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赴日本旅遊的影響因素—Panel Data 的分析方法

Determinants of Inbound Travel to Japan  
-- The Panel Data Approach

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Advisor: Vance Kuang-Ta Lo

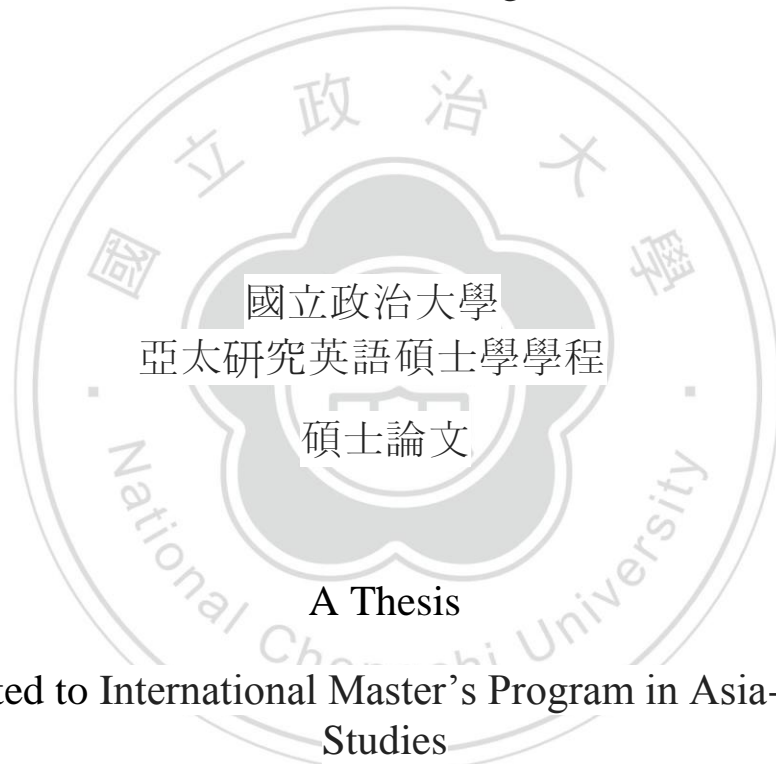
中華民國 106 年 6 月

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## ABSTRACT

International tourism has become a significant source of economic growth for many developed countries that have encountered slowdowns in domestic economic productivity. The Japanese government has begun, in recent years, to promote inbound tourism in an effort to stimulate its own stagnant economic growth. This paper discusses tourism trends and policies the government could implement to increase the number of tourists and become the “tourism-oriented country” it aspires to be.

This paper adopts a Panel Data Analysis with Fixed Effects model to estimate the impact of tourist income and tourism price as well as major events and policy on international tourist arrivals to Japan from 11 Asian countries. The paper finds that tourism demand is sensitive to both origin country income and destination country price. Income elasticity of demand is found to be +3.041 and price elasticity of demand to be -0.486 implying travel to Japan is considered a luxury good and that visitors are price inelastic. Further, the Fukushima nuclear disaster is estimated to have reduced international arrivals by 2,765,669 in its aftermath in 2011 and the implementation of tax-free shopping for foreign visitors led is estimated to have increased international arrivals by 2,115,519 in 2015. The paper finds the expansion of visa exempt travel and major protests against Japan to have no significant impact on international arrivals.

Keywords : Tourism, Inbound tourism, Panel Data Analysis, Japan

## 摘要

國際觀光對於許多國內經濟成長趨緩的已開發國家是重要財源之一，日本政府近年來開始積極推動入境旅遊，來刺激停滯經濟成長。此研究探討觀光趨勢與政府能夠推動可增加觀光客人數的觀光政策進而成為以觀光為發展導向的國家。

此報告採用 Panel Data 分析方法中的固定效應模式來評估觀光收入與觀光價格以及主要事件與相關政策對於國際觀光客的影響，研究對象以十一個亞洲國家到日本旅遊為例。此研究發現觀光需求易受到觀光客出發國家以及目的國家的旅遊價格影響。此研究發現需求的收入彈性係數為+3.041，需求的收價格彈性係數為-0.486，表示對國際觀光客而言，赴日旅遊是較昂貴的商品，觀光客的價格較不彈性。此外，有關當局預估福島核災事件在 2011 年會減少觀光客人次至 2,765,669，而 2015 年的外國觀光客免稅購物政策則導致國際觀光客入境人次 2,115,519。此研究發現免簽證觀光的延長政策以及對日本的重大的抗議對於國際觀光客入境日本並無顯著影響。

關鍵字：觀光、入境旅遊、Panel Data 分析法，日本

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## Chapter 1: Introduction

### 1.1. Tourism as a Global Economic Engine

In recent years, tourism has become one of the most important industries in the world and significant source of economic value for many countries. According to World Travel and Tourism Council (WTTC)'s latest annual research, tourism's contribution to world GDP grew for the sixth consecutive year in 2015, rising to a total of 9.8% of total global GDP (US\$7.2 trillion). Globally, the tourism sector now employs more than 284 million people – accounting for 1 in 11 jobs on the planet. The tourism sector is expected to continue to perform at a solid growth rate and outperform global economic growth despite facing macroeconomic and political challenges in 2016. Overall, tourism is forecasted to grow at a very favorable compound annual rate of 4% over the next ten years.

Table 1.1.1 : Global International Arrivals, 2000-2015

	International Arrivals (Millions)				Compound Annualized Growth Rate (%)		
	2000	2005	2010	2015	2000 to 2005	2005 to 2010	2010 to 2015
Advanced Economies	424	470	516	653	2.1%	1.9%	4.8%
Emerging Economies	250	339	434	533	6.3%	5.1%	4.2%
World Total	674	809	950	1186	3.7%	3.3%	4.5%

SOURCE : World Tourism Organization UNWTO. (2016) UNWTO Tourism Highlights, 2016 Edition Published: July 2016

Globally international tourism is growing rapidly. As shown in Table 1.1.1, international arrivals globally increased by 4.5% between 2010 and 2015 while international arrivals to countries classified as “advanced economies” grew by 4.8% over the same period. What is also interesting from this chart is that the market share for international tourism is split nearly evenly between advanced and emerging economies. Table 1.1.2 shows international arrivals for the Asia-Pacific region showing that tourism in this region is growing even faster than the global trend. Japan specifically is growing at rates significantly in excess of the global trend with 47.1% growth between 2014 and 2015.

Table 1.1.2 : International Arrivals for Select Northeast Asian Countries, 2013-2015

	International Arrivals (Thousands)			Growth (%)		
	2013	2014	2015	2012/13	2013/14	2014/15
China	55,686	55,622	56,886	-3.5%	-0.1%	2.3%
Hong Kong	25,661	27,770	26,686	8.0%	8.2%	-3.9%
Japan	10,364	13,413	19,737	24.0%	29.4%	47.1%
Northeast Asia Total	126,989	136,276	142,075	3.4%	7.3%	4.3%
Asia-Pacific Total	249,925	264,293	279,214	6.9%	5.7%	5.6%

SOURCE : World Tourism Organization UNWTO. (2016) UNWTO Tourism Highlights, 2016 Edition Published: July 2016

At the same time that arrivals are growing, tourism revenue is growing even faster with advanced economies growing at rates greater than 5% per year since 2013. Table 1.1.3 shows annual growth in tourism revenue between 2011 and 2015 included the average growth in terms of compound annualized growth rate for 2011-2015. Comparing this to table 1.1.1, which shows global tourist arrivals to be growing at a compound, annualized rate of 4.5% between 2010 and 2015, global tourism revenue is actually growing faster at

4.9%. Clearly the tourism sector is growing rapidly in terms of arrivals and even more rapidly in terms of revenue with arrivals to Japan growing much faster than the global rate.

Table 1.1.3 : International Tourism Revenue Growth Rates, 2011-2015

	<b>International Tourism Receipts Annual Growth (%-change, local currencies, constant prices)</b>				<b>Compound Annualized Growth Rate (%)</b>
	<b>2011/12</b>	<b>2012/13</b>	<b>2013/14</b>	<b>2014/15</b>	<b>2011-2015</b>
Advanced Economies	3.6%	6.1%	4.9%	3.1%	4.4%
Emerging Economies	5.4%	5.5%	5.5%	6.7%	5.8%
World Total	4.3%	5.9%	5.1%	4.4%	4.9%

SOURCE : World Tourism Organization UNWTO. (2016) UNWTO Tourism Highlights, 2016 Edition Published: July 2016

As large as the tourism sector appears globally and as fast as it is growing its impact on individual countries is often outsized beyond even what the numbers above indicate. Every dollar spent by a tourist has a multiplier effect. First, there is an indirect benefit to the economy because firms that service tourists consume and pay for services from other firms. Second, there is an induced benefit because employees of firms that service tourists use their earnings to purchase unrelated goods and services for themselves (Bunghez, 2016). Further, many countries, regions, or cities within countries rely disproportionately heavily on tourism as part of their local economies. While developing countries benefit from attracting customers much wealthier than their native countrymen, developed countries actually retain a significantly larger multiplier of tourism dollars, estimated to be as high as 3-4 times the multiplier for developing countries (Bunghez, 2016).

Developed countries face additional challenges as well. According to a report from the United Nations Department of Economic and Social Affairs, between 2008 and 2011 the economies of the developed world were essentially flat with average annual GDP growth of 0.1% with some the economics of some countries, like Japan at -0.7%, actually shrinking. Things picked up between 2012 and 2014 with growth increasing to 1.1%, 1.2%, and 1.6%, respectively (2015); however, those numbers are not sufficient to drive real economic growth as a result over 70% of citizens in the developed world saw their real incomes stagnant between 2005 and 2014 (Guardian, 2016). Many, including officials at the International Monetary Fund, speculate that this stagnation has led to the rise of populist, nationalist movements around the globe leading to previously unfathomable results such as the exit of the UK from the European Union and the election of Donald Trump as president of the United States (Ryan, 2016).

## 1.2. Tourism and Japan

In some respects, Japan is ahead of other developed countries in experiencing these problems. Following years of strong growth, Japan entered kicked off its locked “lost decade” in the mid-90s, a period during which it averaged 1% growth per year, least impressive of any industrialized nation. By 2010 its debt-to-GDP ratio had passed 200%, highest in the world (Warner, 2010). During this time, Japan’s once vaunted manufacturing industry had declined to lowest employment numbers in 50 years (Hiyama, 2013) and its overall wages in real terms declined continuously year-over-year (McKinnon, 2007). The result of this led to succession of six prime ministers in a six year period from 2006 to 2012 until Shinzo Abe rode a wave of populist nationalism to return to the position (Mochizuki, 2013). Since his election, he has undertaken a bold plan to

reinvigorate Japan's economy. The results of Abe's economic policies have been mixed so far, particularly in terms of long term effectiveness, (Shibata, 2017) which has led to an increasing focus on tourism as a means to stimulate economic development.

Although not always the case, it is now commonly accepted that international economics and international policy go hand in hand birthing the field of international political economics. There are countless examples from the last 50 years such as the oil embargoes of the 1970, collapse of the Bretton Woods monetary system, fall of communist regimes, and growth of the European Union that show how related international policy and relationships are to domestic economic performance. Conflicts such as between the USA and Cuba and those involving Iran's nuclear program lead to economic sanctions that severely impact the economics of the nations involved. Most recently, South Korea's decision to host an American missile defense system has led to country-wide boycotts of South Korean products in China (Hernandez, 2017).

This paper focuses on the inbound tourism industry in Japan and attempts to use quantitative methods to analyze the relationship between tourist visits to Japan, economic activities in Japan, and economic activities in the origin countries. Also, this paper discusses trends and non-economic factors that could influence the numbers.

### 1.3. Motivation for Research

Given the growing importance of tourism to Japan, the Japanese press has recently been discussing the importance of the country's international relations on tourism and the Japanese economy. The theory is that when the relationship between Japan and another country gets worse, the number of tourists from that country and Japan's revenue from exports of its products to that country both decline. On the opposite

side, when relations with a country improve, we see increased tourism visits and demand for Japanese products from that country. For example, in 2002 Japan and Korea jointly hosted the World Cup which ushered in a great sense of cooperation between the two countries and led to improved relations (Horne, 2004) and served as a trigger for Japanese to become more and more interested in Korean culture. Many Japanese visited Shin-Okubo, the largest Korea-town in Tokyo, to enjoy authentic Korean cuisine and purchase Korean popular culture products such as music albums, movie and TV show DVDs, and posters featuring famous Korean actors and singers. During that time land prices in that district doubled and there were over 30 thousand tourist visitors every weekend for the tiny Korea-town (Sankei Shimbun, 2012).

Table 1.3.1 : Top Ten Source Countries for Inbound Tourism to Japan

Rank	Country	Arrivals	As % of Total
1	China	6,372,948	25.3%
2	South Korea	5,090,302	20.3%
3	Taiwan	4,167,504	18.6%
4	Hong Kong	1,839,189	7.7%
5	United States	1,242,702	5.2%
6	Thailand	901,458	4.0%
7	Australia	445,237	1.9%
8	Malaysia	394,262	1.6%
9	Singapore	361,804	1.5%
10	Philippines	347,860	1.4%
	Others		12.5%

SOURCE: Japan Tourism Agency. (2016). 2016 Foreign Visitors & Japanese Departures

The origin of tourists to Japan can be core of this research. Table 1.3.1 shows international arrivals to Japan for each of the top ten origin countries and the percentage of arrivals accounted for by that country. Clearly tourism to Japan is heavily skewed to North-East Asian tourists with 71.9% of all arrivals coming from China, Korea, Taiwan, and Hong Kong! The top non-Asian country, the USA, accounts for only 5.2% of arrivals and no country from Europe or South America even make the list. This research assumes much of this effect is because of distance and cost, but there are still interesting insights that beg further study such as how Taiwan and Hong Kong together account for more arrivals than China despite being an order of magnitude smaller in population or why Indonesia doesn't show up but Malaysia does even though the former is significantly larger. This research hopes to answer these and other questions here.

#### 1.4. The Importance of this Research

Given that tourism already accounts for 10% of global GDP and employs one in 11 workers and given the economic stagnation faced by much of the developed world over the last ten years it is reasonable to assume that every developed nation is already pursuing an international tourism strategy or soon will be. Further, with the ongoing refugee crisis, the UK vote to exit the EU, the American election of Donald Trump, Russian invasion of Ukraine, nuclear situation in North Korea, and consistent cross-strait tension between China and Taiwan it is clear that we are living in uncertain political times. It is also becoming increasingly clear that these two seemingly unrelated truths are in actuality very much related, *i.e.*, economics are affecting politics and politics are affecting economies. Understanding the relationship between economics, tourism, and politics is thus crucially important for all developed countries.

Japan appears to have recognized this fact and strongly aspires to become a “tourism-oriented country“ as one of its most important policies. Therefore, it is critically important for Japan to identify the factors that affect the number of tourists and what can be done to improve in this area.

### 1.5. Research Purpose

This research focuses on Japan’s tourism policy as well as select economic indicators of Japan and Asian countries with high tourist volume to Japan. The paper starts with a review of recently published literature on relevant topics including international tourism to Japan, significant events and trends potentially affecting tourism to Japan, tourism economics, and tourist decision-making. Following this is a review of recent tourism policy changes implemented by Japan. The paper then introduces a model for estimating the impact of economic indicators, major events, and policy changes on tourism to Japan and results are shown and discussed. The paper closes with a brief section on the potential policy implications of the findings.



## Chapter 2: Literature Review

### 2.1. International Tourism to Japan

Much has been written about Japan's success in increasing tourism over the last decade as, according to the Japan National Tourism Organization, the number of inbound tourists has increased from 6.7 million in 2009 to 24 million in 2016 (2009 and 2016). Building on this growth, the government has publicly declared a goal of 40 million foreign tourists in 2020 (Foreign Press Center, 2016).

There is reason for optimism in accomplishing these goals. In several major East Asian cities, Japan is cited as the most likely future travel destination by economically mobile respondents for reasons ranging from sightseeing to enjoying specialty foods to visiting hot springs (Hakuhodo, 2012). Other research cites the commoditization and subsequent export of Japanese culture via media and other products as a major asset for the country in attracting further tourism growth (Huang, 2011). Further, visitors to Japan tend to concentrate their stays in the major cities of Tokyo, Kyoto, and Osaka which creates significant opportunities to expand to other regions as well as significant challenges for future growth in that simulations show the main destinations today are likely to face shortages of up to 50% for accommodations by 2020 (McKinsey, 2016).

The study of Japan's success in attracting foreign tourists has largely focused on the government's efforts to increase inbound tourism including initiatives such as improved visa facilitation and tax-free shopping (APEC, 2014). Others have expanded on this to show how improvements in areas such as access and mobility, amenities, and

destination marketing have all also contributed to growth (Henderson, 2017). Perhaps the most visible initiative undertaken is Japan's efforts to host 2020 Olympics in Tokyo during which the government expects nearly 1 million spectators to visit Tokyo per day (BOJ, 2016).

According to surveys of visitors conducted by the Development Bank of Japan, the effectiveness of these initiatives are mixed. Most visitors from Asia cited the easing of visa requirements as a significant factor in their decision to visit while at the same time showing little interest in the 2020 Olympics (DBJ, 2014). Another study based on surveys of international tourists in Japan looked at how improvements in the tools and resources available to consumers have influenced Japan tourism finding that family and friends, personal blogs, and other websites have significant impact on how tourists select their destination and that social media is strongly tied to each of these (Hawkinson, 2013).

## 2.2. Significant Events and Larger Trends Affected Tourism to Japan

In 2008, a collapse of the US housing market led to a global financial crisis whose aftermath was felt around the world (FCIC, 2011). Despite the significant effects of the crisis on the global economy, studies on its impact on international tourism have returned mixed results and there remains much debate among academics in this area with no firm conclusions (Sheldon, 2010). It appears no studies on the effects of the crisis on tourism to Japan have been published. In Asia, generally it was found to have an effect in the short term but the effect was expected to dissipate by 2010 (Song&Lin, 2009). China's international tourism was affected but largely offset by growth in domestic tourism (Li, 2010). The effects in Thailand are uncertain due to the coinciding political crisis (Cohen, 2010). In North America, tourism to the United States and Canada was found to have

been affected with the effects lasting years later while Mexico was found to have been affected much more by other events and relatively unaffected by the financial crisis (Ritchie, 2010). In more general macroeconomic terms, real economic growth rates returned to pre-crisis levels in the United States, the five major ASEAN countries, and most emerging countries; slowed but remain strong in China; and dropped significantly in Japan and the EU (JTA, 2016).

In March 2011, The Tohoku region of Japan suffered the triple disasters of a major earthquake, tsunami, and nuclear emergency which had significant local and nation-wide impact on inbound tourism. For the regions directly impacted, though, the recovery has been much slower which the number of guest nights of foreign visitors in hotels in the Tohoku region lower in 2015 compared to 2010 even as the number has increased by 150% for Japan overall over the same period (JTA, 2016). Nationally, inbound arrivals dropping by over 60% in April, 50% in March and May, and almost 30% for all of 2011 (Henderson, 2013). While Japan's image suffered in the immediate aftermath of the earthquake, the events provided an opportunity to rebrand the country's image. In 2014, just three years after the disaster, Japan topped the Country Brand Index which measures perceptions of countries among people around the world, published by global brand consultancy FutureBrand, for the first time in the rankings history (Dill, 2014).

Studies have looked at the impact on tourism of other safety related events such as disease and environmental disasters. One study found significant impact on inbound tourism from SARS proportional to the number of cases but no similar effect from Avian Flu (Kuo, 2008). Another study looked at the following four major crisis that affected

Taiwan between 1996 and 2003: Asian financial crisis in 1997, the 21st September 1999 earthquake, the 11th September 2001 attacks in the United States, and the outbreak of SARS in 2003 and found that the impact of the financial crisis was less significant than the other three leading the authors to conclude that any impact on safety, even outside the destination country, negatively affects tourism demand more significantly than economic events (Wang, 2009).

In 2012, Shinzo Abe was elected prime minister on a platform promising a clear break in Japan's political landscape implementing new economic reforms and wishing to more strongly assert Japan's presence in international relations (Bix, 2013). While the results of Abe's economic policies are still undecided his long-run goal of redefining Japan's international role, with expanded peacekeeping and humanitarian self-defense forces, is even less certain as it has yet gained wide acceptance even within Japan (Patrick, 2015). Such redefinition, to the extent it has been or will be successful would likely affect tourism as it affects the perception among potential foreign visitors.

Another major incident with potential to affect Japan's tourism industry is the dispute with China over the Senkaku/Diaoyu Islands. China and Japan have managed to maintain civility toward each other despite the territorial clash because economic interdependence has repeatedly led to de-escalation. (Koo, 2009). However, in more recent years this issue has flared up more significantly and is now a major destabilizing issue in the region that significantly impacts the perception of each country among citizens of the other making it directly relevant to discussions of international tourism between the two countries (Drifte, 2014).

Lastly, the economic rise of China can not be ignored in any discussion of global tourism trends. While outbound Chinese tourism is a relatively recent phenomenon, it has quickly grown to be a major source of inbound tourism for countries all over the world and especially its Asian neighbors (Ryan, 2009). According to data from the World Bank, the number of departures for international tourism from China more than doubled from 47M in 2009 to 98M in 2013 representing a compound annualized growth rate of 20% (World Bank, 2017). In 2014, Chinese tourists already accounted for nearly 10% of global tourists and were tops in total spending at US\$129 billion (Economist, 2014). As expected given their significance studies have been published on the destination preferences (Kim, 2005) of Chinese tourists, as well as for their preferences in local accommodations such as hotels (Agrusa, 2011) and food (Chang, 2010). I could not find published articles on the impact of Chinese tourists on inbound tourism in Japan, there have been studies published showing their positive economic impact in Taiwan (Chen, 2010).

### 2.3. Economic Drivers of Tourism

A number of studies have been published on the economic drivers of tourism in countries other than Japan. In general, the number of global international tourist arrivals correlates very closely with real global GDP (JTA, 2016). One study found a reciprocal relationship between tourism expansion and economic development in Taiwan suggesting that not only did tourism contribute to economic development, but also that economic development in turn made Taiwan a more attractive destination for inbound tourism. The study found that this bidirectional relationship did not necessarily hold in other countries and the authors speculated on several factors that could determine the direction of the

relationship including size of national economy, openness in the country, level of travel restrictions, economic dependence on tourism, and overall economic development (Kim, 2005). A later study approached the question differently and found that in the case of Taiwan during the 1959-2003 period there were structural breakpoints in terms of tourism receipts and tourism arrivals that correlated strongly with critical economic, political, and tourist incidents and that, moreover, there is a bi-directional, causal relationship between tourism and economic growth (Lee 2008).

Another study looked at international arrivals to Malaysia using a dynamic panel data analysis. This study found the primary determinants of tourism volume were prior year tourist volume, GDP per capita of the origin country, relative cost of living of tourists Malaysia, weighted CPI of five substitute destinations, number of hotel rooms in Malaysia, and political stability in Malaysia. The study further found that a double-logarithmic form was required to eliminate heteroskedasticity. Further the study found it needed to adopt the Generalized Method of Moments estimators to mitigate issues that arrive using lagged dependent variables with relatively small numbers of observations. This study found that 50% of international arrivals were attributable to word-of-mouth or repeat visitor effects. The study further found significant impact from non-economic factors such as SARS (Habibi, 2011).

Another study looked at international arrivals to South Africa. This study discussed variables typically included in tourism demand studies and listed origin country income, relative prices, transportation costs, exchange rates, marketing expenses, qualitative factors such as cultural links, and supply factors such as availability of tourism products. This study used a similar model to Habibi 2011 regressing the year-to-year

differences in tourism arrivals to differences in the dependent variables, called VECM methodology by the paper. The study found that income and price were significant determinants of demand. (Saayman, 2008).

Other studies have attempted to develop models for forecasting tourism demand. One study looked at inbound to Asia and outbound tourism from Asia in the context of the 2009 financial crisis. This study predicted that the financial crisis would have a significant negative impact on tourist arrivals to Asia, that this effect would be larger for origins farther from Asia such as Europe and North America, and that Asian countries should shift focus toward other countries in Asia for future inbound tourism growth. This study also predicted continued growth in outbound tourism from China, a short-term decline that would quickly rebound from other countries in Asia (Song&Lin, 2009). Perhaps more interesting for the purposes of this paper is that the study also found that there is tourism is overall elastic with respect to income (0.93) and also that source countries vary significantly in their income elasticities of tourism ranging from the USA on the high end (2.88) to New Zealand on the low end (0.25) (Song&Lin, 2009). Another study looked at elasticity from the price side and found a large range of sensitivity to price among tourists with many factors, such as age and length of stay, having a significant influence on each individual's price sensitivity (Masiero, 2011). Another study looked at tourism specifically from South Korea outbound to Australia inbound finding that the elasticity of income is 2.98 and elasticity of price -2.54, i.e., changes in tourist income has a larger impact on demand than changes in cost of tourism activities (Lim 2004). Another study identified significant variation in price elasticities between

specific origin-destination pairs and between holiday and business travel (Konovalova, 2013).

#### 2.4. How Individuals Make Tourism Decisions

Studies have looked at how individual tourists select their destinations and there are several theories and/or models listed below that have guided past studies. One study looked at tourist preferences among visitors to Taiwan and developed a 4-level Analytic Hierarchy Process model with 22 attributes and 8 destinations to understand better how tourists choose their destination. Also interesting in this paper was the discussion of how destination choice is influenced by the tourists concept of destination and how they defined it, coming to the conclusion that although destination is largely defined by geographic, political, and legal frameworks, they should be managed as corporate brands with specific attractions thought of as products offered under that brand. Under this model, the traveler's motivations are critically important for developing appropriate marketing strategies to influence their decision making (Hsu, 2009).

Another study developed a nested logit model for helping understand how tourists make destination decisions based on past destinations finding that tourists move through a three stage decision making process. In the first stage, motivation, organizational pattern, duration of stay, and past visitation experience drive the decision to return home or continue to another destination. In the second stage distance from origin to last destination helps inform the type of destination they move onto. In the third stage tourists select the actual destination based on the following factors: number of attractions, competing destination effect, and distance from last destination to their home (Yang 2013).



Another paper about the factors influencing destination selection for domestic tourists in Kenya introduced the idea of influencers outside of an individual's own characteristics or preferences in its discussion of the applicability of several behavioral economic models toward tourist decisions including Rational Choice Theory, which states that individuals make independent value calculations based on their own preferences (Mawioo, 2014), Porter's Theory of Competitive Advantage, which states that firms must pursue low-price or differentiation strategies to generate long term sustainable value (Porter, 1985), and the Theory of Planned Behavior, which states that an individual's decisions are made based on a combination of that person's own preferences and the subjective of that person's society (Mawioo, 2014). How much an individual's behavior is decided by their own attitude or subjective norms has been found to be related to the conspicuousness of the action with more conspicuous consumptions, like tourist travel, more influenced by subjective norms (Schultz, 2006). A later study looked specifically at the influence of social norms on tourist travel decisions in the context of choosing eco-friendly travel options in conflict with an individual's personal interests and found that societal norms do impact tourist decision making but not as much as personal norms such as internally imposed moral obligations (Doran, 2015).

## Chapter 3: Recent Policies in Japan

In 2008, the Japanese Ministry of Land, Infrastructure, and Tourism launched the Japan Tourism Agency to accelerate the growth of inbound tourism as important national government policy. The government set a goal of 20 million international arrivals by 2020 but exceeded it four years early with 24 million international arrivals in 2016 (JNTO 2016) and so extended to 40 million by 2020 and 60 million by 2030. Japanese Prime Minister Shinzo Abe named inbound tourism as one of the goals of his main economic policy, known colloquially as “Abenomics.” He stated growth in inbound tourism can be an component of increasing Japan’s GDP by 600 trillion yen, one of his key economic goals. Japan also aims to increase receipts from international visitors from current 3.5 trillion yen in 2016 to 8 trillion yen in 2020 and 15 trillion yen in 2030 (Naito, 2016). With these goals set at the highest level of government, Japan began implementing various policies described below to achieve these goals.

### 3.1. Visa Relaxation and Simplification

The most obvious policy change was relaxation of visas requirements for many countries. Japan used to have among the most severe requirements among developed countries for visa requirements, but in an effort to bolster international tourism took intentional steps to relax them in recent years. Table 3.1.1 summarizes changes made since 2013 by year and country (MOFA, 2017).

Table 3.1.1: Changes to Visa Requirements for Asian Countries, 2013-2017

Year	Nation	Old Requirement	Relaxed Requirement
2013	Thailand	Multi-entry visa (90d, 3y)	Visa exemption (15d)
	Malaysia	Multi-entry visa (90d, 3y)	Visa exemption (90d)
	Vietnam Philippines Cambodia Papua New Guinea	Single-entry visa (90d)	Multi-entry visa (15d, 3y)
	Indonesia	Multi-entry visa (15d, 3y)	Multi-entry visa (30d, 3y)
	Arab	Single-entry visa (90d)	Multi-entry visa (90d, 3y)
2014	Myanmar India	Single-entry visa (90d)	Multi-entry visa (15d, 3y)
	Indonesia Philippines Vietnam	Multi-entry visa (15-30d, 3y) Single-entry visa (90d)	Significant relaxation of requirements and simplification of application process
	Indonesia	Multi-entry visa (30d, 3y)	Visa exemption (15d)
2015	China	Multi-entry business visa (90d, 5y) Multi-entry visa (90d, 3y)	Relaxation of requirements for educated people, the wealthy, and for visitors to Okinawa and Tohoku regions.
	Brazil	Single-entry visa (90d)	Multi-entry visa (30d, 3y)
	Mongolia	Single-entry visa (90d)	Multi-entry visa (15d, 3y)
2016	India	Multi-entry visa (15d, 3y)	Significant relaxation of requirements
	Vietnam India	Multi-entry business visa (90d, 5y)	Relaxation of requirements
	Qatar	Single-entry visa (90d)	Multi-entry visa (90d, 3y)
	China	Multi-entry business visa (90d, 5y) Single-entry visa (30d)	Relaxation of requirements for educated people. Simplify process for students sightseeing
2017	Russia	Multi-entry business visa (90d, 3y) Single entry visa (90d)	Multi-entry general visa (30d, 3y) Relaxation of requirements for educated people and simplify visa application process.
	India	Single-entry visa (90d)	Simplify visa application process for educated people

SOURCE: Ministry of Foreign Affairs, Japan. (2017). Recent Visa Relaxations

These changes include significant changes to many countries in Southeast Asia including allowing citizens of countries such as Thailand, Malaysia, and Indonesia to visit without visas. Other Asian countries such as Vietnam, Philippines, Cambodia, Papua New Guinea, Myanmar, and India were allowed multiple entry visas for the first time. In addition to new types of visas or visas exemptions, requirements and application process were greatly simplified for a large variety of countries. As can be seen, Japan is clearly making an effort to relax and/or eliminate visa requirements to make it easier for Asian tourists to visit. As of 2017, only citizens from the following five countries, from among the 20 targeted by Japan for increased inbound tourism, still require a visa to visit for the purposes of tourism: India, China, Philippines, Vietnam, and Russia.

Thailand is an example of a country that has had its requirements for visiting Japan significantly reduced. The exemption for 15 day visits went into effect on July 1, 2013. Before that, citizens of Thailand needed to go through a quite complicated process to apply for a visa to visit including going to the Japanese embassy in Thailand to submit a statement of purpose, plans for staying in Japan, and a certificate of bank balance. The chart below shows the increase in visitors from Thailand after 2012 and the continued increases through 2016. Further, in 2014, Sky Scanner, a travel aggregation website, surveyed residents of Thailand and found that Japan was the most popular desired destination. The correlation between the policy change and the increased popularity of visiting Japan among residents of Thailand have led many to assume a causal relationship between the two.

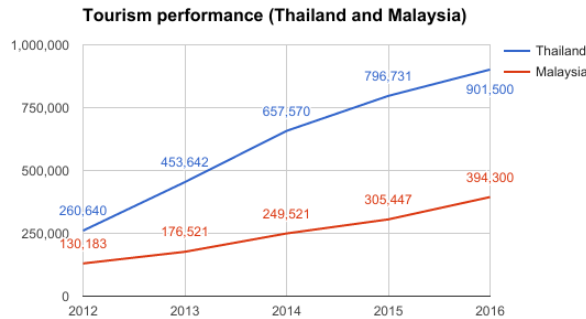


Figure 3.1.1: International Arrivals to Japan from Thailand and Malaysia, 2012-2016  
 SOURCE: Japan Tourism Agency. (2016). 2016 Foreign Visitors & Japanese Departures

### 3.2. Tax-Free shopping system

Japan expanded its tax-free shopping system for foreigners on October 1, 2014 to include all items including consumables such as cosmetics and food. Prior to that only specific, non-consumable goods such as electronics were eligible for tax refund (METI, 2014). Further the Ministry of Economy, Trade, and Industry launched a campaign to recruit more retailers to participate in the program to expand access outside the three large cities of Tokyo, Osaka, and Nagoya. As of 2017, there are more than 23,000 participating stores listed on the official Japan Tax-free Shop website (2017) up from 4,600 licensed stores in 2014 (Betros, 2014). I could not find studies published on the effects of this change, but Japanese believe it to be very effective at attracting Chinese tourists as it even spawned a new Japanese adjective to describe the huge purchase behavior, “爆買い” (baku-ga-i), which was selected as Japan’s top buzzword of 2015 (Ryell, 2015). According to data from the Japan Tourism Agency, visitors from China not

only spend the most in total during visits to Japan, but spend a proportionally much higher amount on shopping compared to visitors from other countries, spending more than double on shopping than visitors from any other country (JTA, 2016). The policy appears to be having an impact as tourism from China, the country whose tourists have the most to gain from the policy, is growing much faster than that from any other country in the time period immediately after policy was implemented to attract tourists for shopping.

### 3.3. Attracting Muslim Tourists

As the Muslim population grows worldwide, Muslim tourists are becoming increasingly common. Two of Japan's target markets for inbound tourism, Malaysia and Indonesia, contain large Muslim populations and Japan has attempted to respond to the needs of this community (Penn, 2015). Private organizations have largely led the way taking a variety of steps including educating hotels and restaurant owners about the special needs of Muslim visitors, offering more Halal certified dining options, making prayer rooms available, producing Muslim targeted souvenirs, and emphasizing Japan's record of safety (Henderson, 2016). Limitations remain such as the extreme expense of certification and Halal products, incompatibilities with Japanese cultural norms around alcohol, language barriers, diversity of requirements for different populations of Muslims, and lacks of services outside of major cities (Henderson, 2016).

### 3.4. Accessibility

The government's Ministry of Land, Infrastructure, and Transport has committed itself to creating a multilingual environment at all international airports throughout Japan

for the convenience of foreign travelers (MLIT 2016). Japan has also steadily improved its transportation infrastructure such as the opening of the Hokuriku Shinkansen Line extension to Kanazawa which shortened travel time between Tokyo and Kanazawa from 3.8 to 2.5 hours and the opening of a third terminal at Narita International Airport to accommodate growing demand for low-cost carriers (JTA, 2016). One study developed an air connectivity index from 2007 data to rate the relative connectivity of countries and found Japan as the 48th most connected country via air connectivity at less than 25% of the connectivity of the top ranked country, the United States, and very similar to its Asian neighbors, China, Hong Kong, and South Korea (Arvis, 2011). Since then Japan has made efforts to improve connectivity with countries like the United States by, for example, opening up additional international arrival slots and allowing daytime arrivals and departures at Tokyo's Haneda airport (Levine-Weinberg, 2016).

Japan has further striven to improve its cultural assets both through promotion of new destinations such as a newly listed UNESCO World Heritage site commemorating the Meiji Industrial Revolution (JTA, 2016) as well as improvement of existing assets such as via repair and introduction of multilingual commentary on 200 cultural assets nationwide. The government has also made efforts to promote attracting large international conferences such as the 2016 G7 Summit hosted in Ise-Shima (JTA, 2016) and cultivating human resources for tourism. Overall the number of international conferences hosted in Japan increases from 150 in 1995 to 337 in 2014 ranking Japan 7th-most of any country in the world and first among Asia-Pacific countries (JTA, 2016).

## Chapter 4: Empirical Model

This paper discusses inbound tourism to Japan and adopts Panel Data Analysis, including fixed effect and random effects models. Section 4.1 provides background information relevant to the selection of the statistic method for estimating the model. Section 4.2 sets up the empirical model for the paper. Section 4.3 provides background information about the research data and variables settings.

### 4.1. Statistical Methodology for Estimation

There are many statistical methods for estimating linear models. From among them this paper considered Ordinary Least Squares (OLS) regression, Panel Data Analysis with Fixed Effects, and Panel Data Analysis with Random Effects.

OLS is a method for estimating the coefficients in a linear regression model. The goal of an OLS model is to calculate the coefficients that minimize the sum of the squares of the differences between observed results and results predicted by the linear function. The OLS is perhaps the simplest form of linear regression, but this simplicity comes at the expense of requiring the model and data to meet many assumptions, including that none of the following are present: endogeneity, linear dependence, heteroscedasticity, and autocorrelation.

If the model is endogenous it means that the error term  $e_{it}$  in our equation above is correlated with one or more of the dependent variables or that the mean of all error terms is not equal to 0. In other words, the independent variables included in the model must be truly independent of each other. In our model this assumption appears to be violated by



the presence of the lagging variables for *touristratio*, price, and income, which are almost certainly strongly correlated to the non-lagging versions indicating one reason OLS might not be the best method for this model.

Linear dependence means that at least one of the independent variables can be predicted via a linear combination of the other variables; in essence, there is a linear relationship between one or more of the independent variables. When this is present the model is said to be multicollinear. In this case, the model as a whole may still be predictive but the coefficients of individual variables become meaningless and the model cannot be used to evaluate things like elasticity or the impact of dummy variables. Because of the lagging variables its very likely this paper's model contains at least some multicollinearity and estimating of things like elasticity and impact of dummy variables is critical to the research questions indicating a second reason OLS might not be sufficient for this model.

Heteroscedasticity means there are sub-populations within the larger dataset that have different variability than others. Typically, this means that the error terms,  $e_{it}$ , in the model are correlated with some other variable in the model or some other characteristic of the data. This typically manifests as error terms getting larger with increasing time or increasing of some other variable. In these cases, simply adopting a log-linear or log-log specification of the model, which our model already adopts, can often correct the problem sufficiently for OLS to still be valid. However, the other case where it can be problematic is if the error is correlated to some other factor outside the model specification such as by sub-groupings of the data such as the case with this paper's dataset where the data can be grouped by countries and years. If characteristics specific to

individual countries impact the dependent variable this would be a type of heteroscedasticity that OLS can not easily account for and would be a third indication that OLS is not ideal for this model.

Autocorrelation or serial correlation means that there is correlation between the error terms of observations typically associated with time series data, panel data, and longitudinal data. Its presence does not necessarily bias the coefficient estimates but instead causes underestimation of the standard errors, which leads the model and its estimates to appear to have more significance than they actually do. As this paper's data includes both time series and panel data, autocorrelation is a potential concern and raises yet another indication that OLS might be suitable for this model.

Panel Data Analysis is another statistical method for estimating the coefficients in a linear regression model that is better suited for datasets exhibiting some of the issues listed above that violate the assumptions of OLS regression. Specifically, Panel Data Analysis attempts to control for cases where the error terms in the model are correlated with some aspect of the independent variables, but still consistent over time. In other words, the data can be grouped into panels with common characteristics. This makes this method well suited for this paper's model where the data is grouped into panels representing different countries.

There are two Panel Data Analysis models this research considered, Panel Data Analysis with Fixed Effects and Panel Data Analysis with Random Effects. The models have their own assumptions. The Fixed Effects version of Panel Data Analysis assumes that there are unique attributes of the entities represented by the panels, representing countries in our case, that do not vary across time and may or may not be correlated with

the individual independent variables. The Random Effects version assumes there are unique attributes of the entities represented by panels that do not vary across time and are not correlated with any of the individual dependent variables. Therefore, Random Effects is special case of Fixed Effects in which the unique attributes are known not to correlate with independent entities (in Fixed Effects they may or may not correlate). More quantitatively, both fixed effects and random effects methods control models in which the error terms of the model vary between panels; however, a fixed effects model is necessary in the cases where the error term is correlated within panels to one or more of the independent variables and a random effects model is better in the cases where the error term is uncorrelated to any of the independent variables.

Fortunately, there are statistical tools to evaluate the dataset against the assumptions above for each model and identify the best methodology for estimating the model. The following statistical tests help with choosing between OLS, Fixed Effects, and Random Effects requires three different tests: the Breusch and Pagan Lagrangian multiplier test for random effects, the Hausman specification test, and an F-test of the joint significance of the fixed effects intercepts.

The Breusch and Pagan Lagrangian multiplier test for random effects for is used to choose between OLS and Random Effects. This test compares the random effects and OLS models with a null hypothesis that variance across entities is zero, *i.e.*, there are no significant differences across units. The output of the test is a p-value. A low p-value indicates the null hypothesis is rejected, variance across entities is greater than zero, and therefore Random Effects is more effective than OLS. A high p-value indicates the null

hypothesis can not be rejected, variance across entities is zero, and therefore OLS is more efficient than Random Effects.

The Hausman specification test evaluates the consistency of an estimator compared to an alternative, less efficient estimator already known to be consistent and is used to choose between Fixed and Random Effects. In the case of Random Effects and Fixed Effects, because Random Effects is a special case of the Fixed Effects model, Fixed Effects will always be consistent when Random Effects is consistent, but there are cases where Fixed Effects is consistent when Random Effects is not. At the same time Random Effects is always more efficient than Fixed Effects when both are consistent. Choosing between the two is therefore an ideal application of the Hausman test. In this test, the null hypothesis is that both estimators are consistent and the output is a p-value. A low p-value indicates the null hypothesis is rejected, only one of the estimators is consistent, and that estimator, Fixed Effects in this case, should be used. A high p-value indicates the null hypothesis can not be rejected, both estimators are consistent, and that the more efficient estimator, Random Effects in this case, should be used.

The F-test of the joint significance of the fixed effects intercepts evaluates whether or not the fixed intercepts are zero and is used to choose between OLS and Fixed Effects. The null hypothesis is that all of the fixed effect intercepts are zero, *i.e.*, there is no reason to use fixed effects. A low p-value indicates the null hypothesis is rejected, there are fixed effect intercepts greater than 0 and Fixed Effects should be used. A high p-value indicates the null hypothesis cannot be rejected, all fixed effect intercepts are 0, and that OLS is more efficient and should be used.

## 4.2. Specification of the Model

Song and Lin (2009) looked at the impact of the 2008 financial crisis on inbound tourism to Asia in their paper “Impacts of the Financial and Economic Crisis on Tourism in Asia”. To model tourism demand, they adopted a non-linear demand function that could be approximated with a linear regression model which allowed them to incorporate dummy variables to account for specific events or policy changes that occurred in specific years to measure their impact beyond economic factors. Equation 1 is the linear regression model they used to model tourist demand in that paper.

$$\ln(Q_{it}) = a_0 + a_1 \ln(Y_{it}) + a_2 \ln(Y_{it-1}) + a_3 \ln(P_{it}) + a_4 \ln(P_{it-1}) + a_5 \ln(Q_{it-1}) + \sum \text{dummies} + e_{it} \quad (\text{Equation 1})$$

In this model  $Q_{it}$  is tourist arrivals from country  $i$  in year  $t$ ,  $Y_{it}$  is tourist income in country  $i$  in year  $t$ ,  $P_{it}$  is tourism price for tourists from country  $i$  in year  $t$ , and dummies are dummy variables indicating the occurrence of one-off events, such as the Asian financial crisis in 1999 and the SARS epidemic in 2003. Lagged dependent and independent variables are included to take “the time path of tourists’ decision-making process into consideration” (Song & Lin, 2009).

This paper builds on their work by adopting this demand model for tourism to Japan with the following changes and additions. First, the ratio of tourists to population of the origin country replaces the number of tourist arrivals as the dependent variable. This change was made to better account for the significant variance in population of the origin countries included. This correction is important for this research because the dataset includes countries whose population ranges from 4.11 million people to 1.37 billion. It is possible that the original research avoided this issue because it was

conducted at a time when China was not yet a significant tourism player. However, the years included in this research capture the rise of China as a dominant tourism player and so the population variance must be accounted for. This research considered two methods to include population in the model. The first method is to switch the dependent variable to a ratio of tourists as a percentage of population. This has a primary advantage of maintaining the integrity of the rest of the model and secondary advantage of accounting for population growth, which was not included in the model Song and Lin used in their paper. The disadvantage of this method is that all results will be reported as a ratio which needs to be multiplied by population to calculate the number of tourists; however, this is not such a problem since results are already reported as the natural log and must be converted anyway to get actual number of tourists.

The second method is to add population as a dependent variable in the model. This method has the advantage of maintaining tourists as the dependent variable but as the disadvantage of potentially distorting the results. The research is attempting to understand tourist flows at the country level and what impacts citizens from specific countries deciding to visit Japan or not. However, country level tourist flows are ultimately an aggregation of the decisions of the individual citizens of those countries. Therefore, the independent variables in the model are all factors that could reasonably be expected to influence tourist decision-making, *e.g.*, income, relative prices, presence of a major safety incident, and policy. It is unlikely that home country population would be a factor in any tourists' decision making and therefore unlikely to be useful in predicting tourist decisions at the individual or aggregate level. However, because of the huge variance in population and its consistent upward trend which roughly matches the

consistent upward trend in tourism numbers it is likely the model would find significant correlation between population even as its unlikely to affect tourist decision making at any level. The potentially large and uncorrectable disadvantage of this second method coupled with the easily correctable disadvantage of the first method is why this research uses ratio of tourists to population in place of tourists to account for differences in population in origin countries.

Finally, four dummy variables were evaluated including two representing policy changes implemented by Japan, one applying globally representing the adoption of tax-free shopping policies (taxfree) and the other opening visa exempt visitation options to specific origin countries (visaexempt). Another represented the occurrence of a major one-off safety related event, the Fukushima Daiichi nuclear disaster (fukushima), and another indicated the occurrence of major protests of Japan in specific countries related to diplomatic incidents (protest). As will be shown later, visaexempt and protest were found to be insignificant and ultimately excluded from the model.

With these changes, the model to be estimated in this research is as follows in equation 2:

$$\ln(Q_{it}/POP_{it}) = a_0 + a_1\ln(Y_{it}) + a_2\ln(Y_{it-1}) + a_3\ln(P_{it}) + a_4\ln(P_{it-1}) + a_5\ln(Q_{it-1}/POP_{it-1}) + a_6\text{taxfree}_{it} + a_7\text{fukushima}_{it} + e_{it} \quad (\text{Equation 2})$$

$Q_{it}$ ,  $Y_{it}$ , and  $P_{it}$  remain the same as in the original model shown in equation 1, tourist arrivals, income, and price for country  $i$  in year  $t$ , respectively.  $POP_{it}$  represents population of country  $i$  in year  $t$ . The dummy variables  $\text{taxfree}_{it}$  and  $\text{fukushima}_{it}$  indicate if that event or policy affected country  $i$  in year  $t$ .

### 4.3. Data Source and Variables Settings

The data for this research includes economic data from the following 11 Asian countries: China, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam corresponding to the variables described in equation (2) in section 4.1.

Data for each country includes the following: international tourist arrivals, population, GDP per capita (PPP), relative CPI, and JPY exchange rate. In addition, the data includes other variables calculated from these base data. For example, tourist ratio is the ratio of international arrivals from a country to that country's population. Price is calculated as relative CPI between Japan and the origin country adjusted by the currency exchange rate such that it essentially represents the price of goods in Japan for international visitors in their currency adjusted by relative inflation over time. Table 4.3.1 shows the variables included in the model, their descriptions, how they were calculated, and the source from which the data was collected.

In terms of the regression model,  $Q_{it}/POP_{it}$ , or *touristratio*, is the dependent variable.  $Q_{it-1}/POP_{it-1}$ ,  $Y_{it}$ ,  $P_{it}$ ,  $Y_{it-1}$ , and  $P_{it-1}$ , or *touristratio\_lag*, *income*, *price*, *income\_lag*, and *price\_lag*, respectively, are independent variables.  $Taxfree_{it}$ ,  $fukushima_{it}$ , and  $visaexempt_{it}$  are dummy independent variables. Although the latter is not included in the main model shown in equation 2, it is shown here as it is used in a different version of the model introduced in a later section of the paper.

One additional point to consider is the choice of GDP per capita (PPP) to represent income instead of nominal GDP per capita. Both metrics start from the total market value of all goods and services produced in a country in its local currency (GDP)



which is then converted into \$USD as a common currency for comparison purposes. The nominal method uses market currency exchange rates for this conversion and is generally acceptable for comparing the performance of countries. Unfortunately, it is flawed for comparing the standard of living of a population as it fluctuates widely with market exchange rates that make little or no real difference to the population's standard of living. Even more, nominal does not take into account the significant differences in costs of living between nations. PPP, or purchasing power parity, solves both of these problems by using an exchange rate derived from the relative cost of goods between countries. This makes it relatively more stable over time and a better measure of a population's relative wealth and standard of living in terms of buying power. Further, market currency exchange rates already factor into the model via their inclusion in the calculation of the price variable including them in income via using nominal GDP would lead to unnecessary correlation between the independent variables that can be avoided by using PPP.

Table 4.3.1: Variables and Sources

Variable	Name	Exp. Sign	Description	Source
$Q_{it}/POP_{it}$	touristratio	NA	International tourist arrivals from origin country divided by population of origin country	Japan National Tourism Organization (International Tourist Arrivals) World Bank (Population)
$Q_{it-1}/POP_{it-1}$	touristratio_lag	+	International tourist arrivals from origin country in the prior year divided by population of origin country in the prior year	Japan National Tourism Organization (International Tourist Arrivals) World Bank (Population)
$Y_{it}$	income	+	GDP per capita (PPP) in the origin country in \$US	World Bank
$P_{it}$	price	-	Relative CPI Japan divided by CPI in origin country adjusted by the exchange rate between Japan and the origin country	World Bank
$Y_{it-1}$	income_lag	-	Same as income variable except for the prior year	World Bank
$P_{it-1}$	price_lag	+	Same as price variable except for the prior year	World Bank
taxfree <sub>it</sub>	taxfree	+	1 during 2015 for all countries, 0 in all other cases	Ministry of Economy, Trade, and Industry
fukushima <sub>it</sub>	fukushima	-	1 during 2011 for all countries, 0 in all other cases	
visaexempt <sub>it</sub>	visaexempt	+	1 during any year in which a countries citizens were allowed to visit Japan without a visa	Ministry of Foreign Affairs

Table 4.3.1 also includes a column, Exp. Sign, indicating the expected sign (positive/negative) of the estimated coefficient. For the most part these are straightforward, tourists should increase with income and decrease with price. The signs for the lag variables of price and income though seem counterintuitive in that they are opposite the variables they lag. However, because of the dynamic nature of the model,

none of these coefficients are actually elasticities by themselves, but must be converted to elasticities as discussed later in section 5.2 using the equations below (Song&Lin, 2009):

$$\text{Income elasticity of demand} = (a_1 + a_2) / (1 - a_5) \quad (\text{Equation 3})$$

$$\text{Price elasticity of demand} = (a_3 + a_4) / (1 - a_5) \quad (\text{Equation 4})$$

The equation for income elasticity can be derived as follows from a simplified version of the model where everything except the touristratio, income and their lag variables remain constant and are represented by C:

$$\ln(Q_{it}/POP_{it}) = a_1 \ln(Y_{it}) + a_2 \ln(Y_{it-1}) + a_5 \ln(Q_{it-1}/POP_{it-1}) + C \quad (\text{Equation 5})$$

Price elasticity of demand can be defined as the ratio  $\ln(y) / \ln(x)$ , where y is the ratio by which touristratio and its lag variable increases when price and its lag variable increase by the ratio x. Add  $a_1 \ln(x) + a_2 \ln(x) + a_5 \ln(y)$  to both sides of equation 5 to get the following:

$$\ln(y^{a_5} x^{a_1} x^{a_2} Q_{it}/POP_{it}) = a_1 \ln(xY_{it}) + a_2 \ln(xY_{it-1}) + a_5 \ln(yQ_{it-1}/POP_{it-1}) + C \quad (\text{Equation 6})$$

This indicates that when price and price lag increase by ratio x and lag touristratio increases by ratio y, tourist ratio increases by  $y^{a_5} x^{a_1} x^{a_2}$  which means the following is true:

$$y = y^{a_5} x^{a_1} x^{a_2} \quad (\text{Equation 7})$$

Rearranging equation 7 and then taking the natural log of both sides yields the following:

$$(1-a_5) \ln(y) = (a_1+a_2) \ln(x) \quad (\text{Equation 8})$$

Equation 8 can be rearranged to the following shows:

$$\ln(y) / \ln(x) = (a_1+a_2) / (1-a_5) = \text{Income elasticity of demand} \quad (\text{Equation 9})$$

Based off equation 9 derived for income elasticity of demand one should expect  $a_1$  and  $a_2$  to be opposite signs and  $a_5$  to be a positive number less than one. Because tourist demand should increase with tourist income,  $a_1 + a_2$  should be positive. The same derivation can be performed for price elasticity with the expectation that tourist demand should decrease with tourist price and so  $a_3 + a_4$  should be negative.

Table 4.3.2 shows summary of descriptive variable statistics for the data used in this paper. All variables show significant variance between countries and through time as can be seen in this table that the standard deviations of *touristratio* and *price* exceed the mean and *income* nearly matches the mean. To better illustrate this variance within the data figures 4.3.1 through 4.3.4 show how each of these variables has changed over time for each of the included countries. Figure 4.3.1 and 4.3.2 plot tourist arrivals in terms of  $Q_{it}$  and  $Q_{it}/POP_{it}$ , respectively, against time where the Y-axis measures arrivals and the X-axis measures time. As can be seen, tourist arrivals increased for every country in the study and there is significant variance among countries in both.

Table 4.3.2: Summary of Descriptive Variable Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>touristratio</i>	143	0.0213206	0.0334688	0.0000429	0.2086442
<i>income</i>	143	21912.1	20347.4	2361.335	85382.3
<i>price</i>	143	29.31684	64.01182	0.0103944	264.7902
<i>taxfree</i>	143	0.0769231	0.267406	0	1
<i>fukushima</i>	143	0.0769231	0.267406	0	1
<i>visaexempt</i>	143	0.4265734	0.4963176	0	1

Figure 4.3.3 plots  $Y_{it}$ , income, for each country against time where the Y-axis measures income and the X-axis measures time. In this case income is measured in terms of GDP Per Capita (PPP) in \$USD. Similar to tourist arrivals, all countries show an increasing trend in income while still showing a lot of variance in income levels and trend between countries.

Figure 4.3.4 plots  $P_{it}$ , price, for each country against time where the Y-axis measures income and the X-axis measures time. In this case price is measured in terms of local currency per 1 yen adjusted by the ratio of relative CPI of the country to relative CPI of Japan over the time period. As stated above, this represents the trend of the price of goods in Japan for international visitors in their home currency adjusted by relative inflation over time. Unlike the other variables, here we see significant year-to-year fluctuation as would be expected as it is based on currency exchange rates that float on the open market. Like the other variables, though, there is a clear consistent trend across all countries indicating decreasing prices over time.

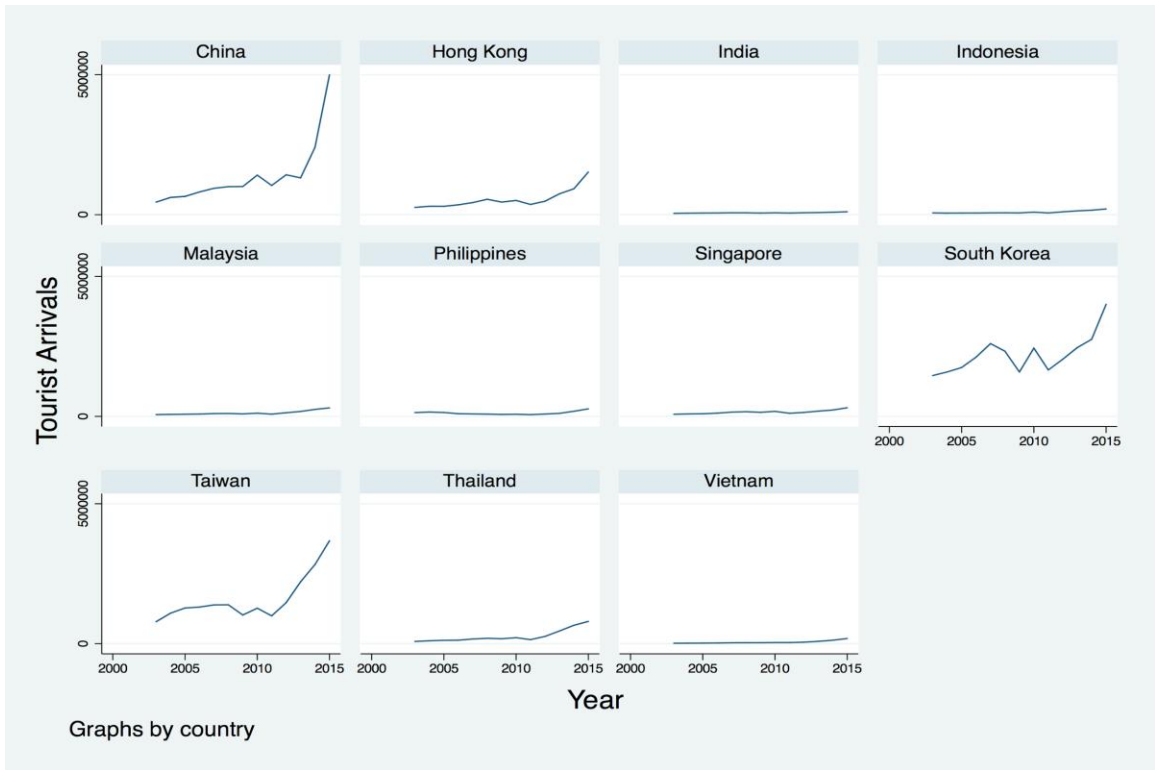


Figure 4.3.1: Tourist Arrivals by Year 2003-2015

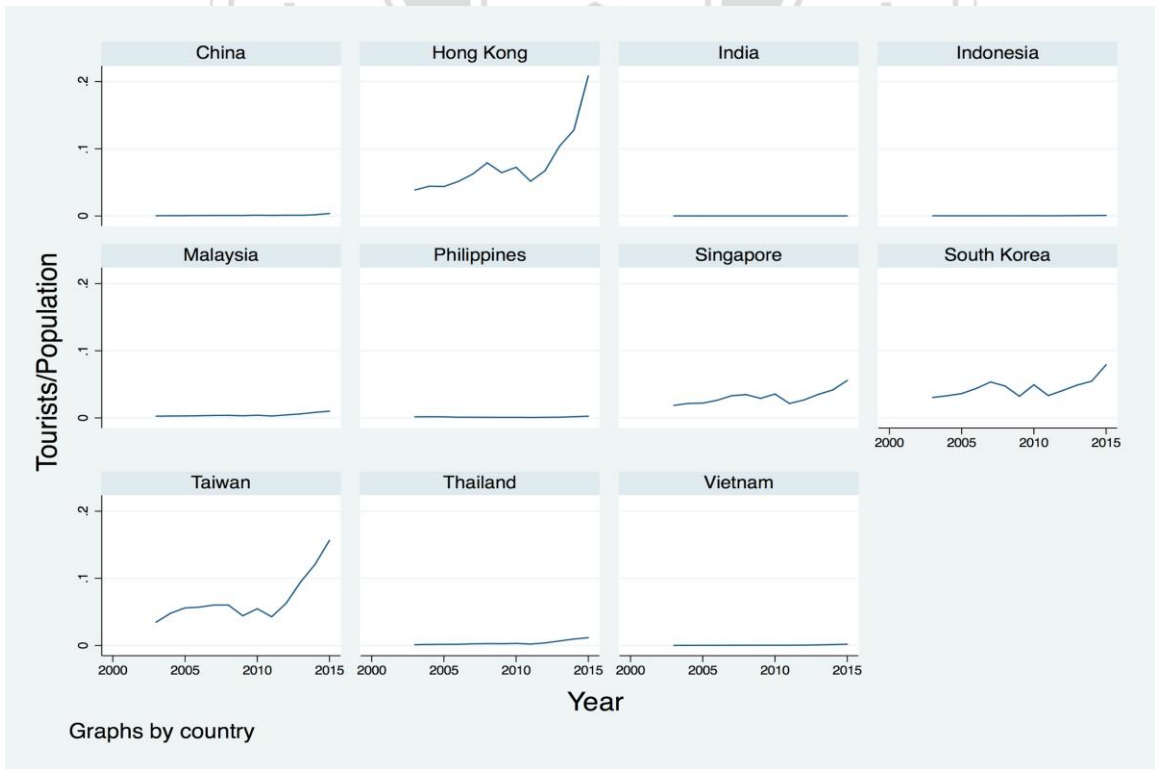


Figure 4.3.2: Tourist Arrivals by Year as Percentage of Population, 2003-2015

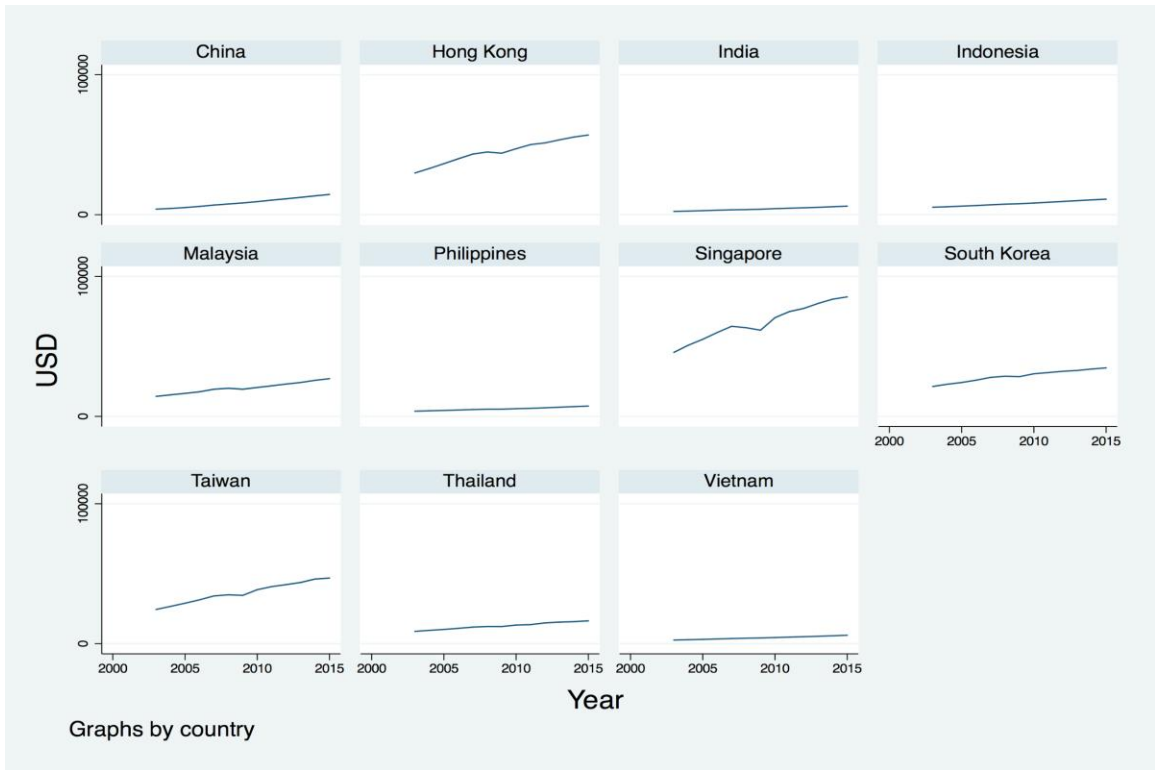


Figure 4.3.3: Income By Year (GDP Per Capita (PPP)), 2003-2015

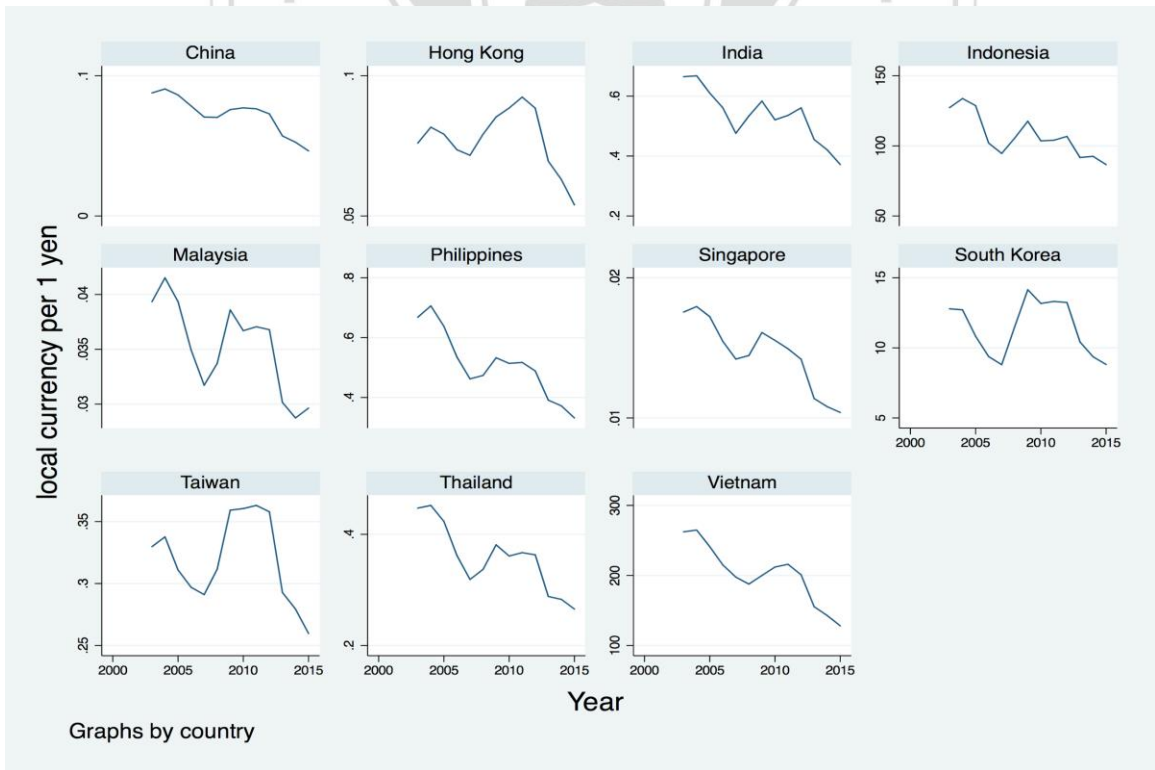


Figure 4.3.4: Price By Year (local currency per yen, adjusted by CPI), 2003-2015

## Chapter 5: Empirical Results

### 5.1. Model Output

This paper used STATA 11 econometric software to perform panel data analysis with fixed effects to obtain estimates for the model described in equation (2) above. Breusch and Pagan Lagrangian multiplier test for random effects, Hausman test, and F-test of the joint significance of the fixed effects intercepts were conducted to validate that Panel Analysis with Fixed Effect is more appropriate than Panel Analysis with Random Effects or OLS regression for estimating the model results. Table 5.1.1 shows the results of the regression using each of these three methods with coefficients rounded to four significant digits. The left column shows the variable, as defined in section 4.3. The second column shows the coefficients estimated for each variable using the OLS method. The third column shows the coefficients estimated for each variable using the Panel Analysis with Random Effects method. The fourth column shows the coefficients estimated for each variable using the Panel Analysis with Fixed Effects method. In all cases, t-values indicating statistical significance are shown in parenthesis beneath the estimated coefficient. For convenience, asterisks are used to highlight variables found to be statistically significant with \*\*\*, \*\*, and \* indicating statistical significance at the 1%, 5%, and 10% levels, respectively.



Table 5.1.1: Estimation Results Using Different Regression Methods

	ln(touristratio)		
Model:	OLS	Panel Analysis Random Effects	Panel Analysis Fixed Effects
Variable:	Estimated value of coefficient (t-values shown in parenthesis)		
ln(touristratio_lag)	0.9772*** (60.97)	0.9423*** (43.79)	0.8163*** (15.03)
ln(income)	1.475*** (2.81)	1.579*** (2.93)	2.485*** (4.23)
ln(price)	-0.5937*** (-3.68)	-0.5494*** (-3.52)	-0.3728** (-2.25)
ln(income_lag)	-1.377*** (-2.66)	-1.383*** (-2.62)	-1.927*** (-3.49)
ln(price_lag)	0.6026*** (3.75)	0.5637*** (3.63)	0.2835* (1.72)
taxfree	0.1855*** (3.42)	0.1827*** (3.52)	0.1474** (2.53)
fukushima	-0.4121*** (-7.75)	-0.4217*** (-8.31)	-0.4531*** (-9.20)
_cons	-1.039** (-2.14)	-2.175*** (-3.39)	-6.430*** (-6.08)
R <sup>2</sup>	0.9950	0.9950	0.9708
Observations	132		
Countries	11		
Breusch and Pagan Lagrangian multiplier test for random effects			X <sup>2</sup> = 1.13 (Prob. > X <sup>2</sup> = 0.1434)
Hausman test			X <sup>2</sup> = 38.72*** (Prob. > X <sup>2</sup> = 0.0000)
F-test of the joint significance of the fixed effects intercepts			F = 5.61*** (Prob. > F = 0.0000)
***, **, * indicate statistical significance at 1%, 5%, and 10% level, respectively			

The table 5.1.1 also includes the results of the Breusch and Pagan Lagrangian multiplier test for random effects, the Hausman test, and the F-test of the joint significance of the fixed effects intercepts. The 0.1434 p-value result for the Breusch and Pagan Lagrangian multiplier test for random effects indicates that OLS regression is more appropriate for this model than Random Effects. The 0.0000 p-value result for the Hausman test indicates that Random Effects is not consistent for this model and that therefore Fixed Effects is more appropriate. Finally, the 0.0000 p-value result for the F-test of the joint significance of the fixed effects intercepts indicates that OLS is not appropriate for this model and that therefore Fixed Effects is more appropriate. The results of these three tests confirm that Panel Data Analysis with Fixed Effects is the most accurate method for estimating the coefficients of the model and so the coefficients estimated with fixed effects will be used for the rest of the paper.

Figures 5.1.1 and 5.1.2 show the predictions for tourist arrivals to Japan compared to actual tourist arrivals for each country and year. The two charts differ only by countries included and vertical axis scale with Chart 5.1 showing the countries that send a higher volume of tourists with a scale of 0 to 500,000 and Chart 5.2 showing the countries that send a lower volume of tourists with a scale of 0 to 100,000. This split is made only for convenience to make differences within the same chart easier to see without sacrificing the ability to compare countries within the same group across a common scale. From visual inspection, the model appears to fit the underlying data fairly well with one caveat. The model appears to significantly underestimate tourism South Korea while similarly overestimating tourism for Singapore.

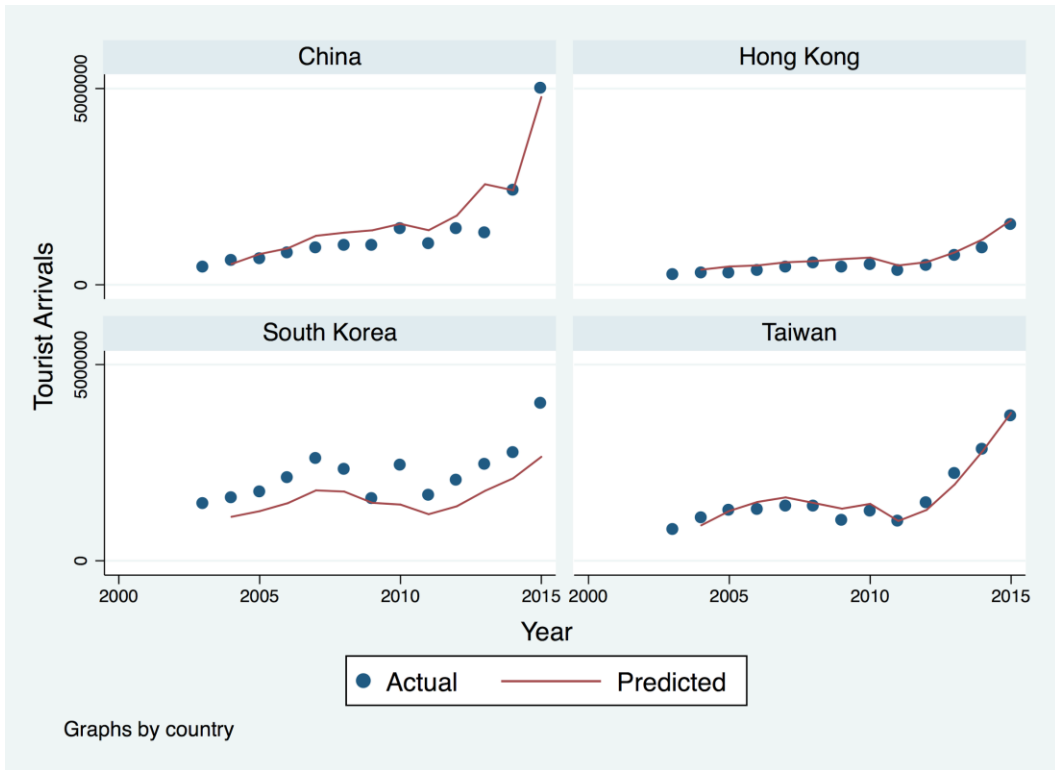


Figure 5.1.1: Tourist Arrivals, Actual vs. Predicted, High Volume Countries

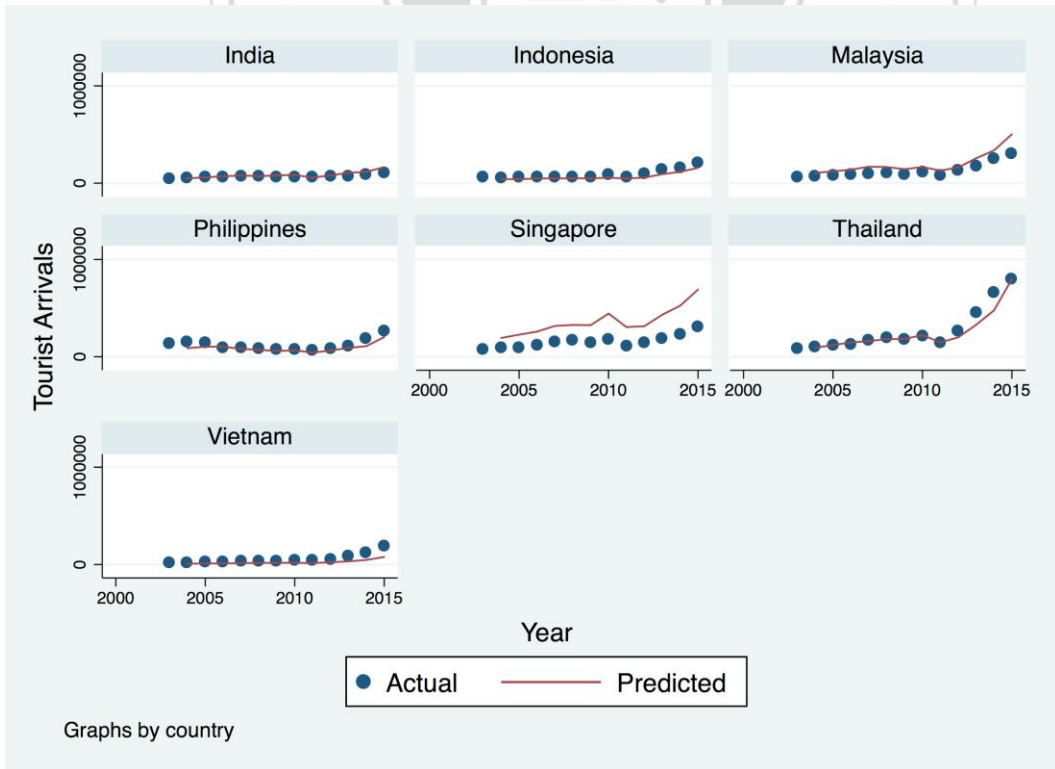


Figure 5.1.2: Tourist Arrivals, Actual vs. Predicted, Low Volume Countries

## 5.2. Income and Price Elasticity of Demand

Because the model includes lagged variables the coefficients of price and income cannot be taken as the demand elasticity; however, the actual elasticity can be calculated using equations 3 and 4 (Song & Lin, 2009). Section 4.3 shows in detail how these equations are derived.

$$\text{Income elasticity of demand} = (a_1 + a_2) / (1 - a_5) \quad (3)$$

$$\text{Price elasticity of demand} = (a_3 + a_4) / (1 - a_5) \quad (4)$$

Table 5.2.1: Income and Price Elasticity of Demand

Income Elasticity of Demand <sup>1</sup>	3.041
Price Elasticity of Demand <sup>2</sup>	-0.486

Using these equations, the elasticity can be calculated and are shown in Table 5.2.1. The estimated income elasticity of demand of 3.041 is quite high and implies that tourism to Japan is a luxury good for residents of other Asian countries (income elasticity >1). This makes sense considering that the average income in terms of GDP Per Capita (PPP) of countries included in the study was USD\$21,912 with a minimum of USD\$2361 (Table 4.3.1). At those income levels visiting Japan is very expensive relative to income. While this result is quite high, it is not outside the bounds of reasonableness for tourism income elasticities. For example, Song and Lin estimated income elasticity for tourists traveling from the United States to Asia to be 2.88 (Song&Lin, 2009). Another paper

<sup>1</sup> Income Elasticity of Demand =  $(2.485059 + -1.926535) / (1 - 0.8163068) = 3.040526$

<sup>2</sup> Price Elasticity of Demand =  $(-0.3727614 + 0.2835104) / (1 - 0.8163068) = -0.485870$

estimated income elasticity of demand for tourists from Thailand and Hong Kong to Japan to be 2.9 (Mizuho, 2016).

The estimated price elasticity of demand of -0.486 implies that tourism demand for travel to Japan is relatively inelastic with respect to price. Research on price elasticity in tourism is surprisingly sparse compared to income elasticity, but one study reviewed published research and found that while price elasticity on average is estimated to be between -0.6 and -0.8 the range of published estimates at that time was quite large ranging from -4.13 to 2.13 (Crouch, 1994).

### 5.3. Impact of Tax-Free Shopping Policy

The statistically significant 0.1474 estimate for the coefficient of the dummy variable representing the implementation of tax-free shopping provides evidence to support the importance of proactive government policy on the tourism industry. In terms of overall impact of this policy, it is difficult to interpret the coefficient directly due to the use of the double-log model. However, we can use the model to predict how many tourists would have visited Japan with tax-free shopping by running a prediction with the tax free dummy variable set to zero for 2015 the results of which are shown in Table 5.3.1.

This table shows actual tourists arrivals in 2015, the number predicted by the model with and without Fukushima, and the difference between the two predictions by country with the total summed at the bottom. From this we can see that actual tourist arrivals from these countries in 2015 was 16,370,035 which was more than the model prediction of 15,439,493. However, the model forecasted that without the implementation of tax-free shopping the number of tourist arrivals would have been 13,323,974 meaning

that according to the model the implementation of tax-free shopping led to the gain of an additional 2,115,519 tourist arrivals from these countries representing a 16% increase relative to the model's prediction for what the number would have been without tax-free shopping.

Table 5.3.1: Impact on Tourist Arrivals from Tax-Free Shopping Policy, 2015

Origin Country	Actual Tourists	Predicted Tourists with Tax-Free	Predicted Tourists without Tax-Free	Predicted Gain from Tax-Free Policy
China	4,993,689	4,783,981	4,128,480	655,501
Hong Kong	1,524,292	1,643,807	1,418,573	225,234
India	103,084	164,916	142,319	22,597
Indonesia	205,083	157,677	136,072	21,605
Malaysia	305,447	502,724	433,841	68,883
Philippines	268,361	202,592	174,833	27,759
Singapore	308,783	691,309	596,586	94,723
South Korea	4,002,095	2,649,108	2,286,127	362,981
Taiwan	3,677,075	3,767,516	3,251,291	516,225
Thailand	796,731	798,724	689,283	109,441
Vietnam	185,395	77,139	66,569	10,570
<b>Total</b>	<b>16,370,035</b>	<b>15,439,493</b>	<b>13,323,974</b>	<b>2,115,519</b>

#### 5.4. Impact of Fukushima Disaster

The statistically significant negative value of -0.4531 estimated for the coefficient for the dummy variable for the Fukushima Daiichi nuclear disaster confirms conventional wisdom that the disaster had a significant negative impact on international tourism arrivals to Japan in 2011. As discussed earlier, tourist arrivals to Japan declined by almost 30% in 2011 relative to 2010 (Henderson, 2013). The model confirms that this reduction holds even when adjusting for economic factors and looking at data paneled by origin-country. It is difficult to assess the significance of the impact of the Fukushima disaster from this coefficient because of the use of the double-log model. However, we can use the model to forecast how many tourists would have visited Japan had the Fukushima disaster not occurred by running a prediction with the Fukushima dummy variable set to zero for 2011 the results of which are shown in Table 5.4.1.

This table shows actual tourists arrivals in 2011, the number predicted by the model with and without Fukushima, and the difference between the two predictions by country with the total summed at the bottom. From this we can see that actual tourist arrivals from these countries in 2011 was 4,623,409 which was less than the model prediction of 4,825,576. However, the model forecasts that without the occurrence of Fukushima the number of tourist arrivals would have been 7,591,245 meaning that according to the model the Fukushima disaster led to a loss of 2,765,669 tourist arrivals from these countries representing a 36% reduction relative to the model's prediction for what the number would have been without Fukushima.

Table 5.4.1: Impact on Tourist Arrivals from Fukushima Disaster, 2011

<b>Origin Country</b>	<b>Actual Tourists</b>	<b>Predicted Tourists with Fukushima</b>	<b>Predicted Tourists without Fukushima</b>	<b>Predicted Loss from Fukushima</b>
China	1,043,246	1,389,371	2,185,658	796,287
Hong Kong	364,865	492,236	774,350	282,114
India	59,354	56,611	89,057	32,445
Indonesia	61,911	48,258	75,916	27,658
Malaysia	81,516	129,660	203,972	74,312
Philippines	63,099	42,731	67,221	24,490
Singapore	111,354	304,563	479,117	174,554
South Korea	1,658,073	1,185,685	1,865,233	679,548
Taiwan	993,974	1,014,605	1,596,103	581,498
Thailand	144,969	147,843	232,576	84,733
Vietnam	41,048	14,012	22,042	8,031
<b>Total</b>	<b>4,623,409</b>	<b>4,825,576</b>	<b>7,591,245</b>	<b>2,765,669</b>



## 5.5. Impact of Visa Exempt Policy

The dummy variable representing adoption of visa exemption rules for travel to Japan is excluded from the final model due to lack of significance and therefore excluded from all prior results. However, in an attempt to gauge the impact of the policy a second version of the model was run including visa exempt policy as a dummy variable. The results of this model estimated using the Fixed Effects method are shown below next to the results shown earlier for the base model used throughout the rest of the paper:

Table 5.5.1: Model Results with Visa Exempt Dummy Included

Model:	Without Visaexempt	With Visaexempt
ln(income)	2.485*** (4.23)	2.383*** (4.04)
ln(price)	-0.373** (-2.25)	-0.377** (-2.29)
ln(touristratio_lag)	0.816*** (15.03)	0.785*** (13.34)
ln(price_lag)	0.284* (1.72)	0.276* (1.68)
ln(income_lag)	-1.927*** (-3.49)	-1.831*** (-3.30)
taxfree	0.147** (2.53)	0.147** (2.54)
fukushima	-0.453*** (-9.20)	-0.443*** (-8.93)
visaexempt	NA	0.0918 (1.38)
_cons	-6.430*** (-6.08)	-6.578*** (-6.15)
R <sup>2</sup> -Overall	0.9708	0.9881

\*\*\*, \*\*, \* indicate statistical significance at 1%, 5%, and 10% level respectively

The p-value for visa exempt in this model is 0.171 failing to achieve even a minimal 10% level of significance. However, we can temporarily assume it is significant and use this version of the model to forecast how many tourists would have visited Japan from Malaysia, Thailand, and Indonesia if Japan had not opened them up to visa exempt travel to get a rough sense of possible impact from the policy. While this may not be as reliable as the estimates above for tax-free shopping and Fukushima it is still perhaps useful as an upper-bound estimate of the impact. Table 5.5.2 shows the results of this for these three countries for the three-year period 2013 through 2015 shows actual tourist arrivals, predicted tourist arrivals by the model and predicted tourist arrivals without visa exemption and the predicted gain from visa exemption.

Table 5.5.2: Estimated Impact of Visa-Exempt Travel, 2013-2015

<b>Origin Country</b>	<b>Actual Tourists</b>	<b>Predicted Tourists with Visa Exempt</b>	<b>Predicted Tourists without Visa Exempt</b>	<b>Predicted Gain from Visa Exempt</b>
Indonesia	1,123,154	1,349,220	1,307,225	41,995
Malaysia	1,590,014	1,807,826	1,732,599	75,227
Thailand	3,416,142	2,908,698	2,771,341	137,357
<b>Total</b>	<b>6,129,310</b>	<b>6,065,744</b>	<b>5,811,165</b>	<b>254,579</b>

From this it appears that the adoption of the visa exempt policy had at most a modest impact on tourist arrivals from the three countries amounting to an additional 254,579 tourist arrivals over the three year period representing an increase of 4.4% over the total predicted without the adoption of the policy. Figure 5.5.1 shows plots of actual tourist arrivals and predicted tourists with and without visa exempt policy for each of the three countries from 2003 through 2015. The green line shows the model's prediction

with visa exempt policy and the red line shows tourists arrivals predicted without visa exempt policy with the two lines diverging in the year the policy was adopted for each country.

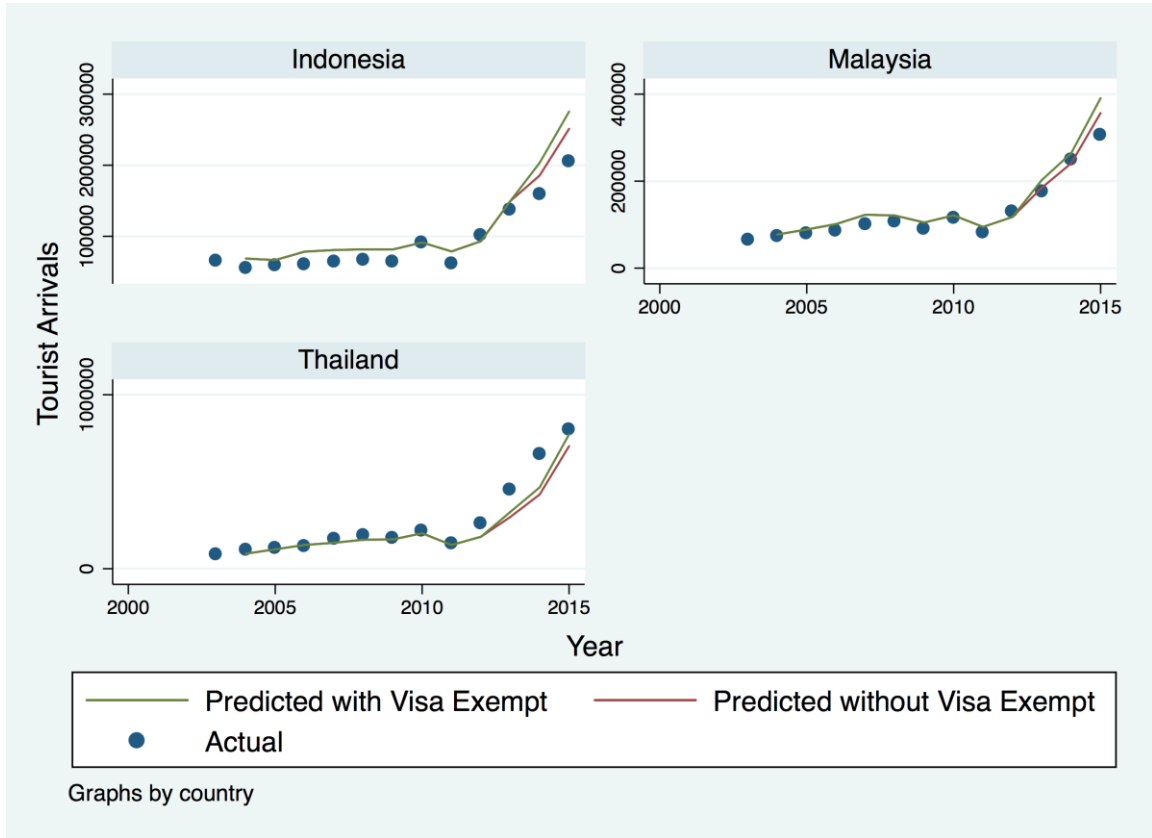


Figure 5.5.1: Tourist Arrivals with and without Visa Exempt Policy

## 5.6. Lack of Impact of Protests of Japan

The dummy variable representing the occurrence of major protests against Japan was excluded from the final model. Model 5 in table A.1 in the appendix shows the regression output for a version of the model including protests and visa exemption. As can be seen in table A.1, neither meets even the 10% level of significance. In both cases this is likely due to small sample size. Of the 11 countries included in the study only Thailand, Malaysia, and Indonesia saw changes to their visa exemption status during the

years included in the study and all three cases occurred relatively late with few observations to follow. As for major protests, the data included only three instances of major protests spread across only two countries. In addition to the extremely small sample size the protest dummy variable differed from the others evaluated in that the criteria for what constitutes a major protest is ambiguous. It is possible the variable was not consistent enough to capture any real effect.



## Chapter 6: Conclusion

### 6.1 Discussion of Findings

The purpose of this research is to identify and measure the impact of the main determinants of international tourist arrivals to Japan from Asian countries. A model was constructed to assess the significant economic and policy drivers on tourist arrivals from eleven Asian countries between 2003 and 2015. Panel data analysis using a Fixed Effects model was used to estimate the coefficients of the model.

The model found the expected result that tourism demand is a function of income and price with outgoing tourism increasing with income and incoming tourism decreasing with price. For Japan the income elasticity of demand was found to be 3.041 and the price elasticity of demand was found to be -0.486 implying that tourism to Japan is considered a luxury good for other Asian countries and that tourists to Japan are relatively price inelastic.

Dummy variables representing the occurrence of the Fukushima Nuclear disaster in 2011 and the implementation of tax-free shopping were included in the model and both were found to have a large impact on tourist arrivals. This paper estimates the Fukushima disaster caused a reduction of 2.7M fewer international arrivals to Japan in 2011 from the 11 Asian countries included in the study representing a 36% drop relative to the 7.6M visitors predicted if the disaster had not occurred. This paper estimates the implementation of tax-free shopping policy caused a surge of 2.1M additional tourists in

2015 from the 11 Asian countries included in the study representing a 16% increase relative to the 13.3M visitors predicted if the policy had not been implemented.

On the other hand, dummy variables representing the adoption of visa exempt travel policy and major protests against Japan were found to be statistically insignificant and were excluded from the model. In both cases this is likely due to small sample size as only three countries saw changes to their visa exemption status and only two hosted major protests of Japan during the years included in the study. Similarly, variables account for elderly population and youth population shows no significance and were also excluded from the model.

## 6.2 Policy Implications

These results suggest that government policy can have a positive impact on tourist arrivals and that Japan is right to take action to make it more attractive as a tourist destination. Travel to Japan appears to be considered as a luxury good and so policies targeted at wealthy tourists can have outsize effect. The implementation of tax-free shopping specifically had a major impact on arrivals and likely an even larger effect on revenue as it is more likely to attract tourists inclined to spend more money.

On the other hand, the model saw little benefit for expanding visa exemption to new countries even as anecdotal evidence suggests they have had some effect. To the extent that changes like this are easy or cost-saving in nature Japan should by all means proceed as they are unlikely to negatively impact tourism. However, it is difficult to recommend significant investment given the results of the model and so Japan should proceed tentatively. One exception to this would be the case of China which is already the largest source of visitors to Japan despite needing a visa to visit and the relatively low

ratio of its total citizenry who visit. It would be interesting to see the impact on tourism from China if Japan were to add to the visa exempt list.

The other area where Japan can influence tourism indirectly through policy is terms of avoiding recurrence of incidents such as the Fukushima Nuclear disaster which had a massive negative impact on international arrivals. Even in this case, though, the rebound was swift as visitors likely assume it was a fluke incident. Still the occurrence of a similar incident could lead to the perception of a pattern and so should be avoided.

Finally, as a luxury good that is relatively price inelastic, the government should not be so concerned about price or currency exchange as a major driver of tourism growth. The focus should instead be on delivering an excellent, high quality experience to visitors. Japan is thus likely served well by the policies discussed earlier regarding increased accessibility and improving the experience for Muslim visitors. Similarly, hosting a highly publicized event like the 2020 Olympics makes sense to the extent that it enhances Japan's brand as a marquee travel destination.

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## APPENDIX

### Model Refinement

Table A.1 shows the estimated coefficients, overall R-squared, and F values various iterations of the model using fixed effect panel data regressions starting from the most basic model (1) without dummy variables represented above in equation 4.2.1. The next iteration of the model (2) adds a lagged variable for price. Subsequent iterations of the model (3 and 4) adds dummy variables representing the occurrence of the Fukushima Daishi nuclear disaster in 2011 and implementation of tax free shopping policies. The next iteration of the model (5) adds a dummy variables representing visa exemption policies and large scale protests of Japan that occurred in various countries during the time period studied. This model (5) was discarded due to lack of statistical significance in the estimation for the coefficients of both dummy variables. It is, nonetheless, still shown as this finding of insignificance of the protests in terms of tourism is still relevant to the research purpose. Although not shown for space considerations, it was also verified that both of these dummy variables also lack significance when added to the model separately.

Model 5 is the model described in equation (2) in section 4.1. However as visaexempt and protest show no significance they will be excluded from the model moving forward. Model (4) is therefore the model determined to be the best fit as it maintains significance of all included variables and has the highest overall R-squared of all candidate models.

Table A.1: Estimation Results for Panel Data Fixed Effects Model

		Q <sub>it</sub> /POP <sub>it</sub>		ln(touristratio)		
Name	Variable	1	2	3	4	5
		Estimated value of coefficient (t-values shown in parenthesis)				
ln(touristratio_lag)	Q <sub>it-1</sub> /POP <sub>it-1</sub>	0.747*** (11.44)	0.779*** (11.78)	0.810*** (11.98)	0.816*** (15.03)	0.785*** (13.25)
ln(income)	Y <sub>it</sub>	0.164 (1.32)	0.184 (1.50)	1.590** (2.05)	2.485*** (4.23)	2.384*** (4.03)
ln(price)	P <sub>it</sub>	-0.829*** (-5.42)	-1.085*** (-5.60)	-0.937*** (-4.50)	-0.373** (-2.25)	-0.379** (-2.27)
ln(income_lag)	Y <sub>it-1</sub>			-1.349* (-1.83)	-1.927*** (-3.49)	-1.833*** (-3.29)
ln(price_lag)	P <sub>it-1</sub>		0.442** (2.11)	0.308 (1.40)	0.284* (1.72)	0.275* (1.66)
taxfree	taxfree <sub>it</sub>				0.147** (2.53)	0.147** (2.52)
fukushima	fukushima <sub>it</sub>				-0.453*** (-9.20)	-0.442*** (-8.84)
visaexempt	visaexempt <sub>it</sub>					0.0914 (1.37)
protest	protest <sub>it</sub>					0.00858 (0.09)
_cons		-3.223** (-2.35)	-3.177** (-2.35)	-3.619*** (-2.66)	-6.430*** (-6.08)	-6.584*** (-6.14)
Overall R <sup>2</sup>		0.585	0.6792	0.6980	0.9708	0.9657
Observations		132				
Countries		11				
***, **, * indicate statistical significance at 1%, 5%, and 10% level respectively						