Research in Globalization 3 (2021) 100044

Contents lists available at ScienceDirect

Research in Globalization

journal homepage: www.elsevier.com/locate/resglo

Tourism recovery and the economic impact: A panel assessment

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ARTICLE INFO

JEL classification:
Z32
F62
O47

Keywords:
Tourism
Economic impact
Economic growth

ABSTRACT

In anticipation of recovery in the tourism industry post COVID-19, this study examines the economic impact of tourism on economic growth and other macroeconomic variables in a panel of 46 countries. Using system-GMM estimation, I find that tourism has a statistically significant positive effect on economic growth. In the linear model, the positive effect on growth is 50 percent higher if tourism receipts relative to GDP is used as the tourism measure, instead of tourist arrivals per capita. When the non-linear specification is considered, it is found that tourism specialization at higher levels dampens the positive effect on growth. However, increased tourist receipts have a positive effect on growth, at all levels. Regardless of the measure of tourism, an increase in tourism augurs well for the services and agriculture value-added shares of GDP as well as the labour prospect in the service and industry sectors and among the vulnerable employed. Increase in the tourism receipts relative to GDP is expected to positively impact the net FDI inflows to GDP ratio. The results suggest that policy makers should be measured in their approach as they navigate their economies post-COVID-19 when the tourism industry is in the recovery phase.

Introduction

The SARS coronavirus (COVID-19) pandemic has had a protracted negative effect on all areas of economic activities across the world. Travel restrictions and closure of international borders severely impacted global travel and the tourism industry, with varying negative effects across countries (World Tourism Organization (WTO), 2020). Other areas of the economy are also affected, given the integrated role travel and tourism play in economic activities, directly and indirectly, especially in tourism dependent economies.

Tourism's effect on the economy spreads beyond economic growth. The connection to growth through the sectoral interlinkages has positive spillover effects. These spillover effects include, but are not limited, to increased employment, added income earnings, a source of government revenue, foreign exchange earnings and balance of payment support (Durbarry, 2002; Oh, 2005; Apergis and Payne, 2012; Pratt, 2015).[1] The economic fallout resulting from COVID-19 is reflected in the decline in global gross domestic product (GDP) as well as deterioration in other key macroeconomic and socioeconomic variables. Putting this into context, international tourist arrivals (WTO, 2021) and global growth (International Monetary Fund, 2021) are estimated to decline for 2020 by 74 per cent and 3.5 percent, respectively.[2] The fallout from the COVID-19 pandemic is far reaching, especially among developing economies, as limited international trade has slowed down foreign exchange inflows. This has resulted in the International Monetary Fund (IMF) providing emergency financial assistance to a number of these countries to meet their balance of payments needs (IMF, 2020).[3]

Given the health protocols in place across the world to minimize and stop the spread of the COVID-19 pandemic, countries and their policy makers should look forward to a recovery in the tourism industry. This study uses the tourism-led growth (TLG) hypothesis (Balaguer & Cantavella-Jorda, 2002) to explain the causal impact of tourism on economic growth. Specifically, this study examines the economic impact of tourism on economic growth and other key macroeconomic variables. This article contributes to the literature on tourism economics by putting in one assessment, the long-run impact of tourism on economic growth, sectoral behaviour as it relates to value-added composition and employment reallocation, as well as the outcome on foreign exchange inflows. It is my expectation that by quantifying the economic impact of an increase in tourism on the average economy, policy makers will be better positioned to determine what

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[1] The economic impact of tourism can be considered from three points of view: direct, indirect and induced (Khan et al., 1995; Jucan and Jucan, 2013).

[2] The largest declines in international tourist arrivals are expected for Asia and the Pacific (84%) and the Middle East (76%) regions. For GDP, the greatest contractions are estimated for South Asia (8.4%) and the South America (8.1%) regions.

[3] A little over half of the countries in this study has so far received IMF assistance. See Table 1A.

https://doi.org/10.1016/j.resglo.2021.100044
Received 26 January 2021; Revised 3 March 2021; Accepted 6 March 2021
Available online 20 April 2021

policy actions may be required to bring economies to pre-COVID-19 levels and place them on a path to sustained growth. Post COVID-19, there is an expected rebound in the demand for international travel and the tourism industry and, the related industries. However, the long-run effect of tourism on each economy will depend on the level specialization in tourism and related activities, the multiplier effect of tourism spending in the domestic country, the structure of the tourism industry as well as the preparedness of the economy for the tourism rebound (Capó et al., 2007; Pratt, 2015).

My findings suggest that the positive long-run effect of tourism on economic growth is 50 percent higher if tourism receipts relative to GDP is used as the proxy for tourism measure, instead of tourist arrivals per capita. When the non-linear specification is considered, it is found that tourism specialization at higher levels dampens the positive effect on growth. However, increased tourist receipts have a positive effect on growth, at all levels. Additionally, increased tourism contributes positively to the services and agriculture value-added shares of GDP as well as the labour prospect in the services and industry sectors. Increased tourism receipts relative to GDP is expected to increase foreign direct investment (FDI) net inflows to GDP ratio. The results suggest that post-COVID-19, emphasis should be placed on policies that seek to reduce the tourism industry vulnerability, enhance the quality of the tourism product and support tourism diversification.

The remainder of the paper is a as follows: a review of the literature in the area, then details of the data and empirical approach, the results then discussion, followed by the conclusion.

Literature review

Studies examining the relationship between tourism and economic growth have found a positive relationship, in both developing and developed economies (Sequeira & Nunes, 2008; Ghartey, 2013; Cannonier & Burke, 2019). There is evidence that the positive effect of tourism on economic growth is as equally important across large and small countries (Sequeira & Nunes, 2008). Lee and Chang (2008) confirm the positive long-run relationship between tourism development and economic growth is greater in non-Organisation for Economic Co-operation and Development (OECD) countries than in OECD countries. Sugiyarto et al. (2003) show tourism growth has the ability to amplify the positive net effect of globalization in a country[4].

Throughout the literature, (such as in Apergis & Payne, 2012; Cannonier & Burke, 2019), the commonly used tourism measures are tourist arrivals, tourism receipts and tourism expenditure normalized to either population, total exports or GDP. Data on tourist arrivals is more readily available and captures the degree of tourism specialization within a country (Ghartey, 2013). On the other hand, revenues from tourism via receipts or expenditure captures how tourism spending feeds through the overall domestic economy by the strong interconnectedness between tourism industry and other areas of the economy (Ghartey, 2013; Zhang & Cheng, 2019). As indicated by Khan et al. (1995) and Jucan and Jucan (2013), the tourism spending multiplier effect drives the domestic economy via the direct, indirect and induced effects.

Empirical assessment of the tourism and economic growth nexus commonly use growth models within a statistical framework to identify the presence of a relationship. System general method of moments (GMM) is commonly used given its ability to over potential endogeneity issues relative to other methods (Sequeira & Nunes, 2008; Cannonier & Burke, 2019). Dynamic panel models such as autoregressive distributed lag (Tang & Abosedra, 2014) and vector error correction model (Oludele & Lydia, 2010) are also employed to jointly ascertain a short and long-term relationship between tourism and growth. Studies with interest in only the short-run effect of tourism on output or growth rely on vector autoregressive (VAR) model to identify the effect of a positive shock to tourism on economic growth (Ghartey, 2013) or a structural Bayesian panel VAR to show the international transmission of economic shocks through the tourism channel to affect output (Canova & Dallari, 2013).

Using data on a broad sample of countries over 1980–2002 period, the results from Sequeira and Nunes (2008) system GMM model showed that tourism has a positive impact on long-run economic growth in their broad sample of countries and in their subset of poor countries. The authors concluded that tourism specialization has the ability to promote economic growth in poor countries as it withstands weak governance and low institutional quality.

Apergis and Payne (2012) showed a bidirectional relationship between tourism and economic growth in both the short and long-run in a panel of nine Caribbean countries. They indicated that the interconnectedness between the tourism and economic growth supports the inflow of foreign exchange and the production process within the Caribbean economy. Using the input-output, linkage analysis and CGE model to study seven Small Island Developing States (SIDS), Pratt (2015) showed that tourism generates huge economic activity by stimulating consumption and investment. The authors however indicated that the large income outflows from the SIDS is a contributing factor to the reduction in investment in the tourism industry which is associated decline in output in both the manufacturing and agriculture sectors. Consistent with other studies, Cannonier and Burke (2019) found that within the small states in the Caribbean islands, a 10 percent increase in tourism spending is expected to increase economic growth between 0.4 and 0.7 percent. The authors recommended that policymakers should play an integral role in the efficient allocation of resource in an effort to intensify and diversify the tourism sector.

Focusing on 113 countries, Antonakakis et al. (2019) used a panel VAR model, controlling for countries economic, political and tourism, found evidence to support the economic growth-led tourism growth hypothesis for developing countries that are non-democratic, highly bureaucratic and have low tourism specialization. The authors also found that the bidirectional relationship between tourism and economic growth is consistent for countries that are stronger, democratic and have an effective government. In this case, these countries should sustain their economic growth by continuously reinvesting in the tourism to further boost economic growth.

Po and Huang's (2008) cross-sectional study of 88 countries revealed a non-linear relationship between tourism development and economic growth. Using tourism receipt as percentage of GDP as a measure of tourism specialization, they found a positive relationship between tourism and economic growth when the degree of tourism specialization is below 4.05 percent or above 4.73 percent. In these cases, tourism development should be included in these countries growth strategy. However, countries with tourism specialization between 4.05 percent and above 4.73 percent should resort to other measures beside tourism to promote economic growth. In a later study, Zhang and Cheng (2019) used panel threshold regression model to show that tourism development was able to stimulate economic growth in 36 earthquake-affected counties of China over the period 2008 to 2016. The results showed that the impact of tourism on economic growth decreased with the levels of tourism specialization and industrial structure above a threshold. The authors suggest that policymakers should recognize the vulnerability of tourism and find ways to strengthen the industry's resilience. The findings of Po and Huang (2008) and Zhang and Cheng (2019) are consistent with Sequeira and Nunes (2008) stylized facts that high tourism dependent economics have higher economic growth.

[4] Notwithstanding, some studies found tourism specialization to have negative effects on the natural resources of these tourism destination. These include overexploitation of natural resources (Capó et al., 2007), water consumption (Hadjikakou et al., 2015) and greenhouse gas emissions (Sun, 2016).

Data & empirical approach

This section outlines the data and the empirical approached I employ to assess the economic impact of tourism on macroeconomic variables. The variables and model selected for the assessment are guided by the literature (Sequeira & Nunes, 2008; Cannonier & Burke, 2019) as well as data availability for the period of assessment. The sample of countries in this study provides sufficient variability across all variables considered.

Data

For this study, I use annual data covering the period 1995 to 2018 for 46 countries.[5] The countries included in this study are selected based on the availability of consistent data across all variables. With the exception of the institutional variables which are sourced from the International Country Risk Guide database, all other data are sourced from the World Bank World Development Indicators database.[6] There are nine dependent variables used in this analysis. They are economic growth, sectors (manufacturing, services and agriculture) value-added (VAD) share of GDP, labour market groups (vulnerable, agriculture, services and industry) share of total employed and foreign direct investments (FDI) net inflows. Economic growth is measured by the growth of GDP per capita. These dependent variables are expected to be impacted by the tourism variables through the three multiplier effects indicated by Khan et al. (1995) and, Jucan and Jucan (2013).

Two measures of tourism are used in this analysis: international tourist arrivals per capita (tourist arrivals divided by population) and international tourism receipts relative to GDP. The use of tourist arrivals per capita captures size effect of tourism specialization, while tourism receipts relative to GDP reflects the structure effect or quality of tourism (Zhang & Cheng, 2019) and captures the tourist spending in the domestic economy (Ghartey, 2013).

I use four variables commonly used throughout the economic growth literature as determinants of economic growth. These control variables are investment, government consumption, trade openness and inflation which are relevant to aiding growth (Burnside & Dollar, 2000). An added control variable included is the initial level of GDP per capita at the start of each 3-year period which captures convergence in the model. Based on the literature on tourism and economic growth, it is expected that tourism should contribute positively to economic growth. For the control variables, it is expected that trade openness, investment and government spending should have a positive impact on growth, while inflation has an adverse impact on long-term economic growth (Cannonier & Burke, 2019).

All variables are averaged over three-year periods as is common in the growth literature to minimize business cycle effects from the data. In this study, the non-overlapping 3-year period averages are 1995–1997, 1998–2000, 2001–2003, 2004–2006, 2007–2009, 2010–2012, 2013–2015, 2016–2018.

Empirical approach

For the empirical analysis, I employ a system-GMM dynamic panel analysis developed by Blundell and Bond (1998). The system-GMM is commonly used throughout the literature given its ability over other models to address issues related to omitted variable bias, endogeneity and heterogeneity.[7] To address the over-identifying restrictions, I use the Sargan (1958) test to show that the restrictions are not weakened by many instruments. The panel growth model I consider from the literature is of the form

$$Y_{it} = \beta_0 + \beta_1 A_{i,t-1} + \beta_2 Tourism_{it} + \sum_{j=3}^{n} \beta_j X_{it} + \mu_i + T_t + \varepsilon_{it} \quad (1)$$

where for country i and time t, Y_{it} is the vector of dependent variables, $A_{i,t-1}$ represents the logarithm of real GDP per capita at the beginning of each 3-year period, X_i represents the set of control variables, μ_i captures unobserved country-specific fixed effects, *Tourism* represents the measure of tourism, T_t is the period effect, $\varepsilon_{it}$is the error term and $\beta's$ are the parameters to be estimated. With the exception of the growth variable which is in percent, all variables are converted to natural logs.

From Eq. (1), the variable of interest is *Tourism*. I am specifically interested in the responsiveness of the nine macroeconomic variables to changes in the measures of tourism, which individually captures tourism specialization or the quality of the tourism product. The responsiveness is captured by β_2. That is, for a percent change in *Tourism* the dependent variable is expected to change by β_2 percent. The only exception is for the growth variable whose response will be in percentage point.

To assess the robustness of the linear model, Eq. (1) is augmented to include two institutional variables (law and order and government stability which are included separately), a tourism quadratic term to capture the non-linear effect of tourism on the macroeconomic variables, and a dummy variable to control for tourism dependent economies. It is important to consider the non-linear nature of the COVID-19 pandemic on tourism in predicting the impact of tourism recovery on the economy. It is in this context, I introduce a general form of non-linearity to the model in the form of the squared tourism term. The non-linear model is represented by:

$$Y_{it} = \beta_0 + \beta_1 A_{i,t-1} + \beta_2 Tourism_{it} + \sum_{j=3}^{n} \beta_j X_{it} + \beta_{n+1} Tourism_{it}^2 + \mu_i + T_t + \varepsilon_{it} \quad (2)$$

In order to assess the marginal effect of tourism on the dependent variable in the non-linear model, Eq. (2), the quadratic term is taken into consideration. In that, the overall the marginal effect of tourism on each macroeconomic variable is represented by:

$$\frac{\partial Y}{\partial Tourism} = \beta_2 + 2 * \beta_{n+1} Tourism \quad (3)$$

In addition to presenting the estimates in the Tables A6 to A9, I provide graphical representation of the non-linear marginal effect of tourism on the dependent variables (see Figs. A1 and A2).[8]

It should be noted that there are limitations to models, as they use data up to 2018, to predict the effect of the eventual recovery in tourism on macroeconomic variables. Further, there are potential scarring effects on travel from COVID-19 which may present some uncertainty. As a result, the models may either under or over-predict what the recovery in tourism is likely to entail.

Results

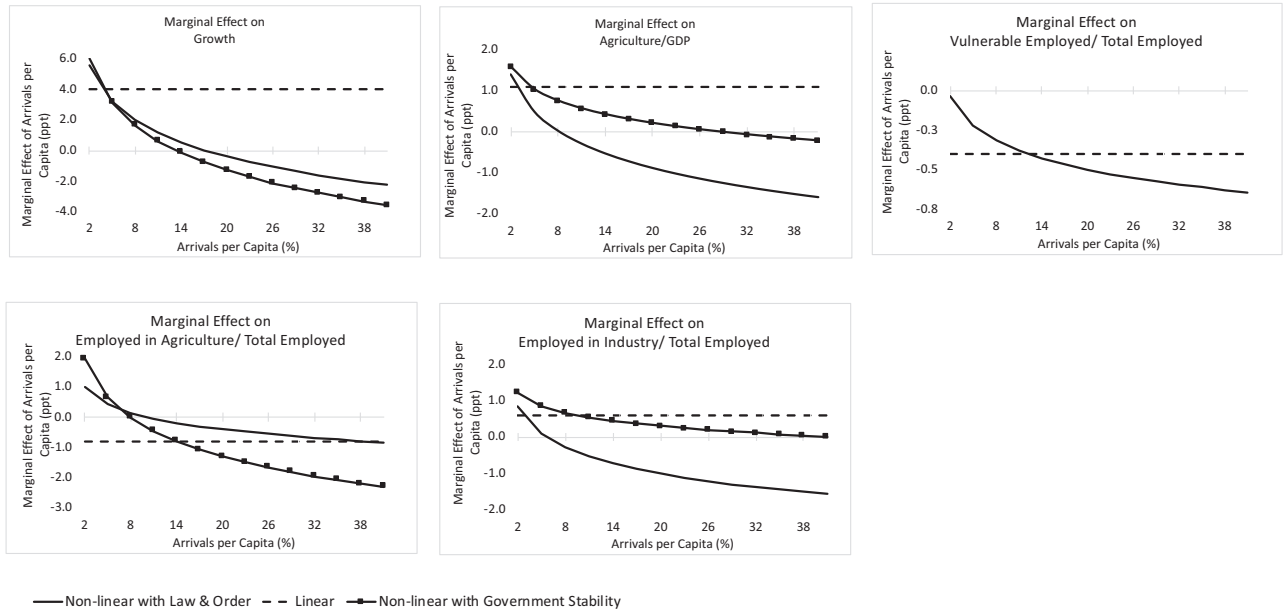
This section presents the results from the sys-GMM estimation based on linear and non-linear models. The results based on the two measures of tourism in the two models are presented in Tables A4 to A5 and Tables A6 to A9, respectively. Only results that have passed the Arellano and Bond (1991) test for autocorrelation are included in Tables A4 and A5. In the presented results, the Sargan test showed that the specifications are not weakened by many instruments. For the growth specification, the estimates of the control variables namely

[5] See Table A1 for list of countries.

[6] See Table A2 for additional data description and Table A3 for summary statistics.

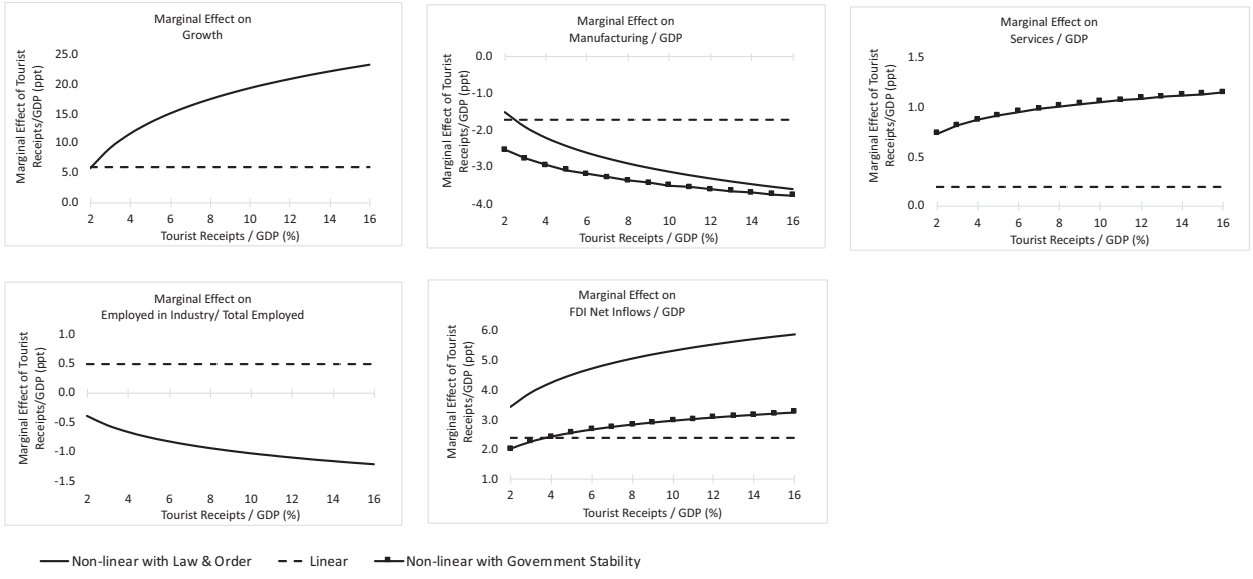
[7] The system GMM estimator handles explanatory variables that are not strictly exogenous as well as controls for heteroscedasticity and autocorrelation within cross-section which makes the estimator more efficient (Hoeffler, 2002; Rodman, 2006).

[8] Graphical representation is only provided where the tourism quadratic term is statistically significant. Where the quadratic tourism term is statistically insignificant, then the linear model is sufficient.



Notes: Marginal effects are only included if the coefficient on the squared Tourist Arrivals per Capita term is statistically significant.

Fig. A1. Marginal Effect on Macroeconomic Variables from a 10% increase in Tourist Arrivals per Capita when Modelled with Institutional Variable.



Note: Marginal effects are only included if the coefficient on the squared Tourist Receipt to GDP term is statistically significant.

Fig. A2. Marginal Effect on Macroeconomic Variables from a 10% increase in Tourist Receipts to GDP Ratio when Modelled with Institutional Variable.

trade openness, investment and government spending and inflation are in line with expectations. The effect of the control variables on the other dependent variables are varied. The two measures of tourism also show that tourism positively impacts long-term growth. In the sub-sections that follow, the results of the linear model is first presented then those from the non-linear model.

Linear model

The results from the linear model, based on both measures of tourism, are reported here. First, for the effect of tourist arrivals per capita on the dependent variables, followed by the effect of tourist receipts to GDP ratio.

Tourist arrivals per capita

Table A4 provides the results of the panel estimates based on tourist arrival per capita along with the control variables (initial GDP per capita, investment, government consumption, trade and inflation). The estimates in the rows correspond with the results from the specifications with the different dependent variables.

Looking at the results in column 1 of Table A4, tourist arrival per capita effect on economic growth is positive and statistically significant. The results indicate that for a one percent increase in tourist arrival per capita, growth is expected to increase on average by 0.4 percentage point. Looking at the services and agriculture VAD share of GDP specifications in columns 2 and 3, the elasticity coefficients on the tourist arrival variable are significant with values of 0.02 percent and 0.11 percent, respectively.

For the labour market specifications, the coefficients on the tourist arrival variable are all statistically significant but with different signs. In this regard, an increase in the tourist arrivals negatively affects the share of the share of vulnerable employed population as well as the share of persons employed in the agriculture sector. Taken together, the negative impact of tourist arrivals suggest that the agriculture industry could be the employer of a large share of the vulnerable population. For the other sectors of the labour market, an increase in tourist arrivals positively contributes to the share of persons employed in both the services and industry sectors.[9]

The impact of tourist arrivals on FDI net inflows into the average country is positive, however, not statistically significant. This result suggests that increase arrivals does not translate into foreign currency inflows to the average domestic economy that could offer significant support.

International tourism receipts relative GDP

The second measure of tourism, tourism receipts to GDP, shows a stronger positive impact on growth when compared to that of the tourist arrivals measure. In this vein, a one percent increase in the tourism receipts to GDP ratio is expected to increase growth on average by 0.61 percentage point (see Table A5 – column 1). This statistically significant impact of tourism receipts to GDP appears to better capture the spending in the average domestic economy and the expected multiplier effect. The elasticity coefficient is stronger than the 0.04 percent to 0.07 percent range found by Cannonier and Burke (2019) for Caribbean states. For the sectoral analysis, an increase in tourism receipts to GDP ratio has a statistically significant positive impact on the services VAD share of GDP with an elasticity coefficient of 0.02 percent, while the similar one percent increase is expected to contribute negatively and significantly to the manufacturing VAD share of GDP with a elasticity coefficient of 0.17 percent.

The responsiveness of the labour market to an increase in tourism receipts to GDP ratio is qualitatively in line with the response to tourist arrival. However, the negative effect on the vulnerable employed is marginally stronger, while the positive effects on the shares of pesons employed in both services and industry are lower (see Table A5 – columns 4, 5 and 6). In terms of the FDI net inflows response to a one percent increase in the tourism receipts to GDP ratio, the elasticity coefficient is positive and statistically significant with a value of 0.24 percent. This finding implies greater foreign exchange inflows that to help to strengthen the balance of payment account.

The results from the linear system-GMM long-run growth model show a positive connection between tourism and growth. In the spirit of providing an economic feel to the assessment, I present what the results mean for the average country. Using the sample mean from the 46 countries in this study, the average real GDP per capita, tourist arrival per capita and tourist receipt to GDP ratio are US$9,596.51, 38.28 percent and 4.53 percent, respectively (see Table A3). Based on the elasticity estimates from column 1 of Tables A4 and A5, individual 10 percent increases in the tourist arrival per capita (approximately 2.6 million persons) and tourist receipt to GDP ratio (approximately US$3.0 billion or 0.5% of sample mean US$GDP) are expected to result in increases in the average real GDP per capita of US$383.9 (=10*0.4%*US$9,596.51) and US$585.4 (=10*0.61%*US$9,596.51), respectively, over a three-year period. The results reveal that the quality of the tourism product as measured by tourism receipt to GDP ratio has a greater impact on growth. While tourism policies aimed at attracting greater tourist arrivals and reinforces tourism specialization should be married with polices that seek to improve the quality of the tourism offerings that will stimulate greater tourist spending.

Table 1 provides additional expected outcome to other macroeconomic variables from a 10 percent increase in each tourism variable. Panel A of the table shows the percent increase in the dependent variable in response to a 10% increase in tourism, panel B presents the sample panel means and panel C shows the expected outcome from the 10 percent change in tourism. As an illustration, a 10 percent increase in tourist receipt to GDP ratio is expected to result in a 1.7 percent decline in the manufacturing VAD share of GDP over a 3-year period. This translates into the manufacturing VAD share of GDP expected to decline to 14.0 percent from 14.24 percent. The percent changes for the macroeconomic variables in response to changes in the tourism variables may appear small, but the economic impact is noteworthy and can have far reaching consequences on the domestic economy. Especially, given the intersectoral linkages with tourism.

Due to the negative economic effect COVID-19 has on the global economy, it is expected that once domestic and international travel restrictions are rested, recovery in tourism will be moderate and so will be the rebound in the directly and indirectly connected areas of the average domestic economy. The findings from this panel analysis can be used by policy makers, particularly those in tourism dependent economies, as a gauge to direct their expectations over a three-year horizon.

To put the results in context, once the recover in the tourism industry begins, the results indicate that this should have a positive impact over the medium term for growth in per capita GDP, services and agriculture share of GDP as well as employment within the service and industry sectors. There are negative impacts expected for the share of manufacture share of GDP, employment for the vulnerable population and those in the agriculture sector. The expected impact on FDI net inflows relative GDP is positive if the tourism measure of tourism receipts to GDP measure is considered.

Non-linear model

Looking at the results from the non-linear model with tourist per capita (Table A6), the estimate for the law and order variable is only statistically significant when assessing the effect on the agriculture sector, employment in the industry sector or on net FDI inflows. In this vein, the effect on these dependent variables are negative in the first two cases but positive in the latter. When compared to the non-linear model with law and order, government stability has an overall positive effect on growth and other areas of the economy (Table A7).

In the non-linear model with tourist receipts to GDP ratio (Table A8), the coefficient on the law and order variable is statistically significant and negative, when assessing the effect on manufacturing share of GDP as well as on employment shares in both the services and industry sectors. While, the government stability institutional measure has a significant negative effect on employment in the industry, but a significant and positive effect on net FDI inflows (Table A9). The results suggest that external capital will flow to countries where there are high levels of institutional quality. However, high levels of institutions dampen growth in some areas of the economy.

[9] Recall that the industry sector consists of mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water).

Table 1
Expected Average Percentage Point Impact on Macroeconomic Variables over a 3-Year Period of an accumulated 10% increase in Tourism.

	Growth (Percentage point)	Manufacturing/ GDP	Services/ GDP	Agriculture/ GDP	Vulnerable Employed/ Total Employed	Employed in Agriculture/ Total Employed	Employed in Services/ Total Employed	Employed in Industry/ Total Employed	FDI Net Inflows/ GDP
Panel A: Elasticity (%)									
Tourism Arrival per Capita	4.0*		0.2**	1.1***	−0.4***	−0.8**	1.1**	0.6***	
Tourism Receipts/GDP	6.1***	−1.7***	0.2**		−0.6**		0.2***	0.5***	2.40***
Panel B: Average for 3-Year Panel data (%)									
Average of data	2.26	14.24	53.70	13.44	42.81	28.49	52.63	18.88	4.00
Panel C: Expected Average Outcome from the respective 10% increase in Tourism measures									
Tourism Arrival per Capita	6.26		53.8	13.59	42.64	28.26	53.21	18.99	
Tourism Receipts/GDP	8.36	14.00	53.8		42.55		52.74	18.97	4.10

Notes: Recall, with the exception of the growth variable which is in percent, all other variables are enter the respective specifications as log of a ratio. For example, a 10% increase in Tourism Arrival per Capita is expected to increase Agriculture/GDP ratio by 1.1% to 13.59% (1.011*13.44% = 13.59%). For the growth variable, a 10% increase in Tourism Arrival per Capita is expected to increase the growth of GDP per Capita by 4.0 percentage points to 6.26% (2.26% + 4.0% = 6.26).

In all specifications, the coefficient on the tourist dependent economy dummy variable signals that heavy reliance on tourism can have a drag on the economy over time. By controlling for the tourist dependent economies and including added control variables, the direct effect of tourism specialization on growth is now 0.74 (see Table A6), relative to 0.4 in the linear model (see Table A4). However, the negative coefficient on the squared tourist arrival per capita term, reinforces the negative effect excessive tourism specialization can have on the economy. That is, at higher levels of tourism specialization, the overall marginal effect of tourism on growth becomes negative. In that, when tourist arrival per capita exceeds 13.4 percent (when modelled with government stability) or 17.2 percent (when modelled with law and order), the overall marginal of tourism specialization on growth becomes negative (see Fig. A1).

The inclusion of the added control variables (particularly the squared term) provide some clarity, where the estimates from the linear model are likely to either under or over-predict what would an eventual rebound of tourism entail. For the model with tourist arrivals, where the non-linear term is statistically significant, it shows that the linear model would have overestimated the marginal effect of tourist arrivals on growth, agriculture share of GDP, share of vulnerable persons employed and share of persons employed in the industry sector (Fig. A1). Looking at the models with tourist receipt to GDP variable, the non-linear model shows that the linear model would have underestimated the effect of tourist spending on growth and other areas of the economy (particularly, manufacturing and services shares of GDP as well as net FDI inflows to GDP ratio) (Fig. A2).

Discussion

The results show that tourism effect on growth is stronger when measured through receipts than arrivals. This outcome is consistent regardless of whether the model used is linear or non-linear. When a country specializes in tourism, it creates a market to attract visitors to its destination. The arrival of visitors provides an initial spending in the economy. In this study, the marginal effect of tourism specialization on growth decreases at higher levels of tourism specialization (Fig. A1). This diminishing return to tourism specialization can be linked to the negative effects of excessive tourism on other sectors of the economy as indicated by Capó et al. (2007), Hadjikakou et al. (2015) and Sun (2016). Tourist receipts having a stronger effect on growth, relative to tourism specialization, relates to the multiplier effect of tourism spending on the overall economy as indicated by Jucan and Jucan (2013), Ghartey (2013) and Zhang and Cheng (2019). That is, the economic impact of tourist receipts captures the direct, indirect and induced effects. In this study, the positive effects of tourist receipts are highlighted in the resulting increases in the services sector share of GDP, employment in the service sector and in the net FDI inflows to GDP ratio. The indirect and induced effects of tourism can be found in the areas of the economy, such as manufacturing and agriculture sectors, that are interconnected with the services sector. The findings also show that the effect of tourist receipts on growth remains positive at higher levels of receipts (Fig. A2).

Table 2
Estimated Loss in Real GDP from the Decline in Tourist Arrivals per Capita, in 2020.

		Real GDP Growth (%)
IMF		−5.4
Linear Model		−9.6
Non-linear Models	(with Law and order)	−6.8
	(with Government Stability)	−6.3

Note: IMF indicates estimate sourced from the International Monetary Fund (2021). Recall, that the linear model is based on a sample of 46 countries, while the non-linear models are based on a sample of 40 countries.

When compared to Cannonier and Burke (2019), the quantitative effect of tourism on growth is much stronger in this study. The difference could be attributed to Cannonier and Burke (2019) looking only at Caribbean economies, with a sample period (1980–2015) that is 15 years earlier than my starting point and, whose average growth is far lower than the average for the sample of countries I examined.[10] Additionally, there exist greater variation in my country sample in terms of tourism specialization, income levels and regions.

Using the WTO (2021) estimates for the decline in international tourist arrivals for 2020, for the sample of countries in this study, I compute the expected loss in real GDP for 2020 using the estimates from the linear and non-linear models. Relative to the IMF's growth estimates for the sample of countries in this study, which shows an average contraction of 5.4 percent, the non-linear models predict contractions that are higher by 0.9 percentage point (ppt) and 1.4 ppt (Table 2). While the linear model predicts a contraction that is 4.2 ppts higher than that of the IMF estimate. The computation exercise suggests that the introduction of tourism non-linearity in the growth model, appears to temper the over prediction of the contraction in the sample of countries.

The findings suggest that with growth in tourism, productive resources could be reallocated to sectors of the economy, such as the services and agriculture, that appear to have a stronger connection to tourism industry. Thus, increasing these sectors VAD composition of GDP. This is consistent with the findings that growth in tourism is

[10] This study includes only two of the Caribbean countries covered by Cannonier and Burke (2019).

expected to be associated with movement in labour towards the services and industry. In tourism specialized economies, tourism related activities constituents a significant component of the service sector. Following a recovery in tourism activities and the inflow of external capital for tourism related projects, it is fair to see the service and industry sectors attracting labour from other sectors.

In terms of the wider economic development of tourism, the study indicates that increased tourism significantly lowers the share of vulnerable persons employed. The lowering of vulnerable employment, is an indication that the socio-economic condition among these workers are likely to improve. To put into context, increased tourism has positive cross-sector spillover effects which can contribute to job growth and growth in the formal economy.

Given the rare effect of COVID-19 on the economy and the uncertainty surrounding the speed of the eventual recovery of tourism, the marginal effects of tourism on the economy from the linear and non-linear frameworks should be used as a guide to aid policy design.

Conclusion

Post COVID-19, policymakers should be prepared for the economic impact from tourism and related activities. This study examines the impact of tourism on economic growth and other key macroeconomic variables among 46 countries. The study uses 3-year period averages for the data variables spanning the period 1995 to 2018. Estimation is carried out using system GMM that has the ability to control for potential endogeneity problems.

The panel analysis found that tourism does have a statistically significant impact on economic growth, regardless of the measure of tourism considered. In this vein, the impact on growth from an increase in international tourism receipts to GDP ratio is 50 percent higher than from an increase in tourist arrival per capita, in a linear specification. When the non-linear specification is considered, it reveals that excessive tourism or tourism specialization at higher levels can have a dampening effect on growth. However, increased tourist receipts, because of its positive multiplier effect, it has a positive effect on growth, at all levels. Additionally, growth in tourism is expected to positively influence the services and agriculture sectors value-added shares of GDP as well as increase employment within the service and industry sectors. However, growth in tourism is expected to negatively affect manufacturing sectors value-added share of GDP. Some negative labour market impact is expected to stem from tourism growth, particularly, as it relates to persons employed in the agriculture sector. Notably, increased tourism lowers the share of vulnerable employment, an indication of improvement in this group socio-economic condition. The expected impact of tourism increase on FDI net inflows relative GDP is predicted to be positive.

A distinction can be made between tourists that spend more versus less. In that, destinations that have greater attractions or offerings will be more likely to garner more spending from visitors, when compared to destinations with limited or less diverse attractions. It can be the goal of policy makers to ensure that the tourism offering is diverse, so that the activities that the average tourist is engaged in, is beyond their initial plan.

In this study, 28 out of the 46 countries examined are not considered to be tourist dependent economies (see Table 1A). In the context of COVID-19 travel restrictions and some travellers' apprehension to travel within the short-term, there may be some room for policy makers in these countries to explore the promotion of domestic tourism. The design of a domestic tourism policy will serve to either enhance domestic absorption or reallocation to fill out the fallout from international tourism. The economic impact of such a domestic tourism policy can be addressed in future research.

I tie the results to the notion that any tourism-led growth strategy pursued by a policy maker should be one that greatly considers improvement in the quality of the tourism offerings while attracting growth in visitor arrivals. It is the quality of the tourism products that will stimulate greater tourist spending and the pass-through of income to other areas of the economy. It is expected that policy makers who are guided by these findings will be better positioned to navigate their economies once the COVID-19 pandemic abates and the global tourism industry is in recovery mode. In addition, policy actions for the tourism industry should form a part of any COVID-19 recovery framework in place for a country. Furthermore, policy makers should recognize the vulnerability of the tourism industry and formulate strategies that would improve its resilience as well as support its economic diversification.

Funding

Not applicable.

CRediT authorship contribution statement

Hubert G. Scarlett: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Table A1
List of Countries by Region.

North America	East Asia & Pacific	Sub-Saharan Africa	Latin America & Caribbean
United States♣	Australia♣	Benin*	Bahamas, The* ♣
	Cambodia ♣	Botswana	Bolivia*
	China	Burundi*	Brazil
	Hong Kong SAR, China	Eswatini*	Chile*
	Indonesia	Gambia, The* ♣	Colombia*
	Japan	Kenya* ♣	Costa Rica* ♣
	Korea, Rep.	Malaysia	Dominican Republic* ♣
	New Zealand ♣	Malawi*	Ecuador*
	Philippines	Mauritius ♣	El Salvador* ♣
	Singapore	Namibia ♣	Guyana
	Thailand ♣	Niger*	Jamaica* ♣
		Nigeria*	Mexico
		South Africa*	Nicaragua* ♣
		Sudan*	Panama*
		Tanzania* ♣	Paraguay*
		Togo*	Peru*
		Uganda* ♣	Uruguay ♣

Note: * indicates countries that received financial assistance from the IMF due to the negative economic effect of COVID-19. ♣ indicates tourist dependent economies whose tourist receipts share of export is above the sample mean.

Table A2
Data Description.

Variable	Measure
Growth	Constructed as the log difference of real GDP per capita (constant 2010 US$).
Initial GDP per capita	Real GDP per capita at the beginning of the respective sample period (constant 2010 US$).
Inflation	Constructed as log difference of the consumer price index.
Investment	Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.
Government consumption	General government final consumption expenditure divided by GDP.
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.
Agriculture/GDP	Agriculture, forestry, and fishing, value added (% of GDP).
Service/GDP	Services, value added (% of GDP).
Manufacturing/GDP	Manufacturing, value added (% of GDP).
Vulnerable	Vulnerable employment, total (% of total employment) (modeled ILO estimate). Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment.
Employed in Agriculture	Employment in agriculture (% of total employment) (modeled ILO estimate).
Employed in Services	Employment in services (% of total employment) (modeled ILO estimate).
Employed in Industry	Employment in industry (% of total employment) (modeled ILO estimate). The industry sector consists of mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water).
Net FDI inflows	net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.
Arrival per capita	International inbound tourists divided by population.
Receipts/GDP	International tourism, receipts (current US$) divided by GDP. International tourism receipts are expenditures by international inbound visitors, including payments to national carriers for international transport.
Law and order	6-point scale (larger values imply more law and order) captures both the strength and impartiality of the legal system and an assessment of popular observance of the law.
Government stability	12-point scale (larger values imply more stability) captures both the government's ability to carry out its declared program(s), and its ability to stay in office.

Table A3
Summary Statistics for 3-Year Panel Data.

	Count	Mean	Standard Deviation	Minimum	Maximum
Growth	368	2.26	2.33	−7.30	10.22
Initial GDP per capita (US$)	368	9596.51	13,375	219.96	55728.68
Manufacturing/GDP	364	14.24	7.22	1.03	34.87
Service/GDP	364	53.70	11.70	23.49	91.45
Agriculture/GDP	367	13.44	11.75	0.03	45.94
Vulnerable Employed	368	42.81	25.79	3.86	94.73
Employed in Agriculture	368	28.49	22.28	0.18	92.28
Employed in Industry	368	18.88	6.66	1.54	38.67
Employed in Service	368	52.63	17.79	5.46	87.94
FDI Net Inflows/GDP	368	4.00	4.93	−1.45	43.65
Tourism receipt/Exports	365	13.30	13.77	0.24	78.57
Arrival/Population	366	38.28	79.57	0.13	569.48
Tourism receipt/GDP	367	4.53	5.06	0.03	33.71
Investment/GDP	368	22.98	6.76	4.73	46.48
Government Consumption/GDP	368	13.64	4.52	1.00	28.14
Trade/GDP	368	81.10	68.22	16.40	419.33
Inflation	365	6.60	7.92	−2.44	82.62
Law and order	320	3.44	1.25	1.00	6.00
Government Stability	320	8.14	1.45	4.61	11.47

Table A4
Estimation Results with Tourist Arrivals per Capita.

	Dependent Variables							
	Growth (Percentage point)	Services/ GDP	Agriculture/ GDP	Vulnerable Employed/ Total Employed	Employed in Agriculture/ Total Employed	Employed in Services/ Total Employed	Employed in Industry/ Total Employed	FDI Net Inflows/ GDP
Initial GDP per capita	−1.13***	0.11***	−0.80***	−0.40***	−0.68***	0.27***	0.28***	−0.02
	(0.25)	(0.02)	(0.05)	(0.02)	(0.05)	(0.08)	(0.03)	(0.16)
Investment	5.98***	−0.11***	0.23***	0.17***	0.40***	0.01	0.14***	1.99***
	(0.59)	(0.02)	(0.04)	(0.04)	(0.08)	(0.09)	(0.04)	(0.21)
Government Cons.	−0.58	0.15***	−0.26***	−0.04*	−0.07	0.06	−0.17***	−0.22*
	(0.49)	(0.03)	(0.04)	(0.02)	(0.05)	(0.07)	(0.03)	(0.13)
Trade openness	1.19***	−0.12***	−0.27***	−0.07***	−0.13**	−0.01	0.06	−0.36*
	(0.45)	(0.02)	(0.06)	(0.02)	(0.06)	(0.06)	(0.04)	(0.20)
(1 + inflation)	−0.28	0.02***	0.06***	−0.03***	0.07***	−0.02	−0.05***	−0.08
	(0.28)	(0.00)	(0.01)	(0.01)	(0.02)	(0.05)	(0.01)	(0.09)
Arrival per capita	0.40*	0.02**	0.11***	−0.04***	−0.08**	0.11**	0.06***	0.20
	(0.24)	(0.01)	(0.04)	(0.01)	(0.04)	(0.05)	(0.01)	(0.13)
Obs.	362	359	362	362	362	362	362	359
AR(1) p-values	0.000	0.023	0.023	0.011	0.078	0.009	0.014	0.030
AR(2) p-values	0.687	0.196	0.387	0.246	0.436	0.478	0.067	0.417
Sargan p-values	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of Instruments	82	51	51	51	82	20	51	51

Notes: All dependent variables, with the exception of growth which is in percent, are converted to natural logs. Standard errors are in parentheses. Time dummies are included and intercept coefficients estimated but are not reported for brevity. The policy control variables are logarithms of initial GDP per capita (i.e. 1995, 1998, 2001, etc.) as well as logarithms of investment/GDP, government consumption/GDP, trade/GDP, (1 + inflation) and tourism variable (1985–1989, 1990–1994, etc.). *, ** and *** indicate significance at the 10, 5 and 1% level, respectively. 'AR' represents Arellano and Bond (1991) test for autocorrelation of order 1 and 2 in first differences. Sargan p-value indicates the Sargan (1958) test of overidentifying restrictions (where restrictions Not robust, but not weakened by many instruments) with a chi-square distribution and the corresponding probability value (p-value). The system GMM model incorporates Windmeijer small-sample correction for the two-step standard errors.

Table A5
Estimation Results with Tourism Receipts share of GDP.

	Growth (Percentage point)	Manufacturing/ GDP	Services/ GDP	Vulnerable Employed/ Total Employed	Employed in Services/ Total Employed	Employed in Industry/ Total Employed	FDI Net Inflows/ GDP
Initial GDP per capita	0.57*	0.02	0.12***	−0.50***	0.37***	0.37***	0.05
	(0.30)	(0.05)	(0.01)	(0.08)	(0.02)	(0.02)	(0.08)
Investment	9.14***	0.21**	−0.16***	0.12	0.05*	0.23***	1.66***
	(0.70)	(0.09)	(0.01)	(0.20)	(0.03)	(0.06)	(0.29)
Government cons.	1.26***	−0.14	0.10***	−0.09	−0.03	−0.05**	−0.21
	(0.31)	(0.09)	(0.01)	(0.11)	(0.02)	(0.02)	(0.16)
Trade openness	2.50***	0.39***	−0.04	0.06	−0.08***	−0.06*	−0.16
	(0.50)	(0.11)	(0.02)	(0.18)	(0.01)	(0.03)	(0.24)
(1 + inflation)	−1.66***	−0.01	0.01**	−0.03	0.03***	−0.01	−0.11
	(0.22)	(0.03)	(0.01)	(0.06)	(0.01)	(0.01)	(0.08)
Tourist receipts	0.61***	−0.17***	0.02**	−0.06**	0.02***	0.05***	0.24***
	(0.16)	(0.04)	(0.01)	(0.03)	(0.01)	(0.01)	(0.07)
Obs.	363	359	359	363	363	363	360
AR(1) p-values	0.008	0.021	0.022	0.007	0.005	0.010	0.039
AR(2) p-values	0.642	0.425	0.225	0.140	0.034	0.057	0.354
Sargan	0.000	0.000	0.000	0.000	0.000	0.000	0.004
Number of Instruments	51	82	51	20	51	51	51

Note: See notes in Table A4.

Table A6
Estimation Results with Tourist Arrivals per Capita and Law & Order.

	Growth (Percentage point)	Services/ GDP	Agriculture/ GDP	Vulnerable Employed/ Total Employed	Employed in Agriculture/ Total Employed	Employed in Services/ Total Employed	Employed in Industry/ Total Employed	FDI Net Inflows/ GDP
Arrival per capita	0.74**	0.02	0.21**	0.01	0.14***	0.11**	0.14***	0.31
	(0.36)	(0.01)	(0.08)	(0.02)	(0.04)	(0.05)	(0.05)	(0.21)
Arrival per capita Squared	−0.13***	0.01	−0.05***	−0.01*	−0.03***	0.00	−0.04**	0.06
	(0.05)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.04)
Law and order	0.01	0.00	−0.25***	−0.02	−0.15***	−0.00	−0.08*	0.40***
	(0.18)	(0.01)	(0.04)	(0.02)	(0.03)	(0.03)	(0.04)	(0.14)
Tourist dependent Dummy	−1.06**	0.25	−0.37	−0.14	−1.01***	0.02	−0.25	−0.56
	(0.45)	(0.18)	(0.32)	(0.19)	(0.28)	(0.15)	(0.25)	(1.63)
Obs.	316	313	316	316	316	316	316	315
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Only 40 out of the 46 countries are included in the non-linear assessment because of the unavailability of institutional quality indicator data for six countries (Benin, Burundi, Cambodia, Gambia, Mauritius and Namibia). The initial GDP per capita, policy control variables (investment/GDP, government consumption/ GDP, trade/GDP and (1 + inflation)), time dummies and intercept are included but not reported for brevity. See Table A4 for further model details.

Table A7
Estimation Results with Tourist Arrivals per Capita and Government Stability.

	Growth (Percentage point)	Services/ GDP	Agriculture/ GDP	Vulnerable Employed/ Total Employed	Employed in Agriculture/ Total Employed	Employed in Services/ Total Employed	Employed in Industry/ Total Employed	FDI Net Inflows/ GDP
Arrival per capita	0.83**	0.02	0.20**	0.01	0.29***	0.11***	0.15***	0.50
	(0.35)	(0.05)	(0.09)	(0.02)	(0.08)	(0.03)	(0.03)	(0.34)
Arrival per capita Squared	−0.16***	0.00	−0.03***	−0.01	−0.07***	−0.01	−0.02***	−0.04
	(0.05)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.06)
Government stability	0.59***	0.01	0.02**	0.01	0.01	−0.00	0.02***	0.28**
	(0.15)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.13)
Tourist dependent Dummy	−1.47***	0.20	−0.49*	−0.25	−0.41**	0.20**	−0.25	−0.21
	(0.41)	(0.14)	(0.29)	(0.19)	(0.16)	(0.10)	(0.16)	(0.69)
Obs.	316	313	316	316	316	316	316	315
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: See notes in Table A6.

Table A8
Estimation Results with Tourism Receipts share of GDP and Law & Order.

	Growth (Percentage point)	Manufacturing/GDP	Services/GDP	Vulnerable Employed/Total Employed	Employed in Services/Total Employed	Employed in Industry/Total Employed	FDI Net Inflows/GDP
Tourist receipts	1.32	−0.08*	0.03*	−0.05**	0.02**	−0.01	0.26*
	(0.98)	(0.05)	(0.02)	(0.02)	(0.01)	(0.03)	(0.15)
Tourist receipts squared	0.42*	−0.05***	−0.00	0.00	0.00	−0.02***	0.06*
	(0.23)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.03)
Law and order	0.35	−0.10**	−0.02	−0.01	−0.03**	−0.09***	0.18
	(0.62)	(0.04)	(0.01)	(0.02)	(0.01)	(0.02)	(0.16)
Tourist dependent Dummy	−12.29**	−1.09***	0.33***	−0.20	0.35**	−0.18	−1.01
	(5.18)	(0.32)	(0.09)	(0.25)	(0.16)	(0.13)	(1.31)
Obs.	317	313	313	317	317	317	316
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: See notes in Table A6.

Table A9
Estimation Results with Tourism Receipts share of GDP and Government Stability.

	Growth (Percentage point)	Manufacturing/GDP	Services/GDP	Vulnerable Employed/Total Employed	Employed in Services/Total Employed	Employed in Industry/Total Employed	FDI Net Inflows/ GDP
Tourist receipts	0.50	−0.21*	0.06***	−0.05**	0.03	0.03	0.16*
	(1.03)	(0.12)	(0.02)	(0.02)	(0.05)	(0.05)	(0.09)
Tourist receipts squared	0.36	−0.03	0.01*	−0.01	0.01	−0.01	0.03*
	(0.24)	(0.03)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)
Government stability	0.59	−0.01	0.00	−0.00	0.01	−0.02**	0.12**
	(0.42)	(0.04)	(0.00)	(0.01)	(0.02)	(0.01)	(0.05)
Tourist dependent Dummy	−9.79*	−0.68	0.14	−0.12	0.34*	−0.31***	−0.33
	(5.16)	(0.57)	(0.15)	(0.23)	(0.19)	(0.11)	(0.94)
Obs.	317	313	313	317	317	317	316
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: See note in Table A6.

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