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Economic Impact of low-cost carrier in a saturated transport market: Net benefits or zero-sum game?

Abstract:

The introduction of low-cost carriers (LCC) can improve the accessibility of destinations, stimulate suppressed demand and offer transportation attractive to lower income residents. This present study estimates the economic contribution of the entry of an additional low-cost carrier into a mature transport market. Both primary and secondary data are used to estimate both direct and indirect economic impacts to the host economy. This research framework captures both displacement effects and the demand for an additional LCC among domestic travelers leaving the destination. Taking these effects into account, there is limited net economic contribution to the host economy with a mature transport market. Based on these findings, local governments as well as aviation policymakers are advised to consider all the economic injections and leakages created by the potential LCC in assessing the economic feasibility of new entrants, especially considering the development stage of a transport market.

Keywords:

Displacement; low-cost carrier; input-output model; hub airport; growth saturation; leisure tourism; mature market;

Introduction

In the early stages of low-cost carriers (LCCs) development for entry into the US and Europe markets, there was much suspicion about the success of such a business model. The opposition came mainly from traditional airlines who dominated the air travel markets in North America and Europe until the 1990s (Doganis, 2001; Goetz & Graham, 2004; Dobruszkes, 2013). LCCs have expanded exponentially into many other regions including Asia and Oceania (Hopper, 1997, 1998; Allroggen, Wittman, and Malina, 2015). In Asia, low-cost carrier operations are relatively young but very dynamic, growing in an expanding and liberalizing market environment (Lawton and Solomko, 2005; Duval, 2008). Currently LCCs claim 26% of the global passenger capacity share (Vuthisopon and Srinuan, 2017).

The reasons why LCCs have developed in such a fast pace are twofold (Taneja, 2017). First, LCCs have opened the opportunity for millions of consumers with relative low incomes to travel by air for business and leisure purposes (Franke, 2004). Second, LCCs have brought competition into the air aviation industry, which again benefits consumers (Tretheway, 2004; Kim and Lee, 2011). Due to the fast growth of LCCs, the airline industry has generated significant income, employment, and tax revenue for economies where LCCs are based. LCCs can be considered an important driver for the growth of a destination (Bieger and Wittmer, 2006).
Commonly claimed as a paradigm change of airline operations, LCCs introduced a new understanding of operational characteristics, which were later copied and adopted by the rest of the industry (Francis, Humphreys, Ison, and Aicken, 2006; Kim and Lee, 2011). Characteristics such as light corporate assets, high aircraft utilization, direct sales, internet booking and e-ticketing, the use of secondary airports or off-peak slots at primary airports, simple point-to-point service, minimum cabin crew and lower wage scales based on a low rate of unionization changed the industry (Klophaus, Conrady, and Fichert, 2012). Furthermore, a single cabin class with a high-density seat configuration, short ground turn-around times, modified or no seat allocation as well as reduced or no in-flight catering (aka “frills”), no cargo operations and a very simple fare structure, amongst other strategies made the LCC concept more competitive in comparison to national airlines and full-service carriers (Morell, 2005).

This research aims to assess the economic impacts of a new LCC entry into the Hong Kong market. It does this by examining the economic impact of the potential introduction of an LCC, in the context of Hong Kong in the areas: the injection of new expenditure into the local market by the LCC, the net expenditures on LCC travel by local residents and, the net expenditures on LCC travel by international tourists.

An economic assessment of new expenditure into the local market by the LCC is relatively straightforward. This includes the direct investment of the new LCC entrant in Hong Kong in infrastructure, facilities, service, administration and maintenance contracts, which will generate income to the local businesses, and employment. The economic assessment of net expenditures by local residents and international tourists are more complicated. First, with the introduction of a new LCC into the market, some local residents will now spend their income on international travel rather than other goods and services. This means they will spend some of the income on air tickets of the LCC entrant but some of their expenditure will be overseas, a leakage to the local Hong Kong economy. This needs to be taken into consideration. Some residents will shift from existing airlines to the new LCC entrant. Hong Kong residents will benefit by having more opportunities to travel abroad with lower travel costs.

The introduction of the LCC entrant will motivate new international tourists to visit Hong Kong who otherwise may not. The increases in passenger flows will certainly benefit the local tourism industry. Some international travelers will switch from traditional carriers to this new LCC entrant. Previous studies have shown that instead of diminishing the market shares of the traditional airlines, LCCs create additional traffic flows by tapping into potential customers, which benefit both LCCs and legacy carriers (Sarker et al., 2012). We take this into consideration.

We assess the economic impacts of a new LCC entry into the Hong Kong market by first estimating the direct economic impacts of the new LCC entrant and then applying input-output analysis to calculate the indirect economic contribution as a result of the direct impacts. We do this by using various data sources including a quantitative survey conducted among Hong Kong residents and by using secondary data sources. One of the features of this research is that, unlike many economic impact studies, we take into account displacement effects.

Literature Review

There has been a significant amount of research has been undertaken into the economic effects of LCCs into a market. Rather than repeat much of these findings, we provide a summary in Table 1 below. It seems clear from the literature that the introduction of LCCs into an economy provides many expected benefits such as increasing both domestic and international tourism, creating employment, generating taxes through increase business activity. The presence of LCCs in a market can open access to destinations, helping low-income earners to take trips they might not have previously taken. LCCs can help smooth seasonality to a destination and even increase traffic for existing carriers in that destination.

Coupled with these positive benefits, however, some researchers have noted the impacts of LCC entry into a market might not be as beneficial as first thought, especially if markets are dense and saturated. For example, little impact on overall growth in short-haul air traffic (Forsyth; 2003) and that LCCs mainly provide individuals in middle and higher income groups with opportunities to afford additional flights (Graham and Dennis, 2010), as opposed to attracting new segments of low income passengers.

[INSERT TABLE 1 HERE]

Beyond the economic effects and environmental degradation, a few studies recommend a case-by-case review of the impact of LCCs. Dobruszkes and Mondou (2013) discuss the possibility of the economic benefits of LCCs being offset against the losses elsewhere. Despite the potential economic importance an airport may have for a region, a holistic evaluation of how an additional carrier impacts a region has received little attention (Brueckner, 2003).

This research seeks to contribution to the body of knowledge in this area by focusing on the analysis of effects by the LCC entrant into a saturated market. Earlier studies when analyzing LCC effects on low-density or seasonal markets. This can be seen as a bias in itself, because in most cases, LCCs prefer secondary or tertiary airports as well as low-density markets. The study takes the effect of an LCC entrant into a primary, hub airport as core of its analysis. Furthermore, the study is estimating both the economic contribution of an LCC in an economy, considering both the impacts of changes in both inbound and outbound tourism and direct contribution by the

LCC entrant. In addition, both direct and indirect economic contribution is considered through the application of economic multipliers. This study provides a reference for others to use when evaluating the economic contribution of a new LCC entry into a saturated, high density market, which is opposite to the usual scenario of low-cost carriers as incubators of economic growth for small and/or new airports as well as slowing regions and/or destinations.

Methodology

The methods used to calculate the economic contribution of a new LCC entrant into Hong Kong are twofold. We first calculate the direct economic contribution of the new LCC entrant by using a quantitative survey conducted among a representative sample of the Hong Kong traveler population. This will estimate the impact of Hong Kong residents' choices and switching patterns to an LCC as well as willingness to pay for LCC flight compared to a flight with a traditional airline. We then use figures provided by Hong Kong Tourism Board to extrapolate to the total travelling population. To calculate the indirect economic contribution, expenditure multipliers were calculated using a recent Hong Kong input-output table and these multipliers were applied to the direct economic impacts to calculate the indirect impacts (details below).

Hong Kong Traveler Survey

As part of the impact assessment, a resident survey was carried out with a view to gauging Hong Kong residents' intention to travel by LCCs. The main questions on the questionnaire include: what are the likelihoods that they would travel by Hong Kong-based LCCs in their future travel, and how much they would be willing to pay for traveling by LCCs as compared with traveling by traditional airlines?

The questionnaire-based survey was carried out online by a professional marketing research company, Lightspeed Research, part of the Kantar Group, with the largest online panels globally. The respondents of the questionnaire survey were drawn from 33,000 panelists representing the Hong Kong public. Online panelists were screened to ensure respondents were 18 years or older, have been living in Hong Kong for more than two years, and had made a trip within Asia by air within the past 12 months or were planning to take a trip by air within Asia in the next 12 months. Quotas reflecting the proportions based on Hong Kong Census data were enforced for

gender, age, and monthly income to ensure a representative sample. To ensure the objectivity and fairness to both the existing airlines and the potential LCC entry, as long as respondents did not rule out the possibility of flying by LCC from Hong Kong, they were eligible to complete the survey. In total 797 residents responded to the survey. The profiles of the respondents show that the male and female split was 47% and 53%. In terms of age profile, 33% of the respondents were between 45 and 54 years old, and the 25-34 and 35-44 age groups accounted for 20.8% and 21.5%, respectively. With respect to education, 53.6% of the respondents had a college or university degree or higher qualifications. In terms of employment status, 31.0% were administrative, secretarial and clerical staff, followed by junior managerial staff (16.6%), students, retired and unemployed collectively comprising 11.5% and senior managerial staff (10.3%). Among the respondents, 40.5% had a monthly household income of HK$10k-30k (US$ 1,280-US$ 3,850), and 27.7% had a monthly household income of HK$30k-50k (US$ 3,850-US$ 6,410). It worth noting that around 12% of the respondents had a monthly household income of less than HK$10k (US$ 1,280) and another 11.7% of the respondents' monthly household income were between HK$50k and HK$70k (US$ 6,410-US$ 8,975).

Direct Impacts and Indirect Impacts

This study reports two different types of economic impacts across a range of economic variables: direct impacts and indirect impacts. As noted by Page and Connell (2009: 398), direct spending impacts are money spent by tourists and tourism businesses on services they need while on vacation in Hong Kong, such as accommodation, food, shopping, and attractions, etc. while indirect spending impacts are expenditures of tourism businesses spent in providing these goods and services to the tourist. The direct visitor expenditure gives rise to the generation of additional economic activity as subsequent rounds of spending spread throughout the economy.

The direct economic impacts such as the number of people directly employed by the new LCC entrant, the amount of investment, the number of expected passengers, and revenues have been directly supplied by new LCC entrant. As such, these data were the basis from which they were making their business decisions.

The indirect economic impacts have been calculated using input-output analysis. This study uses input-output analysis to calculate the future economic contribution of the introduction of the new

LCC entrant in Hong Kong. To calculate output and income multipliers, the Leontief inverse matrix needs to be computed. In fact, there is no 'one' multiplier. There is a multiplier for each sector in the economy. The direct tourist spending needs to be allocated to the various industries producing the goods and services purchased by tourists. The calculation of these multipliers is straight forward, where the input-output table is transformed so that, in matrix notation, $x = (I - A)^{-1} f$ where x is the vector of industry total outputs; I is an identity matrix; A is the technology matrix; and f is a vector of total final demands. Together $(I - A)^{-1}$ is referred to as the Leontief inverse matrix. The matrix describes the economic contribution (change in the value of output / income / tax/ imports) from a change in one sector on the rest of the economy. The income multiplier for each sector is defined as the total value of income from the compensation to labor (wages, salaries, etc.) and the contribution to capital (gross operating surplus) required to satisfy a unit's (HK$) worth of final demand for the output of that sector. The computation of these techniques can be found in Miller and Blair (2009).

The Hong Kong input-output table has been extracted from the Global Trade Analysis Project (GTAP) data base. The GTAP data base has been used extensively by researchers across the globe. The GTAP data base consists of individual country input-output data with bilateral trade, transport and protection matrices that link individual, regional or national economic data (Aguiar et al., 2016). The current version 9 data base is referenced to the year 2011. The original input-output tables of Hong Kong were provided by SALTER project on the reference year 1988. Hong Kong input-output tables have been updated and balanced based on the macroeconomic and trade statistics.

Case Study: JetStar Hong Kong - the New LCC Entrant

The LCC entrant into Hong Kong's aviation market is JetStar Hong Kong. In 2012, JetStar Hong Kong was to be based in Hong Kong and consisted of a joint venture between China Eastern Airlines, Qantas and a Hong Kong conglomerate, Shun Tak Holdings. JetStar Hong Kong planned to serve up to 129 routes out of Hong Kong into China, Japan, South Korea and South-East Asia. The airline planned to purchase nine airbus A320s. However, the airline never took off as the Hong Kong's Air Transport Licensing Authority refused its application for an operating licence in June 2015. The reason given was that JetStar Hong Kong does not have its

Principal Place of Business (PPB) in Hong Kong. The PPB provision is a prerequisite in the Basic Law (Hong Kong's constitutional document) to determine the eligibility of an airline start-up. The authority's ruling means Jetstar Hong Kong cannot obtain an Air Operator Certificate. As such, the analysis is of a hypothetical nature but the scientific value of the paper *per se* is clearly not affected by the fact that the Jetstar Hong Kong project did not materialize.

Opening in 1998, Hong Kong International Airport (HKIA) is one of the busiest in the world in 2016. HKIA ranked 8th in the world (70.3 million) in terms of number of total passengers originating, terminating, transferring and in transit. Further, HKIA is the busiest airport in terms of cargo – 4.5 million tonnes of cargo passed through Hong Kong in 2016. Despite operating 24 hours a day with 90 boarding gates, HKIA is almost at full capacity. In 2012, the Hong Kong Government decided to construct a third runway to expand capacity.

Hong Kong aviation industry is very competitive and a mature market. There are 84 different airlines operating out of HKIA. In 2016, there were 3,372 incoming scheduled passenger flights per week with a total seat capacity of 861,235 per week (Hong Kong Tourism Board, 2017). The largest four airlines offer 61.1% of all seats with Cathay Pacific accounting for 33.4% of the share. Several LCCs already operate in Hong Kong including Cebu Pacific Airlines, HK Express, Peach Airlines and Spring Airlines.

Findings

The economic contribution of the introduction of a new LCC entrant in the Hong Kong market will occur through multiple channels. The economic impact of these different channels / market segments will vary[1]. Hence it is important to distinguish between the impacts of:

- Direct new LCC entrant expenditures
- Hong Kong residents who will now travel with the new LCC entrant but previously did not travel
- Hong Kong residents who will travel with the new LCC entrant and previously traveled with another carrier

[1] There may also be additional value added through increased city pairs and lower fares for the residents of Hong Kong (New LCC entrant's catchment area in Hong Kong).

- International visitors who will travel to Hong Kong with the new LCC entrant but previously did not travel to Hong Kong
- International visitors who will travel to Hong Kong with the new LCC entrant who would otherwise travel with another carrier

Direct Impacts

To calculate the net economic impact to the Hong Kong economy, this research uses the estimated new LCC entrant revenue figures obtained directly from the new LCC entrant. The Point-of-Sale (POS) Hong Kong-based revenue of the new LCC entrant revenue is HK$ 2,823 million (US$ 361.9 million), which is 54% of the total expected revenue of the new LCC entrant (HK$ 5,228 million / US$ 670.3 million)[2]. Online sales will account for, 65% of the HK$ 2,823million (US$ 361.9 million) and 35% will be sold by agents in Hong Kong[3]. The fare revenue per trip in 2016 will average HK$ 825.77 (US$ 105.87)[4]. This average has been derived by estimating an indicative route-by-route, month-by-month network development plan based on a subset of the 129 destinations the new LCC entrant proposes operate in, other factors to consider are:

- Pre-route profitability
- Sales distribution strength at destination ports
- Brand awareness at destination ports
- Price elasticity of demand on a particular route – whether the drop-in prices can stimulate enough demand
- Competitive landscape
- Historical growth in market capacity
- Optimization of utilization hours (around 13 block hours per day)

For each route, the new entrant LCC fare revenue is based on charging a discount of the current full-service carrier fares obtained from websites and travel agencies (generally up to 50% but

[2] Source: Based on benchmarks from other LCC entrant-branded carriers
[3] Source: Based on new LCC entrant internal estimates
[4] Only includes fares, excludes ancillary, cargo, fuel surcharge and no-show.

varies for different times of booking). In calculating the fares, a conservative approach has been adopted:

- Discounting from the lowest average fares of LCCs or FSCs
- Factoring an additional conservative start-up discount on each route for the first 24 months of operation, based on an expected period of time when competitors will aggressively discount to challenge the new LCC entrant's launch in Hong Kong
- Growing fares at below-inflation rates

The new LCC entrant also estimated that, at the steady state, they will be making 4,685,349 trips, which equates to 2,342,674 passengers (each passenger makes an outbound and inbound trip). To determine the economic contribution of the new LCC entrant it is necessary to know what proportion of these 2.34 million passengers will be international passengers and what proportion will be Hong Kong residents. It is also important to estimate how many of these Hong Kong residents will be new air passengers and how many new LCC entrant passengers will have switched from existing airlines. Similarly, we need to estimate how many international passengers will choose Hong Kong as a result of the introduction of the new LCC entrant, not having traveled to Hong Kong previously with existing carriers and how many will have been to Hong Kong previously but are now switching to the new LCC entrant from other carriers.

According to the Hong Kong Tourism Board (2013: 36), 11,559,293 international visitors traveled to Hong Kong by air in 2012. Page 63 of the same document shows that 7,808,890 Hong Kong residents departed by air in 2012. As the best estimate available, we apply these percentages to the new LCC entrant passengers, 40.3% of the new LCC entrant passengers will be Hong Kong residents and 59.7% will be international visitors.

Among Hong Kong residents, the Hong Kong traveler survey (described above) gives some estimates of what proportion will be induced to travel on the new LCC entrant and what proportion will be switching from existing carriers. Residents were asked how many trips they made over the past 12 months by air within Asia. 70.3% had flown at least once within the last 12 months while 29.7% had not. Respondents were then asked to what extent are you willing to travel by a Hong Kong-based LCC. Possible answers ranged from Definitely, Very likely, Likely, Neutral, Unlikely, Very unlikely and Not at all. As per Pratt et al. (2009), the percentage

of Hong Kong residents who were recent air passengers and those who were not recent air passengers were weighted by the likelihood of traveling by LCC to arrive at an estimate of the different traveling segments among Hong Kong residents. The weightings were assigned as follows: Definitely (100%), Very likely (75%), Likely (60%), Neutral (50%), Unlikely (40%), Very unlikely (25%) and Not at all (0%). Based on the survey, Hong Kong residents' response to the introduction of a Hong Kong-based LCC would result in the following segments:

[INSERT TABLE 2 HERE]

Applying the percentage of new travelers and switching travelers to the overall estimate number of Hong Kong residents (7,808,890), the new LCC entrant is estimated to have 247,626 new Hong Kong travelers and 696,897 switching Hong Kong travelers from other carriers.

For international passengers, there is little existing data on what proportion of passengers are new travelers and what proportion have switched from other carriers. Industry estimates predict new passengers who otherwise would not have traveled at 41.9% (NFO, 2002). Applying these percentages to the international passengers, potentially the new LCC entrant's market segments can be found in Table 3.

[INSERT TABLE 3 HERE]

Establishing the proportion of Hong Kong residents and international visitors flying with the new LCC entrant is important as Hong Kong residents will purchase the Hong Kong-based airfare while international visitors will purchase, not only the airfare, but also will spend on shopping, accommodation, meals outside of accommodation, tours, entertainment and other goods and services. As such, these segments generate more economic activity.

Hong Kong Residents – New Travelers

247,626 Hong Kong residents (or 18% of the new LCC entrant's estimated passengers) will be induced to travel because of the introduction of the new LCC entrant into the Hong Kong market. As they previously had not traveled by air, some of their income will be spend on the new LCC entrant fares and some of their household income will be spent overseas on holidays. This is represented in Figure 1.

[INSERT FIGURE 1 HERE]

Previously, their income is assumed to remain in Hong Kong. Now, HK$ 204.48 million (US$ 26.2 million) will be spent on the new LCC entrant air tickets while HK$ 2,021.85 million (US$ 259.2 million) will now be spent on overseas on holidays. This represents a leakage from the Hong Kong economy. Each Hong Kong new traveler is estimated to spend HK$ 3,311.82 (US$ 424.59) on their overseas trip. This estimate was obtained from the Hong Kong Census and Statistics Department's 2003 survey on outbound travel, adjusted for inflation. This trip expenditure takes into account travel within Asia and makes some adjustment for Hong Kong residents who previously would take trips to Macau or Guangdong Province via other modes of transportation but now fly with the new LCC entrant.

Hong Kong Residents – Switched Travelers

The Hong Kong residents' survey estimated there will be approximately 50.6% of consumers would be willing to switch to a LCC in Hong Kong. These Hong Kong residents were already traveling overseas for holidays so their expenditure in this area is assumed to be the same as flying with another carrier. However, this segment will be saving money on airfares with the introduction of a low-cost carrier. In the survey, they were asked what was their average spending on air tickets per trip per person within Asia. The average was HK$ 3,673.46 (US$ 470.96). The average new LCC entrant airfare will be HK$ 825.77 (US$ 105.87), giving a difference of HK$ 2,847.69 (US$ 365.09). Given the size of the segment, it results in an overall saving of HK$ 1,984.55 million (US$ 254.43 million). Respondents were asked a follow-up question of how they would spend this savings. 11.5% stated they would reduce the total annual travel budget by the same amount (i.e., do not spend the saved amount for travel). For Hong Kong residents, this total will remain in Hong Kong - a sum of HK$ 228.99 million (US$ 29.36 million). 37.9% stated they would spend some or all of the savings on other travel expenses (e.g., hotels / dining / entertainment). This total HK$ 753.11 million (US$ 96.55 million) will be spent outside of Hong Kong on other travel items – a leakage to the Hong Kong economy. 50.5% stated they would travel more frequently using the saved money. The total of HK$ 1,002.45 million (US$ 128.52 million) would be spent on more travel. Based on the breakdown of proportion of average travel budgets per trip per person within Asia spend on flights versus non-flight expenditure (28%/72%), a total of HK$ 280.32 million (US$ 35.94 million) would be

spent on increased flights and HK$ 722.13 million (US$ 92.58 million) would be spent on non-flight travel expenses outside of Hong Kong. We made the assumption that all the increased flights are spent with a Hong Kong carrier and hence remain in Hong Kong. Therefore, the total economic leakage for this segment would be HK$ 1,475.24 million (US$ 189.13 million). A schematic of Hong Kong residents who switch is shown in Figure 2.

[INSERT FIGURE 2 HERE]

International Visitors – New Market with the New LCC Entrant

The introduction of the new LCC entrant is estimated to attract 733,720 new international visitors to Hong Kong flying on the new LCC entrant. This market segment is choosing to visit Hong Kong as a result of the new LCC entrant's introduction. As such, this group is solely an injection of international expenditures into Hong Kong's economy. The total direct visitor expenditure is estimated to be HK$ 6,342.11 million (US$ 813.09 million) with HK$ 605.88 million (US$ 77.68 million) coming from the new LCC entrant's fares and HK$ 5,736.22 million (US$ 735.41 million) coming from direct visitor expenditure (Figure 3). The non-airfare component of this estimate is derived from the international visitor expenditure data published by the Hong Kong Tourism Board (2013).

[INSERT FIGURE 3 HERE]

International Visitors – Switching to the New LCC Entrant

We estimate there to be 664,431 new LCC entrant passengers who have switched from other carriers. Estimating their Hong Kong-based expenditure is more complicated than the 'new' international visitors. They will already come to Hong Kong so their Hong Kong visitor expenditure on accommodation, meals, shopping, etc will already occur. However, they do save money on their airfares. Unfortunately, there was no equivalent survey for international visitors, as there was for Hong Kong residents to determine how they spend their savings on airfares. Therefore, as a best estimate we use the same proportions as the Hong Kong residents' survey, 37.9% of international visitors who have switched from another carrier to the new LCC entrant will spend the savings from their airfare on other travel expenses in Hong Kong. This totals HK$ 718.03 million (US$ 92.06 million). The airfare saving that motivates international visitors to

travel more frequently and savings that reduce the total travel budget is assumed to remain in the international visitors' country of origin (Figure 4).

[INSERT FIGURE 4 HERE]

Increased Air Traffic with Existing Carriers

The academic literature and experience in other markets has demonstrated that the introduction of LCCs into a market helps grow the market for full service carriers (FSC) as well as for the LCC. The prevailing evidence shows that routes without low cost carriers grow slower than routes with LCCs and FSCs grow faster on routes when competing with low cost carriers than on routes without LCCs. Additionally, FSCs grow faster on routes with LCCs than the overall market growth.

JetStar Hong Kong analyzed seat capacity of existing routes with LCC operations originating from Hong Kong between Bangkok, Cebu, Clark, Phuket, Seoul-Incheon, Osaka-Kansai, Kalibo, Kuala Lumpur, Manila, Penang, Busan, Singapore, Shijiazhuang and Shanghai-Pudong, over a three-year period, and found that the growth of FSCs was 7.0% per annum when competing with routes with LCCs compared to 2.7% growth for FSCs on routes without LCCs over the same period. The incremental growth for FSCs amounts to 4.3% times the current number of air passengers to / from Hong Kong (19,368,183) results in 832,832 additional passengers to and from Hong Kong on FSCs. Given the existing Hong Kong resident / International visitor split (40.3% / 59.7%), this means there are 335,782 additional Hong Kong residents flying out of Hong Kong on FSCs as a result of the increased competition and 497,050 additional international visitors flying into Hong Kong on FSCs as a result of the increased competition. Increased competition will see a further eroding of FSCs' market share in Hong Kong and growth of LCCs. For example, the increasing number of airlines and subsequent flights operating into and out of Hong Kong. In 2012, there were 2,906 incoming scheduled passenger flights per week with a total seat capacity of 736,051 per week. This increased to 3,372 flights and 861,235 seat capacity by 2016 (Hong Kong Tourism Board, 2013, 2017). We also note the decrease in market share of Cathay Pacific from 34.6% in 2012 down to 33.4% in 2016 while HK Express, an LCC, increased its market share from 0.7% in 2012 to 3.7% in 2016.

This represents additional leakage from Hong Kong residents to the Hong Kong economy and an additional injection of foreign exchange into the Hong Kong economy from international visitors. As in the case of Hong Kong residents traveling on the new LCC entrant, these residents are assumed to spend HK$ 3,311.42 (US$ 424.54) on their overseas trip so the total leakage from the Hong Kong economy would be HK$ 1,112 million (US$ 142.56 million). The additional international visitors, spending HK$ 7,818.00 (US$ 1,002.31) per trip in Hong Kong[5], would see the total additional injection be HK$ $3,886 million (US$ 498.21 million).

There are other direct economic impacts attributable to the new LCC entrant. The new LCC entrant has provided this data. Ancillary revenue per passenger is assumed to be HK$ 150.00 (US$ 19.23). Therefore, the total ancillary revenue is HK$ 351.4 million US45.05 million). A fuel surcharge is charged at HK$ 100 (US$ 12.82) per passenger. This means the direct revenue for 'new' passengers is 981,346 (new LCC entrant passengers) + 832,832 (non-new LCC entrant incremental passengers) = 1,814,178 x HK$ 100 = HK$ 181.42 million (US$ 23.26 million). No-show revenue is the revenue recovered from re-booking by passengers who decided not to show up for their flights at the last-minute. No-show revenue was assumed to be 2.8% of the ticket revenue. This is estimated to be HK$ 54.17 million (US$6.94 million). The percentage assumed is consistent with that seen in other new LCC entrant-branded airlines. The new LCC entrant will fly 32,537 sectors at the steady-state. Assuming cargo will earn HK$ 800 (US$ 102.56) per flight, the total cargo revenue earned will be HK$ 26.03 million (US$ 3.34 million).

Indirect Impacts

There are three sources of external injections of economic activity into Hong Kong that would result as a consequence of the introduction of the new LCC entrant into Hong Kong. The new LCC entrant would attract new international travelers to Hong Kong. These estimated 733,720 new international travelers would spend HK$ 8,644 (US$ 1,108.21) per trip for a total of HK$ 6,342.1 million (US$ 813.09 million) in direct expenditures. Applying the appropriate multipliers to these figures results in HK$ 5,502 million (US$ 705.38 million) in Gross Output and HK$ 2,051 million (US$262.95 million) in GVA to Hong Kong (Table 4).

[5] Assume here that these passengers choose a non-HK carrier, to be conservative.

The introduction of the new LCC entrant into Hong Kong also creates new business for existing carriers, over and above the 'business-as-usual' case. These 497,050 international visitors, spending HK$ 7,818.00 (US$ 1,002.31) per trip inject HK$ 3,886 million (US$ 498.21 million) into the Hong Kong economy. Applying the appropriate multipliers to these figures results in HK$ 3,371 million (US$ 432.18 million) in Gross Output and HK$ 1,257 million (US$ 161.15 million) in net income to Hong Kong (Table 4).

The introduction of the new LCC entrant into Hong Kong also results in some switching behavior among existing international visitors. Part of the savings that they experience, as a result of the lower airfare, will be re-spent on other travel items while in Hong Kong. The total direct impact of this expenditure is HK$ 718.03 million (US$ 92.06 million). Applying the appropriate multipliers to these figures results in HK$ 622.9 million (US$ 79.86 million) in Gross Output and HK$ 232.25 million (US$ 29.78 million) in net income to Hong Kong (Table 4).

[INSERT TABLE 4 HERE]

New LCC Entrant Expenditures

To establish a base in Hong Kong, the new LCC entrant will make investments / expenditures in several different sectors of the economy. These different areas include Engineering, Catering, Fuel, Ground Handling, Repayment of Loans, and Marketing. For each type of expenditure, the direct expenditure was provided by the new LCC entrant and the appropriate Type I multiplier (direct & indirect impacts) was applied to estimate the Gross Output, Net Value Added (Income), Taxes, Imports and Employment for this expenditure.

Table 5 shows that direct expenditure on these items amount to HK$ 1,397 million (US$ 179.10 million), Gross Output is almost HK$ 2 billion (US$ 239.43 million) while NVA or Income, that is, benefits to Hong Kong residents amounts to HK$434.96 million (US$ 55.76 million).

[INSERT TABLE 5 HERE]

Government Revenues

Government revenues can potentially be raised from both direct and indirect sources. In a steady state scenario, the introduction of the new LCC entrant to the Hong Kong market would generate taxes and fees to the value of HK$ 647.89 million (US$ 83.06 million) a year for the Hong Kong SAR Government. Direct taxes include personal income tax that will be received from the wages and salaries of the new LCC entrant employees, corporate tax is levied on the estimated profits that the new LCC entrant will make while departure taxes[6] and airport charges (paid to HKIA) are levied based on the estimate volume of passengers flying with the new LCC entrant (Table 6).

Personal income taxes are calculated by applying Hong Kong's Personal Income Tax rates to the salaries of the new LCC entrant employees. Indirect taxes are those taxes generated as a result of the additional economic activity stimulated by the new LCC entrant's proposed entry into the market. Additional taxes are generated through the increased expenditures by the new LCC entrant outlined above and through the visitors' expenditure while on visiting Hong Kong.
[INSERT TABLE 6 HERE]

Direct Employment Impacts

Hong Kong has more than 73,000 directly employed people in the aviation sector (Jiang, 2016). The new LCC entrant will employ approximately 620 employees in Hong Kong. It is estimated that new LCC entrant's technical crew will total 170, the cabin crew will be 360 and the new LCC entrant head office staff will number 90. As a proportion of existing jobs in Hong Kong's aviation sector, the number of direct jobs generated or sustained is very small (0.8% - see Table 7). The total direct labor costs including wages and MPF / insurance and other 'on-costs' will total HK$ 482 million (US$ 61.79 million).

Indirect Employment Impacts

Almost 8,000 jobs will be derived from the new LCC entrant's expenditure on items such as catering, engineering, ground handling and marketing. Including the economic activity from the new LCC entrant expenditures, the jobs generated or created adds another 10.8% to size of Hong

[6] Model did not assume connecting passengers.
Thus assume 50% of all travelers will pay departure taxes to HK Government.

Kong's aviation sector employment (Table 7). Around 70,000 jobs each will be generated or sustained through the increase in visitors' expenditures due to new air passengers entering and exiting Hong Kong and the economic activity of those air passengers who have switched from another airline (Table 7). This would double the number of jobs in Hong Kong's aviation sector.

[INSERT TABLE 7 HERE]

As with tourist expenditures, a large proportion of the direct wages and salaries are spent on imports and/or is taxed. These represent leakages out of the Hong Kong economy. Hence, the amount of Hong Kong retained economic benefit from this induced expenditure is HK$ 178.42 million (US$ 22.87 million) per year. Table 8 provides a summary of the net economic contribution of the new LCC entrant to the Hong Kong economy.

[INSERT TABLE 8 HERE]

Discussion and Conclusions

The introduction of the new LCC entrant into the Hong Kong economy is estimated to create gross direct expenditures of HK$ 13.44 billion (US$ 1.723 billion). This expenditure includes direct new LCC entrant expenditures, new and switched international visitors, ancillary revenues, cargo revenues, and fuel surcharges. These direct expenditures then circulate in the Hong Kong economy and, taking into account the multiplier effects and the expected leakages in the economy (Hong Kong residents who now spend their income outside of Hong Kong and Hong Kong's average propensity to consume imports), the net economic contribution can be estimated.

The introduction of new LCC entrant will result in income to Hong Kong of HK$ 5.24 billion (US$ 671.34 million) but will also cause leakages in Hong Kong's economy with more Hong Kong residents traveling overseas of HK$ 2.3 billion (US$ 294.27 million). This results in a net benefit of HK$ 2.94 billion (US$ 377.07 million) to Hong Kong. Additionally, over 80,000 jobs are created or sustained as a result of the introduction of the new LCC entrant into the Hong Kong economy. As can be seen in Table 8, the main increases in net economic contribution are derived from new international tourists flying on the new LCC entrant and an increase in air traffic with existing carriers as a result of the increased competition attributable to the new LCC entering the market.

One of the main contributions of this research is that many economic impact studies do not take into account displacement effects. Those studies only estimate the gross contribution of an economic injection of expenditures into the economy. This research demonstrates new air services can results in leakages as well as injections into an economy. Unlike some industry reports and simpler economic frameworks that estimate the economic contribution of the introduction of a new LCC into the market, this research takes a more holistic view. These displacement effects can be quite large so care needs to be exercised when asserting that the introduction of a new carrier brings large economic benefits. As such, tourism economists, as well as politician and regional planners should be encouraged to take into account these effects where possible in future studies or development proposals.

Ultimately, the answer to that issue is a question of empirics. If the new airline transports as many passengers from the local destination as passengers originating overseas, then the resultant economic contribution to the host destination can be a zero-sum game. From a host destination perspective, the extent to which Hong Kong, in this case, benefits economically from allowing the new LCC to operate will depend on the mix of passengers from Hong Kong compared to overseas. Benefits will also depend on the proportion of passengers carried by the new LCC entrant that are new passengers versus those who are switching from other carriers. On an individual passenger basis, new passengers from overseas provide the most beneficial contribution to the host economy (Graham and Dennis, 2010; Lei and Papatheodorou, 2010). New passengers from the host economy are predominantly displacing income from other goods and services they might purchase in Hong Kong and their overseas spending is a leakage out of the host economy (Morrell, 2005). For switching passengers, the new economic contribution will depend on the difference in airfares between the new LCC entrant and the fares of the airline they would have flown with, if the new LCC was not in the market. Further, how and where the switching passenger spends their airfare 'saving' will also contribute to where the economic benefits will fall.

In terms of policy implications for local and/or regional governments as well as aviation policymakers, a clear multi-faceted feasibility study needs to be undertaken before granted a license to any new LCC to operate in existing markets. All the economic injections and leakages created by the potential LCC need to be assessed including accounting for displacement effects.

While the literature has been highlighted that the introduction of LCCs into a market also grows FSC business (Ramos, 2003), the extent of switching behavior and tourism expenditures of those new tourists need to be accurately estimated.

While attempts were made to source data as accurately as possible from JetStar Hong Kong, industry estimates and primary research, there were some assumptions that were unknowable. Congestion costs were difficult to monetarize. Some of the negative impacts on other carriers, such as Cathay Pacific, resulting from switching was captured in the quantitative survey but other impacts such a job losses at existing carriers and their suppliers would most likely occur. Most previous studies into the economic contribution of LCCs were largely developing routes into and from newly-developed regions or airports. This study analyzes the impact of a new carrier operating into and out of an existing major international hub, which already supports many global and regional airlines and is already subject to congestion why the labor market for the aviation industry is in shortage of talents and manpower. As such, in the absence of more accurate as well as longitudinal data, estimates from these other studies were adopted in this study. Many of the direct benefits and costs were obtained directly from the proposed LCC entrant, Jet Star Hong Kong. These estimates were difficult to verify independently. On the other hand, these data were the actual statistics that JetStar Hong Kong would plan for and work to in operating their business. Hence, we believe these estimates to be as accurate as possible with the known information.

Further research can develop into different directions. Existing academic case studies and policy reports can be analyzed against each other within a framework applying a comparative methodology. In addition, further research may look at the lifecycle of airport development and its market to identify promising windows of opportunities for market entrants of LCCs. As mentioned earlier, longitudinal studies might shed light in a different way on the positive effects of LCCs over time as well as in numbers of competitors at the same time.

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Table 1: Summary of Economic Impacts of LCCs

Findings	Author(s) and Year
Economic Growth	
• Regional economic generation	Robertson, 1995; Bowen, 2000; Button and Taylor, 2000; Blume, 2006; Green, 2007
• Supports local economic development	ACI Europe, 1998; ACI Europe, 2004
• Generate business revenue	Cooper, 1990 Button and Taylor, 2000; Donzelli, 2010; Percoco, 2010
• Creates jobs	Cooper, 1990, Button et al, 1999, Button and Taylor, 2000; Donzelli, 2010; Percoco, 2010
• Increases personal income	Cooper, 1990; Button and Taylor, 2000
• Increases taxes	Cooper, 1990; Button and Taylor, 2000
Tourism / Traffic Increases	
• Increases international tourism	Jirasakunthai, 2001; Papatheodorou and Lei, 2006; Aguiló et al., 2007; Graham and Dennis, 2010; Lei and Papatheodorou, 2010; Lian and Denstadli, 2010; Rey et al., 2011; Dobruszkes and Mondou, 2013
• Increases domestic tourism	Lawton and Solomko, 2005; Ryan and Birks, 2006; Samonte and Amojelar, 2006; Mason and Alamdari, 2007; Chung and Whang, 2011; Tsui, 2017
• Stimulate the leisure traveler segment	Lawton and Solomko, 2005; Mason and Alamdari, 2007; Donzelli, 2010
• Increases traffic for existing carriers in same location	Ramos, 2003; Francis, Fidato and Humphreys, 2003
• Smooth seasonality / spread tourism demand more evenly throughout the year	Aguiló et al., 2007; Graham and Dennis (2010); Donzelli, 2010; Rey et al., 2011
• Increase catchment for airport	Pantazis and Liefner, 2006
Consumer Benefits	
• Allow passengers to travel who would not have bought a full-service fare	Dresner, Lin and Windle, 1996; Skeels, 2005
• Widen the range of offers in local markets	Dunleavy and Westermann, 2005; Gutschi, 2007; Cracolici and Nijkamp, 2009; Percoco, 2010; Clavé et al., 2015.
• Create new access to destinations	Donzelli, 2010; Graham and Dennis, 2010; Prideaux and Whyte, 2014
• More choice for customers	Dunleavy and Westermann, 2005; Gutschi, 2007
Airline Industry Impacts	
• Improves the quality of air transport services	Button et al, 1999
• Infrastructure investment	Button and Taylor, 2000
• Multiplier effects to related sectors, such as aircraft maintenance and cargo handling	Button and Taylor, 2000; Brueckner, 2003; Graham, 2003
Negative or Limited Impacts	
• Little impact on overall growth in short-haul air traffic	Forsyth; 2003; Civil Aviation Authority (UK), 2006
• Substitute traffic from FSC to LCC (especially if markets are dense & saturated)	Morrell, 2005; Civil Aviation Authority (UK), 2006
• LCCs mainly provide middle / higher income groups with more affordable additional flights (opposed to attracting new low-income passengers)	Civil Aviation Authority (UK), 2006; Graham and Dennis, 2010
• Financial success or failure of LCC entrants largely depends on choice of airports and routes	Forsyth; 2003, O'Connell and Williams, 2005
• Concerns about LCC safety and service quality	O'Connell and Williams, 2005; Cho and Jeong, 2006
• Concerns about pollution & noise	O'Connell and Williams, 2005; Donzelli, 2010
• Seasonal effects of LCCs depend on the volume of low-cost carrier services	Donzelli, 2010; Graham and Dennis, 2010

• Reduce aeronautical revenues at airports • Adds complexity to airport operations and management (negotiation, cost-structure)	Francis, Fidato, and Humphreys, 2003; Barrett, 2004 Barrett, 2004

Table 2: Hong Kong Residents' Stated Response to the Introduction of a Hong-Kong-based LCC

New Travelers	18.0%
Switching Travelers	50.6%
Not Switching Travelers	19.7%
Not Travelling	11.8%
Total	**100%**

Source: Authors – Quantitative Survey

Table 3: Potential New LCC Entrant's Market Segments

Passenger Type	Hong Kong Residents	International	Total
New	247,626	733,720	981,346
Switched	696,897	664,431	1,361,328
Total	944,523	1,398,152	2,342,674

Source: Author's Quantitative Survey extrapolated to Travelling Population (Hong Kong Tourism Board)

Table 4: Indirect Impact of Introduction of the new LCC entrant

Segments (Contributions in HK$ Mill.)	Direct Expenditure	Gross Output	GVA / Income	Tax
International Visitors – New Market: new LCC entrant	6,342.11	5,501.91	2,051.39	55.58
International Visitors - Switched to new LCC entrant	718.03	622.90	232.25	6.29
International Visitors Market Growth – Other Airlines	3,885.93	3,371.13	1,256.93	34.05

Source: Authors' calculations using Hong Kong Input-Output Table multipliers

Table 5: New LCC Entrant Expenditures by Category

Areas (Expenditure in HK$ Mill.)	Direct Expenditure	Gross Output	GVA / Income	Tax	Import	Employment
Engineering	169.84	211.66	85.90	0.87	83.07	2,219
Catering	24.10	40.40	16.02	0.53	7.54	591
Fuel	896.85	1,100.77	136.87	2.81	757.16	1,091
Ground Handling	153.61	278.61	121.51	4.15	27.95	2,483
Marketing	94.10	150.93	50.67	1.06	42.37	930
Cost of Financing Loans	58.50	85.17	23.99	0.38	34.14	592
Total	**1,397.00**	**1,867.55**	**434.96**	**9.80**	**952.24**	**7,906**

Source: Authors' Calculation using JetStar Hong Kong Expenditures with Hong Kong Input-Output multipliers

Table 6: Potential Government Revenues

Government Revenues	HK$ Million
Personal Income Tax	74.50
Corporate Tax	70.82
Departure Tax	281.12
Airport Charges	108.99
Indirect Tax Revenue from the new LCC entrant Expenditures	16.54
Indirect Tax Revenue from International Visitor Expenditures	95.92
Total Potential Government Revenues	**647.89**

Source: Authors' calculations

Table 7: Potential Employment Generated and Sustained

Employment	No. of Jobs	Potential Jobs Generated or Sustained as % of Existing Jobs Directly Employed in Hong Kong's Aviation Sector
New LCC entrant	620	0.8%
Indirect from the new LCC entrant Expenditures	7,906	10.8%
Indirect from International Visitor Expenditures	72,374	99.1%
Total New or Sustained Employment	**80,900**	110.8%

Source: Authors' calculations

Table 8: Summary of the Net Economic Contribution of the new LCC entrant of Hong Kong Economy

Economic Contribution in HK$ Million	**Income**	**Net Leakages**
New LCC entrant Expenditures	434.96	
New LCC entrant Ancillary Revenue	351.40	
New LCC entrant Cargo Revenue	181.42	
New LCC entrant No-Show Revenue	54.17	
Fuel Surcharge	26.03	
International Visitors – New Market	2,051.39	
International Visitors – Switched to new LCC entrant	232.25	
Increased Air Traffic with Existing Carriers	1,256.93	
Potential Government Revenues	647.89	
Total Injections	**5,236.44**	
Hong Kong Residents – New Travelers		820.09
Hong Kong Residents – Switched Travelers		1,475.24
Total Leakages		**2,295.33**
Net Economic Activity	**2,941.11**	
Employment (Jobs)	**80,900**	

Source: Authors' calculations

Figure 1: Hong Kong Residents - New Air Travelers

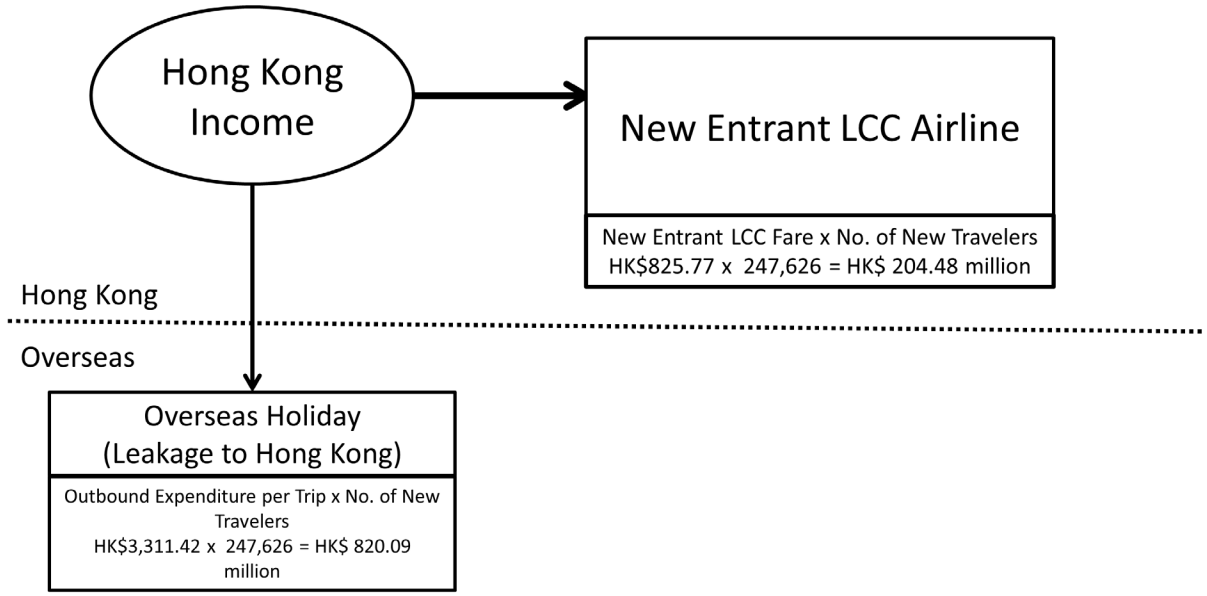

Figure 2: Hong Kong Residents Switching from Another Carrier

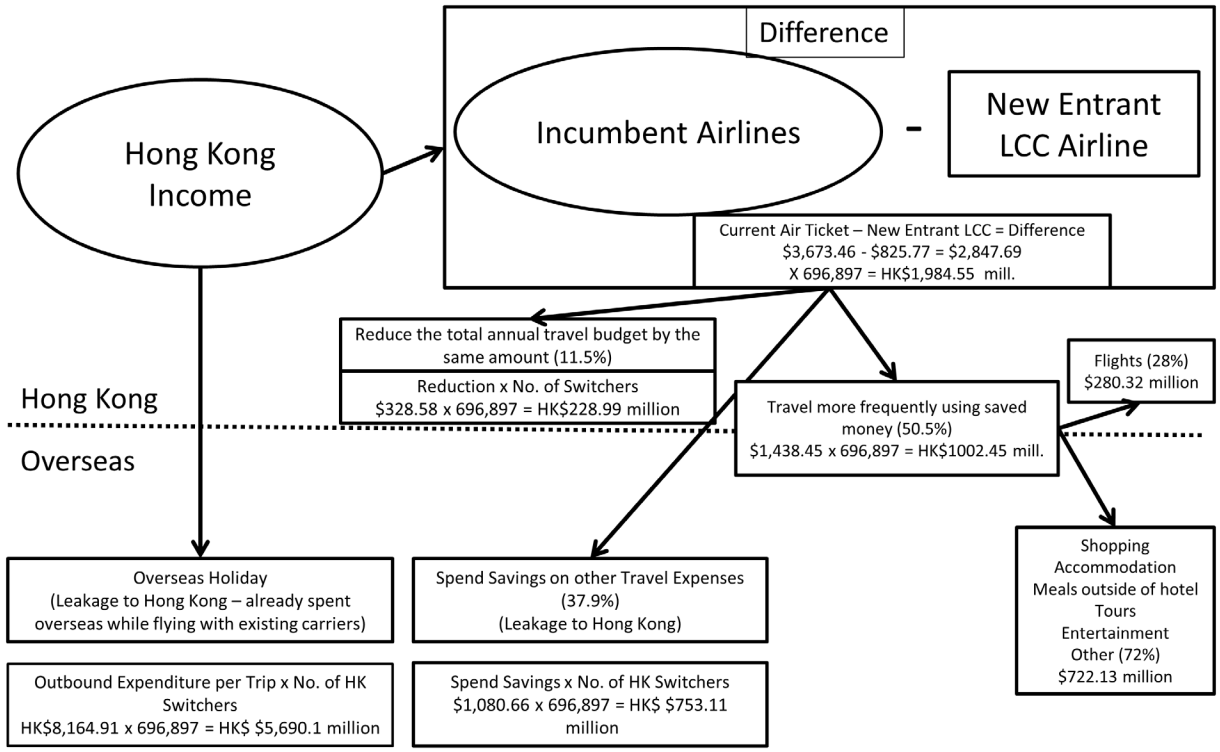

Figure 3: International Visitors - New Market with the new LCC Entrant

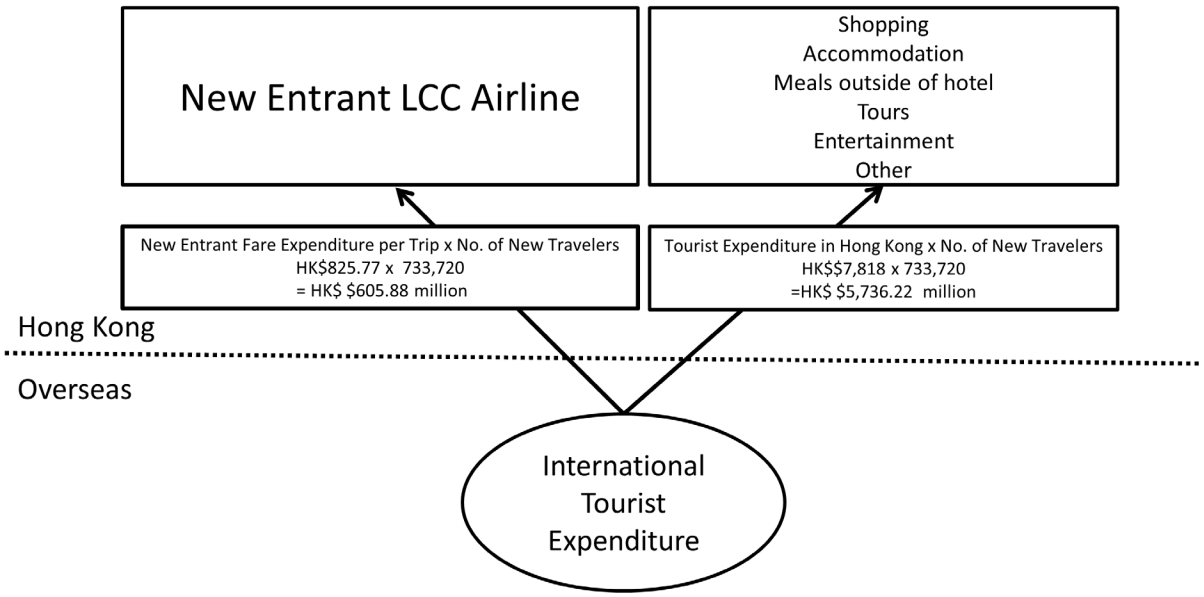

Figure 4: International Visitors who have switched to the new LCC entrant