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# The Impact of e-Visa Policy on Foreign Tourist Arrivals in Indonesia

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## Abstract

Indonesia's tourism recovery following the COVID-19 pandemic faced challenges due to restricted international mobility. In August 2021, the Indonesian government introduced an e-visa policy to simplify immigration procedures and support tourism recovery. This study examines the association between the e-visa policy and international tourist arrivals in Indonesia. Monthly data from January 2008 to October 2025, comprising 214 observations, were analyzed using an Interrupted Time Series (ITS) approach with Ordinary Least Squares (OLS) estimation and Newey–West heteroskedasticity- and autocorrelation-consistent (HAC) standard errors. The results show a significant increase in the post-policy growth trend of 18,866 tourist arrivals per month ($p<0.01$), despite a significant short-term decline in the level of arrivals by 1,194,872 ($p<0.01$) during the pandemic recovery transition. The model explains 90.05% of the variation in tourist arrivals. The novelty lies in quantifying the long-term trend change associated with e-visa implementation using ITS. The e-visa policy is associated with a positive long-term trend in international tourist arrivals.

**Keywords:** E-Visa Policy, Tourism Recovery, Foreign Tourist Arrivals, Interrupted Time Series

## 1. Introduction

Tourism has long been recognized as a strategic sector in Indonesia's economic development, contributing significantly to foreign exchange earnings, employment generation, and regional development. Prior to the COVID-19 pandemic, tourism accounted for nearly five percent of national Gross Domestic Product (GDP) (Parlindungan & Manurung, 2023). However, the global pandemic severely disrupted international mobility, causing foreign tourist arrivals in Indonesia to collapse from 16.11 million in 2019 to 4.05 million in 2020 (Subandi, 2023).

In response, the Indonesian government introduced recovery-oriented measures, including the digital visa (e-visa) system under Minister of Law and Human Rights Regulation No. 29 of 2021, launched on August 16, 2021 (Herawati et al., 2025). From a tourism economics perspective, visa requirements act as institutional travel barriers that impose monetary and non-monetary transaction costs. Visa facilitation through digital transformation reduces administrative friction, improves processing efficiency, and enhances destination accessibility



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(Atierum, 2026; Chen et al., 2021; Kipingu & Shayo, 2021).

The implementation of e-visa can therefore be understood as part of the broader digital transformation of tourism and public services. Digital technologies increasingly play an important role in improving service efficiency, accessibility, and user experience. In the tourism sector, digitalization can simplify travel-related administrative procedures and enhance destination competitiveness (Chen et al., 2021). Digital visa systems enable travelers to complete administrative procedures online, potentially reducing processing time and increasing transparency. Such improvements may reduce perceived barriers to travel and influence destination choices in an increasingly competitive global tourism market (Kipingu & Shayo, 2021).

Studies on visa policy concentrate on visa exemption and visa-free instruments, and to the authors' knowledge none tests Indonesia's e-visa policy with a long national monthly series. The Literature Review examines the theory and prior evidence behind this gap and sets out the hypotheses.

To address this gap, this study employs an Interrupted Time Series (ITS) framework to examine whether the implementation of Indonesia's e-visa policy is associated with changes in the level and trend of foreign tourist arrivals. The ITS approach is particularly relevant because it allows the analysis to distinguish between an immediate change in tourist arrivals following the policy intervention and a subsequent change in the growth trend. Using monthly data from January 2008 to October 2025, this study captures tourism dynamics before the pandemic, during the COVID-19 disruption, and throughout the subsequent recovery period. This long-term time-series perspective provides a more comprehensive assessment of the association between e-visa implementation and changes in tourism demand (Bayramoğlu, 2025).

The novelty of this study lies in its specific examination of Indonesia's e-visa policy as a digital visa facilitation instrument using a national-level monthly time series and an Interrupted Time Series approach. Unlike previous studies that primarily examine visa-free or visa-exemption policies, this study focuses specifically on the digitalization of the visa application process and evaluates its association with both immediate level changes and longer-term changes in the growth trend of foreign tourist arrivals. This approach contributes to the literature on tourism policy and digital transformation by providing empirical evidence on the dynamics of tourism demand following the implementation of a digital visa system.

Accordingly, this study aims to provide empirical evidence on whether the implementation of Indonesia's e-visa policy is associated with changes in the level and long-term trend of foreign tourist arrivals, thereby contributing to the understanding of digital visa facilitation as an instrument supporting tourism recovery.

## 2. Literature Review

### *2.1 Visa Policy and Tourism Demand*

Tourism demand depends on income, relative prices, and the cost of travel in origin countries (Gidebo, 2021). Visa requirements add to that cost through fees, waiting time, and uncertainty over approval. Neumayer (2010) estimates that visa restrictions cut bilateral travel by roughly 52 to 63 percent, with wide regional variation. Rosselló and Santana-Gallego (2024) show that the type of visa regime shapes international tourism flows, so the form of facilitation deserves separate attention. Ullah et al. (2024) treat visa and passport rules as instruments that states use



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to regulate cross-border mobility.

*2.2 Visa Exemption and Evidence from Indonesia*

Evidence from Indonesia points to uneven outcomes. Yudhistira et al. (2021) use monthly panel data by origin country and port of entry. They find that visa exemption raised foreign arrivals by about 5 percent on average, but the gain appeared only in less-traditional destinations. The authors also point to possible diversion away from traditional destinations and conclude that exemption is not a one-size-fits-all policy. Gu (2024) asks a similar question for inbound tourism in China, so the debate reaches beyond Indonesia. The Indonesian evidence suggests that policy design and destination characteristics shape how visa measures affect arrivals.

*2.3 E-visa as Digital Visa Facilitation*

An important issue in the existing literature is the distinction between visa exemption, visa-free policies, and e-visa systems. Visa exemption or visa-free policies remove or reduce the requirement to obtain a visa for eligible travelers, whereas an e-visa system maintains the visa requirement but transforms the application and administrative process into a digital service. Consequently, evidence on visa exemption or visa-free policies cannot necessarily be generalized to e-visa implementation. This distinction provides an important basis for examining e-visa as a specific digital transformation instrument in tourism and immigration services.

Research on Indonesian immigration policy remains narrow in scope. Wardhani et al. (2025) examine immigration policy for MICE delegates at international conferences, which covers one visitor segment rather than total arrivals. Herawati et al. (2025) review public-sector digital innovation in Indonesian smart tourism and focus on the urban–rural digital divide. Neither study tests the link between e-visa implementation and national arrivals over time.

*2.4 Research Gap and Hypotheses*

Three gaps follow from this literature. Most evidence concerns visa exemption or visa-free instruments, not digital visa systems that keep the visa requirement. The Indonesian panel evidence covers the period before the pandemic (Yudhistira et al., 2021), so it cannot describe the recovery phase. To the authors' knowledge, no study tests the e-visa policy at the national level with a long monthly series. This third gap matters because arrivals collapsed during the pandemic (Subandi, 2023), and a policy effect must be separated from the general recovery. Further evidence is needed on whether e-visa implementation is associated with changes in international tourist arrivals over time.

Conceptually, the implementation of e-visa is expected to promote the digitalization of visa services, which can reduce administrative barriers and transaction costs associated with international travel. By improving the accessibility, efficiency, and transparency of visa procedures, e-visa services may facilitate international travel and subsequently contribute to higher foreign tourist arrivals.

Within the ITS framework, the relationship is evaluated through two dimensions: (1) level change, representing the immediate change in foreign tourist arrivals following e-visa implementation, and (2) trend change, representing the subsequent change in the growth trajectory of foreign tourist arrivals.

Based on the theoretical arguments and empirical evidence discussed above, the hypotheses



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are formulated as follows:

H1: The implementation of the e-visa policy is associated with a significant change in the level of foreign tourist arrivals in Indonesia.

H2: The implementation of the e-visa policy is associated with a significant positive change in the growth trend of foreign tourist arrivals in Indonesia.

## 3. Research Methods

### *3.1 Research Design*

This study employs a quantitative approach using an Interrupted Time Series (ITS) framework to evaluate the association between the digital visa (e-visa) policy and foreign tourist arrivals in Indonesia.

The ITS approach is widely used in policy evaluation studies as a quasi-experimental design, particularly when randomized experiments are not feasible. By comparing pre- and post-intervention trends within the same time series, this method identifies both immediate (level) and gradual (trend) changes associated with policy interventions. In this study, the implementation of the e-visa policy in August 2021 is treated as the intervention point (Andrade, 2021).

### *3.2 Data Source and Period*

This study used data from the official website of Badan Pusat Statistik (BPS), which provides monthly statistics on foreign tourist arrivals. The observation period spans January 2008 to October 2025, resulting in 214 observations.

Using long-term time-series data allows more reliable identification of structural changes and reduces the risk of biased estimates from short-term fluctuations.

### *3.3 Variable Specification*

The model contains one dependent variable, three variables that define the ITS design, and two sets of controls. Table 1 states how each variable is defined, measured, and linked to the hypotheses.

Table 1. Variable Definitions and Measurement

| Variable | Definition and measurement | Parameter | Expected sign |
|---|---|---|---|
| Arrivals (dependent) | Monthly number of foreign tourist arrivals to Indonesia, in persons, in levels. Source: BPS. | – | – |
| Time | Month counter from t = 1 (January 2008) to t = 214 (October 2025). | $\beta_1$ | Positive |
| Post_evisa | Dummy equal to 1 from August 2021 onward and 0 from January 2008 to July 2021. | $\beta_2$ | Not specified (H1) |
| Time_after | (Time − $T_0$) × Post_evisa, with $T_0$ = 164 (August 2021). Equals 0 through August 2021, then 1 in September 2021, rising by one each month. | $\beta_3$ | Positive (H2) |



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| | | | |
|---|---|---|---|
| Pandemic (control) | Dummy equal to 1 from March 2020 to July 2021 and 0 otherwise. | $\beta_4$ | Negative |
| Month_i (control) | Eleven seasonal dummies for February (i = 2) to December (i = 12); January is the reference category. | $\beta_i$ | Not specified |

Note: $T_0$ is the time index of the intervention month (August 2021). H1 and H2 are the hypotheses stated in the Literature Review. Arrivals enter the model in levels, not in logarithms, so every coefficient is expressed in persons. The series comes from monthly BPS statistics and covers 214 months from January 2008 to October 2025.

Centering Time at $T_0$ sets Time_after to zero in August 2021. $\beta_2$ then measures the immediate level change at the intervention month, and $\beta_3$ measures the change in the monthly growth of arrivals relative to the pre-intervention trend. The Pandemic dummy ends in July 2021, the month before the e-visa launch, so the two dummies never take the value one in the same month.

*3.4 Control Variables*

Two sets of controls enter the model. The Pandemic dummy absorbs the structural shock of the COVID-19 pandemic between March 2020 and July 2021. Monthly dummies Month_i (i = 2, …, 12) control for seasonality, with January as the reference category.

Model Specification

The ITS regression model is specified as follows:

$$\text{Arrivals}_t = \beta_0 + \beta_1\ \text{Time}_t + \beta_2\ \text{Post_evisa}_t + \beta_3\ \text{Time_after}_t + \beta_4\ \text{Pandemic}_t + \Sigma\beta_i\ \text{Month}_i + \varepsilon_t$$

In this specification:

1. $\beta_1$ captures the baseline pre-intervention trend
2. $\beta_2$ estimates the immediate level change associated with the policy
3. $\beta_3$ measures the change in the growth rate after the intervention
4. $\beta_4$ controls for the structural shock during the pandemic period

*3.5 Estimation Strategy*

**The model is estimated using Ordinary Least Squares (OLS)**

However, time-series data often exhibit autocorrelation and heteroskedasticity, which may lead to biased standard errors and unreliable statistical inference (Kumar, 2023). To address this issue, the estimation employs Newey-West heteroskedasticity- and autocorrelation-consistent (HAC) standard errors, using a Bartlett kernel with an automatically selected fixed bandwidth of 5 lags. (Chaudhary et al., 2022).

This approach ensures that statistical inference remains valid even in the presence of serial correlation and non constant variance in the error term. HAC estimators are widely recommended in time-series regression when classical OLS assumptions are violated (Reckling et al., 2021).

The choice of HAC standard errors is further justified by the Durbin Watson statistic of 0,57 reported in Table 2, which indicates the presence of positive autocorrelation in the residuals.



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**Stationarity and Model Considerations**

Prior to estimation, the Augmented Dickey Fuller (ADF) test was conducted to assess the stationarity properties of the series. The results, indicate that the tourist arrivals series is non-stationary in levels but becomes stationary after first differencing. However, within the framework of Interrupted Time Series (ITS) analysis, the use of level data remains appropriate (Roza et al., 2022).

This is because ITS models explicitly incorporate deterministic components such as time trends and structural breaks associated with policy interventions. In the time series econometrics literature, it is well established that non-stationarity arising from deterministic trends does not necessarily invalidate regression estimates, provided that these components are properly specified in the model (Ryan et al., 2025)

Moreover, the inclusion of time trends, intervention dummies, and seasonal controls helps to capture systematic patterns in the data and reduces the risk of spurious regression (Bojar et al., 2022).

**Validity and Limitations of the ITS Approach**

While the Interrupted Time Series (ITS) approach is a powerful tool for policy evaluation, several underlying assumptions must be acknowledged (Jiang et al., 2022)

First, the method assumes that no other major policy changes or external shocks occurred simultaneously with the implementation of the e-visa policy that could significantly influence tourist arrivals. In practice, this assumption is difficult to fully satisfy, particularly in the context of post pandemic recovery, where multiple overlapping factors such as changes in travel restrictions, vaccination progress, and global mobility trends may also affect tourism demand. Therefore, the estimated effects should be interpreted as net associations rather than fully isolated causal effects (Lopez Bernal et al., 2017).

Second, the model does not explicitly incorporate other key determinants of tourism demand, such as exchange rates, income levels in origin countries, or airline capacity. These variables have been widely recognized in the tourism economics literature as important drivers of international travel. As a result, the estimated coefficients should be interpreted as capturing the net association of the e-visa policy within the broader macroeconomic environment (Gidebo, 2021).

Third, the August 2021 intervention date is assigned based on the regulatory implementation date rather than confirmed through a formal endogenous break date test. Future iterations of this analysis would benefit from a Chow break test or Quandt Andrews test to corroborate this assumption, as well as placebo date or differenced data robustness checks to strengthen the causal interpretation of the trend effect. Despite these limitations, the ITS approach remains appropriate for identifying structural changes associated with clearly defined policy interventions. Its strength lies in its ability to distinguish between pre and post intervention dynamics within a unified analytical framework (Lopez Bernal et al., 2017).

**4. Results and Discussion**

*4.1 Empirical Results*

The estimation results of the Interrupted Time Series (ITS) model are presented in Table 2.



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Table 2. Interrupted Time Series Regression Results

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| **C** | 315372.5 | 35939.97 | 8.774981 | 0.0000 |
| **TIME** | 6393.135 | 405.88 | 15.75123 | 0.0000 |
| **POST_EVISA** | -1194872 | 108006.9 | -11.06293 | 0.0000 |
| **TIME_AFTER** | 18866.02 | 2985.255 | 6.319733 | 0.0000 |
| **PANDEMIC** | -1205382 | 59375.25 | -20.30109 | 0.0000 |

Note:

Standard errors are Newey–West HAC robust standard errors. All coefficients are significant at the 1% level.

Model Statistics: R-squared = 0.9005; Adjusted R-squared = 0.8930; F-statistic = 54.894 ($p < 0.001$); Observations = 214; Durbin- Watson Statistic = 0.57.

*Source: Author estimation using BPS data.*

The model demonstrates strong explanatory power, with an R-squared value of 0.9005, indicating that approximately 90.05% of the variation in foreign tourist arrivals can be explained by the included variables. This suggests that the model adequately captures the underlying dynamics of international tourism demand in Indonesia over the observation period.

The coefficient on the time trend variable (Time) is positive and statistically significant, reflecting a long-term upward trajectory in foreign tourist arrivals before the policy intervention. This finding is consistent with Indonesia's steady tourism expansion in the pre-pandemic period.

The Pandemic variable shows a large and statistically significant negative coefficient, confirming the severe contraction in tourism demand during the COVID-19 period. This result aligns with global evidence indicating that travel restrictions and mobility constraints had a profound impact on international tourism flows.

More importantly, the variables capturing the e-visa policy intervention provide key insights into the policy's association with tourism recovery.

First, the coefficient on Post evisa is negative and statistically significant, indicating an immediate decline in tourist arrivals coinciding with the policy's implementation. This result should not be interpreted as policy failure. Instead, it reflects the timing of the policy introduction, which coincided with a period when international travel was still heavily constrained by pandemic-related restrictions.

Second, and more substantively, the coefficient of Time after is positive and highly significant. This indicates that the e-visa policy is associated with a structural increase in the growth rate of foreign tourist arrivals, with an estimated additional 18,866 visitors per month relative to the pre-intervention trend. This finding suggests that the policy may have contributed to a strong and persistent acceleration in tourism recovery and expansion in the post-pandemic period. This association should not be interpreted as a fully isolated causal effect, because other recovery-related factors acted at the same time, as the Validity and Limitations of the ITS Approach subsection explains.

Taken together, these results highlight the importance of distinguishing between short-term



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level effects and long-term trend effects in policy evaluation.

*4.2 Interpretation of Policy Impact*

The contrasting signs between the Post evisa and Time after coefficients reveal a nuanced policy impact. The negative short-term effect can be attributed to external constraints, particularly global travel restrictions, health protocols, and limited flight availability at the time of policy implementation. In this context, the e-visa policy alone was not sufficient to immediately stimulate tourism demand.

However, as international mobility gradually normalized, the positive and significant trend effect is consistent with the e-visa policy becoming an increasingly effective facilitating mechanism over time although this pattern may also partly reflect the broader post-pandemic recovery trajectory shared across many destinations, rather than the e-visa policy alone.

From an economic perspective, this pattern aligns with adjustment dynamics in demand response. Policy interventions often exhibit delayed effects, particularly when complementary conditions such as transportation availability and traveler confidence are not fully restored.

*4.3 Link to Tourism Demand Theory*

The findings of this study are broadly aligned with the theoretical framework of tourism demand, particularly the role of transaction costs and non-price barriers.

Visa requirements represent a form of institutional friction that can deter international travel. Complex procedures, high costs, and uncertainty increase the perceived burden of travel, effectively reducing demand.

By introducing a digital visa system, the Indonesian government reduced these frictions through:

1. Simplified application procedures
2. Reduced processing time
3. Increased transparency and accessibility

As a result, the e-visa policy is associated with a lower generalized cost of travel, which may help stimulate tourism demand in the long run.

This mechanism is consistent with the broader literature in tourism economics and digital transformation, where improvements in administrative efficiency and service accessibility are shown to enhance destination competitiveness.

*4.4 Comparison with Previous Studies*

The empirical results are broadly consistent with prior studies examining the impact of visa facilitation policies on international tourism, although the literature shows that such effects are not universal.

Neumayer (2010) reports that visa restrictions reduce bilateral travel by 52 to 63 percent on average. Rosselló and Santana-Gallego (2024) provide cross-country evidence that the type of visa regime affects international tourism flows.

However, the present findings should be read alongside Indonesia-specific evidence pointing to more heterogeneous outcomes. Yudhistira et al. (2021) show that visa exemption in



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Indonesia produced uneven gains across destinations, with possible diversion away from traditional destinations. Gu (2024) finds that China's 72-hour visa-free transit policy had no significant effect on the number of foreign tourists. Taken together, these contrasting findings suggest that the positive trend effect identified in the present study is best interpreted as a net macro-level association specific to the e-visa policy instrument and the particular post-pandemic period examined, rather than as generalizable evidence that all visa-related policy instruments uniformly increase tourism demand in Indonesia.

This study contributes to the literature by providing a national-level, long-horizon quasi-experimental evaluation of Indonesia's e-visa policy specifically, complementing the panel-based evidence in Yudhistira et al. (2021) and the difference-in-differences evidence in Gu (2024). Moreover, long-term monthly data enable identification of both immediate and dynamic effects, offering a more comprehensive understanding of the policy's association with tourism recovery.

*4.5 Policy Implications*

The findings carry several important policy implications. First, the positive association with the long-term trend highlights the potential value of digitalization in public service delivery, particularly in sectors that depend heavily on international mobility. Second, the absence of an immediate positive effect suggests that visa facilitation alone may be insufficient to stimulate tourism demand during periods of global disruption. Complementary measures, including coordinated reopening strategies, increased airline capacity, and international cooperation, are therefore essential to support tourism recovery.

Third, the observed change in the long-term trend suggests that further development and expansion of the e-visa system may provide additional benefits. However, this implication should be interpreted cautiously and further validated through robustness checks before being considered a definitive policy conclusion. Key areas for further policy development include:

1. Expanding eligibility: Extending e-visa access to additional high-potential source markets while maintaining appropriate immigration and security requirements.
2. Integrating digital services: Connecting visa systems with tourism promotion platforms to create a more seamless digital journey from travel planning and visa application to destination information.
3. Improving service efficiency: Enhancing the user experience, system usability, processing speed, and transparency of the e-visa application process.

Finally, strengthening digital infrastructure and system interoperability at international entry points is crucial to ensure that improvements in pre-arrival visa services are complemented by efficient and reliable on-arrival immigration procedures.

## 5. Conclusion

This study evaluated the impact of Indonesia's digital visa policy on foreign tourist arrivals using an Interrupted Time Series approach. The findings confirm that while the policy's launch during the pandemic transition was accompanied by an immediate level reduction, it significantly accelerated the long-term growth trend of international tourist arrivals. Digital visa transformation effectively serves as an institutional mechanism to reduce transaction costs and foster sustainable tourism recovery.



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These findings suggest that Indonesia's digital visa policy may have supported the recovery and longer-term growth of international tourism by improving the accessibility and efficiency of visa services. However, the observed association should be interpreted cautiously because other factors, including post-pandemic mobility recovery, air connectivity, economic conditions, and concurrent tourism and visa-related policies, may have contributed to changes in tourist arrivals. Therefore, the findings provide evidence of a significant change in the trajectory of foreign tourist arrivals following the intervention but should not be interpreted as a definitive causal effect attributable solely to the digital visa policy.

*Policy Implications*

These findings suggest several policy implications. First, Indonesia could consider expanding e-visa coverage to additional high-potential source markets, including China, India, and selected countries in the Middle East, while maintaining appropriate immigration and security controls. Second, the e-visa system could be integrated more closely with national digital tourism promotion strategies led by the Ministry of Tourism, creating a more seamless relationship between visa facilitation and destination promotion. Third, digital infrastructure and system interoperability at international entry points should be strengthened to support efficient and reliable immigration processing. Finally, the effectiveness of digital visa policies should be continuously monitored using longitudinal tourism indicators to identify their effects across different markets and policy periods.

*Limitations and Future Research*

This study relies on national-level foreign tourist arrival data and does not explicitly control for several potentially important determinants of international tourism demand. Future research could extend the analysis to regional or destination-level data and incorporate additional explanatory factors, such as exchange rates, airline capacity, international connectivity, and global economic conditions.

Future studies could also strengthen the robustness of the ITS design by applying formal structural break tests, such as the Chow or Quandt–Andrews tests, to assess the assumed August 2021 intervention point. Additional robustness analyses using alternative intervention dates, placebo interventions, and differenced or alternative model specifications could further assess the stability of the estimated trend change and strengthen the interpretation of the findings.

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