

Recovery of Tourism Demand in Hong Kong from the Global Financial and Economic Crisis¹

从全球金融经济危机中复苏：访港旅游需求预测

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This study aims to predict the recovery of the Hong Kong tourism industry from the current global financial and economic crisis. Based on the latest statistics available, this study provides updated forecasts of tourist arrivals to Hong Kong from 10 key source markets over the period 2010-2015. The forecasts include annual and quarterly forecasts of tourist arrivals and the market shares of the source markets concerned. An econometric method is used to estimate the demand elasticities as well as their confidence intervals, followed by the interval demand predictions. The total tourist arrivals to Hong Kong are projected to reach 53.8 million by 2015 with the interval forecasts between 38.4 and 74.4 million, representing an annual growth of 10.48% on average against 2009, with an interval ranging from 4.44% to 16.60%. As far as individual source markets are concerned, their demand recovery takes varying paces. Overall, tourism demand in Hong Kong is relatively resilient to the global financial and economic crisis.

KEYWORDS: Global financial and economic crisis, tourism demand, forecasting, recovery, Hong Kong

本文旨在预测香港旅游业将何时从当前的全球金融和经济危机中复苏。本文根据最新的统计数字，预测2010年至2015年间香港10个主要客源市场的访港旅客人次，包括年度和季度旅客人次预测和客源市场所占的市场份额预测。本文运用计量经济学的方法估计需求弹性及置信区间，再给出区间需求预测值。本文所得出的预测结果显示，到2015年访港总游客人次将达到5,380万，区间预测在3,840万至7,440万之间；与2009年的4.44%至16.60%相比，平均年增长率达10.48%。十个客源市场的访港旅游需求的复苏步伐不尽相同。总的来说，香港的入境旅游需求比较能抵御全球金融经济危机的冲击。

关键词：全球金融经济危机，旅游需求，预测，复苏，香港

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Introduction

The current global financial and economic crisis triggered by a liquidity shortfall in the United States banking system in the second half of 2007 has severely affected the world economy. Compared to previous economic recessions, the current crisis has a broader and all-encompassing impact and has hit tourism services with particular force (Smeral, 2010). According to the United Nations World Tourism Organization (UNWTO), international tourism started to decline during the second half of 2008 and the trend continued in 2009. However, according to the International Monetary Fund (IMF 2010c), “the global recovery is off to a stronger start than anticipated earlier” (p.1). The IMF also predicted a clear return of economic growth in 2010 (+4% worldwide, with stronger performance for emerging and developing economies at +6.0%, alongside a more sluggish one for advanced economies at +2.1%). The economic growth is even more vigorous in mainland China with the prospect of +10% in 2010.

Along with the encouraging economic environment, the tourism industry worldwide has started to report positive growth in terms of international tourist arrivals. Better than expected, the total tourist arrivals in the world were estimated to decrease by 4% in 2009 to 880 million, with signs of recovery in the last quarter of 2009 (UNWTO, 2010). In particular, Asia and the Pacific led the recovery with growth already turning positive in the second half of 2009.

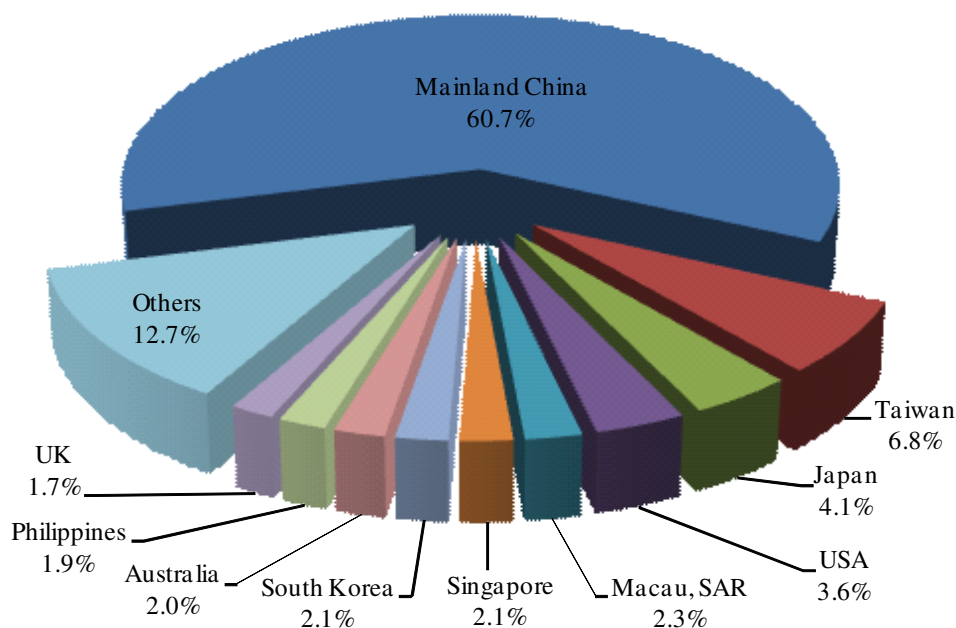


Figure 1. Top Ten Tourism Source Markets of Hong Kong in 2009

Given its geographic proximity to mainland China, and value-for-money tourism product provision, Hong Kong has been less affected by the economic downturn. According to the Hong Kong Tourism Board (HKTB, 2010), the total tourist arrivals to Hong Kong reached 29.6 million in 2009 indicating a year-on-year increase of 0.28 percent. The better-than-anticipated performance of the Hong Kong tourism industry was mainly attributed to the 6.49% growth of the mainland Chinese market, which accounted for over 60% of total tourist arrivals in Hong Kong in 2009. Given the large market size and closer economic and political ties with Hong Kong, mainland China has been the main driving force for Hong Kong's tourism development over the past decade. Other top tourism generating countries/regions for

Hong Kong during the period 2005-2009 are Taiwan, the USA, Japan, Macau, South Korea, the UK, Australia, the Philippines and Singapore (see Figure 1). These nine source markets accounted for 25% of the total arrivals over the period 2005-2009. During the global financial and economic crisis, tourist arrivals from all these nine markets have declined. Given the most severe economic recession during this crisis, the UK and the USA, the two major long-haul markets, started to decline first, since the second quarter of 2008, followed by the other seven markets. Although the global financial and economic crisis had a widespread impact on the Hong Kong tourism industry, its recovery is rather swift. Overall, the 9.0% upswing in the last quarter of 2009 compared with the 1.8%, -8.9%, and -1.6% growth rates in the first three quarters, contributed to a better-than-expected full year growth (see Figure 2).

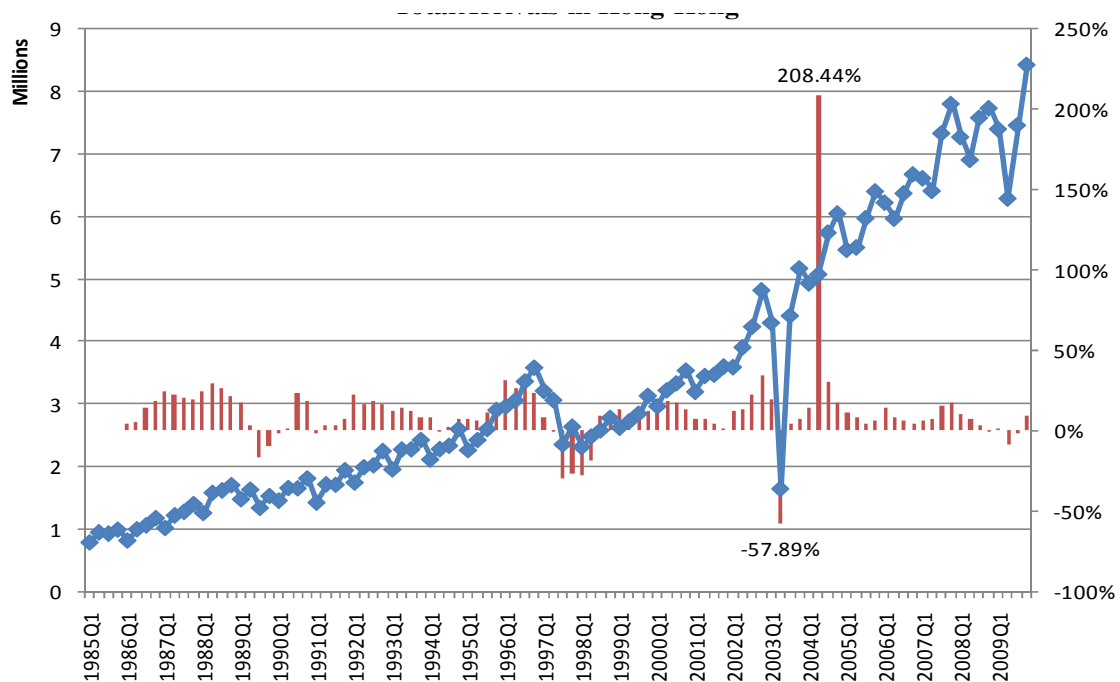


Figure 2. Total Tourist Arrivals in Hong Kong and the Growth Rates (1985Q1-2009Q4)

Since the UNWTO's latest data have shown a clear sign of world-wide tourism recovery, coupled by the promising evidence in the Hong Kong inbound tourism market, it is necessary and important for the tourism industry to understand how quick market recovery will be and when the market is likely to return to the pre-crisis level. With a particular focus on the demand for tourism in Hong Kong, this study attempts to answer the above questions.

Tourism Demand in Economic and Financial Crises

There have been a number of national, regional and global financial and economic crises in recent years, such as the Asian financial crisis in 1997-1998, the economic crisis in Turkey in February 2001 and the current global financial and economic crisis. The direct relevance of these economic and financial crises to tourism is because that tourism involves discretionary income, and is therefore regarded vulnerable to economic uncertainty and volatility (Papatheodorou, Rossello, & Xiao, 2010). Moreover, from an economic perspective, demand theory suggests that consumers' disposable income is one of the most important economic determinants of the demand for a good or service such as tourism. At a national level, the overall economic output is highly related to people's disposable income. Over the last half-

century or so, tourism economists have carried out extensive research on tourism demand analyses. Overviews of these empirical studies suggest that demand for tourism is commonly affected by tourists' disposable income, for which the economic output measured by the gross domestic product (GDP) is often used as an effective proxy in a tourism demand model (Li *et al.*, 2005; Song & Li, 2008). Therefore, economic downturns affect outbound tourism demand adversely, and economic recovery will sooner or later lead to the recovery of tourism demand. Other significant determinants of international tourism demand include the price level in a destination relative to that in the country of origin of tourists, and the substitute prices in alternative destinations (or in a relative term comparing to the prices in the selected destination or in the country of origin). Hence price fluctuations in a tourist destination and in its competitors during an economic recession and booming are likely to affect the tourism demand in this destination to certain extent.

Another common finding across most tourism demand studies is that international tourism is a luxury product, because the estimated income elasticities are generally greater than one. The implication is that demand for international tourism is highly sensitive to the economic volatility in tourists' country of origin. As far as tourism in Hong Kong is concerned, Song and Wong (2003) and Song, Wong and Chon (2003) estimate the long-run income elasticities of tourism demand in six and 14 source markets respectively, and support the above finding (i.e., the income elasticity is greater than one) in all markets with only one exception in each study.

Despite the inevitable effects of financial and economic crises on tourism demand, some scholars such as Prideaux (1999) and Okumus and Karamustafa (2005) note that the relevance of these crises to tourism has been largely overlooked by both tourism and economics researchers. Greater attention to the economic issues of tourism has been called for. So far only a small number of publications have examined the impact of economic or financial crises on tourism. For example, Prideaux studies the effect of the 1997-1998 Asian financial crisis on tourism in this region and concludes that this crisis has little long-lasting effect and tourism may be more resilient to crises than previously expected. Okumus and Karamustafa (2005) investigate the impact of the economic crisis in Turkey in 2001 on the tourism industry in Northern Cyprus. Evidence of both negative and positive impacts on hospitality businesses has been identified. Very recently the *Journal of Travel Research* published three articles featuring on the impacts of the current financial and economic crisis on tourism in Asia and the Pacific (Song & Lin, 2010), Europe (Smeral, 2010) and North America (Ritchie, Amaya Molinar, & Frechtling, 2010), together with two overall discussion papers by Sheldon and Dwyer (2010) and Papatheodorou *et al.* (2010). The common recognition among the above scholars is that the crisis presents both threats and opportunities for global tourism industries. In particular, the opportunities lie in the enhanced competitive advantage of tourism businesses and tourist destinations over the longer term (Sheldon & Dwyer, 2010).

Since the impact of the current global financial and economic crisis on tourism demand has been commonly recognized in the recent literature, this study examines the relevance of this crisis to tourism demand from a different perspective. Given the signals of recovery particularly in the Asian tourism market, it is important for destination management organizations and tourism-related service providers to understand the paces of recovery in different source markets, in order to adjust their supply effectively in response to the demand recovery. This study therefore aims to serve this purpose by providing interval forecasts of international tourism demand in Hong Kong from the top ten source markets respectively

over the coming six years. This study is a new addition to the literature on the relevance of economic crises to tourism with its unique focus on a popular tourist destination's market recovery. Although the UNWTO (2010) and Song and Lin (2010) have reported the forecasts of global and regional tourism growth respectively in the near future, a focus on a specific destination's source market recovery has not been seen in the literature. Different from their forecasts, the present study considers the recovery from the global financial and economic crisis by adopting the latest IMF predictions of GDPs of the source markets in the tourism demand forecasting process. Therefore, this study provides most updated forecasts of the tourism recovery paces in different source markets. Moreover, interval forecasting is relatively new in the tourism context and this study further enriches the tourism forecasting literature by providing confidence intervals of demand forecasts.

It should be noted that during the global financial and economic crisis, swine flu also affected the Hong Kong tourism industry since May 2009 when the first swine flu case was confirmed in Hong Kong. However, this study does not attempt to assess and separate the impacts of the two crises, but focuses on the recovery of tourism demand to the pre-financial crisis level. Different from a financial and economic crisis, swine flu had an immediate and relatively short effect on tourism demand (principally in May and June). Therefore, the predicted tourism demand in 2010 and beyond in this study mainly reflects the recovery to the global financial and economic crisis.

Methodology

The Model and Data

In line with majority of the tourism demand literature such as Kulendran and Witt (2001) and Song *et al.* (2003), the following autoregressive distributed lag model (ADLM) in a log-linear form is employed to study tourism demand in this study.

$$\ln Q_{it} = \alpha_0 + \sum_{j=1}^p \alpha_j \ln Q_{i,t-j} + \sum_{j=0}^p \beta_j \ln Y_{i,t-j} + \sum_{j=0}^p \delta_j \ln P_{i,t-j} + \sum_{j=0}^p \varphi_j \ln P_{is,t-j} + \text{dummies} + \varepsilon_{it} \quad (1)$$

where Q_{it} measures tourist arrivals from origin country/region i to Hong Kong at time t ; Y_{it} is an index of the real GDP from i^{th} origin country/region at time t ; P_{it} is the relative price variable measured by the exchange-rate-adjusted consumer price index (CPI) in Hong Kong relative to that in the country/region of origin i at time t , i.e., $P_{it} = (CPI_t^{HK} / EX_t^{HK}) / (CPI_t^i / EX_t^i)$, where CPI_t^{HK} and CPI_t^i are the CPIs for Hong Kong and the country/region of origin i , respectively, and EX_t^{HK} and EX_t^i are the exchange rate indexes for Hong Kong and the country/region of origin i , respectively; P_{ist} is the substitute price variable calculated as a weighted index of CPIs of six substitute markets according to their market shares of international tourist arrivals at time t , that is, $P_{ist} = \sum_{j=1}^6 (CPI_{jt} / EX_{jt}) w_{jt}^i$ ($j = 1, 2, \dots, 6$, representing mainland China, South Korea, Malaysia, Singapore, Thailand and Taiwan, respectively; w_{jt}^i is calculated as $TQ_{jt}^i / (\sum_{j=1}^6 TQ_{jt}^i)$, indicating the share of international tourist arrivals for country/region j at time t , and TQ_{jt}^i is the tourist arrivals of substitute destination j from origin country/region i at time t). It should be noted that once one of the six substitute markets is considered as a source market in a demand model, it is removed from the

calculation of the substitute price for this model. *Dummies* refer to the seasonal dummy variables and those that capture the influences of one-off socioeconomic events (e.g., SARS in 2003, the handover of Hong Kong to China in 1997 and the current financial and economic crisis and swine flu, and relevant country/region-specific dummies, such as the 9/11 terrorist attack in the USA); ε_{it} is an error term assumed to be normally distributed with zero mean and constant variance, that is, $\varepsilon_{it} \sim N(0, \sigma^2)$.

Equation (1) indicates that the demand for tourism in the current period is affected by the values of the lagged demand variable as well as the current and lagged values of the influencing factors. This specification takes the time path of tourists' decision-making process into consideration. The lag length of an ADLM is normally decided by the Akaike Information Criterion (AIC) as suggested by Song, Witt and Li (2009). In tourism demand analysis most empirical studies suggest that it is sufficient to set up the initial lag length of $p = 4$ for quarterly data and $p = 1$ for annual data (e.g., Athanopoulos & Hyndman, 2008; Shen, Li, & Song, 2009).

Quarterly data from 1985:Q1 to 2009:Q4 are used to estimate the demand models, which are then used to generate the annual and quarterly forecasts from 2010:Q1 to 2015:Q4. The data of the dependent variable, measured by tourist arrivals, were collected from the Visitor Arrival Statistics in Hong Kong (HKTB, 2010). The income variable, Y , measured by the real GDP index (2005=100), was collected from the International Financial Statistics online database of the IMF (2010a) and the official websites of the statistical bureaus or departments of all countries/regions concerned. CPIs (2005=100) and exchange rates were also obtained from the IMF(2010a).

It should be noted that, since the joint effect of the current financial and economic crisis and swine flu till the end of 2009 has been considered in the modelling stage, and little evidence suggests swine flu's effect may continue into 2010, the forecast tourist arrivals mainly represent the recovery of tourism demand to the global financial and economic crisis.

Demand Elasticities

Tourism demand elasticities can serve as a useful tool to analyze the responsiveness of tourism demand to changes in the influencing factors. They provide useful information for tourism policy makers and business managers to assist their effective decision making on pricing, marketing and so on.

It should be noted that the coefficients α_j , β_j and δ_j in Equation (1) are not demand elasticities. Subject to the existence of long-run relationships between tourism demand and its influencing factors, the dynamic tourism demand model of Equation (1) can be transformed into its long-run counterpart as follows:

$$\ln Q_{it} = \frac{\alpha_0}{1 - \sum_{j=1}^p \alpha_j} + \frac{\sum_{j=0}^p \beta_j}{1 - \sum_{j=1}^p \alpha_j} \times \ln Y_{it} + \frac{\sum_{j=0}^p \delta_j}{1 - \sum_{j=1}^p \alpha_j} \times \ln P_{it} + \frac{\sum_{j=0}^p \varphi_j}{1 - \sum_{j=1}^p \alpha_j} \times \ln P_{ist} + \text{dummies} + \varepsilon_{it} \quad (2)$$

where $\frac{\sum_{j=0}^p \beta_j}{1 - \sum_{j=1}^p \alpha_j}$, $\frac{\sum_{j=0}^p \delta_j}{1 - \sum_{j=1}^p \alpha_j}$ and $\frac{\sum_{j=0}^p \varphi_j}{1 - \sum_{j=1}^p \alpha_j}$ are the long-run income, own price and substitute price elasticities, respectively.

In practice, not all of the variables included on the right-hand side of Equation (2) would be statistically significant once the model is estimated. Therefore, a modelling procedure known as the general-to-specific approach is adopted to determine which variables should be kept in the final model based on their statistical significance and economic acceptability (Song et al., 2009). The final model is also required to pass a series of diagnostic tests, including the tests for autocorrelation, heteroscedasticity, non-normality, model misspecification, structural instability and non-exogeneity.

In the past, tourism researchers and practitioners have mainly focused on the point estimates of demand elasticities. The point estimation alone is not informative because of the completely unknown sampling variability (Song, Kim, & Yang, 2010). In tourism demand studies, interval estimation of demand elasticities has been rarely applied, with Song et al. (2010) and Song and Lin (2010) being exceptions. In this study the Delta method developed by Li and Maddala (1999) is used to construct the confidence intervals for elasticities. To evaluate the confidence intervals for the long-run elasticities of tourist arrivals in Hong Kong, the ADLM bounds test proposed by Pesaran, Shin and Smith (2001) are employed to test for the existence of the long-run relationships between the tourist arrivals variable and its determinants. The test begins by estimating a conditional error correction model (ECM) as follows based on the ADLM in Equation (1).

$$\begin{aligned} \Delta \ln Q_{i,t} = & \alpha_0 + \sum_{j=1}^p \psi_{Qj} \Delta \ln Q_{i,t-j} + \sum_{j=0}^p \psi_{Yj} \Delta \ln Y_{i,t-j} \\ & + \sum_{j=0}^p \psi_{Pj} \Delta \ln P_{i,t-j} + \sum_{j=0}^p \psi_{P_{is,j}} \Delta \ln P_{is,t-j} + \pi_1 \ln Q_{i,t-1} \\ & + \pi_2 \ln Y_{i,t-1} + \pi_3 \ln P_{is,t-1} + \text{dummies} + u_{it} \end{aligned} \quad (3)$$

where Δ is the first difference operator (i.e., $\Delta X_t = X_t - X_{t-1}$). The above equation describes the short-run dynamic interactions between the tourist arrival variable and its determinants. The π coefficients specify the long-run relationship between the demand and its determinants. If the values of π are zero, then no long-run relationship exists. F -test and t -test are used to test for the null hypothesis of no long-run relationship against the alternative hypothesis that at least one π is non-zero.

Once the long-run relationships are established, the Delta method can be used to construct the confidence intervals for elasticities. The Delta method is a general approach to calculating confidence intervals of functions of maximum likelihood estimates, which allows the derivation of an asymptotic mean and variance for nonlinear functions of random variables using Taylor's series expansion. Tourism demand elasticities are defined as:

$$\theta \equiv (\beta_Y, \beta_P, \beta_{PS}) = \left(\frac{\sum_{j=0}^{N_1} \beta_{Yj}}{1 - \lambda}, \frac{\sum_{j=0}^{N_2} \beta_{Pj}}{1 - \lambda}, \frac{\sum_{j=0}^{N_3} \beta_{P_{sj}}}{1 - \lambda} \right) \quad (4)$$

where β_Y , β_P , and β_{PS} represents the income, own-price and substitute-price elasticities,

respectively. The Delta method assumes that $\hat{\theta} \sim N(\theta, \sigma_\theta^2)$, where $E(\hat{\theta}) = \theta$. A differentiable function of $\hat{\theta}$ can be defined as $y = g(\hat{\theta})$. The unknown variance is estimated based on the Taylor's series approximation, and the estimator is $\hat{\sigma}_\theta^2 = g(\hat{\theta})' \Sigma_{\hat{\theta}} g(\hat{\theta}) = \frac{\partial g(\hat{\theta})}{\partial \hat{\theta}'} \hat{\sigma}_\theta^2(\hat{\theta}) \frac{\partial g(\hat{\theta})}{\partial \hat{\theta}}$, where $g' = \partial g / \partial \hat{\theta} \big|_{\hat{\theta}=\theta}$ and $\Sigma_{\hat{\theta}}$ is the variance-covariance matrix of $(\hat{\beta}_Y, \hat{\beta}_P, \hat{\beta}_{P_S})$. Then the 95%-confidence interval is given by $[\hat{\theta} - z_{0.025} \cdot \hat{\sigma}_\theta, \hat{\theta} + z_{0.025} \cdot \hat{\sigma}_\theta]$, where $z_{0.025}$ is the 97.5th percentile of a standard normal distribution. The bounds computed by the Delta method can include values that exceed the range of the statistic being estimated. In other words, the bound values could be negative or greater than one.

Empirical Results

All the models are estimated using the ordinary least squares (OLS) method and the general-to-specific modelling approach discussed above is applied to derive the final models for all source markets. The model estimation results suggest that all final models fit the data well, and each of them passed all or most of the diagnostic tests.²

Seasonal dummies are included in all models to capture the influence of seasonality on the demand for tourism. The SARS epidemic in 2003 significantly reduced tourist arrivals from all source markets because the SARS dummy is found to be statistically significant in all models. The Asian financial crisis in 1997 had negative impacts on tourist arrivals from eight source markets (except Macau and Taiwan). The current global financial and economic crisis is found to have negative impacts on tourist arrivals from Japan, mainland China, South Korea and Singapore. The country-specific events such as the 9/11 terrorist attack in 2001 and the return of Hong Kong to China in 1997 are found significant in the USA and UK models, respectively.

Existence of Long-Run Relationships

As mentioned above, both the bounds and t tests were carried out to examine the long-run relationships between the demand for Hong Kong tourism and its major determinants, including the income, own-price and substitute-price variables. Table 1 presents the test results. The initial lag length (p) is set as $p=4$ and the final lag length is determined by the AIC values for each of the source markets. The F and t statistics are calculated based on Equation (3) with appropriate lag structures. The test results show that the long-run relationships do exist between tourist arrivals and the influencing factors in all major source markets except South Korea.

The point estimates of the demand elasticities and their 95% confidence intervals are reported in Table 2. The long-haul markets include Australia, the UK and the USA while the other seven markets are grouped as the short- and medium-haul markets.

² Due to space constraints, the model estimates are omitted from the paper, but available from the authors upon request.

Table 1. ADLM Bounds Test Statistics.

Source Market	<i>F</i> -statistic	<i>t</i> -statistic	Lag (<i>p</i>)
Australia	43.72***	-13.00***	1
Mainland China	5.10*	-4.39***	1
Japan	75.54***	-15.78***	1
South Korea	2.17	-2.07	1
Philippines	12.10***	-6.75***	2
Singapore	52.56***	-13.67***	2
Taiwan	24.97***	-9.77***	2
UK	17.17***	-6.86***	2
USA	53.86***	-14.12***	2

Note. * and *** represent 10% and 1% significance levels, respectively. The critical values of the bounds test (*F*-statistics) and the *t*-statistics are adopted from “Bounds Testing Approaches to the Analysis of Level Relationships,” by M. H. Pesaran, Y. Shin, and R. J. Smith, 2001, *Journal of Applied Econometrics*, 16, pp. 289-326.

Table 2. Point Estimates and 95% Confidence Intervals of Long-Run Demand Elasticities.

Source Market	Income			Own Price			Cross Price		
	L	Base	U	L	Base	U	L	Base	U
Australia	1.02	1.24	1.47	-0.61	-0.47	-0.32	-0.23	0.06	0.36
Japan	-0.71	1.40	3.51	-1.23	-0.56	0.11	-1.53	-0.16	1.21
Macau	-0.58	-0.20	0.17	-5.50	-3.47	-1.44	-0.62	-0.24	0.13
Mainland China	1.23	1.62	2.00	-0.10	0.86	1.82	-2.93	-0.95	1.04
Philippines	-0.42	1.07	2.57	-1.55	-1.06	-0.58	-1.65	-0.74	0.18
Singapore	0.72	0.91	1.09	-0.61	-0.12	0.38	-0.54	0.01	0.55
South Korea	1.53	2.16	2.78	-0.78	-0.47	-0.16	-0.10	1.16	2.42
Taiwan	0.23	0.61	0.99	-0.28	0.28	0.83	-1.12	-0.53	0.05
UK	1.04	1.64	2.24	-0.16	-0.02	0.11	0.36	0.68	1.01
USA	0.86	1.20	1.54	-0.52	-0.29	-0.07	-0.71	-0.31	0.09
Average of long-haul markets	0.97	1.36	1.75	-0.43	-0.26	-0.09	-0.19	0.15	0.48
Average of short- and medium-haul markets	0.29	1.08	1.87	-1.44	-0.65	0.14	-1.21	-0.21	0.80
Average of all markets	0.49	1.16	1.84	-1.13	-0.53	0.07	-0.91	-0.10	0.70

Note. Base, L and U are referred to baseline (point) estimates and their lower- and upper-bounds of the confidence intervals, respectively.

Income Elasticity

Table 2 indicates that the average value of the point (i.e., baseline) estimates of the income elasticity for the ten major source markets is 1.16 with a value of 1.36 for the long-haul markets and 1.08 for the short- and medium-haul markets. This suggests that travelling to

Hong Kong is generally regarded as a luxury product by tourists from these source markets. This result is consistent with the past literature on tourism demand in Hong Kong such as Song and Wong (2003) and Song et al. (2003).

The point estimates of the income elasticity of seven source markets are greater than 1, and the corresponding confidence intervals of four out of the seven markets (i.e., Australia, mainland China, South Korea and the UK) are beyond the value of 1, supporting that the point income elasticity is normally statistically different from 1 (Song et al., 2010). To test for the null hypothesis $H_0: \beta_y < 1$ against $H_1: \beta_y \geq 1$, the t -statistic is used and it is written as

$$t_0 = \frac{\hat{\beta}_y - 1}{se(\hat{\beta}_y)},$$

where $se(\hat{\beta}_y)$ is the standard error of $\hat{\beta}_y$. The calculated t_0 is compared with

the critical value of one-tailed t distribution with $(n-k)$ degrees of freedom, where n and k are the sample size and the number of independent variables, respectively. If the calculated t_0 is greater than the critical value then the alternative hypothesis is accepted, suggesting that the demand is income elastic. The t test results show that the demand for tourism in Hong Kong is income elastic in four of the above-mentioned markets as the t -statistics are significantly greater than 1 at the 5% significance level³.

Most point estimates of the income elasticity are positive, with Macau being the only exception (-0.2), and the value is statistically insignificant. The point estimate of the income elasticity for Taiwan is relatively low, suggesting that the demand for Hong Kong tourism by residents from Taiwan is income inelastic. One possible explanation is that a high proportion of Taiwanese visitors in Hong Kong are transit passengers who regard Hong Kong as the gateway to and from mainland China or other destinations.

Own-Price Elasticity

In line with the law of demand, all estimated own-price elasticities are negative with Taiwan and mainland China being two exceptions. A negative value of the own-price elasticity implies that an increase in the price of tourism goods/services in Hong Kong would lead to a decline in the demand for Hong Kong tourism. Although the sign of the own-price elasticities for Taiwan and mainland China are positive, the values are not statistically different from zero, and the associated confidence intervals cover the value of zero.

The average value of own-price elasticities for the ten major source markets is -0.53, suggesting that price reduction would not necessarily result in significant increases in Hong Kong tourism revenue. The short- and medium-haul markets exhibit higher sensitivity to price changes (-0.65) than that of the long-haul markets (-0.26).

It is found that the point estimate of the own-price elasticity is significantly greater than 1 in the Macau model revealing that visitors from Macau is relatively sensitive to the price changes of tourism products in Hong Kong. The managerial implication of this would be that, for tourism businesses targeting Macau visitors, a decrease in the tourism price holding other variables constant tends to bring about an increase in total tourism revenue. So a careful pricing strategy is crucial for these businesses' financial success. The other nine source

³ Due to space constraints, the t -test results are omitted from the paper, but available from the authors upon request.

markets are found to be price-inelastic.

The *t* test also shows that half of the point estimates of the own-price elasticity, including Australia, Macau, the Philippines, South Korea and Taiwan, are not statistically significant, which is consistent with previous findings in Song et al. (2010).

Cross-Price Elasticity

The estimated cross-price elasticities are positive in the Australia, Singapore, South Korea and the UK models, which means that an increase in the costs of tourism in the competing destinations would lead to an increase in the demand for Hong Kong tourism. It is found that tourists from South Korea are very much aware of the costs of tourism in the alternative destinations, and changes in the prices of tourism in the competing destinations would have a substantial impact on their demand for Hong Kong tourism. Therefore, maintaining the cost advantage of the Hong Kong tourism over the competitors is crucial for Hong Kong to attract tourists from South Korea.

Forecasts of Tourism Demand Up to 2015

Before generating the forecasts of tourist arrivals, the future values of the independent variables including the income, own-price and substitute-price variables need to be predicted first. The latest forecasts of the real GDP changes published by the IMF (2010b, 2010c), as shown in Table 3, are used as the projections of the income variables from 2010 to 2015. The exponential smoothing method is employed to generate the forecasts of the own-price and substitute-price variables. It should be noted that, apart from the model itself, the accuracy of the forecasts may be subject to the precision of the GDP forecasts by the IMF and that of the price forecasts with the exponential smoothing method. The forecasts of the tourist arrivals from all source markets are presented and interpreted in the following sub-sections.

Table 3. Projections of Real GDP Growth (%) of Major Source Markets.

Source Market	2009	2010	2011	2012	2013	2014	2015
Mainland China	8.5	9.0	9.7	9.8	9.8	9.5	9.3
Japan	-5.4	1.7	2.4	2.3	2.0	1.8	1.7
Macau	5.3	7.4	6.6	6.2	5.9	5.5	5.2
Philippines	1.0	3.2	3.8	4.5	4.5	4.5	4.5
Singapore	-3.3	4.1	4.3	4.2	4.6	4.6	4.7
South Korea	-1.0	3.6	5.2	5.0	4.7	4.5	4.6
Taiwan	-4.1	3.7	4.2	4.8	5.0	5.0	5.0
Australia	0.7	2.0	3.3	3.4	3.2	3.0	2.9
UK	-4.4	0.9	2.5	2.9	2.9	2.9	2.8
USA	-2.7	1.5	2.8	2.6	2.5	2.1	1.8

Note. The data are from World Economic Outlook Database, by International Monetary Fund, 2010b, retrieved February 3, 2010, from <http://www.imf.org/external/pubs/ft/weo/2009/02/weodata/download.aspx>, and World Economic Outlook Update: A Policy-Driven, Multispeed Recovery by International Monetary Fund, January 26, 2010c, retrieved January 28, 2010, from <http://www.imf.org/external/pubs/ft/weo/2010/update/01/>.

Forecasts of Annual Demand

To generate the total annual tourist arrivals, the market shares of the ten source

countries/regions from 2010 to 2015 are estimated by employing the exponential smoothing method. The point estimates of total tourist arrivals to Hong Kong are projected to reach 53.8 million in 2015 with a 95% confidence interval between 38.4 and 74.4 million, representing a year-on-year growth rate of 10.48%, 4.44% and 16.60%, respectively (see Table 4 and Figure 3). The 4.92% upswing registered in 2010 compared with the slight increase of 0.28% in 2009 indicates a full recovery from the recession.

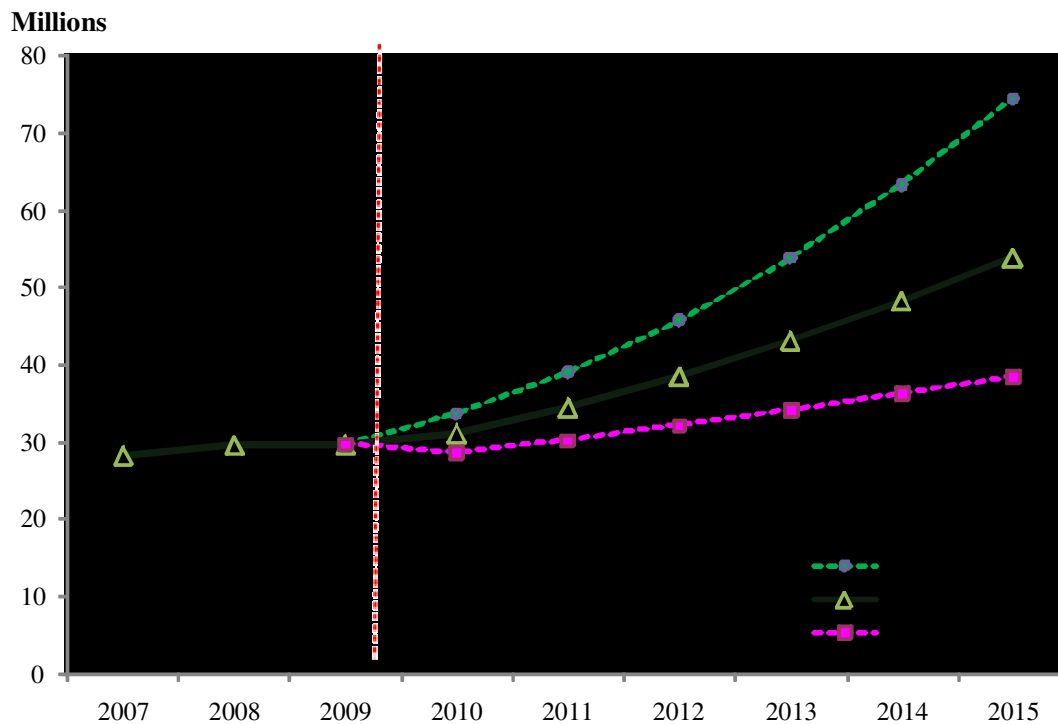


Figure 3. Annual Forecasts of Total Tourist Arrivals in Hong Kong (2010-2015)

As far as individual source markets are concerned, Table 5 suggests that the pace of demand recovery and the length of periods it takes the demand to recover to the pre-crisis level vary significantly. Referring to the baseline forecasts, mainland China, with little impact of the crisis on the demand for Hong Kong tourism, is predicted to continue its fastest growth at a pace of 14.30% annually over next six years. The South Korea and the UK markets are expected to recover with fast paces too (10.07% and 5.89% annually, respectively). In comparison, Taiwanese and Japanese markets are likely to recover most slowly, with an annual growth rate of 0.53% and 1.06%, respectively, throughout the forecasting period. For the markets suffering deeper demand declines such as two long-haul markets—the USA and the UK, and three regional markets—Japan, Taiwan and South Korea, it is likely to take them longer (over five years) to recover to the pre-crisis levels (i.e., the annual demand in 2008 for the USA and the UK, and the levels in 2009 for the rest), as suggested by the baseline forecasts. The other markets are expected to gain full recovery within two or three years. As a more optimistic prospect indicated by the upper-bound forecasts, six out of ten markets may recover to the pre-crisis levels within two years. Even if referring to the lower-bound forecasts, half of the markets are likely to fully recover by 2015. These results are in line with the arguments in the literature that an economic crisis has little long-lasting effect on tourism demand and tourism is relatively resilient to a crisis (Prideaux, 1999).

Table 4. Forecasts of Annual Tourism Demand in Hong Kong by Major Source Markets (2010-2015).

	Australia			Japan			Macau			Mainland China			Philippines		
	L	Base	U	L	Base	U	L	Base	U	L	Base	U	L	Base	U
<i>Annual arrivals (,000)</i>															
2007	634	634	634	1324	1324	1324	626	626	626	15486	15486	15486	553	553	553
2015	641	736	843	740	1283	2119	735	792	852	27759	40042	56458	474	715	1050
<i>Growth rate (%)</i>															
Average (2009-2015)	1.10	3.46	5.82	-7.79	1.06	9.87	1.53	2.79	4.04	7.53	14.30	21.04	-2.86	4.03	10.92
<i>Market share (%)</i>															
2007	2.25	2.25	2.25	4.70	4.70	4.70	2.22	2.22	2.22	54.97	54.97	54.97	1.96	1.96	1.96
2015	1.67	1.37	1.13	1.93	2.38	2.85	1.92	1.47	1.15	72.28	74.40	75.93	1.23	1.33	1.41
	Singapore			South Korea			Taiwan			UK			USA		
	L	Base	U	L	Base	U	L	Base	U	L	Base	U	L	Base	U
<i>Annual arrivals (,000)</i>															
2007	632	632	632	876	876	876	2239	2239	2239	601	601	601	1231	1231	1231
2015	706	789	880	846	1100	1415	1628	2074	2618	625	725	837	1178	1256	1338
<i>Growth rate (%)</i>															
Average (2009-2015)	2.09	4.00	5.91	5.35	10.07	14.79	-3.45	0.53	4.51	3.32	5.89	8.47	1.62	2.71	3.79
<i>Market share (%)</i>															
2007	2.24	2.24	2.24	3.11	3.11	3.11	7.95	7.95	7.95	2.13	2.13	2.13	4.37	4.37	4.37
2015	1.84	1.47	1.18	2.20	2.04	1.90	4.24	3.85	3.52	1.63	1.35	1.13	3.07	2.33	1.80

Note. Base, L and U are referred to baseline forecasts and their lower- and upper-bounds forecasts, respectively.

Table 5. Annual Forecasts of Total Tourist Arrivals in Hong Kong and the Growth Rates (2010 to 2015).

Year	L_Total (,000)	Base_Total (,000)	U_Total (,000)	L_Total (y-to-y, %)	Base_Total (y-to-y, %)	U_Total (y-to-y, %)	Market Share (%)
2007	28169	28169	28169	-	-	-	85.9
2008	29507	29507	29507	4.75	4.75	4.75	86.7
2009	29591	29591	29591	0.28	0.28	0.28	87.3
2010	28475	31046	33616	-3.77	4.92	13.60	89.0
2011	30068	34409	39041	5.60	10.83	16.14	89.6
2012	31988	38442	45736	6.38	11.72	17.15	90.2
2013	34074	43067	53811	6.52	12.03	17.66	90.8
2014	36199	48160	63255	6.24	11.83	17.55	91.4
2015	38405	53819	74360	6.10	11.75	17.56	92.0
AAGR	-	-	-	4.44	10.48	16.60	-

Note. Base, L and U refer to baseline forecasts and their lower- and upper-bound forecasts, respectively. Figures in bold are forecasts. AAGR refers to the average annual growth rate from 2009 to 2015.

Forecasts of Quarterly Demand

As discussed above, all major source markets are expected to recover from the global financial and economic crisis with different paces. Forecasts of quarterly demand show further evidence on the exact time that each market starts to recover and the pace of recovery.

Long-Haul Markets

The three long-haul markets are expected to show positive growth no later than the first quarter of 2010 as the baseline forecasts suggest (See Figures 4(a)-4(c))⁴. It is projected that the tourist arrivals from Australia, the UK and the USA will reach 0.74, 0.72 and 1.26 million, respectively, by 2015.

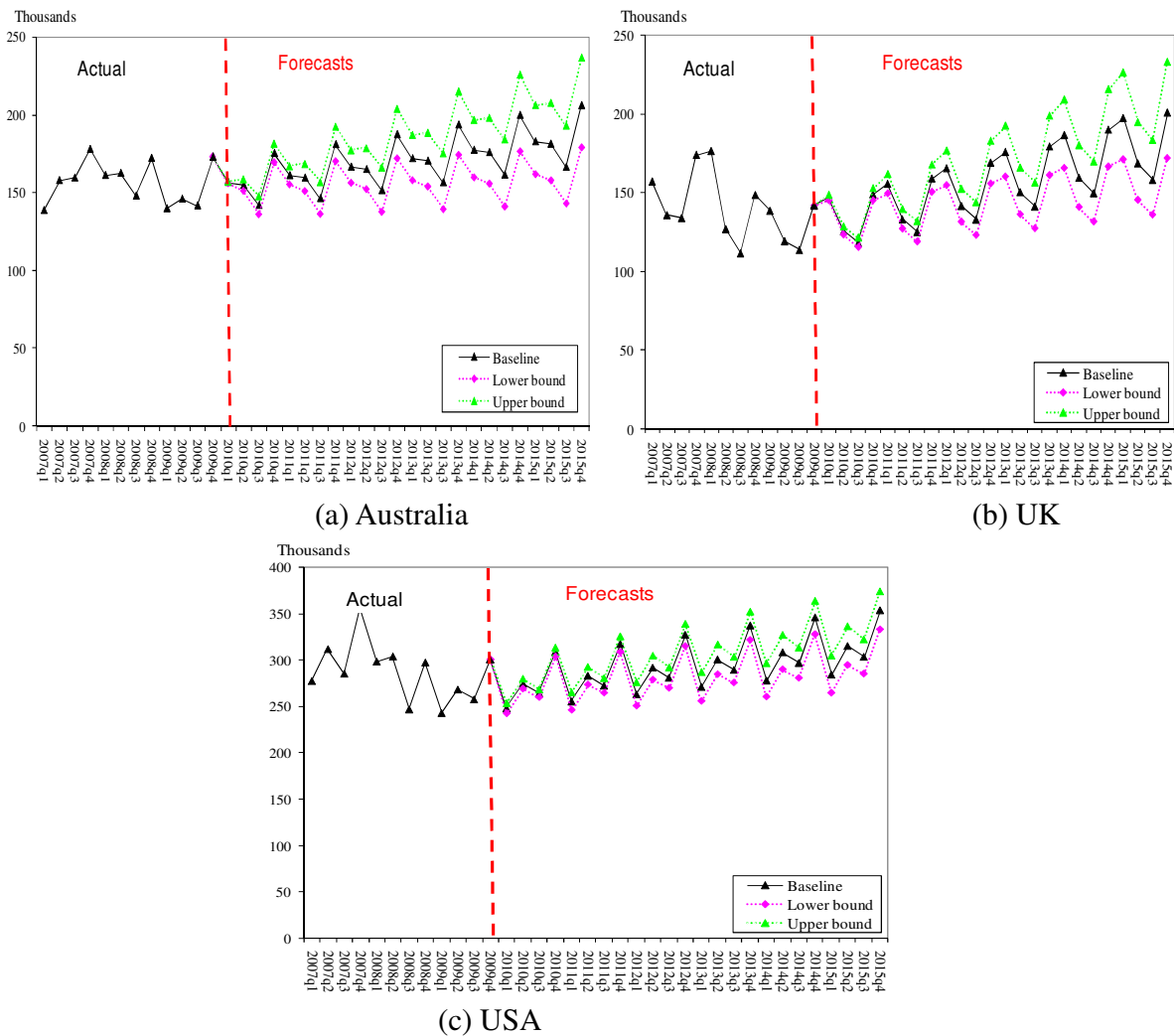


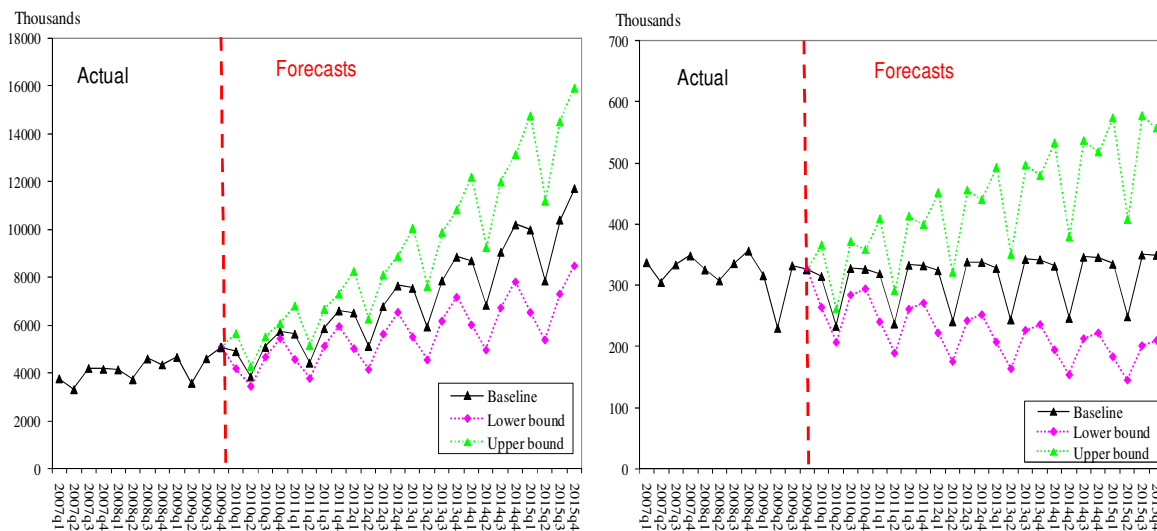
Figure 4. Quarterly Forecasts of Tourist Arrivals from Long-Haul Markets

⁴ Due to space constraints, the forecast values of quarterly tourist arrivals are omitted from the paper, but available from the authors upon request.

As discussed in the previous section, the demand for Hong Kong tourism by tourists from the long-haul markets is more income elastic than that of the short- and medium-haul markets, which means that visitors from the long-haul markets are more likely to cut their holiday expenditures in Hong Kong with adverse economic conditions. Figures 4(a)-4(c) show that the Hong Kong tourism suffered greater loss from the long-haul markets. For instance, tourist arrivals from Australia declined significantly for the period 2008Q3-2009Q3 and from the USA and the UK for the period 2008Q2-2009Q2 due to the global economic turbulence. The UK is projected to be more robust in recovery than Australia and the USA, although it takes the UK longer (seven quarters) to start to recover (i.e., positive growth against the same quarter in the previous year starts to appear) than the other two long-haul markets (five quarters), evidenced by the baseline forecasts.

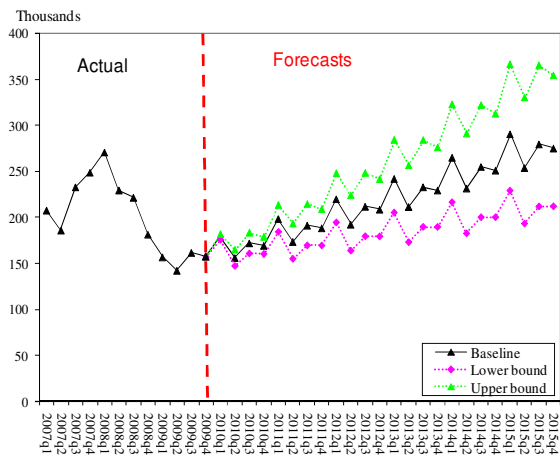
Short- and Medium-Haul Markets

Compared to the long-haul markets, the short- and medium-haul markets were less affected by the global financial and economic crisis outbreak, except South Korea (see Figures 5(a)-5(g)). It is found that South Korea is much more sensitive to the fluctuations of the economic conditions, as a deteriorating performance was found since the second half of 2008 to the end of 2009 resulting in an annual growth of -30% in 2009. This is likely to do with the combination of the economic recession and currency depreciation. Despite the deepest decline, the Korean market is predicted to recover at the fastest pace among the nine markets excluding mainland China. It is most likely to take the South Korean market six quarters to reverse the declining trend, according to the baseline forecasts.

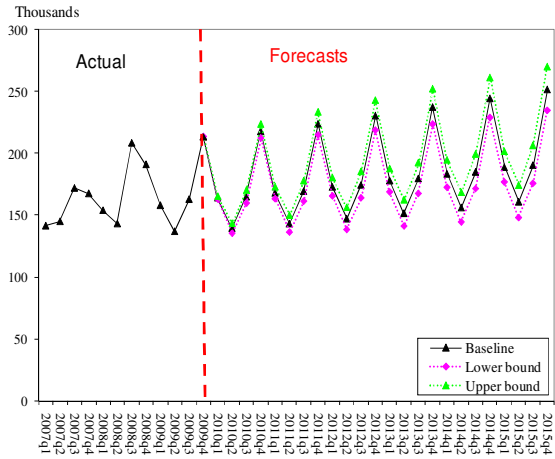


(a) Mainland China

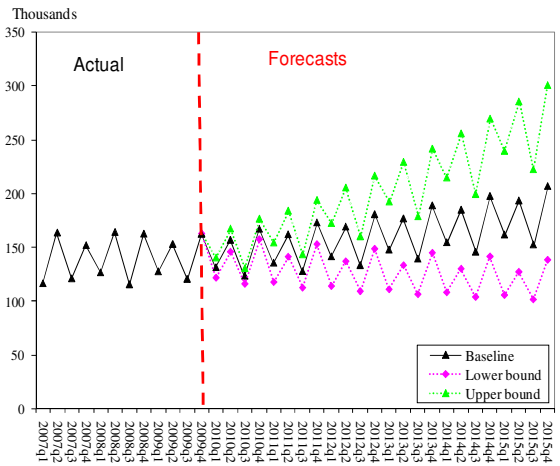
(b) Japan



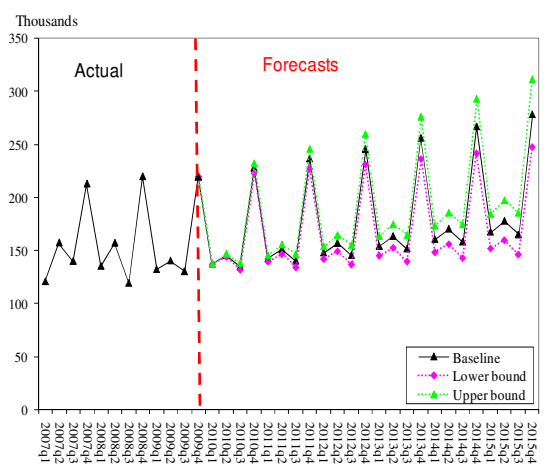
(c) South Korea



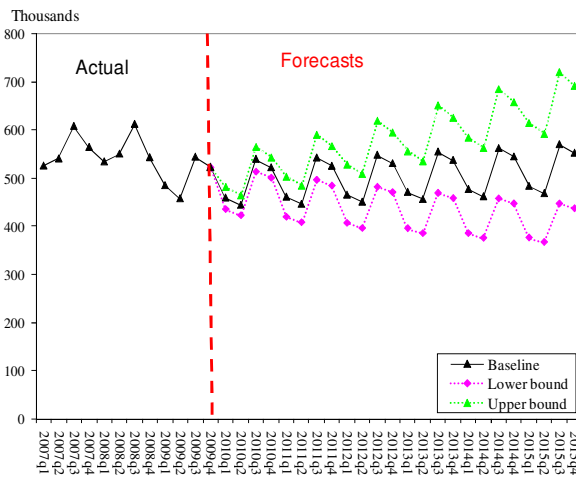
(d) Macau



(e) Philippines



(f) Singapore



(g) Taiwan

Figure 5. Quarterly Forecasts of Tourist Arrivals from Short- and medium-haul Markets

The size of the Chinese market and the expected growth of the Chinese economy will continue to be the main driving force for Hong Kong's tourism industry over the forecasting period. By 2015, tourist arrivals from mainland China are predicted to account for 75% of the total tourist arrivals in Hong Kong.

The poor macro-economic situation and the opening of direct flights between mainland China and Taiwan toward the end of 2008 resulted in the number of arrivals from Taiwan slumping by 10.3% in 2009. As the second largest source market, Taiwan is not expected to have a strong recovery, as it is estimated that tourist arrivals from Taiwan will not return to its pre-crisis level over the forecasting period with a market share shrinking from 6.8% in 2009 to 4.2% in 2015 (see Table 4). The forecasting results show an optimistic prospect for three markets: Singapore, Macau and the Philippines, as steady growth is predicted in these markets over the next six years (see Figures 5(d)-5(f)). In terms of resiliency, the quickest recovery appears in the Philippines and Macau markets (one and two quarters, respectively), while the slowest recovery is presented in the Taiwan and Japan markets (nine and seven quarters, respectively), according to the baseline forecasts. Referring to the upper-bound forecasts, a more optimistic prediction is that Taiwan and Japan may gain a positive growth after six and four quarters' continuous decline respectively, while for the other Asian markets the upper-bound forecasts suggest the same results as the baseline forecasts.

Overall, the mean and median period that it takes all the major markets to reverse the declining trend is about five quarters. This result confirms the above findings based on annual demand forecasts that the Hong Kong tourism market is resilient to the current financial and economic crisis and is expected to gain fast recovery.

Conclusion

This study examines the market recovery of the Hong Kong tourism industry from the current global financial and economic crisis by forecasting tourist arrivals in Hong Kong from ten major source markets (Australia, mainland China, Japan, South Korea, the Philippines, Singapore, Macau, Taiwan, the UK and the USA) up to 2015. The latest projections of the economic conditions of the source markets provided by the IMF are adopted in the forecasting process in order to gauge the ongoing recovery from the current financial and economic crisis.

The demand elasticities along with their confidence intervals are generated by an econometric approach, which are then used to produce the interval predictions of annual and quarterly tourist arrivals from the major source markets. The interval estimates of the demand elasticities are established to examine the possible impacts of changes in income levels of the major source markets, tourism prices in Hong Kong and tourism prices in alternative destinations on the demand for tourism in Hong Kong.

The analysis of demand elasticities indicates a strong relationship between the demand for Hong Kong tourism and the income levels in source markets and the price levels in Hong Kong. The tourism demand of short- and medium-haul markets exhibit higher sensitivity to price changes while the demand of long-haul markets are more sensitive to income changes. In addition, the demand for Hong Kong tourism by tourists from the growing economies (mainland China and

South Korea) is found to be highly income-elastic. It is thus important that the policymakers in Hong Kong should closely monitor the economic conditions in the source markets, particularly in the long-haul markets, also in mainland China and South Korea. In the meantime, the suppliers of tourism goods and services in Hong Kong should take appropriate pricing strategies in order to maximize their total revenues gained from different source markets given their price elasticities. However, it may not be effective to offer a deep price discount which could result in revenue decline because the demand for Hong Kong tourism in most source markets is price inelastic.

Pulling out from the deepest global economic tsunami in recent history, the world economy has started to show strong growth (IMF, 2010b). In 2010, the total number of tourist arrivals to Hong Kong is expected to rise by 4.92% and reach 31.0 million. By 2015 the total tourist arrivals are projected to be 53.8 million, indicating an average of annual growth rate of 10.5% compared to the level in 2009.

The tourism industry in Hong Kong has suffered significant losses from the long-haul markets due to the global financial and economic crisis. However, most of the major source markets are expected to recover strongly from this crisis though with varying speeds. Mainland China and South Korea are predicted to have strongest recovery from 2010 while Taiwan is likely to fail in regaining its pre-crisis level over the forecasting period. It is most likely that half of the major markets will return to their pre-crisis levels within two or three years. According to the baseline forecasts, it will take five quarters on average for these source markets to start to reverse the declining trend of demand for Hong Kong tourism. These findings provide further empirical evidence for the arguments in the literature that tourism demand is more resilient to economic crises than anticipated and the crisis has little long-lasting effects. The implication is that the tourism-related sectors in Hong Kong should carefully review their current resources (including labour, financial and human resources) and service capacities and take necessary adjustments in order to respond to demand recovery timely and effectively. Given different demand elasticities and recovery paces in different source markets, tourism businesses targeting different markets should project market-specific marketing and promotion strategies.

Compared to its performance in the past decade, the mainland Chinese market recorded a slower growth in the period 2008-2009 but will regain its vigorous development since 2010. The forecasts also show that mainland China will continue to be the largest source of tourist arrivals for Hong Kong and the market share may reach up to 75% by 2015. Therefore, tourism businesses in Hong Kong should continue to focus on this market, which is predicted to be the world's fastest growing economy over the next decade.

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