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Japan's Inbound Tourism Boom: Lessons for its Post-COVID-19 Revival

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Japan's Inbound Tourism Boom: Lessons for its Post-COVID-19 Revival

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Abstract

In this paper, we review developments in Japanese inbound tourism and investigate the main determinants of its rapid growth prior to the COVID-19 pandemic. Using a panel autoregressive distributed lag (ARDL) model with data on 34 tourism source markets from 1996Q1 to 2018Q4, we find that not only tourist income and tourism-related relative prices, also visa policies have had significant impacts on Japan's inbound tourism demand in the long run. In the short run, natural disasters have had large and prolonged effects on tourism. We then derive policy implications for the post-COVID-19 revival of Japanese inbound tourism.

JEL Classification Numbers: L83, N75, O53

Keywords: Japan inbound tourism, tourism determinants, Abenomics, visa policy, COVID-19, panel ARDL

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Contents

I. INTRODUCTION

Before the early-2020 COVID-19 bust in tourist arrival numbers set in, Japan's tourism industry had witnessed a boom in the number of international tourists over the previous decade (International Monetary Fund 2020a, 2020b). The number of arrivals almost tripled from 2013 to 2018 to a record 31 million. The average growth rate of tourist arrivals during the 2013–2018 period was 25.1 percent annually. The share of international tourists in Japan's total domestic tourism expenditure increased from 4.7 percent in 2009 to 17.3 percent in 2018, marking their increasing importance for the tourism industry in Japan. However, the number of international visitors has collapsed since the beginning of 2020 due to the outbreak of the COVID-19 pandemic, with essentially no tourists arriving in April and May, 2020 (see Box, Section II).

Although COVID-19 is having a significant adverse impact on the tourism industry, not only in Japan but also in a global context, discussions on how to re-open borders and revitalize the tourism industry have also emerged recently. In light of that, this paper aims to facilitate these discussions by shedding light on potential drivers of the arrival of international tourists to Japan, especially during the tourist boom, and drawing important policy lessons for the tourism revival phase.

This paper contributes to the literature in three ways. First, our data coverage is comprehensive and universal. The dataset covers 34 origin countries, representing 99 percent of total international arrivals to Japan in 2018, and ranges from 1996Q1 to 2018Q4. Second, the paper examines a broad range of possible factors contributing to Japan's inbound tourism demand. Specifically, the paper focuses on five potential factors: (1) income level in tourist origin countries; (2) the bilateral relative price between Japan and the source markets; (3) the substitute prices in Japan's tourism competitors; (4) visa policies; and (5) natural disasters. In particular, we propose a new calculation method for tourism weights to overcome the drawback of existing calculation methods for the price competitiveness of Japan with its tourism competitors in attracting tourists from a specific source market.[2] Besides the mentioned determinants, the Severe Acute Respiratory Syndrome (SARS) disease in 2003 and the Global Financial Crisis are also taken into consideration. Third, employing the econometric technique of a panel autoregressive distributed lag (ARDL) model, we investigate the possible long-run relationship between Japan's inbound tourism demand and its determinants. The panel ARDL is robust for large T, large N data samples, while a panel fixed effect model (as used in previous studies) is subject to possible estimation bias. In particular, the panel ARDL model allows us to confirm whether a long-run relationship exists and to detect potential heterogeneities in long-run parameters among origin markets by comparing different types of estimators.

[2] Nakazawa (2009) used a relative price of Japan's consumer price index (CPI) with averaged third (i.e. non-source market) countries' CPIs as a proxy for substitute prices in alternative destinations.

We find that there exists a long-run relationship between Japan's inbound tourism demand and its determinants. Moreover, we also find that heterogeneities in long-run coefficients exist at the aggregate level, implying that tourists from different source markets can react differently to changes in determinants in the long run. Combining source markets into country groups based on geography and the level of economic development, we confirm that tourists from countries with similar backgrounds are likely to respond homogenously.

In the long run, the GDP of origin countries and the bilateral real exchange rates between Japan and the source markets are among the important factors contributing to the rapid development of Japan's inbound tourism over time. Among country groups, tourism demand from non-Asian countries has the highest income elasticity, while advanced Asia has the highest price elasticity. The substitute prices in alternative destinations seem to influence travel decisions of tourists from emerging Asia, but this result is less robust. The introduction of multiple visas and/or visa exemptions for emerging and developing countries in Asia are found to have boosted Japan's inbound tourism demand significantly.

In the short run, natural disasters are found to have significant effects on demand from all source markets over several quarters, with tourist numbers from non-Asian countries still 4.2 percent lower even nine months after the disaster. The Severe Acute Respiratory Syndrome (SARS) epidemic in 2003 also had a large impact on tourist numbers from all countries. In particular, the number of Chinese tourists dropped 50 percent during the SARS period. Furthermore, a strong pattern of seasonality is another characteristic of inbound tourism demand in Japan.

The rest of the paper is organized as follows. Section II briefly discusses the development of inbound tourism in Japan over recent decades and in the recent COVID-19 tourism bust period. A review of previous studies on tourism determinants in general and on Japan inbound tourism in particular is provided in Section III. Section IV describes the methodology and data, and expected signs for coefficients. Results and findings are presented in Section V. Finally, Section VI concludes with a discussion on lessons from the boom period for the revival of Japan's inbound tourism following the COVID-19 bust in tourist arrivals.

II. INBOUND TOURISM DEVELOPMENTS IN JAPAN

Before the COVID-19 pandemic, the number of international visitors to Japan had surged during the preceding decade (Figure 1). The boom is mostly attributed to the sharp increase in the number of inbound tourists, as the number of foreigners coming to Japan for business and other purposes has evolved much less. Especially from 2013, the number of arrivals witnessed strong growth. This was also the year when the new government of Prime Minister Abe essentially started to reinvigorate tourism-oriented policies to promote the tourism industry. The total number of visitor arrivals has tripled from 2013 to 2018 to reach a record

31 million, with an average annual growth rate of 25.1 percent during this period. The government's target is 60 million tourist arrivals in 2030.

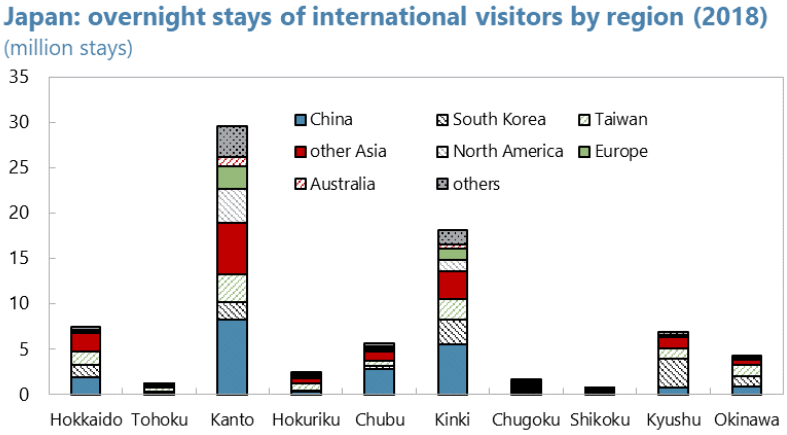
Figure 1. Japan: Total International Arrivals

The number of tourist arrivals has increased from all markets, in particular from Asia (Figure 1). Asia has always been the largest source market for Japanese inbound tourism, and its importance for Japan's tourism industry has been increasing dramatically. While the number of tourists from North America, Europe and Australia was more than twice as large in 2018 than in 2012, the number of Asian visitors has increased three- to six-fold within the same period. Asia now provides 84.5 percent of total visitors to Japan compared to 75 percent in 2012. Of the top-five most important origin markets of Japan in 2018, four were in Asia: the People's Republic of China (26.9 percent of total inbound visitors), South Korea (24.2 percent), Taiwan Province of China (15.3 percent), and Hong Kong SAR (7.1 percent). The fifth most important market was the United States (4.9 percent).

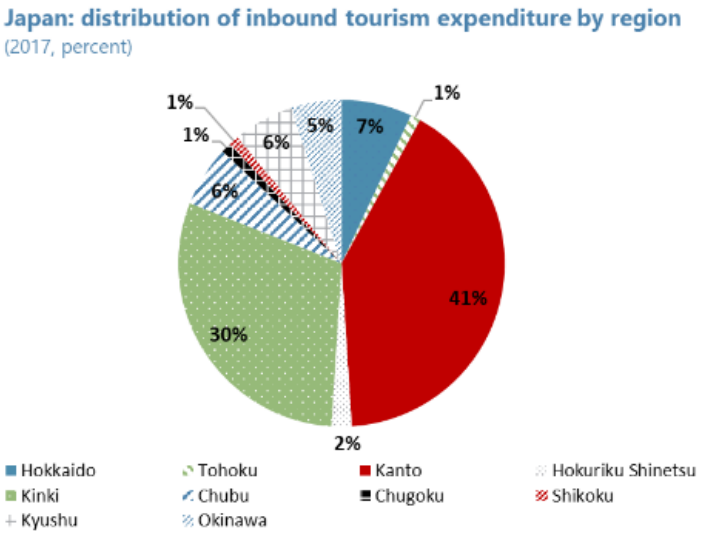
The inbound tourist boom is highly concentrated in certain regions ("tourist hotspots") within Japan. While foreign tourists have also increasingly been venturing into outlying areas, they remain highly focused on the Kanto region in and around Tokyo, the Osaka/Kyoto area (the Kinki region), Hokkaido, and Okinawa (Figure 2).[3] Diversification of origin countries differs too: almost half of all foreign visitors in the Kyushu region are South Korean; and in Kanto and Kinki, 30 percent of visitors are from the People's Republic of China. As per-capita spending is also higher in the tourist hotspots, Kanto and Kinki receive more than 70 percent of total foreign tourist expenditures, while other regions such as Tohoku or Shikoku lag substantially behind these hotspots.

[3] The Kanto region includes Tokyo, Saitama, Chiba, Kanagawa, Tochigi, Gunma and Ibaraki. The Kinki region includes Osaka, Kyoto, Hyogo, Nara, Mie, Shiga and Wakayama.

Figure 2. Japan: Development of Inbound Tourism at the Regional Level



Source: Japan National Tourism Organization; IMF staff calculation.

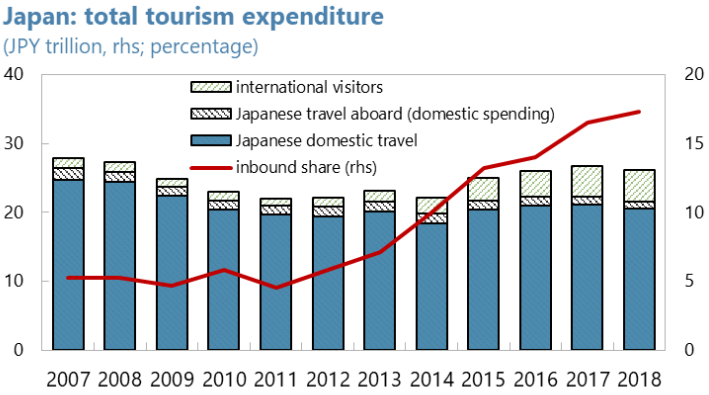


Note: Regions' sequence is from North to South.
Source: MLIT (2018).

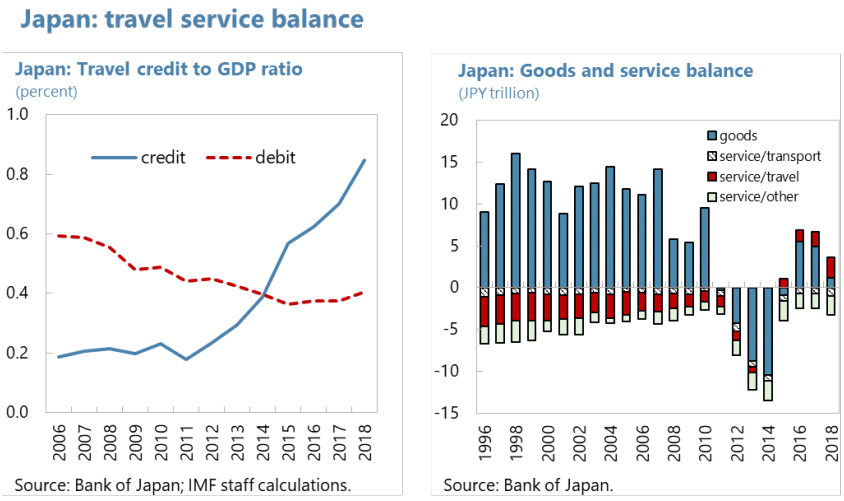
Altogether, inbound tourism has become the main growth engine of Japan's tourism industry. In 2018, Japan's total tourism expenditure was ¥ 26.1 trillion.[4] Although the expenditure of Japanese residents on domestic travel contributes the larger part to the tourism economy, this contribution has been stagnating (Figure 3). In contrast, the contribution of international visitors to total tourism consumption has significantly increased from 4.7 percent in 2009 to 17.3 percent in 2018 to reach ¥ 4.5 trillion.

[4] The total tourism expenditure includes total domestic spending on tourism by inbound visitors, domestic residents' travel, and the domestic spending part of residents travelling abroad (outbound travelers).

Figure 3. Japan: Contribution of Inbound Tourism to the Japanese Economy



Source: Japan Tourism Agency; IMF staff calculation.



Source: Bank of Japan; IMF staff calculations.

Source: Bank of Japan.

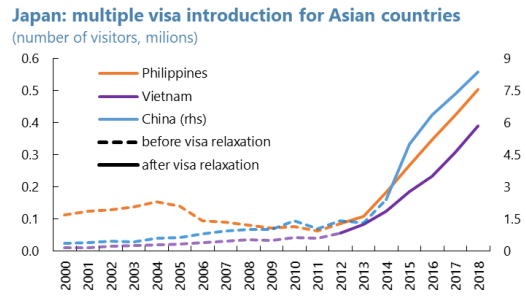
Inbound tourism also contributes to Japan's current account surplus (Figure 3). After turning positive for the first time in 2015, Japan's travel services surplus reached almost 0.5 percent of GDP in 2018. This reflects a step upward trend of travel credits since 2011, and the erosion of travel debits. The latter has been dominated by a fall in the per-capita overseas spending of Japanese tourists rather than a decline in their annual headcount, which has fluctuated around 17 million persons.[5] The structural change in the services balance has been significant. Compared to ten years ago, the travel balance has been transformed from the largest deficit factor into the second-largest surplus factor of the services account, after income from intellectual property (Ministry of Land, Infrastructure and Transport, 2019).

[5] See Japan National Tourism Organization at https://statistics.jnto.go.jp/en/graph/#graph--outbound--outgoing--transition.

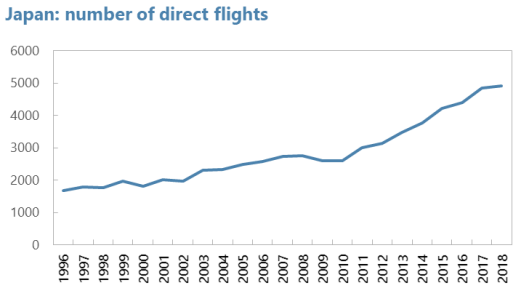
The Japanese Government has been strongly supporting its tourism industry in attracting international visitors (Figure 4). Since the government of Prime Minister Abe established the Ministerial Council on the Promotion of Japan as a Tourism-Oriented Country in March 2013, a broad range of measures have been launched by the government to strengthen Japan's attractiveness for tourists. The measures were then further reinvigorated in 2016 with the initiation of the 2016 Tourism Strategy and the establishment of the Tourism Strategy Promotion Council. In 2017, the budget for tourism promotion and investment on tourism infrastructure had increased four-fold compared to 2012. In January 2019, the government introduced an international departure tax to secure additional financial resources for promoting tourism. Extensive relaxation of visa requirements for international tourists has also been undertaken, benefiting over 40 countries during 2013–2018 either with the introduction of multiple visas or visa exemptions. All those measures helped boost the total number of international visitors to Japan.

Figure 4. Japan: Government Efforts to Boost Tourist Numbers

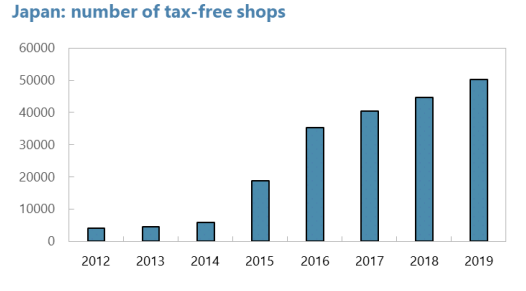
Note: JNTO stands for Japan Natinonal Tourism Organization, a body in charge excecuting the Visit Japan Campain and other tourism marketing activities.
Source: Ministry of Finance, Japan; IMF staff calculation.



Source: Japan National Tourism Organization; IMF staff calculation.



Source: Ministry of Land, Infrastructure and Transport (MLIT), Japan.



Source: Ministry of Land, Infrastructure and Transport (MLIT), Japan.

Box 1. The COVID-19 Shock and Japan's Inbound Tourism

The outbreak of the novel coronavirus (COVID-19) in early-2020 has been weighing significantly on global tourism.

Sources: Japan National Tourism Organization; IMF staff calculations.

The total tourist arrivals to Japan plunged by 58.3 percent (y-o-y) in February and 93 percent (y-o-y) in March, and collapsed to essentially zero thereafter. The sharp fall was led by a decrease in Chinese tourist numbers on the back of the outbreak of COVID-19 in China and subsequent travel restrictions, starting with a ban on group travel imposed by the Chinese government from January 27th, 2020. Subsequently, the further spread of the pandemic, lockdowns and travel policies in origin countries, the reduction of transport links, and finally COVID-19-induced entry restrictions by Japan, which were gradually extended to more and more countries, entailed the ultimate collapse in tourist arrivals.[1]

In the model presented in Section IV, we estimate the impact of the 2003 SARS—another type of the coronavirus—on tourist arrivals. The SARS outbreak had a broad-based impact on tourist arrivals from all source markets, with the largest effect in the case of SARS-hit China, where the number of visitors to Japan dropped by half (see Section V, part C). The SARS experience has only limited applicability to gauge the final impact of the current COVID-19 pandemic, but even the estimated results from the SARS period have already suggested a significant and large negative impact of the new coronavirus on Japan tourism. This has subsequently been confirmed by aforementioned actual developments.

[1] As in other countries, the Japanese government is focusing on promoting domestic tourism at the first stage of re-opening the economy. A "Go To Travel" Campaign was launched on July 22, 2020 to subsidize domestic travel (excluding trips from and to Tokyo where infection cases are concentrated), with subsidy rates of up to half of travel expenses.

III. Literature Review

A. Tourism Demand and its Determinants

The demand for tourism-related services of a country incorporates demand from domestic residents and foreign residents ("inbound demand"), with studies of the latter being dominant in the literature due to better statistical coverage (Song et al., 2019). Among indicators measuring inbound tourism demand, the number of visitor arrivals is most frequently used as a dependent variable, followed by tourist expenditure (Lim, 1997; Li et al., 2005). Inbound tourism demand is typically found to be a function of the income level in the origin countries,

price levels and exchange rates, the accessibility of transportation, and tourism-promoting policies and marketing. A lagged dependent variable is also often used to capture habit persistence and "word-of-mouth effects".[6]

Among the demand-determining factors, tourist income and relative prices are the dominant factors examined in previous studies:

- *Tourist income* is usually proxied by one of the following source market indicators: real GDP (Kumar et al., 2020; Dogru et al., 2017); PPP-adjusted real GDP (Culiuc, 2014); PPP-adjusted real GDP per capita (Konishi, 2019; Laframboise et al., 2014); PPP-adjusted real GNP per capita (Eilat and Einav, 2004); unemployment rate (Laframboise et al., 2014), or industrial production index (Dogru et al., 2017). In this context, data frequency plays a role in selecting proxy variables for income, as some indicators are only available annually.

- *Bilateral real exchange rates* are frequently used as a proxy for relative prices, although some studies try to include the relative consumer price index as a variable that is separate from the bilateral nominal exchange rate (Kim and Lee, 2017; Dogru et al., 2017). However, there are two reasons favoring the use of real exchange rates: first, from an economic point of view, travelers compare the destination's cost of living in their domestic currency when deciding to travel (Song and Li, 2008); and second, from an econometric point of view, including exchange rates and prices separately might yield a biased outcome (Kumar et al., 2020; Kim and Lee, 2017; Dogru et al., 2017). Tourism prices would be ideal proxies for the relative price, but studies utilizing this data are limited due to the scarcity of indices of tourism prices.[7] Instead, consumer price indices (CPI) are often used when calculating the bilateral real exchange rates. Other proxies for prices used in previous studies include transportation cost, usually proxied by oil prices and/or jet-fuel prices, although the influence of those prices is usually found to be statistically insignificant (Kim and Song, 1998; Kim and Lee, 2017).

- Economic theory would also suggest that *third-country price effects* could be important for the development of inbound tourism demand in a specific country. If trips to alternative destinations become cheaper, foreign tourists might choose to go to those alternative destinations instead (Seetaram, 2012). Previous studies usually chose countries with similar geography, climate and culture as substitute destinations. Substitute prices in those destinations are then measured as either unweighted average exchange rate-adjusted prices (Lim and McAleer, 2001; Dogru et al., 2017) or tourism-weighted average exchange rate-adjusted prices (Song et al., 2003; Kumar et

[6] See Dogru et al. (2017).

[7] Dwyer et al. (2000) utilize the tourists' expenditure components and price at a disaggregated level to calculate the tourism price competitive index in 19 destinations, with Australia used as the benchmark.

al., 2020). The latter method is preferable as it allows the weights to change throughout the estimation period to capture changes in travel tastes and trends. Substitution effects are found to be less relevant if third countries serve as "package destinations", that is when travelers visit several countries on one trip (Li et al., 2011).

Non-economic factors have also been included in previous studies to capture external shocks to tourism demand. Those may include seasonality, political instability, disasters, diseases, safety at the destination, marketing effectiveness and tourism-oriented policies. Kumar et al. (2020) provides a comprehensive literature review of these factors.

B. Japan's Inbound Tourism and its Determinants

Despite the rapid development of Japan's inbound tourism, empirical studies on its determinants are limited.[8] At a bilateral level, previous studies mostly addressed the tourism flow from Korea to Japan. Using the data of tourist numbers from South Korea to Japan, Kim and Lee (2017) compare models with several different tourism price variables and identify the model using relative prices and the exchange rate (and without transportation costs) as the best one. Lee et al. (2010) also investigate the effect of Japan's visa-free entry granted for South Korean tourists. They found that Korean tourist numbers to Japan increased by 12.1 percent in the first year and 25 percent in the second year due to the visa exemption. In addition, Kim et al. (2018) investigate the role of Abenomics in boosting Japan's inbound tourism from South Korea. Utilizing interaction terms of a dummy variable for Abenomics with the bilateral exchange rate and Japan's GDP, the paper finds that the impact of the exchange rate and economic growth on Japan's inbound tourism from South Korea is significantly larger than in the pre-Abenomics period.

At a multilateral level, Nakazawa (2009) was among the first to use data on inbound tourist numbers for Japan, from 32 source markets for the period 1996Q1 to 2008Q4, to investigate the determinants of Japan's inbound tourism in three models: panel fixed and random effect models and a gravity model. For recent tourism developments, Konishi (2019) estimates the impact of origin countries' GDP per capita, bilateral exchange rates and visa policies on tourist arrivals using a panel fixed effect model with 20 countries for 2003-2016. All three factors are confirmed to have a significant impact on tourism demand. Mizuho research institute (2016) examined the determinants of tourist arrivals to Japan from 15 countries by conducting quarterly time-series OLS regressions for each country for 1995Q1-2015Q4. Besides the three factors examined by Konishi (2019), Mizuho's research takes into account the oil price and event dummies for each country, such as a SARS dummy, a dummy for political tensions between Japan and China that occurred in 2012, and a 2011 Japan

[8] For non-empirical studies, Henderson (2017) provides a comprehensive overview of recent trends in Japan's inbound tourism and its key determinants. In detail, he reviews the recent development of the five principle determinants of tourism—national conditions, attractions and amenities, government policy, destination marketing, and access and mobility—in Japan.

earthquake dummy. They confirmed that those events played a role in determining the number of tourist arrivals. Utilizing annual time-series data, Asemota and Bala (2012) find that there is a cointegrated relationship between standard determinants and tourist arrivals to Japan from five major Western countries over the period 1962–2009.

IV. DATA AND METHODOLOGY

A. Model

In this paper, we use the panel ARDL modeling approach proposed by Pesaran et al. (1999) to investigate the possible long-run relationship between Japan's inbound tourism demand and its determinants. As derived from the panel error correction model (ECM), the panel ARDL model has the following main advantages: first, it is superior in the presence of a mixed order of integration in the data; second, it is robust to omitted variables bias and simultaneous determination of growth regressors; and third, it is more appropriate when dealing with large *N*, large *T* dynamic panels.[9] Blackburne and Frank (2007) argue that different from traditional large *N*, small *T* panels, the assumption of homogeneity of slope parameters is often violated in large *N*, large *T* panels. The panel ARDL model instead allows the slope parameters to differ among *N* units, using two types of estimators. The first estimator is the Pooled Mean Group (PMG) estimator, for which long-run slope parameters are assumed homogenous across units but short-run parameters can differ. Therefore, the long-run coefficients are the same for all countries in the panel, while the short-run coefficients differ for each country and can be reported either by country or as an average. The second estimator is the Mean Group (MG) estimator which simply estimates *N* time-series regressions and averages the coefficients. The most appropriate of these two estimators can be selected by a Hausman test.

We start with a panel ECM for Japan inbound tourism demand as follows:

$$\begin{aligned}\Delta \ln T_{i,t} = {} & \rho_i \hat{\vartheta}_{i,t-1} + \sum_{k=1}^{q_1} \alpha_{ik} \Delta lnT_{i,t-k} + \sum_{k=0}^{q_2} \beta_{ik} \Delta lnY_{i,t-k} + \sum_{k=0}^{q_3} \delta_{ik} \Delta lnE_{i,t-k} \\ & + \sum_{k=0}^{q_4} \theta_{ik} \Delta lnSP_{i,t-k} + \sum_{k=0}^{q_5} \vartheta_{ik} \Delta visamul_{i,t-k} + \sum_{k=0}^{q_6} \sigma_{ik} \Delta visareq_{i,t-k} \\ & + \sum_{k=0}^{q_7} \pi_{ik} D_{t-k} + \mu_i + \varepsilon_{i,t}\end{aligned} \tag{1}$$

where ln denotes the natural logarithm. $T_{i,t}$ is the number of tourists arriving from country *i* in time *t*. $Y_{i,t}$ is the real GDP of country *i* in time *t*. $E_{i,t}$ is the bilateral real exchange rate of

[9] Pesaran (1997) and Pesaran et al. (1999) show that the traditional ARDL approach can be used for long-run analysis, and that the ARDL methodology is valid regardless of whether the regressors are exogenous or endogenous, and irrespective of whether the underlying variables are *I*(0) or *I*(1).

Japan with country *i* in time *t*, measured by yen per unit of country *i*'s currency. $SP_{i,t}$ is the substitute prices of destinations alternative to Japan for tourists from country *i* in time *t*. $Visamul_{i,t}$ is a multiple visa dummy which takes the value of 1 if tourists from country *i* in time *t* are allowed to apply for a multiple-entry visa and 0 otherwise. If visa requirements are further relaxed so that tourists are not required to have a visa to come to Japan, the additional visa dummy *visareq* will take the value 0, and 1 otherwise. D_t refers to a set of dummy variables: a disaster dummy, a dummy for the Global Financial Crisis, a SARS dummy, and seasonal dummies.[10] μ_i is the country-specific effect, $\varepsilon_{i,t}$ is an error term. $\hat{\vartheta}_{i,t-1}$ is the estimated residual obtained from the following long run cointegration relationship:

$$\ln T_{i,t} = \mu_i + \beta_{1i} lnY_{i,t} + \beta_{2i} lnE_{i,t} + \beta_{3i} lnSP_{i,t} + \beta_{4i} visamul_{i,t} + \beta_{5i} visareq_{i,t} + \vartheta_{i,t} \quad (2)$$

The estimated parameter ρ_i is the error correction term (ECT), indicating the adjustment speed to the long-run equilibrium. If there is a long-run relationship among variables, ρ_i is expected to be significant and negative. A higher ρ_i in absolute value points to faster adjustment of the short-run level back to the long-run equilibrium level.

The panel ECM model can be easily re-written into the form of an ARDL model:

$$\begin{aligned}\Delta \ln T_{i,t} = {} & \rho_{0i} lnT_{i,t-1} + \rho_{1i} lnY_{i,t-1} + \rho_{2i} lnE_{i,t-1} + \rho_{3i} lnSP_{i,t-1} + \rho_{4i} visamul_{i,t-1} \\ & + \rho_{5i} visareq_{i,t-1} + \sum_{k=1}^{q_1} \alpha_{ik} \Delta lnT_{i,t-k} + \sum_{k=0}^{q_2} \beta_{ik} \Delta lnY_{i,t-k} \\ & + \sum_{k=0}^{q_3} \delta_{ik} \Delta lnE_{i,t-k} + \sum_{k=0}^{q_4} \theta_{ik} \Delta lnSP_{i,t-k} + \sum_{k=0}^{q_5} \vartheta_{ik} \Delta visamul_{i,t-k} \\ & + \sum_{k=0}^{q_6} \sigma_{ik} \Delta visareq_{i,t-k} + \sum_{k=0}^{q_7} \pi_{ik} D_{t-k} + \mu_i + \varepsilon_{i,t}\end{aligned} \quad (3)$$

In equation (3), the ECT parameter corresponding to ρ_i in equation (1) is the coefficient ρ_{0i}. The long-run income elasticity is calculated as $\beta_{1i} = -\frac{\rho_{1i}}{\rho_{0i}}$, relative price elasticity as $\beta_{2i} = -\frac{\rho_{2i}}{\rho_{0i}}$, and substitute price elasticity as $\beta_{3i} = -\frac{\rho_{3i}}{\rho_{0i}}$. Meanwhile, the impacts of a change in visa policy from single to multiple visa and from a visa requirement to no visa requirement are captured by $\beta_{4i} = -\frac{\rho_{4i}}{\rho_{0i}}$ and $\beta_{5i} = -\frac{\rho_{5i}}{\rho_{0i}}$, respectively. As β_{4i} and β_{5i} are coefficients of a

[10] Refer to Section IV.B on data for the details of the definition of those dummies.

logarithm variable regressed on dummies, additional calculations were done for scale interpretation. [11]

The estimation of equation (3) also gives us an idea about short-run impacts of changes in the independent variables, especially the effect of natural disasters, the Global Financial Crisis, and the SARS outbreak. In addition, equation (3) captures the seasonality of tourist arrivals.

B. Data/Expected Signs

The data of tourism arrivals used in this paper includes inbound flows from 34 source markets to Japan in the period from 1996Q1 to 2018Q4.[12] This covers almost the total population of tourists coming to Japan, as 99.0 percent of total international arrivals to Japan in 2018 were from these 34 source markets. Countries are grouped in line with the geography and level of economic development.[13]

The income level of tourists is proxied by the quarterly real GDP of their origin country measured in that country's currency. An increase in their income is expected to lead to an increase in the number of visitors to Japan.

The development of the relative price level of Japan compared to a tourist source market *i* is measured by the bilateral real exchange rate of the Japanese yen vis-à-vis *i*'s local currency (E_i) as in the following equation:

$$E_i = \frac{CPI_i/S_i}{CPI_J/S_J} \qquad (4)$$

where S_i and S_J are the bilateral nominal exchange rates of *i*'s local currency and the yen vis-à-vis the U.S dollar, respectively. CPI_i and CPI_J are the consumer price indices (2010=100) of country *i* and Japan, respectively. An increase in E_i implies a real depreciation of the yen against the local currency, making travelling to Japan more affordable for tourists from *i*. Therefore, the expected sign for the coefficient on $E_{i,t}$ is positive.

To measure the price competitiveness of a destination that is competing with Japan, we follow the calculation used in Song et al. (2003) and Kumar et al. (2020) and calculate tourism-weighted substitute prices. Following Song et al. (2003), we choose six countries or territories as alternative/competitor tourism destinations to Japan: Korea, Taiwan Province of

[11] Followed Halvorsen and Palmquist (1980), the impact of the multiple-visa dummy and the visa requirement dummy on tourist arrivals are calculated as $(\exp(\beta_{4i}) - 1)$ and $(\exp(-\beta_{5i}) - 1)$, respectively.

[12] The data on tourist arrivals is released by the Japan National Tourism Organization (JNTO). The tourism arrivals data began in 2005 for Vietnam. Although the data is available for Poland and Turkey from 2013 and Mongolia from 2015, we exclude them from the dataset due to the limited number of observations. Their share in total tourist arrivals was 0.2% in 2018 combined. See Appendix Table 1 for the country list.

[13] See Appendix Table 2 for list of data and sources.

China, Hong Kong SAR, Singapore, Thailand and the People's Republic of China.[14] The substitute prices are calculated as below:

$$SP_i = \prod_{c=1}^{S=6} (CPI_c / S_c)^{w_{i,c}} \qquad (5)$$

where CPI_c is the consumer price index (2010=100) in country c, an alternative destination to Japan. S_c is the nominal exchange rate of c's local currency vis-à-vis the U.S. dollar. The weights are calculated as $w_{i,c} = OT_{i,c} / \sum_{c=1}^{6} OT_{i,c}$, where $OT_{i,c}$ is the number of outbound tourists from the source market i to the substitute destination c. In contrast to previous studies, we allow the weight $w_{i,c}$ of the substitute destination c to vary by source markets.[15] The source-market-specific weights, which also vary by year, allow us to capture precisely the travel tastes and trends of tourists from a specific source market over time. A decrease in $SP_{i,t}$, either because of a decrease in the overall price level at the substitute destination c or a depreciation of the local currency of c, implies that the trip to c becomes less expensive. If the substitution effect is larger than the income effect, this would lead to a decrease in inbound tourism to Japan, and, therefore, the expected sign of the coefficient of SP_i would be positive. However, if the income effect dominates, both the competitor destinations and Japan could benefit from more inbound tourism from country i and the coefficient of SP_i would be negative. In a similar vein, a negative sign could also result if (all or some of) the competitor countries are packaged together with Japan as a destination and visited together during one trip.

The disaster dummy takes into account the specified disasters that happened during the 1996–2018 period. It takes the value 1 for the quarter in which a disaster happened, and 0 otherwise.[16] The Global Financial Crisis dummy takes the value 1 during the 2008-2009 period. Finally, the SARS dummy takes the value of 1 during Q1 and Q2 in 2003 when SARS peaked, and 0 otherwise.

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[14] For reference, in the ranking lists of most visited countries using United Nation World Tourism Organization (UNWTO) data, the Japan Tourism Agency highlighted ten Asian countries, in which the selected six countries/territories are closest to Japan's rank. We also take into consideration the countries'/territories' similarity by utilizing the Travel and Tourism Competitiveness Index (T&T-CI) published by The World Economic Forum (WEF 2017). The T&T-CI compares the overall tourism environment of 136 countries worldwide based on a detailed scoring system of 14 pillars.

[15] Song et al. (2003) and Kumar et al. (2020) calculated the substitute prices using the same weight $w_c = TA_c / \sum_{c=1}^{S} TA_c$ for all source markets, with TA_l being the total arrivals from substitute country c to the country with which the substitute countries are competing. This method is misleading when the objective is to measure the preferences of tourists from source markets. The data on outbound tourism from each source market to the substitute countries should instead be utilized to accurately capture the travel preferences of tourists from a specific source market.

[16] The Japanese government adopted ordinances designating a disaster as a 'specified disaster' if it was particularly devastating. During the estimation period, four specified natural disasters occurred: the 2004 Chuetsu region tremblor in Niigata (2004Q4), the March 2011 Great East Japan Earthquake and tsunami (2011Q1), the 2016 Kumamoto earthquakes (2016Q2) and the 2018 torrential rain in western Japan (2018Q2).

We use Im, Pesaran and Shin (IPS) unit root tests to check the stationarity of variables. All data are confirmed to be stationary in first difference (Appendix Table 3). The lag order of the ARDL regressions were selected using the Bayesian Information Criterion with the maximum lag length set to 4.

V. RESULTS

A. Heterogeneity in Long-run Behavior of Japan Tourists from Different Countries

Table 1 shows the PMG's long-run coefficients obtained from equation (3), estimated during the period 1996–2018 for all 34 source markets together as well as for different sub-groups of source markets. Column (1) shows the PMG's long-run coefficients of the estimation for all 34 markets. The Hausman test rejects the null hypothesis that the PMG is more preferred than the MG, suggesting heterogeneity across countries in the way their tourists react to changes in the independent variables in the long run. This points to the necessity of further analysis at source market sub-group level.

We therefore initially divided the source markets into four groups in line with geography and income levels: advanced Asia, emerging Asia, advanced non-Asia and emerging non-Asia.[17] However, a series of Hausman tests suggested the following final grouping: advanced Asia, emerging Asia (excluding the People's Republic of China), the People's Republic of China, and non-Asia.

To elaborate on the detailed derivation of this final grouping, as shown in column (2) of Table 1, the Hausman test accepts the null hypothesis of a preference for the PMG estimator over the MG estimator in the case of advanced Asia. However, for the group of seven emerging Asian countries, the test could not be performed. We suspected China may be an outlier in this group, and therefore performed the test again for the same group but without China.[18] For this smaller group with six countries, the Hausman test accepted the homogeneity in long-run parameters (column (4)). Finally, the groups of emerging non-Asia and advanced non-Asia are merged due to the limited number of emerging non-Asian countries in the dataset. Countries in the non-Asia group are also confirmed by the Hausman test to have homogeneous long-run parameters (column (5)).

B. Long-run Tourism Determinants

As shown in Table 1, we confirm a long-run homogenous relationship at country sub-group levels between total tourist arrivals in Japan and their determinants during the 1996–2018

[17] See Appendix Table 1 for the countries in the different sub-groups. The country categorization along income levels is in line with the International Monetary Fund's classification as of August 20, 2019.

[18] The six countries are India, Indonesia, Malaysia, Philippines, Thailand and Vietnam. The reason for the heterogeneity between the group of these six countries and China may lie in different preferences and, hence, spending patterns.

period.[19, 20] The ECTs are all significant and range from 0.07 to 0.67, indicating that 7 to 67 percent of the deviation of the short-run from the long-run level are adjusted in the next quarter.

In the long run, tourist income as well as relative price movements have a significant impact on the total number of tourist arrivals from all country groups to Japan. Income elasticities range from 2.4 to 5.3, indicating that a one percent increase in real GDP of the tourist origin country can raise the number of Japan tourist arrivals from there by 2.4 to 5.3 percent in the long term. In addition, a one percent yen depreciation in real terms vis-à-vis the origin country currency leads to a 0.7 to 2.5 percent increase in the number of tourists, with tourist numbers from advanced Asian countries responding the most to the real exchange rate movement. As tourist arrivals from these countries account for around half of all arrivals to Japan (50.8 percent in 2018), this result suggests a high sensitivity of Japan's inbound tourism to exchange rate changes.

The availability and competitiveness of alternative destinations seem to influence the demand for Japan tourism in China and other emerging Asian countries. In these groups, the substitute price elasticity is negative, indicating the dominance of income effects over substitution effects, including the possibility of alternative destinations serving as 'package destinations' together with Japan.[21] For instance, income effects might discourage tourists from coming to Japan if alternative destinations that the same tourists also want to visit in a given time period become more expensive and hence constrain their budget for Japan tourism as well.

The success of the government's visa relaxation policy in boosting the number of tourists to Japan is strongly confirmed by our empirical results. The coefficients of the multiple-visa dummy are 1.17 and 0.63 for China and the group of other emerging Asia, respectively, indicating that the introduction of multiple visas increases the number of tourists from China and other emerging Asian countries respectively by 224 percent and 87 percent in the long run (derived from the estimated coefficients of the dummy variable of 1.18 and 0.63, respectively).[22] Furthermore, removing visa requirements fully would lift the total number of

[19] The results in Table 1 and Table 2 are from the same regression model (3) and presented separately for long- and short-run determinants.

[20] As a robustness check, Pedroni panel cointegration tests are also performed. As shown in Appendix Table 4, the results confirm the existence of a cointegration relationship among tourist arrivals and its determinants.

[21] For a robustness check, we use another substitute price variable in line with the method in Asemota and Bala (2012), to calculate the real effective exchange rate ($REER_{i,t}$) of the origin country's currency to the currencies of the alternative destinations. The results are shown in Appendix Tables 5 and 6 and suggest that the substitute price effects are now also applicable for non-Asian tourists. However, one caveat with this alternative calculation is that the origin country's price level and the nominal exchange rate of its currency vis-à-vis the U.S. dollar will enter both the bilateral real exchange rate $E_{i,t}$ and the new substitute price variable ($REER_{i,t}$) in the regressions, which might cause estimation bias.

[22] See footnote 11.

tourists from emerging Asia by 307 percent (from a coefficient of 1.40) in the long run. Japan's relaxation of visa requirements for over 40 countries in 2013 to 2018 has therefore likely contributed a great deal to Japan's inbound tourism boom during that period.

C. Short-run Tourism Determinants

Table 2 shows averaged parameters of short-run determinants of tourism arrivals for each group of source markets in the 1996–2018 period.[23] In addition to the long-run determinants, a disaster dummy, a Global Financial Crisis (GFC) dummy, a SARS dummy and quarterly dummies are included to capture the possible short-term impacts of those factors on Japan's tourism demand by foreigners.

The results confirm the vulnerability of Japan's inbound tourism demand to natural disasters. The disaster dummy shows simultaneous negative impacts on tourism demand from most source markets—tourist numbers could decrease by 11 to 17 percent in the period in which a disaster happens. The impact becomes even larger in the following period, reaching a fall of as large as a 46 percent in tourist numbers from emerging Asia. For non-Asian tourists, even the second quarterly lag is significant, with tourist numbers still 4.2 percent lower two quarters after the disaster happened.

The SARS outbreak had a broad-based impact on tourist arrivals from all source markets. During the first and second quarter of 2003, an estimated 16–20 percent of tourists canceled their trips to Japan due to the SARS outbreak. The figure was extremely high in the case of virus-hit China, with the number of visitors to Japan dropping by half.

Finally, Japan's inbound tourism also exhibits large seasonality patterns, which differ among source markets. Q1 is chosen as the reference point in this paper. The pattern is that compared to Q1, Q2 and Q4 are favored by tourists from emerging Asia (excluding China); Q3 witnesses the highest tourist numbers from China and advanced Asia; and non-Asian tourists prefer to visit Japan in Q2, Q3, and Q4 more than they do in Q1. While seasonality in aggregate tourist numbers is somewhat mitigated by the varying seasonality across country groups, it can still pose challenges on the supply side, that is in terms of securing sufficient labor and other inputs in tourism-related industries during seasonal peaks.

VI. Conclusions and Policies

Our analysis has crystalized important lessons from Japan's pre-COVID-19 tourism boom for the tourism revival phase that will follow the COVID-19 crisis. The most important conclusions are as follows.

[23] The short-run parameters differ by source market and therefore can be presented at the country level. Results for the short-run parameters of each country are available upon requests.

The rapid development of Japan's inbound tourism before COVID-19 was to a large extent the outcome of the government's substantial efforts to attract tourists through extensive relaxation of visa requirements, supported by other favorable developments such as yen depreciation and income convergence overseas. In the tourism revival phase following COVID-19, the further relaxation of visa requirements could be considered as a powerful tool to not only attract more tourists in aggregate but also to diversify tourism source markets. Targeting a broader set of Asian emerging markets would help reduce risks from idiosyncratic shocks in dominant tourism source markets.

In addition, the empirical results point to a high sensitivity of Japan's tourism industry to price factors, that is relative prices and exchange rates, including any sudden yen appreciation due to the yen's safe-haven status (Han and Westelius, 2019). This could pose risks to the revival of inbound tourism.

To reduce the price and exchange rate sensitivity of inbound tourism, greater orientation toward tourism experiences, especially toward Japan-specific unique experiences, and associated product differentiation ("Japan branding"), could help. Bringing more tourists into non-urban regions could be one important way to foster the transition to experience-oriented tourism and away from a shopping-oriented tourism, which is currently particularly pertinent among Asian tourists.[24] The "regionalization" of tourism could then in turn incentivize longer stays, repeat visits, and more per-capita spending by tourists. Preparing for more regional tourism would also be in line with likely post-COVID-19 demand shifts as regional (non-urban) tourism may well become more attractive to tourists than urban areas in the presence of COVID-19 and other health concerns, which puts a premium on closeness to nature and low population density (OECD, 2020). Against this backdrop, revamping regional tourism through experience-oriented tourism can also be a good policy in the post-COVID-19 period, as it also fosters tourism at the high end of per-capita spending.

Our research also confirms that natural disasters can have a large and prolonged impact on inbound tourism in the short term. As international tourists react adversely to disaster and post-disaster situations, countermeasures for mitigating the impact of natural disasters on tourism are necessary in not only disaster-affected areas but also unaffected areas. Implementation of a disaster information policy, including the efficient and accurate provision of information about the geographic reach and duration of disaster effects, will help prevent tourists from staying away and assist them in rescheduling their visits. Similar lessons would apply in the case of contagious diseases, such as COVID-19, with respect to information on health-related matters, including on the high standards of medical care and health provision in Japan. Nurturing active cooperation and partnerships with the health-care sector to foster its preparedness to cater for the needs of tourists would also be beneficial, not

[24] Laframboise et al. (2014) showed that higher-end destinations have lower price elasticity.

only in the case of contagious diseases. Above all, measures to restore travelers' confidence will play a major role in attracting tourists after any crisis.

Finally, a revival in inbound tourism needs to be synchronized with the supply of tourism-related services, including labor inputs and tourism infrastructure. While fostering labor-saving efficiency gains, more foreign labor (as well as greater female and elderly labor market participation) will need to be considered as Japan's labor force continues to shrink. In light of the COVID-19 pandemic, investment in appropriate technology can be effective both to reduce labor needs and costs, and foster social distancing and other contagion-prevention measures. In addition, continuing to enhance tourism infrastructure—such as free Wi-fi, multilingual signage and cashless payment systems—are among the top priorities to ease tourists' concerns about travelling to Japan.[25]

[25] A Japan Tourism Agency (2019) survey showed that the most uncomfortable issues tourists encounter when traveling in Japan are lack of public Wi-fi, poor non-Japanese language skills by some residents, lack of multilingual signage, including for public transportation, and lack of cutting-edge payment settlement methods.

Table 1. Japan: Long-run Results of ARDL Panels for Tourist Arrivals (1996–2018)

VARIABLES	ln(tourist arrivals) (lnT_t)				
Country/ Country group	(1) All countries	(2) Advanced Asia	(3) China	(4) Emerging Asia excl. China	(5) Non-Asia
			Panel A: Long-run determinants		
$lnY_{i,t}$	2.996***	3.027***	2.436***	4.095***	5.291***
	(0.350)	(0.457)	(0.206)	(0.252)	(0.861)
$lnE_{i,t}$	2.345***	2.471***	1.477**	0.678***	1.453***
	(0.199)	(0.226)	(0.688)	(0.222)	(0.392)
$lnSP_{i,t}$	0.396*	0.186	-2.893**	-1.926***	0.419
	(0.230)	(0.328)	(1.218)	(0.351)	(0.368)
$visamul_{i,t}$	1.284***		1.178***	0.631***	
	(0.366)		(0.208)	(0.117)	
$visareq_{i,t}$	-0.829**	0.395***		-1.404***	5.515
	(0.371)	(0.138)		(0.119)	(9.524)
$ECT_{i,t-1}$	-0.0956***	-0.221***	-0.666***	-0.275**	-0.0745***
	(0.0142)	(0.0743)	(0.153)	(0.116)	(0.0103)
Hausman test	51.12***	1.4		7.65	3.24
	[0.00]	[0.845]		[0.177]	[0.518]
Observations	1098.182	440	88	488	1896
Estimator type	PMG	PMG	MG	PMG	PMG
Max log likelihood	2912	157.56	–	173.91	805.438
Number of country	34	5	1	6	22

Sources: Author's calculations.
Notes: ***/**/* indicate statistical significance at the 1%, 5% and 10% level, respectively. Standard errors in parentheses () and p-values in square brackets [].

Table 2. Determinants of Japan's Tourist Arrivals in the Short run (1996–2018)

VARIABLES	Δln(tourist arrivals) (ΔlnT_t)			
Country/ Country group	(1) Advanced Asia	(2) China	(3) Emerging Asia excl. China	(4) Non-Asia
	Panel B: Short-run determinants			
$ECT_{i,t-1}$	-0.221***	-0.666***	-0.275**	-0.0745***
	(0.0743)	(0.153)	(0.116)	(0.0103)
ΔlnT_{t-1}	-0.295***	0.204	-0.369***	-0.299***
	(0.0545)	(0.148)	(0.0868)	(0.0324)
ΔlnT_{t-2}	-0.125***	0.174	-0.242***	-0.285***
	(0.0291)	(0.127)	(0.0581)	(0.0302)
ΔlnT_{t-3}	-0.157**	0.0239	-0.283***	-0.180***
	(0.0650)	(0.111)	(0.0462)	(0.0152)
$\Delta lnY_{i,t}$	2.197**	8.231	2.400*	0.554
	(0.911)	(5.717)	(1.287)	(0.527)
$\Delta lnE_{i,t}$	0.298	-0.735	0.0348	-0.350***
	(0.321)	(0.733)	(0.217)	(0.0689)
$\Delta lnSP_{i,t}$	0.0843	2.295	0.108	-0.287
	(0.405)	(3.105)	(0.417)	(0.183)
$\Delta visamul_{i,t}$		0.581*	0.127	
		(0.325)	(0.130)	
$\Delta visareq_{i,t}$	-0.234**		-0.253	-0.00639
	(0.0992)		(0.168)	(0.00639)
$disaster_t$	-0.128**	0.0703	-0.166***	-0.112***
	(0.0648)	(0.163)	(0.0279)	(0.0141)
$disaster_{t-1}$	-0.341***	-0.343**	-0.464***	-0.276***
	(0.0574)	(0.163)	(0.0487)	(0.0218)
$disaster_{t-2}$	0.0430**	0.222	0.0165	-0.0416**
	(0.0185)	(0.169)	(0.0471)	(0.0193)
GFC	-0.0396	-0.0216	-0.0564	-0.107***
	(0.0442)	(0.121)	(0.0558)	(0.0110)
SARS	-0.207**	-0.502**	-0.197***	-0.160***
	(0.0920)	(0.212)	(0.0705)	(0.0513)
Q2	0.106	0.0220	0.373***	0.265***
	(0.116)	(0.117)	(0.0725)	(0.0494)
Q3	0.150***	0.289***	-0.0447	0.203***
	(0.0429)	(0.110)	(0.0882)	(0.0526)
Q4	0.0898	-0.344***	0.242***	0.124***
	(0.138)	(0.119)	(0.0754)	(0.0310)
Constant	-4.315***	-9.582***	-8.531**	-2.793***
	(1.270)	(2.161)	(3.518)	(0.385)
Observations	440	88	488	1896
Estimator type	PMG	MG	PMG	PMG
MLL	157.56	-	173.91	805.438
Number of country	5	1	6	22

Notes: ***/**/* indicate statistical significance at the 1%, 5% and 10% level, respectively. Standard errors in parentheses () and p-values in square brackets [].

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Appendix Table 1. Country Group Information

Advanced Asia (5)	**Emerging Asia (8)**	**Advanced non-Asia (19)**	**Emerging non-Asia (3)**
Hong Kong SAR, Israel, South Korea, Singapore, Taiwan Province of China.	The People's Republic of China, India, Indonesia, Malaysia, Philippines, Thailand, Vietnam	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherland, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States.	Brazil, Mexico, Russia

Note: Categorization is in line with the International Monetary Fund classification, as of August 20, 2019.

Appendix Table 2. List of Data and Sources

Data	Source
Tourist arrivals	Japan National Tourism Organization (JNTO)
Real GDP (local currency)	International Monetary Fund, *World Economic Outlook* (WEO)
Nominal exchange rates vis-à-vis U.S. dollar	
Consumer price indices	
Number of outbound tourists	United Nation World Tourism Organization (UNWTO)
Information on visa to Japan	Japan Ministry of Foreign Affairs (JMoFA)
Information on geography and economic development	International Monetary Fund

Appendix Table 3: Panel Im-Pesaran-Shin (IPS) Unit Root Test Results

Variables	without trend		with trend	
	Level	First difference	Level	First difference
number of tourist	1.85	-60.08***	-11.21	-61.51***
Real GDP	2.23	-25.120***	-1.47*	-24.18***
Bilateral real exchange rate	-1.92	-37.48***	-4.02	-36.49***
Substitute prices index	11.79	-36.11***	-2.45***	-36.86***

Notes: We perform the IPS unit root test with one lag, and with/without trend. All variables are expressed in natural log. ***/**/* indicate statistical significance at the 1%, 5% and 10% level, respectively.

Appendix Table 4. Pedroni Panel Cointegration Test

Test statistics	Advance Asia	Emerging Asia excluding China	Non-Asia
Within dimension			
Panel v-statistic	3.927***	3.404***	4.758***
Panel rho-statistic	-19.61***	-13.71***	-23.43***
Panel PP-statistic	-17.43***	-16.32***	-25.43***
Panel ADF-statistic	-5.566***	1.403	-1.436*
Between dimension			
Group rho-statistic	-22.68***	-13.63***	-24.07***
Group PP-statistic	-21.7***	-19.4***	-30.01***
Group ADF-statistic	-2.207**	2.464	0.5419
Number of obs.	460	515	1987

Notes: Panel cointegration tests are performed for Model (2) $\ln T_{i,t} = \mu_i + \beta_{1i} lnY_{i,t} + \beta_{2i} lnE_{i,t} + \beta_{3i} lnSP_{i,t} + \beta_{4i} visamul_{i,t} + \beta_{5i} visareq_{i,t} + \vartheta_{i,t}$ for three country groups. ***/**/* indicate statistical significance at the 1%, 5% and 10% level, respectively.

Appendix Table 5. Results of ARDL Panel (Long-run Parameters) for Tourist Arrivals by Country Groups (1996–2018), Using Alternative Substitute Price Variable

VARIABLES	ln(tourist arrivals) (lnT_t)			
Country/ Country group	(1) Advanced Asia	(2) China	(3) Emerging Asia excl. China	(4) Advanced non-Asia
	Panel A: Long-run determinants			
$lnY_{i,t}$	3.068***	2.788***	2.932***	5.700***
	(0.318)	(0.326)	(0.275)	(0.403)
$lnE_{i,t}$	2.586***	1.937**	-0.182	1.770***
	(0.236)	(0.934)	(0.388)	(0.253)
$lnREER_{i,t}$	0.304	0.872	-1.528***	1.303***
	(0.295)	(0.546)	(0.484)	(0.171)
$visamul_{i,t}$		0.934***	0.790***	
		(0.231)	(0.171)	
$visareq_{i,t}$	0.418***		-1.460***	0.603
	(0.134)		(0.166)	(3.384)
$ECT_{i,t-1}$	-0.220***	-0.721***	-0.221***	-0.0986***
	(0.0708)	(0.171)	(0.0764)	(0.0208)
Observations	440	88	488	1,632
Estimator	PMG	MG	PMG	PMG
Max log likelihood	158.607	-	161.885	810.764
Number of country	5	1	6	19

Note: ln$REERi,t$ is the natural log of the real effective exchange rate of origin country i's currency to a currency basket of the six alternative destinations' currencies. ***/**/* indicate statistical significance at the 1%, 5% and 10% level, respectively. Standard errors in parentheses.

Appendix Table 6. Results of ARDL Panel (Short-run Parameters) for Tourist Arrivals by Country Groups (1996–2018), Using Alternative Substitute Price Variable

VARIABLES	Δln(tourist arrivals) (ΔlnT_t)			
Country/ Country group	(1) Advanced Asia	(2) China	(3) Emerging Asia excl. China	(4) Advanced non-Asia
Panel B: Short-run determinants				
$ECT_{i,t-1}$	-0.220***	-0.721***	-0.221***	-0.0986***
	(0.0708)	(0.171)	(0.0764)	(0.0208)
ΔlnT_{t-1}	-0.294***	0.254	-0.396***	-0.285***
	(0.0578)	(0.159)	(0.0659)	(0.0323)
ΔlnT_{t-2}	-0.128***	0.243*	-0.258***	-0.281***
	(0.0328)	(0.139)	(0.0511)	(0.0319)
ΔlnT_{t-3}	-0.157**	0.0696	-0.292***	-0.185***
	(0.0648)	(0.118)	(0.0430)	(0.0153)
$\Delta lnY_{i,t}$	2.142**	13.52***	2.511**	0.788
	(0.947)	(5.151)	(1.086)	(0.547)
$\Delta lnE_{i,t}$	0.437*	-0.978	-0.0527	-0.335***
	(0.263)	(0.740)	(0.181)	(0.0809)
$\Delta lnREER_{i,t}$	0.296	1.087	-0.230	0.0189
	(0.403)	(1.553)	(0.169)	(0.0785)
$\Delta visamul_{i,t}$		0.598*	0.0879	
		(0.330)	(0.105)	
$\Delta visareq_{i,t}$	-0.231**		-0.196	-0.0128
	(0.0981)		(0.125)	(0.0128)
$disaster_t$	-0.123**	0.127	-0.163***	-0.108***
	(0.0605)	(0.168)	(0.0209)	(0.0149)
$disaster_{t-1}$	-0.337***	-0.376**	-0.468***	-0.267***
	(0.0525)	(0.167)	(0.0521)	(0.0232)
$disaster_{t-2}$	0.0402*	0.190	0.0160	-0.0337*
	(0.0230)	(0.172)	(0.0532)	(0.0183)
GFC	-0.0342	0.106	-0.0801**	-0.0826***
	(0.0381)	(0.129)	(0.0382)	(0.0140)
SARS	-0.207**	-0.388*	-0.159**	-0.157***
	(0.0925)	(0.212)	(0.0634)	(0.0533)
Q2	0.109	-0.00481	0.367***	0.269***
	(0.122)	(0.117)	(0.0720)	(0.0498)
Q3	0.152***	0.277***	-0.0493	0.205***
	(0.0462)	(0.108)	(0.0892)	(0.0521)
Q4	0.0923	-0.376***	0.250***	0.123***
	(0.137)	(0.119)	(0.0739)	(0.0309)
Constant	-4.689***	-21.46***	-3.155**	-4.600***
	(1.333)	(7.627)	(1.252)	(0.948)
Observations	440	88	488	1,632
Estimator	PMG	MG	PMG	PMG
MLL	158.607	-	161.885	810.764
Number of country	5	1	6	19

Note: ln*REERi,t* is the natural log of the real effective exchange rate of origin country *i*'s currency to a currency basket of the six alternative destinations' currencies. ***/**/* indicate statistical significance at the 1%, 5% and 10% level, respectively. Standard errors in parentheses.