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WORKING PAPER NEW SERIES

THE EFFECTS OF WORLD HERITAGE SITESON DOMESTIC TOURISM:A SPATIAL INTERACTION MODEL FOR ITALY

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The Effects of World Heritage Sites on Domestic Tourism:
A Spatial Interaction Model for Italy

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Motivations

- **Cultural tourism** is gaining increasing importance in modern tourism industry → it allows destinations and regions to:
  - expand their customer base, by gaining new clients otherwise interested in other types of attractions
  - diversify their offer, particularly for destinations which typically exploit different tourism typologies (e.g. seaside, lake, mountain tourism) and/or off-season tourism (decreasing seasonality)
  - extend the stay of tourists (overnight stays)

- National governments and regions make efforts to obtain official accreditation for their historical and cultural attractions, like **UNESCO's World Heritage Sites (WHS) label**

- Particularly relevant for **Italy** which has:
  - rich historical heritage and highest number of WHS entries
  - regions taking an active role in promoting tourism

Motivations (2)

- **Tourism** is one of the fastest growing and most profitable sectors of the Italian economy

- We analyse Italian '**domestic tourism**' → tourism involving residents of a given country travelling only within the country itself

- Recently, the tourism industry has shifted from the promotion of inbound tourism to the **promotion of domestic tourism**, to contribute to the local economy
  - Domestic tourism, historically speaking, is the <u>first form of tourism</u>, and today continues to account for most of this activity
  - In <u>Italy</u>, it represents the greatest share of the entire tourism sector

Objectives

- To investigate the **importance of the regional endowment in WHS** for domestic tourism

- How and to what extent **WHS designation affects the flows of tourists** between each pair of Italian regions
  1) by separating the effects on tourism flows of WHS located in the <u>residence region</u> of the tourists (origin region) and in the <u>destination region</u>
  2) by taking into account potential <u>spatial substitution or complementarity</u> between regions induced by their WHS endowment

- To provide an interpretative framework for the varying effects of WHS endowment on tourism flows, according to a **spatial sensitivity analysis**

Literature

- Several studies have investigated whether or not **WHS endowment**, or more generally **cultural offer**, increases tourism demand, but the empirical evidence is mixed
    - Cultural heritage and attractions of a country are <u>important determinants of tourism demand</u> (e.g., Carr 1994; Alzua et al. 1998; Vietze 2008)
    - <u>No</u> clear positive relationship between cultural endowment and tourism flows (e.g., Cellini and Cuccia 2007 and 2009)
    - <u>Other cultural 'goods'</u>: contrasting evidence on tourism flows and attendance at cultural attractions such as temporary arts exhibitions (Di Lascio et al. 2011) or museums and monuments (Cellini and Cuccia 2009)
    - <u>WHS</u>: the debate is still open (e.g., Arezki et al. 2009; Yang et al. 2010; Cellini 2011; Yang and Lin 2011)
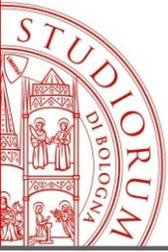
Research Questions

We investigate the **importance of the regional endowment in WHS** for domestic tourism, through two research questions:

1) **Origin- and destination-level effects** of WHS endowment

   - Does <u>destination region</u>'s WHS endowment attract greater 'incoming' tourism flows (inflows)? → <u>'pull effect'</u>

   - Does <u>origin region</u>'s WHS endowment push the inhabitants to travel more (or less), influencing 'outgoing' tourism flows (outflows)? → <u>'push effect'</u>

Research Questions (2)

2) How are the tourists' choices influenced by the **spatial distribution of the WHS**?

- Does the WHS endowment of the regions surrounding each possible destination region ('**destination neighbours**') cause a *spatial competition* for tourism demand or *spatial complementarity* (mutual beneficial effects deriving by trip-chaining) between regions?
  → from a policy perspective, regions could use WHS designation for competition or towards joint benefits

- Does the WHS endowment of the regions surrounding the tourist's origin region ('**origin neighbours**') create a substitution between *'recordable' tourism* (hotel stays) and *daily trips of excursionists*?
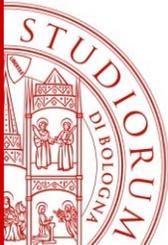
Modelling Framework and Data

- Modelling framework → **spatial interaction model**
  a) Push variables (push effect)
  b) Pull variables (pull effect)
  c) Deterrence variables (distance), usually not identifiable in a panel framework

- **Unconstrained model** (*vs.* doubly-constrained model)

- **Poisson-based** (*vs.* log-linear) estimation
  - negative binomial estimation (two-way fixed effects)
  - spatial filtering estimation (origin & destination fixed effects, network autocorrelation)

- **Main effects** (direct effect)

- **Spatial lags** of WHS endowment (indirect effect)
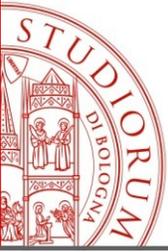
Modelling Framework and Data (2)

- **Dependent variable** → arrivals (T_{ijt})

- **Key variables** → WHS endowment (WHS_{it} and WHS_{jt})

- **WHS spatial lags** → $L.WHS_{it} = \mathbf{W} * WHS_{it}$
  and $L.WHS_{jt} = \mathbf{W} * WHS_{jt}$
  where the <u>spatial weights matrix</u> $\mathbf{W}$ can be defined by:
  - <u>general model</u> → surrounding regions: rook-contiguity (average # of neighbours = 3.1, ranging from 0 to 6)
  - <u>spatial sensitivity analysis</u> → according to two further definitions of proximity
    - k-nearest neighbours, for k = 1, …, 4 (great circle distance)
    - distance-based neighbours: h * min($dist$), for h = 2, … 4 (distance bands)

- **Control variables** → characteristics of the regions which are relevant for tourism demand, but not a key interest for our research topic (X_{it} and X_{jt})

- **Origin-related variables** / **Destination-related variables**

- **Bilateral variable**: <u>distance</u> (d_{ij}) which is a deterrence variable

- **Demand variables** / **Supply variables**

Modelling Framework and Data (3)

- **Models**
  1. Base model, <u>without WHS</u>

$$T_{ijt} = \exp(\alpha_{ij}, year_t, X_{it}, X_{jt}) + \varepsilon_{ij},$$

  2. Model with <u>WHS and spatial lags</u>

$$T_{ijt} = \exp(\alpha_{ij}, year_t, X_{it}, WHS_{it}, L.WHS_{it}, X_{jt}, WHS_{jt}, L.WHS_{jt}) + \varepsilon_{ij},$$

  3. Model with <u>distance</u> and <u>spatial filter</u>

$$T_{ijt} = \exp(\alpha_i, \alpha_j, year_t, X_{it}, WHS_{it}, LWHS_{it}, X_{jt}, WHS_{jt}, LWHS_{jt}, d_{ij}, \sum_k e_{k,ij}) + \varepsilon_{ij},$$

where α_{ij} are individual fixed effects; α_i and α_j are origin and destination fixed effects; $year_t$ are time fixed effects; e_k is the k_{th} selected network autocorrelation eigenvector (spatial filter)

- **Data**
  - Source: Italian Statistics Institute (ISTAT)
  - 11-year panel (years 1999–2009) of domestic tourism flows, between the 20 Italian regions
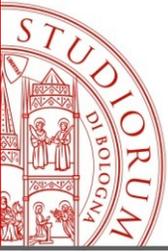
Explanatory Variables

- **Supply side** → key variable
  - WHS endowment (*WHS*)

- **Demand side** → control variables
  - regional population, capturing market size (*Pop*)
  - regional GDP, capturing income (conditional to market size) (*GDP*)
  - prices index for accommodation and related goods/services, e.g. restaurants (*PricesH&R*)
  - cultural demand per state institute, aiming to capture museum quality (*CultDem*)
  - diffusion of cultural and recreational events: tickets sold per inhabitant for theatrical and musical events (*DiffShows*)

Explanatory Variables (2)

- <u>Supply side</u> → tourism specialization
  - share of total regional value added by "accommodation and restaurants, transports and communication, commerce, repairs" (*SpecTour*)
  - share of total regional public spending in recreational, cultural and religious activities (*ExpRecr*)
  - off-season tourism: overnight stays per inhabitant (*OffSeas*)
  - percentage of non-bathable coastline (*NonBath*)

- <u>Supply side</u> → other control variables
  - share of customers satisfied with railway service (*SatisTrain*)
  - small and violent crime indices (*CrimDiff* and *CrimVio*)
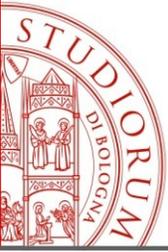
Empirical Estimates

	Estimate (Std error) (FE model)	Estimate (Std error) (FE model)	Estimate (Std error) (SF model)
GDP orig	0.2101 (0.3498)	0.1834 (0.3481)	0.3470 (0.6337)
GDP dest	–2.2471 (0.3636)	–2.4442 (0.3670)	–2.2774 (0.6524)
SpecTour orig	0.2823 (0.1098)	0.2973 (0.3670)	0.3177 (0.2408)
SpecTour dest	0.3686 (0.1373)	0.1753 (0.1407)	0.1701 (0.2692)
ExpRecr orig	0.0846 (0.0670)	0.0422 (0.0667)	0.0469 (0.1254)
ExpRecr dest	–0.0681 (0.0552)	–0.0832 (0.0595)	–0.0632 (0.1246)
PricesH&R orig	0.2101 (0.2610)	0.2307 (0.2646)	0.3454 (0.4700)
PricesH&R dest	–0.8296 (0.2405)	–1.1275 (0.2453)	–1.3658 (0.4594)
Pop orig	–0.4803 (0.4571)	–0.1232 (0.4522)	–0.7002 (0.7332)
Pop dest	0.3004 (0.2860)	0.6503 (0.2590)	0.3365 (0.5801)
CrimDiff orig	0.1159 (0.0533)	0.1153 (0.0533)	0.1139 (0.0992)
CrimDiff dest	–0.0237 (0.0279)	–0.0044 (0.0280)	0.0117 (0.0733)
CrimVio orig	0.0522 (0.0264)	0.0563 (0.0270)	0.0577 (0.0492)
CrimVio dest	–0.0214 (0.0251)	0.0099 (0.0255)	–0.0010 (0.0500)
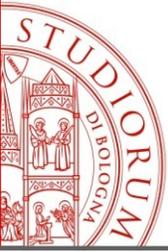
	Estimate (Std error) (FE model)	Estimate (Std error) (FE model)	Estimate (Std error) (SF model)
SatisTrain orig	0.0695 (0.0450)	0.0292 (0.0460)	0.0677 (0.1073)
SatisTrain dest	0.0551 (0.0514)	0.0627 (0.0499)	0.1059 (0.1059)
CultDem orig	–0.0356 (0.0222)	–0.0305 (0.0223)	–0.0234 (0.0456)
CultDem dest	0.1879 (0.0223)	0.2073 (0.0233)	0.1971 (0.0452)
DiffShows orig	0.0574 (0.0390)	0.0656 (0.0391)	0.0818 (0.0689)
DiffShows dest	0.0967 (0.0309)	0.0868 (0.0317)	0.0818 (0.0624)
NonBath orig	0.0007 (0.0027)	0.0011 (0.0027)	0.0003 (0.0048)
NonBath dest	0.0006 (0.0027)	0.0016 (0.0028)	0.0016 (0.0060)
OffSeas orig	–0.0033 (0.0393)	0.0020 (0.0389)	0.0230 (0.0778)
OffSeas dest	0.4093 (0.0521)	0.3915 (0.0514)	0.3541 (0.0927)
WHS orig	–	–0.0164 (0.0079)	–0.0203 (0.0159)
WHS dest	–	0.0355 (0.0067)	0.0420 (0.0147)
L.WHS orig	–	–0.0451 (0.0198)	–0.0516 (0.0364)
L.WHS dest	–	–0.1035 (0.0204)	–0.0983 (0.0365)
Distance	–	–	–1.0165 (0.0362)

Results

- **<u>Demand side</u>**
  - regional GDP (GDP)
    - Negative effect for destination (3/3) → tourists look for more relaxing destinations (search of getaway from heavily industrialized / denser regions? Or spurious result?)
    - Not significant for origin
  - prices of accommodation and related goods/services, e.g. restaurants ($PricesH\&R$)
    - Negative effect on destination (3/3) → confirmation of theory
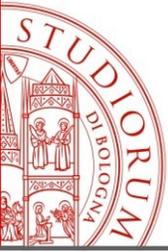   - Not significant for origin

Results (2)

- <u>Demand side</u> → quality of cultural offer
  - Cultural demand per institute (*CultDem*)
    - Positive effect for destination (3/3)
    - Not significant for origin
  - Diffusion of cultural and recreational events, per inhabitant (*DiffShows*)
    - Positive effect for destination (2/3)
    - Not significant for origin
- <u>Distance</u> (d_{ij})
    - Negative effect (confirmation of theory)

Results (3)

- <u>Supply side</u> → tourism specialization
  - Share of total regional public spending in recreational, cultural and religious activities (*ExpRecr*)
    - Not significant
  - Off-season tourism: overnight stays in the off-season, per inhabitant (*OffSeas*)
    - Positive effect for destination (3/3)
    - Not significant for origin

Results (4)

- <u>Supply side</u> → tourism specialization
  - Share of total regional value added by "accommodation and restaurants, transports and communication, commerce, repairs" (*SpecTour*)
    - Not significant for destination
    - Positive effect for origin (2/3) → possibly 'addiction to tourism' or search for a refuge from the summer overcrowding
  - Satisfaction levels of railway services (*SatisTrain*)
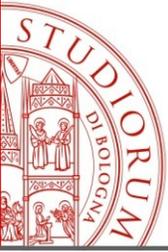   - Not significant

Results (5)

- <u>Supply side</u> → other control variables
  - Small crime index (*CrimDiff*)
    - Not significant for destination
    - Positive effect for origin (2/3) → residents of at-risk areas tend to get away in search of safer (and therefore, again, more relaxing) destinations
  - Violent crime index (*CrimVio*)
    - Not significant for destination
    - Positive effect for origin (2/3) → same as for Small crime index

Results (6)

- **Main effect** (direct eff.) → WHS endowment (*WHS*)
  - <u>Positive effect for destination</u> → an increase of one WHS, for a generic destination, would imply an inflows increase between 3.6% and 4.2%
  - <u>Negative effect for origin</u>, but only marginally significant

- **Spatial lags** (indirect eff.) → WHS endowment of surrounding regions (*L.WHS$_{it}$* and *L.WHS$_{jt}$*)
  - <u>Negative effect for both origin and destination</u>
    - Destination region → spatial competition between contiguous regions induced by WHS endowment
    - Origin region → substitution for nearby (alternative) destinations between hotel stays (traditional tourism) and daily excursions

Spatial Sensitivity Analysis

- **Robustness analysis** → how robust are our findings to different hypotheses on the nature and geographical extent of spatial interaction?

- Numerical extent and statistical significance of results may be **sensitive to the choice of spatial weights matrix W**

- We test specifications of **W** for **increasing number of assigned neighbours**, according to:
    - k-nearest neighbours method, for $k = 1, \ldots, 4$
    - distance bands: $h * \min(dist)$, for $h = 2, \ldots 4$

- New **spatial lags** for WHS ($L.WHS_{it}$ and $L.WHS_{jt}$) are computed for each **W**

The case of **spatial competition** with **invariant flows**

No neighbours ($k = 0$)

One neighbour ($k = 1$)

Two neighbours ($k = 2$)
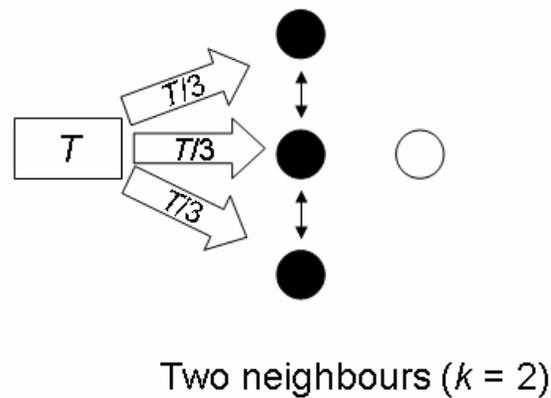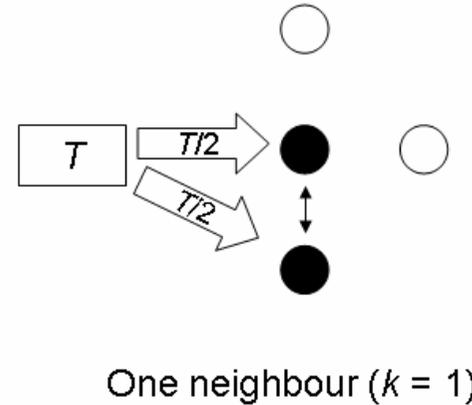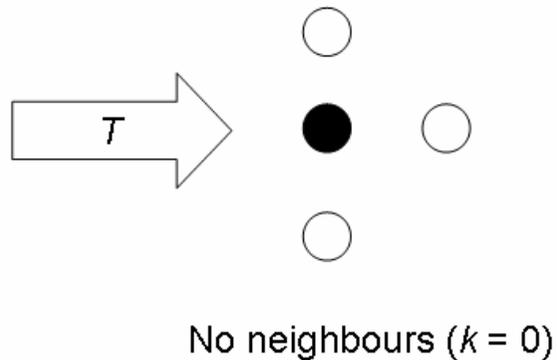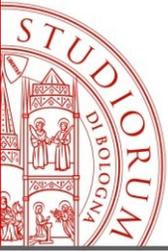
Effect of WHS Designation and Spatial Competition/Complementarity

- **Tourism flows** to a single destination T may depend on pre-existing (exogenous) destination characteristics (T_0) and on a WHS designation (T_1)

- **WHS-related flows** are conditional to the **number of neighbours** (k)
    - Complementarity: additional flows increase with k (e.g., cultural district)
    - Competition: additional flows decrease with k

- **Crowding-out** (E) can occur because of, e.g., tourism pressure due to designation, price increase, change in accessibility of sites

- Simplifying to the **linear case**
    - In levels $\rightarrow$ $T = T_0 + T_1(k)/(1 + k) - E$
    - In growth rates $\rightarrow$ $g(k) = g_T(k)/(1 + k) - g_E$

- E.g., for no neighbours: $g(0) = g_T(0) - g_E \geq 0$, assuming $T_1(0) > E$

In case of **dominance of complementarity over competition**, curves would be increasing over k
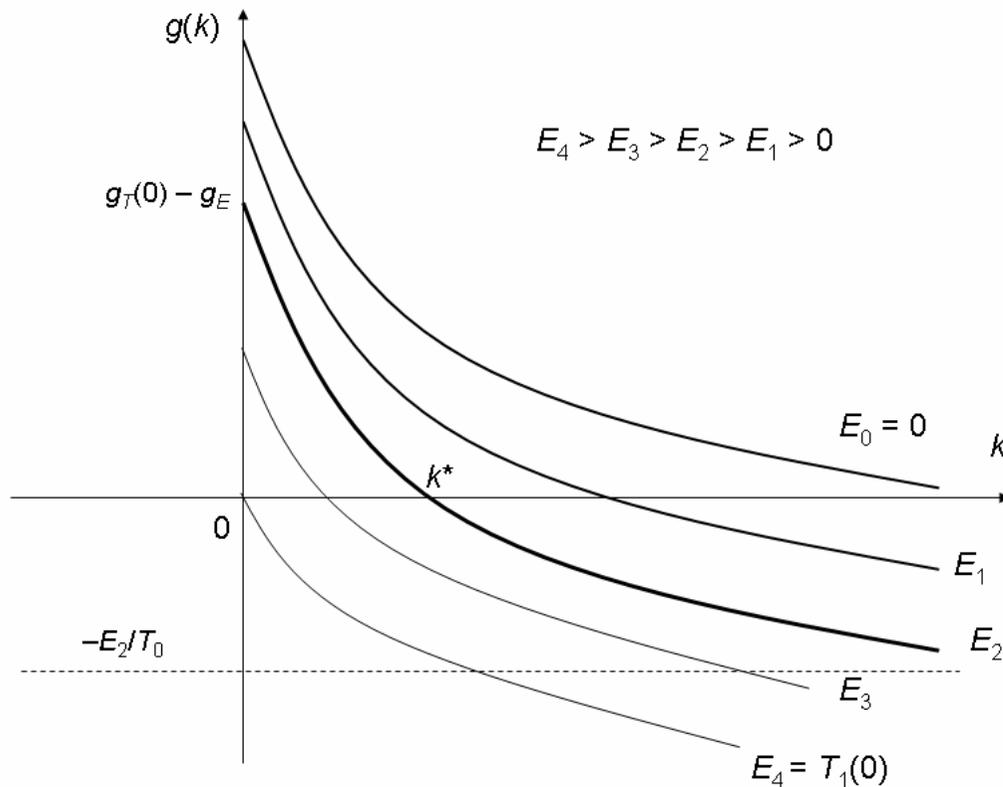
k-nearest neighbours

- Direct effect is stable over estimations
- Indirect effect increases but becomes significant only with $k \geq 4$
- Likelihood ratio (LR) χ^2 tests against $k = 0$ model always reject hypothesis of equivalence
- LR χ^2 test against overall effect = 0 not rejected for $k = 4$
  → non-negative overall effect

k-nearest neigh.	0	1	2	3	4
Direct effect	+4.0***	+3.9***	+3.9***	+3.7***	+3.6***
Indirect effect	–	–1.5	–2.1	–3.2	–7.3***
AIC	71762	71758	71757	71755	71736
LR (χ^2) test H_0: $k = 0$	–	8.04**	9.14**	10.62***	30.41***
LR (χ^2) test H_0: dir.+indir. = 0	–	–	–	–	1.48
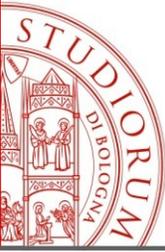
Distance-based neighbours → min(dist) = 67km

- Direct effect is again stable
- Indirect effect increases and is always significant
- Likelihood ratio (LR) χ² tests against $h = 0$ model always reject hypothesis of equivalence
- LR χ² test against overall effect = 0 becomes significant for greater distances → negative overall effect for $h \geq 4$

Distance	0	2 * min(dist) (1.3 neigh.)	3 * min(dist) (3.3 neigh.)	4 * min(dist) (5.1 neigh.)
Direct effect	+4.0***	+3.7***	+3.7***	+4.0***
Indirect effect	–	–3.2**	–4.8**	–13.9***
AIC	71762	71757	71749	71714
LR (χ²) test H_0: $h = 0$	–	8.83**	16.80***	52.51***
LR (χ²) test H_0: dir.+indir. = 0	–	0.07	0.20	13.99***

Conclusions

- Effect of WHS endowment on inflows → towards **destination regions**

  - <u>Positive direct effect</u>: WHS endowment can attract further tourism flows, all else being equal → an increase of one WHS in a region implies a 3-4% increase of inflows
  - <u>Negative indirect effect</u> (up to 14%) becomes significant when a greater extent of spatial interaction is considered
  - <u>Overall effect</u> is first positive (for reduced spatial interaction), then non-significantly different from zero, and finally negative
    → this result could explain the <u>mixed empirical evidence</u> in the current literature
  - <u>Spatial competition</u> appears to dominates spatial complementarity → no observable effect of cultural districts
  - A significant <u>crowding-out</u> effect exists

Conclusions (2)

- Effect of WHS endowment on outflows → from **origin regions**

  - <u>Negative direct effect</u> (around 1.4-1.8%): WHS endowment has a negative effect on regional outflows
  - <u>Negative indirect effect</u> (up to 8%) reinforces direct effect and also increases with extent of spatial interaction

    → evidence suggests a decrease in "recordable" mobility of the residents, possibly because of a substitution between hotel stays and daily excursions

Conclusions (3)

- **Spatial sensitivity analysis** for WHS → confirms robustness of results

  - <u>General model</u> (surrounding regions, with average # of neighbours = 3.1) has the same AIC of <u>k-nearest neighbours</u> model for $k = 4$ neighbours

  - <u>Distance-based neighbours</u> model has the best AIC for $h = 4$ (5.1 neighbours)

  - For all definitions of proximity tested, <u>models including indirect effects</u> (spatial lags) outperform in terms of AIC the model with only direct effects

Policy Implications

1) **WHS endowment** does appear to influence arrivals to tourism destinations for Italian domestic tourism

→ the <u>local policymakers' lobbying</u> towards the national government for obtaining UNESCO designation for further cultural sites would appear to be justified

2) However, **spatial substitution** and **crowding out** may <u>reduce the positive direct effect down to a negative overall effect</u>, once more alternatives are considered

→ desirability of WHS designation depends then on the expected spatial extent of competition

→ regions could use WHS designation for competition: possible role of regional tourism promotion agencies

3) Our results may potentially <u>not carry over</u> to **international tourism**