

How important is tourism for the international transmission of cyclical fluctuations? Evidence from the Mediterranean.

On-line Appendix

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This on-line appendix reports additional materials discussed in the paper. Section 1 is dedicated to evidence produced using data on tourist arrivals. Section 2 reports results for the number of nights spent and per-capita expenditures.

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1 Number of tourist arrivals

1.1 Tourism data in (log) levels

1.1.1 Tourist arrivals: Cyprus

Figure 1: Number of tourist arrivals: Cyprus

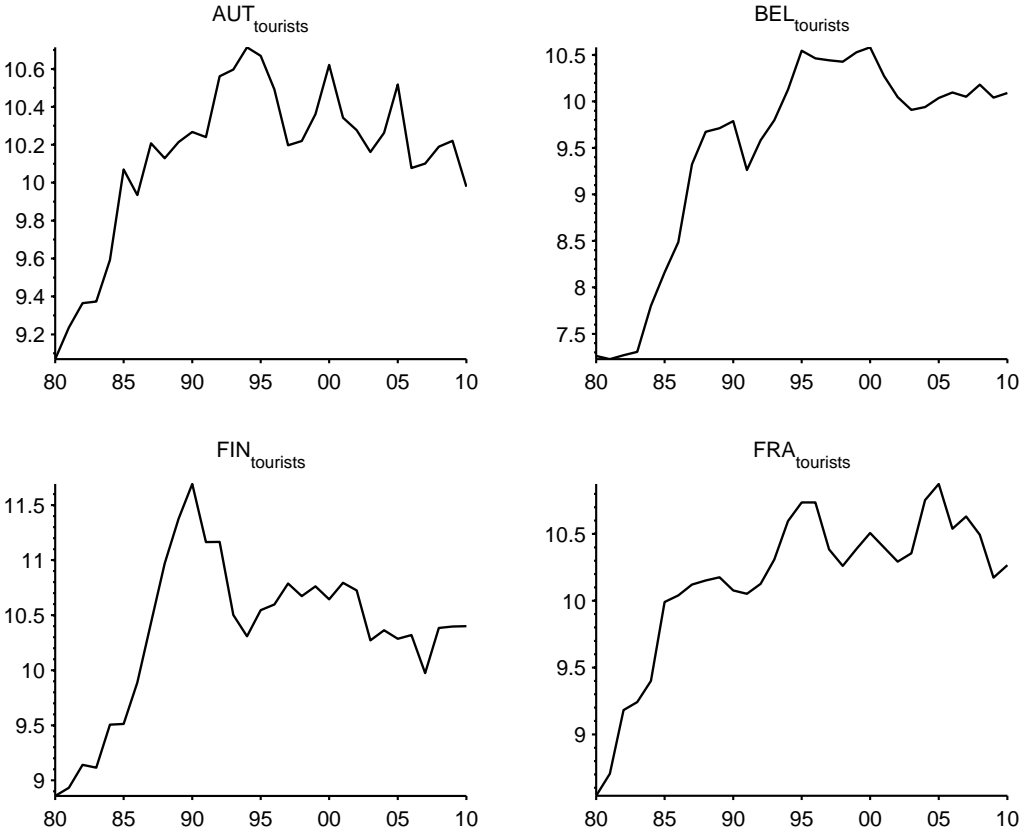


Figure 2: Number of tourist arrivals: Cyprus

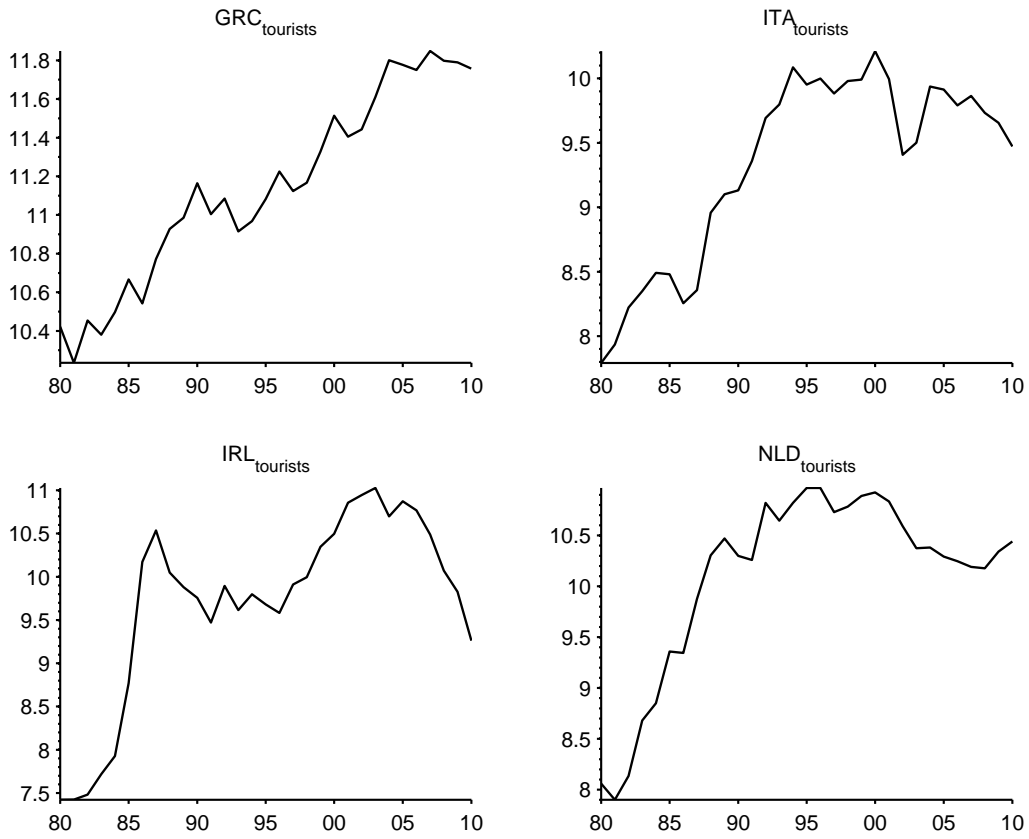


Figure 3: Number of tourist arrivals: Cyprus

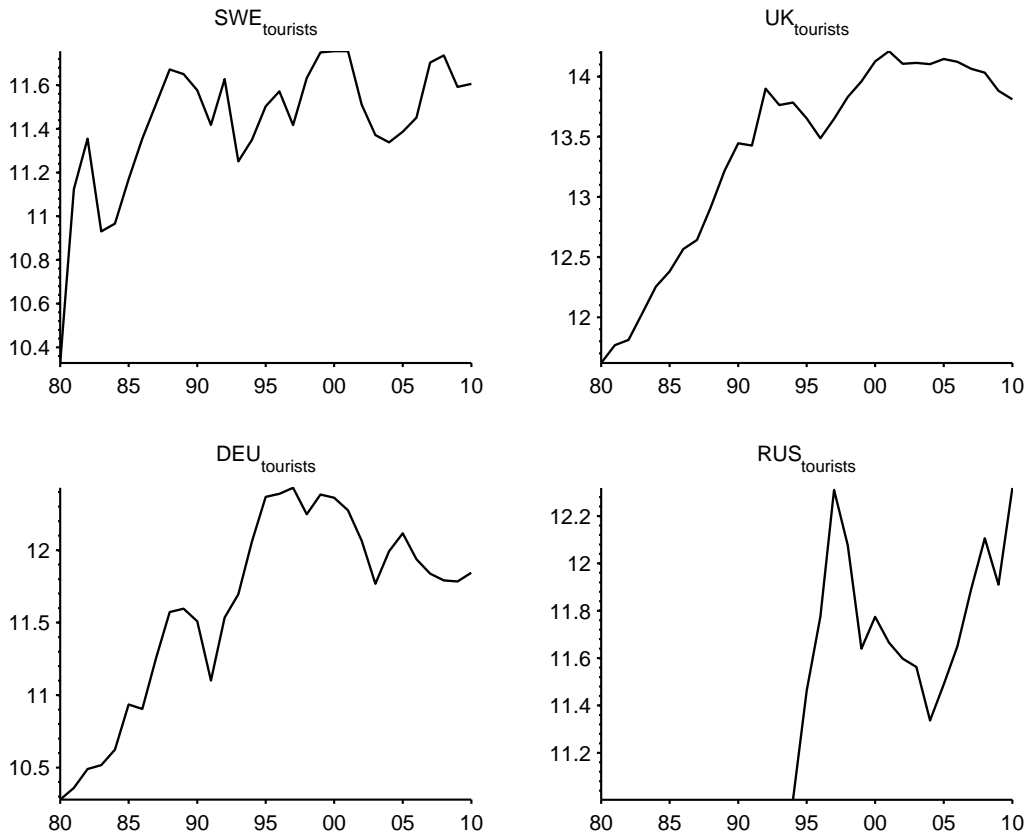
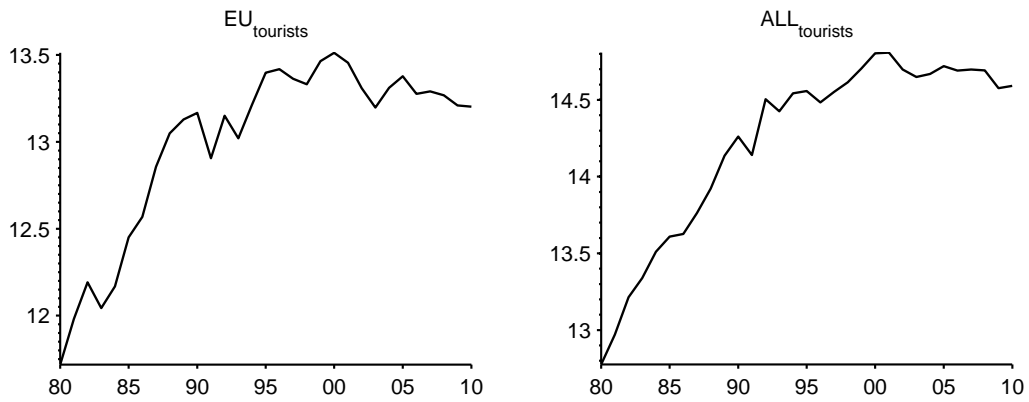


Figure 4: Number of tourist arrivals: Cyprus



1.1.2 Tourist arrivals: Morocco

Figure 5: Number of tourist arrivals: Morocco

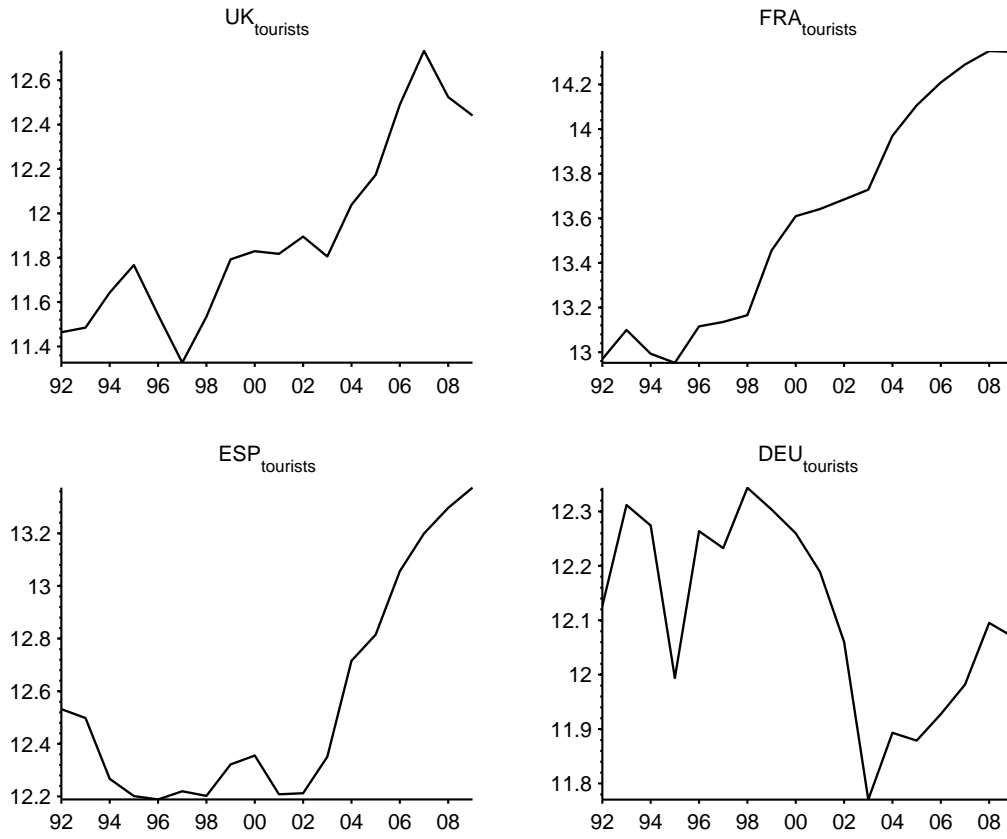
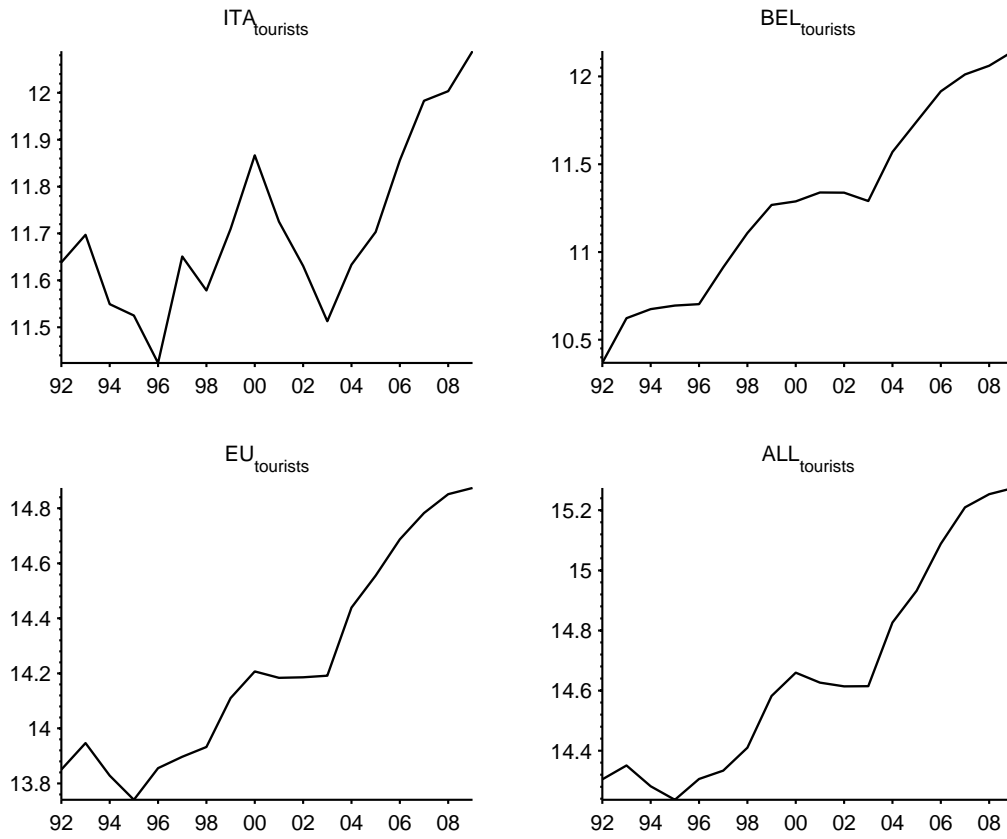


Figure 6: Number of tourist arrivals: Morocco



1.1.3 Tourist arrivals: Syria

Figure 7: Number of tourist arrivals: Syria

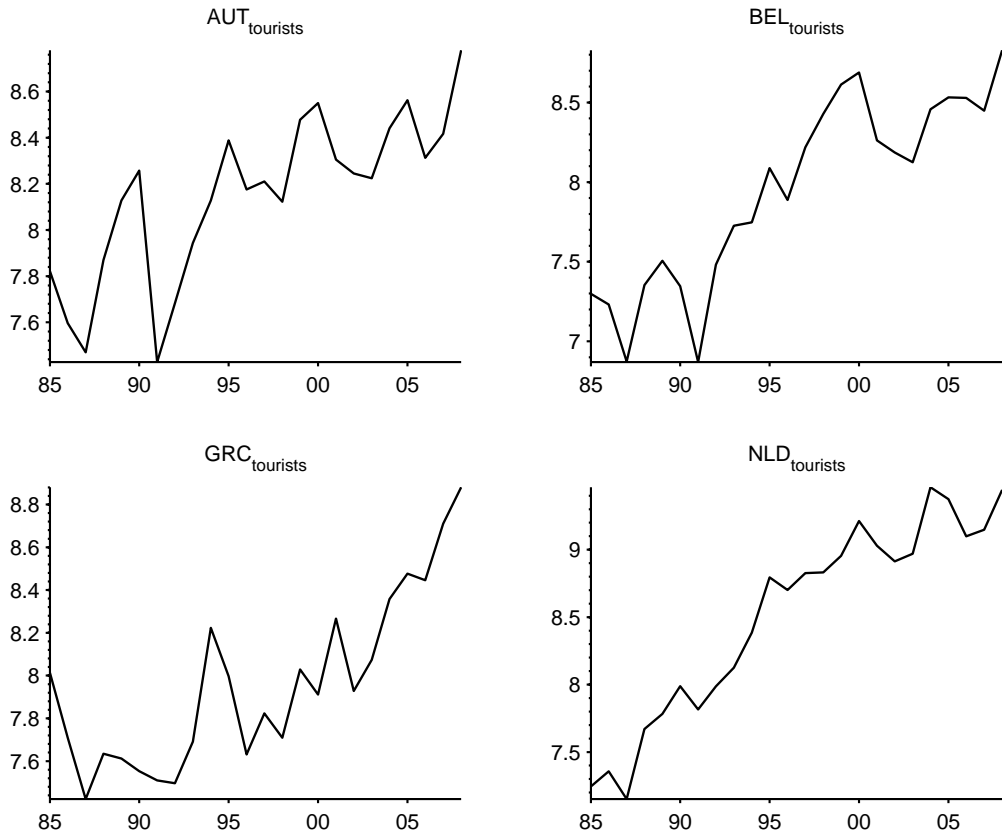


Figure 8: Number of tourist arrivals: Syria

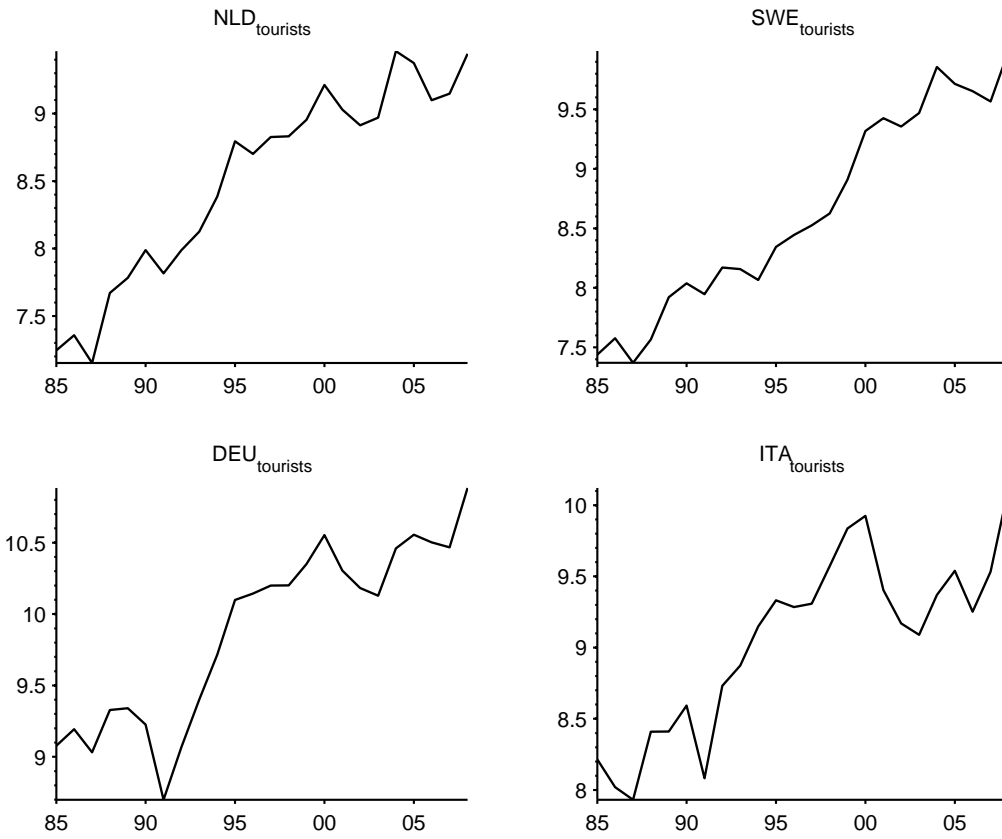


Figure 9: Number of tourist arrivals: Syria

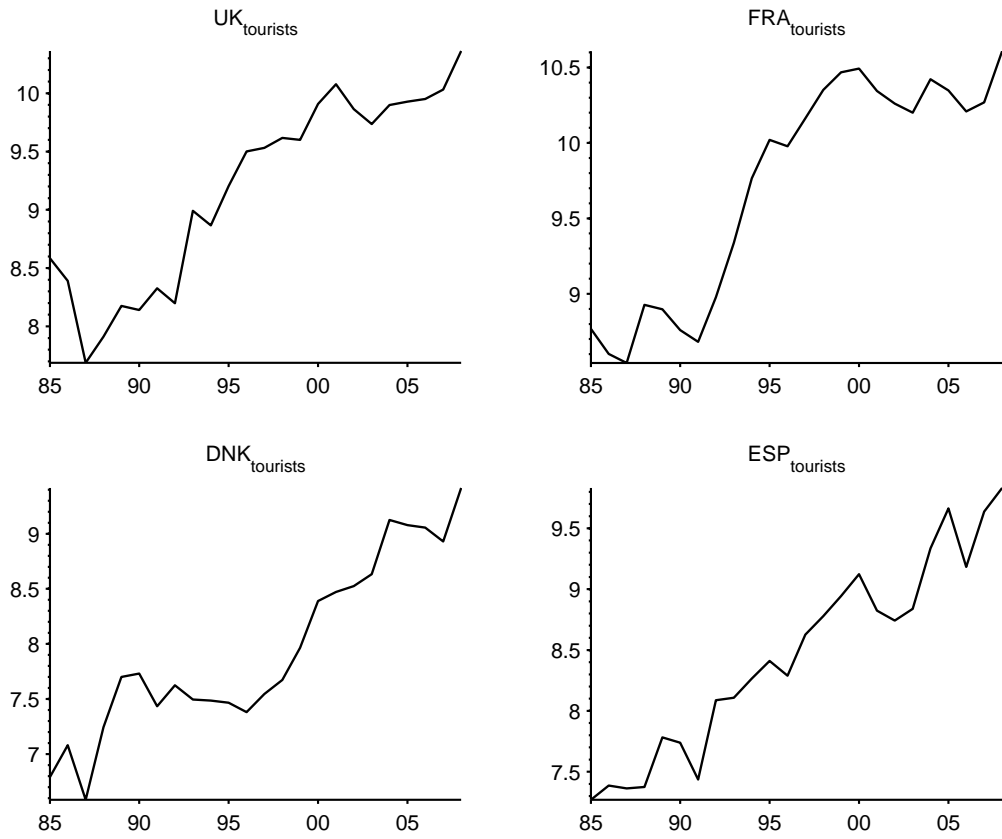
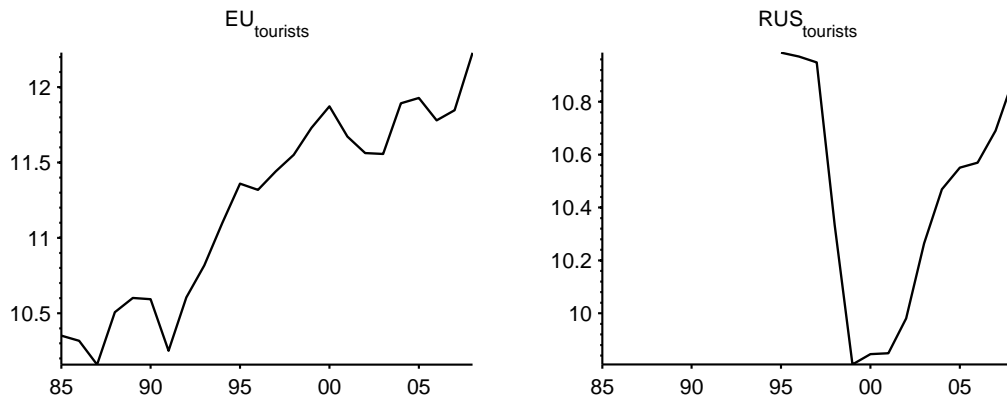


Figure 10: Number of tourist arrivals: Syria



1.1.4 Tourist arrivals: Tunisia

Figure 11: Number of tourist arrivals: Tunisia

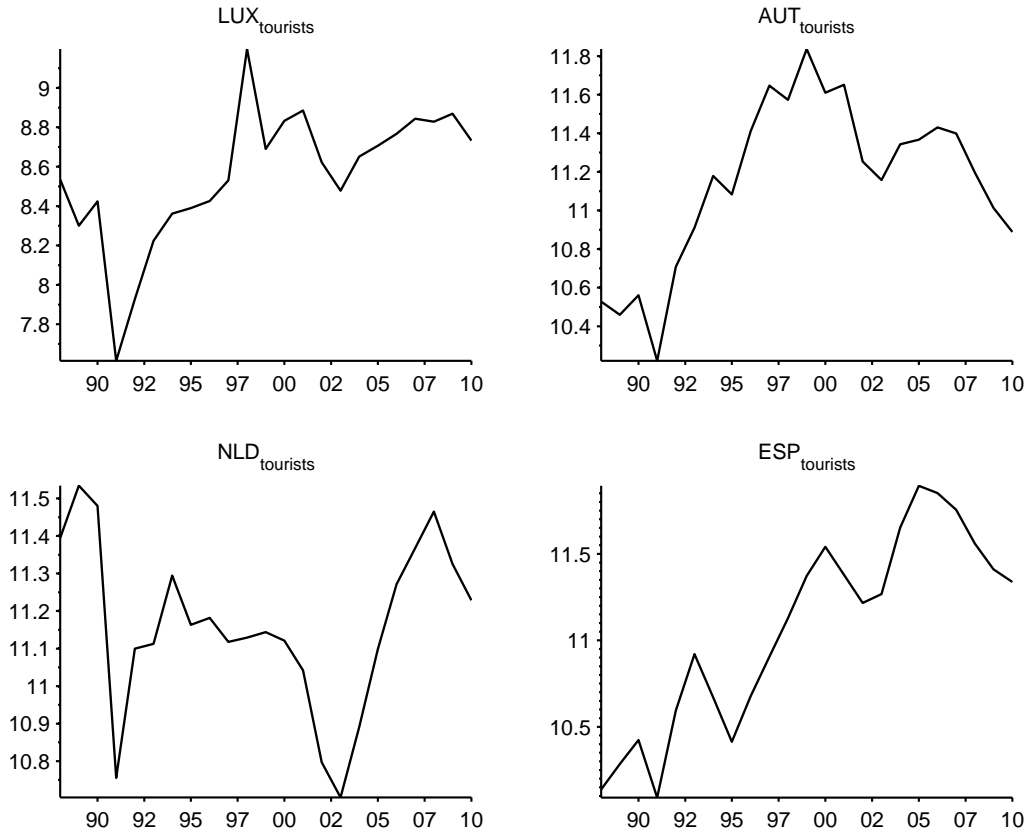


Figure 12: Number of tourist arrivals: Tunisia

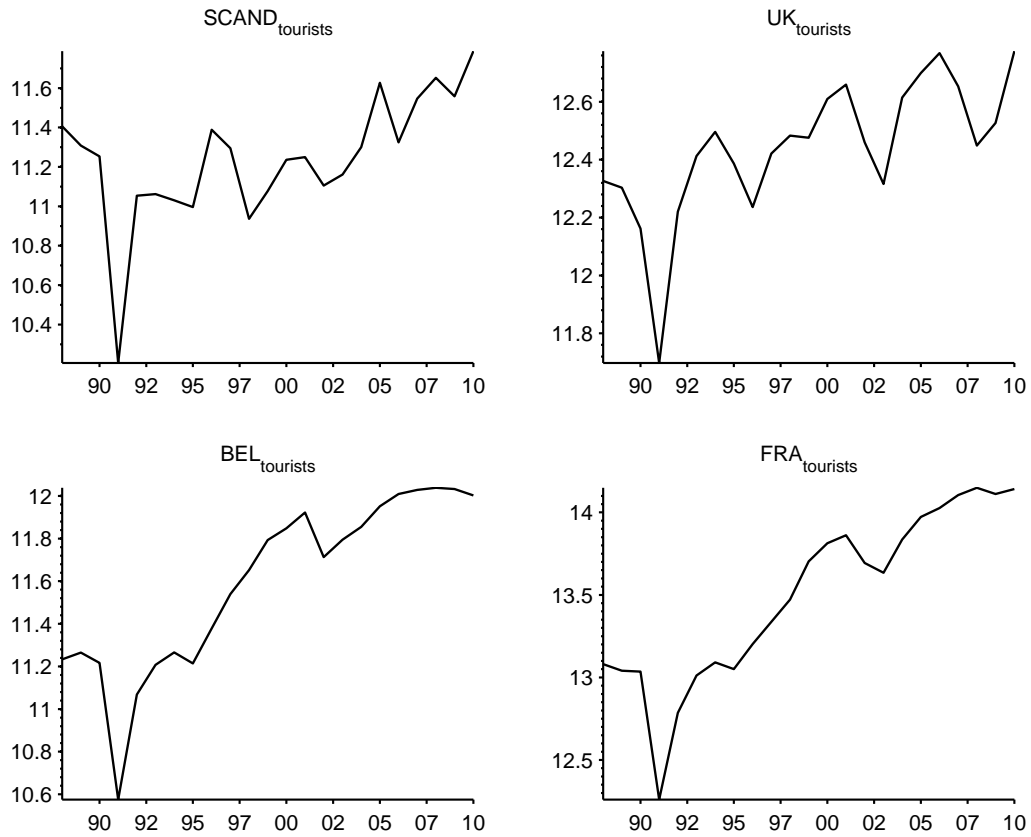
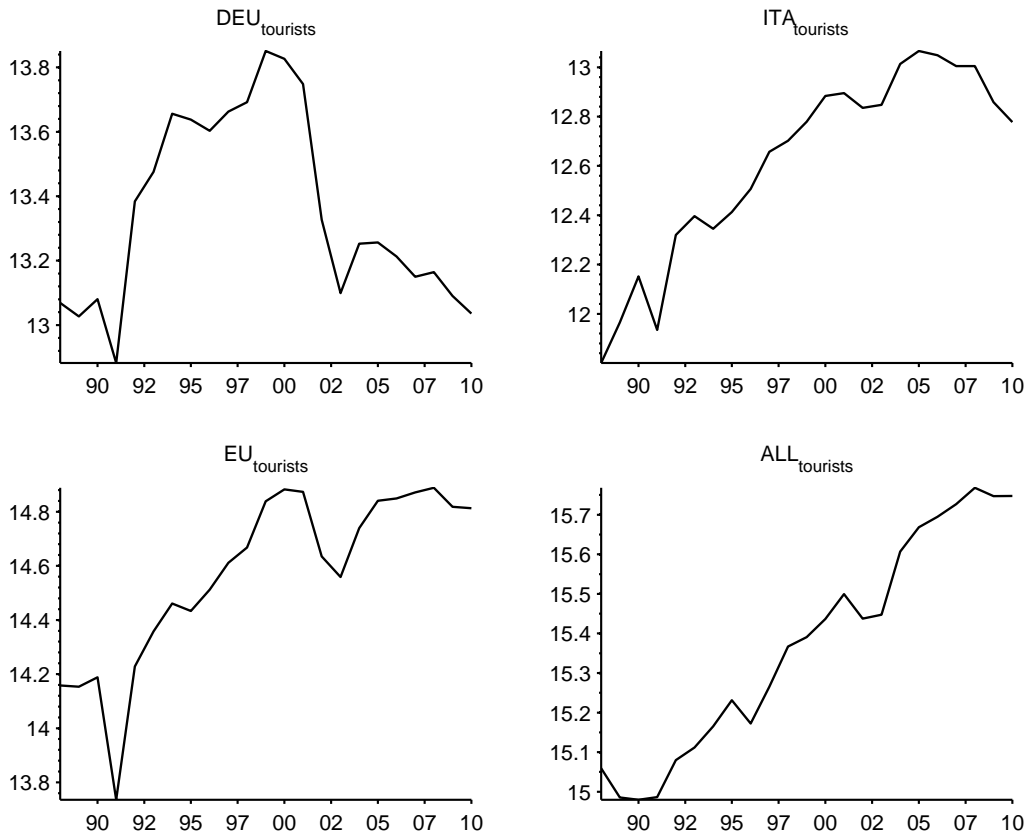


Figure 13: Number of tourist arrivals: Tunisia



1.1.5 Tourist arrivals: Turkey

Figure 14: Number of tourist arrivals: Turkey

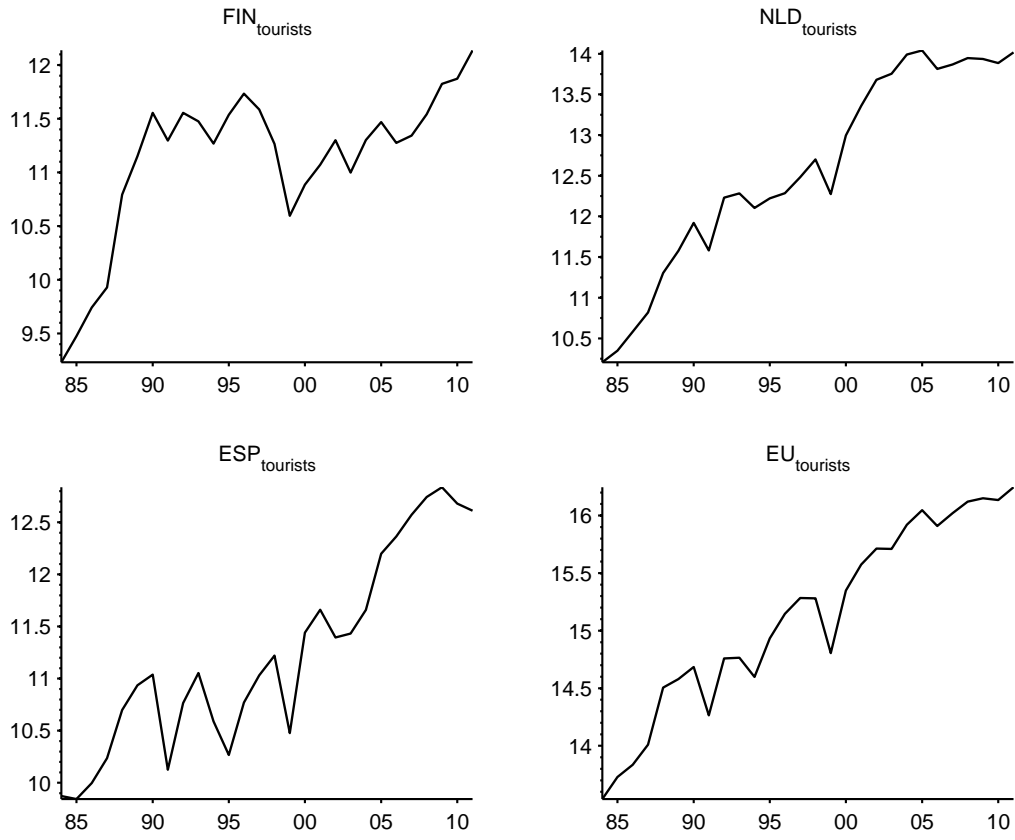


Figure 15: Number of tourist arrivals: Turkey

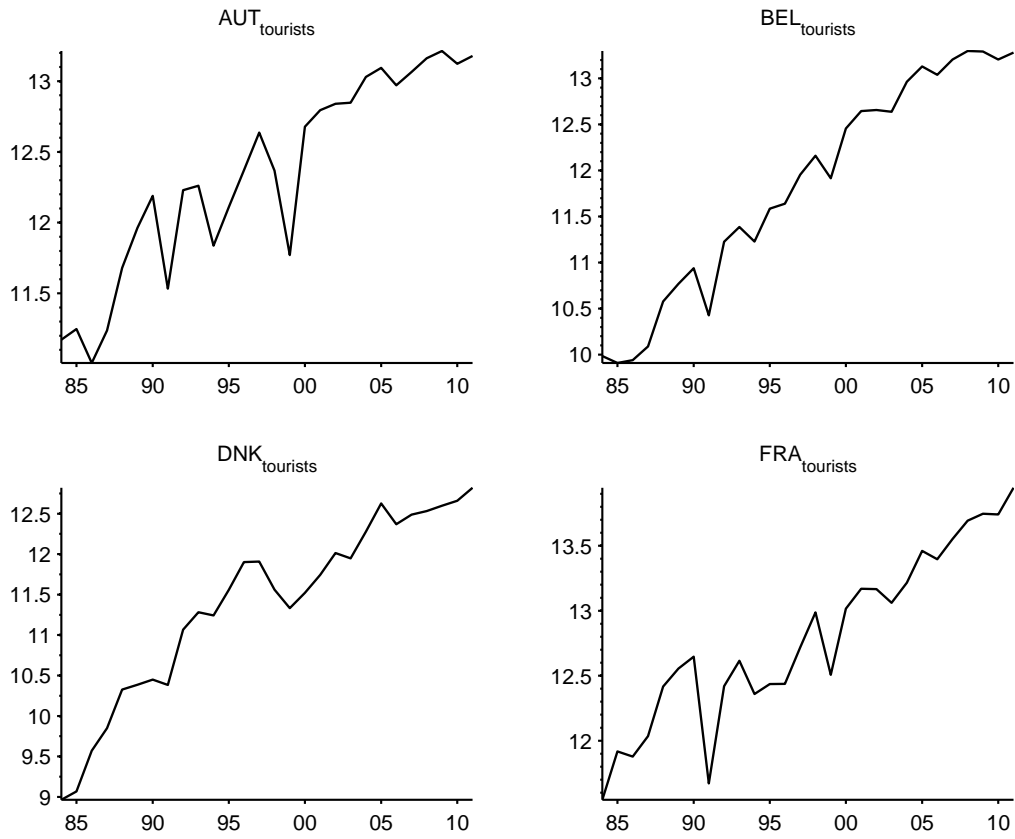


Figure 16: Number of tourist arrivals: Turkey

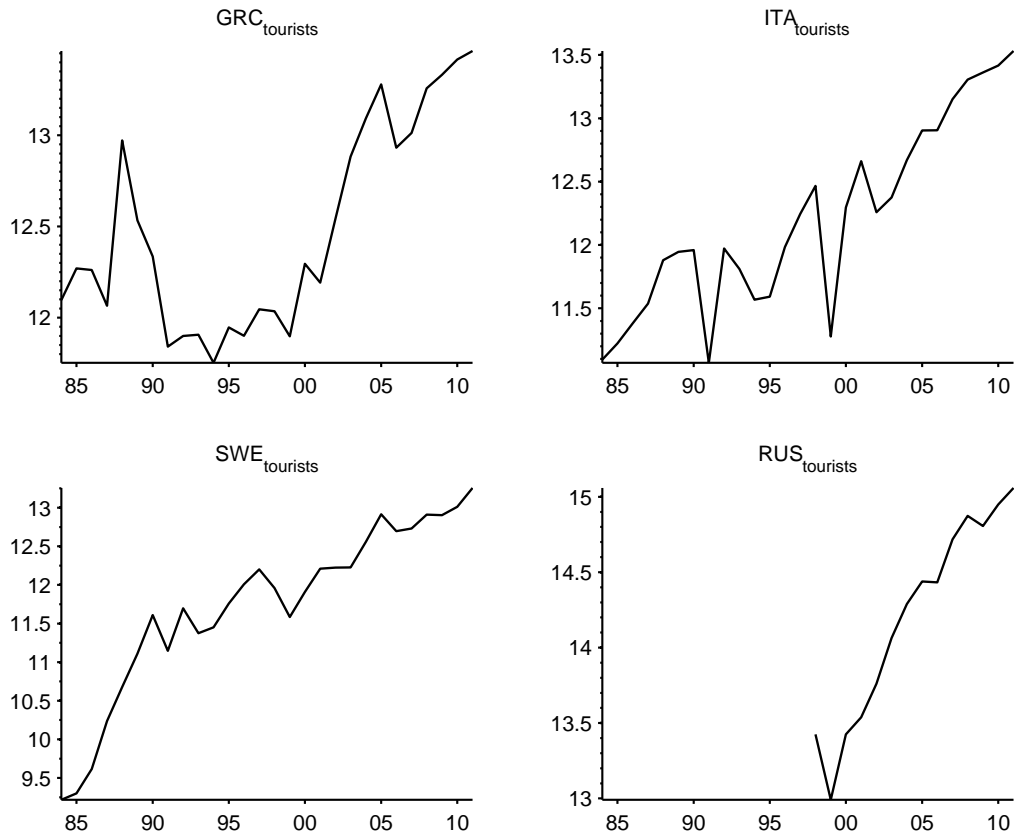
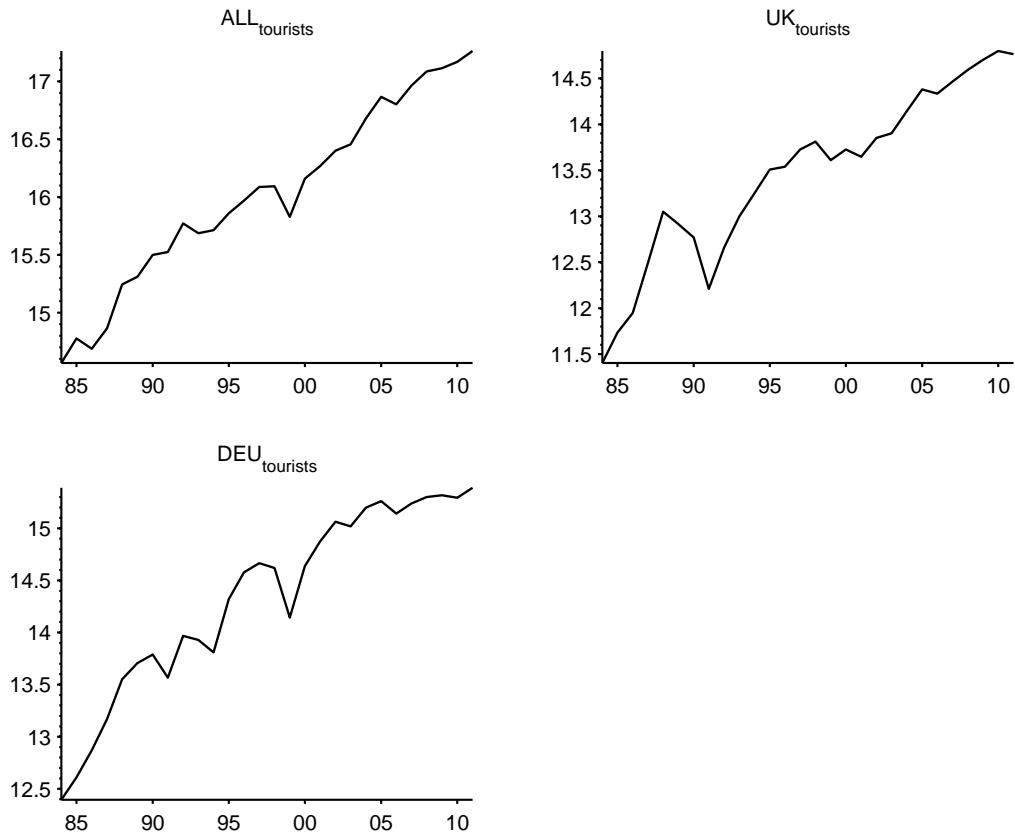


Figure 17: Number of tourist arrivals: Turkey



1.2 Granger causality test

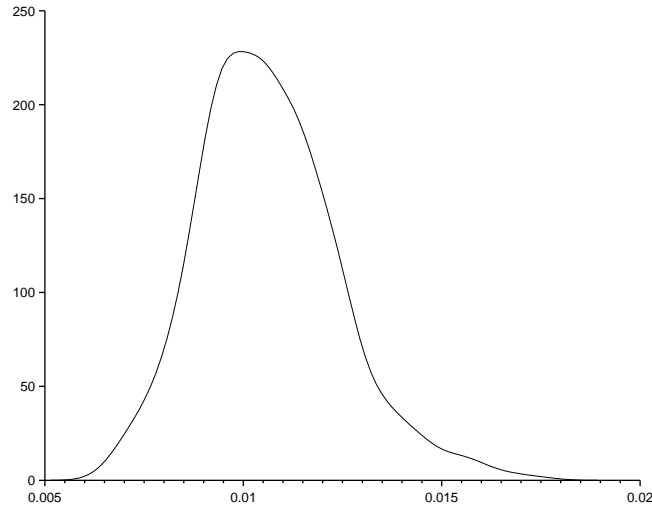
Table 1: Tourist arrivals: granger causality test

	10% c.v.	F-test
EA output → EA tourist arrivals in CY	2.894	0.002
EA tourist arrivals in CY → CY output	2.894	0.136
UK output → UK tourist arrivals in CY	2.894	0.644
UK tourist arrivals in CY → CY output	2.894	0.973
EA output → EA tourist arrivals in MA	3.073	0.177
EA tourist arrivals in MA → MA output	3.073	0.655
FR output → FR tourist arrivals in MA	3.073	2.864
FR tourist arrivals in MA → MA output	3.073	0.544
EA output → EA tourist arrivals in SY	2.961	1.670
EA tourist arrivals in SY → SY output	2.961	2.180
RU output → RU tourist arrivals in SY	3.225	3.438
RU tourist arrivals in SY → SY output	3.225	17.170
EA output → EA tourist arrivals in TN	2.975	0.024
EA tourist arrivals in TN → TN output	2.975	6.751
FR output → FR tourist arrivals in TN	2.975	0.032
FR tourist arrivals in TN → TN output	2.975	6.771
EA output → EA tourist arrivals in TR	2.918	0.743
EA tourist arrivals in TR → TR output	2.918	0.654
RU output → RU tourist arrivals in TR	3.225	2.165
RU tourist arrivals in TR → TR output	3.225	1.617

Notes: If F-test > critical value, reject the null hypothesis of no Granger causation. Arrows indicate the direction of causality. The sample length varies across cases: see the paper for details. Country codes: EA is Euro area; UK is United Kingdom; FR is France; RU is Russia; CY is Cyprus; MA is Morocco; SY is Syria; TN is Tunisia; TR is Turkey.

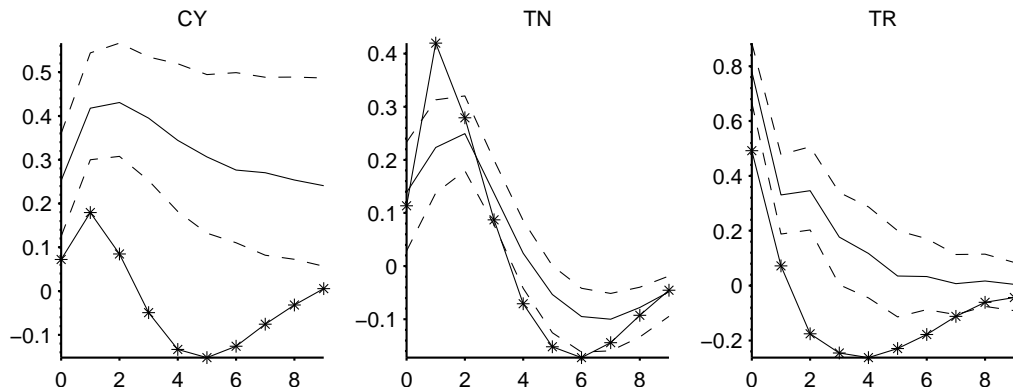
1.3 Posterior density of the hypervariance parameter

Figure 18: Posterior density of the hypervariance parameter



1.4 Counterfactual output for case studies

Figure 19: Tourist arrivals: counterfactual destination country output, case studies



Notes: Left: Cyprus. Middle: Tunisia. Right: Turkey. The source country is the United Kingdom for Cyprus and Russia for Turkey. Continuous line: median posterior IRF. Dotted lines: 68% confidence bands computed from the posterior distribution of IRFs. Starred line: counterfactual dynamic response of the destination country output without the tourism channel. Country codes: CY is Cyprus; TN is Tunisia; TR is Turkey.

2 Extensions: number of nights spent and per-capita expenditures

2.1 Tourism data in (log) levels

2.1.1 Nights spent: Tunisia

Figure 20: Number of nights spent: Tunisia.

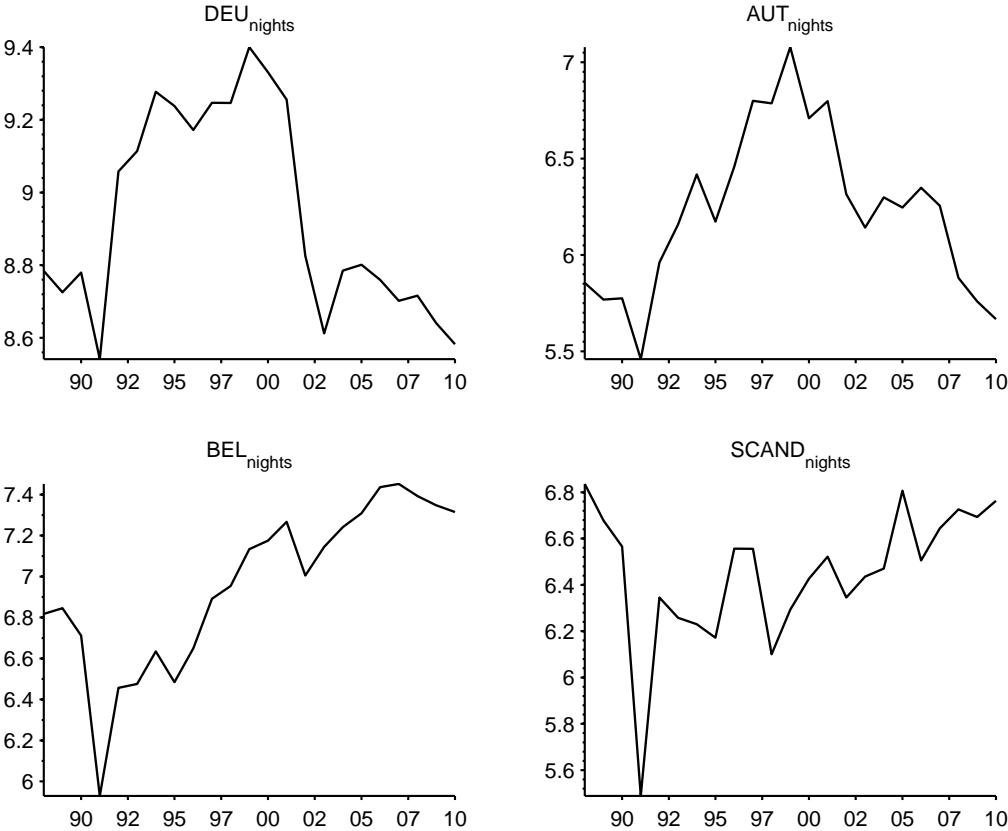


Figure 21: Number of nights spent: Tunisia.

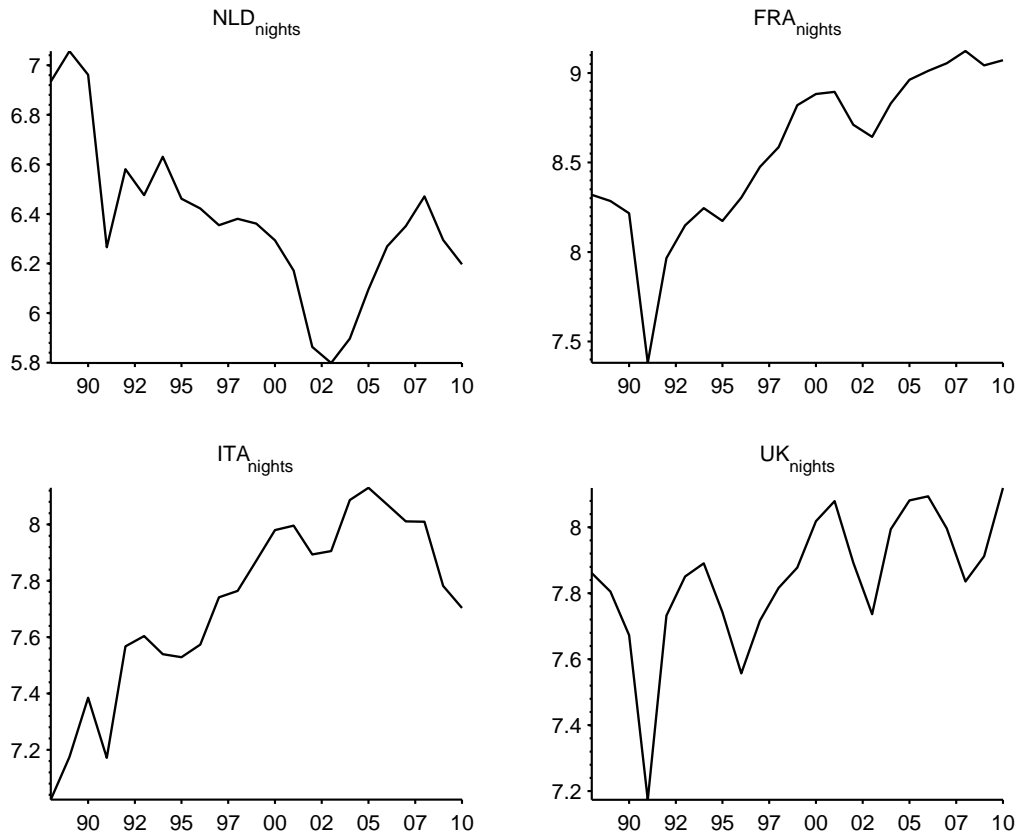
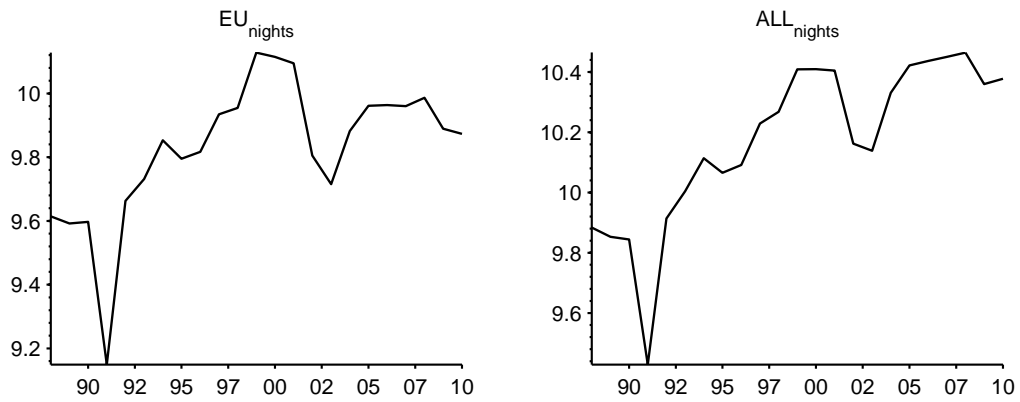


Figure 22: Number of nights spent: Tunisia.



2.1.2 Per-capita expenditures: Cyprus

Figure 23: Per-capita expenditures: Cyprus.

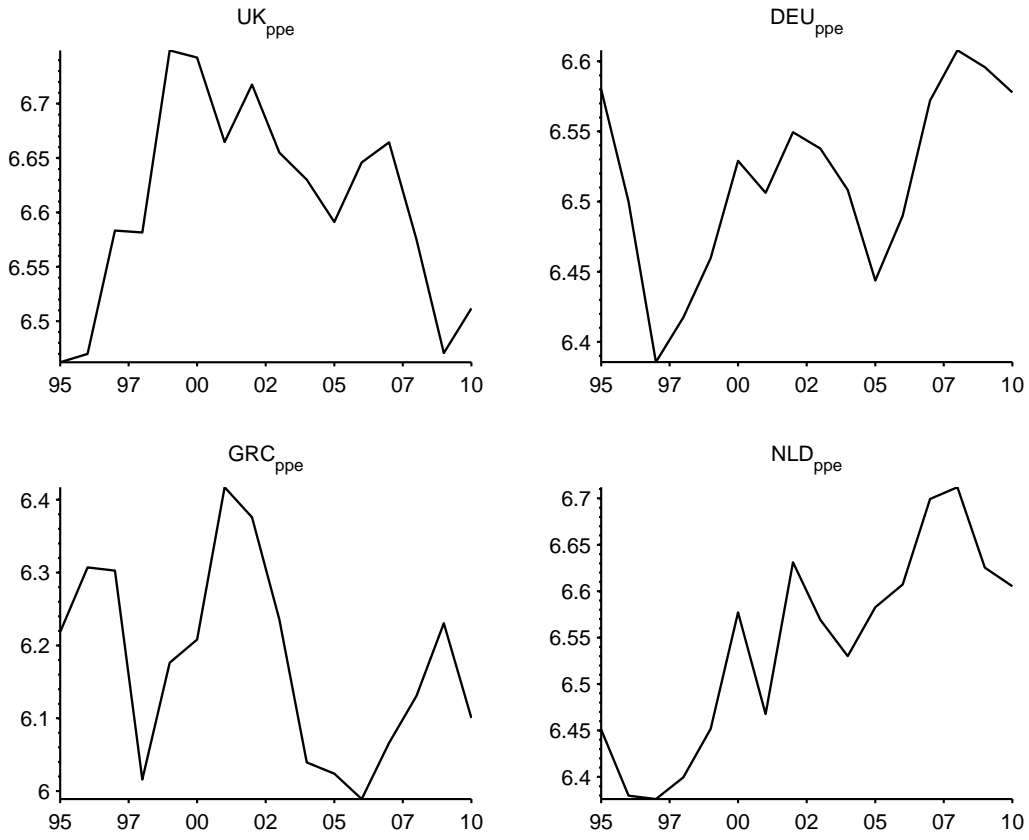


Figure 24: Per-capita expenditures: Cyprus.

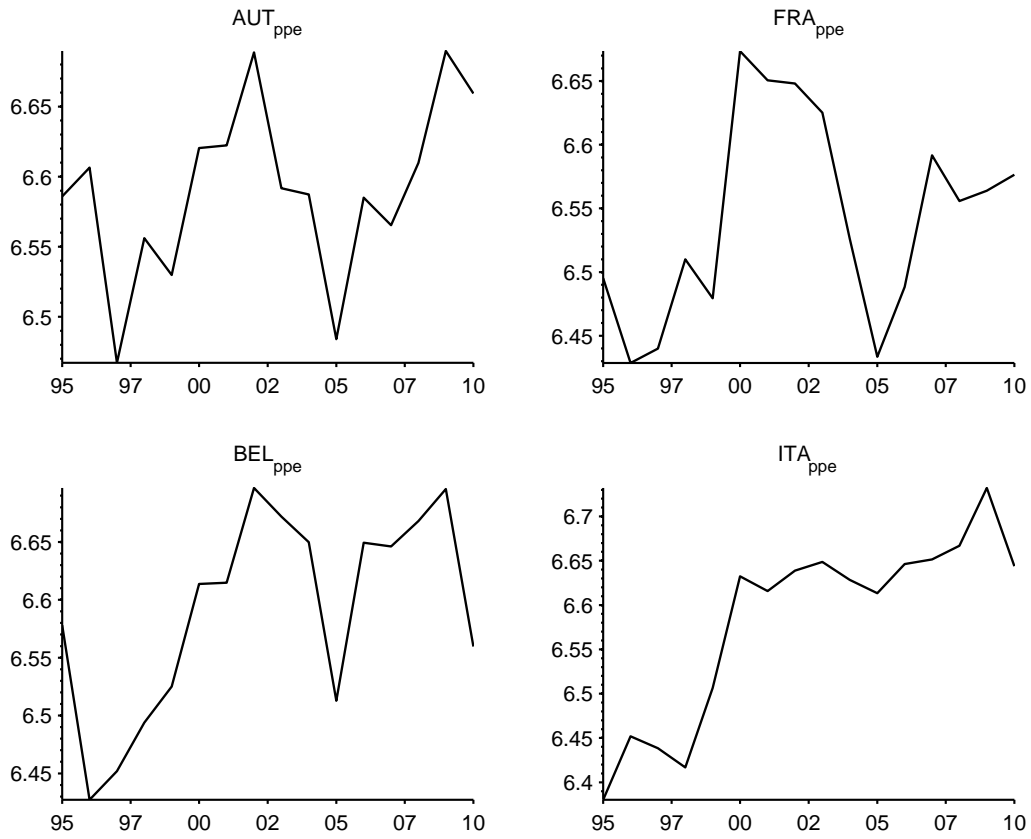
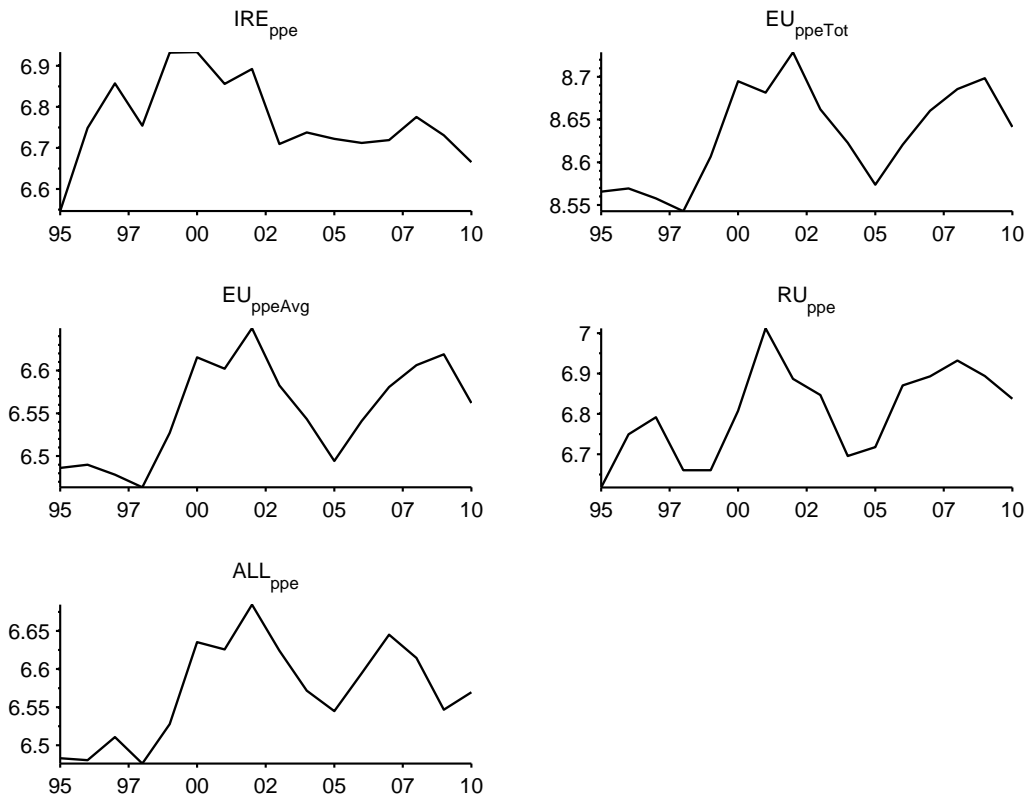
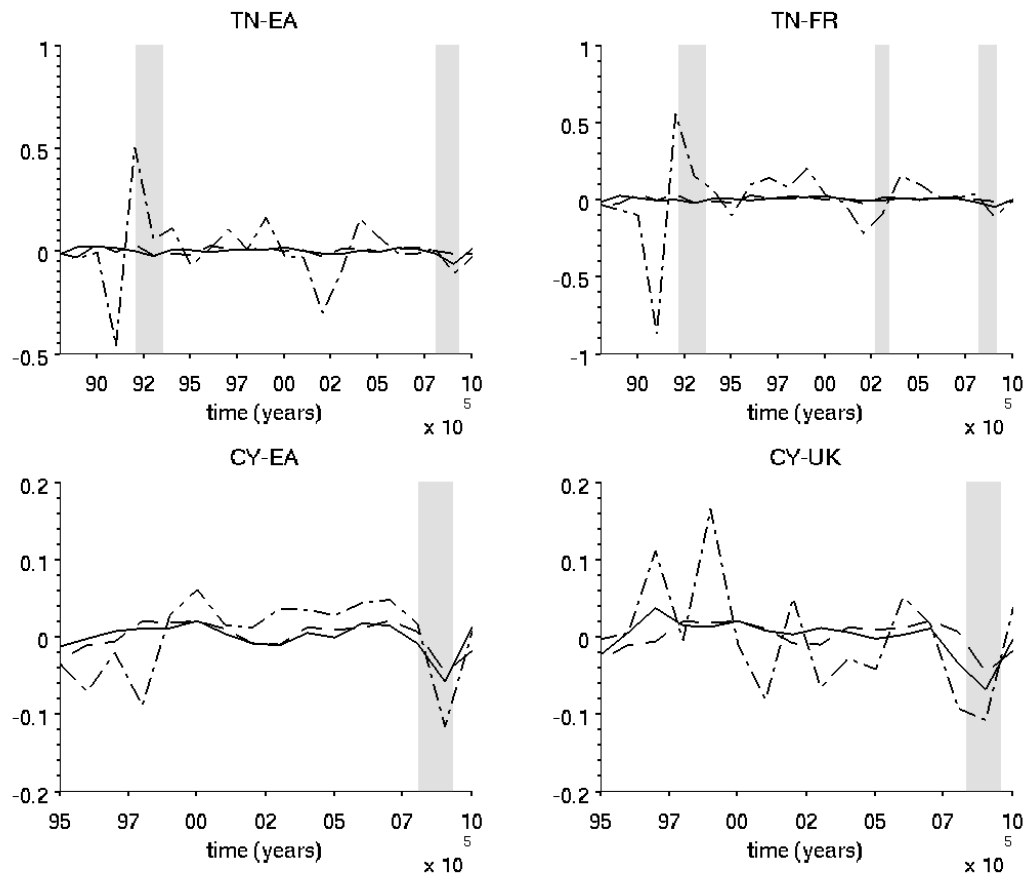


Figure 25: Per-capita expenditures: Cyprus.



2.2 Cyclical fluctuations

Figure 26: Cyclical fluctuations



Notes: Top panel: number of nights spent in Tunisia. Bottom panel: per-capita expenditures in Cyprus. Dashdotted line: annual changes of (log) tourist arrivals. Continuous and dashed lines: annual changes of the source country and destination country (log) output respectively. Shaded regions: recessions. Country codes: CY is Cyprus; TN is Tunisia; EA is Euro area; FR is France; UK is United Kingdom.

2.3 Unconditional cross-correlations

Table 2: Nights spent: unconditional cross-correlations

Output in SC & Nights in MED	Lags or leads (in years)				
	-2	-1	0	1	2
EA - TN	0.299*	-0.074	0.050	-0.050	-0.102
FR - TN	0.364*	-0.025	0.152*	-0.111	-0.284
Nights in MED & Output in MED					
EA - TN	0.369*	-0.112	0.428*	-0.496*	0.094
FR - TN	0.428*	-0.116	0.337*	-0.483*	0.092*
Output in SC & Output in MED					
EA - TN	-0.256*	-0.191*	0.292*	0.404*	-0.048
FR - TN	-0.095	-0.250*	0.286*	0.395*	0.028

Notes: The numbers in the table represent $corr(x_t, y_{t+i})$, where $i = [-2, -1, 0, 1, 2]$, x_t is the country listed first and y_t is the country listed second. The sample length varies across cases: see the paper for details. In each table, the top panel computes correlations between output in the source country (SC) and the number of nights spent in the destination country (MED); the middle panel computes correlations between the number of nights spent and output in the destination country (MED); the bottom panel computes correlations between output in the source country (SC) and in the destination country (MED). Starred values mean that the 68% confidence interval does not include zero. Confidence intervals are computed from 500 bootstrapped replications of the sample cross-correlation. Country codes: EA is Euro area; TN is Tunisia; FR is France.

Table 3: Per-capita expenditures: unconditional cross-correlations

Output in SC & Expenditures in MED	Lags or leads (in years)				
	-2	-1	0	1	2
EA - CY	-0.492*	-0.189*	0.610*	0.192*	-0.043
UK - CY	-0.050	0.452*	0.578*	0.020	-0.009
Expenditures in MED & Output in MED					
EA - CY	0.125	0.327*	0.592*	0.238*	-0.438*
UK - CY	-0.462*	-0.130	0.251	0.590*	0.257*
Output in SC & Output in MED					
EA - CY	-0.304*	-0.058	0.794*	0.568*	-0.157
UK - CY	-0.481*	-0.141	0.636*	0.716*	0.275*

Notes: The numbers in the table represent $corr(x_t, y_{t+i})$, where $i = [-2, -1, 0, 1, 2]$, x_t is the country listed first and y_t is the country listed second. The sample length varies across cases: see the paper for details. In each table, the top panel computes correlations between output in the source country (SC) and per-capita expenditures in the destination country (MED); the middle panel computes correlations between per-capita expenditures and output in the destination country (MED); the bottom panel computes correlations between output in the source country (SC) and in the destination country (MED). Starred values mean that the 68% confidence interval does not include zero. Confidence intervals are computed from 500 bootstrapped replications of the sample cross-correlation. Country codes: EA is Euro area; UK is United Kingdom; CY is Cyprus.

2.4 Dynamic correlations

Table 4: Dynamic correlations

Output in SC & Tourism in MED	Frequencies	
	0	$\frac{\pi}{2}$
EA - CY	0.305	0.761
UK - CY	0.724	0.602
EA - TN	0.199	-0.167
FR - TN	0.206	-0.015
Tourism in MED & Output in MED	Frequencies	
	0	$\frac{\pi}{2}$
EA - CY	0.620	0.681
UK - CY	0.344	0.330
EA - TN	0.478	0.081
FR - TN	0.604	-0.037
Output in SC & Output in MED	Frequencies	
	0	$\frac{\pi}{2}$
EA - CY	0.876	0.802
UK - CY	0.653	0.646
EA - TN	0.184	0.367
FR - TN	0.373	0.261

Notes: Frequencies centered at zero capture comovement in the long run; frequencies around $\pi/2$ coincide with business cycles of about four years. The sample length varies across cases: see the paper for details. The tourism variable identifies number of nights spent for Tunisia and per-capita expenditures for Cyprus. The top panel computes dynamic correlations between output in the source country (SC) and the tourism variable in the destination country (MED); the middle panel computes dynamic correlations between the tourism variable and output in the destination country (MED); the bottom panel computes dynamic correlations between output in the source country (SC) and in the destination country (MED). Country codes: EA is Euro area; UK is United Kingdom; FR is France; CY is Cyprus; TN is Tunisia.

2.5 Granger causality test

Table 5: Nights spent: granger causality test

	10% c.v.	F-test
EA output → EA nights spent in TN	2.975	0.028
EA nights spent in TN → TN output	2.975	7.517
FR output → FR nights spent in TN	2.975	0.148
FR nights spent in TN → TN output	2.975	6.450

Notes: If F-test > critical value, reject the null hypothesis of no Granger causation. Country codes: EA is Euro area; TN is Tunisia; FR is France.

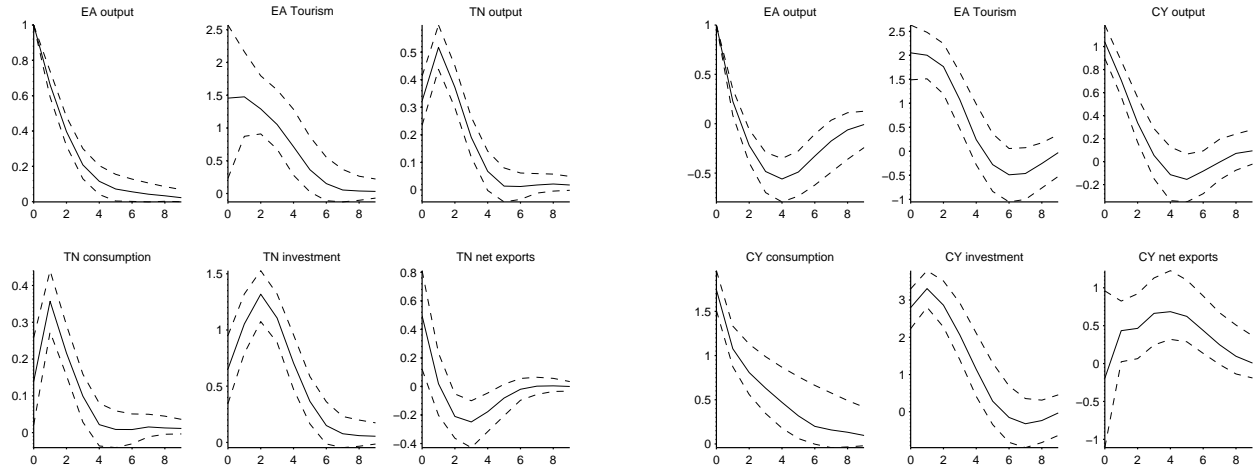
Table 6: Per-capita expenditures: granger causality test

	10% c.v.	F-test
EA output → EA expenditures in CY	3.136	0.030
EA expenditures in CY → CY output	3.136	0.023
UK output → UK expenditures in CY	3.136	0.034
UK expenditures in CY → CY output	3.136	5.049

Notes: If F-test > critical value, reject the null hypothesis of no Granger causation. Country codes: EA is Euro area; CY is Cyprus; UK is United Kingdom.

2.6 Structural analysis

Figure 27: IRFs to source country output shocks, sensitivity analysis



Notes: Left: number of nights spent in Tunisia. Right: per-capita expenditures in Cyprus. Continuous line: median posterior IRF. Dotted lines: 68% confidence bands computed from the posterior distribution of IRFs. The order of the plots is the following: source country output, source country tourist variable, MED output, MED consumption, MED investment, MED net exports. Here, MED identifies either Tunisia or Cyprus. Country codes: EA is Euro area; CY is Cyprus; TN is Tunisia.

Table 7: Forecast error variance decomposition, sensitivity analysis

Tunisia	Time horizon (in years)			
	0	1	4	8
EA tourism Shock1	5 (2,10)	7 (3,12)	10 (6,16)	11 (7,17)
Shock2	95 (90,98)	92 (86,96)	85 (79,90)	83 (76,89)
TN output Shock1	16 (8,23)	33 (26,41)	35 (27,43)	33 (26,41)
Shock2	5 (2,10)	16 (12,22)	22 (16,29)	25 (18,34)
TN consumption Shock1	8 (3,18)	26 (17,37)	27 (19,37)	27 (19,36)
Shock2	8 (3,16)	22 (14,32)	29 (20,38)	31 (22,40)
TN investment Shock1	13 (6,25)	22 (13,32)	36 (28,45)	34 (26,43)
Shock2	32 (21,44)	20 (14,28)	24 (17,33)	27 (20,37)
TN net exports Shock1	17 (7,33)	17 (9,28)	19 (11,27)	19 (12,28)
Shock2	24 (11,42)	30 (19,43)	38 (27,49)	38 (29,50)

Cyprus	Time horizon (in years)			
	0	1	4	8
EA tourism Shock1	19 (10,29)	24 (15,34)	28 (19,38)	29 (21,39)
Shock2	81 (71,90)	69 (59,78)	53 (44,65)	48 (38,58)
CY output Shock1	50 (40,59)	46 (36,55)	38 (28,47)	37 (28,47)
Shock2	2 (1,5)	9 (5,14)	22 (13,32)	23 (14,32)
CY consumption Shock1	69 (57,77)	61 (49,70)	55 (44,65)	52 (41,63)
Shock2	2 (1,4)	5 (3,9)	10 (5,15)	11 (7,18)
CY investment Shock1	53 (38,66)	56 (42,66)	53 (42,63)	48 (38,59)
Shock2	4 (1,8)	12 (7,21)	17 (11,25)	19 (13,28)
CY net exports Shock1	27 (12,50)	25 (14,43)	29 (19,42)	31 (20,43)
Shock2	22 (8,42)	33 (18,50)	36 (24,48)	31 (22,44)

Notes: The first column indicates the countries considered and the relevant variables in the VAR. "Shock1" is output shock in the source country; "Shock2" is tourism shock which identifies a shock to the number of nights spent in Tunisia and a shock to per-capita expenditures in Cyprus. The numbers in parenthesis are the lower and upper 68% confidence intervals. Country codes: EA is Euro area; CY is Cyprus; TN is Tunisia.