Please reference this paper as:
Cao, Z., Li, S., Song, H. and Shen, S. (2016) The Distributional Effect of Events on Rural and Urban Households in China. *Journal of Travel research*.

The Distributional Effect of Events on Rural and Urban Households in China

(Paper has been accepted for publication in *Journal of Travel Research*)

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Abstract

International tourism is considered an effective means of economic development. However, the effects of tourism are not evenly distributed between rural and urban households in China. In the wake of significant socioeconomic events, the uneven distribution of the economic effects has huge welfare implications for Chinese households. This study is the first attempt to evaluate the distributional effect of two large, recent, sequential events on China's rural and urban households. It adopts an innovative approach that combines an econometric model and a two-household computable general equilibrium model. The results show that in terms of welfare, urban households were more adversely affected by the events than rural households. To mitigate the loss of welfare, measures should be taken to continually promote China as a destination and attract tourists after such events occur. Meanwhile, training and education should be made more accessible to rural households to increase their job opportunities.

Keywords: rural-urban divide; distributional effect; impact of events; econometric model; computable general equilibrium (CGE) model.

***** Corresponding author. The authors would like to acknowledge the financial support of The Hong Kong Polytechnic University (Grant No.: B-Q34G).

1. Introduction

Many countries consider international tourism to be an effective means of improving their local economy because it can bring in foreign exchange and investment and ultimately stimulate local economic growth (Blake et al. 2008; Durbarry 2004; Schubert, Brida, and Risso 2011; Seetanah 2011). Closely associated with tourism, large events such as sporting competitions and festive celebrations are often used by governments to attract tourists and boost the local economies. However, from the perspective of the local residents, the economic benefits from these large events may not be shared evenly between households from different socioeconomic backgrounds. Consequently, the welfare levels of the households are affected differently, leading to social inequality.

The Chinese economy has long been characterized by a dualistic structure in which rural and urban areas are unequally developed. Over the past four decades of reform, China has seen a widening gap between the earnings of rural households and urban households. Although China has made significant progress in urbanization, with the percentage of urban households increasing from 26.4% in 1990 to 52.6% in 2012 (National Bureau of Statistics of China 2013), the disparity between rural and urban households persists. To bridge the gap between the two household groups, further reforms have been carried out. The latest policy announced in July 2014 aims to gradually abolish the division between rural and urban households in the public administration system (see Branigan 2014; Silk 2014; Zhang 2014). The public has widely welcomed this development, but the rural-urban disparity is set to linger for years before the target of granting 100 million migrant workers urban status is reached.

Given the welfare effects of large events on the two household groups in China, an evaluation of the *distribution of economic effects* between households has practical importance. Two large events are considered in this study: the Beijing Olympic Games in

2008 and the global financial crisis of 2008-2009. The study specifically aims to answer the following questions.

How much was China's inbound tourism demand changed by the Beijing Olympic Games, the associated visa restrictions before and during the Games, and the recent financial crisis?

How much did the changes in tourism demand affect the entire economy and industries in China?

How were the welfare effects distributed between the rural and urban households in China?

This study adopts an innovative approach that combines an econometric model and a two-household computable general equilibrium (CGE) model to evaluate the distributional effect of events.

In this study, events are understood in a general sense. *One-off events* are normally high-visibility events associated with economic, social, and political consequences and may even involve terrorism and local violence (Decker et al. 2005). *Special events* such as sporting and cultural events are normally considered to be opportunities that bring benefits to the host country (Dwyer, Forsyth, and Spurr 2005). Political and economic crises are also considered to be events, but they may have negative effects on tourism-related sectors and cause economic loss (Prideaux and Faulkner 2003).

Little research has been conducted on the economic effects of a special event and a crisis occurring in the same year or the policy implications that accompany such an occurrence. The Beijing Olympic Games were one of the largest and most important special events ever held in China. However, in the year they took place, a global financial crisis negatively affected China's international tourist industry. This study evaluates the economic

effects of the two events and discusses the policies put into place to improve household welfare.

This study makes four contributions. First, it sheds new light on the issue of the rural-urban disparity in China and its associated welfare implications, which have not been researched within the tourism and event management fields. Studies of such events have tended to report only on their total welfare effects. For event organizers and public administrative bodies, knowing how the total effects are distributed between household groups helps them to better allocate resources. Second, this study estimates the economic effects by taking into account China's household registration system, which divides households into rural and urban categories. The effect of China's household registration policy has been examined in areas such as environmental issues (e.g., Liang and Wei 2012) and China's economic opening-up policy (e.g., Hertel and Zhai 2006), but not in the fields of tourism or events. Third, this study combines the advantages of econometric and CGE modeling. Econometric models are well suited to measure the direct economic effects that result from a change in the number of tourist arrivals in the wake of these events. Meanwhile, CGE models can further extend the evaluation to the total economic effects in terms of changes to household welfare by considering the interactions between various sectors. Fourth, unlike studies that have merely focused on the distribution of positive effects from tourism between households with different income levels (e.g., Blake et al. 2008), this study is based on the perspective of tourism setbacks brought about by crises.

2. Research Background and Literature Review

2.1. The economic effects of events and effect distribution

Special events are considered opportunities for a host country to build a positive image, attract tourists, and increase economic benefits (Dwyer, Forsyth, and Spurr 2004). A number of studies have evaluated the economic effects of special events such as the Olympics in London in 2012 (Blake 2005), Beijing in 2008 (Li, Blake, and Thomas 2013), and Sydney in 2000 (Madden 2006), and other large sporting events such as the 2010 FIFA World Cup in South Africa (Bohlmann and Heerden 2005) and 2003 Rugby World Cup (URS Finance and Economics 2004). Special events are normally understood to generate large economic benefits (see Madden 2006; Blake 2005). Nonetheless, several recent studies have focused on the negative effects of large special events due to crowding-out effects and visa restrictions. Crowding-out effects arise when inbound tourists cancel or postpone their trips to avoid the high prices, long queues, and busy traffic caused by a large event (Baim 2004). In addition, for security reasons, some host countries such as China might tighten their visa rules before and during a special event (Giulianotti and Klauser 2010). As a result, the crowding-out effects and visa restrictions could offset any potential benefits derived from the special event. For example, China's tight visa policies before and during the 2008 Beijing Olympic Games deterred international tourists in 10 major source markets from visiting China and consequently cost China a welfare loss equivalent to US$193,563 million. The crowding-out effects due to the Games themselves caused a further welfare loss equivalent to US$44,337 million[1] (Li and Song 2013). However, Li and Song (2013) do not show the distribution of the welfare loss between rural and urban households, so the policy implications for the two household groups have not yet been evaluated.

As opposed to special events, crises create a negative image that decreases tourism demand and causes economic loss (Sonmez, Apostolopoulos, and Tarlow 1999). There are

two main types of crises: natural and manmade. Manmade crises can be further divided into security-related and financial crises (Li, Blake, and Cooper 2010). Page, Song, and Wu (2012) find that the swine flu pandemic and the 2008 global financial crisis decreased inbound tourism demand in the United Kingdom from 14 source markets such as the United States, Germany, Ireland, and Spain. Ritchie, Molinar, and Frechtling (2010) reveal that Canada and the U.S. were greatly affected by the global financial crisis but that Mexico was more influenced by the swine flu, the exchange rate, and weather conditions. Considering other similar crises, Eugenio-Martin, Sinclair, and Yeoman (2005) find that foot-and-mouth disease had a large negative effect on French tourists' arrivals and that the September 11th attacks had an effect on German tourists.

The economic effects of events are mainly studied at the aggregate level; however, it often remains unclear how the effects are distributed between different household groups. The distributional effect has been studied in other fields, such as international trade. One of the frameworks used to study income distribution has been the *three-channel* framework developed by McCulloch, Winters, and Cirera (2001) in the context of trade liberalization. This framework has also been applied by Blake et al. (2008) to study the role of tourism in poverty relief. The three channels are *prices*, *earnings,* and *government revenue*. In the context of tourism, it has been argued that poor households are likely to be negatively affected by the price channel because inbound tourism expenditures tend to result in increased prices and decreased real income. However, poor households may benefit from the earnings channel due to increased wages in tourism-related sectors, provided that they meet the skills required for employment in these sectors. The growth in inbound tourism generally leads to an increase in tax revenue, but the patterns of government spending dictate whether poor households are better off (see Blake et al. 2008 for more discussion). Blake et al. (2008)

find that in the case of Brazil, tourism expansion could result in welfare gains for the lowest-income households in the country, which had the potential to reduce income inequality.

Although the distributional effect of tourism on different income-level groups has been studied (e.g., Blake 2008), it has not yet been discussed in the context of households in different localities. In addition, the effects from two different types of events taking place simultaneously have not been investigated, where one event (e.g., a sporting event) improves a country's image and brings benefits and the other (e.g., a financial crisis) causes loss. In terms of event studies, it is worth investigating the distributional effects of large events on China's rural and urban households, because large events are likely to have huge welfare implications.

2.2. Approaches to evaluating the economic effects of events

The economic effects of tourism are most commonly evaluated using the input-output (I-O) and CGE methods (Li and Song 2013; Song et al. 2012; Stabler, Papatheodorou, and Sinclair 2009). Both methods incorporate the links between different sectors within an economy. Compared with the I-O method, the CGE method is considered to be more suitable for assessment of the economic effects of events, because it makes more reliable assumptions. For example, the CGE method recognizes the constraints placed on factors of production when businesses operate at or near full capacity (Li and Song 2013; Stabler, Papatheodorou, and Sinclair 2009). Therefore, the CGE method allows for price changes in the commodity and factor markets. Aggregate supply is no longer perfectly elastic, which results in displacement and negative effects on the economy. The CGE method is able to encompass the interactions between households, producers, and the government on the commodity, factor, and capital markets, whose behavior is governed by optimization principles. General equilibrium is achieved when all of the markets clear simultaneously, as opposed to partial

equilibrium, which relies on the concept of *ceteris paribus* (Stabler, Papatheodorou, and Sinclair 2009).

As articulated by Blake et al. (2006), econometric models complement the CGE method in two main respects. First, econometric models can be used to estimate tourism demand elasticities for a specific destination, which is an important parameter in CGE models. Proxies for demand elasticities are often borrowed from other studies, which is one of the main limitations in the literature. Second, econometric models can evaluate the direct effects of events on tourism demand, which is a key input in the CGE method. Econometric modeling can evaluate changes in tourism demand caused by events such as financial crises (Lim and McAleer 2005; Smeral 2010) and the Olympics (Athanasopoulos and Hyndman 2008); however, it cannot capture the total economic effect. CGE modeling can be used to evaluate the effects on the overall economy in terms of GDP and employment. Studies that use CGE models alone are based on crude estimations of changes in tourism demand, which may lead to unreliable results (e.g., Blake 2005; Madden 2006; Li et al. 2010). This study overcomes these limitations by using both econometric and CGE models in its effect assessment.

2.3. The unbalanced distribution of economic effects in China

Under the *household registration* (i.e., *hukou* in Chinese) system universally implemented across the country, Chinese residents are administratively divided into *rural* and *urban* households (see Kanbur and Zhang 1999; Sicular et al. 2007; Yao, Zhang, and Feng 2005; Yao, Zhang, and Hanmer 2004). Such a deliberate division is bound to have profound implications for the life opportunities of people with different *hukou* status (Chan and Zhang 1999), thereby leading to inequality. Tables 1 and 2 show two target variables for inequality: annual income and annual cash consumption. As the tables show, the contrast between the living conditions of the rural and urban households has been persistently striking.

<Please insert Table 1 about here>

<Please insert Table 2 about here>

The *hukou* system has certain leading administrative functions. Among others, *internal migration control* and the management of targeted people are still prevalent functions of the system (Wang 2004). *Hukou* is very much a "birth-subscribed" system, because a person's *hukou* is largely inherited from his or her parents (Chan and Zhang 1999). This facilitates the state's control of rural-urban migration by requiring anyone who seeks official sanction (i.e., to convert from rural to urban status) to complete an approval process (see Chan and Zhang 1999 for a detailed discussion). The conversion of one's *hukou* status from rural to urban is extremely appealing due to the associated improvements in areas such as education, employment opportunities, housing, and medical care (Chan and Zhang 1999).

In addition to *internal migration control*, *urban-biased policies* exacerbate the rural-urban divide. The rationale for urban-biased policies has historically stemmed from the strategy of a centrally planned system that has favored heavy industrial development and has extracted agricultural surplus largely for urban capital accumulation and urban-based subsidies (Yang 1999). With capital goods excessively concentrated in urban areas and a large fraction of the labor force restrained from leaving agriculture, the productivity and earnings of urban workers have far exceeded those of their rural counterparts (Yang 1999). Meanwhile, urban workers have been more likely to benefit from the government's financial transfer programs, because government expenditures and investments have tended to favor

the urban sector and more new loans have been channeled to urban state-owned enterprises than to rural areas (Yang 1999).

The *hukou* system has been widely criticized for creating population immobility, economic irrationality, and market segmentation and retardation. Since 2014, reforms have been proposed with a view to removing the restrictions of *hukou* conversion in small cities and relaxing the restrictions in medium-sized cities (Branigan 2014; CCTV America 2015). In the face of large events at home and abroad, the rural-urban divide has particular implications for the welfare of rural and urban households, because the effects of events are likely to be unevenly distributed. From the perspective of tourism development, the accumulation and concentration of capital under *urban-biased policies* ensure that the tourism-related sectors in the urban areas are much better established. For example, urban areas have better facilities (e.g., hotels, restaurants, shopping centers, recreational centers, and convention and exhibition centers) and infrastructure (e.g., IT services, transport, and other public services), although rural areas have more natural resources for tourism (e.g., landscapes and seaside resorts). In the meantime, the existence of *internal migration control* segments the entire country's labor force and limits the job opportunities available to rural households. As a result, the income directly and indirectly associated with tourism-related sectors is more likely to be circulated among urban households.

Although the rural-urban disparity in China has long been noted in the academic literature, the distributional effects are mainly discussed in relation to environmental issues such as carbon taxing/charges (e.g., Brenner, Riddle, and Boyce 2007; Liang and Wei 2012) and the effects of the opening-up of China's economy, such as its entrance into the World Trade Organization (e.g., Anderson, Huang, and Ianchovichina 2002; Hertel and Zhai 2006). Measurement of the distributional effect of events on Chinese households is still a new topic

and has policy relevance for future instances in which China prepares for a large special event or responds to a crisis.

2.4 The two events in China

The two events under investigation in this study are the Beijing Olympic Games (a special event) and the global financial crisis (a crisis). The former type of event is considered an opportunity to attract tourists, and the latter is likely to cause a decrease in tourism. This study is among the first to evaluate the effects of the occurrence of both types of events in the same year in a large economy.

2.4.1 Beijing Olympic Games, 2008

Special events such as the Olympic Games are expected to attract tourists and are therefore often justified on the basis of economic development. The Beijing Olympic Games were a perfect occasion to showcase China's ability to host world class events. The Games had once been anticipated to bring in half-a-million foreign visitors and additional income of US$4.5 billion to Beijing (Barboza 2008). Before the Games, a huge amount was invested in preparatory work. It has been reported that around US$40 billion had been spent on improving Beijing's urban infrastructure since 2001 (Caijing 2008; Xinhuanet 2008) and that revenue of approximately US$3 billion had been generated accordingly (National Audit Office of the People's Republic of China 2009).

Compared with the eager anticipation of the Games, the less-than-impressive turnover was mainly attributed to stringent visa regulations before the Games, along with a series of events that caused crises or disasters, such as the torch-relay protests, an alleged terrorist plot, and the Sichuan earthquake in 2008 (Li and Song 2013; Song, Gartner, and Tasci 2012). Reports and limited official announcements indicate that changes were made to visa policies, such as the suspension of multi-entry visas and an increase in visa fees (Song, Gartner, and Tasci 2012). Although these visa restrictions might not have been intended to apply to all

foreign source markets, the perception of cumbersome formalities and the diminished ability to obtain a visa could have deterred visitors from traveling. Due to the visa restrictions, China suffered a decrease of more than 10% in the number of tourist arrivals from 10 major source markets during the second and third quarters of 2008 (Song, Gartner, and Tasci 2012). In addition, although it was expected to attract inbound tourists, the Olympic Games might in fact have had some crowding-out effects, whereby tourists canceled or delayed their trips to avoid issues such as traffic jams, higher prices, and long queues (Li and Blake 2009).

2.4.2. The global financial crisis, 2008-2009

Apart from the Olympic Games, another event in 2008 that had a significant effect on the Chinese economy was the global financial crisis. It began in the U.S. as a subprime mortgage crisis but was soon transmitted across countries and ignited a global recession. For the tourism sector, international tourism began to decline during the second quarter of 2008 and plummeted by 8% in terms of arrivals between January and April 2009 (Papatheodorou, Rosselló, and Xiao 2010; Smeral 2010). Similar decreases in worldwide passenger traffic and hotel performance were recorded (Smeral 2010).

China's inbound tourism market was hit hard because its major source markets are developed countries, which were the most affected by the recession. Hence, significant losses were unavoidable. From an economic perspective, the losses could be explained by the decline of output growth in the developed world, from 2.5% in 2007 to −0.5% in 2009, and the appreciation of the Chinese yuan against the U.S. dollar, with the nominal rate changing from 7.61 in 2007 to 6.83 in 2009 (International Monetary Fund 2012; Li, Blake, and Cooper 2010).

Since the recession, studies of its implications on tourism-related sectors have appeared, such as those by Ritchie, Molinar and Frechtling (2010), Smeral (2010), and Song and Lin (2010). However, few have been dedicated to an analysis of China's inbound market.

3. Methods

Following Li and Song (2013), this study adopts a combined approach that consists of econometric and CGE modeling. This approach is supported by Blake et al. (2006). As explained in Section 2.2, the rationale for combining the two modeling methods is to provide reliable CGE model outputs for policy evaluation.

The combined approach has two steps. The first is to estimate the increase or decrease in China's tourism demand caused by the two events and to calculate the tourism demand elasticities. To this end, an econometric model known as the autoregressive distributed lags (ARDL) model was used. In the second step, the results from the ARDL model were fed into a two-household CGE model as inputs to evaluate the distributional effect of the two events on welfare.

3.1. Econometric model

An ARDL model was constructed to estimate the increase or decrease in China's inbound tourism demand caused by the events of 2008-2009. The model specification follows Song, Gartner and Tasci (2012):

$$\begin{aligned}\Delta lnTA_{it} = \alpha_0 &+ \sum_{j=1}^{p} \alpha_j \Delta lnTA_{it-j} + \sum_{j=0}^{p} \beta_j \Delta lnY_{it-j} + \sum_{j=0}^{p} \gamma_j \Delta lnP_{it-j} \\ &+ \sum_{j=0}^{p} \delta_j \Delta lnP_{ist-j} + \lambda_1 lnTA_{it-1} + \lambda_2 lnY_{it-1} + \lambda_3 lnP_{it-1} + \lambda_4 lnP_{ist-1} \\ &+ DR08G + D08G + D08F + other\ dummies + \varepsilon_{it}\end{aligned} \quad (1)$$

where

$lnTA_{it}$ is the logarithm of the number of tourist arrivals (in thousands) from source country *i*;

lnY_{it} is the logarithm of the real income level of source country *i*, denoted by the real GDP index (Year 2005=100);

lnP_{it} is the logarithm of the relative price between China and the source country *i*, calculated as $P_{it} = \frac{CPI_{China}/EX_{China}}{CPI_i/EX_i}$, which reflects the consumer price index comparison (adjusted by exchange rates against the U.S. dollar) between China and the source country, with both consumer prices (CPI) and exchange rates (EX) serving as indices (Year 2005=100);

lnP_{ist} is the logarithm of the substitute price for source country *i*, calculated as $P_{ist} = \sum_{j=1}^{5} \frac{CPI_j}{EX_j} w_{ij}$, which is the weighted average of the competing destinations' consumer price indices (adjusted by exchange rates against the U.S. dollar), and $w_{ij} = TA_{ij} / \sum_{j=1}^{5} TA_{ij}$ (TA_{ij} is the number of tourist arrivals to competing destination *j* from source country *i*), with Hong Kong, Taiwan, Japan, South Korea, and Singapore serving as the five competing destinations;

DR08G is a dummy variable that denotes the implementation of visa restrictions before and during the Beijing Olympic Games (=1 for 2008 Q2-Q3);

D08G is a dummy variable for the Beijing Olympic Games (=1 for 2008 Q3);

D08F is a dummy variable for the recent financial crisis (=1 for 2008 Q3-2009 Q4);

other dummies include seasonal dummies, dummy variables for the Tiananmen Square Incident and subsequent visa restrictions in 1989, the Asian financial crisis in 1997, the September 11th terrorist attacks in 2001, and the SARS epidemic in 2003;

p is the number of lags determined by the Akaike information criteria (AIC) and the Schwarz information criteria (SIC); and

α, β, γ, δ, and λ are the unknown coefficients to be estimated, and ε_{it} is the error term.

The selection of the preceding variables is well documented in the tourism demand modeling/forecasting literature and is backed by consumer demand theory in economics in addition to empirical evidence (see Dwyer, Forsyth, and Dwyer 2010; Li, Song, and Witt 2005; Stabler, Papatheodorou, and Sinclair 2009). The dataset covers 10 major source markets for China: Australia, Canada, France, Germany, Japan, Korea, Malaysia, Singapore, the United Kingdom, and the United States. Quarterly data for the real GDP and the consumer price and exchange rate indices were collected from the international financial statistics database of the International Monetary Fund, the *OECD.stat* database of the Organization for Economic Co-operation and Development, and the National Statistics Bureau of China. The data for tourist arrivals were collected from the Yearbook of China Tourism Statistics published by the National Tourism Administration of China (2009).

From the ARDL model, two main sets of results were derived: the increase or decrease in tourist arrivals due to the events and the long-run demand elasticities. The change in tourist arrivals was calculated as the difference between the model fitted values of the tourist arrival variable and its projected (i.e., counterfactual) values in which the dummy variable for an event takes the value of zero. This difference reflects the tourism demand gap that China could have filled were it not for the event. The long-run demand elasticities were calculated as follows (using the estimated values): $-\hat{\lambda}_2/\hat{\lambda}_1$ for income elasticity, $-\hat{\lambda}_3/\hat{\lambda}_1$ for own-price elasticity, and $-\hat{\lambda}_4/\hat{\lambda}_1$ for cross-price elasticity (see Song, Gartner, and Tasci 2012).

3.2. Computable general equilibrium (CGE) model

A Chinese CGE model with two household groups, *rural and urban*, was applied to evaluate the distributional effects of the two recent events in 2008-2009. The model is a single-country

static model calibrated to the 2007 China I-O tables with 42 sectors. The I-O tables were the main data sources for this model. They provided data indicating "the interaction between economic activities of various economic agents for a given year" (Li and Song 2013, 260). The Chinese model was based on the standard model structure of Lofgren, Harris and Robinson (2002). The main function forms used in the CGE models are the Leonitief, Cobb-Douglas, constant elasticity of substitution, and constant elasticity of transformation functions.[2] The price elasticity of tourism demand (−0.802) was the key parameter of the CGE model, taken from Song, Gartner and Tasci (2012).

To evaluate the economic effects of changes in tourism demand, the CGE model was extended to include a new sector (the tourism export sector) and a new consumer group (international tourists). The details of the introduction of tourism into the standard CGE model are explained by Wattanakuljarus and Coxhead (2008) and by Li, Blake, and Cooper (2011).

The extended model includes two additional functions. The Cobb-Douglas function represents the aggregate price of international tourism

$$p^T = \lambda \prod_n p_i^{\alpha_i} \tag{2}$$

where p^T is the aggregate price of international tourism, λ is a shift parameter, p_i is the individual product price, and $\sum_i \alpha_i = 1$.

A function of the aggregate tourism price can represent the demand for the Cobb-Douglas aggregate product:

$$q^T = \overline{Q^T} \left(\frac{e}{p^T} \right)^{\mu-1} \tag{3}$$

where q^T is the quantity demanded by inbound tourists, $\overline{Q^T}$ is the benchmark quantity demanded by inbound tourists, *e* is the exchange rate, and μ is the price elasticity of tourism demand.

Two household groups were incorporated into the CGE model, which was constructed on a three-channel framework: *prices*, *earnings*, and *government revenue* (Blake et al. 2008). This study focuses on the price and earnings channels and omits the government channel. Although, from the perspective of poverty reduction, the government channel is important in terms of redistribution of income (McCulloch, Winters, and Cirera 2001; Blake et al. 2008), the situation is slightly different when it comes to one-off events. The fact that the two recent events occurred within a relatively short period of time and that their major influences took place a few months afterward (see Song, Gartner, and Tasci 2012) mean that the government might not have been able to react in a timely manner by changing its spending and tax rates. Therefore, the government channel was not explored in this study.

The price channel captures the effects brought about by changes in the prices of different goods due to an event. The breakdown of spending of the two household groups on different goods in 2008 has already been shown in the China I-O tables. The urban households spent US$143.8 billion, and the rural households spent US$484 billion. In the CGE model, the price channel can be reflected through household spending, which is calculated by multiplying prices by quantity. When an event has negative effects and decreases inbound tourism expenditure, the prices of tourism-related products decrease. In China, urban households spend more on tourism-related products such as flights, hotels, and restaurants, so they are better off when accounting for the prices channel.

The earnings channel captures the changes in income earned by different labor groups. The labor earnings from 42 sectors were separated for the rural and urban labor forces based

on various data sources, including the China I-O table, 2008 China Statistical Yearbook, China Rural Household Survey, and 2008 China Financial Yearbook. The total rural and urban labor earnings were US$1580 billion and US$610 billion, respectively. A decrease in tourism demand due to an event may cause a decrease in employment in tourism-related sectors and a decrease in household earnings. Because urban households obtain more earnings from tourism-related sectors in China, they are more affected by the earnings channel. Given that rural and urban households purchase different types of goods and are employed in different sectors, an event brings about different effects on households through the two channels.

The results from the CGE model are presented at both the macroeconomic and industry levels. One of the key indicators used at the macroeconomic level was equivalent variation (EV), which measured the effect of the Olympics and the financial crisis in terms of welfare. EV is "the amount of income that would have to be given to (or taken away from) the economy before the policy change (or an external shock) to leave the economy as well off as the economy would be after the policy change" (Andriamananjara et al. 2004, 17). Unlike the GDP, which includes income earned by both non-residents and governments, EV is capable of capturing the welfare of local residents. Studies that used CGE modeling often presented model results in terms of EV values (Ahmed 2008; Fane and Ahammad 2003; Ye, Lee, and Chen 2006).

4. Results and Analysis

4.1. The loss of tourism demand

The two recent events resulted in a loss in terms of international arrivals to China, because there were fewer tourists than the econometric model's projected level. Based on the econometric model described in Section 3.1, this loss in tourism demand before and during the Beijing Olympic Games (2008 Q2-Q3) was an estimated 1238 thousand arrivals from 10 major source countries. In monetary terms, the loss of arrivals implies a loss equivalent to US$1174.7 million in tourism receipts to China. Calculations show that the decline in tourist arrivals during the financial crisis of 2008-2009 was 530 thousand arrivals from the 10 countries, with an associated loss of tourism receipts totaling US$530.5 million.

The preceding figures were further processed to estimate the loss in tourist arrivals and tourism receipts from all foreign source countries to China. Table 3 presents the overall loss from China's inbound tourism.

<Please insert Table 3 about here>

The two events and the visa restrictions associated with the Olympics had sizable negative effects. In particular, because the Olympics were expected to increase tourist arrivals, the organizers and the government were insufficiently prepared and did not have proper strategies in place to address the negative results attributed to crowding-out effects. The visa restrictions along with the crowding-out effects may well explain why the Beijing Olympic Games adversely affected the Chinese economy.

4.2. The distributional effect

Before the distributional effect on rural and urban households is presented, the total economic effect of the two events is discussed. Table 4 shows the total economic effect, calculated from the CGE model. The key results for welfare loss in row (b) are stated in terms of EV. Before and during the Beijing Olympic Games, the total household welfare declined by US$415.7 million, US$338.2 million of which resulted from the visa restrictions and US$77.5 million from the Olympics themselves.

According to row (b), the welfare loss from the Olympics (US$−415.7 million) was much higher than the loss from the global financial crisis (US$−184.0 million). One potential reason for this is that the Olympics were held in China, which had a direct effect on inbound tourists traveling to China. In contrast, the global financial crisis initially occurred in the U.S. and affected China's tourism indirectly.

<Please insert Table 4 about here>

The contracted tourism demand resulted in a decreased price, as shown in row (d). The scale of real tourism consumption in row (c) is lower than the loss of tourism receipts in row (a), because the former considers the effects of price changes in row (d). In other words, the decreased prices counteracted the decrease in real tourism consumption.

Table 5 depicts the total industry effect of China's inbound tourism due to the Olympics and the financial crisis. The 44 sectors in the China IO tables are grouped into three categories: primary, secondary, and tertiary. The primary industries mainly include the agricultural sectors; the secondary industries include the manufacturing sectors; and the tertiary industries refer to the service sectors, which include tourism-related areas such as transportation, accommodation, and catering. The two events that occurred during 2008-2009

decreased tourism demand, which further decreased the use of labor and capital in the tourism-related sectors. It is implied that more employees in tourism-related sectors lost their jobs or were paid less. This is reflected in the decrease in labor and capital used in the tertiary industries. Urban labor suffered a larger decline (US$−330.3 million) in the tertiary industries than rural labor did (US$−104.1 million), which can be attributed to the larger number of employees in tertiary industries among urban households.

Apart from urban labor used in the primary industries, an increase in the value of labor and capital use can be observed in both the primary and secondary industries. This can be explained as an effect of reallocating labor and capital resources from the tertiary industries to the primary and secondary industries. For example, an employee working in a restaurant (a tertiary industry) might have lost his or her job in the wake of a decrease in inbound tourism demand; consequently, he or she might have ended up with a new job in a company manufacturing clothes (a secondary industry).

A larger value of rural labor (US$90.1 million) was reallocated to primary industries. From the perspective of the labor supply, rural households tend to consist of more unskilled and/or semi-skilled laborers due to the financial difficulties involved in gaining access to higher education. Therefore, it is likely that these households would be reallocated to primary industries. However, because factories are mainly located in urban areas, those with an urban *hukou* are more favored in the urban job market. The *hukou* system practically imposes a barrier that prevents rural labor from accessing certain job opportunities in secondary industries in urban areas. The secondary industries are capital intensive and are allocated a greater value of capital use totaling US$774.0 million.

In terms of the value of urban labor use, the reallocation is not only from tertiary to secondary industries, but also from primary to secondary industries. Urban households, which hold urban *hukou* status and provide more semiskilled and skilled labor, have much more

flexibility in choosing whether to work in primary or secondary industries. A smaller decrease in the price index can thus be observed in the secondary industries (−0.104). This further led to a smaller decrease in supply and in labor wages than in the primary industries. Therefore, it can be concluded that the value of urban labor in both the primary and tertiary industries flowed to the secondary industries.

A negative percentage change in the price index can be observed across all three industries. The decline in tourism demand brought down the prices in the tourism-related sectors (tertiary). As the primary (agricultural) and secondary (e.g., construction and food processing) industries were direct or indirect suppliers to the tourism-related sectors, a decreased tourism demand caused a decrease in the demand for those suppliers in the other two industries, which further decreased their price index. The secondary industries experienced a smaller decrease in the price index (−0.104) than the primary industries (−0.110). Because the secondary industries were much larger in scale than the primary industries, the effect on the price index of the former was smaller.

<Please insert Table 5 about here>

The distributional welfare effects of the Olympics and the financial crisis between rural and urban households are displayed in Table 6. In general, the visa restriction policies, Olympics and financial crisis had much larger negative welfare effects on urban households than on rural households. The total welfare loss of urban households was US$468.5 million, more than three times larger than that of rural households (US$131.2 million). In other words, of the total welfare effects (US$−599.8 million), the greater effects (above 78% of the total)

were distributed to urban households, and much smaller effects (below 22% of the total) were distributed to rural households.

<Please insert Table 6 about here>

The earnings and price channels within the three-channel framework can mainly explain this. First, the earnings effects were higher for urban households. Although many tourism-related sectors such as restaurants and hotels require low- and medium-skilled labor, there are more urban households working in these sectors because more tourism-related sectors are located in urban areas and many of them require an urban *hukou*. The fact that more urban households are employed in tourism-related sectors results in a larger change in the income earned from these sectors. The Olympics and financial crisis caused a decline in tourism demand, which temporarily led to a contracted tourism sector. This brought a larger welfare loss to urban households. Second, the price channel plays an opposing role to the earnings channel. A decline in tourism demand brought about a slightly decreased price index in the tourism-related sectors, which slightly increased real income levels. This means that the price channel slightly offset the negative welfare effects brought on by the earnings channel.

5. Policy Implications

The estimation results show that the two events under consideration brought about a substantial welfare loss to Chinese households, thanks to the crowding-out effects and visa restrictions before and during the Beijing Olympic Games and the global economic crisis. Overall, urban households suffered 3.6 times as much welfare loss as rural households (see Table 6). To mitigate such loss measures should have been taken to generate income from tourism activities and to distribute income more equally between the rural and urban households.

For the Olympics event organizers and the local governments, the measures could have focused on increasing tourism activities and supporting tourism-related businesses in the short term. Although the Olympic Games were supposed to generate a positive effect, they actually brought welfare loss to the country's households. Hence, there should have been contingency plans in place to deal with potentially adverse situations. In view of the visa restrictions on international tourists, attracting domestic tourists could have been one way to increase tourism demand for Beijing. This could also have counteracted the negative effects of the global financial crisis. The local Beijing government could have made use of the National Stadium to host other events such as concerts to boost tourism following the Games. Meanwhile, ongoing marketing efforts could have been made to entice both international and domestic tourists to visit Beijing after the Olympics. Along with these measures to increase tourism activities, the local government might have considered providing subsidies to the tourism-related businesses affected by the events so that they could weather the economic downturn.

In the long term, measures to mitigate welfare loss may focus on addressing the rural-urban divide. That requires retraining of people who lose their jobs and are shifted to other industries. According to Table 5, urban households employed in tertiary industries are likely

to be reallocated to secondary industries such as manufacturing, and rural households are likely to be reallocated to primary industries including agriculture, partly due to the lower skill sets required. Training in the skills required to work at manufacturing firms can be provided to the urban households affected, and subsidies for purchasing seeds and fertilizer for plants can be offered to the affected urban households. More fundamentally, education can be made more accessible for the rural households to increase their employability, which ultimately translates into higher income.

Long-term measures should include fostering a balanced development of the tourism-related sectors between the rural and urban areas. As discussed in Section 2.3, the urban-biased policies and internal migration control implemented through the *hukou* system have created economic segmentation and inequality in China. The potential of tourism to boost the local economies, as predicted by the tourism-led-growth hypothesis (e.g., Kim, Chen, and Jang 2006; Nowak, Sahli, and Cortes-Jimenez 2007), has rendered tourism development an ideal means of alleviating the rural-urban divide. Hence, government policies should facilitate capital accumulation and job creation in the rural areas. This means further investment in infrastructure (e.g., highways and railways) to access rural areas and in tourism facilities (e.g., hotels, hostels, and restaurants). Job opportunities for rural households would accompany these investments. For example, rural households could become involved in tourism. As Blake (2008) comments, "tourism is not necessarily pro-poor ... if the poor are not involved in tourism either actively or passively, tourism activities might serve to deepen social inequalities and widen the gap between those with access to capital and those who are landless and on the threshold of subsistence." By securing job opportunities, rural households can benefit from tourism development and improve their welfare level.

6. Concluding Remarks

Given its far-reaching links to other sectors, tourism is bound to have economy-wide effects when it is influenced by various events. In China, the economic effects associated with changes in tourism demand are unevenly borne by rural and urban households. As such, balancing the distribution of economic effects has a profound significance for the overall welfare of the society.

This study finds that due to the deterrence of inbound visits during 2008-2009, urban households in China suffered 3.6 times as much welfare loss as their rural counterparts. However, urban households gain much greater economic benefits when advantageous events such as the Olympics do take place. This contrast clearly points to the need for measures that counter the rural-urban divide.

From a methodological standpoint, this study represents an additional attempt to complementarily use the econometric and CGE models at different stages of estimation to obtain more accurate results. The two-household CGE model also makes it possible to evaluate economic effects in detail. One limitation is that the econometric model relies on the availability of relevant data such as macroeconomic and tourism demand variables; the CGE model requires national account data and IO tables. The data may be published for some destinations only, and the observations may cover a short period of time, which makes it difficult to conduct the modeling exercise. This study conducts a post-event evaluation that provides implications for future events.

Future studies can apply the approach developed in this study to conduct pre-event evaluations of the distributional effects of events and by doing so offer suggestions for event management even before the events occur.

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Table 1 – Per Capita Annual Income of Rural and Urban Households

Unit: thousand US$

	1990	**2000**	**2010**	**2011**	**2012**
Urban (a)	0.27	0.60	1.99	2.35	2.64
Rural (b)	0.08	0.16	0.57	0.73	0.86
Ratio(c)=(a)/(b)	2.2	2.8	3.2	3.1	3.1

Source: China Statistical Yearbook, National Bureau of Statistics of China, 2013; adjusted by the annual average exchange rate.

Table 2 – Per Capita Annual Cash Consumption of Rural and Urban Households

Unit: thousand US$

	1990	2000	2010	2011	2012
Urban (a)	0.32	0.76	2.82	3.38	3.89
Rural (b)	0.14	0.27	0.87	1.08	1.25
Ratio(c)=(a)/(b)	3.4	3.9	3.5	3.2	3.1

Source: China Statistical Yearbook, National Bureau of Statistics of China, 2013; adjusted by the annual average exchange rate.

Table 3 – The Loss of China's Inbound Tourism from Foreign Source Markets

	Olympic Games, 2008		**Financial crisis, 2008-2009**
	Due to visa restrictions	Due to the Olympics	Due to the crisis
Tourist arrivals (a) (thousand persons)	-1,780.8	-413.2	-921.4
Tourism receipt per capita (b)(thousand US$)	0.950	0.946	1.001
Tourism Receipts(c)=(a)*(b)(million US$)	-1,691.1	-390.7	-922.0

Source: Li and Song (2013), Song, Gartner and Tasci (2012), and the authors' own calculation from the econometric model.

Note: The values (b) and (c) are at the 2008 price.

Table 4 - Macroeconomic Effect of China's Inbound Tourism

	Olympic Games, 2008		**Financial crisis, 2008-2009**
	Due to visa restrictions	Due to the Olympics	Due to the crisis
Loss of tourism receipts (a)(million US$)	−1691.1	−390.7	−922.0
Welfare loss (b)(million US$)	−338.2	−77.5	−184.0
Real tourism consumption (c)(million US$)	−1670.2	−385.0	−910.3
Price of inbound tourism consumption (%)(d)	−0.067	−0.015	−0.036

Source: The authors' own calculation from the econometric model.

Table 5 - The Effect on Factor Use at the Industrial Level

	Primary	Secondary	Tertiary
Value of urban labor use (million US$)	−53.8	384.1	−330.3
Value of rural labor use (million US$)	90.1	14	−104.1
Value of capital use (million US$)	5.5	774	−779.5
Price index (%)	−0.110	−0.104	−0.117

Source: The authors' own calculation from the CGE model.

Table 6 - Welfare Effects (Losses) on Rural and Urban Households

	Olympic Games, 2008		**Financial crisis, 2008-2009**	**Total**
	Due to visa restrictions	Due to the Olympics	Due to the crisis	
Urban households (a)(million US$)	−265	−59.8	−143.7	−468.5
Rural households (b)(million US$)	−73.2	−17.7	−40.4	−131.2
Total (c)=(a)+(b)	−338.2	−77.5	−184	−599.8
Ratio (d)=(a)/(b)	3.6	3.4	3.6	3.6

Source: The authors' own calculation from the CGE model.

Endnotes

[1] Welfare loss is denoted by the equivalent variation (EV). This is discussed in Section 3 ("Methods").
[2] A detailed explanation of these functions can be found in a study by Li, Blake and Cooper (2011).