# Impact of Internet Connectivity on Tourist Arrivals in Singapore

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**Abstract:** *This study employs regression analysis to examine the influence of internet connectivity tot tourist arrivals in Singapore. Key factors including internet connectivity in origin and in destination and their impact on tourist arrivals on Singapore are analyzed. Results reveal significant influences of number of internet users in origin country on tourist arrivals in Singapore. Challenges such as multicollinearity are taken into consideration, and R-squared value of 0.794 indicates a high level of explanatory power of model.*

**Keywords:** *Tourism, Internet, Internet Connectivity, Singapore, Inbound Tourism.*

**Introduction:** Like any industry in modern world tourism industry is also being highly affected by Internet and digital connectivity. Understanding the impacts and influence of digital connectivity is important to form future tourism policies and promotional campaigns. This research employs linear regression analysis to analyze impact of digital connectivity to tourist arrivals in Singapore. Factors such as internet connectivity in origin and in destination are analyzed to understand their complex impact. Examination of these variables aims to provide valuable conclusions for researchers and policymakers.

## Literature review
### Tourism and Internet.

N.Kumar and R.Kumar (2020) found a direct relationship between Information and communication technologies and number of tourist arrivals when they found 0.11% increase in number of tourist arrivals when internet subscriptions increased by 1%. They also highlighted the importance of income levels since its effect on internet connectivity. While analyzing the factors influencing number of tourist arrivals in Indonesia it was reported that 1% of increase in Internet use resulted 0.49% increase in tourist arrivals indicating internet`s ability to improve tourist arrivals independent from other factors (Millia and et.,2020). Internet connectivity also provides a great opportunity for tourism marketing campaigns allowing tourists to see and share their experiences. This is very important to boost the number of tourists arrivals since it serves as key for reaching marketing campaigns for potential visitors (Dellaert, 1999).

Also with the number of internet users, availability of tourism related content also grows which significantly influence tourists` choices showing direct link between online content quality and destination attractiveness. It also increases overall satisfaction of destination (Dramićanin & Sančanin, 2020).  Internet connectivity also paved a way for various platforms facilitating booking, planning, visa applications, commerce and resulting increase in number of online tourism platforms. It contributed significant growth of tourism demant per Ramos and Rodrigues (2013).

## Dataset Overview:

The dataset used for this research includes set of variables covering demographic, economic and internet connectivity indicators which influence number of tourist arrivals in Singapore. Data covers all the countries over the years, providing a dynamic perspective on the influence of internet connectivity to tourism arrivals.

## Variables and Definitions

### Dependent Variable:

*Intou (Tourist Arrivals):* Total number of international tourist arrivals in Singapore.

### Independent Variables:

*Distance:* Distance between the origin and destination.

*Internet_d*: number of internet users in Singapore.

*Internet_o*: number of internet users in origin country.

*Inpop_orig:*Total population of origin country.

*Inpop_dest*: Total population of Singapore.

*lngdppc_dest:* GDP per capita in the Singapore.

*lngdppc_orig:* GDP per capita in the origin country.

Data were taken from reliable sources such as **UNWTO** and **World Bank**. This dataset provides an opportunity to examine relationship between internet connectivity and tourist arrivals in Singapore. Usage of indicators from both origin and destination allows for a wider understanding influence of internet connectivity on tourist arrivals.

## Methodology

Paper implements linear regression model to analyze the relationship between tourist arrivals in Singapore (Intou) and various independent variables. Linear regression analysis conducted using statistical software SPSS. Significance of coefficients assessed through p-values: Variance Inflation Factors (VIF) were calculated for each independent variable to analyze multicollinearity.

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95,0% Confidence Interval for B | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Tolerance | VIF |
| 1 | (Constant) | -11,382 | 7,661 | | -1,486 | ,138 | -26,411 | 3,647 | | |
| | distance | -4,678 | ,087 | -,783 | -53,569 | ,000 | -4,850 | -4,507 | ,717 | 1,395 |
| | lngdppc_orig | ,919 | ,030 | ,647 | 30,268 | ,000 | ,860 | ,979 | ,335 | 2,988 |
| | lngdppc_dest | ,571 | ,531 | ,055 | 1,074 | ,283 | -,472 | 1,613 | ,058 | 17,171 |
| | internet_o | ,009 | ,002 | ,128 | 5,215 | ,000 | ,005 | ,012 | ,253 | 3,953 |
| | internet_d | -,013 | ,003 | -,159 | -4,456 | ,000 | -,019 | -,007 | ,120 | 8,328 |
| | lnpop_orig | ,839 | ,016 | ,721 | 53,844 | ,000 | ,809 | ,870 | ,854 | 1,171 |
| | lnpop_dest | ,721 | ,691 | ,048 | 1,042 | ,298 | -,636 | 2,077 | ,071 | 14,019 |

a. Dependent Variable: lntou

Overall fit of the model evaluated using the R-squared value.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | ,891a | **,794** | ,793 | ,93902124 |

a. Predictors: (Constant), lnpop_dest, distance, lnpop_orig, lngdppc_orig, internet_o, internet_d, lngdppc_dest

The R-squared value of 0.794 indicates 79.4% of the variability in number of tourist arrivals in Singapore is explained by independent variables selected for this study and analyzed in linear regression analysis. This shows high level of explanatory power, meaning selected independent variables have strong correlation with the number of tourist arrivals in Singapore.

## Data processing

During regression analysis no variable showed constant values and all variables were included in regression analysis showing lack of unnecessary data.

## Function

***Intou***$=\alpha+\beta 1$distance $+\beta 2$ internet_o$_t$ $+\beta 3$ internet_d$_t$ $+\beta 4$ Inpop_dest$_t$ $+\beta 5$ Inpop_orig$_t$ $+\beta 6$lngdppc_dest t$+\beta 7$ lngdppc_orig$_t$

## Results

Negative coefficient *(-4.678)* for "***distance***" suggests that the greater distance between origin and Singapore, the number of tourist arrivals decreases. This relationship is statistically significant (p-value < 0.001) and we reject null hypothesis. VIF of 1.395 shows low multicollinearity. ***"internet_o"*** coefficient of 0.009 shows its positive correlation with number of tourist arrivals to Singapore. Since it is less than 0.001, we reject null hypothesis accept alternative hypothesis and reject null meaning increase in number of internet users in origin country leads to more tourist arrivals to the Singapore. VIF (3.953) indicates some minor multicollinearity issues might be present. However, since its less than 5, it is considered as non-significant. Meanwhile Internet usage in destination (***"internet_d")*** surprisingly shows negative coefficient of -0.013 meaning the number of tourist arrivals in Singapore decreases when the number of Internet users increase in the country. However relatively high VIF (8.328) indicates it happened due to potential multicollinearity issues which needed to be addressed in future studies. ***GDP per capita in the origin country ("lngdppc_orig")*** is statistically significant at p<0.001 level(0.919)which means tourists from wealthier nations, who also tend to have higher internet connectivity, are more likely to come to Singapore. So, we accept alternative hypothesis and reject null. VIF shows moderate level (2.988) of multicollinearity however it is not concerning.

Meanwhile economic situation in Singapore *("lngdppc_dest»)* seems not to have not effect since it is not statistically significant with p-value of 0.298, so we accept null hypothesis meaning there is no significant relationship between GDP per capita of Singapore and number of tourist arrivals to country. VIF is extremely high (17,171) which shows concerns regarding result interpretation. Results of analysis (0.721) of *"Inpop_dest"* shows increase of population in Singapore might result to increase of tourist arrivals as well, however due to low p-value (0.298) result is not statistically significant (p-value > 0.5) and we accept null hypothesis.  VIF for this indicator is also extremely high.

Positive (0.0839) and significant coefficient (0.000) at p<0.001 level for *" Inpop _orig"* indicates strong positive relationship meaning the larger the population of origin country, the more likely it results to higher number of arrivals to Singapore. We accept alternative hypothesis and reject null. VIF is also extremely low (1.171).

## Discussions and Limitations

## Discussions

Regression analysis shows significant impact of economic factors as well as internet connectivity to number of tourist arrivals in Singapore supporting findings of Kumars (2020) and Milia(2020). It shows countries with higher digital connectivity are more highly to visit to Singapore, possibly due to easier access to online platforms and information availability supporting findings of Dramićanin & Sančanin (2020).

While results of indicators related to origin completely aligns with existing literature findings and positively impacts on number of tourists arrivals, indicators in destinations seem to have either negative impact no significance at all. It is partially can be explained since tourists tend to not put so much weigh on internet connectivity of origin however most logical answer would be analytical challenge presented by high multicollinearity in indicators of destination. Showing low level of explanatory power.

## Limitations

Study has several limitations which can be seen after examination including following: *High Multicollinearity* of indicators as mentioned above, related to destination country raises some questions regarding reliability of those coefficient estimates and since might not represent the actual impact of those variables.

Also there is some *data limitations*  meaning number of internet users itself might not represent digital connectivity and its influence on tourism since it does not include factors such as online tourism services and digital marketing campaigns.

And lastly, findings are *generalized* in context of Singapore and results might not apply for other countries equality.

## Conclusion

In Conclusion this study examined total number of tourists arrivals to Singapore and how it is affected by internet connectivity. Literature review showed there is positive impact between number of tourist arrivals and internet connectivity. Analyzing data from trusted sources with SPSS software, study results aligned with findings of existing knowledge meaning increase connectivity in origin country resulted growth of number of tourists to Indonesia. Study suggest for future researchers to take into account multicollinearity and data limitations while conducting similar studies.

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