Temperature and destination choice – a pan-European perspective

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Abstract

Temperature and destination choice a pan-European perspective

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This paper explores the relation between temperature and the propensity to spend nights in commercial accommodations. As far as leisure tourism is concerned, it is expected that there will be a strong tendency for the demand for bednights to be concentrated in the warmest months of year, with the exception of a few alpine and other dual season tourism destinations. Business and leisure tourism seasons are different, with business tourism only partly affected by temperature. Thus the meeting industry has a high season in September, when the holiday season is finished, but when the weather is still nice. As far as travel outside of Europe is concerned, destinations with relatively high temperatures seem to be preferred in the European winter months. It is the contention of this paper that temperature drives tourism both domestically and internationally. Domestically the demand for bednights is concentrated in the summer months. This, both has natural and institutional causes, namely temperature as a natural cause, and school summer holidays as an institutional cause. Temperature also drives tourism internationally, since in the summer holiday season, Europeans tend to prefer the warmer to the cooler destinations. Thus holiday-makers from northern Europe tend to travel south, to the higher temperatures and more sun safe destinations, for their summer holiday. The question is, though, to what extent are the choice of the warmer destinations driven by a desire for higher temperature or lower prices or other attributes of the destinations? Costs consist of transportation costs and costs at the destination (for accommodation and other things). If the travel is straight south, from northern Europe, this could indicate both a desire for higher temperatures, and a desire for low travel costs. If the destination has relatively low prices, this could indicate that also low prices play a role for destination choice. If the travel deviates from the straight south direction, this could indicate that other things than the desire for higher temperatures play a role. In light of the increasing average temperatures, this paper will show, if the peak summer months of July and August has accounted for a declining percentage of all bednights in Europe over the last two decades, and if so, it will be discussed to what extend this is related to climate change or other factors. The main data set applied in this study is monthly bednight statistics for all European countries (4 segments: hotel/other, domestic/international) for the period 1990-2010. The research question of this paper is: What is the role of temperature in destination choice? And hereunder: To what extent is destination choice for holidays and leisure travel in general by the desire for (higher) temperature or (lower) prices? - Has climate change affected seasonality (and destination choice)?

Overview

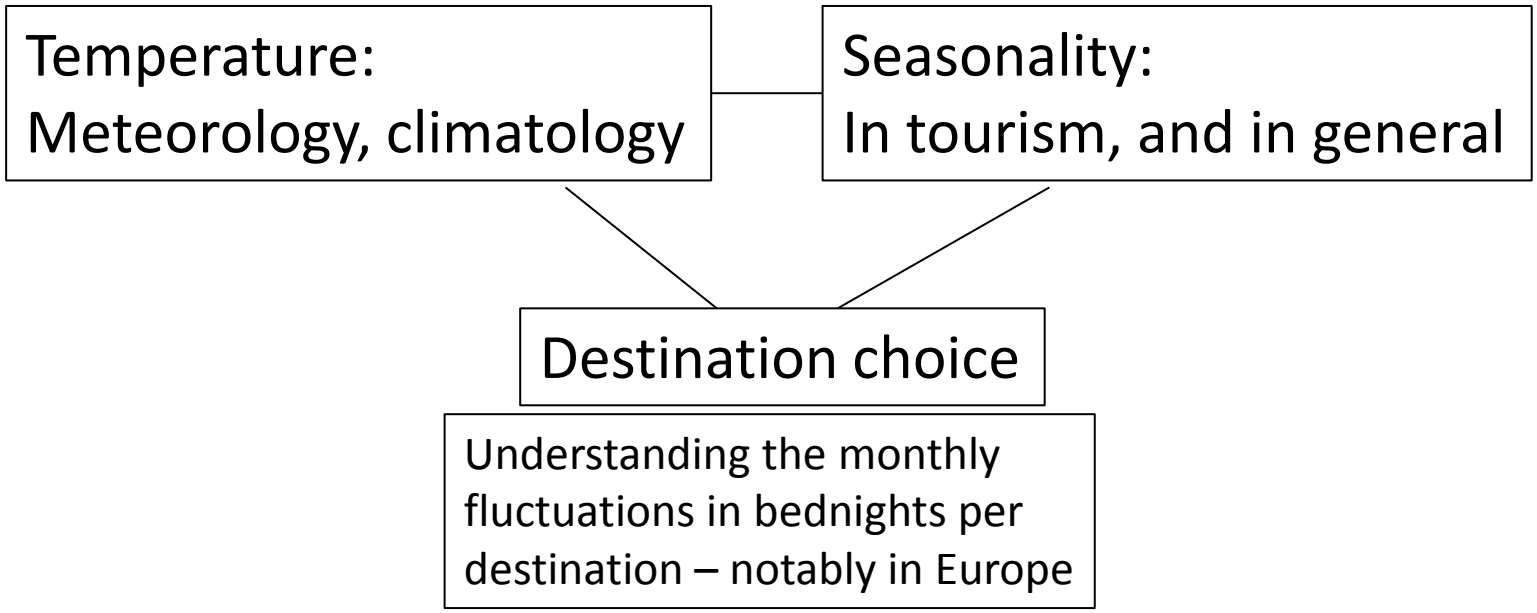
1. Introduction
2. The [varying] significance of temperature as a determinant of monthly bednight for European destinations - at the national levels
3. The falling share of July and August in the total no. of bednights in Europe (EU27)
4. Summary – Discussion, Q&A

Purpose

The purpose of the paper is to explore the role of temperature in destination choice in Europe.

A puzzling question: What are the reasons for the declining share of July and August in the bednighs in Europe?

Streams of literature – related to temperature←→destination choice: bednights



The model

[ln] no. of bednights per month =
F (temperature,
[ln] income,
relative prices at the destination,
transportation costs,
timing of holidays*, ..
.. coastlines, islands)

* Holidays: For example Easter.
Also: % of market area in school holidays, but this is already correlated with temp.

One result

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1441740.041	300535.195		-4.797	.000
	Foreigners	-659427.335	42145.454	-.303	-15.646	.000
	Hotels	1011155.169	41868.921	.464	24.150	.000
	C_33_destination	103545.775	2877.404	.698	35.986	.000
	GDP_index_EU27	10213.410	2271.304	.086	4.497	.000

a. Dependent Variable: Europe_33_day

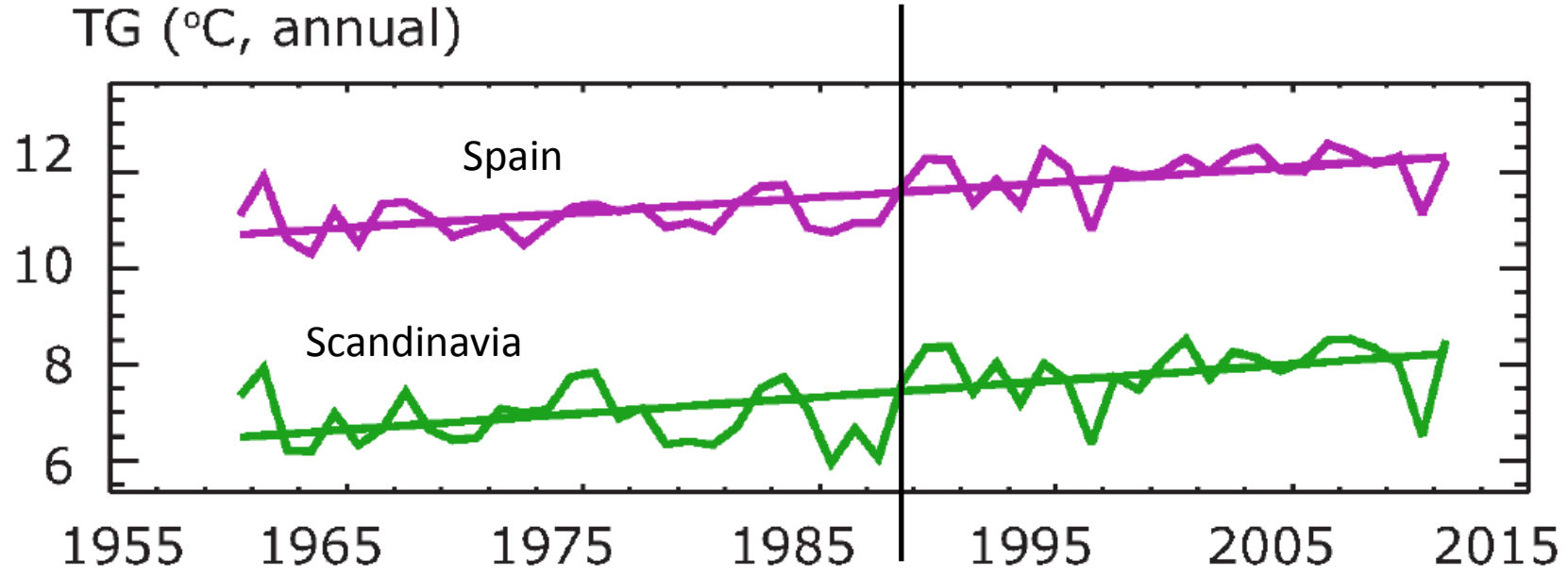
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.790	.789	501181.999

a. Predictors: (Constant), GDP_index_EU27, Hotels, Foreigners, C_33_destination

PS: The analysis can be run for the four segments separately, to avoid 2 dummies (“Foreigners” and “Hotels”). - Also: The analysis may be run on LN of bednights per night, and LN of GDP_index_EU27.

European temperature trend(s): Around 0.33°C higher per decade



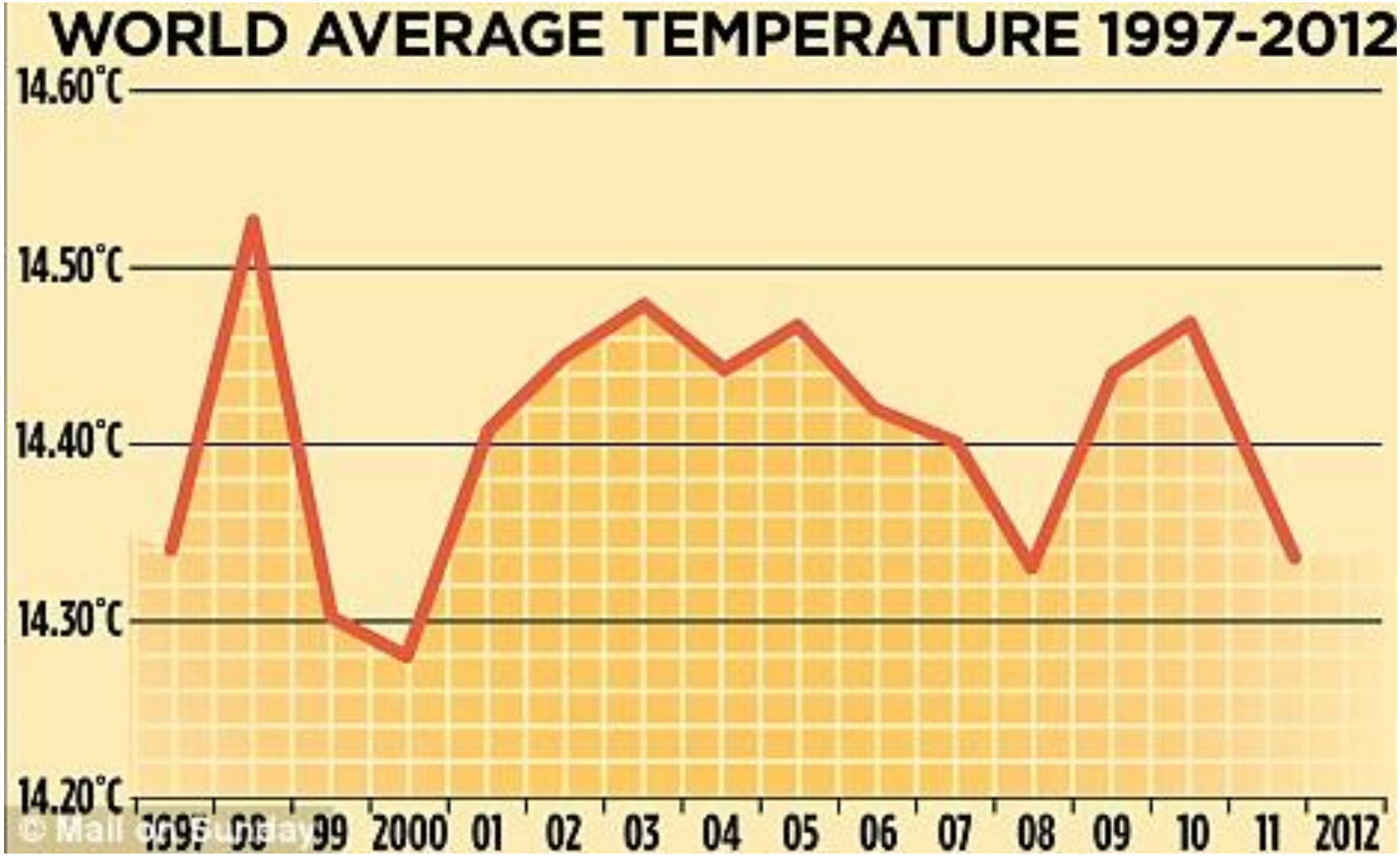
Scandinavia — Annual: 0.32 °C per decade (0.22 to 0.40).
Total change of 1.58 °C from 1960 to 2012
(1.12 °C to 2.02 °C)

Spain — Annual: 0.34 °C per decade (0.21 to 0.44).
Total change of 1.70 °C from 1960 to 2012
(1.05 °C to 2.21 °C)

EEA: European Evironmental Agency

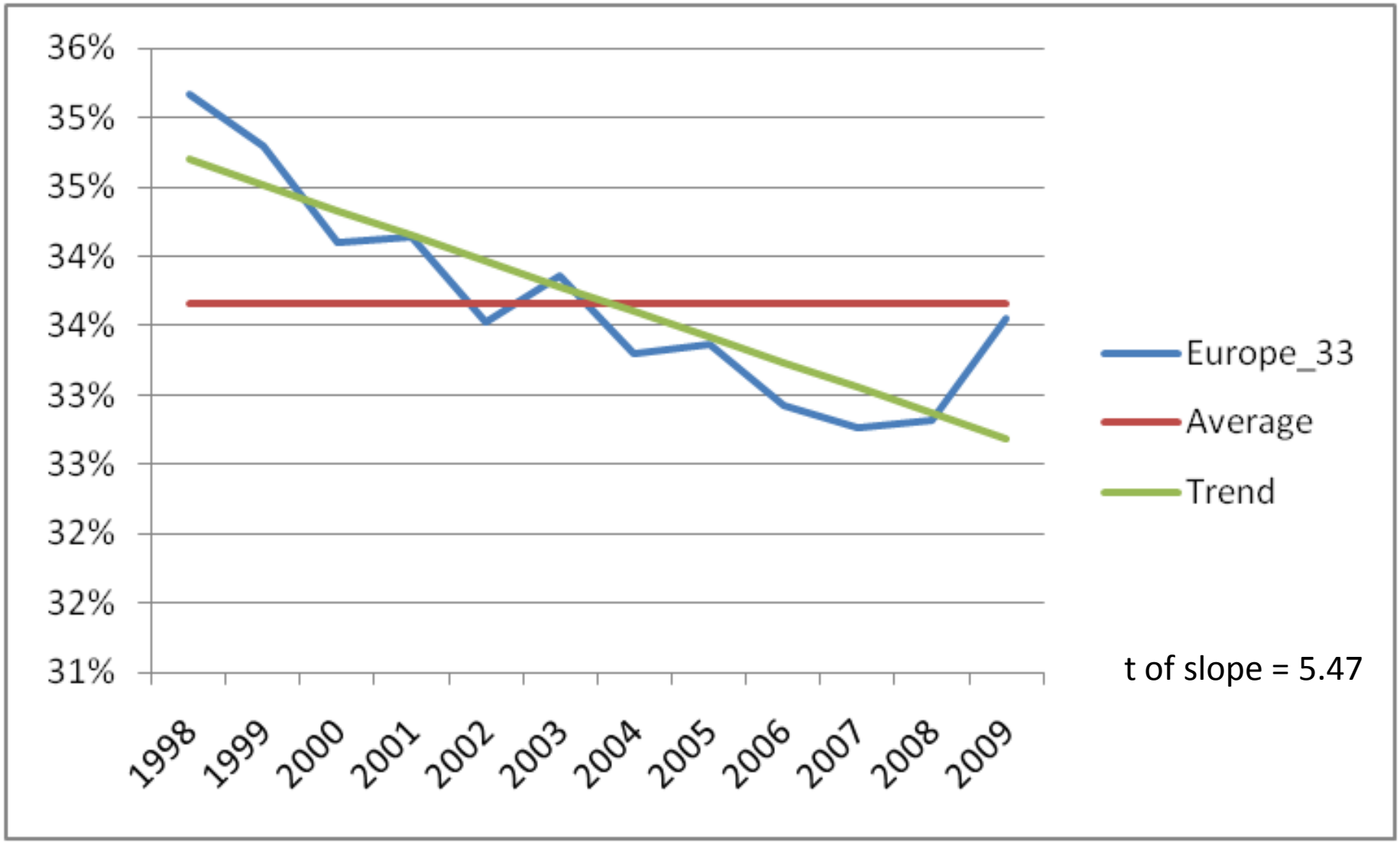
Source: www.eea.europa.eu/data-and-maps/figures/decadal-average-trends-in-mean, June 2012

World average temperature 1997-2012

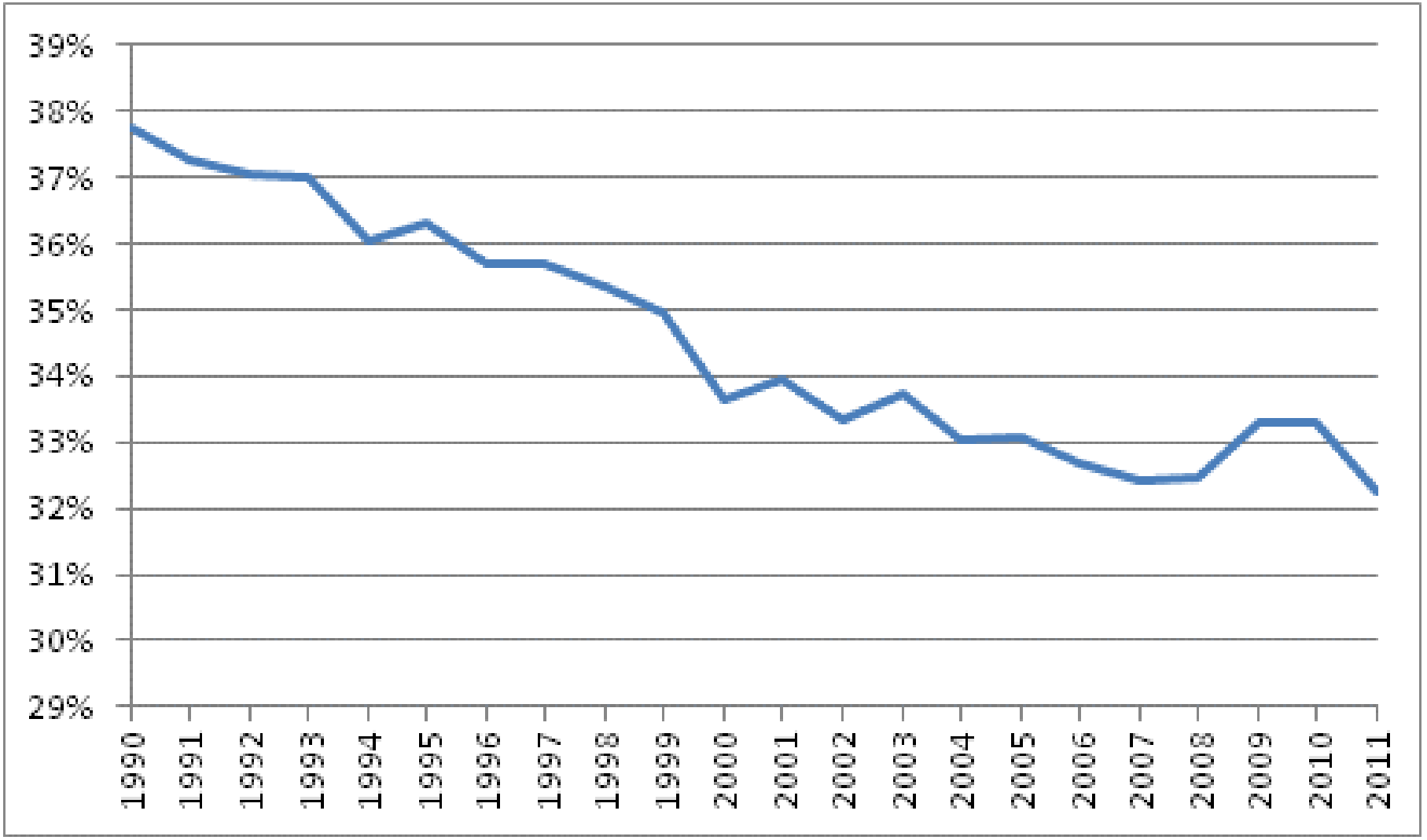


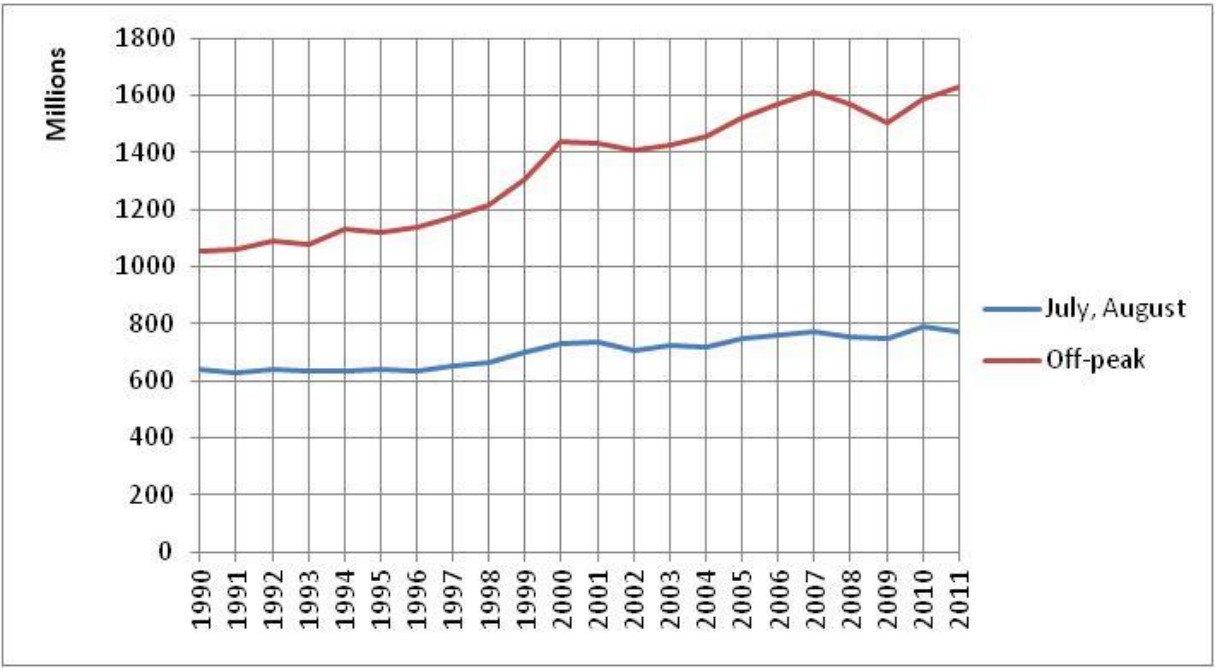
Source: http://www.dailymail.co.uk/sciencetech/article-2093264/Forget-global-warming--Cycle-25-need-worry-NASA-scientists-right-Thames-freezing-again.html

July+August in percent of all bednights



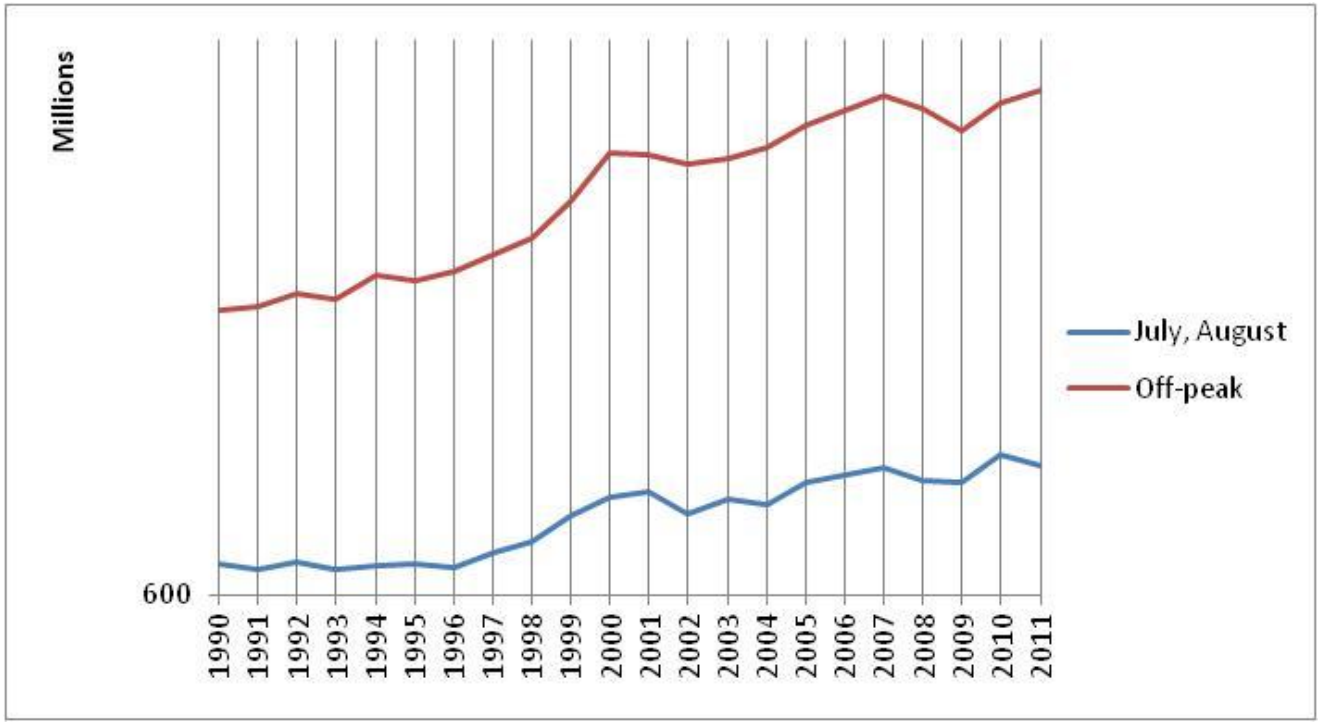
July+August in % of all bednights EU27

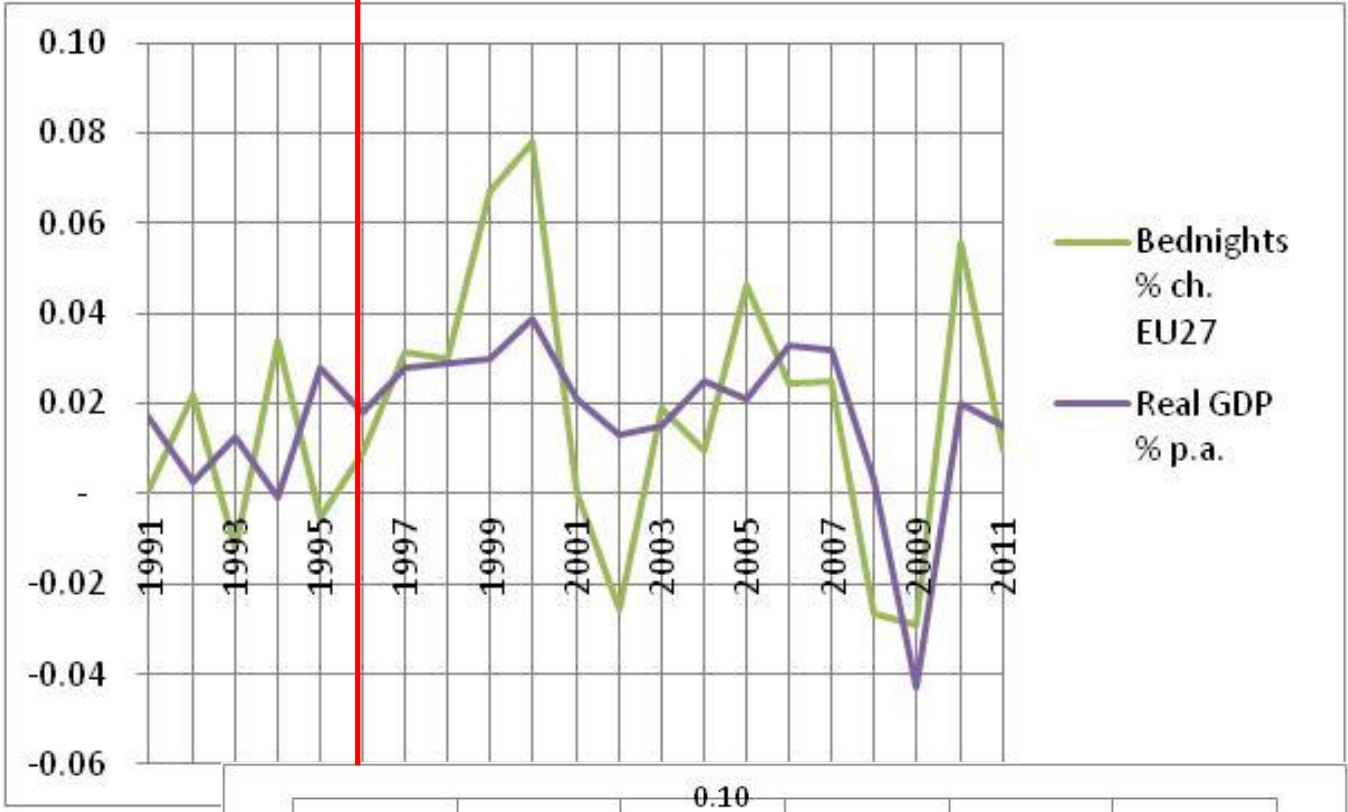


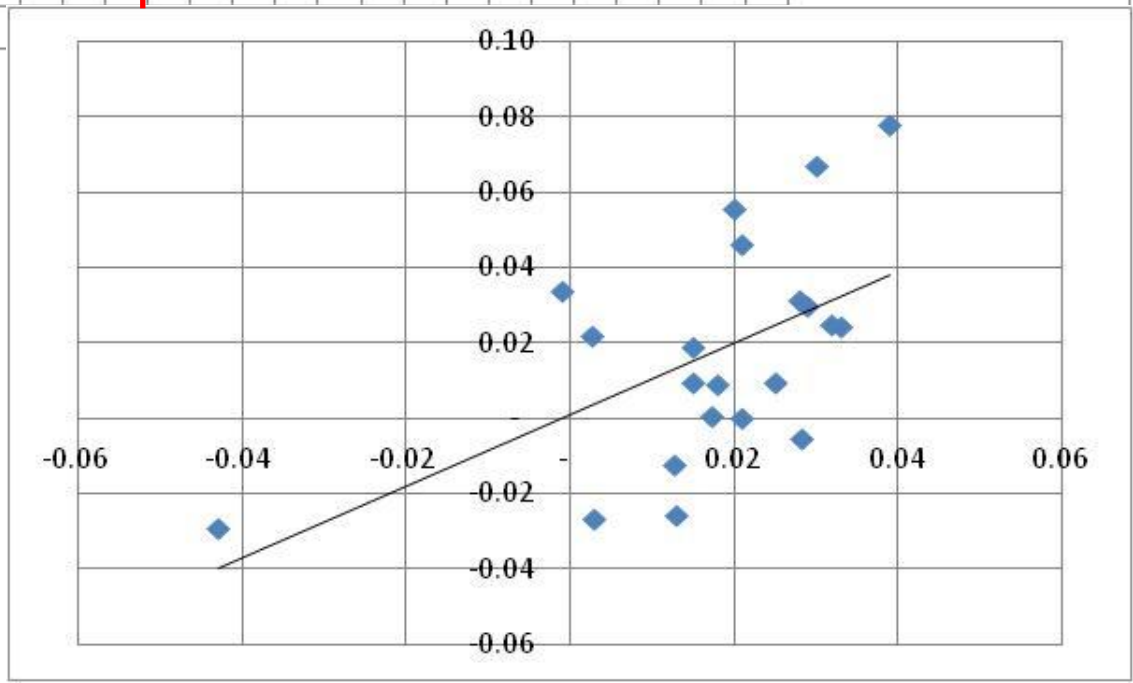


In absolute numbers, bednights in July and August in not fall, but bednights increased faster during off-peak months than in the July and August

Log scale

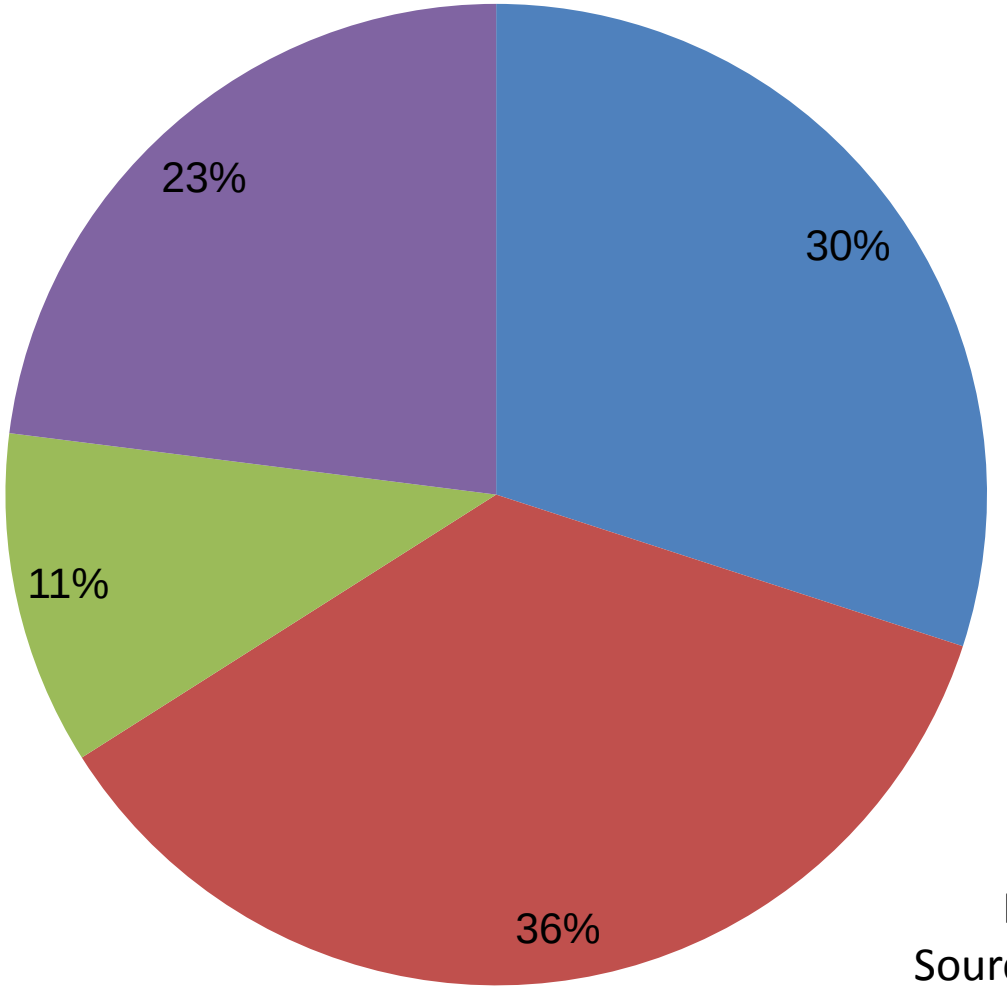






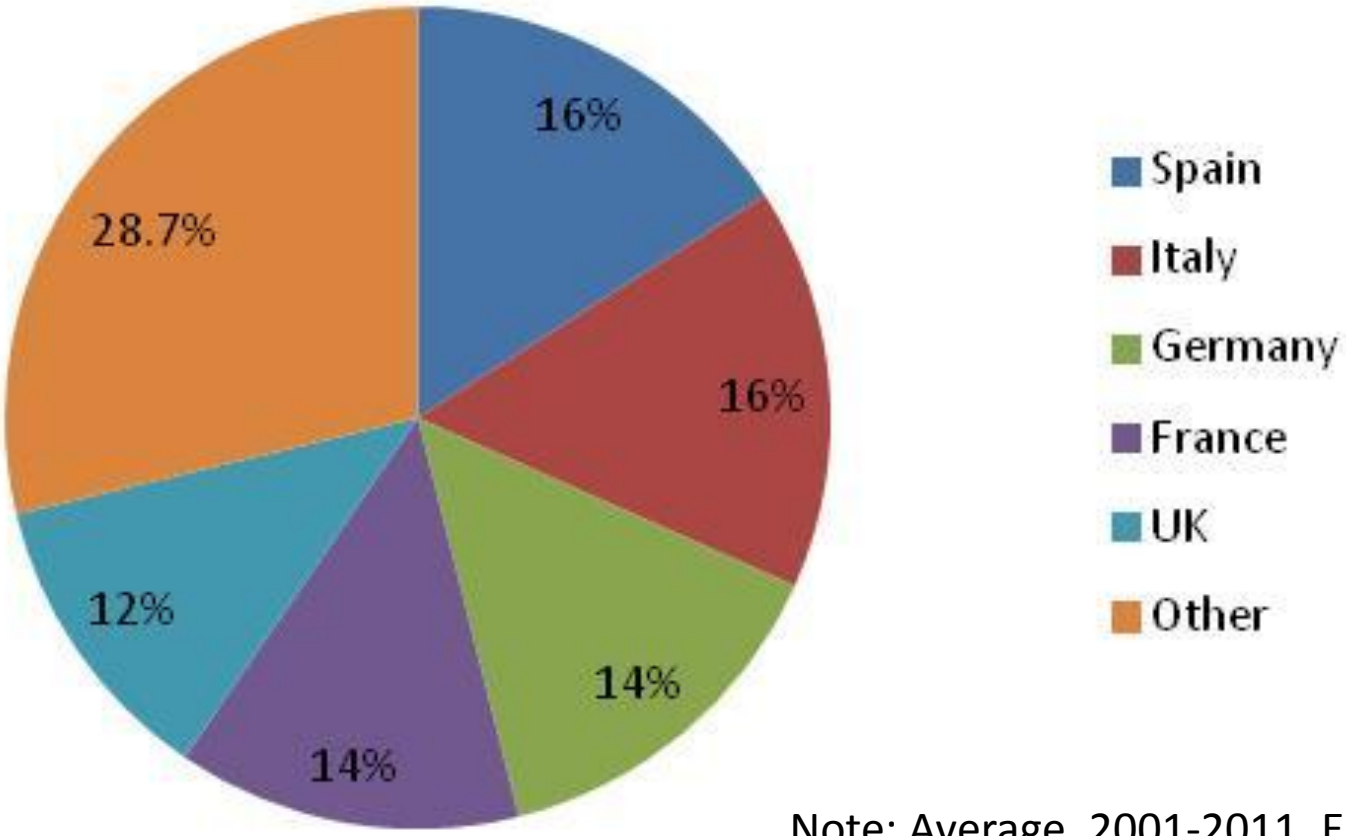
Bednight=f (real income, ...)

The 4 accommodation segments



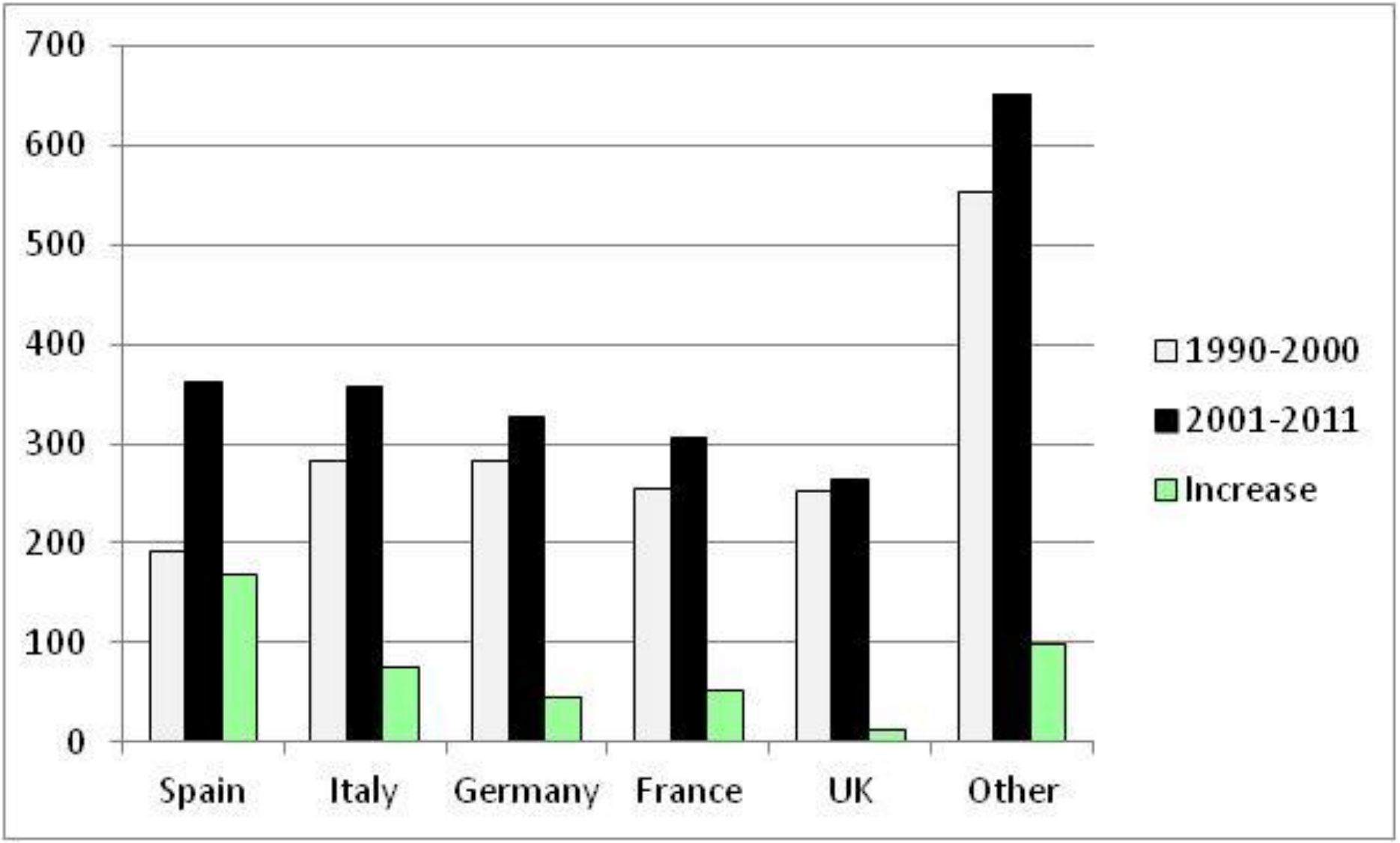
Note: Average, 2001-2011, EU27
Source: Based on data from Eurostat.

The top destinations – major economies – by no. of bednights

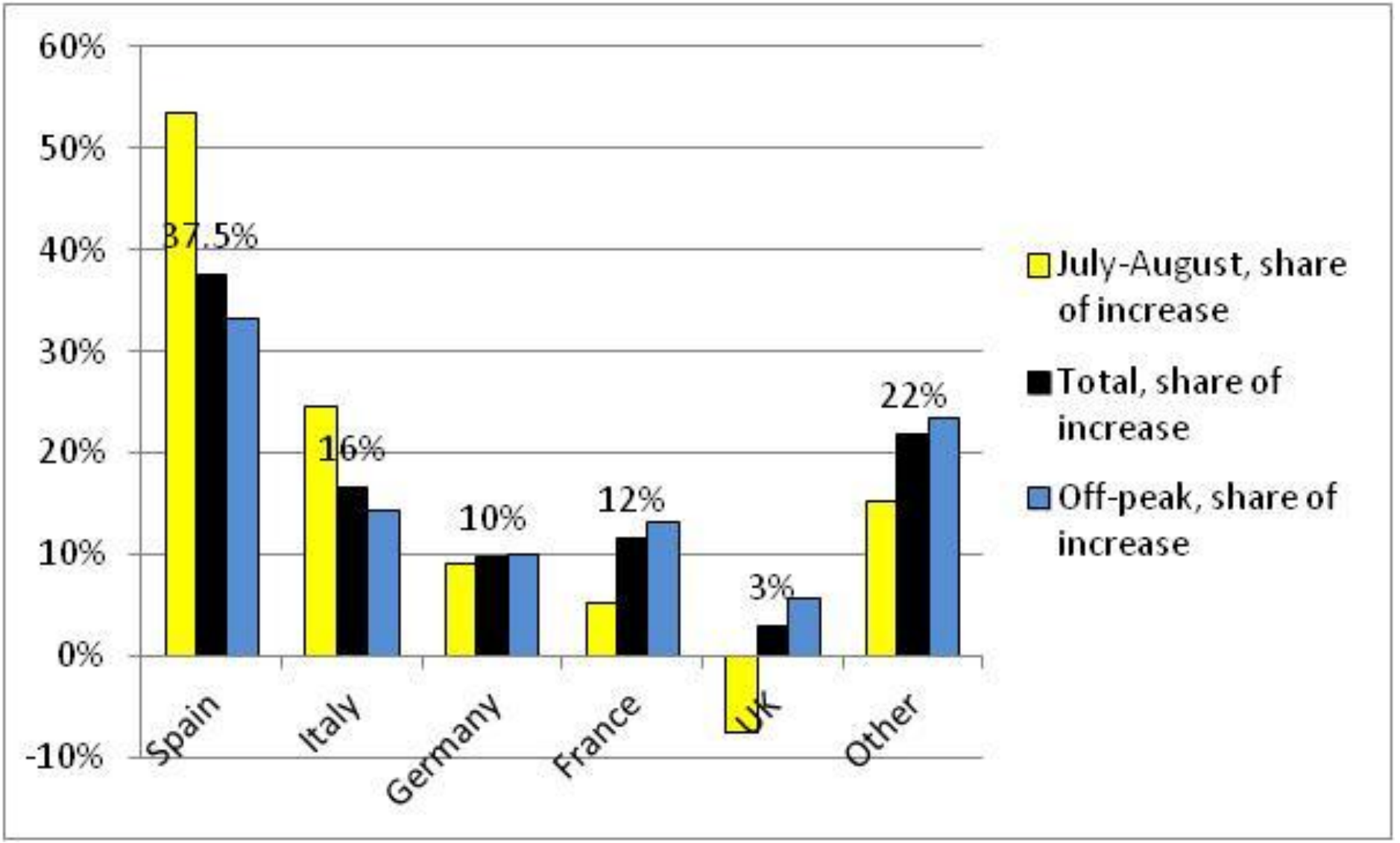


Note: Average, 2001-2011, EU27
Source: Based on data from Eurostat.

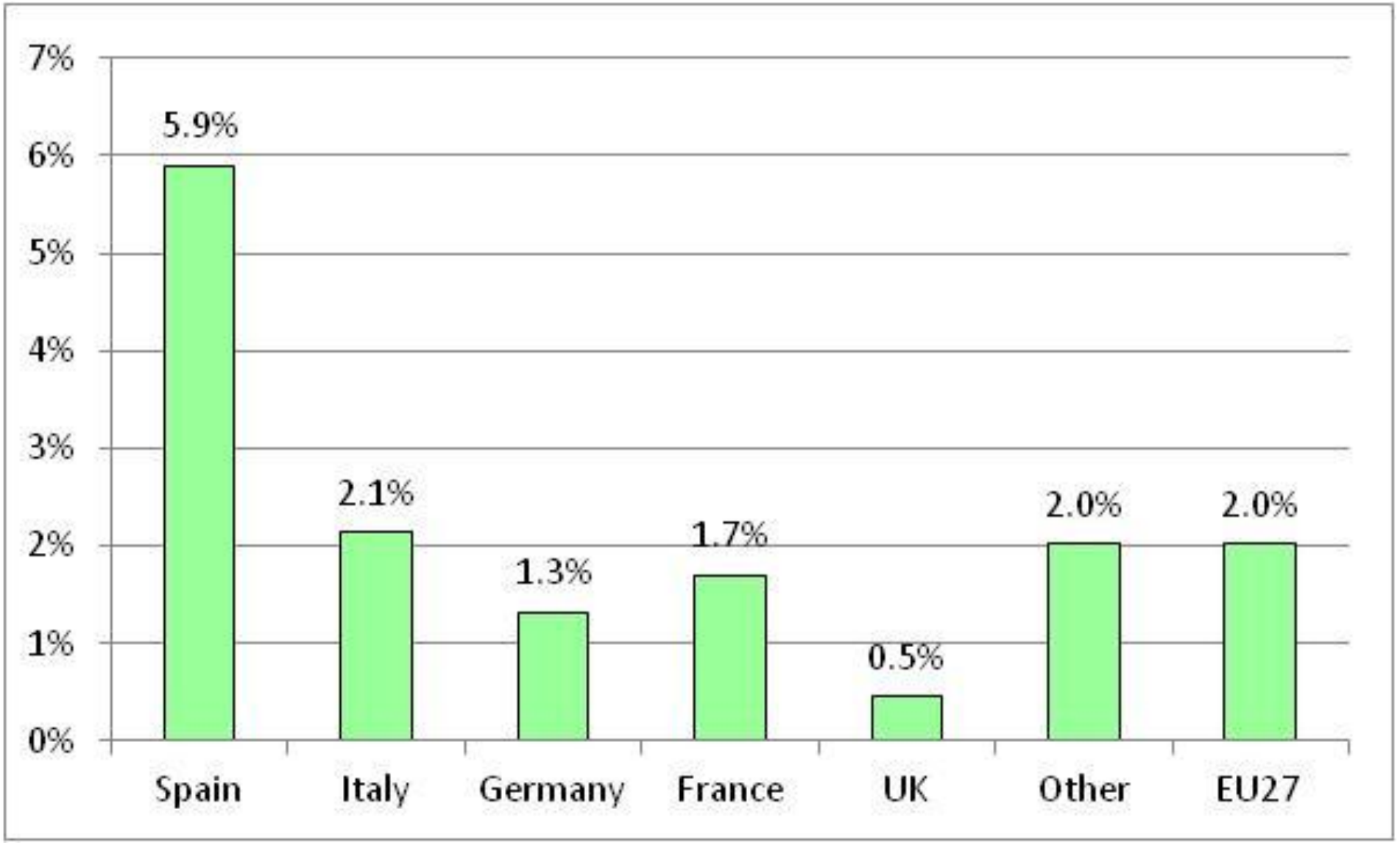
Million bednights p.a., 2 periods, EU27



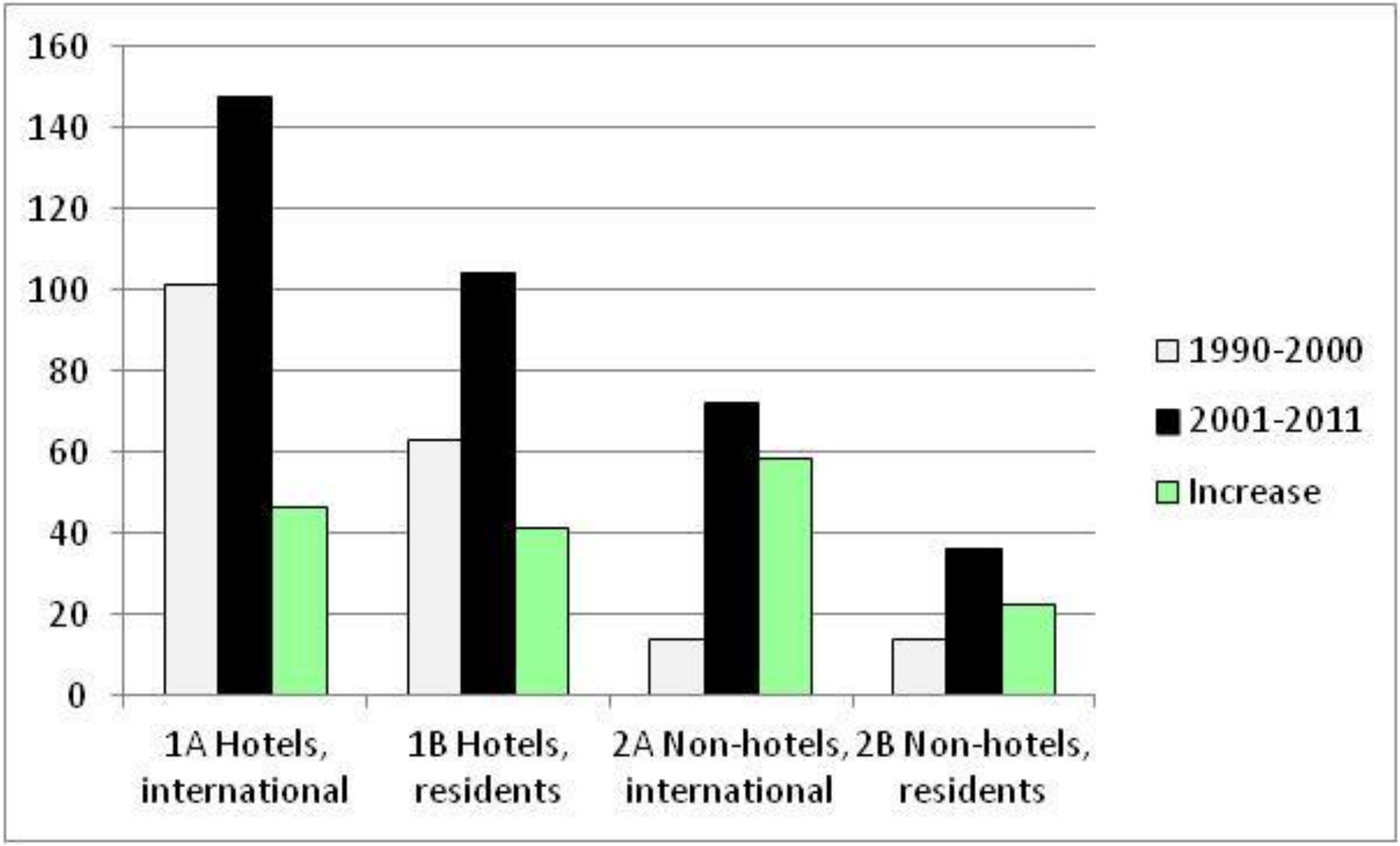
At the warmest destinations the increase (2001-2012 over 1990-2000) in warmest months were highest



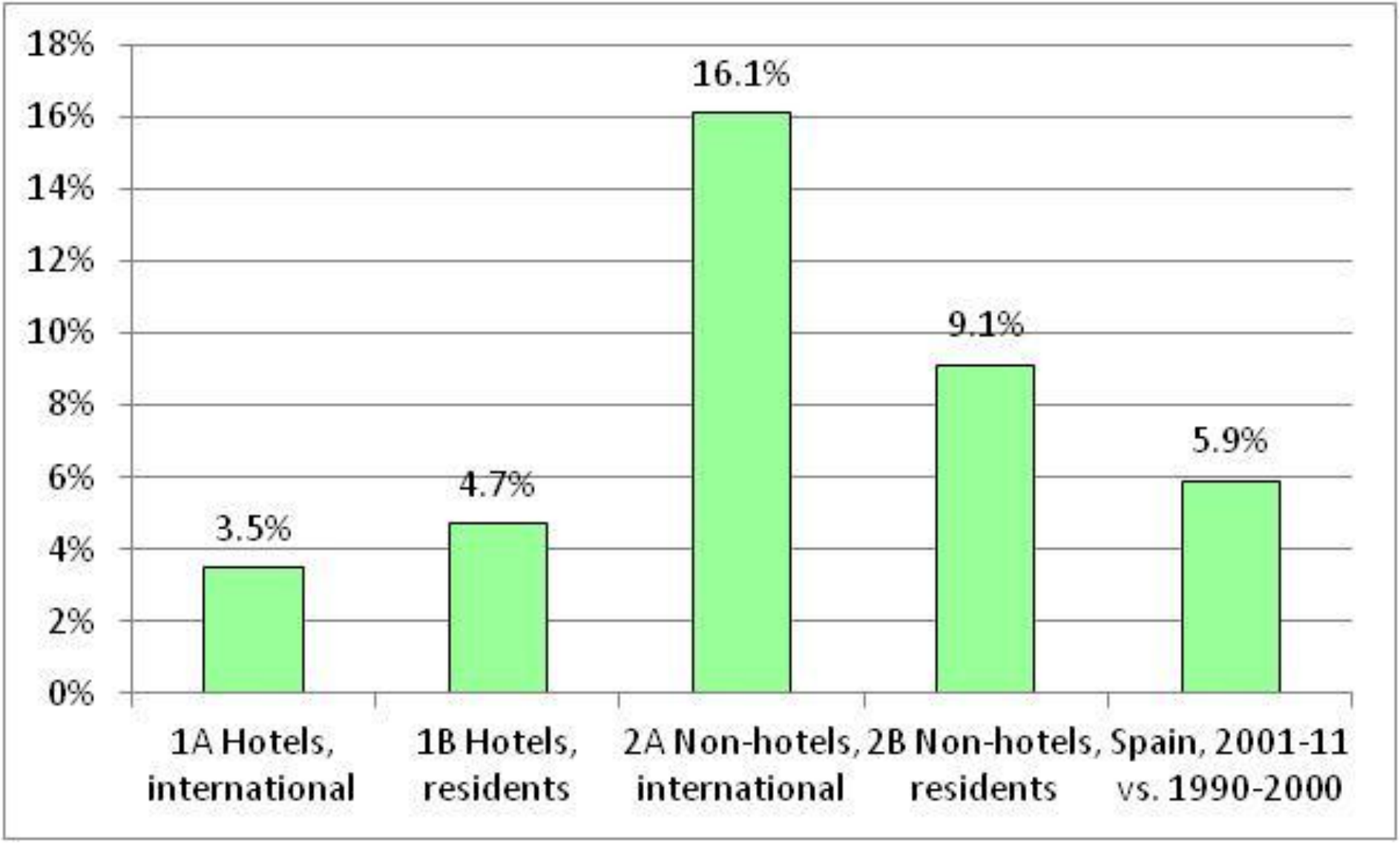
Increase p.a. in bednights pr. main destinations, 2001-2011 vs. 1990-2000



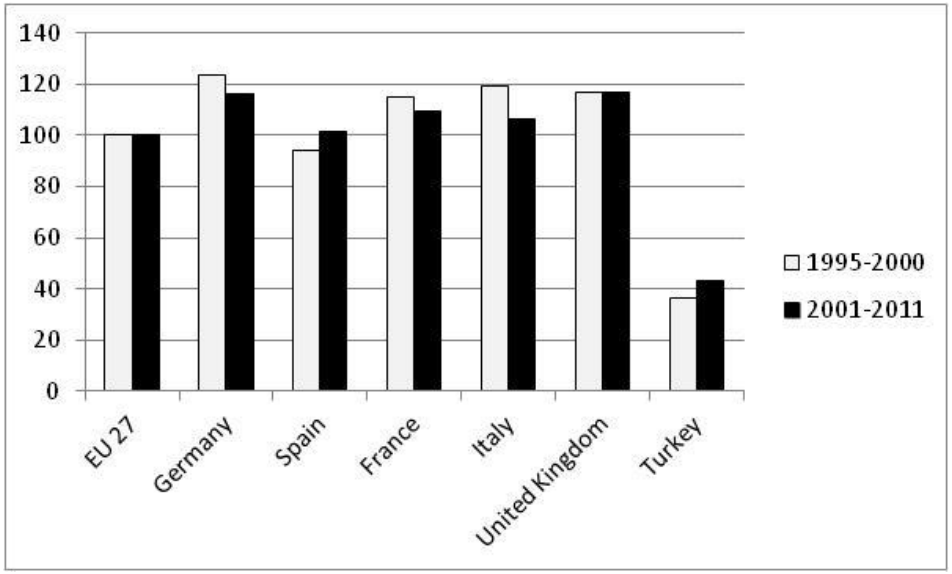
Million bednights p.a., 2 periods, Spain

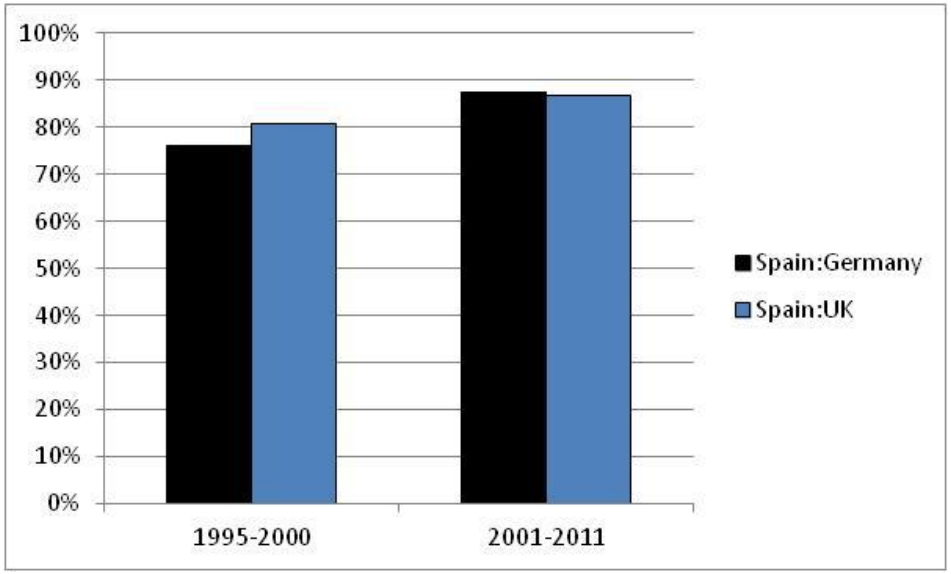


Increase p.a. in bednights in Spain by type of accommodation and market, 2001-2011 vs. 1990-2000

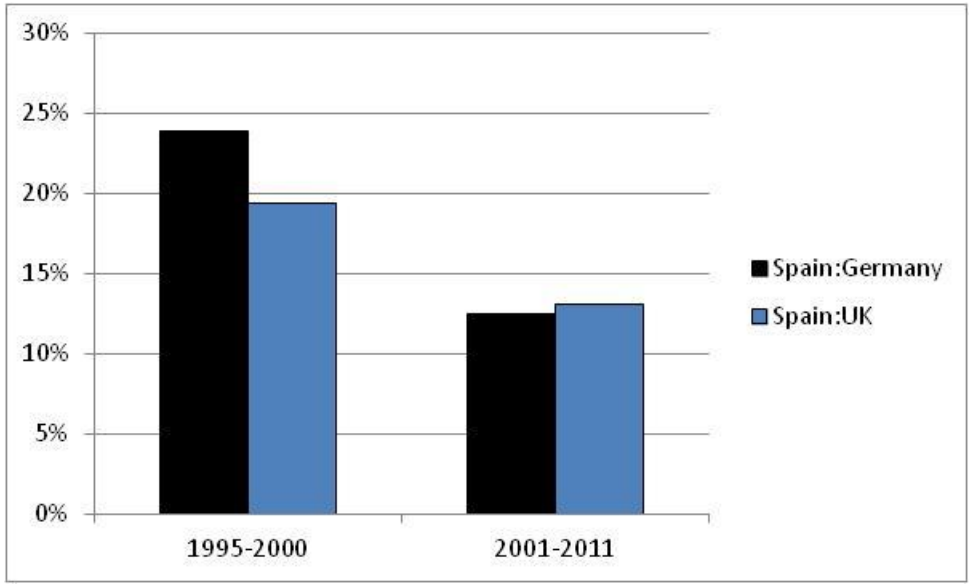


Indication of relative price levels (1)





General price levels were lower in Spain during 1990-2000 than in Germany and the UK, for example ....



.. and general price levels remained lower in Spain during 2001-2011 than in Germany and the UK, ... and the weather is warmer ...

Part conclusion

Temperature increases were not the cause of the declining share of July and August of the total number of bednights per month.

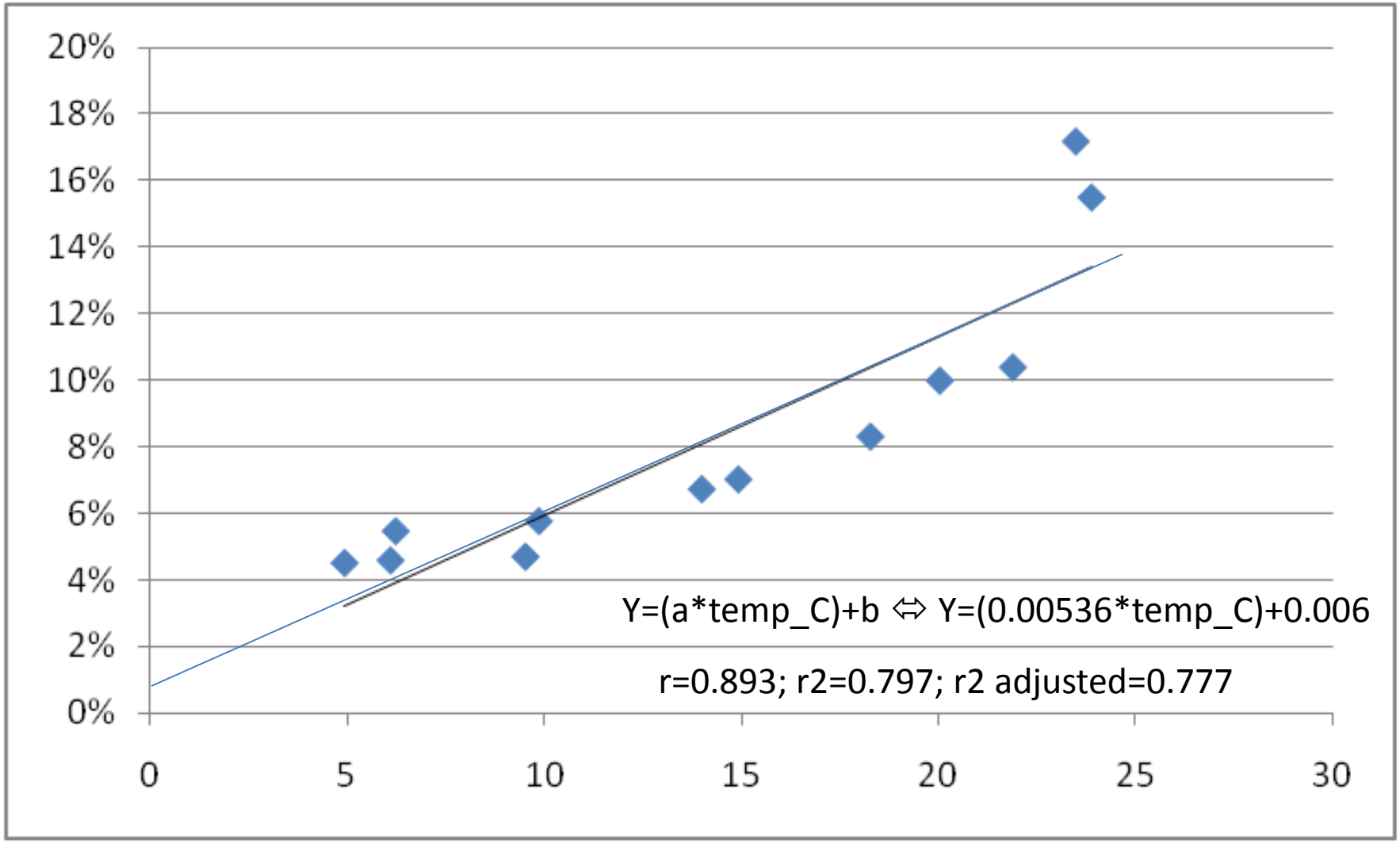
Bednights in July and August did not fall in EU27, in absolute numbers, in period 2 compared to period 1. However, bednights in EU27 in increased faster than in the off-peak months than in the peak months July and August.

Spain took the largest share of the increase in bednights in EU27 – from period 1 to period 2.

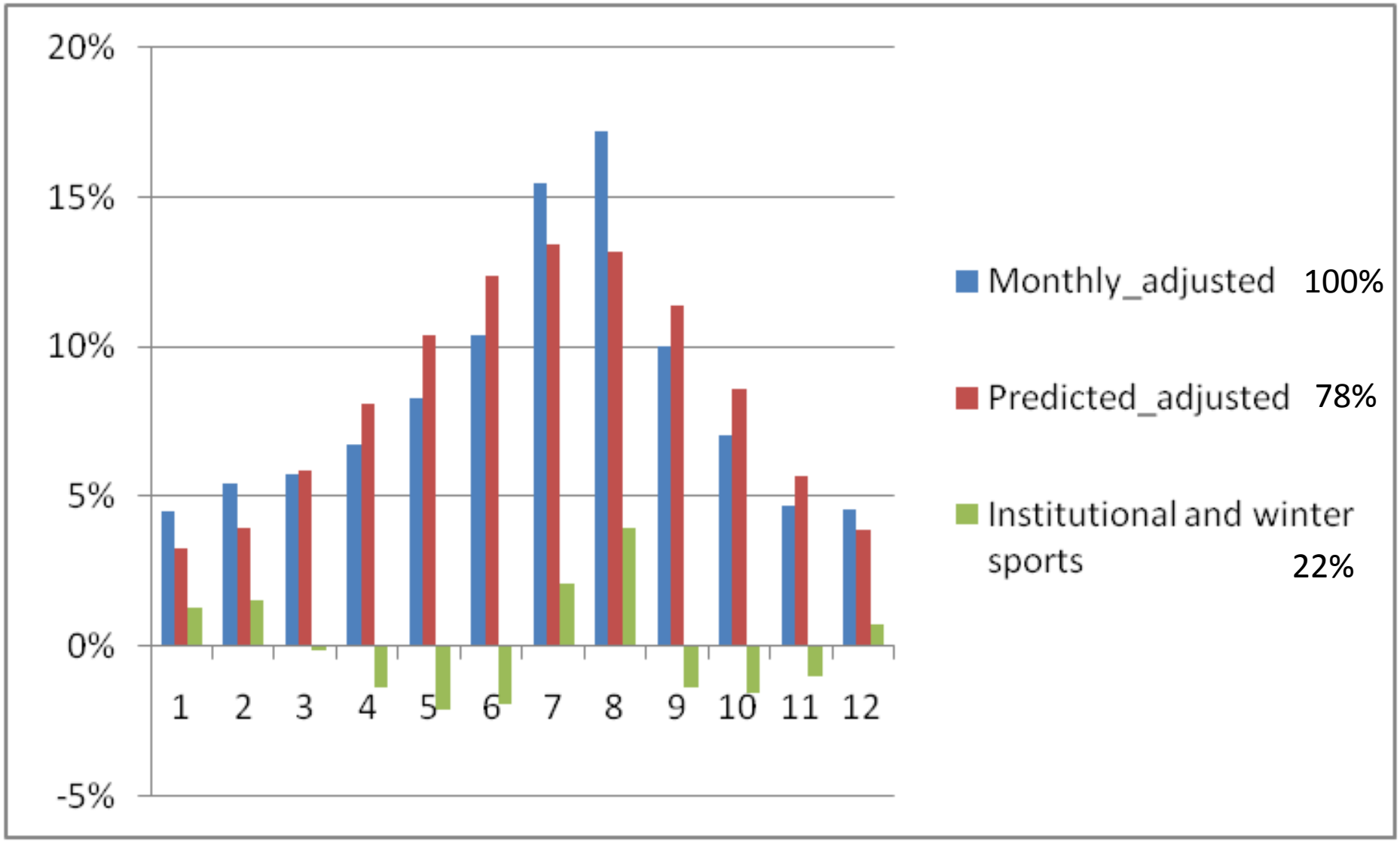
Spain did something right, cf. the building boom! – And it helped that the general prices were lower than the largest north European origin markets.

Although there are cheaper destinations in Europe, the location if Spain in relation to main source markets is convenient , and well serviced by flights.

Bednights per month (%) as a function of mean highest temperature per month in Europe (EU27 + EFTA4 + 2)

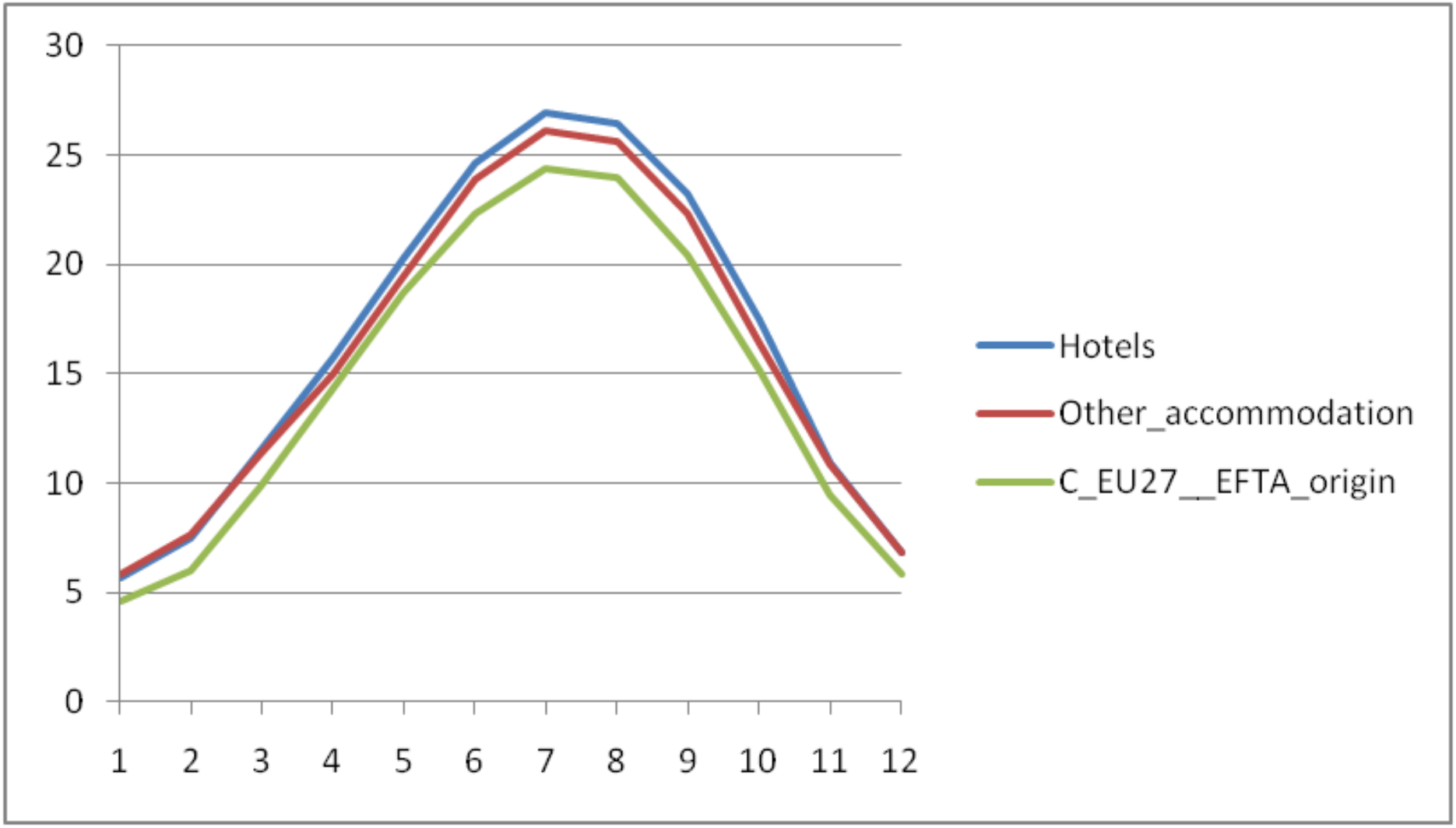


Natural causes (in red, predicted by temp.) and institutional causes (residual, in green) of seasonality

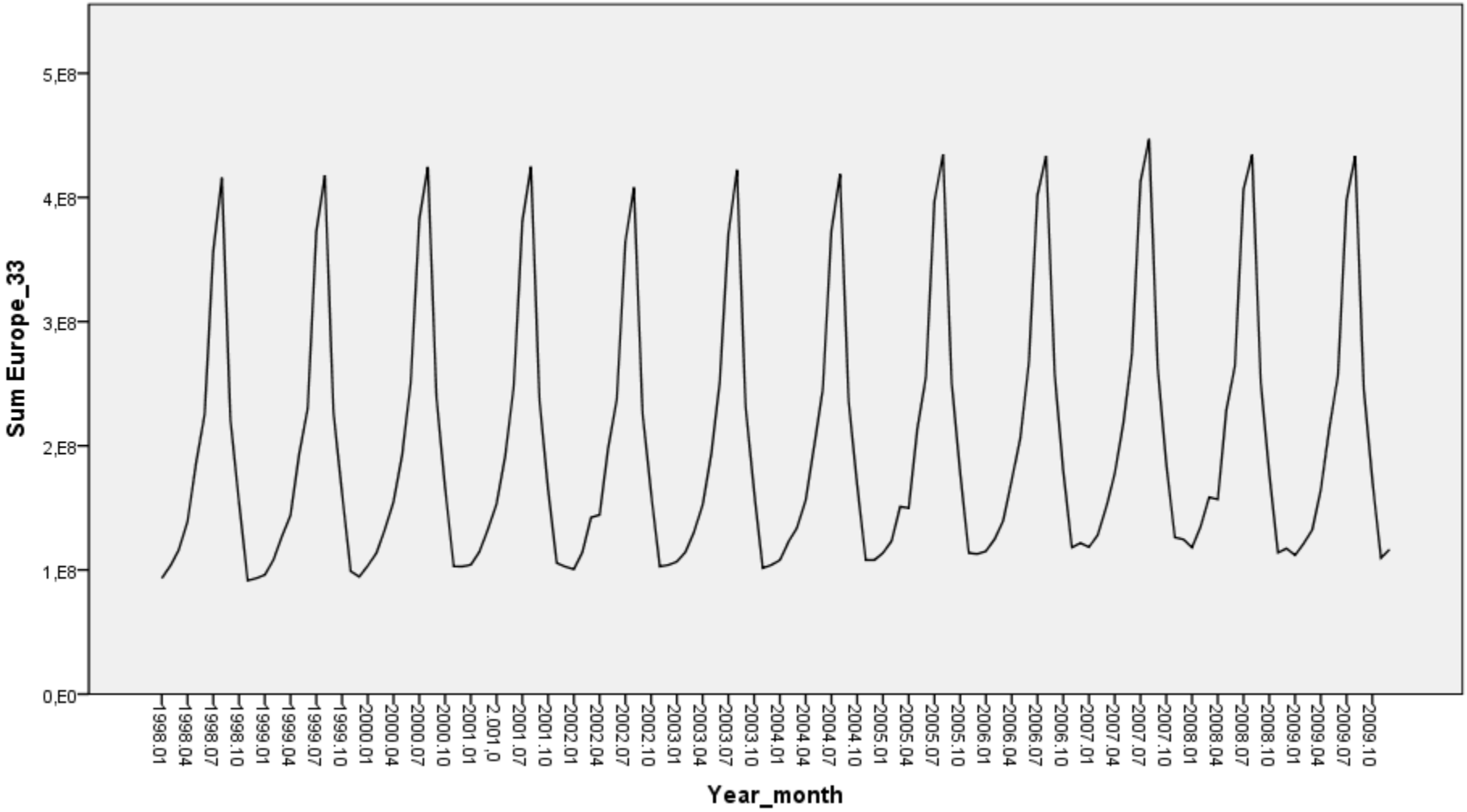


A craving for warm/sunny destinations

– Degrees C (normal) at international destinations vs. origins by month of year (ave. 1998-2009)



Absolute no. of bednights per month, 1998-2009, EU27+EFTA4+2



Correlation of bednights and temp

	Destination	Temp_corr	Nearest_corr_co	Nearest_corr
1	Italy	0,70	France	0,84
2	Europe_33	0,69	Italy	0,92
3	Spain	0,62	Luxembourg	0,88
4	Iceland	0,61	Slovenia	0,86
5	Croatia	0,59	Luxembourg	0,81
6	Denmark	0,58	Sweden	0,85
7	Hungary	0,57	Portugal	0,88
8	Belgium	0,56	Czech_Rep	0,81
9	France	0,56	Italy	0,84
10	Norway	0,54	Sweden	0,86
11	United_King	0,53	Germany	0,85
12	Slovenia	0,50	Hungary	0,87
13	Netherlands	0,48	Poland	0,92
14	Sweden	0,48	Norway	0,86
15	Slovakia	0,46	Czech_Rep	0,87
16	Turkey	0,44	Greece	0,97
17	Ireland	0,44	Portugal	0,92

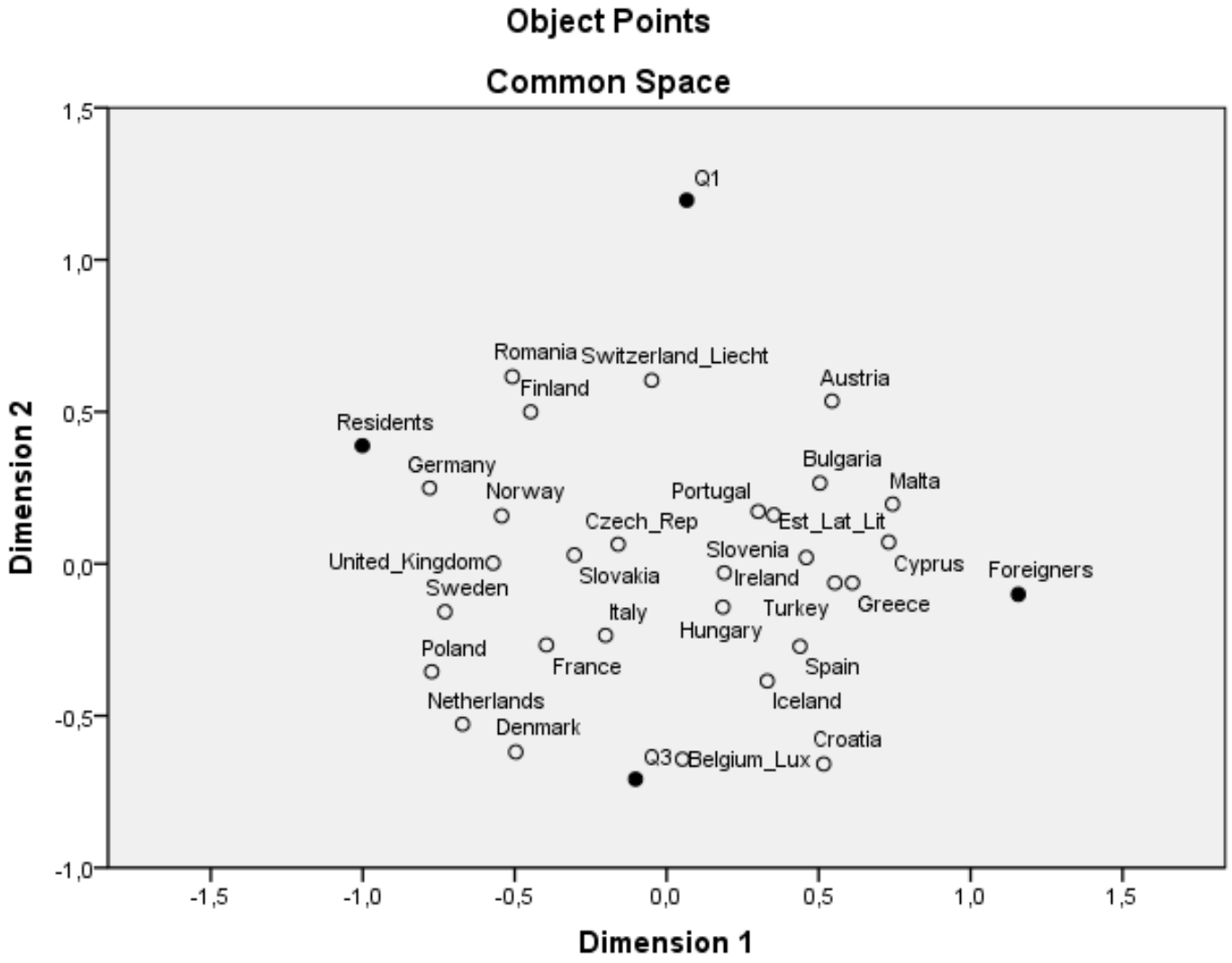
	Destination	Temp_corr	Nearest_corr_co	Nearest_corr
18	Czech_Rep	0,44	Slovakia	0,87
19	Portugal	0,44	Ireland	0,92
20	Greece	0,43	Turkey	0,97
21	Lithuania	0,42	Hungary	0,69
22	Luxembourg	0,39	Croatia	0,81
23	Bulgaria	0,38	Turkey	0,93
24	Germany	0,35	United_Kingdo	0,85
25	Poland	0,35	Netherlands	0,92
26	Latvia	0,32	Ireland	0,87
27	Switzerland	0,31	Slovakia	0,66
28	Romania	0,30	Finland	0,88
29	Cyprus	0,28	Malta	0,96
30	Estonia	0,28	Latvia	0,94
31	Finland	0,27	Romania	0,88
32	Malta	0,18	Cyprus	0,96
33	Liechtenstei	0,15	Malta	0,84
34	Austria	0,06	Liechtenstein	0,84

Note: All correlations between bednights and temperature are significant, with the exception of Austria, before taking into account the effects of winter tourism. -
These correlations are not based on bednights per day but bednights per month. Therefore the difference between the earlier shown r=0.78 and this r=0.69 is the effect of differences in length of month. - - - Correlations to the right are those destinations with the highest correlation with each of destinations 1-34 based on total monthly bednights during the period 1998-2009.

Segmenting destinations using factor analysis

Long/dual season, international	Summer destinations	Domestic dominated	PEAK season
Malta	Netherlands	Romania	Croatia
Cyprus	Poland	Finland	
Ireland	Denmark	Germany	
Greece	Czech_Rep	Norway	
Portugal	Belgium_Lux	United_Kingdom	
Turkey	Slovakia	Italy	
Est_Lat_Lit	Switzerland_Liecht	France	
Bulgaria	Sweden		
Spain			
Slovenia			
Austria			
Hungary			
Iceland			
38,337	22,635	21,310	5,950
38,337	60,972	82,282	88,232
% of variance explained, by principal component and accumulated.			

MDS diagram: European destinations by time of year and domestic--international



Conclusions / Summary of finding

- **Temperature is a key driver of leisure tourism**

both temporally over the year (also relating to domestic tourism) and internationally (in combination with prices at the destination), since European tourists generally go south for their vacations.

- Preliminarily, there are **no indications that the declining share of bednights in July and August in the total number of registered bed in Europe, 1990-2011 is caused by climate change**. On the contrary, other factors such as increased second home ownership in Spain as reflected in the building boom along the coastlines and islands of Spain are important. Bednights in July and August did not decline, but off-peak bednights increased more than peak nights.

- The trend towards more and shorter holidays is important. Probably, second home owners and other users of non-hotel types of accommodation such as holiday apartments will want to visit their property several times a year.

- Increasing no. of holidays outside of the EU27 or EFTA4 may also play a role in the decreasing percentage in July and August