Economic performance tourism nexus in small islands

Kevin Cerveaux
(Université de La Réunion)

Fabien Labondance
(Université de Franche-Comté – CRESE & OFCE – SciencesPo)

Tourism specialization and vulnerability: Evidences and challenges for sustainable development in small island territories
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I- Introduction

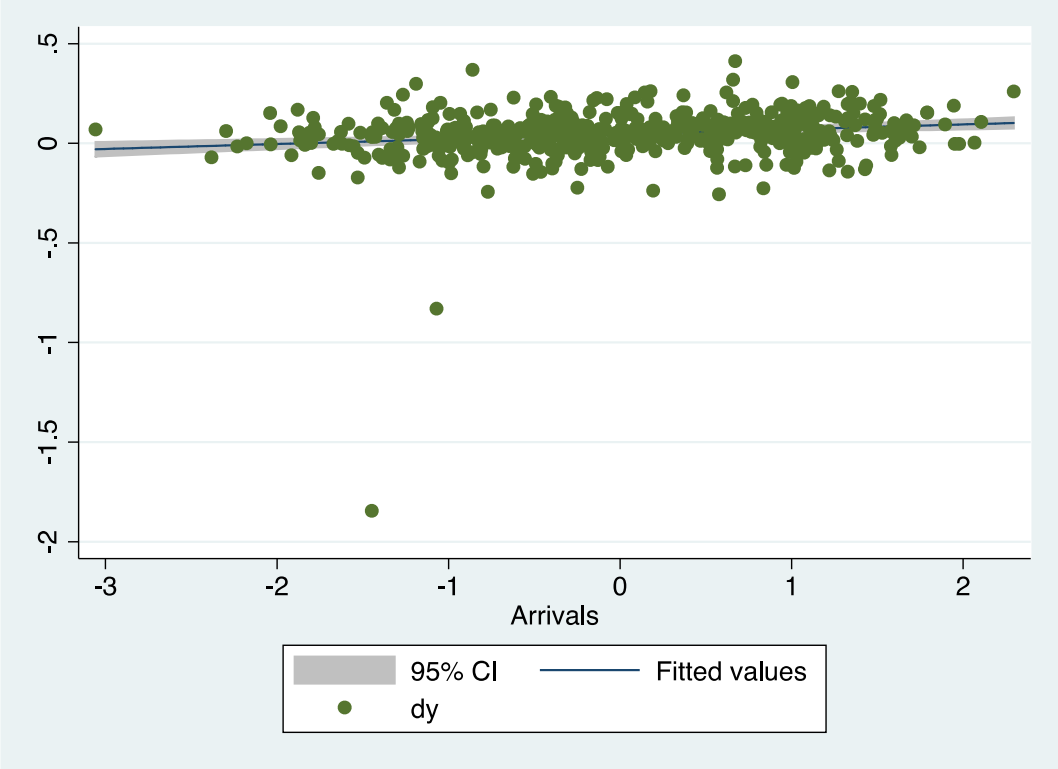
Motivations

1. Special interest in literacy in the last decades for the link between tourism and economic growth in small island.
2. Territories characterized by a paradox : not the least developed economies in spite of numerous hurdles (geographical, colonial past, insularity).
3. The industrialization model of Lewis (1955) failed to explain the resilience of these islands with small populations and lack of economy of scale and intensive manufacture activities.

Research questions

1. Does tourism activity drive economic performance in small islands?
2. By which channel tourism promotes growth?

Graph 1 : Link between GDP growth and tourists arrivals

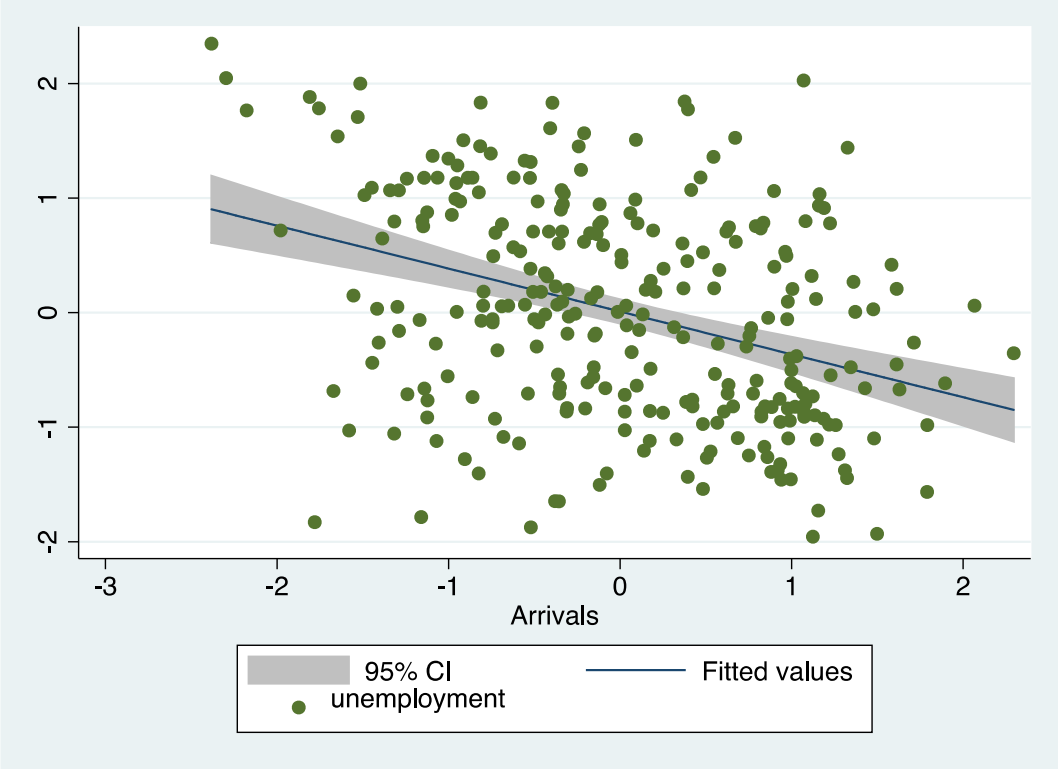


Arrivals data are centered and reduced

Graph 2: Link between Investment growth and tourists arrivals

Arrivals data are centered and reduced

Graph 3 : Link between unemployment and tourists arrivals



Arrivals data are centered and reduced

Contributions

1. Analysis of the tourism and economic performance nexus on a sample of 35 small islands.
2. Using Arellano & Bond methodology (Panel GMM with IV).
3. Confirmation of the none effect of tourism on household's consumption in small islands.
4. Evidence of the effects of tourism on economic growth, investment and unemployment. Results robusts to various indicators and estimators.

II- Literature review

Economic performance determinants

Four seminal determinants of the Solow-Swan model (1956) : the initial income, rates of physical and human capital accumulation and population growth.

Durlauf and al. (2005) identified at least 43 different growth theories proposing at least 145 distinct significant explicative variables whose :

GDP Tendency of an economy to approach its long-run position.	**Investment ratio** Saving rate (DeLong and Summers, 1991).	**Education or life expectancy** Human capital accumulation.	**Trade openness –** Investment opportunities (Frankel and Romer, 1999).	**Government consumption –** Distortions in the economy (Barro, 1991).

Tourism economic performance nexus

Gravity models (Wilson, 1967) - Bilateral tourism depends on multidimensional factors such as common border, common language, destination risk, exchange rates or price elasticities (Eilat and Einav (2004).

Tourism Led Growth Hypothesis - Multiplier effects of tourism (Mathieson & Wall, 1982) : direct, indirect and induced effects. Tourism is a substitute form of exports which improve the balance of payment, generate employment and increase government receipts (Belisle & Hoy, 1980; Davis, Seng, & Cheong, 1990).

Link between high specialization in tourism and substantial growth of the per capita average income for small countries (Lanza and Pigliaru, 2000).

Tourism-economic link vary over time in terms of magnitude as well as of direction after the Great Recession of 2007 and the Eurozone debt crisis of 2010 (Dragouni, Filis & Antonakakis, 2013).

Table 1 : Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP/cap growth rate	525	.0453421	.1277341	-1.845039	.4123437
Disposable income growth rate	447	.0416714	.0514775	-.2115848	.2373851
Investment growth rate	433	.0625412	.1714601	-.9227827	.6125449
consumption growth rate	451	.0036667	.0790739	-.3719342	.584765
Unemployment	281	8.242349	4.51765	1.1	23.2
I/GDP	495	.2409854	.2520466	0	2.087744
Population Growth	495	.0127639	.0091065	-.0160958	.0532158
School	364	2.019582	.3449891	.7419373	2.525729
Tourism Arrivals	525	1802.156	3892.416	11	36030.01
Tourism receipts	493	1.87e+09	3.37e+09	5900000	2.82e+10
Tourism expenditures	347	1927.031	3571.402	9	28214

Table 2 : Correlation coefficients

	GDP/cap growth rate	Disposable income growth rate	Investment growth rate	consumption growth rate	Unemployment	I/GDP	Population Growth	School	Arrivals	Expenditures	Receipts
GDP/cap growth rate	1										
Disposable income growth rate	0.30***	1									
Investment growth rate	0.45***	0.41***	1								
consumption growth rate	0.02	-0.20***	-0.14***	1							
Unemployment	-0.11*	-0.09	-0.01	-0.01	1						
I/GDP	-0.01	0.07	0.29***	-0.03	-0.25***	1					
Population Growth	0.03	-0.08*	0.13***	-0.07	-0.10	0.02	1				
School	0.17***	0.06	0.09	0.02	-0.20***	-0.26***	-0.08				
Arrivals	0.18***	0.17***	0.21***	-0.07	-0.36***	0.03	-0.03	0.54***	1		
Expenditures	0.14***	0.07	0.16***	-0.07	-0.36***	0.07	-0.05	0.57***	0.72***	1	
Receipts	0.21***	0.05	0.13**	-0.03	-0.44***	0.12***	-0.09*	0.55***	0.67***	0.96***	1

IV-Empirical methodology

Two step GMM estimator (Arellano and Bond, 1991) :

$$y_{i,t} = \beta y_{i,t-1} + \gamma X_{i,t} + \delta Z_{i,t} + \varepsilon_{i,t} \qquad (1)$$

Where subscripts i and t represent respectively country and time period, $y_{i,t}$ is the dependent variable of economic performance, $y_{i,t-1}$ represents its lagged value, $X_{i,t}$ is a set of explanatory variables typically used in this type of study, $Z_{i,t}$ includes explanatory variables of tourism and $\varepsilon_{i,t}$ is the error term that includes country-specific effect and time-specific effect.

Econometric issues :

1. Variables included in $X_{i,t}$ and $Z_{i,t}$ may not be fully exogenous and causality may run in both directions.
2. Country fixed-effects contained in the error term can be correlated with the explanatory variables.
3. Panel dataset has a relative short time dimension and a larger country dimension.

Issues addressed by the two-step GMM estimator from Arellano and Bond (1991) in which the set of instrumental variables is constituted by the lagged values of all explanatory variables, including $y_{i,t-1}$.

Equation (1) rewrote in first difference (Arellano and Bond, 1991) :

$$\Delta y_{i,t} = \beta \Delta y_{i,t-1} + \gamma \Delta X_{i,t} + \delta \Delta Z_{i,t} + \Delta \varepsilon_{i,t} \qquad (2)$$

Effects of the transformation of the regressors in 1st difference :

- Country fixed-effect is removed
- New potential bias: the new error term can be correlated with the lagged dependent variable.

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Procedure of Arellano and Bond (1991) under assumptions that the error term is not serially correlated and that the explanatory variables are weakly exogenous.

1st Step	**2nd Step**
Error terms are assumed to be homoskedastic and independent over time and across countries.	Residuals obtained in the first step are used to build a consistent estimate of the variance-covariance matrix.

Asymptotically more efficient because assumptions of independence and homoskedasticity are then relaxed.

We obtain robust standard errors using the Windmeijer (2005) finite sample correction.

To avoid over-identification, we use variables in level as instruments only up to 3 lags.

V-Benchmark results

Table 3 :Benchmark estimations – the link between tourism and Economic Performance

	GDP/cap growth rate		Consumption growth rate		Investment growth rate		Disposable income growth rate		Unemployment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Initial Economic Performance	-0.084***	-0.108***	-0.046***	-0.063***	-0.145***	-0.202***	-0.032***	-0.059***	0.390**	0.390**
	[0.02]	[0.03]	[0.01]	[0.02]	[0.03]	[0.05]	[0.01]	[0.02]	[0.19]	[0.19]
I/GDP	0.012	0.007	0.005	0.003	0.148***	0.144***	0.010*	0.006	-0.349***	-0.286**
	[0.02]	[0.02]	[0.01]	[0.01]	[0.03]	[0.03]	[0.01]	[0.01]	[0.12]	[0.12]
School	0.018	0.017	0.000	-0.000	0.057	0.044	0.017**	0.017	-0.320*	-0.060
	[0.04]	[0.02]	[0.00]	[0.01]	[0.04]	[0.03]	[0.01]	[0.01]	[0.18]	[0.13]
Population Growth	-1.610	-4.040	-2.706	-3.915	6.329	-0.730	-1.129	-3.572	-2.903	18.031
	[4.89]	[6.87]	[1.99]	[2.93]	[8.92]	[14.99]	[2.00]	[3.50]	[52.31]	[46.40]
Arrivals		0.097***		-0.000		0.148***		0.044***		-0.502**
		[0.02]		[0.01]		[0.05]		[0.01]		[0.20]
Constant	0.062	0.053	0.033	0.048	-0.005	0.010	0.078***	0.089***	0.041	-0.104
	[0.06]	[0.07]	[0.02]	[0.03]	[0.09]	[0.16]	[0.03]	[0.03]	[0.63]	[0.53]
Sargan Tes p-val	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.00
AR1	0.03	0.02	0.15	0.14	0.21	0.18	0.05	0.03	0.00	0.00
AR2	0.71	0.16	0.65	0.75	0.72	0.12	0.88	0.69	0.95	0.75
Number of Islands	20	20	19	19	19	19	18	18	14	14
Obs	194	194	199	216	191	191	183	183	147	147

Table 4 : Robustness – other Tourism variables

	GDP/cap growth rate		consumption growth rate		Disposable income growth rate		Investment growth rate		Unemployment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Initial Economic Performance	-0.124***	-0.139***	-0.059***	-0.054***	-0.061*	-0.059***	-0.214***	-0.244***	0.227	0.297**
	[0.03]	[0.04]	[0.02]	[0.02]	[0.03]	[0.02]	[0.07]	[0.06]	[0.14]	[0.15]
I/GDP	0.016	0.002	0.007	0.009**	0.011	0.006	0.128***	0.120***	-0.280**	-0.274**
	[0.01]	[0.01]	[0.00]	[0.00]	[0.01]	[0.01]	[0.03]	[0.02]	[0.11]	[0.11]
School	0.027	0.008	-0.004	-0.001	0.017	0.017**	0.039	0.018	-0.072	-0.066
	[0.02]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]	[0.04]	[0.02]	[0.12]	[0.11]
Population Growth	-7.532	-7.912	-8.121***	-2.831	-4.549	-1.961	-3.878	5.302	85.287	71.820
	[8.97]	[9.17]	[2.68]	[2.58]	[11.01]	[2.57]	[15.77]	[10.97]	[64.42]	[68.02]
Tourism expenditures	0.107***		0.004		0.033*		0.139***		-0.454	
	[0.03]		[0.00]		[0.02]		[0.04]		[0.29]	
Tourism receipts		0.124***		0.000		0.034*		0.156***		-0.553*
		[0.03]		[0.01]		[0.02]		[0.04]		[0.28]
Constant	0.120	0.121	0.084***	0.030	0.121	0.076**	0.081	-0.049	-0.715	-0.655
	[0.10]	[0.10]	[0.03]	[0.03]	[0.14]	[0.04]	[0.15]	[0.11]	[0.57]	[0.67]
Sargan Tes p-val	1.00	0.99	1.00	1.00	0.99	0.99	1.00	1.00	1.00	1.00
AR1	0.07	0.03	0.03	0.14	0.01	0.03	0.23	0.18	0.02	0.00
AR2	0.44	0.36	0.22	0.68	0.51	0.87	0.73	0.94	0.31	0.10
Number of Islands	16	19	15	18	14	17	15	18	12	13
Obs	157	199	150	187	135	171	142	179	122	136

Table 5 : Robustness – Alternative estimators

	GDP/cap growth rate		consumption growth rate		Investment growth rate		Disposable income growth rate		Unemployment	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Initial Economic Performance	-0.066***	-0.069***	-0.018***	-0.019***	-0.154***	-0.147***	-0.040***	-0.042***	0.351***	0.443***
	[0.01]	[0.01]	[0.00]	[0.00]	[0.02]	[0.02]	[0.01]	[0.01]	[0.07]	[0.06]
I/GDP	0.006	0.008	-0.000	0.001	0.127***	0.118***	0.004	0.003	-0.112*	-0.138**
	[0.01]	[0.01]	[0.00]	[0.00]	[0.01]	[0.01]	[0.00]	[0.00]	[0.06]	[0.06]
School	0.021*	0.022**	0.007	0.006	0.028*	0.031**	0.012**	0.010**	-0.046	0.049
	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]	[0.01]	[0.00]	[0.09]	[0.09]
Population Growth	-0.815	0.036	-1.076	-0.563	1.294	2.466*	-1.889***	-0.688*	-6.595	0.706
	[1.46]	[0.78]	[0.83]	[0.50]	[2.01]	[1.44]	[0.62]	[0.41]	[10.07]	[6.82]
Arrivals	0.071***	0.068***	-0.010*	-0.011**	0.117***	0.104***	0.036***	0.037***	-0.338***	-0.346***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]	[0.09]	[0.08]
Constant	0.043***	0.035***	0.018*	0.013*	0.030**	0.012	0.070***	0.054***	0.152*	0.006
	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]	[0.01]	[0.09]	[0.10]
R2 Adj.	0.114		0.055		0.457		0.291		0.239	
R2 Within	0.204	0.198	0.153	0.135	0.515	0.296	0.367	0.185	0.320	0.541
R2 Between	0.000	0.008	0.198	0.003	0.041	0.244	0.000	0.001	0.297	0.675
Obs	246	266	233	253	226	246	214	232	178	194

VI-Conclusion

1. We study the link btw economic performance and tourism in small islands with a panel GMM-IV.
2. Number of arrivals is positively correlated and significant for GDP growth rate and investment growth rate.
3. Consequently to the development of tourism, investment and GDP growth per capita rise and unemployment decreases.
4. Nevertheless, it has none effect on household's consumption.

Future studies

1. Disentangle the effects of tourism over poverty, inequality and environment.
2. Analysis of the direction and the amplitude of the tourism/economic performance relationship following the economical crisis of 2008.

Thanks for your attention