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Heterogenous Effects of Visa Exemption Policy on International Tourist Arrivals: Evidence from Indonesia*

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Abstract
We examined the potential heterogeneous impact of implementing a series of visa-exemption policies on foreign tourist arrivals in Indonesia by exploiting a rich dataset of monthly series of foreign tourist arrivals, by country and by port of entry between January 2014 and December 2018. This is the first study in providing empirical evidence of the heterogenous impact of a country's visa-exemption policy across tourist's origins and within-country destinations. Using a panel data approach, our estimates showed that while the policy increased monthly foreign tourist arrivals by 5% on average, the effect was evident for non-traditional destinations only. The policy also potentially provided a diversion effect between destinations, such that created an adverse effect on the traditional destinations of Indonesia. Our estimates also suggest a heterogenous impact at the continent level, and an 8% higher impact per year after the policy's introduction, which was relatively lower than has been found in other studies. The findings imply that the visa-exemption policy is not a one-size-fits-all policy in attracting international tourist arrivals.

JEL Classification: L83; Z32; Z38

Keywords
visa exemption — foreign tourist arrivals — Indonesia — panel

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1. Introduction

Tourism is one of the fastest growing sectors in the world and expected to invigorate economic growth (Vita & Kyaw, 2016) through trade, investment, income, taxes, and employment (Banerjee et al., 2016; Santana-Gallego et al., 2011; Su & Lin, 2014; Tang, 2012). In 2018, the World Tourism Organization recorded that the number of international tourist arrivals worldwide reached 1.4 billion. Global international tourist arrivals in 2018 rose by 6% (UNWTO, 2019a) and generated $1.7 trillion (USD) in export revenue (UNWTO, 2019b). Due to its revenue-generating potentials, many countries put pro-growth regulation at the heart of their tourism development agenda in order to boost national economic development on the back of the tourism sector (Kim et al., 2018; Pham et al., 2017; Shafiullah et al., 2019). Despite concerns about security, national sovereignty (Czaika & Neumayer, 2017), and the potential threat of wider inequality (Alam & Paramati, 2016; Mahadevan et al., 2017), countries continue to compete to attract more international tourists through various policy packages, including the visa-exemption or visa-simplicity policy.

Visa application is associated with additional monetary and non-monetary costs for potential tourists' travel decisions. Exempting the visa application reduces travel costs, likely stimulating potential tourist visits and possibly diverting them from other destinations. Recent literature has documented the positive impacts of the visa-exemption policy on international tourist arrivals. At the international level, the policy has potentially increased international tourist arrivals by 5% to 25%, depending on the package provided and the market targeted (UNWTO, 2014). The effect is likely to be asymmetric; the positive effect of visa exemption on tourist arrivals is potentially smaller in magnitude than the adverse effect of visa restriction (Czaika & Neumayer, 2017). At the national level, empirical evidence also supports a favourable effect for Japan (Goto & Akai, 2017; Kim & Lee, 2017), Turkey (Balli et al., 2013), and the United States (Reilly & Tekleselassie, 2017); however, the exemption policy also costs the economy, aside from forgone revenue, in the form of the problem of visa overstays (Goto & Akai, 2017; Neumayer, 2006).

Despite its importance in promoting international tourist arrivals, very little is known about the extent to which the visa-exemption policy provides heterogenous effects on the country of origin or within-country destinations. Meanwhile, recent empirical evidence suggested that determinants of international tourist arrivals may vary across destinations, such as in Australia (Shafiullah et al., 2019). Hence, understanding different policy effects may help policy makers avoid the promotion of one-size-fits-all policy recommendations. The government can increase the demand more

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efficiently by minimizing the amount of potential revenue that is foregone.

In this paper, we have examined the extent to which the visa-exemption policy exerted a heterogenous effect on foreign tourist arrivals. We used Indonesia, a developing country, which introduced extensive visa-exemption policy in the last five years to boost international tourist demand. The Government of Indonesia (GoI) set a visa-exemption policy for visits of less than 30 days that cannot be extended. The policy started in June 2015 for tourists from 30 countries. Through a series of follow-up decrees, tourists from at least 169 countries have been exempted from the visa requirements, and this policy has remained valid up to the date of this writing. The exposure of the policy varied according to time, port of entry, and country of origin, which provided us with a setting in which to measure the heterogeneous causal impact of the policy on tourist arrivals across countries of origin and within-country destinations. To estimate the average effect, our dependent variable was monthly foreign tourist arrivals by nationality and port of entry, as a function of visa policy and other control variables. We used a fixed-effect panel data model to reduce potential biases caused by unobserved heterogeneity across origins and destinations. While visa-exemption policy increased the international tourist arrivals on average, we found that the effect was higher for non-traditional destinations and for tourists from developed countries. In addition, the average effect was higher during the peak season period and when responses were counted from a period extending over a year.

Our study fills the gap in this area of research with regard to three areas. First, we provided empirical evidence that the effect of visa exemption was spatially heterogeneous across destinations within a country. We found that the within-country effect was heterogeneous across destinations and likely to increase tourist arrivals in less popular destinations. We argue that the policy may increase attractiveness for non-traditional destinations by opening alternative travel packages. In contrast, the visa-exemption policy was not an important factor for attractiveness of traditional destinations. Aside from the saturated demand argument, perhaps more stimulus packages are needed to promote higher tourist demand in traditional destinations. Recent empirical evidence further showed that the visa-exemption policy provided diversion effect at international level (Czaika & Neumayer, 2017; Silva et al., 2017). We enriched the existing literature by showing that the diversion effect of visa-exemption policy was found for within-country destinations. Second, to the best of our knowledge, this study was the first study to provide estimates of the effect of the visa-exemption policy in Indonesia and government interest for visa policy evaluation. While the policy began gradually, starting in 2003, we found no studies quantifying the visa-exemption policy. Recent studies have only focused on the impact of the tourism sector on macroeconomic variables (Lumaksono et al., 2012; Mahadevan et al., 2017; Sugiyarto et al., 2003). Our study should be of international interest also, as Indonesia, similarly to other countries, promotes its tourism sector through various packages, including the visa-exemption policy. The effect of the policy was small, however, as the cost of applying for the visa might be small relative to the tourists' average travel expenditure. Nevertheless, our results potentially provide a quantitative measurement of the effectiveness of the visa-exemption programme, among others. Last, our study examined the effect of visa-exemption policy from the immediate one-month time frame to responses over a year from the implementation of policy.

This paper is organised as follows: Section 1 contains a review of the context of the visa-exemption programme in Indonesia. Section 2 briefly presents the model specifications and data sources used in this work. Section 3 provides the estimation results. Section 4 describes the analysis. Section 5 delivers the conclusions and suggestions for further research.

2. Institutional background: A visa-exemption policy in Indonesia

Indonesia's tourism plays an important role in increasing its national economic development. The travel and tourism sector contributed 6% to Indonesia's gross domestic product, equalling $62.6 billion (USD) in 2018. This value was almost double compared to only $38 million (USD) in 2008 (World Data Atlas, 2018; World Travel and Tourism Council, 2019). The travel and tourism sector also created 10% of the total employment, equal to 13 million employment opportunities in 2018 (World Travel and Tourism Council, 2019).

To further accelerate the contribution, the GoI responded with the issuance of a visa-exemption policy for partnering countries. The aim of this regulation was to increase the number of foreign tourist arrivals traveling to Indonesia through selected entry airports and seaports. We were interested in Indonesia because the country issued multiple visa-exemption policies in a relatively short period (i.e., 7 main regulations within 13 years).

Figure 1 summarises the status of the Indonesian visa-exemption policy since 2003. The policy started in 1983 with Presidential Decree No. 15/1983, which created a visa-free policy that applied to short visits from 48 countries. This decree became invalid with the issuance of Presidential Decree No. 18/2003 on March 31, 2003. This policy granted a visa-exemption to visitors from 11 countries, including Thailand, Malaysia, Singapore, Brunei Darussalam, Philippines, the Hong Kong Special Administration Region, the Macao Special Administration Region, Chile, Morocco, Turkey, and Peru, via all immigration checkpoints. This short-visit visa-free policy was restricted to 30-day visits only and could not be renewed or converted into any other immigration clearance.

The GoI modified its exemption policy through Presidential Decree No. 103/2003 on December 17, 2003, as a revision of Presidential Decree No. 18/2003. This decree excluded Turkey and added Vietnam. The decree also stated that visitor's visa could be renewed in special cases, such as natural disaster, accident, or illness, with ministerial approval. The second and third changes were implemented by the issuance of Presidential Regulation No. 16/2008 and 43/2011. The former change added Ecuador and the latter added Cambodia, Laos, and Myanmar for visa-free status. The GoI widely expanded the exemption policy through a series of regulations in 2015–2016. On June 9, 2015, it issued Presidential Regulation No. 69/2015. This regula-

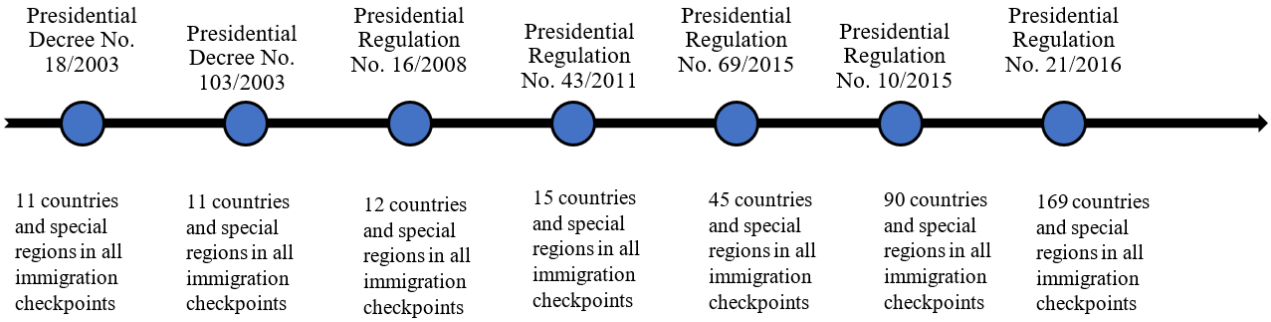

Figure 1. Timeline of Indonesian visa-exemption policy

tion added 30 countries to the visa-free list for immigration checkpoints via airports (i.e., Soekarno Hatta, Tangerang; Ngurah Rai, Bali; Kualanamu, Medan; Juanda, Surabaya; and Hang Nadim, Batam) and seaports (i.e., Sri Bintan, Sekupang and Batam Center, Tanjung Uban).

Figure 2 further illustrates spatial distribution of the port of entries for tourist arrivals in Indonesia. This regulation officially annulled the previous regulation (Presidential Regulation No. 43/2011), but the countries that had already been granted special status by previous regulation were still guaranteed visa-free entry at all immigration checkpoints. Thus, the total number of countries granted visa-free status into Indonesia became 45.

The GoI included more countries and authorised checkpoints through the issuance of Presidential Regulation No. 104/2015 on September 18, 2015. This regulation added another 45 countries (bringing the total to 90 countries). Along with the additional countries, Minister of Law Decree No. 31/2015 regulated nine additional immigration checkpoints, mainly seaports.

Most recently, Presidential Regulation No. 21/2016 on March 2, 2016 was issued to grant visa exemptions to 169 countries in toto; it is noteworthy that 63 of these countries have waived their own visa requirement for Indonesian travellers. The number of immigration checkpoints was also increased significantly, including not only seaports and airports, but also cross-border posts. These additional checkpoints were regulated by the Minister of Law Decree No. 17/2016, which has remained valid since April 20, 2016.

3. Methodology

3.1 Estimation strategy

We were interested in examining the average effect of visa-exemption on international tourist arrivals in Indonesia. Our empirical estimation was:

$$\ln(y_{ipt}+1) = \alpha_{ip} + \beta D_{ipt-1} + X'\gamma + \theta_{m:y} + \delta_i D_i t + \delta_p D_p t + e_{ipt} \quad (1)$$

The dependent variable was y_{ipt}, the number of international tourist arrivals from country i entering port p in month t. This more detailed data gave us an advantage over other studies. Most studies on the determinants of international tourist flow used either the total number of arrivals to a country over a period of time (Zhang & Jensen, 2007) or a pooled number of annual origin-to-destination arrivals (Eilat & Einav, 2004; Gil-Pareja et al., 2008; Neumayer, 2010) as their dependent variable. In our study, the variable was added to by one to avoid reducing observations, as zero tourist arrivals were recorded in some observations.

D_{ipt-1} was a variable of interest that captured policy changes in visa exemption. The value was 1 if the tourists from country i, entering port p in month $t-1$, were granted a visa exemption and zero otherwise. The first lag of dummy policy was used to ensure that the policy had started prior to month t and had been fully implemented. The variable varied between countries and ports of entry, as not all countries and ports were granted visa exemptions. As the dependent variable was expressed in natural logarithm, the effect was then represented as percentage change by $100(e^{\beta}-1)$ (Wooldridge, 2012).

The visa-exemption policy was effective in inviting more international tourist arrivals if $\beta > 0$ and was statistically different from zero. The policy reduced travel costs for potential tourists to Indonesia, in terms of both money and time. Lower travel costs were associated with the lower generalized cost of tourism demand, inducing higher international tourist inflow. Nevertheless, we suspected that the estimate was small in magnitude, as the cost of a visa was relatively low compared to the average spending of foreign tourists in Indonesia. The cost of a tourist visa was about 450 thousand rupiahs, equivalent to 33.3 US dollars (1 USD = 13,500 rupiahs) or 3% of the average spending of a foreign tourist ($1,103 US dollars) in 2016 (Statistics of Indonesia, 2018).

Our X' represented a vector of control variables. In general, we followed the body of literature to include macroeconomic shocks (Eilat & Einav, 2004; Kim & Lee, 2017; Prideaux, 2005; Tang, 2012; Vita & Kyaw, 2013), attractiveness variables (Balli et al., 2013; Ji et al., 2015; Su & Lin, 2014), and any other relevant factors. We included a real effective exchange rate (REER) to serve as a price variable, expressed as $t-1$. It was necessary to incorporate the variable into the model in order to control the effect of the price difference between two countries because foreign tourists tend to take the relative price of goods and services in tourism destination areas into account. A higher REER indicated the lower purchasing power of a foreign currency to buy goods and services in Indonesia. We expected that the rate was negatively associated with the number of tourist arrivals. The number of holidays per respective month controlled the driving factor of tourist arrivals. The list included the international jet fuel price in month $t-4$ in order to

Figure 2. Spatial distribution of point of entry for international tourists in Indonesia
Note: Government of Indonesia (2016)

capture the price of an air ticket, assuming that the airline companies set their air ticket price by considering their hedged jet fuel price. Our control also included the number of days per month. All continuous variables, except for the number of holidays, were regressed in log natural form.

A series of dummy variables were also incorporated to control the effects of other events on tourist arrivals. In 2014, a legislative and presidential election dummy was introduced, as countries tended to send travel warnings during this period. We included Eid al-Fitr and the month after Eid al-Fitr, which followed the lunar calendar year, as some Islamic countries may have had longer holidays during these months. We included controls for the annual Sail Indonesia programme, the Asia-Africa Conference in April 2015 at Bandung, and the annual Djakarta Warehouse Project in December. A natural disasters dummy variable was also added to control for the closure of international ports near the disasters for security reasons. Detailed explanations of each variable are presented in the Appendix.

We included month-of-year dummies, $\theta_{m:y}$, to control monthly seasonality. As each country's monthly variable and population size variable were unavailable, we included a linear time trend, $D_i t$, which varies across countries to reduce the estimation bias from omitting both variables. Similarly, we included a linear trend for each port, $D_p t$, to control for possible changes in regional attractiveness or local government policies and their effect on its tourism sector.

We used a fixed-effects panel data approach to estimate Equation 1. As the data varied across countries, ports, and months, we used three-dimensional panel data. We generated a country-port variable as a cross-section identifier, creating 855 identifiers, and let month serve as a time-series identifier. This approach was appropriate for reducing the endogeneity caused by an unobserved heterogeneity variable, and was likely to provide more unbiased results. Our Hausman test further confirmed our strategy, as it rejected null hypotheses of using random-effects panel at 5% significance level.

It is possible that our dataset suffered from a non-stationarity problem. We performed augmented Dickey-Fuller unit root tests on the dependent variable. Initially, to simplify the tests, the dependent variable was aggregated to obtain monthly total tourist arrivals. We found weak evidence of unit root behaviour. We performed the tests at a more disaggregated level at the country and port-of-entry levels. The results were relatively similar, with the data being stationary in most cases. Hence, we ran Equation 1 at level.

β in Equation 1 measured the average effect of visa exemption on international tourist arrivals. One might argue that the impact could vary by country of origin. Some countries are likely to be more sensitive towards visa price than other countries. To accommodate the origin-variation of the impact, we ran Equation 1 into different subsamples, namely Asian, European, and Australian and American countries. The latest was combined as one group due to data availability.

Using similar subsample specifications, we also estimated the average regional effect of the visa-exemption policy, based on the hypothesis that the effect can be heterogenous across destinations. Additional ports of entry may stimulate more direct international flights than others; 19 ports were thus divided into four destination groups, namely Java, Bali, Sumatera, and all other destinations.

While β of Equation 1 captured the immediate impact of the visa-exemption policy, we argue that the visa-exemption impact is more persistent in the longer term. To capture this impact, we followed Burke et al. (2017) by estimating:

$$\ln(y_{ipt}+1) = \alpha_{ip} + \sum_{l=1}^{L} \beta_l D_{ipt-l} + \mathbf{X}'\gamma + \theta_{m:y} + \delta_i D_i t + \delta_p D_p t + e_{ipt} \quad (2)$$

$\sum_{l=0}^{L} \beta_l$ of Equation 2 captured an estimate of the average L-month visa impact on tourist arrivals. Our dataset allowed us to test the impact up to a year after the policy took effect. The estimate was expected to be higher than β of Equation 1 because the policy needed time to be fully socialized, and international tourists may have been slow in adjusting their travel plans. The full-year effect was then comparable with other similar studies that used an annual dataset.

3.2 Source of data

We built the estimation model based on a dataset of multiple sources. The dependent variable used monthly series data from 2014 to 2018 for the number of foreign tourist arrivals from the 44 origin countries and by 19 ports of entry, made available by the Statistics of Indonesia (2019). The statistics pooled tourist arrivals from other countries into "other" category, and we dropped it from our analysis.

To construct the visa-exemption policy dummy variable, we collected information from seven government regula-

tions related to the visa-exemption policy that were applicable over the period of 2014–2018. The regulations covered information by which countries were granted the visa exemption, which ports of entry were eligible for the application, and when the regulation effectively started. Since the visa-exemption policy was amended by the Indonesian Ministry of Law and Human Rights several times during the period from 2003–2016, we treated the policy sequence that resulted from these amendments as an exogenous variation in our main variable interest.

The real effective exchange rate (REER) was constructed from data by the International Monetary Fund. We measured such variables in foreign currency per Indonesian rupiah and evaluated by the respective consumer price index. The REER was then calculated with $REER_{it} = ER_{it} * \frac{CPI_{ind,t}}{CPI_{it}}$, where ER_{it} was the nominal exchange rate (foreign currency per rupiah) of country i and time t. $CPI_{ind,t}$ and $CPI_{i,t}$ represented the consumer price indexes of Indonesia and country i at time t, respectively. Unavailable numbers were replaced by United States numbers. An increase in $REER_{it}$ represented an appreciation of the Indonesian rupiah.

Since we were not able to obtain detailed data about the flight ticket prices, we substituted the price with international jet fuel prices, per gallon in USD (International Monetary Fund, 2019). We argue that the changes in jet fuel price would reflect the changes in average flight ticket prices as well.

The number of holidays in origin countries (including Sundays) per respective month and number of days per month were drawn from the Country National Calendar of https://www.timeanddate.com/. We also created a dummy variable to control the effect of the peak season of international traveling activities based on the maximum number of holidays per respective month. We set the dummy variable at a value of 1 for July, August, and December and zero otherwise. For the case of Indonesia, we inserted a dummy variable of the annual Islamic holiday season (i.e., Eid al-Fitr).

Other dummy variables were constructed based on events that were assumed to affect tourist arrivals. The Indonesian Ministry of Transportation's official website provided data about natural disaster events that related to airport closures. Legislative and Presidential Elections dummy variables were 1 for April 2014 and July 2014 and zero otherwise. Dummy variables capturing Sail Indonesia, the Asia-Africa Conference, and Djakarta Warehouse Project were based on the Indonesian Ministry of Tourism's official website.

3.3 A glance at tourist arrivals in Indonesia

To gain some insight into the relationship between tourist arrivals and the visa policy, Figure 3 shows the trend of foreign inbound tourists to Indonesia on a monthly basis from January 2014 to December 2018. The tourists were divided into two groups. The first group represented those who entered from the five major ports, accounting for about 90% of the total arrivals. These included Soekarno-Hatta International Airport (Jakarta), Juanda International Airport (Surabaya), Kualanamu International Airport (Medan), Ngurah Rai International Airport (Bali), and Batam Port (Batam). The second group was comprised of those who entered through the other 14 ports.

The average annual growth of foreign tourist arrivals in the five major ports and other ports during 2014–2018 were 7% and 5%, respectively. By the location of major ports, the average annual growth of tourist arrivals from the highest to the lowest were Bali (11.9%), Batam (5.8%), Surabaya (4.8%), Jakarta (2.9%), and Medan (0.2%). Additionally, 52% of total foreign tourists enter Indonesia by traveling directly to Bali. Compared to other major ports, this number was double the number of foreign tourists traveling to Jakarta (26%) and three times greater than those going to Batam (17%).

Tourist arrivals were seasonal. June–July and December are peak season periods due to the summer break and year-end holidays; however, the trends between these two groups differed from each other. From January 2014 to September 2015, there was a positive trend for tourist arrivals in the five major ports, mainly driven by an increasing trend of arrivals via Ngurah-Rai International Airport, Bali. Meanwhile, a positive trend was evident in arrivals via other ports after the visa-exemption policy.

We also found some drops in tourist arrivals during certain periods. Some unexpected events may have influenced the expected outcome of the visa-exemption policy. For example, volcanoes erupted in East Java and Bali, in July 2015 and November 2017, respectively. This led to a temporary deactivation of Juanda International Airport and Ngurah Rai International Airport, which in turn, affected connecting flights both from and to these airports.

Figure 4 further disaggregates tourist arrivals by region of origin. The visitors were dominated by tourists from the Association of Southeast Asian Nations (ASEAN) and other Asian countries between 2014 and 2016. Both regions contributed 38% and 32% of the total foreign tourist arrivals, respectively. The rest was almost equally shared by European countries (15%) and other regions (14%). There was a spike in tourist arrivals from the ASEAN at the end of the year between 2014 and 2016, most likely caused by the higher number of holidays available during the month of December.

Nevertheless, neither of these two figures provided clear indicative evidence of the effects of the visa-exemption policy. We only found that tourist arrivals entering other ports as shown in Figure 3 experienced an increasing trend since the fourth quarter of 2015, after the visa-exemption policy had been implemented. The causal impact of the policy is presented in the estimation results below.

4. Impact of the visa-exemption policy

We started our analysis with the average impact of the visa-exemption policy by regressing Equation 1. The analysis was then followed by estimating the n-month effect of Equation 2 and the effects across origins and destinations of Equation 3.

4.1 Base results

Table 1 reports the estimates for Equation 1. We performed a stepwise regression in Columns 1 to 4, as a simple robustness check, by adding more control variables in subsequent columns. We selected the controls based on the recent literature of the determinants of tourist arrivals. In Column 5 the

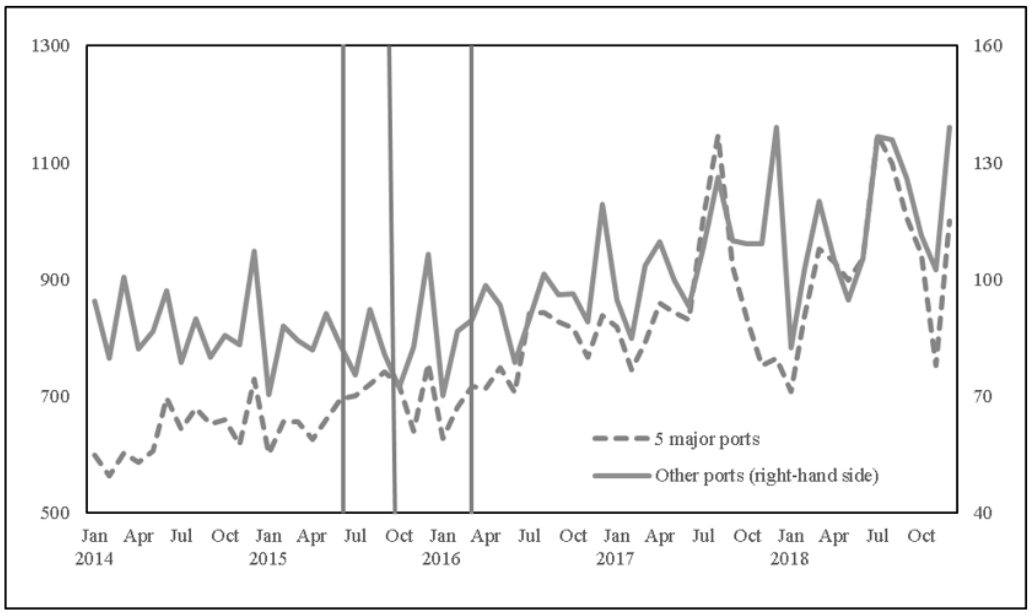

Figure 3. Indonesia's monthly foreign tourist arrivals, 2014–2018

Note: The y-axis represents monthly international tourist arrivals, measured in thousands of visits. Vertical lines indicate when the series of visa-exemption policies were introduced. Source: Statistics of Indonesia (2019).

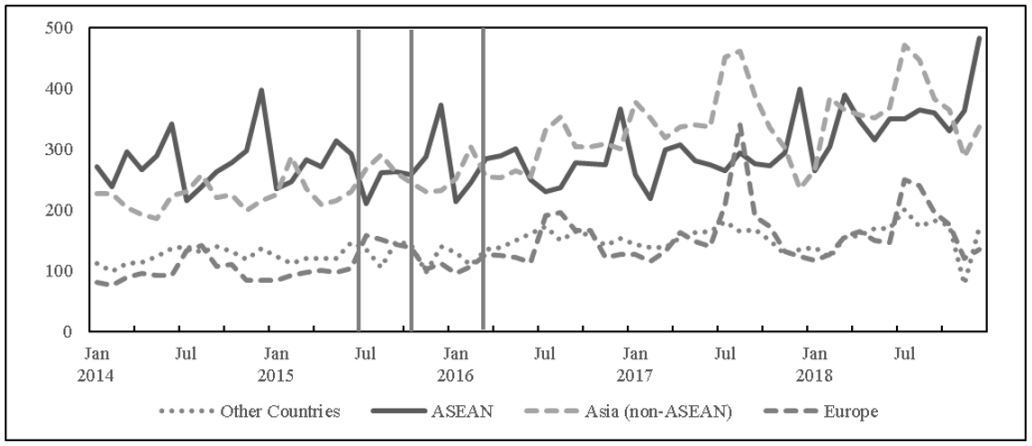

Figure 4. Monthly tourist arrivals by origin, 2014–2018 (in thousands)

Note: The y-axis represents monthly international tourist arrivals, measured in thousands per visit. Vertical lines indicate when the series of visa-exemption policies were introduced. Source: Statistics of Indonesia (2019).

policy variable were interacted with the peak-season dummy variable to estimate whether the effect varied between peak and off-peak seasons. All specifications included all sets of event-related dummy variables, controls for monthly seasonality, and time trend.

Our estimates suggest that the visa-exemption policy contributed to the increase in international tourist arrivals by 7.0%; however, the estimates were reduced to 5.1% under full control-variable specifications, being statistically different from zero at a 1% significance level. This is our preferred estimate. The last column further suggests that the effect was magnified during the peak season, reaching 10.6%. Our estimates were much lower than any other empirical evidence that had reported a double-digit impact (e.g., see Czaika & Neumayer, 2017). Nevertheless, our result is justified, as we used monthly data, which is more representative of the immediate impact of the visa-exemption policies.

We have provided a discussion on some of the control variables. The number of holidays for each tourist's country of origin had a positive association on the number of tourist arrivals, statistically significant at a 1% level. One extra day of holiday in the respective month of the tourists' country of origin was associated with a 0.7% increase in the number of foreign tourist arrivals. Estimates also showed that the appreciation of foreign REER, as a proxy of relative price, had a positive association with tourist arrivals at 10% significance level, contrary to our hypothesis. The results were in contrast to the study of Pham et al. (2017) in a developed country case, Australia. They used price index instead of REER to show the sensitivity of Chinese tourists toward price changes in the destination country, Australia. The study showed that the demand of the Chinese for tourism to Australia was affected by price changes. We argue that depreciation in local exchange rates also partly represented local political instability (Bouraoui & Hammami, 2017), and that unstable political conditions in a country likely have an adverse effect on arrivals (Issa & Altinay, 2006). Unfortu-

Table 1. Effect of Visa-exemption Policy on Foreign Tourist Arrivals, base results

	(1)	(2)	(3)	(4)	(5)
$Visa_{(t-1)}$	0.068***	0.058***	0.058***	0.050***	0.028*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$Visa_{(t-1)}$*peak season					0.073***
					(0.010)
Ln $REER_{(t-1)}$		0.188*	0.193**	0.172*	0.173*
		(0.098)	(0.098)	(0.100)	(0.100)
Holiday			0.007***	0.008***	0.007***
			(0.003)	(0.003)	(0.003)
Ln jet fuel $price_{(t-4)}$				-0.019	-0.026
				(0.002)	(0.002)
Country-port fixed effects	Yes	Yes	Yes	Yes	Yes
	836	836	836	836	836
Month of year dummy	Yes	Yes	Yes	Yes	Yes
R^2 (within)	0.116	0.116	0.116	0.116	0.117
Observations	50160	50160	50160	50160	50160
Number of countries	44	44	44	44	44
Impact (%)	7.0***	6.0 ***	6.0 ***	5.1 ***	10.6 ***

Note: Robust standard error in parentheses. ***, **, * indicate statistical level of significance at 1%, 5%, and 10%, respectively. Other control variables are listed in the Appendix. The impact of visa-exemption policy is presented in the last row and calculated as percentage change by $100(e^{\beta}-1)$ where β is the parameter of estimate. The number in last column of the last row represents the impact during peak season.

nately, we could not include a political stability variable in this study, due to data unavailability. Thus, our estimate on exchange rates indicated that the adverse effect of political instability outweighed the benefit of lower relative prices from depreciation. Our estimate also indicated that tourist arrivals were less sensitive to jet fuel price, as the price elasticity was -0.02, statistically not different from zero. We also found that the 2014 presidential election, legislative election, and 2015 Asia-Africa conference reduced the international tourist arrivals. The same magnitude was also found for the variable Eid al-Fithr Islamic holiday, which also decreased arrivals. However, promotional events like the annual Sail Indonesia and Djakarta Warehouse Project provided limited effects; the estimates were statistically not different from zero.

4.2 Region-specific results

We estimated Equation 2 into subsamples based on origins to observe how the visa-exemption policy affected the number of tourist visitors from Europe, Asia, and America. Those visitors who originated from Asia were divided into two regions—Southeast Asia and other Asian countries. We focused on these areas, from which a majority of tourist arrivals originated, accounting for more than 80% of total tourist arrivals. In addition, the origins were also divided into two subsamples due to per capita income: developed and developing countries.

Table 2 reports the estimates for each origin. The estimates showed that visa exemption positively affected the number of foreign tourist arrivals at various magnitudes. All things being equal, the policy was likely to invite more international tourists from developed countries by 5.9%, statistically different from zero at 1%. The increase of international tourists was from Europe (7.3%). We also found that the policy was associated with higher tourist arrivals from other Asian countries by 5.8%. In contrast, the policy had limited impact on developing and Southeast Asian countries. As the visa cost is about 3% of the average spending of international tourists (Statistics of Indonesia, 2018), we argue that non-monetary cost may have played an important role in promoting tourist arrivals from developed countries. The visa-exemption policy also eliminated time cost associated with visa application that can be higher than the monetary cost. The magnitude was also possibly higher for those from developed countries with higher per capita income than those from developing countries.

The visa-exemption policy also provided a heterogeneous impact across destinations. Figure 5 presents the estimates on a destination basis. The destinations were divided into five regions, namely Java, Bali, Sumatera, Kalimantan, and other destinations (covering destinations from Sulawesi and Nusa Tenggara).

Our estimates showed that the effects of visa-exemption policy also varied across destinations and likely promoted non-traditional tourist destinations. The effect was highest for tourist arrivals to Sumatera, with an increase of about 12%, and statistically significant at 1%. Other destinations in the eastern part of Indonesia enjoyed about 5.8% of international tourist arrivals, statistically significant at 10%. In contrast, the policy had a limited effect on traditional tourist destinations like Bali. The policy even had negative effects for Java, although they were statistically insignificant. Our results shed light on the presence of a diversion effect at the national level, even though all destinations were granted the visa exemption. We enriched the existing literature that showed the presence of inter-country diversion effect at the international level (Czaika & Neumayer, 2017; Silva et al., 2017).

4.3 Long-run effect of visa-exemption policy

Table 3 presents our estimates for the long-run effect of the visa-exemption policy. Column 1 includes one lag of the exemption policy only, corresponding to Column 4 of Table 1. Subsequent columns add additional lags up to a year period.

The estimates suggest that the impact increased as the

Table 2. Effect of visa-exemption policy on number of foreign tourist arrivals by continent

	Developed	Developing	Europe	South East Asia	Other-Asia	America and Australia
$Visa_{(t-1)}$	0.0572***	0.0541	0.0705***	0.0289	0.0565***	0.0244
	(0.015)	(0.034)	(0.021)	(0.072)	(0.022)	(0.037)
Country-port fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
	551	285	285	152	304	228
Month of year dummy	Yes	Yes	Yes	Yes	Yes	Yes
R2 (within)	0.093	0.203	0.113	0.188	0.135	0.151
Observations	33060	17100	17100	9120	18240	13680
Number of Countries	29	15	15	8	16	12
Impact (%)	5.9***	5.5	7.3***	2.8	5.8***	2.4

Note: Robust standard error in parentheses. ***, **, * indicate statistical level of significance at 1%, 5%, and 10%, respectively. All estimates include the control variables introduced in Column (4) of Table 1. The impact of visa-exemption policy is presented in the last row and calculated as percentage change by $100(e^{\beta} - 1)$ where β is the parameter of estimate.

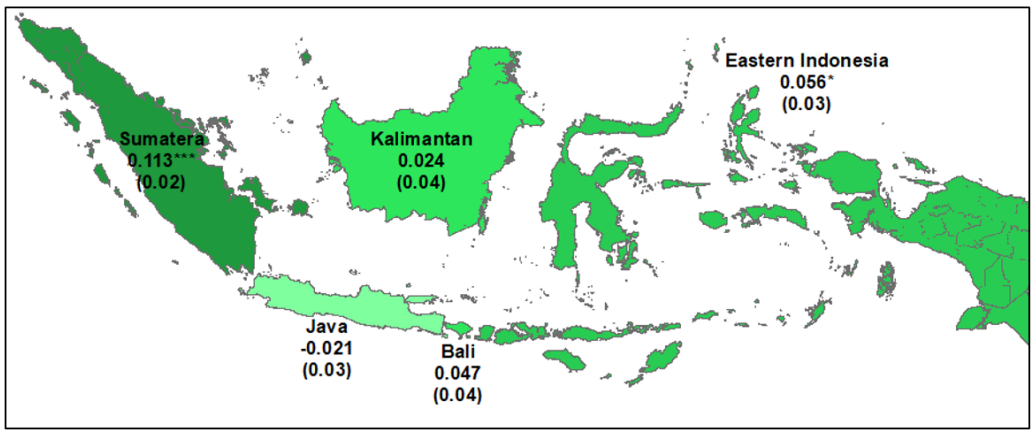

Figure 5. Effect of Visa-exemption Policy on Number of Foreign Tourist Arrivals by Destination

Note: Robust standard error in parentheses. ***, **, * indicate statistical level of significance at 1%, 5%, and 10%, respectively. Darker (lighter) shade implies a larger (smaller) point estimate of the effect of visa-exemption policy. All estimates include the control variables introduced in Column 4 of Table 1.

months passed, reaching about 5.1% after an initial revision in the visa policy. The amount of impact slightly increased up to 8% ten months after the policy was introduced and was statistically significant at 1%. An immediate increase in the estimate appeared within one month after the policy and was relatively constant for the rest of the months after the revised policy's introduction. This result also implies that foreign tourists needed time to adjust their travel plans when considering the policy.

5. Conclusions

There is wide literature to show that the results on the impact of visa policy on international tourist arrivals; however, limited research has examined the extent to which a country's visa-exemption policy attracted international tourists with regard to countries and destinations. This study contributed to the literature by showing that, despite various lines of empirical evidence of the positive impact of visa exemption on foreign tourist arrivals, the effect was heterogeneous across country of origin, tourist destination, and time frame. Using Indonesia's monthly tourist arrivals data, we found that a series of visa-exemption policy changes in 2015–2016 provided more benefits for non-traditional destinations as an alternative travel destination for international tourists. The policy also attracted more tourist arrivals from developed countries, particularly from European countries. The average effect initially had a relatively small effect—5% on average—but the effect reached 8–9% after a year, indicating a higher impact on arrival over an extended timespan. Along with the fixed-effect panel technique, we argue that the detailed monthly dataset provided more robust, and more unbiassed estimates.

The findings also imply that the visa-exemption policy is not a one-size-fits-all policy in attracting international tourist arrivals. Policy makers should be aware that visa exemption should be introduced to non-traditional destinations rather than to saturated traditional travel destinations. Similarly, the policy makers should target the exemption towards tourists from countries that are more sensitive towards the handling cost of visas in order to minimize potential revenue loss.

Our empirical evidence provided several policy implications for the GoI. Alternative forms of tourism promotion, aside from visa exemption, must be formulated if the GoI is to also target more tourists that are less sensitive to the exemption policy. The worse-off regions must be compensated by additional promotion in order to minimise the diversion effect. Finally, the policy could become popular if the policy was well communicated, and by doing so, the potential impact could be maximised over a shorter period.

Our study has, however, a number of limitations. First, we could not fully control the effect of a similar policy being implemented in other countries in our model. As pointed out by Czaika and Neumayer (2017), visa-exemption policies in other countries could affect the tourist arrivals in

Table 3. Long-run effect of visa-exemption policy on international tourist arrivals

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Visa(t-1)	0.0500***	0.0477***	0.0441***	0.0414***	0.0419***	0.0421***	0.0420***	0.0419***	0.0418***	0.0421***	0.0419***	0.0421***
	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Visa(t-2)		0.009	0.004	-0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
		(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Visa(t-3)			0.018	0.012	0.013	0.014	0.014	0.013	0.013	0.013	0.014	0.013
			(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Visa(t-4)				0.021	0.023	0.023	0.023	0.023	0.022	0.023	0.023	0.023
				(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Visa(t-5)					-0.005	-0.004	-0.005	-0.005	-0.006	-0.005	-0.004	-0.004
					(0.015)	(0.016)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Visa(t-6)						-0.004	-0.004	-0.006	-0.007	-0.005	-0.004	-0.004
						(0.016)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017
Visa(t-7)							0.002	0	-0.002	0.002	0.003	0.004
							(0.016)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)
Visa(t-8)								0.006	0.002	0.008	0.010	0.011
								(0.018)	(0.020)	(0.020)	(0.020)	(0.020)
Visa(t-9)									0.009	0.023	0.027	0.029
									(0.021)	(0.024)	(0.025)	(0.025)
Visa(t-10)										-0.03	-0.02	-0.013
										(0.024)	(0.026)	(0.028)
Visa(t-11)											-0.02	0.008
											(0.028)	(0.037)
Visa(t-12)												-0.041
												(0.043)
Obs	50160	50160	50160	50160	50160	50160	50160	50160	50160	50160	50160	50160
Impact (%)	5.1***	5.7***	6.7***	7.7***	7.9***	8.1***	8.2***	8.4***	9.0***	8.1***	9.0***	8.1***

Note: Robust standard error in parentheses. ***, **, * indicate statistical level of significance at 1%, 5%, and 10%, respectively. All estimates include the control variables introduced in Column (4) of Table 1. Numbers in the last row represent cumulative n-month impacts of the visa-exemption policy. The impact is calculated as percentage change by $100\left(e^{\Sigma\beta}-1\right)$ where β is the parameter of estimate.

any given country. In addition, despite our attempt to include many control variables to refine the estimates, our identification may have missed some time-varying country to port variables due to data availability, such as our country's travel warnings for specific areas in Indonesia. These exclusions may have partly affected our estimates of the visa-exemption policy's impact. Second, due to data limitations, our estimates only provided for the impact on the quantity of tourist arrivals, while the exemption policy also potentially increased the quality of the tourism experience as represented by the average number of days or money spent (Liu & McKercher, 2014). For example, data on the length of stay was only available at the aggregate level. We leave this for future research.

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Appendix

Appendix A: List of countries and ports

Table A1. Origin countries

Australia	Egypt	Kuwait	Portugal	Sweden
Austria	Finland	Laos	Qatar	Switzerland
Bahrain	France	Malaysia	Russia	Taiwan
Bangladesh	Germany	Myanmar	South Korea	Thailand
Belgium	Hong Kong	Netherlands	Saudi Arabia	UAE
Brunei Darussalam	India	New Zealand	Singapore	USA
China	Italy	Norway	South Africa	United Kingdom
Canada	Yemen	Pakistan	Spain	Vietnam
Denmark	Japan	Philippines	Sri Lanka	

Table A2. Ports

Adi Sucipto, DIY	Makassar, Sulsel	Sultan Syarif K II, Riau
Adi Sumarmo, Jawa Tengah	Minangkabau, Sumbar	Tanjung Balai Karimun, Kep. Riau
BIL, NTB	Ngurah Rai, Bali	Tanjung. Pinang, Kep. Riau
Batam, Kep. Riau	Polonia, Sumut	Tanjung. Priok, DKI Jakarta
Entikong, Kalbar	Sam Ratulangi, Sulut	Tanjung. Uban, Kep. Riau
Husein Sastranegara, Jabar	Sepinggan, Kaltim	
Juanda, Jatim	Soekarno-Hatta, Banten	

Appendix B: List of variables

Tourist arrivals: Number of foreign tourist arrivals from a country at a port during a month. Source: Statistics of Indonesia (2019).

Visa exemption: Equals 1 for the month of the country and port granted by the visa-exemption policy, 0 otherwise.

REER: real effective exchange rate, measured in foreign currency per rupiah, evaluated by the respective consumer price index. Source: International Monetary Fund (2019).

Holidays: Number of holidays in origin countries, including Sundays. Source: https://www.timeanddate.com/.

International jet fuel price: Per-gallon international jet fuel price, measured in USD. Source: U.S. Energy Information Administration (2019)

Legislative election dummy: Equals 1 if April 2014, 0 otherwise.

Presidential election dummy: Equals 1 if July 2014, 0 otherwise.

Eid al-Fitr dummy: Equals 1 for the month of the first day of Eid al-Fitr, 0 otherwise.

Month after Eid al-Fitr dummy: Equals 1 for the month after Eid al-Fitr in 2014, 0 otherwise. Source: https://www.timeanddate.com/.

Days in the month: The number of days in each month.

Peak season. Equals 1 for July, August and December, 0 otherwise.

Djakarta Warehouse Project: An annual Asian dance and music festival, held every December in Jakarta. Equals 1 if December and Soekarno-Hatta Banten airport, 0 otherwise.

Sail Indonesia: Indonesia has held Sail Indonesia annually since 2011. The place and time differ each year. The variable was assigned 1 for the date and nearest seaport to the location where the event was held. For example, the 2013 Sail Indonesia was July–September on Komodo Island, near Makassar, South Sulawesi.

Asia-Africa Conference: Held in Bandung in April 2015. Equals 1 for April 2015 and Soekarno-Hatta International Airport, 0 otherwise.

Disaster: Dummy variable to control the effect of natural disasters. The variable was assigned 1 for the date and nearest to the locations where the disaster took place, zero otherwise.

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