They include weakening of the acquiree, strengthening of the acquirer, financial situation of the acquiree, compatibility of network, compatibility of business model, concerns of airport slots, branding of acquiree and external business environment. To examine the changes and effects of M&As, an improved Fishcer and Platzer model is used to study dimensions of post-merger effects. We figure out 5 different dimensions of effects brought by the acquisition including operational services, investor confidence, internal confidence, possible structural changes of the Cathay Group, and the possible changes towards the external business environment. This study may serve as a useful reference for relevant stakeholders.

keywords:

merger and acquisition, airline industry, HK Express, Cathay Pacific, drivers and effects

1 INTRODUCTION

2 The airline industry is very competitive with profits over small margins. Hence, it
3 accommodates several strategies to survive and strengthen their power and existence, like using the
4 latest technology and inventions to reduce their cost, etc. Mergers and acquisitions (M&As) of other
5 airlines is a viable option and result in productive outcome in many cases. It increases market power
6 and economic efficiency along with the inducive future for the stakeholders involved (1). Drivers and
7 motives behind M&As can be varied and may depend on case to case basis. The investigation of these
8 driving factors and the effects they brought in the post-merger era can be interesting and helpful in
9 defining and predicting the future scenarios of a particular aviation industry (2). A successful M&A
10 between airlines has to be carefully done in the pre-acquisition stage (3). Analysis of the merger of
11 North Central Airlines and Southern Airlines with the help of a mathematical model reveals that the
12 merger is likely to provide substantial benefits to passengers with improved services (4). Comparison
13 of fare prices before and after the first two years of airline consolidation in China in 2002 of the China
14 Eastern and China Southern Group, showed that M&A caused no major changes in airfare, which means
15 it does not harm the passengers' interest (5).

16 The available literature are often in the form of a single perspective view, usually passengers
17 or the local governments. Few considered the cases more holistically by considering multiple
18 stakeholders' views during a M&A of airlines. Moreover, there is still a lack of literature covering the
19 acquisition cases locally in Hong Kong, especially for the case of HK Express being acquired by Cathay
20 Pacific. Therefore, this study aims to fill the aforementioned research gaps by developing a deeper
21 understanding of Hong Kong's aviation industry. Here we present a revealing identification of the
22 drivers causing and triggering an acquisition act in the airline industry, as well as the effects brought to
23 the local aviation industry for different stakeholders considering the case of HK Express acquisition.
24 The present study provides an answer to the questions like "Why did Cathay Pacific acquired HK
25 Express?", "What changes occurred to the Cathay Group after the acquisition?" etc.

27 RESEARCH METHODOLOGY

28 The study used a mixed method research combining both qualitative and quantitative research
29 methods to identify the drivers and effects of M&As in aviation industry. Details can be found in next
30 subsections.

32 Qualitative Research

33 Mainly two types of qualitative research have been conducted to acquire the information and
34 data needed for this study, including the literature review and interview. Specifically, several peers
35 reviewed articles related to strategic management in aviation, airline mergers, and research methods
36 used in the aviation industry, etc. have been thoroughly studied. Many interviews have been conducted
37 to gain some specific data for supporting the arguments and points made in this paper. To encourage
38 participants to have a casual conversation, informal ways of interviews have been selected to reduce the
39 pressure given to both the interviewer and interviewee to speak more freely and openly (6). The
40 following graph visualizes the interview process, stakeholders involved, and the interviewee and their
41 respective positions in the aviation industry.

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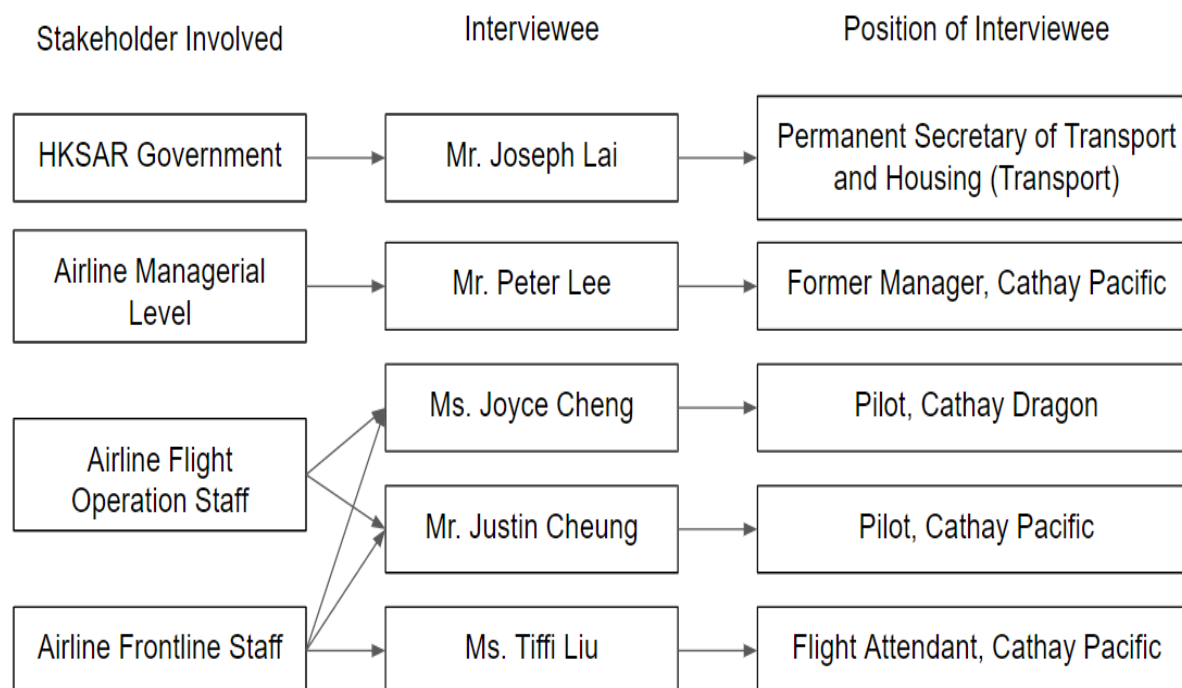


Figure 1 Summary of interviewees

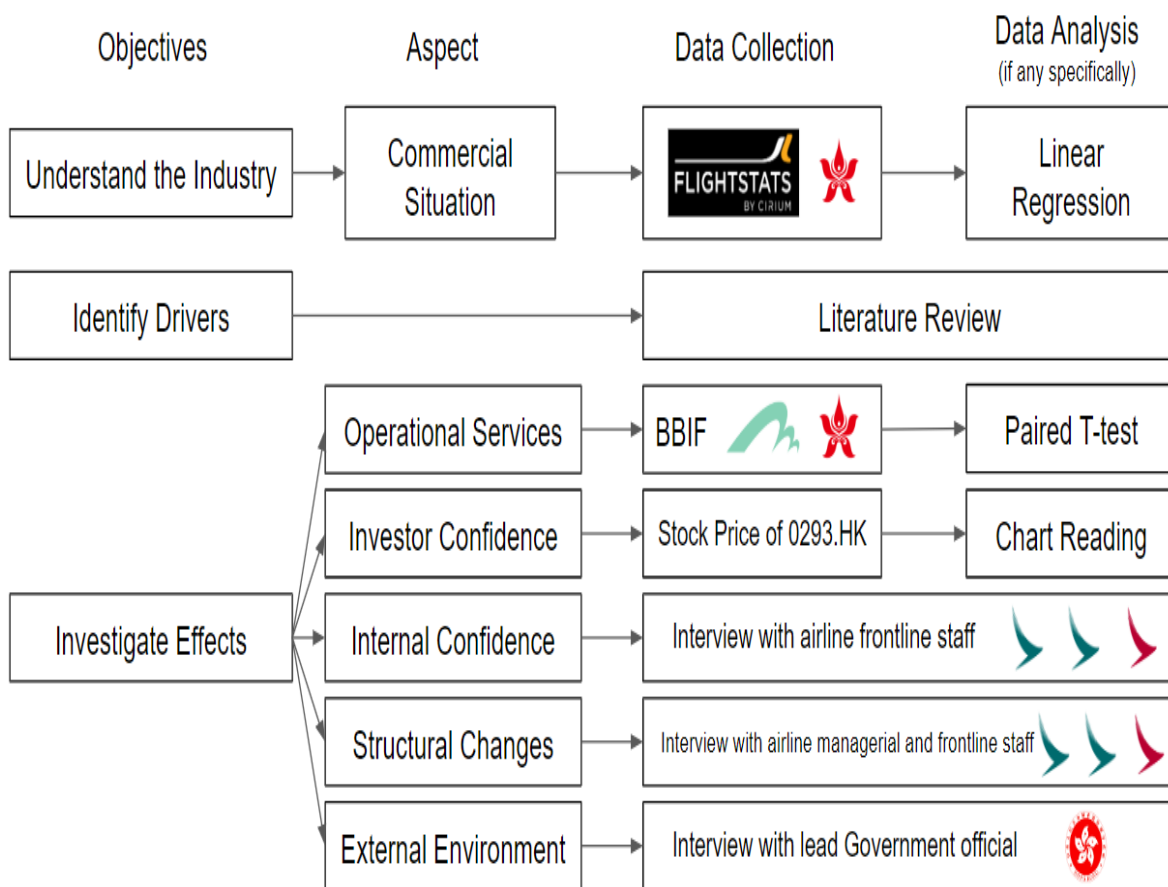
Quantitative Research

Some authentic quantitative data including the market share data and on-time performance data have also been collected and analyzed in various ways. First, data on the annual number of flights and seats available of the four passenger airlines based in Hong Kong from 2011 to 2018 have been collected through the aviation database 'Flightstats by Cirium' (7). Via basic statistical methods, data have been analyzed to understand the current commercial situation of the Hong Kong aviation industry. Secondly, the on-time performance data is collected from the Airport Authority Hong Kong's database 'BBIF' (8). The access to these databases has been provided by the Operations Management Centre of the Ground Operations Department of Hong Kong Airlines Limited. To nullify the uncontrollable factors in out ports to the four locally based passenger airlines, only the flights departing from Hong Kong are considered, for the analysis of the operational strength over the period from June 2019 to July 2019. An on-time flight is defined as the flights that can depart within 15 minutes of their scheduled time of departure denoted by D15 (9). With the help of Microsoft Excel, the on-time departure rate and the chart of daily on-time can be obtained. The rate of on-time departure flights can be obtained by comparing the number of on-time departed flights to the total number of flights scheduled to depart from the Hong Kong International Airport. Moreover, paired T-tests have been conducted using SPSS software to compare the performance before and after the acquisition of HK Express by Cathay Pacific.

Collection and Analysis of Cathay Pacific Airways Stock Data

Due to the flexibility provided by the interactive chart, the stock data of Cathay Pacific is retrieved from the open-to-public database Yahoo Finance (10). Changes in the stock prices at the time of events that happened during the acquisition are considered for analyzing the confidence of the investors. As the stock data is not normally distributed, simple chart reading skills were applied. The following figure visualizes the methodology applied for the mentioned aspects of airline mergers.

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Figure 2 Summary of Methodology Applied in this Study

UNDERSTANDING THE AVIATION IN HONG KONG

Before we analyze the case of Cathay Pacific acquisition, it is important to have a good understanding of the scheduled passenger airlines currently based in Hong Kong and their commercial situations. To this end, we present in the following table all the information studied for the four scheduled passenger airlines currently based in Hong Kong.

TABLE 1 Summary of the Hong Kong Based Scheduled Passenger Airlines

Information studied	Cathay Pacific	Cathay Dragon	Hong Kong Airlines	HK Express
Logo				
Founded in	1946	1985	2006	2004/2013
Founded by	<ul style="list-style-type: none"> • Roy Farrell • Sydney de Kantzow 	<ul style="list-style-type: none"> • Kuang-piu Chao 	<ul style="list-style-type: none"> • HNA Group 	<ul style="list-style-type: none"> • Stanley Ho

Predecessor	N/A	Dragon air	CR Airways	Hong Kong Express
IATA Code	CX	KA	HX	UO
ICAO Code	CPA	HDA	CRK	HKE
ICAO Callsign	CATHAY	DRAGON	BAUHINIA	HONGKONG SHUTTLE
Business Model	<ul style="list-style-type: none"> ● Legacy ● International 	<ul style="list-style-type: none"> ● Legacy ● Regional 	<ul style="list-style-type: none"> ● Legacy ● Regional 	<ul style="list-style-type: none"> ● LCC ● Regional
Major Serving Area	<ul style="list-style-type: none"> ● Asia ● Europe ● North America 	<ul style="list-style-type: none"> ● Asia 	<ul style="list-style-type: none"> ● Asia ● North America (ceased) 	<ul style="list-style-type: none"> ● South-east Asia
Skytrax Recognition	5-star	4-star	4-star	N/A
Parent Group/ Company	Swire Pacific	Swire Pacific/ Cathay Pacific	HNA Group	Swire Pacific/ Cathay Pacific
Fleet	<ul style="list-style-type: none"> ● B777 ● A330 ● A350 	<ul style="list-style-type: none"> ● A330 ● A321 ● A320 	<ul style="list-style-type: none"> ● A320 ● A330 ● A350 	<ul style="list-style-type: none"> ● A320 ● A321

To eliminate the detrimental effect on calculations due to the difference in the size of aircraft deployed, total available seats have been used instead of the number of flights. Data from 2014 to 2018 have been taken to eliminate the interpretation of data from HK Express before its transition in 2013 for the sake of fair comparison. By combining the departure and arrival figure, the annual total available seats can be obtained as shown below. To obtain the market share according to the available seats, the individual figure of each airline is divided by the corresponding annual total figure offered in and out of Hong Kong. This figure, in percentage, will then be taken as the market share.

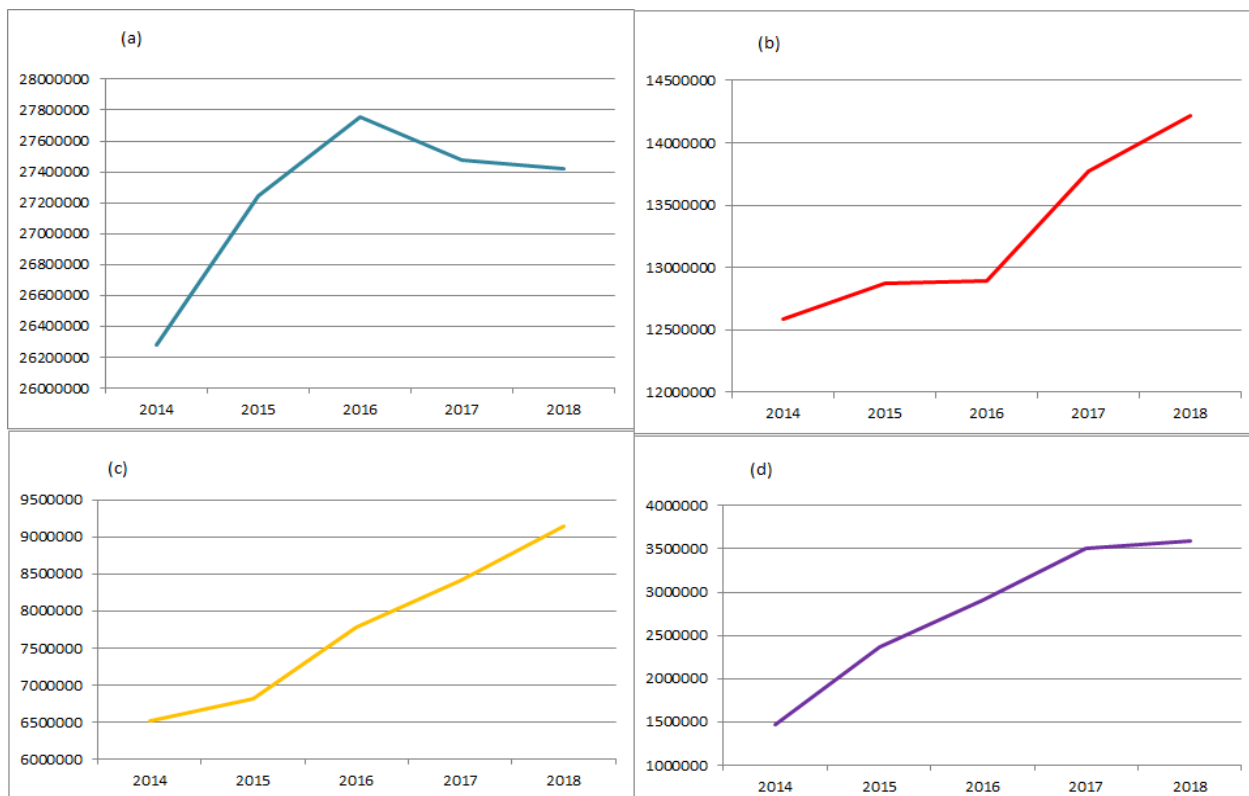
TABLE 2 Annual Total Available Seats and Market Share of Hong Kong Based Airlines

Airlines	Annual Total Available Seats				
	2018	2017	2016	2015	2014
Cathay Pacific	27,417,858	27,478,196	27,753,776	27,243,451	26,282,369

Cathay Dragon	14,215,782	13,769,255	12,894,577	12,871,307	12,584,946
Hong Kong Airlines	9,142,574	8,407,666	7,773,624	6,823,042	6,518,131
HK Express	3,595,677	3,506,268	2,911,542	2,361,945	1,467,252
Annual Figure	88,669,226	87,596,634	85,419,149	83,109,557	80,886,935
Market Share by Available Seats					
	2018	2017	2016	2015	2014
Cathay Pacific	30.92%	31.36%	32.49%	32.78%	32.49%
Cathay Dragon	16.03%	15.71%	15.09%	15.48%	15.55%
Hong Kong Airlines	10.31%	9.59%	9.10%	8.20%	8.05%
HK Express	4.05%	4.00%	3.40%	2.84%	1.81%

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By plotting the above figures into a line graph, the available seats by each airline annually from 2014 to 2018 can be clearly shown for the analysis of their market size.



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Figure 3 (a) Annual Total Available Seats by Cathay Pacific (CX), (b) Cathay Dragon (KA), (c) Hong Kong Airlines (HX), (d) HK Express (UO) Respectively

Fig. 3 shows the growth of Cathay Pacific's market size is relatively stronger from 2014 to 2016 whereas Cathay Dragon market size is growing particularly from 2016 to 2018. On the other hand, Hong Kong Airlines and Hong Kong Express show rather substantial growth. By combining the Fig. 3 (a), (b), (c), and (d), a comparison of the market size between the four airlines has been presented. Furthermore, to enhance the comparison of the rate of growth of the airlines, linear regression has also been done. The results are illustrated in Fig. 4.

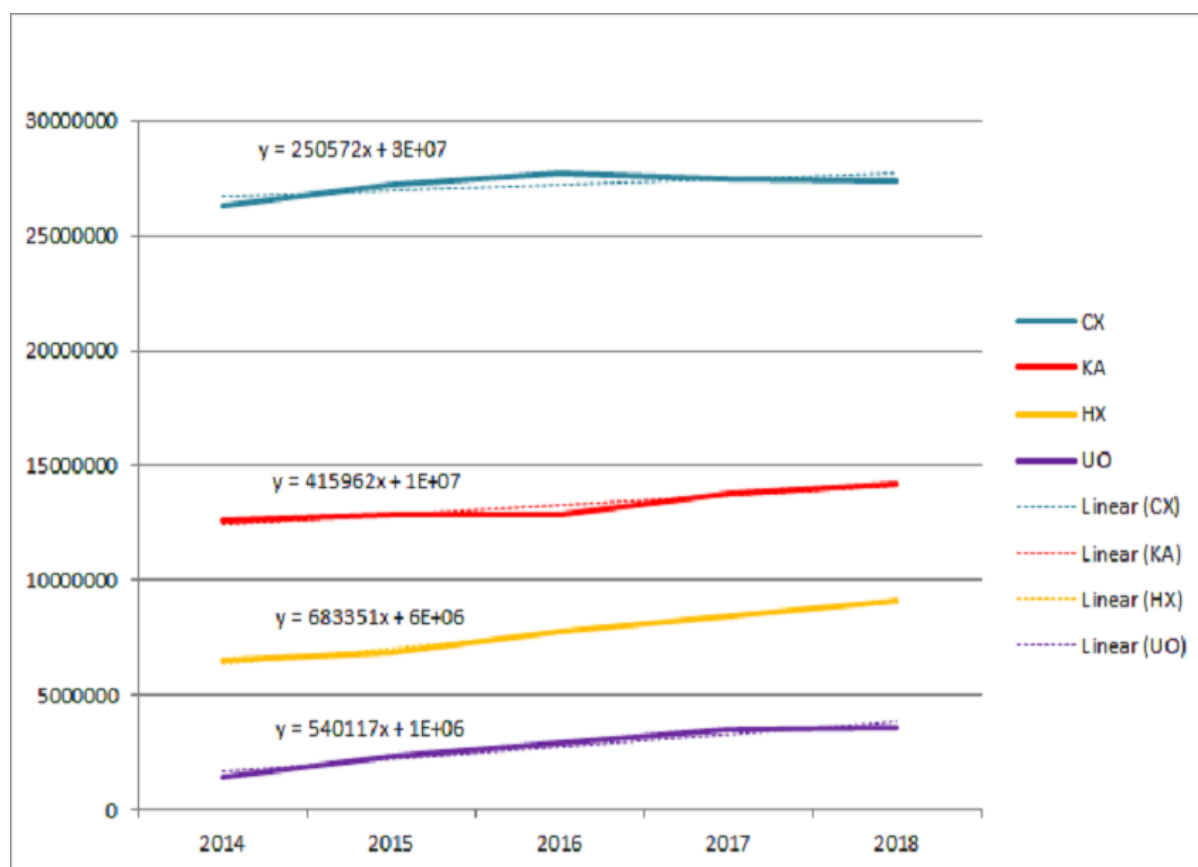
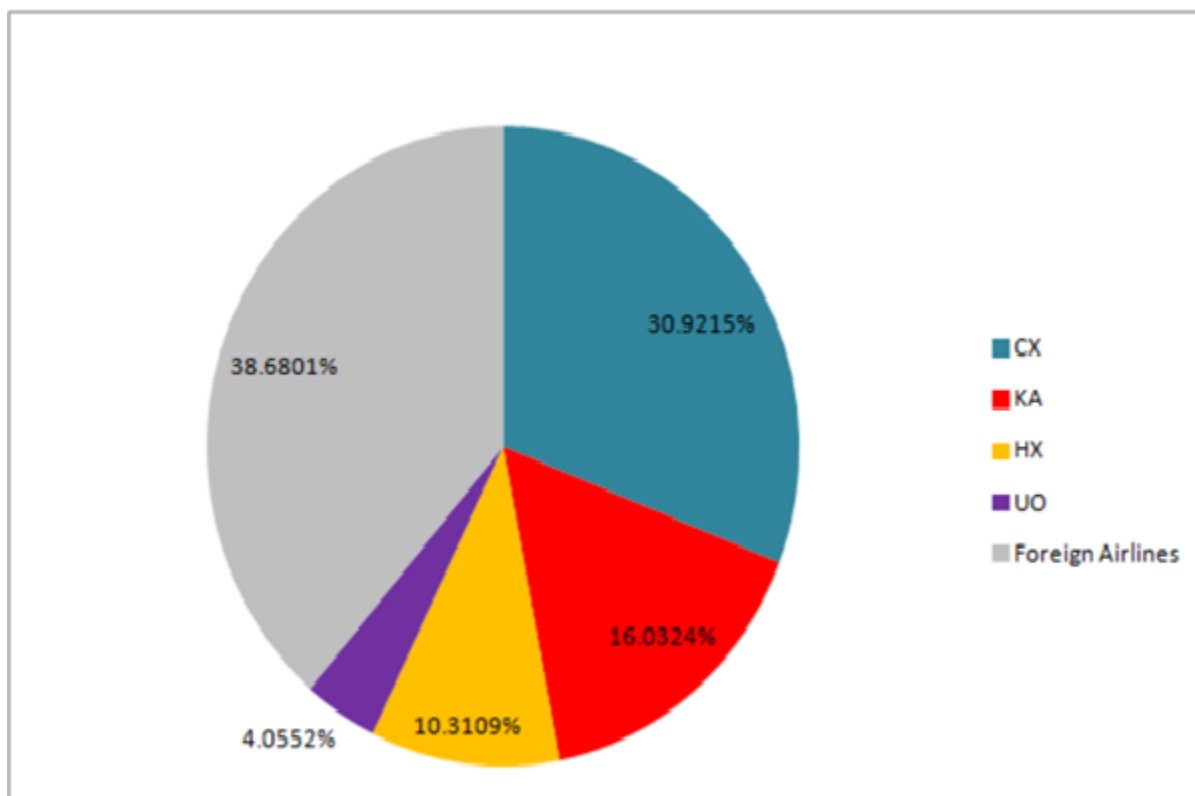


Figure 4 Annual Total Available Seats by Cathay Pacific (CX), Cathay Dragon (KA), Hong Kong Airlines (HX), HK Express (UO)

The following pie chart in Fig. 5 demonstrates the market share of Hong Kong aviation industry in 2018. The foreign airlines were also considered here to better understand the competition faced by Hong Kong-based airlines. Overall, Cathay Pacific (CX) takes nearly one-third of the market share followed by Cathay Dragon (KA) with 16%, while Hong Kong Airlines (HX) and HK Express (UO) covered one-tenth and 4% of the market respectively.



1
2 **Figure 5 Market Share of Hong Kong by Available Seats in 2018**
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4 All Hong Kong-based airlines altogether took over 60% of the market, leaving behind less than
5 40% being taken by foreign airlines. If the data in 2018 is considered for the current situation of Cathay
6 Group where it includes HK Express as one of its members, it can be considered to have taken up over
7 half of the market share in Hong Kong. Hence it is rational to believe that the Cathay Group after the
8 latest acquisition becomes more dominant in the Hong Kong market given that its market share in 2018
9 had already exceeded 50%.

10 Fig. 6 shows the percentage market share of the four Hong Kong-based airlines and a combined
11 market share of foreign airlines. Linear regression has also been performed to quantify the growth or
12 reduction of the market share in these years.
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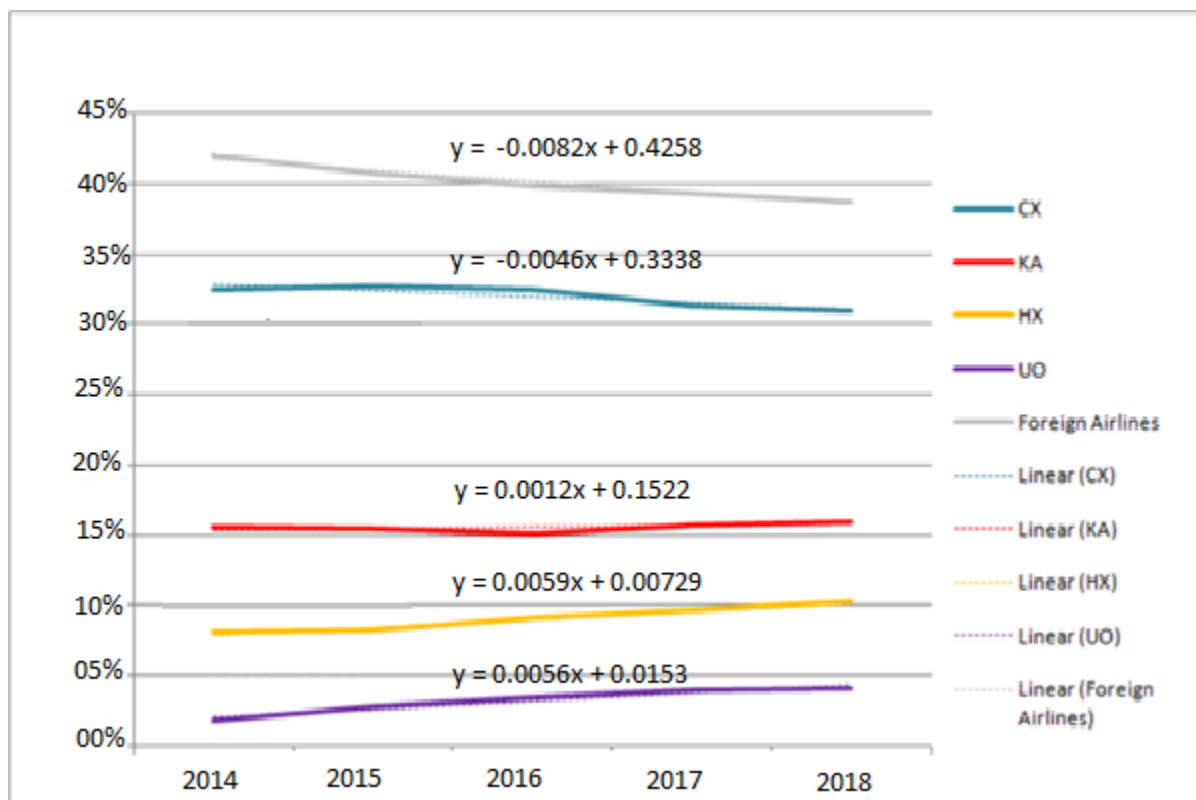


Figure 6 Market Shares of the Airlines Operating in Hong Kong

Table 3 shows the ranking of four airlines in market size by comparing the value of the annual total seats. By comparing the slopes of the four sets of data in Fig. 4, the ranking in growth of market size has been measured. Fig. 6 shows that the market share of the foreign airlines has been shrinking compared to the Hong Kong-based airlines. It means the general market in Hong Kong is shifting towards the side of Hong Kong-based airlines, whereas Cathay Pacific also shows a general drop in its market share just like the foreign airlines.

TABLE 3 Ranking in Market size, Growth of Market size and Growth of Market share

	Ranking in Market Size	Ranking in Growth of Market Size	Ranking in Growth of Market Share
1st	Cathay Pacific	Hong Kong Airlines	Hong Kong Airlines
2nd	Cathay Dragon	HK Express	HK Express
3rd	Hong Kong Airlines	Cathay Dragon	Cathay Dragon
4th	HK Express	Cathay Pacific	Cathay Pacific

CASE STUDY OF ACQUISITION OF HK EXPRESS BY CATHAY PACIFIC

After understanding the aviation in Hong Kong and current commercial trends, it is requisite to analyze the case of HK Express acquisition to see future scenarios. Entire acquisition case between Cathay Pacific and HK Express is discussed in three Sections. First, the drivers causing and triggering

1 the acquisition are investigated. Then the events that happened during the acquisition are showcased in
2 the Peri-Acquisition Stage. Effects brought by the acquisition to the stakeholders involved are discussed
3 later.

5 **Pre-Acquisition Stage**

6 We will investigate the case to look for the drivers and motives that lead to this acquisition in
7 following sub-sections.

9 ***The weakening of HK Express***

10 The exact process of acquisition is to weaken the acquiree firm since it helps the acquirer to
11 gain a better financial position (11). HK Express showed signs of weakening, commercially as well as
12 on operational level before the acquisition. In fact, HNA Group, as the parent group of HK Express, has
13 been reported to have a total debt of CN¥ 598 billion in 2017 (12), which kept the HNA Group under
14 huge financial threat. Hence, Chinese banks that had been supporting the HNA Group in their expansion
15 globally halted the funding support (13). Due to the cancellation of 18 flights in October 2017 (Known
16 as a golden week), HK Express faced difficult times, affecting thousands of passengers. After an
17 investigation by the Air Transport Licensing Authority (ATLA) along with HK Express the immediate
18 cause was found to be the shortage of qualified trainers, which results in the inadequacy of standby
19 crew. Despite the remedial actions from ALTA and airline itself, this incident heavily damaged the
20 public's trust towards the airline. Due to the weakening of the parent group and the airline itself, it
21 becomes easier for Cathay Pacific to bargain and acquire HK Express.

23 ***Strengthening of Cathay Pacific***

24 Strengthening of the acquirer firm plays a critical role in a successful acquisition. In the current
25 scenario, Cathay Pacific was in deficit for the past few years due to the failure in fuel hedging. However,
26 on 19th February 2019, it announced the expected profit of 2018 to be HK\$ 2.3 billion as a result of its
27 three-year transformation program (14). This led to the stock of Cathay Pacific to jump up to 8.8% on
28 20th February (15), the largest single-day jump since October 2011 (16). The stock price of Cathay
29 Pacific raised by HK\$1.60 per share on 21st February (see Fig. 7).



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2 **Figure 7 Stock Price of Cathay Pacific, Red Line Marked the Day of Announcement (10)**
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4 On 9th April 2019, Cathay Pacific published their annual report for the year 2018 through the
5 Hong Kong Stock Exchange, showing that Cathay Pacific is regaining their power (17). Multiple
6 indexes of the operating statistics showed that the operational performance of the Cathay Group had
7 increased before the acquisition, while some of the cost related operating indexes decreased including
8 the different rates of fuel consumption (see Fig. 8). Such performance in the year before the acquisition
9 gave the airline a foundation to acquire HK Express.
10

Operating Statistics – Cathay Pacific and Cathay Dragon

		2018	2017	Change
Available tonne kilometres ("ATK")	Million	32,387	31,439	+3.0%
Available seat kilometres ("ASK")	Million	155,362	150,138	+3.5%
Available cargo & mail tonne kilometres ("AFTK")	Million	17,616	17,163	+2.6%
Revenue tonne kilometres ("RTK")	Million	24,543	23,679	+3.6%
Passenger revenue per ASK	HK cents	47.1	44.2	+6.6%
Revenue passenger kilometres ("RPK")	Million	130,630	126,663	+3.1%
Revenue passengers carried	'000	35,468	34,820	+1.9%
Passenger load factor	%	84.1	84.4	-0.3%pt
Passenger yield	HK cents	55.8	52.3	+6.7%
Cargo and mail revenue per AFTK	HK\$	1.40	1.20	+16.7%
Cargo and mail revenue tonne kilometres ("RFTK")	Million	12,122	11,633	+4.2%
Cargo and mail carried	'000 tonnes	2,152	2,056	+4.7%
Cargo and mail load factor	%	68.8	67.8	+1.0%pt
Cargo and mail yield	HK\$	2.03	1.77	+14.7%
Cost per ATK (with fuel)	HK\$	3.27	3.12	+4.8%
Fuel consumption per million RTK	Barrels	1,830	1,866	-1.9%
Fuel consumption per million ATK	Barrels	1,387	1,405	-1.3%
Cost per ATK (without fuel)	HK\$	2.25	2.14	+5.1%
Underlying* cost per ATK (without fuel)	HK\$	2.16	2.12	+1.9%
ATK per HK\$'000 staff cost	Unit	1,801	1,775	+1.5%
ATK per staff	'000	1,217	1,208	+0.7%
Aircraft utilisation	Hours per day	12.3	12.3	-
On-time performance	%	72.7	71.2	+1.5%pt
Average age of fleet	Years	9.9	9.3	+6.5%
GHG emissions	Million tonnes of CO ₂ e	18.0	17.7	+1.7%
GHG emissions per ATK	Grammes of CO ₂ e	556	564	-1.4%
Lost time injury rate	Number of injuries per 100 full-time equivalent employees	4.55	3.54	+28.5%

* Underlying costs exclude exceptional items and are adjusted for the effect of foreign currency movements and the adoption of HKFRS 15.

Figure 8 Operational Statistics for the Cathay Group in 2018 Annual Report (17)

HK Express v. s. Hong Kong Airlines

Both HK Express and Hong Kong Airlines were showing signs of weakening before HK Express's acquisition. There were rumors in the market that Cathay Pacific was interested in both but ultimately, they only chose HK Express. It means that there were some critical factors making this happen. We will discuss them below.

Unlike HK Express, Hong Kong Airlines was in a huge amount of debts (US\$550 million) reported in January 2019 (18). ATLA ordered the consolidation of the airline's financial situation and failure of doing so will lead to the suspension of its air operator certificate (19). Such debts later led to a series of unwanted events, including the closure of its long-haul routes in February 2020 (20). Cathay Pacific, in case of the acquisition, has to repay such debts that might threaten the financial stability of Cathay Pacific itself as well as the development of airline in the future, resulting in no benefits. Secondly, the network of Hong Kong Airlines, especially after the cessation of its long-haul routes will be very similar to that of the Cathay Dragon, contributing none in terms of diversity, while the network coverage of HK Express includes multiple tourist attracted destinations like Hiroshima, Takamatsu, Nagasaki, and Kagoshima from Japan and Nha Trang from Vietnam, not currently covered by the group.

Moreover, the business model was also very critical to decision making. Hong Kong Airlines is currently a regional legacy airline, very similar to Cathay Dragon. In contrast, the introduction of HK Express (the only low-cost carrier based in Hong Kong) will allow the group to become a very diversified airline group that operates legacy airlines internationally and regionally as well. Mr. Peter Lee, the former manager of Cathay Pacific pointed out in an interview that Cathay Pacific has been

1 considering owning a Low-Cost Carrier (LCC) since 2008. By acquiring HK Express, it can have an
2 LCC without the need to start from scratch. Through the comparison of HK Express against Hong Kong
3 Airlines, we can find three key drivers that affect the decision making of airline acquisition, including
4 the financial situation of the acquiree, the compatibility of network, and the compatibility of business
5 model.

7 *HK Express v. s. Oasis Hong Kong Airlines*

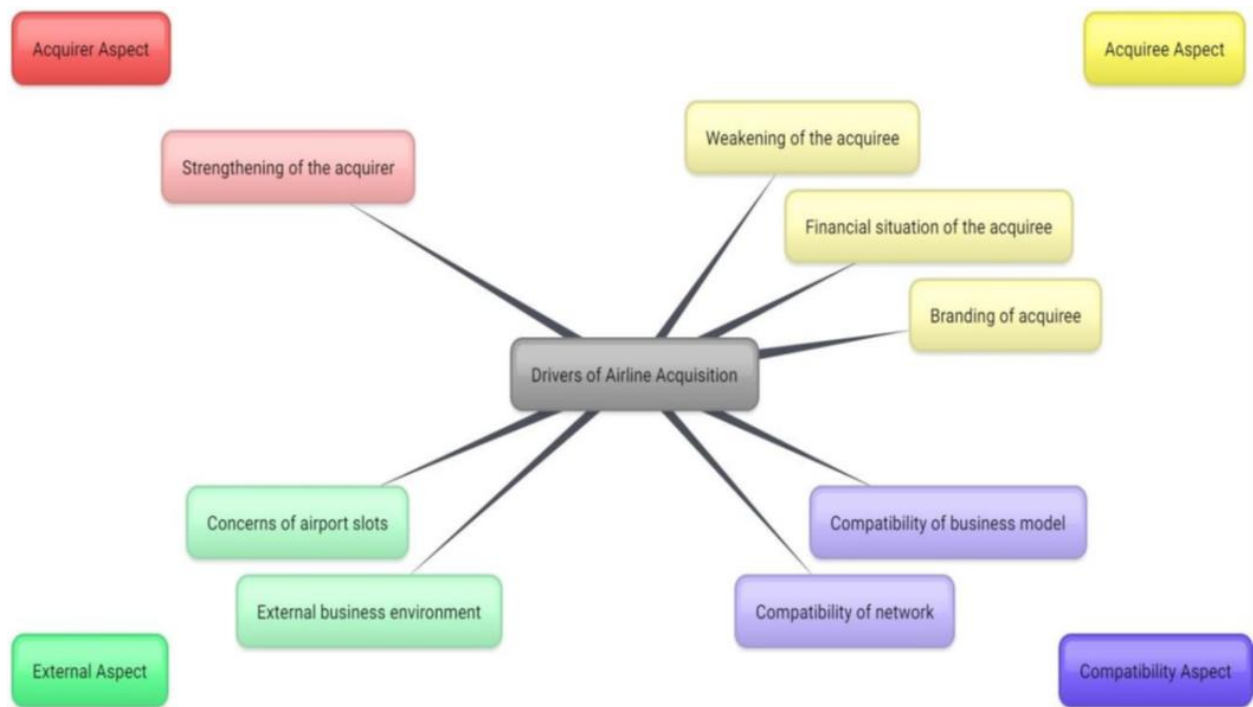
8 Oasis Hong Kong Airlines (Operation ceased in 2008 due to increasing financial difficulties)
9 did not receive the offer from Cathay Pacific despite being an LCC. It means that there are some critical
10 factors in the decision making other than just simply having a compatible business model with the
11 acquirer firm. We will discuss them below.

12 Even though Oasis Hong Kong Airlines was an LCC, it was very different from HK Express
13 such that it could not bring much benefit to the Cathay Group. Oasis Airlines' focus was on the long-
14 haul market, offering flights from Hong Kong to London and Vancouver. By operating long haul flights
15 in an LCC model, they were running their business with no major differences as a legacy airline. Being
16 an LCC that does not operate at a cost that is sufficiently low to allow extended profit margins, the
17 Oasis Hong Kong Airlines had not been attractive to the Cathay Group. On the other side, HK Express
18 operate their flights in a regional area covering countries like Japan, South Korea, Taiwan, and Vietnam.
19 Such short-haul routes are more profitable. Hence in terms of the geographic scope of the business
20 model, HK Express was more ideal for Cathay Pacific to acquire. Furthermore, by acquiring HK
21 Express, Cathay Pacific can have access to a wider range of airport slots in the Hong Kong International
22 Airport after the establishment of the Chapter 619 Competition Ordinance of the Hong Kong Law and
23 the Competition Commission in June 2012 (21), which restrict airlines to obtain slots as they want.
24 Therefore, HK Express was a more attractive acquiree to Cathay Pacific. Another difference is the
25 branding of both airlines. HK Express made good use of the internet and collaborated with multiple
26 online travel agencies, while Oasis Hong Kong Airlines did not. By having better branding, the airline
27 created an image in the minds of the people that increase the chances of people taking flights with HK
28 Express. In Cathay Pacific's point of view, it was better to acquire an airline with better branding.

29 In 2008, when Oasis Hong Kong Airlines was in difficulties, the external business environment
30 for the global airline industry was rather uncertain. The jet fuel price in 2008 reached the highest peak
31 ever in the recent 30 years' time. A higher price of jet fuel lead to an increase in the airline's operating
32 expenses since aircraft operations rely heavily on jet fuel. Even worse, an outbreak of a massive
33 financial crisis occurred in 2008. It was described as the worst economic disaster since the Great
34 Depression of 1929 (22). In such a depressing external business environment, M&A was greatly
35 discouraged globally, and instead, companies were busy saving their businesses from getting into
36 trouble including Cathay Pacific. On the other hand, in the upper half of 2019 when Cathay Pacific
37 decided to acquire HK Express from the HNA Group, no major events were affecting the global
38 financial market and the external business. Both the outbreak of the social events and the pandemic
39 occurred after Cathay Pacific decided to acquire HK Express. Through the comparison of HK Express
40 against Oasis Hong Kong Airlines, we can find four key drivers that affect the decision making of airline
41 acquisition, including the compatibility of business model, concerns of airport slots, branding of the
42 acquiree and the external business environment.

43 In summary, based on the HK Express acquisition case, a total of 8 drivers of airline acquisition
44 have been identified, including weakening of the acquiree, strengthening of the acquirer, financial

1 situation of the acquiree, compatibility of network, compatibility of business model, concerns of airport
 2 slots, branding of acquiree and external business environment. To better arrange the drivers of airline
 3 acquisition, the factors are classified into four categories of aspect, namely the acquirer aspect, the
 4 acquiree aspect, the compatibility aspect, and the external aspects. The following graph has been
 5 produced for better visualization.
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9 **Figure 9 Summary Graph for Drivers of Airline Acquisition**
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11 **Peri-Acquisition Stage**

12 Several key and critical events during the transition of the ownership of HK Express from the
 13 HNA Group to Cathay Pacific were studied (23)-(27). Such a chain of events stretched from February
 14 to July 2019, almost half-year time. These events showed the progress and revealed some of the
 15 incidents happening behind the acquisition case and hence are important in the study of the acquisition
 16 case. To sum up the events, the following timeline graph have been produced.

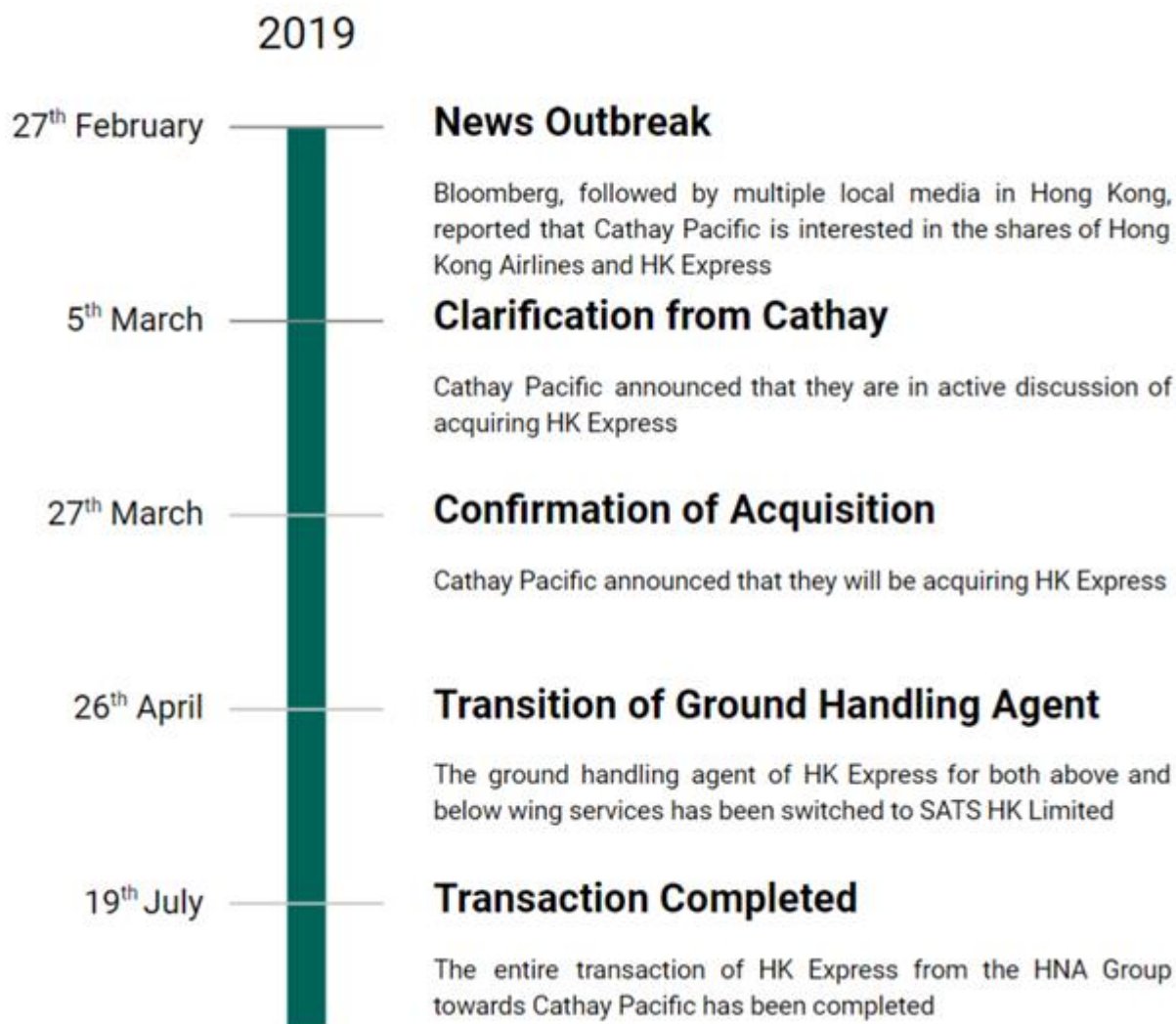


Figure 10 Summary Timeline of Events in the Acquisition of HK Express by Cathay Pacific

Post-Acquisition Stage

Changes and reaction brought to the aviation industry of Hong Kong by the acquisition have a critical importance to the future development of the industry. To analyze the dimensions of post-merger effects, we have developed a detailed model with dimensions echoing the Fishcer and Platzer model (28), as shown in Table 4.

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TABLE 4 Dimensions of Post-Merger Effects to be Analyzed

Fishcer and Platzer Model	Our Model
Fares	N/A
Services of Airport to localities	Operational Services
Competition	Possible Changes towards External Business Environment
Effects towards Workforce	Internal Confidence
Other Effects	Possible Structural Changes of the Cathay Group
	Investor Confidence

Operational Services

Two indexes, i.e., the daily sectors operated, and the on-time performance rate based on the D15 standard on flights originating from Hong Kong, will be analyzed before and after the transaction of HK Express. The exact days to be investigated are from 9th July 2019 to 28th July 2019, 10 days before and after the completion of the transaction. The data shown in the following table is extracted from the set of data collected for the on-time performance data.

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3 **TABLE 5 Extracted Data for Operational Services Analysis**

Timing Data		HK Express (UO) Data	
Stage	Date	Sectors Operated	On-Time Performance (OTP) Rate
Before Completion	09-Jul	32	87.40%
	10-Jul	29	34.48%
	11-Jul	34	73.53%
	12-Jul	30	96.67%
	13-Jul	31	70.97%
	14-Jul	35	77.14%
	15-Jul	32	93.75%
	16-Jul	32	96.88%
	17-Jul	29	93.10%
	18-Jul	33	72.73%
After Completion	19-Jul	32	62.50%
	20-Jul	31	67.54%
	21-Jul	35	65.71%
	22-Jul	32	84.38%
	23-Jul	33	90.91%
	24-Jul	30	100.00%
	25-Jul	34	88.24%
	26-Jul	32	96.88%
	27-Jul	31	83.87%
	28-Jul	35	48.57%

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5 A paired T-test was conducted on SPSS, for the daily sectors operated and on-time performance
6 rate with interval significance level at 5% and the hypothesis as shown in Table 6. The paired T-test
7 shows that the acquisition of HK Express by Cathay Pacific did not affect the operational services of
8 HK Express within the immediate period after the acquisition. These results were expected since there
9 were no new policies, requirements, and standards regarding the operational services established, by
10 Cathay Pacific or the management of HK Express.

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4**TABLE 6 Hypothesis and Results of Paired T-test for Operational Services Analysis**

		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	Df	Sig (2-tailed)
Pair 1	Sectors Before-After	-.800000	2.201009	.6960204	-2.37450	.7745076	-1.149	9	.280
Pair 2	OTP Before-After	.007950	.1987893	.0628627	-1.34255	.1501553	.126	9	.902

Hypothesis for Operational Services Analysis

Null hypothesis	H ₀	The mean before and after the completion of acquisition for the number of daily sectors operated/ on-time performance rate has no change i.e. $\mu_d = 0$
Alternative hypothesis	H _a	The mean before and after the completion of acquisition for the number of daily sectors operated/ on-time performance rate has significant changes i.e. $\mu_d \neq 0$

Summary of Results

Index	P-value	Conclusion
Daily Sectors Operated	0.28	P-value > 0.05, hence the null hypothesis is accepted, there is no change in the daily sectors operated daily
On-time Performance Rate	0.902	P-value > 0.05, hence the null hypothesis is accepted, there is no change in the on-time performance rate

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Investor Confidence

Investor confidence is a very critical effect. It reflects the confidence of the general public towards a certain decision. It can be analyzed by the changes in stock prices immediately after certain events occurred. To analyze investor confidence in the decision of acquiring HK Express, three critical events, i.e., news outbreak by Bloomberg, confirmation of acquisition, and completion of transaction were evaluated.

The red line in Fig. 15 (a) indicates the date of Bloomberg's initial report on Cathay Pacific's intension to take part in HK Express and Hong Kong Airlines. The trend immediately after that shows a dropping trend until 4th March, the day before Cathay Pacific clarified that they were under the negotiation of acquiring HK Express and the price continued to drop for one more day. This shows that the investors and the general public do not view such news as good news. Fig 15 (b) indicates the day Cathay Pacific announced the confirmation of acquiring HK Express. The stock price after that day remains to fluctuate until mid-April and May. The drop starting from mid-April is rather far away from the day of the announcement and hence will not be considered as an outcome of the announcement of acquiring HK Express. It is concluded that the announcement did not arouse significant reactions from the general public. Fig. 15 (c) marks the day when HK Express became a fully subsidiary of Cathay Pacific. The immediate reaction is a drop for almost a month. It is not solely due to the completion of the acquisition itself but also due to the continuous social instability caused by the anti-extradition bill movements related to the aviation industry. Several social events that occurred within that period might have raised doubts upon the investors and caused negative impacts on the stock price of the airline. In the investor confidence dimension of the acquisition case of HK Express, it is shown that the general public does not reflect positive confidence towards the deal.



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Figure 11 (a) Cathay Pacific Stock Price Chart Focusing on 27th February 2019, (b) on 27th March 2019, and (c) on 19th July 2019 Respectively (10)

Internal Confidence

Internal confidence refers to the confidence of the staff within the companies involved in the concerned acquisition case, towards the future development of the firms as a Group. From the commercial perspective, it is believed that by acquiring HK Express, the Cathay Group will be able to reach a wider spectrum of customers in the Hong Kong market pointed out by Mr. Justin Cheung, a current pilot in Cathay Pacific. Low-cost carriers are generally more profitable in the industry and this acquisition will help Cathay Group to earn profit in all kinds of air travel customer groups and will provide a brighter future for the entire group.

In the operational perspective, Ms. Joyce Cheng, a current pilot in Cathay Dragon showed her disappointment on the already-happened split of resources. A total of 32 Airbus A321neo were ordered by Cathay Pacific in 2017 (29), intended to replace the A320ceo aircraft under the fleet of Cathay Dragon. However, shortly after the decision of acquiring HK Express, Cathay Pacific decided to split half of what were ordered and gave that to HK Express. Moreover, concerns were raised about the usage of premises of the Group. Currently, the cockpit and cabin crew from both Cathay Pacific and Cathay Dragon rely on Cathay Pacific City, the headquarters of Cathay Pacific. Ms. Tiffi Liu, a current flight attendant in Cathay Pacific stated that under the current operations, the Cathay Pacific City is already very crowded, and this has resulted in inefficiencies in the routine operations. If such operations of crews from HK Express are also consolidated in Cathay Pacific City, the operations of all the three airlines under the Cathay Group will be seriously affected.

In terms of the internal customer policies that will potentially benefit the staff from the two other airlines under the Cathay Group, Ms. Liu said that it might not benefit her a lot. Since the flights of HK Express are usually in a full load. Thus, the joining of HK Express will not create many benefits under the internal customer policies offered to staff from the Cathay Group. Thus, the staff believed that it is likely for the group to achieve a better financial situation by acquiring HK Express, but they do not see a bright future in the development of the airlines, if there are no other plans.

Possible Structural Changes of the Cathay Group

There will be structural changes occurring sooner or later. In terms of the operational structure, it is expected that there will be a re-routing, to optimize the distribution of flight routes of airlines under the group, as mentioned by Ms. Joyce Cheng in an interview. Another operational structural change that raised concerns is the complete merger of Cathay Dragon into Cathay Pacific. As pointed out by Mr. Peter Lee, the former manager in multiple operational departments of Cathay Pacific, Cathay Dragon is just a steppingstone for Cathay Pacific to grow in the market and it will be merged into Cathay Pacific within 10 years to reduce the unnecessary operating costs of having duplicated departments and company structure just to fulfill the regulations. But Ms. Joyce Cheng and Mr. Justin Cheung, current pilots of Cathay Dragon and Cathay Pacific respectively, both informed that there are huge barriers in merging the two airlines, especially in the flight operations department in terms of their compatibility. The seniority structure of the two airlines is completely different and they also have completely different operating procedures and standards. Ms. Cheng also said that the structure of overflying rules and flying rights are rigid in Mainland China so that Cathay Pacific may not be able to operate the routes that Cathay Dragon is currently flying. It means Cathay will have to lose almost all of their routes in Mainland China. This issue regarding the merger of Cathay Dragon has remained controversial and

1 uncertain.

2 Regarding the commercial structure, it is generally believed that there will be changes in
3 branding. As agreed by both interviewees, Ms. Cheng and Mr. Lee, there would be branding actions
4 conducted on HK Express to deepen the public image of HK Express being a part of the Cathay Group
5 just like Dragon air in 2016 renamed as Cathay Dragon, 10 years after its acquisition by Cathay Pacific.

7 ***Possible Changes towards External Business Environments***

8 Passengers and aviation analysts are worried that by acquiring HK Express, the Cathay Group
9 will be in control of three out of four airlines based in Hong Kong (30). As the law in Hong Kong
10 concerning anti-competition acts does not regulate the M&A in the airline industry. If acquiring HK
11 Express leads to the monopoly of the airline market in Hong Kong by Cathay Pacific, its impact will be
12 huge on the entire airline industry in Hong Kong and even the Asia Pacific region. Mr. Joseph Lai, the
13 current Permanent Secretary for Transport and Housing in the HKSAR Government, stated in an
14 interview that he is not worried about Cathay Pacific monopolizing the airline market since the market
15 that HK Express focuses on is very different from that of the other airlines based in Hong Kong. By
16 acquiring the LCC, Cathay Pacific only shifted the profits into the bank accounts of a different group,
17 but the balance of the airline market remain unchanged. Mr. Lai also thinks that the choice of the
18 passengers does not reduce after the acquisition of HK Express by Cathay Pacific.

19 Also, as supported by the statistics, even if the Cathay Group will hold over 50% of the seats
20 available after the acquisition, it does not mean that huge changes are to occur towards the external
21 business environment. According to the combined market share of Cathay Pacific and Cathay Dragon
22 in 2018, the Group had reached a stunning 46.95% of the annually available seats. Adding the 4.05%
23 of what HK Express had achieved in that year does not lead to a huge relative change (+8.64%) to the
24 Cathay Group since the Group itself, before acquiring HK Express, already represented a huge portion
25 of the market. Hence, by acquiring HK Express, the impact on the external business environment is
26 limited.

27 In summary, the effects of the acquisition of HK Express by Cathay Pacific in the mentioned
28 dimensions have been investigated deeply and the following conclusions are made.

- 29 (i) Operational Services - There are no significant changes in the operational services after
30 performing paired t-test on numerical data on daily sectors operated and the on-time
31 performance rate of HK Express, before and after the completion of the acquisition.
 - 32 (ii) Investor Confidence - Great confidence has not been shown after looking into the
33 change of stock prices after the three critical events in the acquisition.
 - 34 (iii) Internal Confidence - Staff in the Cathay Group has shown a positive assurance in terms
35 of the commercial perspective whereas negative perception towards operational
36 perspective.
 - 37 (iv) Possible Structural Changes of the Cathay Group - It is generally believed that there
38 will be rebranding and re-routing for the HK Express after being acquired by Cathay
39 Pacific but the operational structure, especially the complete merger of Cathay Pacific
40 and Cathay Dragon remained controversial.
 - 41 (v) Possible Changes towards External Business Environment - It is believed by the
42 Government that the acquisition of HK Express by Cathay Pacific will not harm the
43 competition and the airline market in Hong Kong.
- 44

1 CONCLUSIONS AND FUTURE RESEARCH

2 The above analysis has enhanced the understanding of the aviation industry in Hong Kong
3 including in-depth research into the 4 currently operating scheduled passenger airlines based in Hong
4 Kong namely Cathay Pacific, Cathay Dragon, Hong Kong Airlines, and HK Express. Drivers and effects
5 of merger and acquisitions in the airline industry have been identified, considering the case study of HK
6 Express acquisition.

7 There are still a few limitations to this study which could be compensated by future research.
8 For example, the airfare dimension of the effects brought by airline acquisition has not been considered
9 due to the limitation of resources and time. The airfare dimension is worth investigating since it affects
10 one of the most essential stakeholders, the passengers. Future studies should be carried out to look into
11 the changes in fare prices before and after the acquisition and see if there are any changes in prices of
12 the routes common among airlines in the Cathay Group and the routes that are unique to HK Express.
13 Our research has investigated typical short-term effects of the acquisition due to the constraints of time.
14 It would be meaningful to continuously monitor the situation of the Hong Kong aviation industry so as
15 to explore the long-term effects brought by this M&A.

17 AUTHOR CONTRIBUTIONS

18 Jeff Lap In Man: Conceptualization; Investigation;

19 Min Xu: Conceptualization; Writing-review & editing;

20 Saad Ahmed: Writing-original draft.

21 There is no conflict of interest in this study.

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