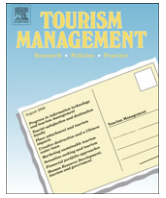




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Analysis of international tourist arrivals in China: The role of World Heritage Sites

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ABSTRACT

This paper analyzes the determinants of international tourist arrivals in China, especially for World Heritage Sites and various kinds of travel spots. Utilizing annual provincial panel data over the 2000–2005 period, the empirical results suggest that key determinants include the relative income, population in the original country, cost of travel, and tourism infrastructure. In addition, World Heritage Sites are also found to be significant in explaining the numbers of international tourists and have a greater tourist-enhancing effect. Other famous tourist sites rated 4A- and 3A-class are also attractive to foreign tourism. Moreover, cultural rather than natural sites attract more interest among foreign tourists, because China is internationally renowned for its long-standing historical and cultural assets. Finally, the importance of the determinants of the demand for tourism varies from country to country.

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1. Introduction

The tourism industry is now without doubt the largest industry in the world. In 2006, about 800 million international tourists expended some US\$735 billion dollars. The World Tourism Organization (2000) predicts that international tourist arrivals worldwide will, by the year 2020, reach 1.6 billion persons and tourism receipts will exceed US\$2 trillion. Moreover, the tourism industry has a strong linkage effect that benefits other service industries by creating jobs and earning foreign exchange. Meanwhile, the pollution produced by this industry is recognized to be lower compared to the manufacturing sector. Therefore, many countries have channeled greater efforts into developing their tourism industry in order to promote economic growth.¹ Indeed, income from tourism constitutes the largest 'export' and often exceeds one-fourth of the GDP of many small developing countries. An increasingly large number of studies have been devoted to investigating the determinants of the demand for tourism, such as Naude and Saayman (2005) for Africa, Dhariwala (2005) for India, Dougan (2007) for Guam, Dritsakis (2004) for Greece, and Maloney and Montes Rojas (2005) for Caribbean destinations.²

In the global tourism market, China is a latecomer. Before its "open door policy" was initiated in the late 1970s, China was closed

to the outside world and cloaked in mystery. In 1986, China started to expand its tourism industry as part of its national plan for economic development by improving infrastructure and service facilities for international tourism. Benefiting from rich tour resources, such as numerous scenic spots and historical sites, long cultural traditions and colorful folk customs, China has subsequently attracted a huge number of international tourists every year since the early 1990s.³ Its great potential in developing tourism has been evident in the rapid growth in the number of tourists, and foreign exchange earnings (see Table 1).⁴

After the 1989 Tiananmen Square protests, the number of international tourists experienced a steady upsurge in each year, except in 2003 when the Severe Acute Respiratory Syndrome (SARS) epidemic prevailed in China. It increased from 10.484 million persons in 1990 to 49.913 million persons in 2006 and in terms of the corresponding ranking for international tourism China climbed from 11 to 4. Even in 2003 when SARS prevailed in China, the number of international tourists still amounted to 11.403 million persons. Since 2006, China has been ranked as the world's fourth largest tourism destination behind France, Spain, and the U.S., but ahead of Italy, thus reflecting the popularity of China in the global tourism market. In 2006, China accounted for 5.89 percent of the world total in terms of revenue from tourism. On the other hand, the international revenue from tourism increased more than

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¹ In the tourism literature, there is the argument of a tourism-led growth hypothesis.

² As for the earlier literature, see Crouch (1994) for a comprehensive survey.

³ For China's international tourism development, see Zhang, Pine, and Zhang (2000).

⁴ Tourists from Hong Kong, Macau, and Taiwan are not included as international tourists in China's tourism statistics.

Table 1
International tourist arrivals and foreign exchange earnings of China.

Year	Overnight tourism (millions)	Rank	Foreign exchange earnings (US\$ millions)	Rank
1986	9.001	12	1531	22
1987	10.760	12	1862	26
1988	12.361	10	2247	26
1989	9.361	12	1860	27
1990	10.484	11	2218	25
1991	12.464	12	2845	21
1992	16.512	9	3947	17
1993	18.982	7	4683	15
1994	21.070	6	7323	10
1995	20.034	8	8733	10
1996	22.765	6	10,200	9
1997	23.770	6	12,074	8
1998	25.073	6	12,602	7
1999	27.047	5	14,099	7
2000	31.229	5	16,224	7
2001	33.167	5	17,792	5
2002	36.803	5	20,385	5
2003	32.971	5	17,406	7
2004	41.761	4	25,739	7
2005	46.809	4	29,296	6
2006	49.913	4	33,949	5

Source: National Tourism Administration of China and World Tourism Organization (UNWTO).

15 times from US\$2.218 billion dollars in 1990 to US\$33.949 billion dollars in 2006 and accounted for 1.272% of gross domestic product. While China has served as an important tourism destination in the global tourism market, the analysis of international tourism has attracted little attention among economists, suggesting the need for a systematic investigation.

To develop the tourism industry, the construction of infrastructure and service facilities are deemed to be essential inputs. The more important question is what can be done to attract international tourists and how? As suggested by Dritsakis (2004), popular tour destinations have an *a priori* focus on tourism-related “raw materials” that refer to a combination of natural, cultural, and man-made elements that are closely related to the demand for tourism. These “raw materials” are unique to the tour destination and therefore cannot be transferred or reproduced in another location. Therefore, there is no doubt that a country with various kinds of travel spots, such as natural landscapes, historical sites, cultural traditions, or specific modern facilities, has a relative advantage when it comes to attracting tourists in the global tourism market. Among these factors, the scenic spots, which are inscribed on the list of World Heritage Sites (hereafter, WHSs) by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), are extremely attractive for global tourists. While the initial purpose in listing the World Heritages was to protect and maintain these tangible and intangible assets belonging to humankind, these scenic spots have been treated as the main tourism resources in many countries. In fact, heritages are regarded as a significant and rapidly growing factor in tourism and have been identified as a major driving force for further growth in many developed countries (Herbert, 2001; McIntosh & Prentice, 1999). Moreover, heritage tourism can help develop a national image and produce a national identity (Li, Wu, & Cai, 2008).⁵ However, it is widely argued that a conflict between heritage protection and tourism development may exist. That is, are the WHSs being

overloaded with tourists resulting in their gradual destruction? This question has elicited serious concerns among experts in various disciplines. Given the importance of this question, one essential issue is to clarify how and to what extent WHSs affect tourism. It is surprising that this important issue has been little explored.

Based on the motivations discussed above, this study aims to analyze the determinants of international tourist arrivals in China and to contribute to the literature in the following ways. First, this paper is the first empirical study to investigate the determinants of tourists who visit China. Specifically, we place more emphasis on analyzing the influence of World Heritage Sites in terms of attracting tourists. By nature, the number of historical, natural and cultural sites is fixed over time, since they were established in the past. However, what changes is the label given by UNESCO after the Chinese authorities proposed the applications. The impact of such labeling recognition on tourism demand is an important topic especially for regional development. By utilizing a panel dataset, this study can provide preliminary evidence on whether the increase in the number of WHSs has really attracted more international tourist arrivals.⁶ Secondly, by separating historical and cultural spots from natural landscapes and modern tourist spots in the estimates of the tourism demand equation, this study compares their potential differences in affecting the numbers of tourists among the various kinds of traveling spots. Third, we divide the entire list of sourcing countries into several sub-samples to examine the potential differences in their tourism behavior in China.

The rest of this paper is organized as follows. Section 2 briefly introduces the WHSs inscribed by UNESCO and discusses their potential impacts on international tourism. Moreover, the spot classifications of China are also introduced. By borrowing from the commodity version of the gravity model, this study develops a new empirical specification of the tourist demand equation in Section 3. In addition, we introduce the dataset utilized in this study. Section 4 reports the empirical results, while Section 5 provides a further comparison of tourism behavior across countries. Concluding remarks are summarized in the final section.

2. World Heritage Sites, traveling spots, and international tourist arrivals

2.1. World Heritage Sites and tourists

In order to attract international tourists, many countries may devote their efforts to developing travel sites with distinguishing features. Although the construction of modern recreational facilities, such as casinos, amusement parks, complex skyscrapers, and so on is actually one of a number of feasible strategies to promote the tourism industry, the abundance and diversity of natural and cultural resources are widely recognized as essential tourism assets for a country to develop its tourism industry. Specifically, tourist sites which are listed as World Heritage Sites by UNESCO are treated as catholicons in promoting the tourism industry.

Along with economic development and industrialization, most cultural and natural heritages are increasingly threatened by destruction resulting from the traditional causes of decay and by changing social and economic conditions which aggravate the situation. In noting this formidable phenomenon of damage or destruction and considering that protection of this heritage at the national level often remains incomplete, the World Heritage

⁵ From the viewpoint of domestic tourists, heritage tourism is recognized as an effective way of achieving the educational function of tourism (Dean, Morgan, & Tan, 2002; Light, 2000).

⁶ To evaluate the impact of the labeling policy on tourism demand, a more appropriate strategy is to examine the change in tourism demand of an individual traveling site before and after its being listed as a World Heritage Site.

Table 2
Total number of properties inscribed (Cumulated).

Year	Total inscribed	Inscribed in China	Ratio (China/Total)
1990	335	7	2.09%
1991	357	7	1.96%
1992	377	10	2.65%
1993	410	10	2.44%
1994	439	14	3.19%
1995	468	14	2.99%
1996	505	16	3.17%
1997	551	19	3.45%
1998	581	21	3.61%
1999	629	23	3.66%
2000	690	29	4.20%
2001	721	30	4.16%
2002	730	30	4.11%
2003	754	33	4.37%
2004	788	35	4.44%
2005	812	35	4.31%
2006	830	35	4.21%
2007	851	35	4.11%

Source: United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Convention of UNESCO in 1972 began to enact an international treaty called the Protection of the World Cultural and Natural Heritage. The World Heritage mission is to encourage the identification, protection, and preservation of cultural and natural heritages around the world, which are considered to be of outstanding value to humanity.

According to the heritage classifications defined by UNESCO, world heritages are classified into three categories: cultural, natural, and mixed (both cultural and natural) heritages.⁷ The World Heritage Committee meets once a year and has the final say on whether a property is inscribed as a World Heritage Site. As shown in Table 2, the number of sites inscribed by UNESCO has increased from 335 in 1990 to 851 in 2007. Benefiting from its long history and abundance of landscapes, China has many sites that are being inscribed on the list of WHSs. The number of sites in China included as WHSs has increased steadily from 7 in 1990 to 35 in 2007, ranking China in third place behind only Italy and Spain. Over that same period, the ratio of Chinese world heritages to the overall total has increased steadily from 2.09% in 1990 to 4.11% in 2007.

Although the list of world heritages aims to identify, recognize and protect those sites with global value, there are at least two advantages that inscribed world heritages have in terms of contributing to national tourism. First, the WHSs are widely used in marketing campaigns to promote national tourism. The marketing campaigns for WHSs can increase the global visibility of destinations and in that way attract huge numbers of international tourists. For example, in 1999, *National Geographic Traveler* showcased 50 of the world's top destinations or places that every curious traveler should visit in a lifetime. Among those destinations, except for recommended cities, most sites were listed as WHSs. This report seems to be regarded as a traveling Bible for international tourists and therefore has resulted in huge numbers of tourists visiting World Heritage Sites, and forming a wave of heritage tourists. Second, a developing or poor country perhaps lacks the economic, scientific, and technological resources to protect and maintain these heritages. Once sites are inscribed on the list of WHSs, UNESCO will provide financial as well as technological aid to repair and maintain those heritages, thereby helping the heritages to be preserved. These two advantages are quite important for developing countries and they are therefore aggressive in submitting famous sites in order to obtain a world heritage listing.

⁷ In 2001, UNESCO added one new category of world heritage: the oral and intangible heritage of humanity.

However, there is a long-standing conflict between heritage protection and tourism development. World heritages can attract large numbers of tourists and then generate revenue and create jobs. Alternatively, WHSs draw world attention to their significance and attract excessive numbers of visitors, with the result that they have the potential to destroy the environmental and cultural integrity of World Heritage Sites, because they were not designed to accommodate millions of tourists when they were built. This is in conflict with the initial goal of the World Heritage Convention, which was to protect and retain the sustainability of these sites.⁸ To clarify this debate, the prerequisite is to assess the extent to which World Heritage Sites attract international tourists, and then information can be provided regarding the potential damage caused by the overloading of tourists.

2.2. China's scenic sites

Although World Heritage Sites are accepted as the main attractive destinations, a country without any WHSs can also attract the attention of international tourists because each country has unique and charming features that other countries do not possess. In addition to the distinguishing features of World Heritage Sites, China possesses rich tourism resources including many splendid landscapes, a venerated history, and a rich cultural legacy which have added to the fascination of China as a dream destination of international tourists.

The year 2000 was a key year for China's tourism industry in regard to inheriting the past and ushering in the future. A large number of rules, regulations and documents related to tourism were put forward in that year, and played a key and guiding role in the development of the tourism industry. In the field of strengthening macro-management, in combination with the systemic introduction of national spots to domestic and foreign visitors, the China National Tourism Administration (CNTA) issued the "Managerial Methods for Planning Tourism Development" which was based on a modification of the "Temporary Methods on the Management of Tourism Development Planning" issued in 1999.

One measure of the development planning is the work of classification and the evaluation of tourist areas and spots. According to twelve criteria used to assign the corresponding points and sum up,⁹ tourist spots are classified into four classes: 4A, 3A, 2A and 1A. The 4A-classification is the highest class, representing the spot within a province that is the most worth visiting.¹⁰ By October 2000, the work of classifying and evaluating 215 4A-class tourist spot candidates in 31 provinces had proceeded smoothly. At first a group of 187 tourist areas (spots) won the honor of being regarded as 4A-classifications. The final list included 99 famous national historical and cultural cities, 750 national cultural sites under key protection, and 119 major scenic resorts and sites of historical and cultural interest. In the same year, 27 renowned scenic places were also inscribed on to the lists of world cultural and natural heritage sites. According to the rating standard, CNTA reviews the spots each year and accepts new applications to be registered as A-class spots. The distribution of spots included as A-class spots in 2001 is displayed in Table 3a and b.

By looking at Table 3a and b, it is apparent that the distribution of spots is unequal geographically. The number of A-class spots

⁸ For example, Wager (1995) discussed how to achieve a balance between the strict protection of archaeological sites and the planned development of tourism, as well as urban and rural development in the Angkor region.

⁹ For detailed information concerning these twelve criteria, please refer to the CNTA website, <http://www.cnta.gov.cn>.

¹⁰ In 2004, CNTA revised the classifications of spots into five categories: 1A–5A.

Table 3a
Number distribution of world heritage sites in each province.

	2000	2001	2002	2003	2004	2005
Beijing	5	5	5	6	6	6
Tianjin	0	0	0	0	0	0
Hebei	3	3	3	3	3	3
Shanxi	1	2	2	2	2	2
Neimenggu	0	0	0	0	0	0
Liaoning	0	0	0	0	1	1
Jilin	0	0	0	0	1	1
Heilongjiang	0	0	0	0	0	0
Shanghai	0	0	0	0	0	0
Jiangsu	1	1	1	2	2	2
Zhejiang	0	0	0	0	0	0
Anhui	2	2	2	2	2	2
Fujian	1	1	1	1	1	1
Jiangxi	1	1	1	1	1	1
Shandong	2	2	2	2	2	2
Henan	1	1	1	1	1	1
Hubei	2	2	2	2	2	2
Hunan	1	1	1	1	1	1
Guangdong	0	0	0	0	0	0
Guangxi	0	0	0	0	0	0
Hainan	0	0	0	0	0	0
Chongqing	1	1	1	1	1	1
Sichuan	4	4	4	4	4	4
Guizhou	0	0	0	0	0	0
Yunnan	1	1	1	2	2	2
Tibet	1	1	1	1	1	1
Shaanxi	1	1	1	1	1	1
Gansu	1	1	1	1	1	1
Qinghai	0	0	0	0	0	0
Ningxia	0	0	0	0	0	0
Xinjiang	0	0	0	0	0	0

Source: United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Table 3b
Number distribution of A-class spots in each province, Year 2000.

Province	4A	3A	2A	1A
Beijing	17	4	22	4
Tianjin	2	0	9	1
Hebei	15	1	0	0
Shanxi	3	0	0	0
Neimenggu	0	1	0	0
Liaoning	9	9	0	0
Jilin	4	0	37	3
Heilongjiang	3	5	21	2
Shanghai	6	0	0	0
Jiangsu	21	4	13	3
Zhejiang	10	6	0	0
Anhui	5	1	32	12
Fujian	8	0	0	0
Jiangxi	7	2	0	0
Shandong	11	16	26	4
Henan	6	14	0	0
Hubei	8	3	0	0
Hunan	9	8	0	0
Guangdong	12	0	0	0
Guangxi	7	8	0	0
Hainan	4	0	0	0
Chongqing	7	3	4	3
Sichuan	13	7	0	0
Guizhou	4	2	2	0
Yunnan	12	9	44	9
Tibet	5	0	0	0
Shaanxi	9	0	0	0
Gansu	4	0	0	0
Qinghai	3	0	0	0
Ningxia	2	0	0	0
Xinjiang	2	5	2	1

Source: Statistical Yearbooks of each Province, 2001.

across provinces ranged from 1 to 74 in Neimenggu and Yunnan provinces, respectively. In actual fact, Li et al. (2008) also depicted the skewed distribution of World Heritage Sites in China. This suggests that the spatial distribution pattern can provide an intuitive inspection of tourism demand. From the perspective of foreign travelers, due to the restrictions of time and travel budgets, 4A and 3A spots are more worth visiting than 2A and 1A spots. In actual fact, many of the 4A and 3A spots which are not inscribed on the list of WHSs are also internationally renowned for their value. For example, the Hunan Provincial Museum is classified as a 4A-class spot. However, the exhibition of excavations of Mawangdui tombs of the Western Han dynasty (about 193–110 B.C.) is one of the major archaeological discoveries of the twentieth century. Over 3000 cultural relics and a well-preserved female corpse are on display and millions of tourists visit that museum annually. Therefore, both 4A and 3A spots will be included in this study to examine their impacts on international tourist arrivals.

3. Empirical specification and data

3.1. Modeling the demand for international tourist arrivals

Although there are a number of tourism demand models in the literature (Nordstrom, 2005; Ryan & Huyton, 2000; Salman, 2003),¹¹ they focus on econometric techniques rather than the theoretical fundamentals of empirical specification. To investigate the determinants of international tourist arrivals in China, the commodity version of the gravity model is adopted in this study, by

treating tourist arrivals as one kind of traded good. The gravity model has been proved to be a flexible general equilibrium framework consistent with a variety of general equilibrium trade models (Bergstrand, 1985, 1989). The gravity model is specified as:

$$Q = \frac{m_i m_j}{d_{ij}} \quad (1)$$

where Q is the amount of trade, and m_i and m_j denote the characteristics of country i and j , respectively. The term d denotes the geographic distance between i and j . The application of the gravity model to tourism demand is plausible because tourism is essentially a form of international trade (Eilat & Einav, 2004) in that the amount of tourist arrivals is heavily affected by both countries' characteristics and the transportation cost (distance).

Therefore, the tourism version of the gravity model expresses the bilateral tourism flow as a function of the characteristics of the countries of origin and destination, distance (transportation cost), and factors that augment or distort tourist arrivals. Of course, the numbers of World Heritage Sites and A-class spots are the main variables of interest that might increase the number of tourists. By referring to the determinants considered in the existing literature and adopting the specification by indexing individual provinces of China as the destinations to examine international tourist arrivals from China's perspective, the starting point of the empirical model is specified as:

$$\begin{aligned} \ln TOUR_{ijt} = & \beta_0 + \beta_1 \ln CPGDP_{ijt} + \beta_2 \ln POP_{it} + \beta_3 \ln EXCH_{jt} \\ & + \beta_4 \ln DIS_{ij} + \beta_5 \ln ACCOM_{it} + \beta_6 \ln INFRA_{i,t-1} \\ & + \beta_7 \ln CRIME_{i,t-1} + \beta_8 \ln HR_{it} + \beta_9 SARS + \beta_{10} \ln FDI_{jt} \\ & + \beta_{11} WHS_{it} + \beta_{12} 4A_{it} + \beta_{13} TIME + DAIRPORT \gamma \\ & + DCOUNTRY \xi + u_i + \varepsilon_{it} \end{aligned} \quad (2)$$

¹¹ For a comprehensive review on the specification of the tourism demand function, please refer to Lim (1997a, 1997b). Moreover, Co (2003) provided a comparison of different approaches to tourist arrival forecasting.

The dependent variable *TOUR* is the logarithm of overnight stays from tourist arrivals and the subscripts *i*, *j*, and *t* denote the Chinese province, the country of origin, and the time period, respectively. The term ϵ is a normally distributed error term.

Regarding the explanatory variables, the core factors include the relative per capita GDP (*CPGDP*) of country *j* to province *i* at 2001 prices, and the population of the countries of origin (*POP*). They are used to capture the relative income and market size which are widely accepted as being associated with a positive impact on tourism, such as in Naude and Saayman (2005) and Dougan (2007). Another important factor influencing the demand for international tourism is the exchange rate between the destination and sourcing countries. When a country's currency depreciates, it indicates its price level becomes lower compared to other countries and it can then attract more international tourism. We adopt the direct quotation method in this study, that is, exchange rate (*EXCH*) is denoted as the ratio of foreign currency to Chinese Yuan. A higher exchange rate indicates that the sourcing country's currency appreciates and there will be more tourists visiting China. The geographical distance between province *i* and country *j* (*DIS*) is included to represent the transportation cost.

Four local characteristics that might promote or decrease the numbers of tourists are taken into account: *ACCOM* represents the number of international hotels that are labeled as being one star at least.¹² The size of the hotel accommodation is needed for a destination to reach the so-called "critical mass" (Christie & Crompton, 2001). A certain volume of hotel rooms may be necessary to convince airlines to establish routes as well as to justify investment in complementary infrastructure such as roads (Naude & Saayman, 2005). Therefore, the infrastructure constructed in each province (*INFRA*) is also included. It is measured by the sum of operated railways and roads in terms of kilometers. However, there is a potential causal relationship between infrastructure and tourist arrivals so that tourism demand leads to new transportation facilities; this variable therefore enters the equation in the form of a lag-one period. The sufficiency of infrastructure should contribute positively to tourist arrivals. *CRIME* denotes the public security that is measured by the number of criminal cases defended per year. A region with a higher criminal rate usually reduces the willingness of international tourists to visit, while more tourists alternatively attract potential criminals to commit crimes. To reduce the problem of the simultaneous relationship between tourism and crime, the crime variable also enters the equation in the form of a lag-one period. Dhariwala (2005) and Dougan (2007) found political instability and civil war to have a negative impact on tourist arrivals. Thus, the estimated coefficient of public security is expected to be negative. The term *HR* is the proxy variable for sanitary conditions which is measured by the number of hospital beds.

SARS is a dummy variable which equals one for the year 2003 when the Severe Acute Respiratory Syndrome (SARS) epidemic prevailed in China. The onslaught of the epidemic should have lowered the number of visits by foreign tourists in China. Moreover, this study aims to focus on sightseeing tourists rather than business travelers, implying that we should exclude the number of business travelers from international tourists. This issue is relevant to China's international tourist arrivals, because China has been very successful in attracting foreign capital, emerging from having practically nothing to being second globally, after the US, since 1993. To control for the business travelers, the inflow of foreign capital (*FDI*) is included as a proxy for business tourists.

As discussed in the previous section, the unique "raw materials" of the destination, especially for famous spots, are particularly relevant to attracting international tourism. The main concern of this study is how and to what extent World Heritage Sites affect the numbers of international tourist arrivals in China. We therefore include the number of World Heritage Sites (*WHS*) to assess their impact in terms of attracting tourists. By calculating this from the estimated coefficient, we can obtain a rough contribution of *WHS*s to tourists. Moreover, the number of famous sites (spots) inscribed as 4A- or 3A-class sites is also included (43A),¹³ because these spots are also attractive to foreign tourists. It is particularly interesting to compare the estimated coefficients of the variables *WHS* and 43A which allow us to assess the relative impacts of World Heritage Sites and 4A- or 3A-class sites on international tourist arrivals. *TIME* is the time trend.

Finally, two sets of dummy variables are included: the first set contains three dummy variables for international airports. The airports of Beijing, Shanghai and Guangzhou are the three largest international airports which are located in the northern, central, and southern parts of China, respectively. As the first stop for foreign visitors, the tourists may stay there one night if the plane has a late arrival time. This situation results in overestimates of the numbers of international tourists staying overnight in those regions. The inclusion of these three dummies enables us to eliminate this bias. The second set of dummy variables contains country-specific dummies, aiming to capture the sourcing country effect.

In contrast to vacation-oriented islands, China possesses diversified tourist resources which may have different degrees of attraction to foreign visitors. To further examine the potential differences in the impacts of various kinds of spots, we reclassify these spots into historical and cultural spots (*CUL*), natural landscape (*NAT*), and modern facilities (*MOD*). The empirical specification is revised as follows:

$$\begin{aligned} \ln \text{TOUR}_{ijt} = & \beta_0 + \beta_1 \ln \text{CPGDP}_{ijt} + \beta_2 \ln \text{POP}_{it} + \beta_3 \ln \text{EXCH}_{jt} \\ & + \beta_4 \ln \text{DIS}_{ij} + \beta_5 \ln \text{ACCOM}_{it} + \beta_6 \ln \text{INFRA}_{i,t-1} \\ & + \beta_7 \ln \text{CRIME}_{i,t-1} + \beta_8 \ln \text{HR}_{it} + \beta_9 \text{SARS} \\ & + \beta_{10} \ln \text{FDI}_{jt} + \beta_{11} \text{CUL}_{it} + \beta_{12} \text{NAT}_{it} + \beta_{13} \text{MOD}_{it} \\ & + \beta_{14} \text{TIME} + \text{DAIRPORT}\gamma + \text{DCOUNTRY}\xi + \epsilon_{it} \end{aligned} \quad (3)$$

In exploring the determinants of the demand for tourism, we allow for the existence of individual effects which are potentially correlated with the right-hand side of the regression, such that

$$\epsilon_{it} = u_i + v_{it} \quad (4)$$

Here, u_i is the unobserved province-specific effect that varies across provinces but is invariant within a province over time, and v is a white noise error term. To deal with the unobservable individual effect in a panel data model, using a within panel estimator, the fixed effect (FE) or the random effect (RE) technique, to eliminate the individual effect is a standard estimation method. The fixed-effects model assumes that each province has an individual unobserved province-specific effect and estimates the constant term (unobserved province-specific effect) for each province, while the random-effects model estimates only one constant term by assuming that the unobserved province-specific effect follows a normal distribution. However, this province-specific component

¹² According to the hotel regulations in China, hotels with at least one star are allowed to accommodate foreign tourists.

¹³ To avoid the double-counting problem, the number of *WHS*s is excluded from the counting of 4A and 3A spots.

in the error term may be quite plausibly correlated with a province's tourist infrastructures, implying that the RE estimators are inconsistent when the assumption of zero correlation between the error term and right-hand side regressors is violated. We use both the random-effects and fixed-effects models along with the Hausman test to judge which model is more accurate. Due to the short length of the panel (six years), the numbers of tourist sites rated 4A and 3A and world heritage sites change slightly and are roughly constant (see Table 3a and b), preventing us from having robust estimates of the impact of the changes in WHSs on tourist arrivals. That is, it does not allow us to clearly distinguish what part of tourism demand is due to the province fixed effect and what part is due to the label effect. Moreover, some variables in equations (1) and (2) are time invariant and will be eliminated in the fixed-effects model and the large variation in tourist arrivals can be captured by the sourcing country effect. Therefore, we also estimate the pooling OLS regression that may provide more appropriate estimates.¹⁴

3.2. Data sources

The main series used to create the dependent variable comprises the provincial statistics on international tourist arrivals originating from various countries between the years 2000 and 2005. The main reason why we select this period is that the work of classifying and evaluating tourist areas and spots began in the year 2000, enabling this study to assess not only WHSs, but also spots classified as 3A or above spots in terms of attracting international tourists. To compare the potential differences in tourist behavior across original countries, we need to collect data on the annual numbers of tourists based on their countries of origin in each province. However, the detailed statistical data concerning tourist statistics displayed in the "Provincial Statistical Yearbook" are not the same across provinces. Most provinces collect and display the data on international tourists according to the main countries of origin, while a few provinces show only the sum of international tourist arrivals. In order to obtain the largest dataset and the representative sample, we thoroughly checked the Statistical Yearbook of each province and finally selected tourist data for nine original countries in 26 provinces during the 2000–2005 period. Therefore, there are 234 observations (9×26) each year and a total of 1404 observations. As for the explanatory variables, except for the original countries' per capita GDP that is drawn from the databank of the World Bank, these variables are obtained from various issues of the statistical yearbooks of individual provinces. Moreover, since there is no annual number of hotels in the provincial statistical yearbooks, we therefore obtain this information from the website of a large Chinese travel agent.¹⁵ The drawback of this data source is that it forces us to assume that the number of hotels in each province remained the same during the sampled period rather than providing the actual number of hotels in each year, although it is helpful to reduce the endogenous causality running from tourist arrivals to the number of hotels. The definition of and basic statistics for each variable are the averaged values during the ten years and are shown in the table in the Appendix.

Before continuing, some limitations on the use of this dataset are worth noting. First, information with regard to four provinces, namely, Jilin, Henan, Hubei and Guizhou, as well as Tibet, is not included in this study due to the unavailability of data on various countries of origin. Second, as for the countries of origin, we include

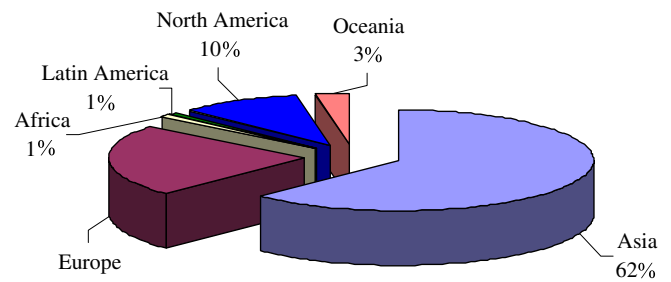


Fig. 1. Tourist arrivals in China by country of origin.

only nine countries rather than all countries in the world. The nine countries include Japan and Singapore in Asia, Canada and the U.S. in North America, France, Germany, Italy, and the U.K. in Europe, and Australia in Oceania. All the 9 selected countries happen to be relatively high-income countries, implying that the findings drawn from this study are perhaps not applicable to tourists who originate in developing countries. Despite the limitations stated above, the dataset is representative in terms of analyzing the determinants of international tourist arrivals.

As for the numbers of international tourist arrivals over the period from 2000 to 2005, the average number of visitors in each year was 12.902 million. The corresponding figure for those four provinces was 1.256 million, accounting for 9.035%, with the coverage of overseas tourists being above 90% in this study. On the other hand, from Fig. 1 it can be seen that between 2000 and 2005 about 62% of all international tourist arrivals in China originated from Asian countries, mainly Japan, Korea, and Singapore. This was followed by 23% from European countries, 10% from North America, and 3% from Oceanic countries. The nine countries considered in this study are the major countries of origin of international tourist arrivals in China. One drawback with the sampling is that the second largest country of origin, Korea, is not included due to the unavailability of data on Korean visitors. In brief, the sum of the tourists from Japan and Singapore accounts for more than 51% of the total number of tourists in each year during our sampled years, suggesting that the data provide a representative sample.

4. Results

In this section, the regression results of various specifications of tourist sites are reported. This allows us to identify to what extent the WHSs and 3A and above spots affect international tourist arrivals and enables us to compare the influences of various kinds of spots.

4.1. The influences of world heritage sites and 3/4A spots

We first look at the regressions obtained from equation (1) and the estimates are shown in Table 4. We present the estimates of the pooling OLS regression along with the fixed-effects model, because the statistics from the Hausman test reject the null hypothesis, suggesting that the fixed-effects model is more appropriate than the random-effects model.¹⁶

It is clear that the estimates for RE and FE are quite similar, indicating that relative income and the population of countries of origin are all significant (mostly at the 1% level) determinants of tourist arrivals in China. This result is economically intuitive in that

¹⁴ Naude and Saayman (2005) also adopted the technique of OLS regression to estimate the determinants of tourist arrivals in Africa based on similar arguments.

¹⁵ <http://www.elong.com>.

¹⁶ In actual fact, the estimates obtained from the random-effects models are similar to those obtained from the fixed-effects models.

Table 4

Determinants of international tourist arrivals in China.

	Pooling (1)	FE (2)	Pooling (3)	FE (4)	Pooling (5)	FE (6)
Constant	−155.6*** (31.137)		−44.458 (36.408)		−32.147 (36.440)	
lnCPGDP	0.292* (0.118)	1.126*** (0.150)	0.332*** (0.117)	1.143*** (0.150)	0.390*** (0.115)	1.139*** (0.150)
lnPOP	0.676*** (0.044)	0.518*** (0.034)	0.675*** (0.043)	0.516*** (0.034)	0.668*** (0.043)	0.517*** (0.034)
lnEXCH	0.147*** (0.038)	0.102*** (0.025)	0.148*** (0.038)	0.101*** (0.025)	0.147*** (0.038)	0.101*** (0.025)
lnDIS	−1.417*** (0.275)	0.124 (0.288)	−1.551*** (0.273)	0.121 (0.288)	−1.597*** (0.273)	0.122 (0.288)
lnACCOM	0.571*** (0.050)	–	0.546*** (0.050)	–	0.576*** (0.049)	–
lnINFRA	0.200*** (0.066)	−0.001 (0.155)	0.174** (0.065)	0.036 (0.156)	0.152** (0.065)	0.033 (0.155)
lnCRIME	0.059 (0.075)	0.040 (0.115)	0.049 (0.074)	0.009 (0.115)	0.041 (0.074)	0.002 (0.113)
lnHR	0.593*** (0.133)	−0.412 (0.382)	0.565*** (0.132)	−0.618 (0.394)	0.679*** (0.128)	−0.613 (0.394)
SARS	−0.627*** (0.065)	−0.676*** (0.043)	−0.595*** (0.064)	−0.668*** (0.043)	−0.582*** (0.064)	−0.669*** (0.043)
lnFDI	0.296*** (0.042)	0.259*** (0.076)	0.257*** (0.042)	0.257*** (0.076)	0.231*** (0.042)	0.257*** (0.076)
WHS	0.106*** (0.020)	0.010 (0.080)	0.076*** (0.021)	−0.024 (0.082)		
43A			0.013*** (0.002)	0.004** (0.002)		
SITE					0.017*** (0.002)	0.004** (0.002)
TIME	0.077*** (0.016)	0.164*** (0.017)	0.022 (0.018)	0.145*** (0.020)	0.017 (0.018)	0.145*** (0.020)
DAIRPORT	Yes	deleted	Yes	deleted	Yes	deleted
DCOUNTRY	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.750	0.901	0.756	0.901	0.755	0.901
Hausman test		32.38***		39.40***		39.53***
# of provinces	26	26	26	26	26	26
# of obs.	1404	1404	1404	1404	1404	1404

Notes: Figures in parentheses are standard deviations. *, ** and *** represent significance at the 10%, 5% and 1% statistical levels, respectively.

a rich and populous country should be the major consuming country in the global tourism market. Moreover, the exchange rate plays an important role in affecting the tourism market in that the depreciation of the host country's currency relative to sourcing countries can attract more international tourist arrivals, *ceteris paribus*. The variable of geographical distance is found to be associated with a significantly negative coefficient for the pooling estimates, suggesting that, as transportation costs increase, international tourist arrivals will be reduced substantially, *ceteris paribus*. However, the coefficient of distance is not significant in the FE model due to the geographical distance between two countries being time invariant. Indeed, transportation costs are widely accepted to account for the largest share of the cost of an international journey. Given two destinations with similar tourism resources, the farther destination will be less attractive due to the higher transportation costs and longer flights. This situation has recently been particularly relevant to the international tourism market which has encountered serious problems due to the high price of petroleum.

As for the impacts of regional characteristics, the estimated coefficients for *lnACCOM* and *lnINFRA* are both positive and significant at the 5% or 1% significance levels. This finding is consistent with previous studies in that infrastructure and sufficient accommodation facilities are essential inputs in developing and promoting the tourism industry. The coefficient for the public security variable in terms of crime frequency is positive but not significant, while this study has controlled for the possible endogeneity problem. This finding does not support the results obtained by *Eilat and Einav (2004)* and *Naude and Saayman (2005)* in that a country with a high crime rate delays the willingness of international tourists to visit. In fact, a region with more famous tourism sites may attract more tourist arrivals, while it also attracts potential criminals who will cluster together to seek potential victims. One alternative reason is that the destination country we observe is only one country and tourists may treat the conditions of public security as being similar across different regions in China. On the other hand, the "health risk" variable shows consistent results in the pooling estimates in that it is associated with a significantly positive coefficient as expected. This suggests that better public health is helpful in attracting international tourists. To sum up, the

signs and significance of the above regional characteristics support the importance of the tourism infrastructure and related services.

The unexpected outbreak of the SARS epidemic in 2003 as expected had a strong and negative impact on tourist arrivals. Moreover, the FDI variable utilized to capture the impact on business traveler associates had a significantly positive sign in relation to tourist arrivals. This indicates that at least some tourists arriving were planning to visit China for business purposes rather than for recreation.

To what extent are WHSs relevant to tourist arrivals in China and how are they relevant? Models (1) and (2) provide estimates that include spots inscribed as World Heritage Sites. The coefficient associated with the WHS variable is positive and significant at the 1% statistical level in the pooling estimates, suggesting that the number of WHSs is actually one of the major driving forces of the international tourist arrivals in China. As for the insignificant impact obtained by the fixed-effects model, it can be attributed to the less variation in the WHS lists within the sampling period. The influence of WHSs exhibits a moderate fall when the 4A- and 3A-class spots are included. The estimates in models (3) and (4) show that the coefficient of variable 43A is positive and statistically significant, while the coefficient for the variable *WHS* remains significantly positive in model (3).

While the above finding is intuitive, it is very important from the perspective of the tourism market that World Heritage Sites are much more attractive than 3/4A-class spots when international tourists visit China. However, the positive but insignificant coefficient of WHS in the fixed-effects models suggests that the additional tourists brought on by inscribing existing famous sites in the WHS lists seems to be limited. One point worth noting is that the geographical distribution of World Heritage Sites is concentrated mainly in four areas: Beijing, the Yellow River Basin, the Lower Yangtze River Basin, and Southwest China.¹⁷ Given the fact that all provinces are visited by huge numbers of tourists but not all provinces possess World Heritage Sites, this implies that 3/4A-class spots actually play an important role in attracting tourist arrivals.

¹⁷ For the geographical distribution of World Heritage Sites in China, please refer to Figure 1 in *Li, Wu, and Cai (2008, p.309)*.

More importantly, it is possible that the demand for 3/4A-class spots is a derived demand.

If a traveler plans to visit China on only one occasion within a couple of years, she(he) may stay for at least several nights on that journey in China, implying that the journey perhaps includes several different provinces rather than being confined to one province. When tourists have finished visiting the targeted WHSs, they may continue to visit other 3/4A-class spots located in the same or in other provinces, implying that the combination of WHSs and 3/4A-class spots might be considered together as they make the tourism decision. By adding the sum total of the WHSs and 3/4A-class spots as a new variable *SITE*, we find that estimates of models (5) and (6) show that scenic spots have the expected positive sign and that they exert a significant impact on international tourist arrivals.

The elasticity of WHSs, which is drawn from the estimated coefficients of the World Heritage Sites by pooling estimates, hovers between 0.076 and 0.106, which is about six times higher than that of the 3/4A-class spots of 0.013. This implies that, by keeping other variables at their means, an increase in one World Heritage Site will induce about six times the amount of international tourist arrivals for a new 3/4A spot. From the standpoint of increasing international tourist arrivals and foreign exchange, it becomes apparent why each country is aggressive in submitting candidate spots to apply for the lists of World Heritage Sites. To be specific, the growth of China's domestic tourism has been very rapid since the late 1990s along with the economic development. In 2005, the number of international tourist arrivals was 46.809 million persons, while the number of domestic tourist arrivals reached 1121 million persons, which was nearly 26 times higher than that of international tourist arrivals. If both the effects of international and domestic tourists are taken into account, the increase in the number of tourists should be huge, thus giving rise to concerns about a conflict between heritage protection and tourism development.

4.2. How elastic are natural, cultural, and modern spots?

In contrast to small vacation-oriented islands for which the tourism resources are concentrated in sea, sand, and sun, China is a vast country that is rich in tourism resources. Specifically, it is internationally renowned for its abundance of historical and cultural resources. Does the tourist effect of various kinds of spots then differ? By implementing the techniques of the panel data model, the results obtained from estimating equation (2) are displayed in Table 5.

In considering only World Heritage Sites, the estimates of models (7) and (8) show that the coefficients for both cultural and natural WHSs are all positive, but only those obtained from pooling estimates are significant at the 1% statistical level. Again, due to a slight change in the number of WHSs, the estimated coefficients obtained from the FE model are not statistically significant. One point worth emphasizing is that the magnitude of the coefficient for cultural WHSs is four times as large as the corresponding magnitude of the variable for the impact of the natural WHSs, denoting the relative attraction of cultural sites in terms of influencing international tourist arrivals. When visiting China, natural spots may be less important compared to historical and cultural spots, because China's long history of five thousand years enables it to have a large historical and cultural heritage which is unique and also attractive to foreign tourists, especially for tourists from Western countries.

We further pool WHSs and 3/4A-class spots and reclassify them into cultural, natural, and modern spots and then implement the econometric estimation. The results displayed in model 9 show that only the coefficient concerned with the cultural spots (43A-CUL) is

Table 5
Various scenic spots and tourist arrivals.

	Pooling (7)	FE (8)	Pooling (9)	FE (10)
Constant	1.929 (36.556)		-18.047 (36.245)	
lnCPGDP	0.428*** (0.115)	1.131*** (0.150)	0.318*** (0.115)	1.150*** (0.150)
lnPOP	0.658*** (0.043)	0.518*** (0.034)	0.682*** (0.043)	0.515*** (0.034)
lnEXCH	0.141*** (0.038)	0.102*** (0.025)	0.150*** (0.037)	0.101*** (0.025)
lnDIS	-1.615*** (0.271)	0.123 (0.288)	-1.667*** (0.302)	0.119 (0.288)
lnACCOM	0.578*** (0.050)	-	0.581*** (0.051)	-
lnINFRA	0.175*** (0.066)	0.029 (0.157)	0.218*** (0.067)	0.051 (0.156)
lnCRIME	0.016 (0.075)	-0.015 (0.117)	0.098 (0.074)	0.033 (0.115)
lnHR	0.691*** (0.126)	-0.482 (0.386)	0.486*** (0.130)	-0.335 (0.408)
SARS	-0.623*** (0.063)	-0.678*** (0.043)	-0.596*** (0.063)	-0.660*** (0.043)
lnFDI	0.264*** (0.041)	0.243*** (0.076)	0.223*** (0.041)	0.238*** (0.077)
WHS-CUL	0.032*** (0.005)	0.002 (0.005)		
WHS-NAT	0.008*** (0.003)	0.004 (0.004)		
43A-CUL			0.055*** (0.006)	0.009 (0.010)
43A-NAT			-0.001 (0.007)	0.014* (0.008)
43A-MOD			0.005* (0.003)	-0.006 (0.004)
Time	-0.001 (0.018)	0.148*** (0.020)	0.009 (0.018)	0.154*** (0.019)
DAIRPORT	Yes	deleted	Yes	Delete
DCOUNTRY	Yes	yes	Yes	Yes
R-square	0.759	0.901	0.762	0.901
Hausman test		41.162***		34.984***
# of provinces	26	26	26	26
# of obs.	1404	1404	1404	1404

Notes: Figures in parentheses are standard deviations. * and *** represent significance at the 10% and 1% statistical levels, respectively.

positive and statistically significant at the 1% level. This result is consistent with the findings drawn from model (7) that suggests that the tourism elasticity of cultural heritage sites is greater than that of cultural sites. Moreover, the increase in the number of natural spots (43A-NAT) also contributes to attracting more tourist arrivals, as shown in model 10.

The sign and significance of 43A-MODERN is interesting, since it is significantly positive, indicating that modern facilities and festivals also play an important role in attracting tourist arrivals. In practice, not all provinces have abundant tourist resources in terms of cultural and natural spots. For those provinces, holding exhibitions and festivals, creating modern facilities (amusement parks, ecological parks, skyscrapers, featured museums) and so on are plausible strategies for developing the tourism industry. This mode of tourist development can also stimulate the potential tourist growth.

By drawing from the analysis of the results shown in Table 5, historical and cultural spots seem to be most favored by foreign tourists and this coincides with the knowledge that China is one of the representative countries of oriental culture and is famous for its historical and cultural resources in the international tourism market. However, despite its historical and cultural spots having been identified as a major driving force in tourist arrivals, the diversified tourist resources in terms of natural landscapes and

modern recreational facilities are also important factors in relation to the numbers of tourist arrivals in China.

5. Comparison of countries of origin

As depicted in Fig. 1, the visitors from overseas arriving in China mainly come from Asia, Europe (Western Europe), and North America. However, the behavior of tourists from various continents is perhaps quite different, thus enabling the influence of determinants to exhibit different elasticities. In this section, we will implement the estimates of the tourism equations for the Asian countries (Japan and Singapore), European countries (France, Germany, Italy, and the U.K), and North American countries (Canada and the U.S.), respectively. This will allow us to identify whether tourists from different countries of origin differ in their determinants. The empirical results are displayed in Table 6.

The results of both the pooling and fixed-effects models indicate the existence of differences in the determinants of the total number of tourists in China. First, there are few sourcing countries in each group alone with the consideration of country-specific dummies, causing the impacts of country-specific characteristics to be insignificant, *ceteris paribus*. However, the geographic distance has a significant and negative impact on tourist arrivals, especially for North American and European countries. Asian tourists are less sensitive to the geographic distance between their country and destinations in China, because it takes only few hours to fly to China from Singapore or Japan. By contrast, the traveling distance between China and European and North American countries is extremely long, causing it to be a major component of tourist demand.

As for the impacts of regional characteristics, the sufficient numbers of qualified hotels and supporting infrastructure in terms of conventional traffic networks are the most influential determinants. One interesting finding is that there are different attitudes toward the crime issue and health risks between Asian and European (North American) tourists. As expected and as theoretically predicted, European and North American tourists have similar consumer behavioral traits in that they tend to be

significantly concerned with the crime issue and health risks. The InCRIME and InHR variables have significantly negative and positive impacts on tourist arrivals, respectively. These findings suggest that, other things being equal, European and North American tourists favor visiting a province with a lower crime rate and better sanitary conditions. By contrast, the estimates for Asian tourists show that the coefficient of the crime variable is significantly positive in the fixed-effects model and the coefficient of sanitary conditions is insignificantly negative. We cannot, however, infer that Asian (Japanese and Singaporean) tourists prefer to take risks during their travels in China. A possible interpretation is that most Japanese and Singaporeans can read Chinese characters and look similar to Chinese, thereby enabling them to appear more confident and to have a better ability, compared with Western tourists, to deal with unexpected situations while they are in China.

The SARS epidemic is widely recognized as the predominant cause of the sharp decrease in international tourist arrivals in 2003. The coefficients obtained by estimating the numbers of tourist arrivals from different countries of origin show that the impact of SARS seems to be similar for tourists from different countries. Moreover, FDI is utilized as a proxy for business travelers and the results in Table 6 suggest that higher levels of FDI are consistent with more tourist arrivals, especially for European enterprises.

Turning to the main factor with which we are concerned, there are also minor differences when differentiating between Asian and European/North American tourists. World Heritage Sites as opposed to 3/4A-class spots exhibit a significantly positive relationship with Asian tourist arrivals. By benefiting from the shorter geographical distance, tourists from Asian countries may visit China many times over a period of a couple of years. Asian tourists usually visit China by organizing a tour group and stay there only a few days. To be specific, the tour package offered focuses mainly on a few famous spots, especially WHSs. This tourism behavior therefore induces Asian tourists to focus on sightseeing at World Heritage Sites. Alternatively, both World Heritage Sites and 3/4A-class spots are relevant to European and North American tourists. The long

Table 6
Determinants of Tourist Arrivals in China – Cross Country Comparison.

	Asia		Europe		North America	
	pooling	pooling	pooling	pooling	pooling	pooling
Constant	101.191 (85.217)	38.214 (79.954)	-63.044 (108.289)	-31.044 (106.487)	-465.511 (825.429)	-490.293 (816.154)
InCPGDP	0.041 (0.255)	0.099 (0.252)	-0.099 (0.195)	0.059 (0.190)	-0.204 (0.228)	-0.089 (0.225)
InPOP	0.091 (1.322)	0.206 (1.323)	-0.030 (0.277)	-0.034 (0.274)	-143.067 (257.490)	-155.618 (254.993)
InEXCH	-0.336 (1.080)	-0.239 (1.072)	0.105 (0.692)	-0.056 (0.684)	-0.282 (0.902)	-0.427 (0.897)
InDIS	0.006 (0.347)	-0.067 (0.347)	-4.540*** (0.668)	-4.618*** (0.664)	-7.841*** (1.021)	-7.908*** (1.022)
InACCOM	0.487*** (0.082)	0.521*** (0.079)	0.530*** (0.074)	0.580*** (0.073)	0.679*** (0.086)	0.714*** (0.086)
InINFRA	0.430*** (0.134)	0.510*** (0.137)	-0.157 (0.101)	-0.142 (0.102)	0.041 (0.117)	0.052 (0.119)
InCRIME	0.203 (0.136)	0.283** (0.139)	-0.240** (0.111)	-0.264** (0.112)	-0.098 (0.130)	-0.108 (0.132)
InHR	-0.252 (0.272)	-0.227 (0.267)	0.783*** (0.207)	0.964*** (0.198)	0.366 (0.240)	0.502** (0.230)
SARS	-0.519*** (0.125)	-0.537*** (0.124)	-0.533*** (0.109)	-0.572*** (0.108)	-0.503*** (0.115)	-0.531*** (0.114)
InFDI	0.569*** (0.092)	0.576** (0.090)	-0.072 (0.069)	-0.053 (0.067)	0.008 (0.080)	0.024 (0.079)
WHS	0.111*** (0.040)		0.092*** (0.031)		0.064* (0.036)	
43A	0.007 (0.004)		0.017*** (0.003)		0.013*** (0.004)	
WHS-CUL		0.165*** (0.040)		0.042*** (0.007)		0.030*** (0.008)
WHS-NAT		-0.086 (0.060)		0.007* (0.004)		0.005 (0.005)
Time	-0.059 (0.047)	-0.025 (0.043)	0.057 (0.054)	0.041 (0.054)	1.506 (2.631)	1.626 (2.604)
DAIRPORT	Yes	Yes	Yes	Yes	Yes	Yes
DCOUNTRY	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.791	0.794	0.709	0.715	0.843	0.844
# of provinces	26	26	26	26	26	26
# of obs.	312	312	624	624	312	312

Notes: Figures in parentheses are standard deviations. *, ** and *** represent significance at the 10%, 5% and 1% statistical levels, respectively.

flight required to visit China can prevent European and North American tourists from visiting China as often as Asian tourists. They then tend to stay longer in China on average and maximize their visits by visiting multiple sites.

Given the potential problems associated with aggregated data, the estimates for various kinds of World Heritage Sites show that historical and cultural sites consistently coincide with more tourist arrivals. When comparing European and North American tourists, this is particularly relevant for European countries which are mostly characterized by a cultural and artistic atmosphere and instill in their nationals a higher sense of appreciation for historical and cultural matters. The elasticity of cultural WHSs for European and North American countries is lower than that for Asian countries. One may argue that the similarities of culture and folk customs between China and Asian countries imply that the cultural WHSs should be less attractive to Asian tourists. In fact, the Chinese cultural tour organized for older people is very popular in Japan and Singapore, because many of the older generation in Singapore and Japan have specific ties to China.¹⁸ Overall, this finding reveals that the universal value of cultural World Heritage Sites has received a high level of attention throughout the world. Compared with the unique and irreplaceable historical and cultural assets, the natural landscapes in China seem to be less appreciated by international tourists. The estimated coefficient of WHS-NAT is significantly positive only in European countries. Both cultural and natural World Heritage Sites are intangible assets belonging to all of humankind and they should be strictly protected to secure their sustainability regardless of their significance in promoting the development of international tourism.

6. Conclusions

The number of tourist arrivals in China has witnessed rapid growth in recent decades, resulting in China having become an important and popular destination in the international tourism market. Given the successful development of China's tourism industry, the determinants of international tourist arrivals have been less systematically investigated. The aim of this paper is to examine the determinants of international tourist arrivals in China, taking into account the specific factor, namely, the World Heritage Sites, which have been at the center of many international debates on the conflict between promoting tourism and sustainable preservation. Moreover, both the potential differences in the tourism-enhancing effect of various kinds of travel spots and differences in the behavior of tourists from different countries are also examined in this study.

By using panel data for the visits by tourists from nine countries or groups of countries in 26 provinces in China from 2000 to 2005, this study employs the commodity version of the gravity model to examine the determinants of international tourist arrivals in China. The empirical results show that the core variables of relative income, the population of countries of origin, and geographical distance enter as important factors in foreign tourism. Specifically, the transportation cost represented by distance is the key determinant of tourist arrivals in China, resulting in the fact that most international tourists visiting China come from its Asian neighbors. As for the regional characteristics, tourism infrastructure in terms of roads, railways, and

star-level hotels is an important consideration for tourists from all continents. The effects of public order and sanitary conditions are less relevant for tourists.

What is also interesting and important is the significance of World Heritage Sites and 3/4A-class spots, indicating the importance of scenic spots in developing the tourism industry. The estimated elasticity of WHSs is much higher than that of 3/4A-class spots, lending support to the widely-recognized view that World Heritage Sites constitute one of the major driving forces in promoting tourist arrivals. However, the significant contribution of 3/4A-class spots in attracting international tourist arrivals indicates that each country has its own unique features which are attractive to foreign visitors.

As World Heritage Sites are separated into cultural and natural heritage sites, cultural WHSs are found to exhibit a stronger impact on tourist arrivals than natural heritage sites, indicating that the most influential travel resources in China are historical sites, cultural traditions and colorful folk customs which are unique and hard for other countries to copy. While modern facilities are found to be less relevant to attracting foreign visitors in China, they are, however, important for countries without an abundance of tourism resources related to cultural and natural heritage. To promote the tourism industry, there are many strategies available to the authorities, such as holding sports events, holding specific festivals, and developing tourism facilities, and so on. One limitation that should be emphasized is that the sample countries we select are high-income countries, implying that the above arguments may not apply to all international tourist arrivals in China.

This study also examines whether different determinants are important to tourists from different countries. The impacts of regional characteristics seem to reveal differences between Asian and European/North American tourists. In particular, European and North American tourists have more significant concerns, relative to Asian tourists, regarding the crime issue and sanitary conditions across provinces in China. Finally and most importantly is that WHSs, especially the cultural and historical WHSs, are particularly relevant for all international tourist arrivals, contributing significantly to promoting the tourism industry in China.

While this study finds that both world heritage sites and 3/4A-class spots have a significantly positive impact on international tourist arrivals, we cannot clearly identify the influence of the labeling policy on tourism demand and then draw insightful implications for labeling policy. The tourist sites rated 4A and 3A by the Chinese authorities appear to be constant and the recognition of WHSs (Table 3a and b) is also roughly constant (there is only one smooth change in 6 out of 31 provinces) throughout the period we study. Therefore, the empirical estimates cannot separate the part of tourism demand that is due to the province's fixed effect from that which is due to the label effect, thereby preventing us from identifying the influence of the labeling policy on tourism demand. Our findings suggest that this important issue to do with labeling policy is worth further investigating.

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¹⁸ The population of Singapore is composed of a large share of Chinese whose ancestors emigrated to Singapore from China. Moreover, there are many Japanese who have stayed in China over the past one hundred years, particularly during the World War II period.

Appendix

Table

Definitions of variables and basic statistics.

Variable	Definition	Mean (S.D)
TOUR	The number of overnight-stay international tourist arrivals for province <i>i</i> from country <i>j</i> (thousands).	40.474 (98.454)
CPGDP	The relative real per capita GDP between country <i>j</i> and province <i>i</i> .	15.083 (20.267)
POP	Population of the country of origin (millions)	83.205 (82.053)
EXCH	Exchange rate. It is denoted as the ratio of foreign currency to Chinese Yuan	7.986 (2.615)
DIS	Geographic distance between the capital city of province <i>i</i> and country <i>j</i> (KM)	9893.028 (3537.081)
ACCOM	The number of star-class hotels in province <i>i</i> (source: http://www.elong.com)	96.077 (134.955)
INFRA	Infrastructure: the sum of operated railways and roads in province <i>i</i> (thousands of kilometers)	58.759 (35.114)
CRIME	Public security. It is measured by the number of criminal cases defended per year	10430.63 (6428.29)
HR	Health risk. It is proxied by the number of hospital beds. (thousands)	10.428 (5.615)
WHS	The number of World Heritage Sites in province <i>i</i> .	1.064 (1.374)
43A	The sum of 4A and 3A spots, excluding the World Heritage Sites	18.519 (15.754)
CUL	The number of historical and cultural spots FDI inflow (RMB billion)	5.058 (5.177)
NATURE	The number of natural spots	8.474 (7.494)
MODERN	The number of modern and man-made spots (RMB million)	6.199 (6.304)

Note: The means and standard errors of variables are calculated by pooling the data for the 2000–2005 period.

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