International Tourism and Short-Run Growth

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Abstract: Using a panel of 157 countries for 1995–2017, this paper explores the relationship between tourism specialization and short-run growth. Making use of bilateral tourism and manufacturing flows, differences in importing countries' preference and demand side shocks, defined in terms of GDP per capita of tourism-importing countries, we construct an instrument for tourism specialization. 2SLS estimation results are very close to those obtained with OLS estimation results, but are associated with larger standard errors. We find that an 1% increase in tourism specialization is (on average) associated with 0.01 percentage point (or 0.5% in terms of elasticity) increase in the growth rate of GDP per capita for OECD countries, *cet. par.*, though it does not have a statistically significant effect when all countries are included.

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1 Introduction

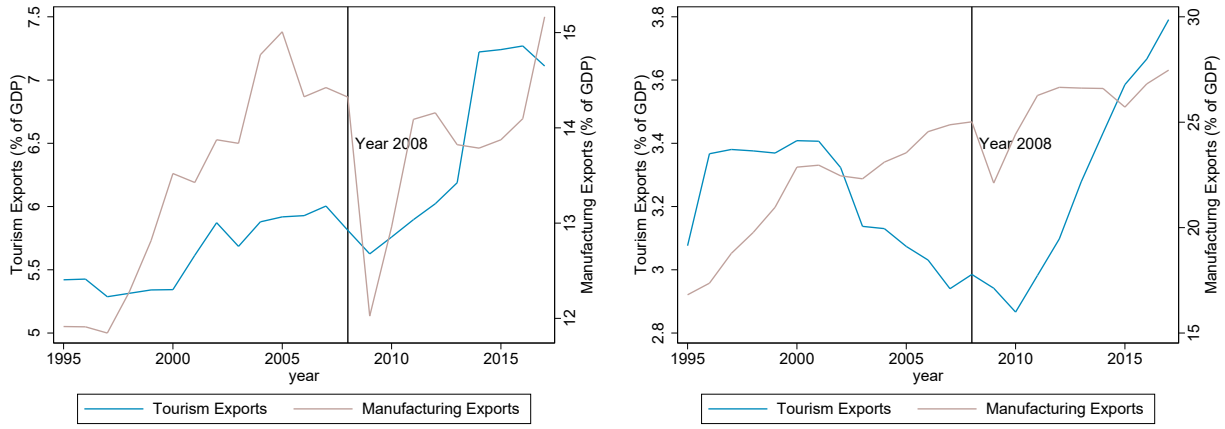
During the past few months, the coronavirus pandemic has exerted huge negative impacts on the economies throughout the world. Many countries have witnessed unprecedented drops in their GDP and skyrocketing levels of unemployment. How to efficiently allocate resources and help economies recover has been a paramount concern of economists and policy makers. A lot of potential solutions have been proposed. One of them is to encourage the restart of international tourism flows. This paper explores the past pattern of international tourism and short-run economic growth in order to quantify the impact of such policies.

Over the last two decades, tourism exports have become increasingly important throughout the world. Such exports have been growing very rapidly due to lower transportation costs and higher incomes. Exports of tourism services is of course very different from exports of manufacturing goods. Typically, manufacturing goods are exported by shipping domestic goods to other countries for further processing and local consumption and investment. In contrast, tourism is exported when visitors travel from one to another country and consume tourism-related services locally.

As Figure 1a plots, the world average share of tourism exports in GDP increased by 31%, from 5.42% in 1995 to 7.11% in 2017. During the same period, the world average share of manufacturing exports in GDP increased by 27%, from 11.91% to 15.17%. Compared with manufacturing exports, tourism exports have grown more rapidly, and stagnated more slowly following the 2008 global financial crisis. From the perspective of the exporting country, tourism has the additional benefit of being more environment-friendly, as it typically pollutes less than manufacturing production. Figure 1b plots the world average tourism share in GDP for the OECD countries. Manufacturing exports shares in total GDP are higher for OECD countries, compared with the world average. OECD countries specialize less in international tourism. However, since 2010, tourism exports have been growing fast: their share in GDP has increased by 32% from 2010 to 2017.

Relatively few studies have examined the impact of tourism exports on countries' growth. Sequeira et al. (2008) [8] estimate a dynamic panel model and find evidence that tourism specialization promotes economic growth during the period 1980 to 2002. Specifically, they find an impact multiplier between 0.03 and 0.11, implying that an 1% increase in the share of tourism spending in GDP accounts for a 0.03–0.11% increase in GDP per capita in the short run. Arezki et al. (2009)

Figure 1: Tourism and Manufacturing Exports as Share of GDP, 1995-2017



(a) World Average

(b) OECD Country Average

Notes: Data source: World Bank (World Development Indicators).

[1] estimate a cross-sectional model, using the number of UNESCO World Heritage sites as an instrument for tourism exports. Their 2SLS results show that a 1 percentage point increase in the average of tourism exports as a share of total exports for the period 1980 to 1990 is associated with 0.012-0.017 percentage point increase in the growth of GDP per capita over the period 1980 to 2002. More recently, Faber and Gaubert (2019) [5] explore the effects of tourism on economic development, but their analysis is limited to Mexico and contains a lot of specific detail about its economy.

The present paper seeks to contribute to this rather small literature by relying on an instrument that is constructed based on the difference in importer countries' tastes regarding tourism-related services and manufacturing goods, specifically by using the change in their relative importance across years, and estimating the causal impact of tourism specialization on output growth. With our panel data, a simple OLS model, even with fixed effects, is likely to suffer from endogeneity bias. For instance, the growth rate of GDP per capita may affect governments' fiscal as well as regulatory policies that influence the allocation of resources across the tourism and manufacturing sectors and thus reversely affect tourism specialization. Sequeira et al. (2008) [8] partially address such an endogeneity by including the lagged dependent variable, i.e., lagged GDP per capita. Arezki et al. (2009) [1] use the number of UNESCO sites as an instrument, but since that instrument is time-invariant, they are only able to estimate a cross-sectional model. The present paper makes use

of data on bilateral tourism and manufacturing flows and importers' GDP per capita and constructs an exogenous instrument for use in estimations with panel country-level data.

2 Data and Methodology

2.1 Data

The data used in this paper come from several sources. One is the World Development Indicators (WDI) [9]. The WDI provide information on countries' annual GDP per capita, which is used both as the dependent variable in the structural model and in the construction of the instrument for tourism specialization. Second is the UN Comtrade [10] database, which provides data on bilateral manufacturing flows since 1962. A third data source is the *Yearbook of Tourism Statistics* from the World Tourism Organization (UNWTO) [11]. It provides bilateral tourism flows in terms of numbers of arrivals during 1995–2018. [2]

The key explanatory variable is tourism specialization, which we define as the share of tourism exports in total tourism and manufacturing exports. The tourism exports [3] come from the WDI, and are available for 1995–2017. The manufacturing exports come from UN Comtrade. While the manufacturing exports are available for more years, we make use of data for 1995–2017 only. Additional control variables including population, fertility rate, government consumption, openness to trade, life expectancy are also from the WDI.[4] The investment-output ratio and human capital index are from Penn World Table [6, 12].

Table 1 reports summary statistics for the relevant variables, separately for all countries and for the 37 OECD countries. Compared with the whole sample, the OECD countries have higher GDP per capita, slightly smaller GDP per capita growth rate, and specialize less in the tourism sector.

[2]The available tables are different for different countries. The ones we use are: (1) Arrivals of non-resident tourists at national borders, by nationality; (2) Arrivals of non-resident tourists at national borders, by country of residence; (3) Arrivals of non-resident visitors at national borders, by nationality; (4) Arrivals of non-resident visitors at national borders, by country of residence; (5) Arrivals of non-resident tourists in hotels and similar establishments, by nationality; (6) Arrivals of non-resident tourists in hotels and similar establishments, by country of residence; (7) Arrivals of non-resident tourists in all types of accommodation establishments, by nationality; (8) Arrivals of non-resident tourists in all types of accommodation establishments, by country of residence.

[3]The variable is international tourism, receipts.

[4]Fertility rate is Fertility rate, total (births per woman), government consumption is General government final consumption expenditure (% of GDP), openness to trade is calculated as sum of imports and exports of goods and services as the share of GDP, and life expectancy is Life expectancy at birth, total (years).

Table 1: Summary Statistics

variable	N	mean	sd	min	max
All countries					
D.ln(GDP per capita)	2758	0.0235	0.0395	-0.4550	0.2852
GDP per capita	3046	14026.99	18170.37	183.55	111968.40
Tourism Specialization	3046	21.99	23.67	0.05	97.90
Fertility Rate	3009	2.67	1.41	0.86	7.73
Gov. Consumption	2754	16.13	5.54	0.91	47.19
Openness	2930	0.90	0.55	0.00	4.43
D.ln(Population)	2793	0.01	0.01	-0.04	0.09
Investment-Output ratio	2921	0.23	0.09	0.00	0.96
Life Expectancy	3007	70.91	8.70	42.52	84.68
Human Capital Index	2519	2.56	0.67	1.07	3.97
OECD countries					
D.ln(GDP per capita)	747	0.0214	0.0322	-0.1540	0.2150
GDP per capita	791	34000.59	21029.21	4796.06	111968.40
Tourism Specialization	791	10.46	7.64	1.09	49.21
Fertility Rate	791	1.68	0.39	1.05	3.11
Gov. Consumption	791	18.90	3.76	9.83	27.94
Openness	791	0.89	0.55	0.17	4.16
D.ln(Population)	747	0.01	0.01	-0.02	0.03
Investment-Output ratio	791	0.25	0.05	0.10	0.55
Life Expectancy	791	78.07	3.37	66.96	84.10
Human Capital Index	791	3.17	0.39	1.85	3.81

Notes: Data source: WDI, UN Comtrade, and Penn World Table. D.ln(GDP per capita) is measured with PPP at constant 2017 international $. The level of GDP per capita is in 2010 USD. Tourism specialization is defined as (Tourism Exports/(Tourism Exports+Manufacturing Exports))*100%. Government consumption is the % of GDP. Openness is ((Imports + Exports)/GDP)*100%.

2.2 Methodology

Like with all goods and services, tourism exports and manufacturing exports for a particular country are determined by both the supply and demand. Here for the purpose of constructing an instrument, we consider the issue from the perspective of the demand side and assume supply is not limited by capacity.

We assume that each importer country j spends a share α of its income on manufacturing and tourism goods from host country i. Countries vary with respect to preference for manufacturing goods and tourism services. In particular, we assume that country j spends a share η_{ijt} on tourism services and $1-\eta_{ijt}$ on manufacturing goods. Then, we define the tourism specialization as follows:

$$\begin{aligned} Tourism_{it} &= \frac{TourismExports_{it}}{TourismExports_{it} + ManufacturingExport_{it}} * 100\% \\ &= \frac{\sum_j \alpha GDPpc_{jt} * \eta_{ijt}}{\sum_j \alpha GDPpc_{jt} * \eta_{ijt} + \sum_j \alpha GDPpc_{jt} * (1-\eta_{ijt})} * 100\% \\ &= \frac{\sum_j \alpha GDPpc_{jt} * \eta_{ijt}}{\sum_j \alpha GDPpc_{jt}} * 100\% \\ &= \left(\sum_j \frac{GDPpc_{jt}}{\sum_j GDPpc_{jt}} * \eta_{ijt} \right) * 100\%. \end{aligned} \tag{1}$$

Eq. (1) suggests that the tourism specialization for the exporter country i is a weighted average of the preference of the importer country j, where the weight is the importer country j's relative income compared with the income of all countries importing from i (the $\left(\frac{GDPpc_j}{\sum_j GDPpc_j}\right)$'s).

Suppose that country j's preference consists of two parts:

$$\eta_{ijt} = \eta_{ij} + \varepsilon_{it}, \tag{2}$$

where η_{ij} is the "benchmark" preference of country j, and ε_{it} is the time-varying shock based on conditions in country i. For instance, investments in tourism-related activities by country i would represent a positive shock in ε_{it}.

Since ε_{it} can be endogenous, we can construct an instrument for tourism specialization by fixing the preferences of importer countries and making use of the variation in change in the "weight".

Specifically, we construct the instrument by using the importer countries' last year's preference and the current year's weight:[5]

$$Tourism\_IV_{it} = \left(\sum_j \frac{GDPpc_{jt}}{\sum_j GDPpc_{jt}} * \eta_{ijt-1} \right) * 100\%, \tag{3}$$

where

$$\eta_{ijt-1} = \frac{TourismExports_{ijt-1}}{TourismExports_{ijt-1} + ManufacturingExports_{ijt-1}}, \tag{4}$$

The bilateral manufacturing flow $ManufacturingExports_{ijt}$ is obtained directly from UN Comtrade. However, the bilateral tourism flow from UN WTO is in terms of numbers of arrivals. Therefore we proceed by apportioning the total tourism exports for country i to each tourism-importing country j based on the number of arrivals:

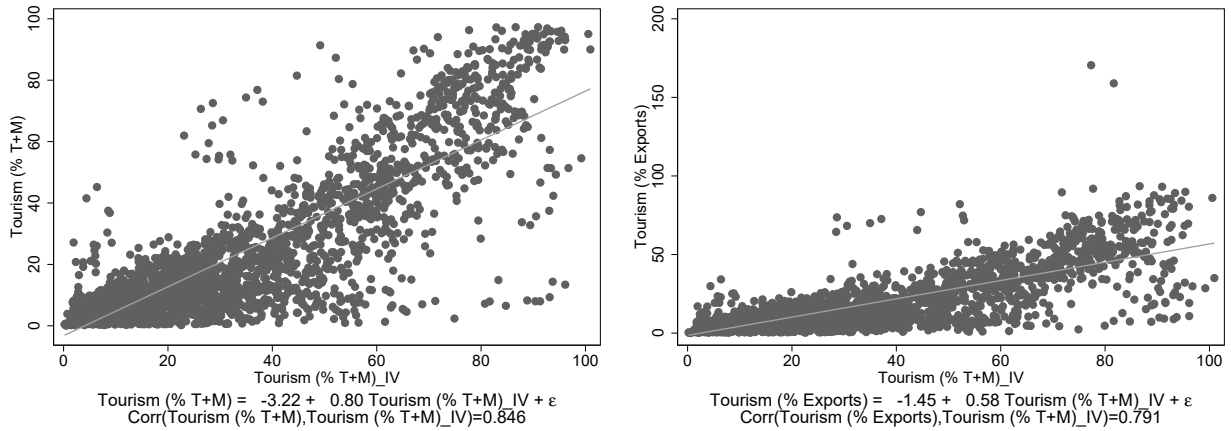
$$TourismExports_{ijt} = \frac{Arrival_{ijt}}{Arrival_{it}} TourismExports_{it}, \tag{5}$$

where $TourismExports_{it}$ is the total tourism exports of country i in year t. $Arrival_{ijt}$ is the number of arrivals from country j to country i in year t, and $Arrival_{it}$ is the total arrivals for country i in year t. Note that the summation of bilateral tourism flow $Arrival_{ijt}$ over all importer country j does not always equal to the total arrival $Arrival_{it}$, because not all origins of arrivals are observed. For instance, the origin sometimes is stated as "other countries of the world".

We keep only the importer countries that have both non-missing data on tourism exports and manufacturing exports. They are not a complete list of all importers. Hence, in practice, eq. (1) does not hold exactly since the second equality does not hold. Despite of the above mentioned data issue, the instrument we construct is still a good predictor of the actual tourism specialization, as can be seen from the scatter plot between the constructed instrument and the actual tourism specialization in Figure 2a. Figure 2b implies that it is also a good predictor for the share of tourism exports in total exports, instead of the sum of tourism and manufacturing exports.

[5] A similar approach has been employed by Boustan *et al.* (2013) [2], who construct the instrument for Gini index by fixing initial income distribution and predicting Gini index with national patterns of income growth.

Figure 2: Predicted Tourism Specialization and Actual Tourism Specialization



(a) % Tourism + Manufacturing Exports

(b) % Total Exports

3 Empirical Analysis

We consider the relationship between tourism specialization and short-run growth by estimating the following model:

$$\Delta lnGDPpc_{it} = \alpha_0 + \alpha_1 lnTourism_{it} + \gamma X_{it} + \tau_i + \eta_t + \mu_{it}, \tag{6}$$

where the dependent variable is the first difference of the log of GDP per capita (i.e., the growth rate of GDP per capita as conventionally defined in the macro literature) for country i in year t. The explanatory variable is the log of tourism specialization for country i in year t. The set of control variables X_{it} includes fertility, general government final consumption expenditure (% of GDP), openness to trade, investment-output ratio, life expectancy, human capital index, all in logs, and the growth rate of population; τ_i and η_t are country fixed effects and year fixed effects, respectively, and μ_{it} is the error term.

Table 2 reports the OLS regression results for eq. (6).[6] Columns (1), (2), (3) and (4) report the results for all countries and columns (5), (6), (7) and (8) for the OECD countries only. Columns (1) and (5) include only fertility, government consumption, and the growth rate of population as control variables. Column (2) and (6) add additionally openness to trade; column (3) and (7) add investment-output ratio; column (4) and (8) add life expectancy and the human capital index. For

[6]For consistency, the sample in OLS regressions is restricted to the same as that used in the IV estimation.

all countries, on average, tourism specialization does not exhibit a statistically significant effect on the growth rate of GDP per capita. However, there is a positive significant effect for the OECD countries. The coefficients range from 0.008 to 0.011, indicating that a 1% increase in tourism exports as the share of tourism and manufacturing exports is associated with around 0.01 percentage point increase in the growth rate of GDP per capita for the OECD countries, *cet. par.*. With the mean of GDP per capita growth rate being around 2 percentage points, the elasticity is around 0.5.

While the fixed effects eliminate all time-invariant unobserved factors, the OLS estimation of the above model still suffers from endogeneity bias, due to other time-varying unobserved factors. For instance, there would likely be reverse causality if the GDP per capita growth rate determines government policies that influence resource allocation between the tourism and manufacturing sectors. In addition, GDP per capita and tourism exports might be jointly affected by other unobserved shocks, including changes in political risk and exchange rates (Eilat and Einav 2004 [4]), occurrence of conflicts and disasters, and numerous other factors.

To address potential endogeneity problems, we use 2SLS estimation methods. The instrument is constructed following eq. (3) and eq. (4), as described in the previous section. Table 3 reports the IV estimation results for eq. (6). Like with OLS estimation, tourism specialization does not have a significant impact on GDP per capita growth rate for all countries on average, but does have a positive effect for the OECD countries. The point estimates are the slightly larger than those in the OLS estimation, but as the standard error increases, the coefficients are in some cases less statistically significant. The F statistics for the first stage are above 161 for regressions for all countries and above 241 for OECD countries. The partial R^2 for the instrument in the first stage is 0.2 for all countries and 0.43 for OECD countries, as reported in Table 4. We tried specifications without all control variables, for both OLS and IV estimations, but the estimated coefficients for tourism specialization are close to zero and not statistically significant in those cases.

We also tried using alternative measure of the growth rate of GDP per capita, namely based on constant 2010 USD, and also growth rate of GDP based, respectively, on 2010 USD and PPP 2017 international dollar as the dependent variable. Results barely change.

Table 2: OLS estimation

	Dep. var: D.ln(GDPpc, PPP, 2017 international money)							
	(1) All	(2) All	(3) All	(4) All	(5) OECD	(6) OECD	(7) OECD	(8) OECD
ln(Tourism (% T+M))	-0.00653	-0.00609	-0.00713	-0.00413	0.00783	0.0106**	0.0101*	0.00876*
	(0.00481)	(0.00478)	(0.00477)	(0.00471)	(0.00494)	(0.00469)	(0.00536)	(0.00511)
ln(Fertility)	-0.0482***	-0.0507***	-0.0463***	-0.0518***	-0.0695***	-0.0752***	-0.0712***	-0.0890***
	(0.0137)	(0.0136)	(0.0128)	(0.0158)	(0.0191)	(0.0198)	(0.0196)	(0.0196)
ln(Gov. Consumption)	-0.0151	-0.0154	-0.0164	-0.0164	-0.0989***	-0.0948***	-0.0739***	-0.0746***
	(0.0131)	(0.0137)	(0.0139)	(0.0140)	(0.0190)	(0.0196)	(0.0234)	(0.0233)
D.ln(Population)	-0.771***	-0.751***	-0.782***	-0.714**	-0.296	-0.152	-0.670	-0.719*
	(0.278)	(0.279)	(0.278)	(0.320)	(0.419)	(0.429)	(0.399)	(0.367)
ln(Openness)		0.0149**	0.0143**	0.0117**		0.0307***	0.0384***	0.0433***
		(0.00617)	(0.00591)	(0.00588)		(0.0104)	(0.0129)	(0.0126)
ln(Investment-output ratio)			0.0263***	0.0276***			0.0414***	0.0472***
			(0.00587)	(0.00716)			(0.00877)	(0.00962)
ln(Life Expectancy)				0.0435				-0.129
				(0.0988)				(0.212)
ln(Human capital index)				-0.00925				-0.178**
				(0.0282)				(0.0722)
Constant	0.140***	0.148***	0.191***	0.0134	0.337***	0.335***	0.336***	1.112
	(0.0433)	(0.0455)	(0.0502)	(0.464)	(0.0577)	(0.0583)	(0.0638)	(0.903)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Group	154	154	148	129	37	37	37	37
Observations	2512	2512	2472	2210	747	747	747	747
R2	0.188	0.193	0.221	0.220	0.518	0.528	0.556	0.568
R2-adj	0.180	0.184	0.213	0.210	0.502	0.511	0.539	0.551

Robust standard error in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: IV estimation

	Dep. var: D.ln(GDPpc, PPP, 2017 international money)							
	(1) All	(2) All	(3) All	(4) All	(5) OECD	(6) OECD	(7) OECD	(8) OECD
ln(Tourism (% T+M))	0.00252	0.00357	0.00132	0.00742	0.00845	0.0111*	0.0131**	0.00958
	(0.00872)	(0.00877)	(0.00896)	(0.00990)	(0.00611)	(0.00630)	(0.00632)	(0.00623)
ln(Fertility)	-0.0465***	-0.0491***	-0.0450***	-0.0480***	-0.0693***	-0.0752***	-0.0708***	-0.0889***
	(0.0102)	(0.0102)	(0.00982)	(0.0128)	(0.0135)	(0.0138)	(0.0134)	(0.0144)
ln(Gov. Consumption)	-0.0156	-0.0159	-0.0166	-0.0170	-0.0993***	-0.0950***	-0.0756***	-0.0752***
	(0.0101)	(0.0104)	(0.0106)	(0.0118)	(0.0185)	(0.0182)	(0.0176)	(0.0186)
D.ln(Population)	-0.768***	-0.747***	-0.781***	-0.716***	-0.301	-0.155	-0.685**	-0.723**
	(0.189)	(0.188)	(0.189)	(0.232)	(0.277)	(0.275)	(0.288)	(0.285)
ln(Openness)		0.0158***	0.0152***	0.0126***		0.0309***	0.0396***	0.0436***
		(0.00511)	(0.00495)	(0.00485)		(0.00892)	(0.00935)	(0.00948)
ln(Investment-output ratio)			0.0256***	0.0261***			0.0413***	0.0471***
			(0.00568)	(0.00645)			(0.00927)	(0.00927)
ln(Life Expectancy)				0.0615				-0.125
				(0.0501)				(0.146)
ln(Human capital index)				-0.00240				-0.179***
				(0.0286)				(0.0524)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2511	2511	2472	2210	747	747	747	747
R2	0.182	0.187	0.217	0.212	0.518	0.528	0.555	0.568
R2-adj	0.120	0.124	0.157	0.151	0.475	0.484	0.514	0.527
Sanderson-Windmeijer F statistic	170.592	167.734	165.598	160.942	254.786	240.506	245.235	248.819
Elasticity	0.107	0.152	0.056	0.318	0.395	0.517	0.610	0.448

Robust standard error in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: First stage estimation

	(1) All	(2) All	(3) All	(4) All	(5) OECD	(6) OECD	(7) OECD	(8) OECD
ln(Tourism (% T+M)_IV)	0.395***	0.394***	0.398***	0.390***	0.610***	0.597***	0.600***	0.595***
	(0.0302)	(0.0304)	(0.0310)	(0.0307)	(0.0382)	(0.0385)	(0.0383)	(0.0377)
ln(Fertility)	-0.228***	-0.220***	-0.220***	-0.399***	-0.0395	0.00791	0.0179	0.107
	(0.0660)	(0.0671)	(0.0676)	(0.0758)	(0.109)	(0.108)	(0.107)	(0.106)
ln(Gov. Consumption)	0.0641	0.0650	0.0471	0.0604	0.274***	0.234**	0.280***	0.360***
	(0.0661)	(0.0667)	(0.0673)	(0.0713)	(0.101)	(0.0996)	(0.104)	(0.108)
D.ln(Population)	-0.596	-0.659	-0.386	-0.223	4.703**	3.440*	2.250	2.923
	(1.116)	(1.111)	(1.097)	(1.340)	(1.829)	(1.802)	(1.833)	(1.859)
ln(Openness)		-0.0487	-0.0673	-0.0486		-0.246***	-0.228***	-0.230***
		(0.0558)	(0.0607)	(0.0593)		(0.0733)	(0.0741)	(0.0738)
ln(Investment-output ratio)			0.0523*	0.105***			0.0939*	0.104**
			(0.0300)	(0.0326)			(0.0479)	(0.0480)
ln(Life Expectancy)				-1.395***				-3.616***
				(0.331)				(1.041)
ln(Human capital index)				-0.528**				1.122***
				(0.210)				(0.386)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2511	2511	2472	2210	747	747	747	747
SW F-stat	170.592	167.734	165.598	160.942	254.786	240.506	245.235	248.819
Partial R2	0.200	0.199	0.204	0.207	0.442	0.434	0.437	0.434

Robust standard error in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4 Robustness

Currently the tourism specialization is computed with the tourism exports and manufacturing exports. The former variable comes from WDI while the latter comes from UN Comtrade. As they are from different data sources, they may have been processed with different methodologies, causing measurement error in the variable that is a combination of them. Hence, we check the results with the share of tourism exports in total exports, a directly available variable from WDI, as the key explanatory variable. The instrument we construct is still a strong predictor in this case, as can be seen from Figure 2a and the large F statistics in Table 6.

Likewise, the OLS estimation in Table 5 shows a positive correlation between tourism specialization and economic growth for OECD countries, with the coefficients range from 0.01 to 0.015. Unsurprisingly, the instrument is weaker than before, yet it is still strong in the traditional sense: it just goes down from 240 in Table 3 to 140 in Table 6. Again, the coefficients from IV estimation are larger than the OLS estimation. Although the standard errors increase as well, they are now more statistically significant. The coefficients for the OECD countries range from 0.014 to 0.022, and the elasticities ranges from 0.68 to 1.04. However, now the IV estimation suggests a negative impact of tourism specialization on economic growth for all countries on average.

Table 5: OLS estimation

	Dep. var: D.ln(GDPpc, PPP, 2017 international money)							
	(1) All	(2) All	(3) All	(4) All	(5) OECD	(6) OECD	(7) OECD	(8) OECD
ln(Tourism (% Exports))	-0.00206	-0.000939	-0.00175	0.00141	0.00967*	0.0142**	0.0151***	0.0142**
	(0.00541)	(0.00529)	(0.00509)	(0.00326)	(0.00552)	(0.00528)	(0.00544)	(0.00554)
ln(Fertility)	-0.0471***	-0.0512***	-0.0465***	-0.0576***	-0.0707***	-0.0766***	-0.0723***	-0.0891***
	(0.0140)	(0.0139)	(0.0130)	(0.0142)	(0.0187)	(0.0189)	(0.0197)	(0.0198)
ln(Gov. Consumption)	-0.0214**	-0.0225**	-0.0237**	-0.0234**	-0.102***	-0.0984***	-0.0772***	-0.0791***
	(0.00917)	(0.0101)	(0.00947)	(0.0106)	(0.0198)	(0.0207)	(0.0243)	(0.0245)
D.ln(Population)	-1.040***	-1.009***	-1.074***	-1.034***	-0.226	-0.0632	-0.628	-0.682*
	(0.216)	(0.218)	(0.199)	(0.248)	(0.409)	(0.417)	(0.402)	(0.378)
ln(Openness)		0.0203***	0.0197***	0.0180**		0.0344***	0.0427***	0.0464***
		(0.00734)	(0.00706)	(0.00702)		(0.0102)	(0.0127)	(0.0130)
ln(Investment-output ratio)			0.0285***	0.0314***			0.0426***	0.0475***
			(0.00484)	(0.00517)			(0.00881)	(0.00969)
ln(Life Expectancy)				-0.0548				-0.0513
				(0.0497)				(0.201)
ln(Human capital index)				-0.0272				-0.178**
				(0.0341)				(0.0706)
Constant	0.150***	0.162***	0.210***	0.470**	0.343***	0.342***	0.342***	0.781
	(0.0340)	(0.0366)	(0.0350)	(0.212)	(0.0589)	(0.0596)	(0.0641)	(0.829)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Group	151	151	145	126	37	37	37	37
Observations	2410	2410	2370	2121	718	718	718	718
R2	0.235	0.245	0.282	0.293	0.523	0.535	0.564	0.574
R2-adj	0.227	0.237	0.273	0.283	0.506	0.517	0.547	0.557

Robust standard error in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: IV estimation

	Dep. var: D.ln(GDPpc, PPP, 2017 international money)							
	(1) All	(2) All	(3) All	(4) All	(5) OECD	(6) OECD	(7) OECD	(8) OECD
ln(Tourism (% Exports))	-0.0106*	-0.00939	-0.0138**	-0.0122*	0.0142**	0.0176***	0.0218***	0.0188***
	(0.00618)	(0.00616)	(0.00570)	(0.00662)	(0.00643)	(0.00668)	(0.00664)	(0.00661)
ln(Fertility)	-0.0486***	-0.0523***	-0.0480***	-0.0628***	-0.0694***	-0.0760***	-0.0711***	-0.0885***
	(0.0105)	(0.0105)	(0.00998)	(0.0122)	(0.0136)	(0.0137)	(0.0133)	(0.0142)
ln(Gov. Consumption)	-0.0203***	-0.0214***	-0.0223***	-0.0221***	-0.105***	-0.100***	-0.0808***	-0.0820***
	(0.00568)	(0.00585)	(0.00583)	(0.00637)	(0.0187)	(0.0183)	(0.0179)	(0.0184)
D.ln(Population)	-1.036***	-1.007***	-1.068***	-1.019***	-0.249	-0.0705	-0.647**	-0.698**
	(0.166)	(0.166)	(0.165)	(0.190)	(0.271)	(0.269)	(0.282)	(0.280)
ln(Openness)		0.0189***	0.0176***	0.0162***		0.0362***	0.0463***	0.0487***
		(0.00512)	(0.00475)	(0.00464)		(0.00937)	(0.00977)	(0.00983)
ln(Investment-output ratio)			0.0292***	0.0333***			0.0429***	0.0475***
			(0.00557)	(0.00591)			(0.00928)	(0.00927)
ln(Life Expectancy)				-0.0802***				-0.0269
				(0.0295)				(0.141)
ln(Human capital index)				-0.0344				-0.180***
				(0.0258)				(0.0509)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2409	2409	2370	2121	718	718	718	718
R2	0.229	0.240	0.272	0.281	0.523	0.534	0.563	0.574
R2-adj	0.169	0.180	0.215	0.224	0.477	0.489	0.520	0.531
Sanderson-Windmeijer F statistic	203.081	195.935	196.474	163.145	155.889	141.637	143.769	145.132
Elasticity	-0.436	-0.388	-0.567	-0.510	0.681	0.842	1.039	0.901

Robust standard error in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: First stage estimation

	(1) All	(2) All	(3) All	(4) All	(5) OECD	(6) OECD	(7) OECD	(8) OECD
ln(Tourism (% T+M)_IV)	0.406***	0.403***	0.409***	0.385***	0.521***	0.502***	0.503***	0.492***
	(0.0285)	(0.0288)	(0.0292)	(0.0302)	(0.0417)	(0.0421)	(0.0419)	(0.0409)
ln(Fertility)	-0.191***	-0.164**	-0.165**	-0.383***	-0.0917	-0.0148	-0.0115	0.0492
	(0.0674)	(0.0697)	(0.0701)	(0.0784)	(0.126)	(0.119)	(0.118)	(0.113)
ln(Gov. Consumption)	0.140**	0.146**	0.136**	0.104	0.388***	0.325***	0.339***	0.408***
	(0.0584)	(0.0588)	(0.0600)	(0.0654)	(0.109)	(0.103)	(0.108)	(0.106)
D.ln(Population)	0.646	0.447	0.832	1.089	2.468	0.384	-0.00618	0.582
	(1.243)	(1.227)	(1.224)	(1.514)	(1.984)	(1.892)	(1.957)	(2.015)
ln(Openness)		-0.127*	-0.140*	-0.114		-0.404***	-0.399***	-0.392***
		(0.0758)	(0.0803)	(0.0794)		(0.0811)	(0.0815)	(0.0825)
ln(Investment-output ratio)			0.0201	0.0875***			0.0292	0.0404
			(0.0293)	(0.0334)			(0.0525)	(0.0507)
ln(Life Expectancy)				-1.169***				-3.162***
				(0.291)				(1.209)
ln(Human capital index)				-0.347				0.810*
				(0.213)				(0.415)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2409	2409	2370	2121	718	718	718	718
SW F-stat	203.081	195.935	196.474	163.145	155.889	141.637	143.769	145.132
Partial R2	0.182	0.180	0.186	0.176	0.340	0.334	0.334	0.323

Robust standard error in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5 Conclusion

This paper explores how tourism specialization can affect a country's short-run economic growth. The OLS analysis based on the evidence over the past 21 years suggests that tourism specialization is positively correlated with the growth rate of GDP per capita for the OECD countries. A 1% increase in tourism exports as the share of total tourism and manufacturing exports is (on average) associated with 0.01 percentage point (or 0.5% in terms of elasticity) increase in the growth rate of GDP per capita for the OECD countries, *cet. par.* However, even with fixed effects, the OLS estimation suffers from endogeneity. We address this concern by constructing an instrument for tourism specialization by making use of the difference in preference for the importer countries and the change of their relative weight across years. The IV estimation result suggests that the OLS estimation slightly underestimates the positive effect of tourism specialization on short-run economic growth.

Our findings of positive effects shed light on the potential policies governments may employ to restart their economies after the coronavirus pandemic has been successfully controlled: with resources being limited, encouraging the opening up of tourism can be an effective policy, as tourism specialization has positive short-run effects, albeit small. Compared with the manufacturing sector, the tourism sector has other potential potential benefits, too: it requires minimal additional capital investment (being less capital-intensive than the skilled manufacturing industries), is more environment-friendly, promotes cultural exchanges, etc.

This paper restricts attention to quantifying the effects of tourism specialization on short-run economic growth and does not investigate the underlying mechanisms. Future studies should focus more on such aspects and provide more detailed cost-benefit analyses. The paper does not address the potential effects on the importing economies of diversion of travel and tourism from domestic to international destinations. Still, by quantifying the benefits to exporting countries, the study would hopefully help decision makers in exporting countries when making decisions about restarting tourism in the context of the economic costs of the sudden onset and (as of the time of this writing) ongoing pandemic. Tourism involves mixing populations and could have the potentially deleterious effects of seeding further infections. In spite of these caveats, the need to revive economies is so pressing and evident that hopefully our estimations provide some guidance and will provoke further

research beyond this admittedly very simple framework. Whether these benefits are worth the risks involved is not addressed by this paper.

In addition, when adopting relevant policies and despite the existence of positive gains in the short run, one must also take into consideration long run consequences. A potential aspect is discouragement of human capital accumulation. As the tourism sector is relatively low-skilled, its expansion will likely increase the opportunity cost of schooling, especially higher education. Chen (2020) [3], which is based on data for 64 developing countries, shows empirically that the expansion of tourism exports has negative effects on individuals' long term educational attainment when they are considered during their schooling ages. Hence, governments may need to offset such effects by using tax revenue from tourism-related activity to subsidize education.

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