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# Mizuho Economic Outlook & Analysis

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February 19, 2016

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## *Determining factors of inbound travel to Japan* *A stronger yen matters more for the NIEs than China*

### < Summary >

- ◆ To analyze the sustainability of inbound travel to Japan, we estimated a demand function that incorporates visa requirements in addition to income and exchange rate factors.
- ◆ Exchange rate elasticity is relatively large in Europe, the US and the NIEs, and particular attention is required as to the impact of the rising yen on Taiwanese tourists visiting Japan. Meanwhile, income and relaxation of visa requirements play a greater role with respect to Southeast Asia.
- ◆ The number of Chinese visitors is affected less by exchange rates but more by political factors, such as Japan-China relations and relaxation of visa requirements.

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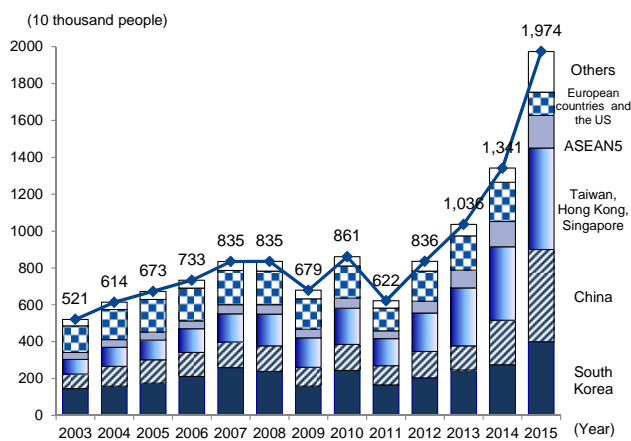
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## 1. Foreign visitors to Japan surged in 2015

Given the sharp rise of foreign visitors to Japan in 2015 (19.74 million, or an increase of around 50% y-o-y), the Japanese government's target to raise the number of inbound visitors to 20 million by 2020 has been more or less achieved (**Chart 1**). While domestic demand continues to stagnate, the increase in demand related to inbound travel is one of the few positive factors for the Japanese economy. Growth in foreign visitors' consumption is registered as service export in GDP statistics. It is estimated that the real GDP growth rate in 2015, which remained subdued at +0.4% y-o-y, was pushed up by 0.2% Pt by inbound demand (**Chart 2**). The government expects the number of foreign visitors to increase further, as seen in its deliberations to raise the target number.

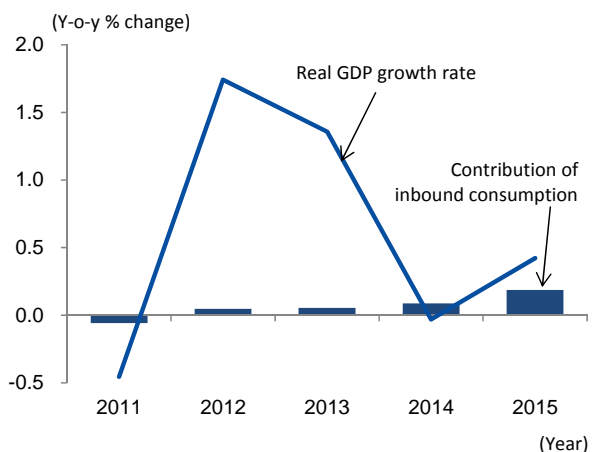
Even so, pessimistic views on the outlook for the emerging market (EM) economies such as China are prevailing, and with the yen now on a rising trend, uncertainty looms over the sustainability of inbound visitors. In this report, in order to forecast the future course of inbound visitors, we have estimated inbound demand functions for the major origin countries and clarified what factors in each country best explain the surge in the number of tourists in 2015.

**Chart 1: Number of foreign visitors to Japan**



Source: Japan National Tourism Organization (JNTO)

**Chart 2: Impact of inbound consumption on GDP**



Note: Inbound consumption = direct purchases by non-resident households

Source: Made by MHRI based on the Cabinet Office, *National Accounts*.

## 2. Outline of the inbound demand function

Demand on travel to Japan may be affected by factors such as income levels and exchange rates of the country of departure, earthquakes, and also by how cumbersome it is to enter the country as represented by visa requirements. Neiman and Swagel (2009), who analyzed the impact of visa policy changes in the US after the terrorist attacks on September 11, 2001, derived a demand function based on households' utility-maximizing behavior, which also incorporated the visa requirement factor, as follows.

$$\log Entry_{it} = \alpha_i + \theta_t + \beta_1 \log GDP_{it} + \beta_2 \log RER_{it} + \mathbf{VISA}'_{it}\boldsymbol{\gamma} + u_{it} \quad [1]$$

$Entry_{it}$ : Number of visitors entering from country  $i$ ,

$\alpha_i$ : Fixed effect of country  $i$  that is constant throughout the sample period,

$\theta_t$ : Time fixed effect of period  $t$  that affects every country,

$GDP_{it}$ : Real GDP of country  $i$ ,  $RER_{it}$ : Real exchange rate,

$\mathbf{VISA}_{it}$ : Vector of dummy variables that represent visa requirements,

$u_{it}$ : Random shocks that capture the taste of country  $i$

This specification carries the same structure as the export function of goods which often incorporates exchange rates and income of the destination country as explanatory variables. Although Neiman and Swagel estimate equation [1] using panel data (time  $\times$  country), we utilize time series data for each country since our main purpose is to uncover differences among the countries.

$$\log Entry_t = c + \beta_1 \log GDP_t + \beta_2 \log RER_t + \mathbf{VISA}'_t\boldsymbol{\gamma} + \mathbf{X}'_t\boldsymbol{\delta} + u_t \quad [2]$$

$\mathbf{X}_t$  represents factors that affect visitors coming to Japan from all countries in period  $t$ . Here, we included such variables as crude oil prices (WTI), which may influence travel demand through fares, as well as the SARS (Severe Acute Respiratory Syndrome) dummy and the Great East Japan Earthquake dummy as event factors (refer to the appendix for the dummy variables).<sup>1</sup> In practice, we also took into account the seasonal dummies, and for Chinese tourists visiting Japan, deterioration in the Japan-China relations following the nationalization of the Senkaku Islands (hereinafter the ‘‘Senkaku dummy’’). We did so because the period of worsening Japan-China relations from the fall of 2012 overlaps with the period of the weakening yen triggered by the launch of Abenomics. Without considering the Senkaku dummy, we will not be able to appropriately extract the impact of the exchange rate (to be explained later).

For the exchange rates, we used real exchange rates against the yen after adjusting for prices (nominal rate denominated in foreign currency  $\times$  Japan's consumer price /

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<sup>1</sup> According to Neiman and Swagel (2009), such factors are controlled by the time fixed effect ( $\theta_t$  of equation [1]). They propose crude oil prices as the leading example.

consumer price of country  $i$ ). Since an increase in  $RE R_t$  shows the appreciation of the yen in real terms, the sign for  $\beta_2$  is expected to be minus. Concerning visa requirements, we created a dummy variable that distinguishes the multiple-entry visa and visa exemption by country (refer to the appendix for visa requirements).

Our estimate period covers the first quarter of 1995 up to the fourth quarter of 2015 due to data availability.<sup>2</sup> In order to see whether there were any changes after the “Visit Japan Campaign (VJC)” kicked off in April 2003, we also estimated our model for the period after the second quarter of 2003. We selected 15 countries with a large share in the number of visitors to Japan and from which we could obtain time series data (such as GDP). These 15 countries accounted for around 93% of the total number of foreign visitors in 2015.

South Korea, China, Taiwan, Hong Kong, Thailand, Singapore, Malaysia, Indonesia, Philippines, UK, France, Germany, US, Canada, Australia

### **3. Political factors play a major role in China, while exchange rates matter more in NIEs**

#### **(1) Impact of a stronger yen is greater in NIEs than in China**

The upper graph in **Chart 3** depicts the income elasticity ( $\beta_1$ ) of each country based on equation [2]. Looking at the estimates under all sample periods, the figures were positive and statistically significant for all countries, exceeding 2 even in France and Germany, not to mention the emerging economies in Asia (= as income grows by 1%, visitors increase by more than 2%). On the other hand, income elasticity is relatively small in Canada and the US. The same trend applies to the sub-sample (2003 Q2 -) which covers the period after the launch of the VJC.

Regarding the exchange rate elasticity ( $\beta_2$ ) (lower graph in **Chart 3**), many countries in Southeast Asia generated results that are not statistically significant. The elasticity for Chinese visitors, which is the center of focus, becomes statistically significant in the period after the VJC, but the figure stands at a relatively low level at approximately 0.4. On the other hand, note that elasticities are larger in the NIEs such as Taiwan, Hong Kong and South Korea for both sample periods. If we focus on Asia, we can say that the higher the income, the greater the effect of the exchange rate. Since visitors from the

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<sup>2</sup> Data on the number of inbound visitors up until 2003 were taken from the JNTO website, and data before 2002 from *International Tourism Statistics of Japan* (2014) issued by JNTO. The estimation period for Malaysia and Indonesia is from 2000 and from 1998 for the Philippines due to the availability of GDP statistics; and from 1999 for Germany and France due to the availability of foreign exchange data.

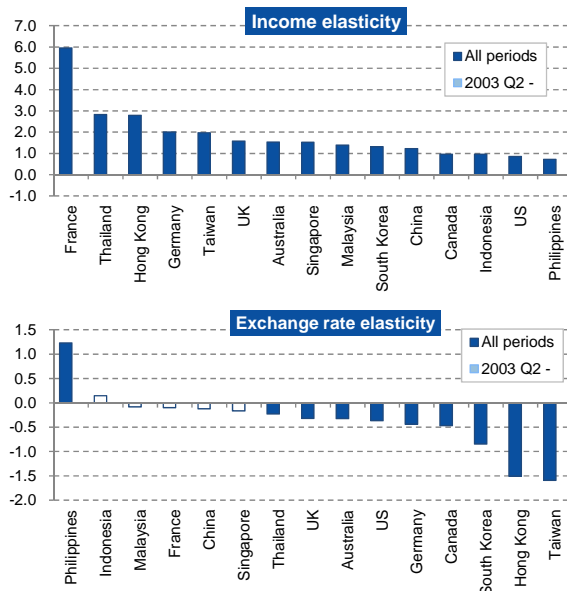
NIEs represent a large share (**Chart 1**), we need to pay particular attention to the impact of the recent appreciation of the yen in those countries.

## (2) China's inbound function requires some caution

Historically, restrictions have been imposed on Chinese tourists visiting Japan. Note that travel to Japan for sightseeing purposes were not permitted prior to September 2000. Even after that, travel to Japan was limited to group tours, and it was only in July 2009 that the ban on private travel was lifted. For this reason, comparing the period after the 1990s with the post-VCI period may not be appropriate. When we estimated the model using the period after September 2000, when entry to Japan for sightseeing was permitted, no major differences appeared in the income elasticity and dummy variables, but the exchange rate elasticity became statistically significant (the upper table of **Chart 4**). Since visits to Japan prior to September 2000 were limited to commercial purposes, it seems that the exchange rate only played a minor role in deciding whether to travel to Japan. In the case of tourists, however, lower travel costs may be considered an important factor in such decision making.<sup>3</sup>

With regard to the impact of the exchange rate on Chinese visitors, we need to focus

**Chart 3: Income and exchange rate elasticity**



Note: Bars colored in white represent data that are not significant at the 10% significance level.  
Source: Estimated by MHRI based on JNTO and CEIC, among others.

**Chart 4: Inbound function for China**

	Difference by period		
	1995 1Q - 2015 4Q	2000 4Q - 2015 4Q	2003 2Q - 2015 4Q
Constant term	0.560	0.185	0.259
log(GDP)	1.222 ***	1.237 ***	1.228 ***
log(real exchange rate)	-0.122	-0.333 *	-0.400 *
log(crude oil prices)	0.062	-0.016	-0.056
SARS dummy	-0.547 ***	-0.567 ***	-0.598 ***
Earthquake dummy	-1.402 ***	-1.311 ***	-1.262 ***
Senkaku dummy	-0.526 ***	-0.546 ***	-0.543 ***
Visa relaxation dummy	0.901 ***	0.761 ***	0.716 ***
adj. R2	0.979	0.967	0.953
D.W.	1.758	1.763	1.777

	Case where Senkaku dummy is not included		
	1995 1Q - 2015 4Q	2000 4Q - 2015 4Q	2003 2Q - 2015 4Q
Constant term	1.406 **	1.590 *	1.941 *
log(GDP)	1.128 ***	1.084 ***	1.036 ***
log(real exchange rate)	-0.055	-0.226	-0.362
log(crude oil prices)	0.097	0.039	-0.024
SARS dummy	-0.523 ***	-0.567 ***	-0.634 ***
Earthquake dummy	-1.191 ***	-1.080 ***	-0.979 **
Visa relaxation dummy	1.061 ***	0.981 ***	0.911 ***
adj. R2	0.964	0.933	0.906
D.W.	1.157	1.077	1.088

Note: The above estimates also include seasonal dummies.  
\*\*\*, \*\* and \* show that they are significant at the 1%, 5% and 10% significance level, respectively.  
Source: Estimated by MHRI based on JNTO and CEIC, among others.

<sup>3</sup> Although it is desirable to analyze the period after July 2009 when the ban on private travel was lifted, the sample period is currently too short.

on the fact that excluding the Senkaku dummy yielded results that are not statistically significant for all periods (lower table of **Chart 4**). We believe this is because the yen depreciation triggered by the launch of Abenomics and the significant decline in the number of Chinese visitors on the back of worsening Japan-China relations occurred simultaneously. At first glance, the cheaper yen had no effect on lifting the number of tourists visiting Japan, but if we control the factors behind it, the exchange rate becomes statistically significant. Since Chinese tourists are more affected by political factors, we need to incorporate this impact when specifying the equation.<sup>4</sup>

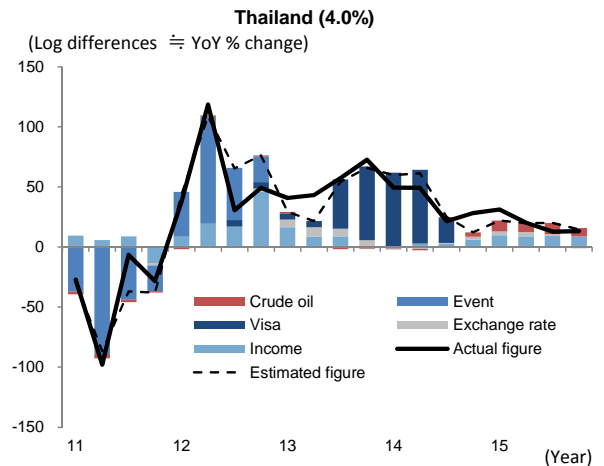
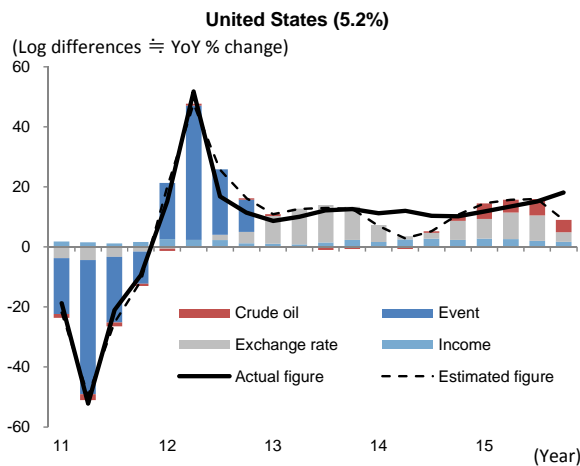
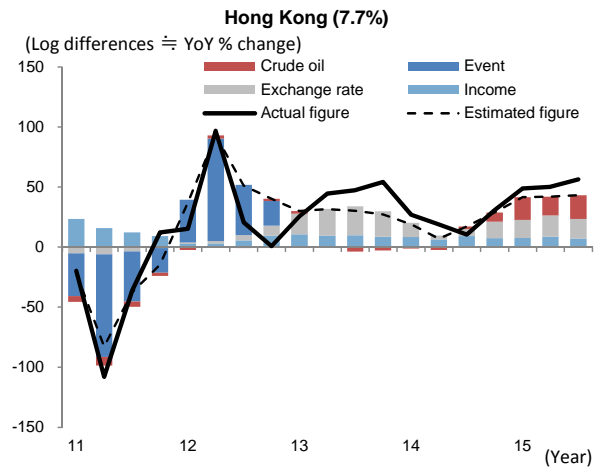
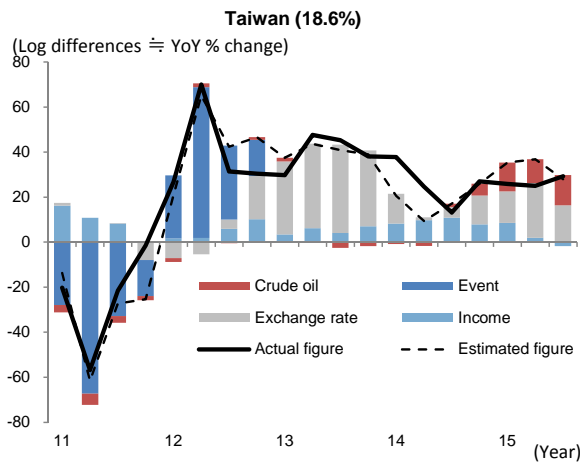
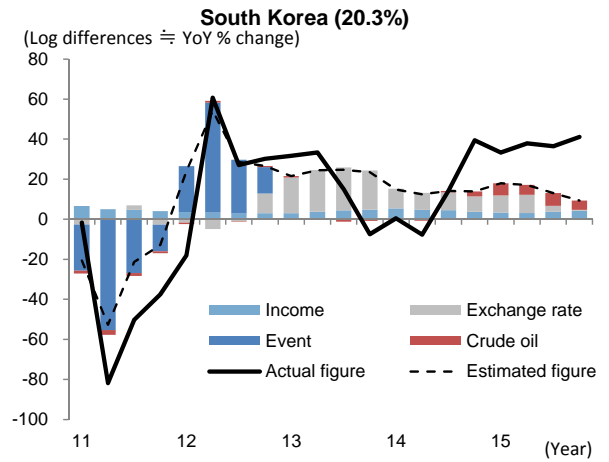
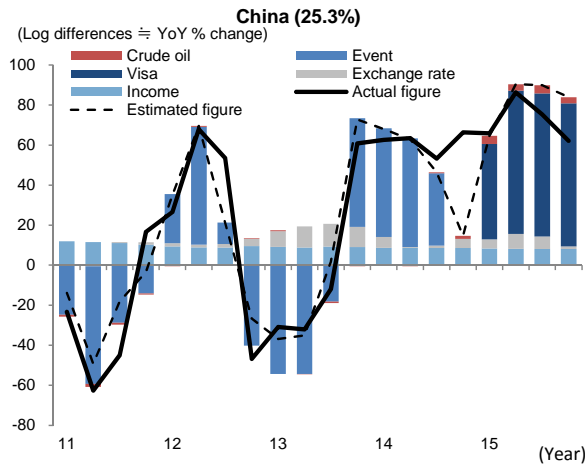
### **(3) Decomposition**

Given the considerable variation in income and exchange rate elasticities, reasons behind the increase in the number of visitors should vary by country. Therefore, based on the estimated demand functions, we conducted a decomposition for the six countries with the largest number of visitors to Japan (China, South Korea, Taiwan, Hong Kong, US and Thailand) (**Chart 5**). According to our analysis, the fluctuation in the number of visitors is greater for China than for the other countries, presumably due to Japan-China relations. Since the impact of the foreign exchange factor was small, this indicates that the main factor behind the surge in tourists in 2015 was the relaxation of visa requirements. If we assume that visa requirements are defined by bilateral relations, stable relations between Japan and China may be the most important factor in determining the volume of Chinese tourists. Also, for Taiwan, Hong Kong and the US, exchange rates and (lower) crude oil prices proved to be the driving forces behind the growing number of tourists. In South Korea, while deviation between the estimated and actual figures was relatively large, the exchange rate played a certain role in pushing up the number of tourists. Meanwhile in Thailand, the impact of the exchange rate was minimal, and visa exemption and income growth seemed more important.

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<sup>4</sup> We can see from the D.W. statistics that the issue of serial correlation was mitigated by incorporating the Senkaku dummy. This also suggests that the Japan-China relationship is an important variable.

**Chart 5: Decomposition of foreign visitors**



Note: Figures following the country name represent the share of visitors to Japan in 2015. Event factors in the chart show the impact of the Great East Japan Earthquake and deterioration in the Japan-China relations for China, and the impact of the Earthquake for other countries.

Source: Estimated by MHRI based on JNTO and CEIC, among others.

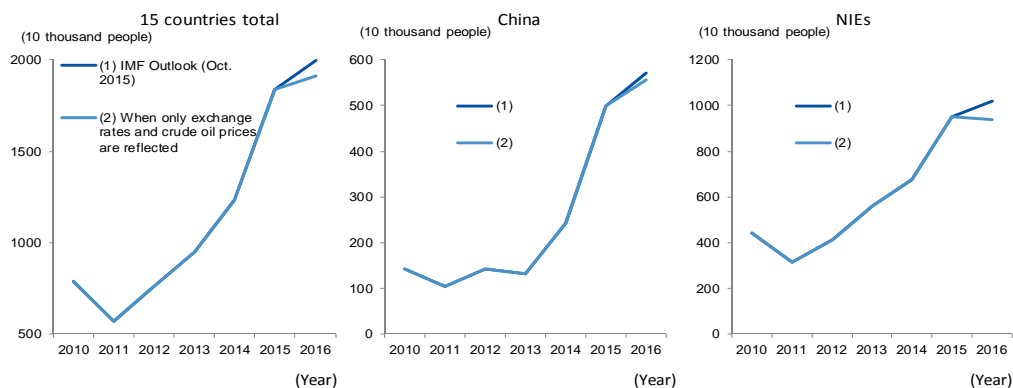


#### 4. Number of visitors will continue to grow in 2016, albeit at a slower pace

We have shown that the determining factors regarding inbound visitors vary by country. As for the Asian countries with a large share of visitors, China is more affected by political factors, NIEs by exchange rates, and Southeast countries by income.

Finally, we present a rough estimate of the number of inbound visitors in 2016 (for the 15 subject countries) (**Chart 6**). If we apply the data from the IMF's World Economic Outlook for GDP, exchange rates and crude oil prices, the number of inbound visitors from China will be 5.7 million, an increase of around 14% from 2015 (4.99 million), and the number of visitors from the 15 subject countries stands at 19.96 million, a rise slightly less than 10%. It should be noted, however, that the IMF forecast was made in October 2015 and reflects neither the negative impact of the yen appreciation from early 2016 nor the positive impact of lower crude oil prices. Therefore, we made a simple estimate assuming that exchange rates and crude oil prices would remain at the level on February 17<sup>th</sup> (data taken from Bloomberg) and used the same macroeconomic variables. Under this scenario, visitors from the NIEs will decline due to the negative impact of the exchange rate, but the number of visitors from China will rise on the back of income growth and be little affected by the exchange rate. As a result, the overall number of foreign visitors to Japan is expected to increase slightly. Since changes in exchange rates and crude oil prices usually affect other variables such as GDP, we need to keep in mind that the above estimate is only a primitive one. But if the extent of the yen appreciation stays at the current level, it is highly probable that the number of inbound tourists will continue rising in 2016, albeit at a slower pace.

**Chart 6: Rough estimate of foreign visitors to Japan  
(for the 15 subject countries)**



Source: Estimated by MHRI based on JNTO, CEIC, IMF and Bloomberg, among others.

## **Appendix: Data applied in the estimate and estimated coefficient figures**

### **(1) Time dummy**

- We made the SARS dummy 2003 Q2 = 1.
- Although the impact of the Great East Japan Earthquake should surface in 2011, we assumed its effect would diminish gradually. Specifically, we estimated equation [1] as panel data and standardized the fixed effect from 2011 Q1 to Q4 so that they would total 1: 2011 Q1 = 0.19, Q2 = 0.47, Q3 = 0.23, Q4 = 0.11.
- Assuming that tensions between Japan and China over the nationalization of the Senkaku Islands continued for one year beginning in September 2012, we set the Senkaku dummies as follows: 2012 Q3 = 0.333, Q4 = 1, 2013 Q1 = 1, Q2 = 1, Q3 = 0.667.

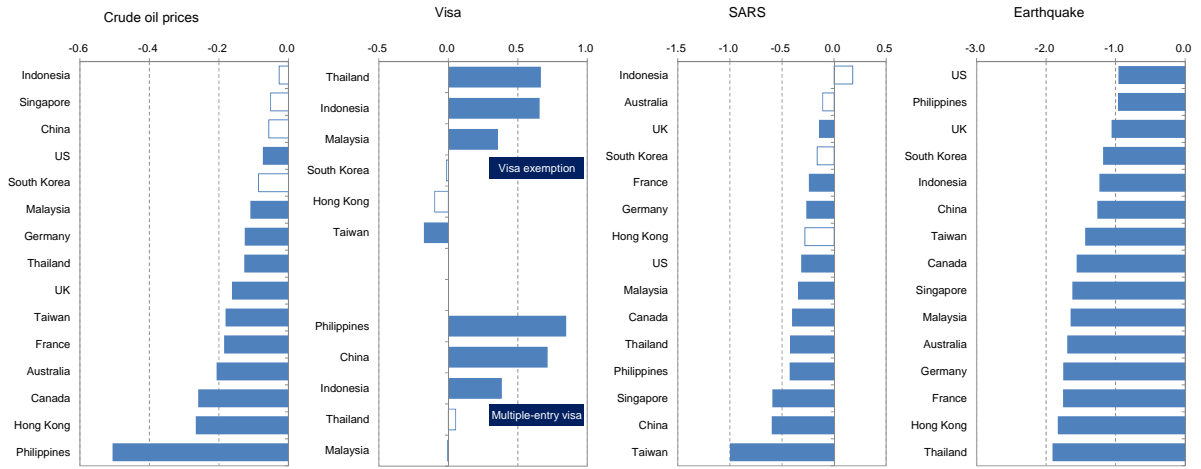
### **(2) Visa requirements**

We listed visa requirements taken into account in our analysis on the following page. We established dummy variables from the month immediately after the enforcement of the new visa conditions (for example, if visa requirements were relaxed in January, we made Q1 = 0.667 and 1 for the successive periods). There may be cases where trivial requirements and staying periods were mitigated, but the list includes only the times when the multiple-entry visa was first introduced or when visas first became exempt. It should be noted that for China, the multiple-entry visa requiring travelers to visit Okinawa or three northeastern prefectures was introduced in 2011 and 2012, respectively; but for the sake of consistency with other countries, we only included the relaxation which occurred in January 2015, when the multiple-entry visa with no visiting requirement was introduced (the visa, however, was issued only to “individuals with substantially high levels of income”).

### **(3) Impact of the relaxation of visa requirements, SARS and earthquake by country**

Coefficients other than the income and exchange rate elasticity in equation [2] are as follows.

## Impact of crude oil prices, relaxation in visa requirements, SARS and Earthquake



Note: Estimated from 2003 Q2 and onward.  
 Source: Estimated by MHRI based on JNTO and CEIC, among others.

## List of relaxation in visa requirements

	South Korea	China	Taiwan	Hong Kong	Thailand	Singapore	Malaysia	Indonesia	Philippines	UK	France	Germany	US	Canada	Australia	
Mar-95																Mar-95
Jun-95																Jun-95
Sep-95																Sep-95
Dec-95																Dec-95
Mar-96																Mar-96
Jun-96																Jun-96
Sep-96																Sep-96
Dec-96																Dec-96
Mar-97																Mar-97
Jun-97																Jun-97
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Dec-97																Dec-97
Mar-98																Mar-98
Jun-98																Jun-98
Sep-98																Sep-98
Dec-98															Exempted (Dec.)	Dec-98
Mar-99																Mar-99
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Dec-99																Dec-99
Mar-00																Mar-00
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Jun-03																Jun-03
Sep-03																Sep-03
Dec-03																Dec-03
Mar-04				Exempted (Apr.)												Mar-04
Jun-04																Jun-04
Sep-04																Sep-04
Dec-04																Dec-04
Mar-05	Exempted (Mar.)		Exempted (Mar.)													Mar-05
Jun-05																Jun-05
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Dec-11																Dec-11
Mar-12																Mar-12
Jun-12					Multiple entry (Jun.)											Jun-12
Sep-12							Multiple entry (Sep.)	Multiple entry (Sep.)								Sep-12
Dec-12																Dec-12
Mar-13																Mar-13
Jun-13																Jun-13
Sep-13					Exempted (Jul.)		Exempted (Jul.)		Multiple entry (Jul.)							Sep-13
Dec-13																Dec-13
Mar-14																Mar-14
Jun-14																Jun-14
Sep-14																Sep-14
Dec-14								Exempted (Dec.)								Dec-14
Mar-15		Multiple entry (Jan.)														Mar-15
Jun-15																Jun-15
Sep-15																Sep-15
Dec-15																Dec-15

Note: The above chart shows the enforcement date of changes in visa requirements. Blank columns show that a single entry visa is required. For Malaysia, although visa acquisition had been exempted, we made the columns blank since visa acquisition was recommended after 1993. For China, we did not take into account the multiple-entry visa with the condition to visit Okinawa or three northeastern prefectures.

Source: Made by MHRI based on press releases of the Ministry of Foreign Affairs and the *White Paper on Tourism* for each year, among others.

## Reference

Neiman, B. and Swagel, P. (2009) “The impact of post-9/11 visa policies on travel to the United States,” *Journal of International Economics*, 78 (1), pp. 86-99.