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THE FEASIBILITY OF LOW COST AIRLINES IN KAOHSIUNG, SOUTHERN CITY OF TAIWAN

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Abstract

The budget airlines have caused tremendous impact in air business and travel population. Even though the budget airlines in Europe and USA are already quite popular, the budget airlines are still new in Taiwan. Pearson (2014) suggested that LCCs now are growing particularly within Asia-Pacific. Since then, there have been many studies about LCCs strategies or models, or the competitions between full service airlines, but few have focused on the relationship between geographical locations and budget airline routes. That is, whether the LCCs' flying routines, almost on local city or sub-airports, will help the prosperous tourism business of the local city, Kaohsiung City, a southern city of Taiwan.

Keywords

Tourism Business, Low Cost Airlines (LCA), Full Service Carriers (FSC), Kaohsiung International Airport (KIA)

1. Introduction

Since the involvement of first budget airline (also named LCA, low cost airlines), Southwest Airlines, in air transportation in 1973, it has been a tremendous impact in air business and travel population. Even though the budget airlines in Europe and USA are already quite popular, the budget airlines are only springing up recently in Taiwan in 2012. It complies with the study of Pearson (2014) that LCAs are growing particularly within Asia-Pacific. There have been many studies about LCAs strategies or models, or the competitions between full service airlines, but one issue attracts the interest of study. That is, to what extent are the LCAs' flying routines, almost on local city or sub-airports, will help the prosperous tourism business of the local city. Some researchers supported that LCA entrances have demonstrable influence for passengers and city economic growth (Donzelli, 2010; Graham& Dennis, 2010), and also show competitive advantages comparing with full service carriers (so called FSC), the traditional scheduled airlines providing full services.

Hence, the study is focused to inspect the influence of LCAs in Kaohsiung City, a southern city of Taiwan, who is the runner-up airport in Taiwan on the air transportation and on the local economy. Moreover, our interest also focuses on any improvement of Kaohsiung Airport after LCA entrance.

The next section starts with a brief introduction of Kaohsiung International Airport (KIA) and LCAs in Kaohsiung. Also some positive and negative reviews of LCA are surveyed. Furthermore, one research question with statistical analysis of regression is applied to view the correlation of LCAs on Kaohsiung tourism business and some descriptive analysis charts followed. Also the correlation comparison of variants was analyzed to support the related relationships between variants. The final section summarizes findings and suggestions. Figure 1 shows the flying route map of KIA.



Figure 1: The flying route map of KIA

2. Asian LCAs routing

In 2001, the LCAs domain rate only 8%, and it largely came to 26.1% in 2012. In Europe market, the occupation rate is 36.6%; and 30.1% in North America. Among all, the Asia market, lately stepped in but potentially profitable also rated 24.1%. The first LCA into Taiwan market in 2004, Jetstar Air, encroached into the route of Taiwan vv Singapore with around USD29 for the sector airfare, almost half price of FSCs. In 2012 the market share in

Taiwan only 3.9% (CAA, Taiwan) and until December in 2014, there are total thirteen LCAs and operating sixteen schedule routes and the market share rounds up to 7.2%.

2.1 LCAs in Kaohsiung

Since the involvement of first LCA on Oct. 27, 2013, Spring Air, routing to Shanghai, encroached into Kaohsiung market. It really arouse the orientation of new start for LCAs because of the following LCA operations as Juneyuo Airlines (routing to Shanghai) on Nov.1, 2013, Air Busan (routing to Pusan) on Dec. 11,2013, Peach Air (routing to Osaka) on Jan. 18, 2013. Tiger Air inaugurated first route from Kaohsung to Macau on Dec. 18, 2014. Vanilla Air started on Feb.1, 2015 (routing to Tokyo). FlyScoot provided transferred service from Singapore to Kahoisiung to Osaka on Jul. 9, 2015. Air Asia routing to Kuala Lumpur on Jul. 16, 2015. In summary, there are total 7 LCAs operating internatinal flight schedules while 15 FSCs on internatinal flying routing in Aug., 2016. All the LCA flying hours are within 3 to 4 hours. Generally, the LCAs provide point-to-point service on short-haul with attractive competitive airfare (Gillena & Lallc, 2004). The LCAs are growing east-ward within Asia-Pacific according to Pearson's study (2014). Coming with LCAs' entrance, the low airfare competition indeed brings some impact on travelers' choice. The consumer demand patterns are changed speedily by increasingly competitive air travel environment (Davison and Ryley, 2010; Dobruszkes, 2006). Figure 2 presents the market share in the period which LCAs start to operate with FSC, like China Airlines and Eva Airlines. Basically the demand on LCAs shows averagely growing though it's still little share comparing with FSCs. FSCs' demand up to 112% while LCAs' demand rate grows 241%. That is higher demand rate than FSC.

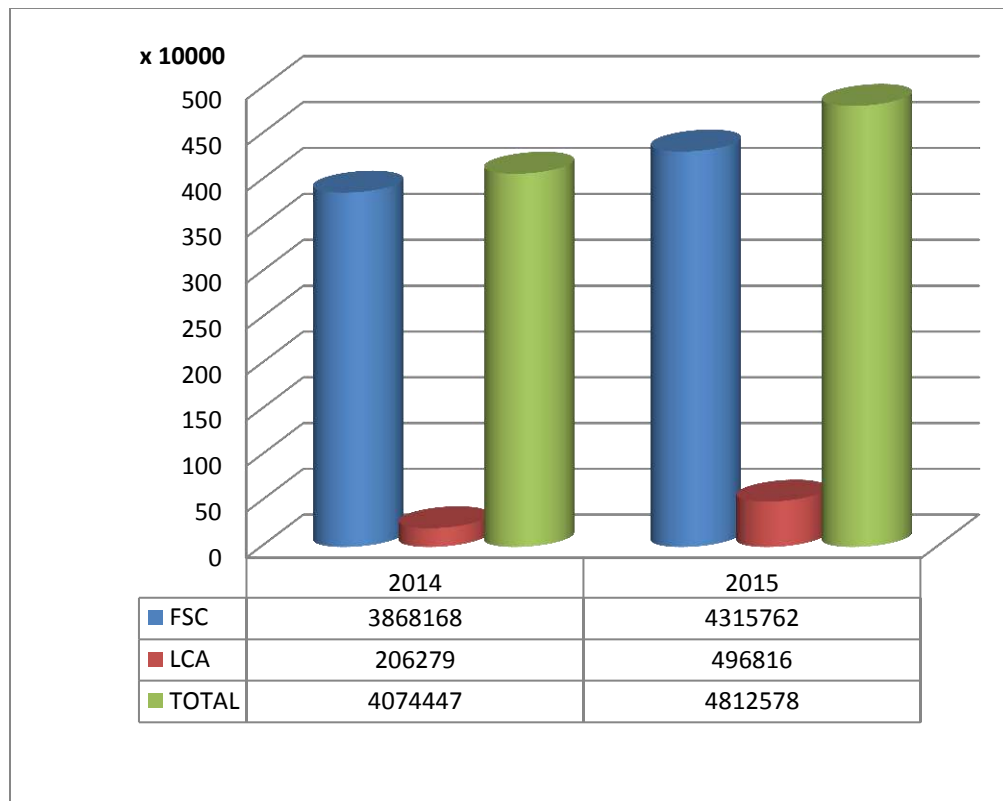


Figure 2: *The market share of FSCs and LCAs and total in 2014-2015*

2.1.1 Kaohsiung International Airport (KIA)

Kaohsiung International Airport is an air transportation hub in southern Taiwan. It was initially as a training base for Air Force and in 1965 it started offering domestic air transportation and in 1969 the international airfreight was launched. In 2013, the KIA has offered 24,941 international flights, showing an increase of 1,775 over 2012, up 7.7% (figure 1 shows the routes of KIA) and served 3,401,454 passengers of international flight, showing an increase of 209,134 passengers over 2012, up 6.5% and transported 55,000 tons of cargo (KIA, 2013). There are 14 FSC operates international airfreight as China Airlines, EVA Airlines, TransAsia Airways, Mandarin Airlines, Far Eastern Air Transport, Japan Airlines, Dragonair, Viet Air, Air Macau, Xiamen Airlines, China Eastern, China Southern, Hong Kong Airlines, Asiana Airlines and 7 LCA routes as Spring Airlines, Juneyuo Airlines, Air Busan, Peach Air. Figure 3 presents the air-travel demand for the six calendar

years from 2010 to 2015. The positive demand growth is on international route while the domestic route remains averagely same. More clearly depicted to say, Figure 4 shows the percentile of rate comparing with previous calendar year. Obviously the domestic flights (most flights to nearby islands, like Penghu, Green Island and Lanyu) encounter the recession in tourism development. Since there was no LCA route to domestic operation, the development of inland construction will not be further discussed then.

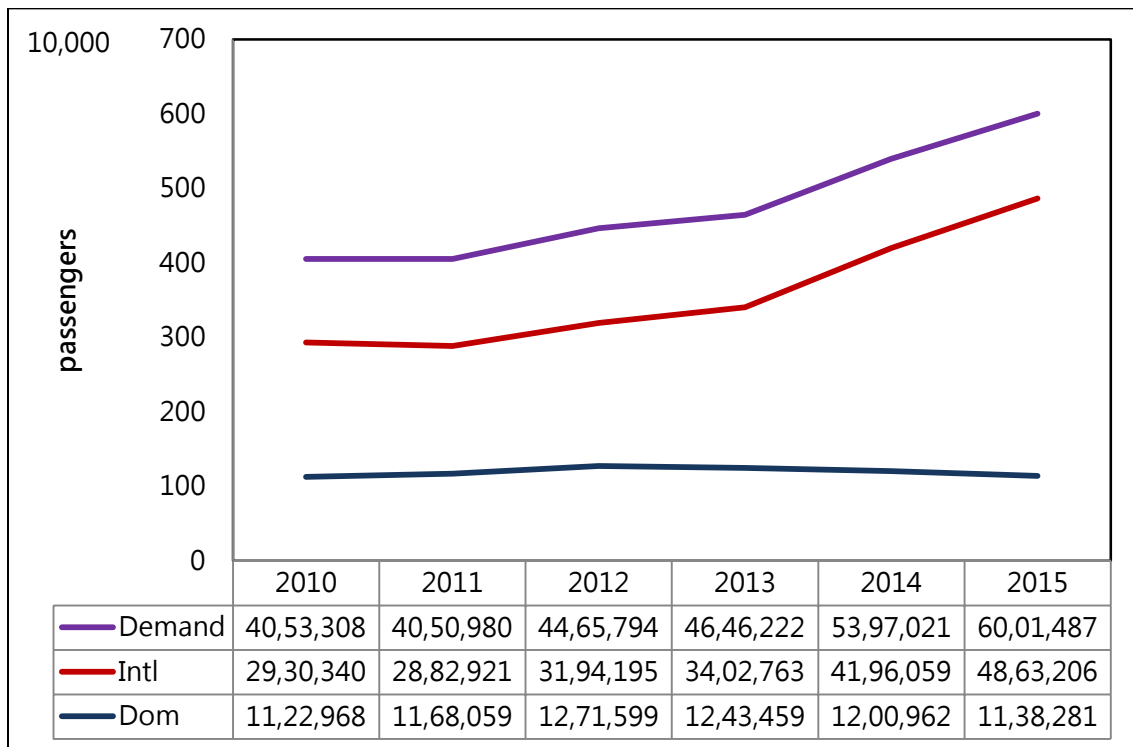


Figure 3: The market share of total demand, international and domestic in KIA

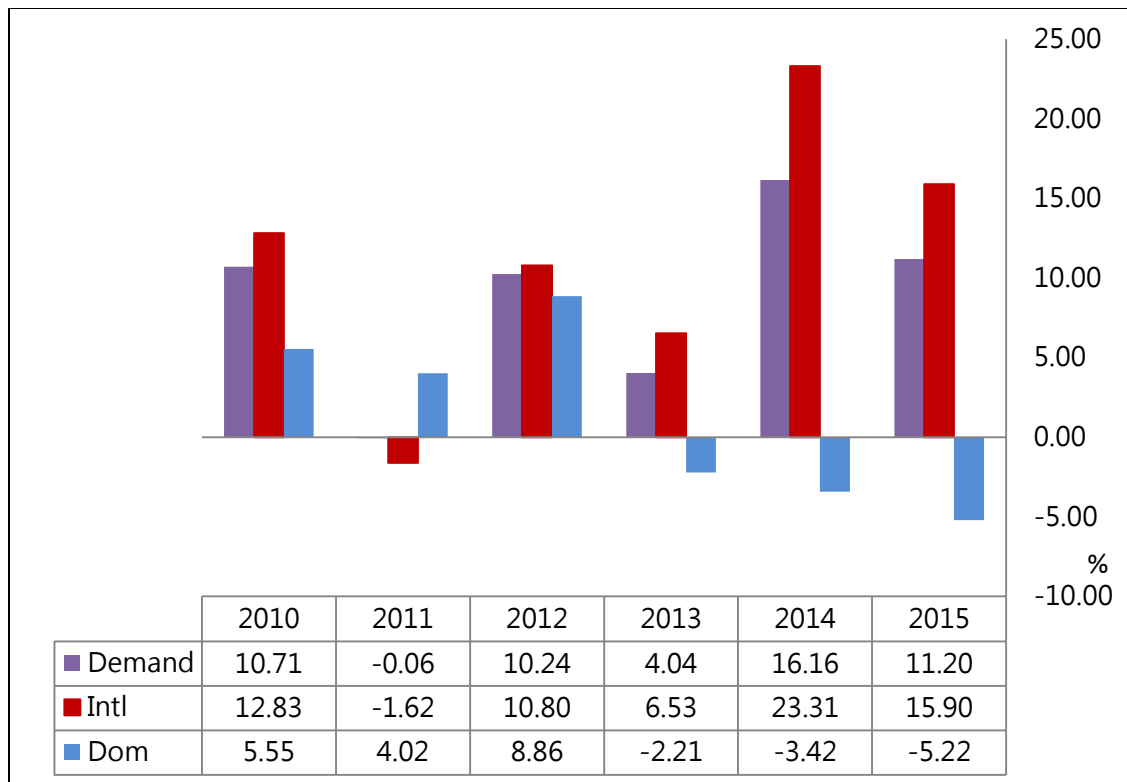


Figure 4: *The market share percentage of demand, Intl and domestic tourists in KIA*

As the most southern city of Taiwan, the routes of international flights are almost in Asia, the short-haul flight area. And the flying time utmost is up to four hours, as to Japan. The characteristics show some same flight pattern of LCAs' operations. Typically LCAs have utilized secondary airports in order to take advantage of slot availability and spare airport capacity, which is essential for quick aircraft turn-around as an important cost-saving strategy (Yap & Tae, 2013).

2.2 Positives and negatives of LCAs in Asia

There are many controversial arguments about the emergence of LCAs in positive or negative operations. Some extensive perspectives about local and regional economic development, especially on LCAs Asian route operating, will be discussed in the following. The table one shows the general LCAs operation in the Asian routes.

2.2.1 Positive Perspective

According to Skeets (2005) observation, most (59%) of LCA passengers are new customers. Also within all of LCA tourists, only 37% have replaced their preferences from original full schedule carriers (FSC) to LCAs. The holding rate should be highly leveled now since more LCAs encroach in the air in Asia. Of Skeets' research, 70% of LCA passengers claimed that the reason to choose LCA is on behalf of FSC's expensive airfare. The main attraction of LCAs is the cheap airfare comparing with FSC's. The new demand of flight route for Viet Jet, somehow called as Bikini Air, operated schedule from Taipei to Ho Chi Minh City, with airfare TWD5000, only half of FSC on Dec.12, 2014. It attracts lots of new customers and those would not travel before.

Secondly, aircraft of LCAs in Asia are most with single aircraft type, A320. Single aircraft type can easily obtain skillful maintenance and A320 provides quick turn-around time. The utility of aircraft can be perfectly performed without source waste. The parking bay is also easy to arranged, especially in local airport. Further, Donzelli (2010) claimed that LCAs stimulate the job opportunities and promote tourism revenue profit in a tourist destination region. Generally speaking, the research implied that LCAs have the influence of spreading tourism demand more thoroughly.

In addition, for LCAs in Asian routes, there is an advantage of "4-hours theorem" for LCA predominance that signifies the flying schedule time. LCAs gain the image of quick and time-save by the short-haul flying time. Most of travelers would prefer flying time up to four hours at most. Within the destinations, either the point v.v. is utmost up to 4 hours flying. Table 1 and Table 2 describe the flight allocations. Most of the flight route for FSCs and LCAs are within Asia; that is, short haul route, within 4-hours flying time.

Table 1: FSCs fly schedule in KIA

Carriers	Air Schedules	Website
China Airlines	Bangkok, Singapore, Hong Kong, Manila Taipei (Taoyuan), Tokyo (Narita), Shanghai, Shengzhen, Beijing, Chongqing, Ho chi minh, Osaka (Kansai), Nanchang, Incheon, Hokkaido (New Chitose), Kumamoto, Okinawa	www.china-airlines.com
Eva Air	Macao, Shanghai, Guangzhou, Ningbo, Tianjin, Tokyo(Narita), Osaka(Kansai), Fukuoka, Incheon, Macao	www.evaair.com.tw
Uni Air	Fuzhou, Qingdao, Hang Zhou, Kunming, Wuxi, Huangshan	www.uniair.com.tw
TransAsia Airway	Xuzhou, Macao, Fuzhou, Xiamen, Changsha, Nanning, Lanzhou	www.tna.com.tw
Japan Airlines	Tokyo(Narita)	www.jaa.com.tw
Dragon Airlines	Hong Kong	www.dragonair.com.tw
Viet Air	Ho Chi Minh City, Hanoi	www.vietnamair.com.vn
Air Macau	Macao	www.airmacau.com.mo
Mandarin Airlines	Hang Zhou, Changsha, Hong Kong, Okinawa, Incheon, Urumqi	www.mandarin-airlines.com
Xiamen Airlines	Xiamen, Fuzhou	www.xiamenair.com.cn
Far Eastern Air Transport	Chengdu, Taiyuan, Nanchang, Haikou	www.fat.com.tw

Juneyao Airlines	Shanghai	www.juneyaoair.com
China Eastern Airlines	Wuhan、Nanjing、Nanchang、Wuxi	www.ceair.com
China Southern Airlines	Wuhan、Zhengzhou	www.csair.com
Sichuan Airlines	Sanya (Phoenix Intl.)	www.scal.com.cn

Table 2: LCAs fly schedule in KIA

Airlines	Air Schedules	Website
Peach Aviation	Osaka(Kansai)	www.flypeach.com.tw
Spring Airlines	Shanghai	www.china-sss.com
Air Bussan	Bussan	www.airbusan.com.tw
Tiger air	Macao、Osaka(Kansai)、 Tokyo(Narita)	www.tigerair.com.tw
Vanilla Air	Tokyo(Narita)	www.vanilla-air.com.tw
Scoot	Osaka(Kansai)、Singapore	www.flyscoot.com
Air Asia	Kuala Lumpur	www.airasia.com.tw

2.2.2 Negative Perspectives

However, some disadvantaged doubts are discussed about the entrance of LCAs. CAA (2006) prevailed that LCAs' encroachment has carried out dramatic result on FSCs' business operation in air transport market. Derived from the involvement of LCAs into air transportation, some airports become incapable of handling encroaching terminal management and results in possible airport safety problems and flight delay.

Another criticism about LCAs is their price strategy. For LCAs, competitive prices are their outstanding winning solution; however, it becomes the threat for FSCs. The pricing fluctuates might be based on LCAs ambition to predominate the air transport market. Like the new Tigerair in Oct, 2014, they waive out the low price as to USD50 for the itinerary of Taipei v.v. Chinmai (Internet from Tigerair.com, 2014). Comparing with FSCs, the prices go around USD350 for the same itinerary. The competitive low price is the sounding and effective method for LCAs to occupy the niche market. Some of the FSCs might struggle to fail or might slash discount price or de novo pricing, respect to LCAs pricing to counteract the LCAs low airfare. Somehow, it causes the airfare market unstable. There hence, the LCAs might result in failure of no profits, overhead cost unable to cover the cost. According to Forsyth (2003), LCAs' strategies on their pricing design, financial construct, and airport choice and routs decide their success or failure on the entrances to the target market.

Another criticism about LCAs is their flight safety and service. When the term, LCA, low cost carrier, appears to passengers' image, the first impression is "low cost" equal "low safety and cheap service". Flight safety is a serious issue and the most concern among all for the passengers. It might explain why the legacy carriers still sit back with their market share. Lots of surveys show that passengers are willing to pay little more in order to have a safe flight and quality service (Chang & Hung, 2013; Barbot, 2008). As the LCAs step into Asian market, in which passengers might not well understand LCAs operation, and most of the passengers assume LCAs have less safety and poor service. That is why Yang (2005) made some suggestions to LCAs weakness. That is, LCAs should prioritize the maintenance of aircraft and service quality. Also the LCAs should cope with local government's regulations, and establish an organized and well-managed human resource system.

3. Impact of LCAs on Kaohsiung tourism business

Since the LCAs entrance to Kaohsiung, there are only few researches about the influence on Kaohsiung tourism business and Kaohsiung Air traffic market. Therefore, this study chose some index to represent the tourism business. One is the profits of tourism

hotels; the direct effect for tourism business as the travelers would stay in the hotels during their travel. Another index is the consumer index which is calculated monthly for Kaohsiung citizens' consumption ability. Also another index is the popular tourism destination: Fong Guang Shan Monastery, a Mahayana Buddhist cultural, religious and educational complex located in Kaohsiung City, one of Taiwan's largest Buddhist organizations. The center purportedly houses one of the tooth relics of Gautama Buddha, the founder of the Buddhist faith and the biggest Buddha Statute in the world (Fong Guang Shan, 2013). The studies are examined as the following: (1) to see whether LCAs have become new tourism trend and can enlighten tourism profit to Kaohsiung (2) to check whether LCAs have impacted on Kaohsiung local economy based on salary, unemployed rate and consumer index (3) to test whether LCAs have influenced FSCs' loading factor (4) last some survey questionnaires of KIA is used to predict whether LCAs have caused the airport transportation crowded.

First, we applied multiple regression analysis with several variables in order to scrutinize whether LCAs have influenced tourism business in Kaohsiung, The monthly-based data are collected from November 2013 to June, 2016, with total 32 months since the LCAs inaugurated business regularly in November, 2013. Tourism demand, as the dependent variable, counts the total amount of travelers to Kaohsiung. LCA entrance, as the independent variable, the amount of travelers to Kaohsiung, helps us discriminate months before and after LCA entrance. This study expects the result that if the LCA entrance helps create tourist demand, the positive association between LCA entrance and tourism demand would be significant associated. To enhance the level of confidence of multiple regressions due feasible low statistic figures, the correlation statistic was also analyzed to certify the correlative relationship between the variants. The Table 3 shows the variables are related. In order to evaluate whether if the tourism demand was impacted by LCA or other control variables, the authentic variables must be correctly picked. The correlation analysis implies the level of confidence for the variables. Even hotels and FKMT (Fong Guang Shan Monastery) are not certified with significance, they are the main elements for tourists. Therefore, the study would like to support the two variables within the analysis.

Table 3: *The correlation of variants*

	demand	LCA	index	salary	unemp	hotel	FKMT
demand	1						
LCA	.509(**)	1					
index	.358(*)	.589(**)	1				
salary	-.414(*)	-0.267	-0.268	1			
unemp	.445(*)	.656(**)	0.131	-0.19	1		
hotel	0.213	0.101	0.273	-0.109	0.008	1	
FKMT	-0.082	0.188	0.065	0.08	-0.007	0.055	1

Dependent variable: tourism demand *P<0.1 **P<0.05 ***P<0.01

In addition, three control variables are also analyzed in this regression model. (1) Tourism hotels profits (2) Kaohsiung unemployment (3) Kaohsiung monthly salary. (4) Kaohsiung famous destination tourists' numbers. These data were collected from National Statistics Taiwan, Tourism Bureau, M.O.T.C. Taiwan, Civil Aeronautics Administration and e-mail application from Kaohsiung City Statistics Office. According to the historical studies, the determinants of tourism demand to a popular attraction usually involve tourists' earnings and employment status (Cho et al., 2006; Cooper et al., 2005; Goeldner et al., 2002, Chung et al., 2011). The tourism hotels profits are also a key determinant to show the impact of LCA entrance (Wei & Chuang, 2012). The results of the multiple regression analysis were shown on Table 4

In table 4 the result shows that no significant impact value. However F value is significant to imply acceptable analysis together with The VIF values are all < 10 and that means no overlapping between independent variables. Even though the control variables none have impact to tourism demand, there are still some evidences to scrutinize. That is, consuming index and unemployment rate is positively associated with tourism demand,

especially consuming index. Hotel revenue and LCA demand though has positive influences, but almost low impact. Contrast with positive variables, salary and FKMT show negative association with tourism demand. Salary and touristic attraction, FKMT are not impacted by tourism demand.

Table 4: Regression Results

variables	<i>b</i>	Std. Error	β	<i>t</i>		VIF	Adj- R^2	<i>F</i>
constant	-198976.598	1488104.445		-0.134			0.403	2.703*
LCA	0.785	0.848	0.275	0.925		3.543		
index	4367.701	14515.406	0.068	0.301		2.078		
salary	-1.424	0.922	-0.258	-1.545		1.126		
unemp	76.548	88.674	0.204	0.863		2.256		
hotel	0.873	1.001	0.144	0.872		1.097		
FKMT	-0.011	0.015	-0.124	-0.744		1.114		

Dependent variable: tourism demand *P<0.1 **P<0.05 ***P<0.01

In order to explain the possible reasons for other variables, the Table 5 is listed. The table presented three individual months, August in three year of other variables: tourist destination, hotel revenue, unemployment rate and salary. The numbers of destination increase dramatically between 2013 and 2015. In Aug., 2015, the tourists dropped. We might consider that the most attraction factor in Taiwan is not scenery spot, but culinary delicacies. For hotel revenues, it seemingly increases the profits, but some implied factors might be surveyed also. Where do the LCA passengers stay during their travel? Are they definitely in star-level tourism hotels? It might be another issue that we could research.

Coming with personal salary income, the salary only increases about US\$100 after one year. Somehow it might cause by local economic situation; that is to say, the employers' consideration of revenue to cost. Generally speaking, the LCA entrance brings some impact of more tourists, decreasing unemployment rate, but seemingly not much help in economic growth.

Table 5: *Destination, Hotel Revenue, Unemployment, Salary Description*

	AUG,2013	AUG,2014	AUG,2015
Numbers of tourists to attraction	407277	377451	304990
Accommodation revenues(NT\$)	481249932	509740164	639435014
Unemployment(Unemp)	561	601	1024
Salary(NT\$)	42241	44502	35455

We also provide the passengers numbers in 2015 from January to December and peak season (generally from May to October) in 2015 to make a comparison in Fig. 6 and Fig. 7. Obviously the total passengers increase in total demand, FSC and LCA. In 2015, total passengers increase 1.18% of 2014 total passengers. The rate of major FSC passengers in 2014 is 95% in total passengers; also the rate of major FSC passengers in 2015 is 90% in total passengers. It means that even the LCA entrance might really threat FSC revenue.

With the total passengers increase, the KIA facility somehow becomes a concern as handling passengers. We retrieved the questionnaire survey in 2013 and 2014, sampled by KIA. The question items include as KIA information counter service, KIA security officers' service, and luggage check-in handling speed, KIA toilets cleanness, KIA information sign board. In 2013, the satisfaction rate is 97% and in 2014, the satisfaction rate is 97.1%. It shows no difference. Then we can assume the LCA entrance has no big impact on KIA.

However, the total demand in rush hour causes congestion with long queue which is an unavoidable problem.

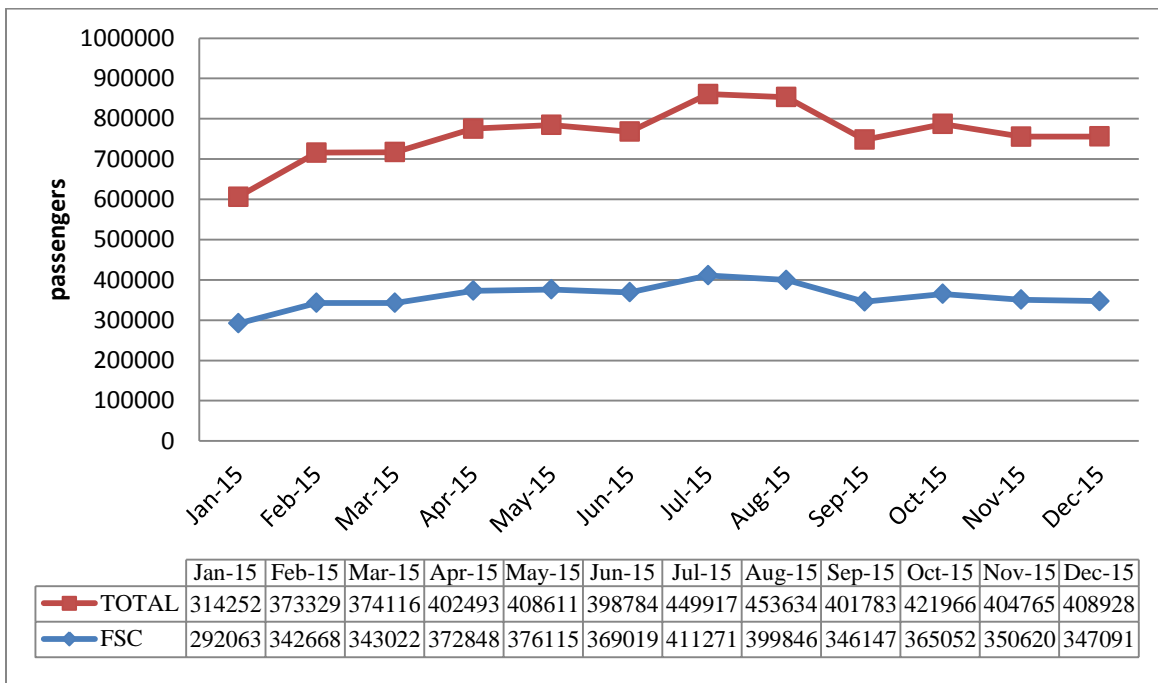


Figure 6: Passenger numbers of total and major FSC from Jan. to Aug., 2015

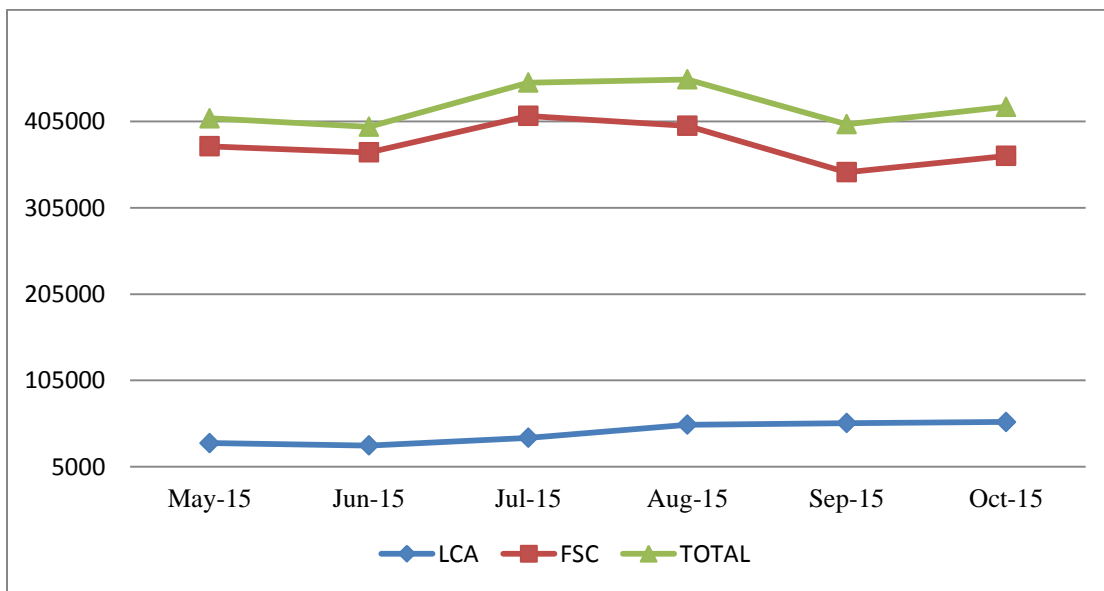


Figure 7: Passenger numbers of total, major FSC and LCA from Jan to Aug., 2015

4. Result and Suggestions

Generally speaking, the researches show that LCAs encourage the tourist demand. LCA have generated new tourism demand according to our statistical analysis. In this study, we also found FSCs grow together with LCAs. According to literature research, LCA entrance has at least fairly made improvement for the local economy (Donzelli, 2010; Graham & Dennis, 2010; Skeets, 2005, Chung, et al., 2011). It might imply on the unemployment rate of our study results. The LCA entrance has associated with decrease of unemployment rate in Kaohsiung.

Secondly, according to some previous studies (Donzelli, 2010; Chung et al., 2011), local economy tends to have little improvement once the regional airports operate both FSCs and LCAs. The services of FSCs and LCAs together in the same airport appear to be inefficient, unless the LCAs services provide high level performance (Yap & Tae, 2013). KIA has only one terminal and all carriers use the terminal together. It becomes hard to attract LCAs entrance. Usually the airport facility charge is a demanding cost for the carrier enterprises. Not as Hotelling's location model (1929), expressing the relationship between locations and pricing behavior of firms, assumes all consumers and product characteristics are identical and are evenly dispersed along the line; the profits of competing firms reach the balance as so-called rule of principle of minimum differentiation. The characteristics and pricing strategies between FSCs and LCAs are with distinct standpoints. More likely D'Aspremont et al. (1979) and Osborne and Pitchik (1987) model, the spatial dispersion location is preferred based on different pricing and product characteristics. Therefore, the profits of competing firms will flow to their own utmost profits, the rule of the Principle of Maximum Differentiation.

Also there are some implications by observing the LCAs entrance. Since LCAs entrance brought impact on tourism demand, the LCAs might have the effect on gathering economic growth in the future. Only once the attractions and hotels can improve their promotion and marketing strategies. The LCAs start to operate in just 2013 in Kaohsiung (Once Jetstar Air took a demo-like try of short period of time in Kaohsiung). That means that LCAs still have great niche market in Kaohsiung air transportation. Considering the

good natural geographical environment for LCAs, KIA is closed to any short-haul route within Asia. Kaohsiung government might take into account in supporting LCAs to attract their entrance. As Kim et al. (2009) suggested with four supportive strategies: “an airport facility best fitting LCAs, the adoption of a transparent route-allocation process, human resource development for LCAs, and improvements in the regulatory environment”. KIA might consider arranging another terminal for LCAs.

5. Conclusion

While this study provides the understanding of LCAs influence on Kaohsiung, it also induces some issues for future study. For the tourism hotels, the LCAs profits increase, but hotels revenues are not associated with LCAs. The future researchers might consider some alternative accommodations, like some other normal hotels, or homestays which might be the attraction of LCA’s passengers. Thus, the tourism destination could be a key factor to attract tourists. Kaohsiung has lots of natural scenery views, but lack of promotion. The future researchers might find out the key determinants of attractions for tourists, like culinary food in Kaohsiung. It might be the factor as tourists’ primary choice.

To sum up, one important issue should be considered; that is, environmental protection. Local government should consider the development of economic benefits against the possible environmental destruction, like airport new facility construction or tourism destination development without destroying natural environment. The aircrafts carbon emission and noises, supervised by Airport Bureau, should be controlled to cope with environmental requirement. The Airport Bureau can apply penalty charge or complimentary discount to airlines, no matter FSCs or LCAs. With sustainable green environment, the tourism demand definitely maintains and grows.

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