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World Heritage Inscription and Tourist Arrivals in Japan

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Abstract

This study examines the impact of World Heritage inscriptions on tourist arrivals to assess their role in stimulating local economies and promoting sustainable tourism. Statistical data covering the period from 1980 to 2023 were collected for 15 World Heritage sites in Japan. The analysis employed a 20-year observation window for each site, considering a period that extended 10 years prior to and 10 years after their sites' inscriptions. The explanatory variables included tourism budget, per capita income, proportion of population aged 65 years old and over, average household size, and a dummy variable indicating the post-inscription period. The estimation results are summarized as follows. First, the relationship between tourist arrivals and tourism budget was significantly positive in fixed effect model by reflecting the characteristics of each region. Second, prefectural per capita income in fixed effect model and demographic variables - including total population, population aged 65 years and over, and household size - did not show statistically significant effects. However, per capita income in pooled OLS is positively estimated in significance, inferring that the income is an important element for the whole country whereas it is not for individual regions. Third, the dummy variable for inscription status demonstrated a statistically insignificant correlation with estimations that did not assume heteroscedasticity. These findings suggest that increasing tourism-related investment in strategic initiatives, such as events and urban revitalization projects, may be more effective in enhancing tourist arrivals than relying solely on World Heritage inscriptions.

JEL classification: F62, F68, L83.
Keywords: World Heritage site, Tourist arrivals, Tourism budget, Japan.

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1. Introduction

World Heritage is an international framework for protecting for the common cultural and natural heritage of humanity under the “Convention Concerning the Protection of the World Cultural and Natural Heritage” (World Heritage Convention), adopted at the UNESCO General Conference in 1972. Japan ratified the Convention in 1992, and the following year four Buddhist Monuments in the Horyu-ji Area, Himeji-jo, Yakushima, and Shirakami-Sanchi - were inscribed on the World Heritage List. As of 2026, Japan has 27 World Heritage sites, comprising 22 cultural and five natural heritage sites. Beyond their original purpose of preserving cultural and natural assets, World Heritage sites have been positioned as a regional brand and tourism resource, serving as vital instruments for regional revitalization by both local and national governments. This trend aligns with government-level policy initiatives that position tourism as a driver of economic growth, such as the Tourism Nation Promotion Basic Act in 2007 and the action plan as “Tourism Vision to Support the Tomorrow of Japan” in 2016.

The renewed attention given to World Heritage research in recent years has been driven by the rapid expansion of inbound tourism to Japan and the resulting issue of overtourism. The number of international visitors reached a record high of 31.88 million in 2019. Although visitor numbers declined drastically during the COVID-19 pandemic, they recovered to 25.06 million in 2023 and were projected to exceed the previous record in 2024. At World Heritage sites such as Kyoto, Mount Fuji, and the Itsukushima Shinto Shrine, the concentration of tourists has intensified environmental pressures, disrupted local residents’ daily lives, and increased the risk of damage to the cultural properties. Consequently, countermeasures such as entry restrictions, mountain-climbing fees, and hikes in accommodation taxes have been implemented. In contrast, at sites such as Shirakawa-go and the Iwami Ginzan Silver Mine, tourist numbers have plateaued or decreased in the years following their inscription. These patterns indicate that the "sustainability" of the economic effects generated by the World Heritage inscription warrants closer scrutiny.

From the perspective of environmental economics, a substantial body of research has evaluated the economic value of cultural properties using contingent valuation (CVM) and travel cost (TCM) methods, showing that willingness to protect the natural resources. Additionally, from the side of the cultural economics, participation rate is estimated by some regional elements such as the municipal budget, the average age, the per capita income, and family size since cultural facilities such as museum is supported by the entrance fee and sales in souvenir shops. Recent research has highlighted the necessity of empirical studies on the medium - to long-term effects of the World Heritage inscription - spanning 10 to 20 years post-inscription - rather than focusing solely on its short-term economic effects. Nevertheless, the research remains limited to individual case analyses while comparative panel data analyses encompassing multiple heritage sites remain relatively scarce.

To address this gap, we constructed a balanced panel dataset comprising 300 observations from 15 World Heritage sites in Japan, over a 20-year period (covering a period extending 10 years before and 10 years after each site’s inscription). Using this dataset, we estimated the effects of World Heritage inscriptions on tourist arrivals by conducting an econometric analysis with explanatory variables such as tourism budgets, prefectural income, household size, and a World Heritage inscription dummy variable. The remainder of this paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the data and methodology. Section 4 presents and discusses the estimation results. Finally, Section 5 concludes the paper.

2. Literature Review

A substantial body of empirical research has examined the impact of World Heritage sites on tourism arrivals. Bertacchini et al. (2024) and Canale et al. (2019) have summarized the economic impact of World Heritage sites on local economies.

Utilizing gravity models, several studies have reported that the World Heritage inscription has a positive effect on tourism arrivals. Arezki et al. (2009), using data from 127 countries from 1980 to 2002, estimated a positive relationship between World Heritage inscriptions and tourist arrivals. Yang et al. (2010) also found such a positive effect in China by examining provincial panel data from 2000 to 2005. Moreover, Patuelli et al. (2013) also found that the World Heritage inscription positively affects tourism demand by using panel data from 1998 to 2009, while Su and Lin (2014), using data from 66 countries from 2006 to 2009, reached similar conclusions. In contrast, others conclude that World Heritage inscriptions do not have a positive effect on tourism demand. Cellini (2011) questioned the robustness of the findings reported by Yang et al. (2010). Huang et al. (2012) found no significant long-term relationship between tourism at World Heritage sites and the local tourism economy in Macau. Cuccia et al. (2016), using provincial data in Italy from 1995 to 2010, concluded that cultural and environmental endowment play a more important role in attracting tourists than the World Heritage inscription itself.

Beyond gravity models, the results of research using other methodologies were also examined. Kim et al. (2017) employed the contingent valuation method (CVM) questionnaire for 808 persons to investigate visitors' willingness to pay for two World Heritage sites in Korea, Namhansanseong (World Heritage list in 2014) and Hwaseong (World Heritage list in 1997), and found that respondents with stronger heritage awareness exhibited higher willingness to pay. Using the TCM, Voltaire et al. (2017) estimated that the recreational benefits generated by Mont Saint-Michel (calculated according to the cost and visiting times) amounted to at least €154 million per year. Yang et al. (2019) conducted a meta-regression analysis of 43 studies and found that determining the effects of the World Heritage inscription itself is difficult, as they vary considerably depending on factors such as the research period, level of development, heritage type, data type, and endowment measures. Overall, these findings suggest that the effects of World Heritage inscriptions cannot be isolated from broader contextual conditions.

Furthermore, research in cultural economics deems the participation rate important for analyzing the factors driving tourist arrivals. As summarized by Sakurai and Oguni (2025), the foundations of cultural economics can be traced to Baumol and Bowen (1966), whose pioneering work on the performing arts was subsequently extended to broader fields using qualitative analysis. Subsequent research has employed quantitative analyses to estimate the influence of factors such as income, career, vocation, and age on participation in literary museums. In addition, the price and income elasticities of demand have also been estimated. Atece-Amestoy (2008) examined the factors affecting participation in cultural activities in the United States of America, while Nagayama (1998) analyzed the relationship between higher education rates and participation in cultural activities in Japan. Katsuura and Arima (2016) further summarized research focusing on Japan and indicated that family size and the availability of cultural facilities, such as libraries and art museums, influence participation in cultural activities.

Among single-country research, studies from Italy have received particular attention because of its rich cultural heritage and large number of World Heritage inscriptions (Bertacchni et al. 2024, p. 2). Canale et al. (2019) demonstrated that both World Heritage inscription and regional endowment environments positively influenced tourism using provincial data from 2000 to 2014. De Simone et al. (2019) similarly reported positive effects using provincial data from 1997 to 2015. However, using municipal data, Ribaudo and Figini (2017) showed that tourism growth was stronger during the five years preceding inscription than during the subsequent five years, suggesting that the inscription itself did not generate a sustained increase in tourist demand. Bertacchini et al. (2024) estimated land prices in Italy and found a positive effect on property prices.

In Japan, research estimating impact of World Heritage inscriptions can be divided into three groups (Sakurai and Hashikura 2025). The first examines the economic impact of increases in tourist arrivals

following World Heritage inscriptions. Fukuhuji (2005) classified tourism trends after inscription into increasing, stable, and declining categories based on year-on-year growth rates. Sawamura (2016), using approximately 20 years of data for ten Japanese World Heritage sites, identified four distinct tourism patterns: increases following inscription, increases unrelated to inscription, no clear trend, and continued decline regardless of inscription; Sawamura's study also suggested that tourist arrivals at the Nikko and Shirakami Mountains will return their long-term trends approximately ten years after inscription. The second category examines the economic value of each cultural heritage site using the CVM. Kakiuchi and Nishimura (2004) estimated that the economic value of Gokayama village (Toyama Prefecture) exceeded JPY 129 billion nationally and JPY 1 billion based on visitor surveys. Ujiie et al. (2006) estimated that Miyajima in Hiroshima Prefecture generated approximately JPY 35 billion in final demand. Otsuki et al. (2007) reported that on average, tourists were willing to pay approximately JPY 4,000 for preserving the Historic Monuments of Ancient Kyoto (corresponding to a total value ranging from JPY 20 billion to JPY 180 billion). In addition, Ogawa et al. (2017), investigating Kyoto City using the CVM, estimated economic values of approximately JPY 55 billion, JPY 31 billion, and JPY 25 billion for Kiyomizudera Temple, Kinkakuji Temple, and Nijyo Castle, respectively. Jimura (2011), using questionnaire data, estimated the economic value the World Heritage site in Shirakawamura Village, Gifu Prefecture, and found that more than 45% of respondents believed their business had expanded following the World Heritage inscription. Sawamura (2010), employing a regional input-output table, summarized the economic value of five places considered cultural heritage sites, finding that although World Heritage inscription generally generated positive economic effects, long-term regional revitalization depended more on complementary local development strategies than on inscription alone. The third category focuses on the valuation of natural World Heritage sites in Japan. Kuriyama et al. (2000) estimated the environmental value of Yakushima Island using both CTM and CVM. Their estimates ranged from JPY 2.7 billion to JPY 8.2 billion based on travel costs, while respondents were willingness to pay JPY 1,500–5,600 JPY for environmental conservation. These findings indicate that Yakushima Island possesses substantial environmental and recreational value despite the inherent challenges of measuring non-market benefits.

Overall, we observed that while Japan's estimation of the economic value of World Heritage is worth measuring, research has mainly used CVM for this purpose. Addressing this gap, we aimed to examine the medium- and long-term effects of World Heritage inscriptions in Japan by considering policies meant to vitalize the regional economy.

3. Empirical Analyses

3.1 Data

We employed a balanced panel dataset consisting of 15 World Heritage sites in Japan, each observed over a 20-year period comprising the 10 years preceding and the 10 years following World Heritage inscription. Table 1 presents the World Heritage sites analyzed in this study. Our empirical analysis employed six key variables, the first of which was tourist arrivals, shown as "arrival" in this estimation. Because some sites did not have data on arrivals, prefectural tourist arrival data were used as a proxy. Tourist arrivals are converted into logarithms to demonstrate the growth rate. The second key variable was tourism budget, shown as "budget" in this estimation. Because the tourism budget system in Japan is very complex and subsidies are almost impossible to count accurately, we included them in the prefectural tourism budget. Moreover, inflation was considered using the Consumer Price Index (CPI), although Japan experienced zero inflation in the 21st century. The third key variable was the per capita prefectural gross national product (GNP), obtained from the national accounts statistics. The real base is used and named as "income." The fourth and fifth key variables were demographic characteristics: the proportion of the population aged 65 years and over and the average family size, respectively. Since these indicators were surveyed only once every five years, values for the intervening years were estimated using linear interpolation. Because the variables "age65" and "family" size could emerge as endogenous problems, they were estimated separately. The sixth and final variable was the distance between Tokyo and each prefectural hall. These data are collectively presented in Table 2.

Table 1: World Heritage sites of Japan (including 20-year data)

No.	World Heritage Site	Year of Inscription	Classification	Data Source for Number of Visitors
1	Buddhist Monuments in the Horyu-ji Area	1993	Cultural	"Nara Prefecture Tourism Survey," "National Tourism Trends (Number of Visitors by Prefecture)"
2	Himeji-jo	1993	Cultural	"Statistical Yearbook of Himeji City, Hyogo Prefecture," "National Tourism Trends (Number of Visitors to Himeji City)"
3	Yakushima	1993	Natural	"Kagoshima Prefecture Tourism Statistics," "National Tourism Trends (Number of Visitors to Yakushima)"
4	Shirakami-Sanchi	1993	Natural	"Number of Visitors to Fukaura Town, Aomori Prefecture," "National Tourism Trends (Number of Visitors to Fukaura Town)"
5	Historic Monuments of Ancient Kyoto	1994	Cultural	"Kyoto Tourism Comprehensive Survey," "National Tourism Trends (Number of Visitors to Kyoto Prefecture)"
6	Historic Villages of Shirakawa-go and Gokayama	1995	Cultural	"Tourism Statistics of Shirakawa Village, Gifu Prefecture," "National Tourism Trends (Number of Visitors to Gifu City)"
7	Hiroshima Peace Memorial (Genbaku Dome)	1996	Cultural	"Hiroshima Peace Memorial Museum (Cumulative Number of Visitors)"
8	Itsukushima Shinto Shrine	1996	Cultural	"Miyajima Visitor Statistics Table"
9	Historic Monuments of Ancient Nara	1998	Cultural	"Report on the Survey of Number of Visitors to Nara City," "National Tourism Trends (Number of Visitors to Nara Prefecture)"
10	Shrines and Temples of Nikko	1999	Cultural	"Survey Results on the Number of Tourism Visitors and Estimated Overnight Stays in Tochigi Prefecture," "National Tourism Trends (Number of Visitors to Nikko City)"
11	Gusuku Sites and Related Properties of the Kingdom of Ryukyu	2000	Cultural	"Trends in the Number of Inbound Visitors to Okinawa Prefecture and Visitors to Shurijo Castle Park," "National Tourism Trends (Number of Visitors to Okinawa Prefecture)"
12	Sacred Sites and Pilgrimage Routes in the Kii Mountain Range	2004	Cultural	"Tourism Dynamics of Wakayama Prefecture (Number of Visitors to the Mt. Koya Area)"
13	Shiretoko	2005	Natural	"Survey Report on the Number of Tourism Visitors to Hokkaido"
14	Iwami Ginzan Silver Mine and its Cultural Landscape	2007	Cultural	"Shimane Prefecture Tourism Survey (Number of Visitors to Iwami Ginzan, Oda City)"
15	Hiraizumi	2011	Cultural	"Tourism Statistics - Iwate Prefecture (Number of Visitors to Hiraizumi Town)"

Table 2: Data Description

	ln_arrival	budget	income	age65	family	dis
N	300	300	300	300	300	300
mean	14.876	1.792	2.599	409.170	2.844	578.853
std	1.612	1.592	0.394	258.041	0.296	336.071
max	17.927	10.739	3.313	1,519.000	3.545	1,553.600
min	11.675	0.238	1.410	122.000	2.148	98.800

3.2 Methodologies

Our empirical analysis employed a balanced panel dataset consisting of 300 observations from 15 World Heritage sites over a 20-year period. The panel data estimation is conducted based on Equation (1), following the literature in cultural economics. Following the literature in cultural economics and tourism economics, the impact of World Heritage inscription on tourist arrivals was estimated using the following panel data model (the "visitor" variable was converted into a logarithm; subsidies are given in billions (JPY), while income is given in thousands (JPY).

$$\ln arrival_{it}=\alpha_i+\gamma_t+\beta_1 ibudget_{it}+\beta_2 income_{it}+\beta_3 age65_{it}+\beta_4 family_{it}+\beta_5 dis_{it}+\beta_6 dummy_{it}+\varepsilon_{it} \quad (1)$$

where:
$\ln\_arrical_{it}$: Logarithm of tourist arrivals at site *i* in year *t*.
$budget_{it}$: tourism budget (billion yen) in prefecture *i* in year *t*.
$incoe\_t_{it}$: per capita prefectural income (measured in terms of a thousand yen) in prefecture *i* in year *t*.
$age65_{it}$: proportion of population aged 65 years and over in prefecture *i* in year *t*.
$family_{it}$: family size in prefecture *i* in year *t*.
dis_{it}: geographical distance from Tokyo to the prefectural hall associated with the site.
$dummy_{it}$: dummy variable for the years following a World Heritage inscription.

Panel analysis was useful for considering both temporal trends and heterogeneities across heritage sites. This estimation method was used for both the pooled ordinary least squares (OLS) and fixed effect models. Pooled OLS captured the basic relationship across all observations, whereas the fixed effect model was used to consider the time-invariant characteristics specific to each site. The explanatory variable "dis_{it}" was omitted from the fixed effect models because it remained constant for each site throughout the study period. Since senior people (age 65 and over) and family size may have multicollinearity, these variables are estimated separately. The choice between the pooled OLS and fixed effect model was evaluated using the F-test. In addition, standard error was used for the cluster.

4. Estimated Results

We employed both pooled OLS and fixed effect models as our estimation methodologies. For the pooled OLS analysis, three model specifications were presented: both the proportion of the population aged 65 and over and the average household size were used as explanatory demographic variables. Since distance is the same through the estimated periods, explanatory of distance in the fixed effect models are eliminated.

Our estimation results are presented in Table 3. Overall, the following two points are indicated. First, estimated results of coefficients and p-value in fixed effect models and pooled OLS models differ partly because they reflect the unique characteristics of each region. Second, adjusted R^2 is relatively low but these are standard in micro-level panel data analysis with fixed effects, as showing the causal effect than maximizing the predictive power of the model (Wooldrige 2009).

Additionally, estimated results in Table 3 are summarized as follows:

First, a robust relationship was found between the budget and the number of tourist arrivals in fixed effect models, whereas an insignificant relationship was found in pooled OLS, inferring that the idea of each region for vitalizing regional economy is also important. Under this circumstance, a 100-million-yen increase in prefectural subsidies was associated with an approximately 4% increase in tourist arrivals. Second, prefectural per capita income exhibited a weak relationship with tourist arrivals. Although the coefficient became statistically significant in pooled OLS, but it was statistically insignificant in fixed effect models, which infers that the income is an important element in the whole country whereas it is not in each region. One possible explanation is that the statistics of the tourist arrival include a substantial proportion of intra-prefectural tourists, implying that increases in regional income do not necessarily lead to higher local tourism demand; other relevant factors may play more decisive roles in this regard. Third, the demographic variables - the proportion of citizens aged 65 years and over and the average household size - were statistically insignificant, indicating that they do not necessarily influence tourist arrivals. Furthermore, estimations using total prefectural populations yielded statistically insignificant results. Fourth, the distance from Tokyo was also estimated to be statistically insignificant, indicating a lack of clarity on whether a greater distance from Tokyo necessarily leads to a decline in tourist arrivals. Fifth, the dummy variables were generally insignificant, meaning that the World Heritage inscription is not necessarily a decisive factor for tourists. This finding suggests that the World Heritage inscription does not invariably increase tourist arrivals. Finally, the constant term was deemed statistically significant at the 1% level across all the specifications, suggesting that (for better or worse) the number of visitors to the registered sites remains stable.

Table 3: Estimation Results

Estimated results of age 65 and over in population elements

dependent variable: ln_arrival
estimation period : ten years before and ten years after inscription

estimation way	pooled OLS			Fixed Effect		
explanatory variable	Coef.	[95% CI]	P>|t|	Coef.	[95% CI]	P>|t|
budget	0.036	[-0.243, 0.315]	0.787	0.046	[-0.000, 0.091]	0.051
income	1.049	[-0.183, 2.282]	0.089	-0.248	[-0.727, 0.230]	0.284
age65	0.001	[-0.001,0.004]	0.236	0.000	[-0.002, 0.002]	0.711
dis	0.000	[-0.003, 0.002]	0.891			
dummy	-0.370	[-0.687, -0.052]	0.026	0.081	[-0.153, 0.315]	0.470
_cons	11.807	[7.893, 15.722]	0.000	15.268	[14.119, 16.417]	0.000
				within = 0.039		
R^2	0.132			between = 0.011		
				overall = 0.005		
				Prob > F = 0.000		

Estimated results of family size

dependent variable: ln_arrival
estimation period : ten years before and ten years after inscription

estimation way	pooled OLS			Fixed Effect		
explanatory variable	Coef.	[95% CI]	P>|t|	Coef.	[95% CI]	P>|t|
budget	-0.016	[-0.331, 0.300]	0.915	0.040	[0.009, 0.072]	0.015
income	1.415	[0.048, 2.783]	0.043	-0.205	[-0.703, 0.293]	0.393
family	0.321	[-3.501, 4.143]	0.860	0.158	[-1.050, 1.366]	0.783
dis	0.000	[-0.002, 0.002]	0.818			
dummy	-0.186	[-1.194, 0.822]	0.698	0.158	[-0.052, 0.367]	0.129
_cons	10.264	[-3.137, 23.666]	0.123	14.807	[10.567, 19.048]	0.000
				within = 0.038		
R^2	0.094			between = 0.071		
				overall = 0.039		
				Prob > F = 0.0000		

No elements of population

dependent variable: ln_arrival
estimation period : ten years before and ten years after inscription

estimation way	pooled OLS			Fixed Effect		
explanatory variable	Coef.	[95% CI]	P>|t|	Coef.	[95% CI]	P>|t|
budget	0.001	[-0.284, 0.286]	0.993	0.041	[0.008, 0.074]	0.019
income	1.305	[0.064, 2.546]	0.041	-0.230	[-0.682, 0.222]	0.293
dummy	-0.258	[-0.684, 0.168]	0.215	0.117	[-0.069, 0.304]	0.200
_cons	11.610	[8.579, 14.641]	0.000	15.343	[14.194, 16.492]	0.000
				within = 0.036		
R^2	0.092			between = 0.094		
				overall = 0.054		
				Prob > F = 0.0000		

5. Conclusion

This study empirically analyzed the medium- and long-term impacts of World Heritage inscriptions on local tourism in Japan, utilizing a balanced panel dataset comprising 15 World Heritage sites observed over a 20-year period from 1980 to 2023. By tracking tourist arrivals during the ten years preceding and the ten years following inscriptions, we sought to identify the factors that stimulate regional economic revitalization and foster sustainable tourism resource utilization. Our empirical findings yielded three primary conclusions. First, a positive relationship was identified between tourist arrival and regional tourism budgets in fixed effect model while this relationship is not seen in pooled OLS. Specifically, increases in prefectural sightseeing expenditure were associated with substantial increases in tourist arrivals, suggesting that public investment in tourism promotion and related initiatives is highly effective in stimulating tourism demand if considering activating characters in each region. Second, the direct effect of a World Heritage inscription, represented by the inscription dummy variable, demonstrated a statistically insignificant correlation with tourist arrivals only under specific modeling conditions that did not assume heteroscedasticity. This result suggests that a World Heritage inscription does not automatically guarantee the sustained expansion of a region's tourism market. Third, macroeconomic and demographic characteristics - including prefectural per capita income in fixed effect model, total population, household size, and the proportion of elderly aged 65 years and over - were generally found to be statistically insignificant determinants of tourist arrivals. Nevertheless, the inclusion of demographic structures, particularly the proportion of aging tourists population, improved the statistical performance of several policy-related explanatory variables in our model.

These findings carry crucial policy-related implications for local governments and tourism stakeholders in Japan. Relying solely on the "brand value" of a UNESCO World Heritage inscription appears insufficient to ensure long-term economic sustainability. Instead, proactive and strategic institutional support, including target-oriented events, destination marketing, and urban revitalization initiatives backed by substantial budgetary allocations, are likely to be more effective in maintaining and maximizing the economic benefits generated by cultural and natural heritage assets.

Future research, considering the limitations our study, can benefit from a more granular analysis incorporating localized site-specific budgets rather than only prioritizing aggregate prefectural expenditures. Moreover, a closer examination of the "honeymoon effect" (the immediate post-inscription surge in tourist arrivals followed by long-term plateauing) would further enrich our understanding of the long-term sustainability of heritage tourism.

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