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Long term trends in the Austrian tourism industry: A shift-share analysis

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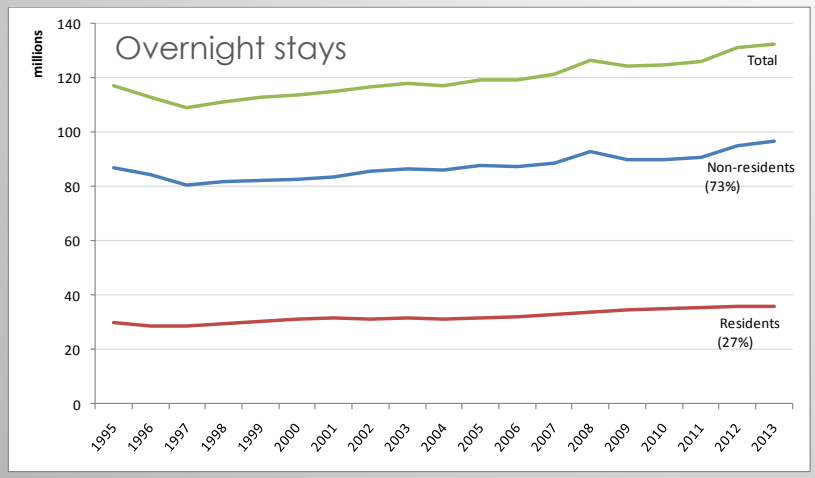
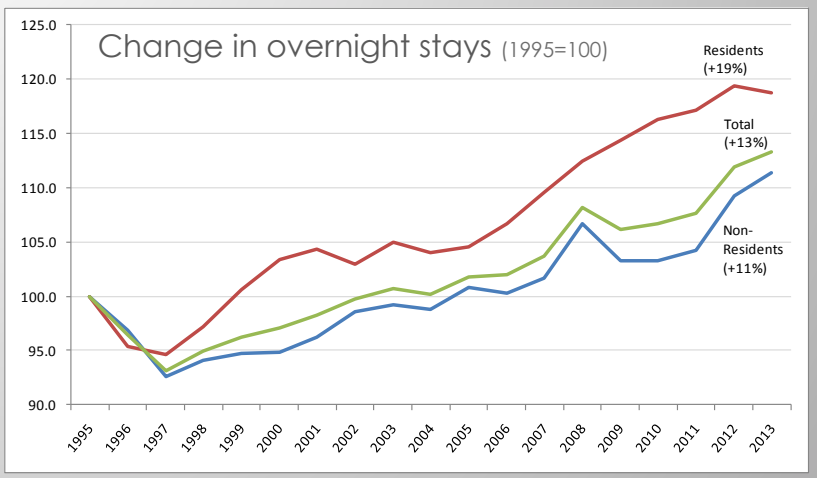
Outline

- Motivation and research agenda
- Methodology
- Results
- Summary, conclusions and further research agenda

Preliminary, ongoing work!

- Tourism is of high importance for the Austrian economy:
  - 36,8 mio. of arrivals and 132,6 mio. overnight stays (2013)
  - Share in GDP 7,3% (2013; direct effects 5,5%, indirect effects 1,8%)
  - direct employment of 326 tsd. (7,5% of total employment 2012)
- Demand increased over time:

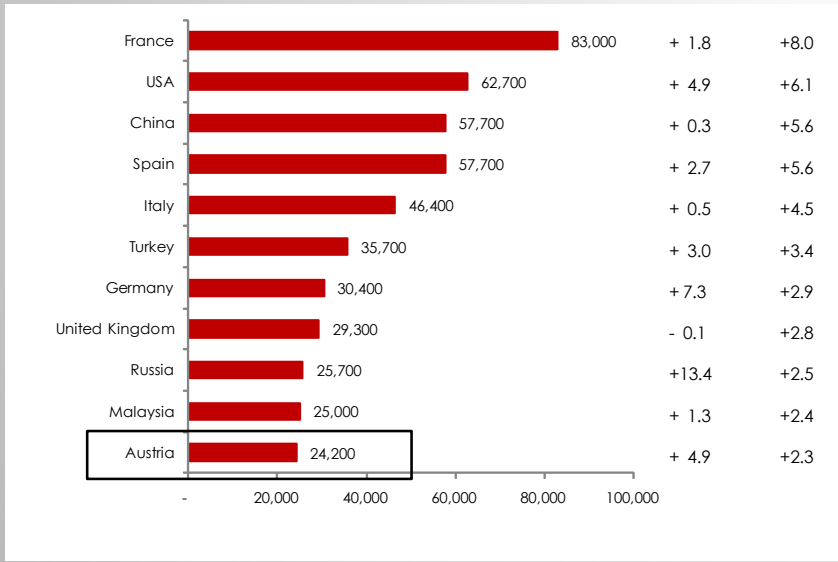




Austria in Comparison

- International comparison confirms that Austria is a tourism country:

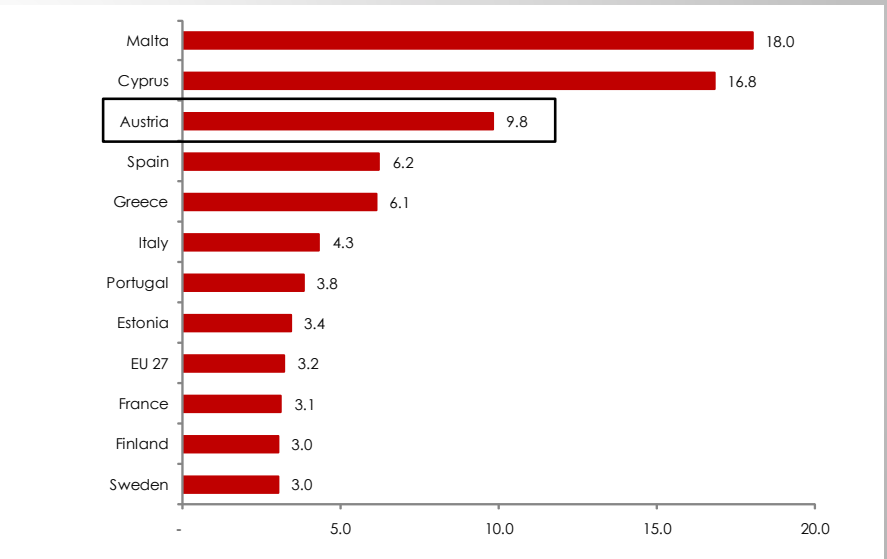
International Arrivals in 1,000



	Change 2012/11 (%)	Market share (%)
France	+ 1.8	+8.0
USA	+ 4.9	+6.1
China	+ 0.3	+5.6
Spain	+ 2.7	+5.6
Italy	+ 0.5	+4.5
Turkey	+ 3.0	+3.4
Germany	+ 7.3	+2.9
United Kingdom	- 0.1	+2.8
Russia	+13.4	+2.5
Malaysia	+ 1.3	+2.4
Austria	+ 4.9	+2.3

Source: Eurostat.

Overnight stays per inhabitant

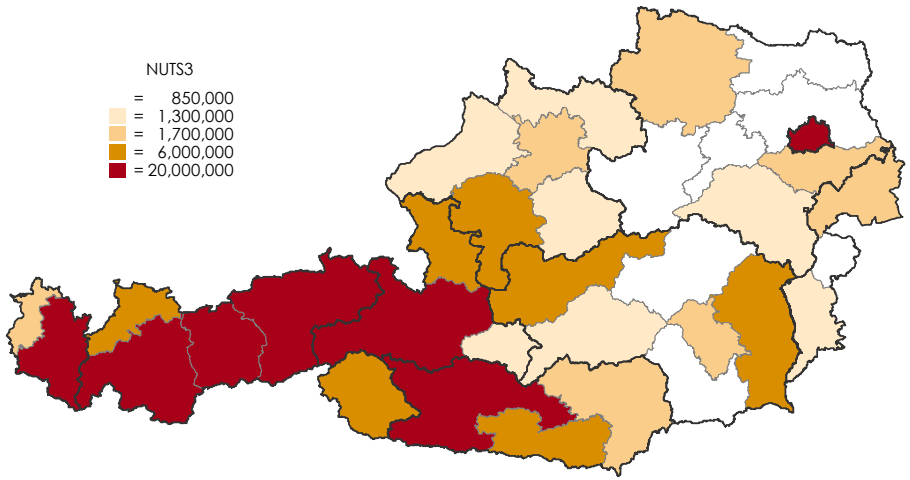


Source: Eurostat.

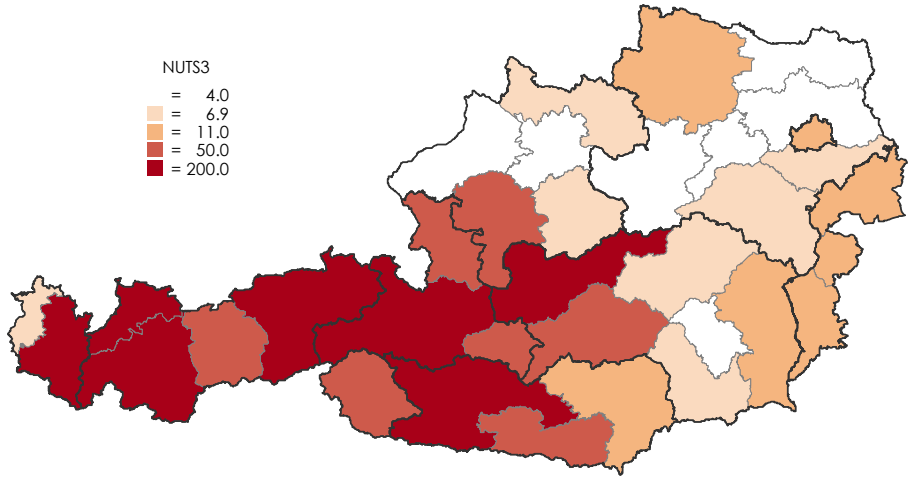
The Regional Perspective

- Tourism demand and benefits are unequally distributed across Austrian regions

No. of overnight stays by NUTS 3 region, 2013

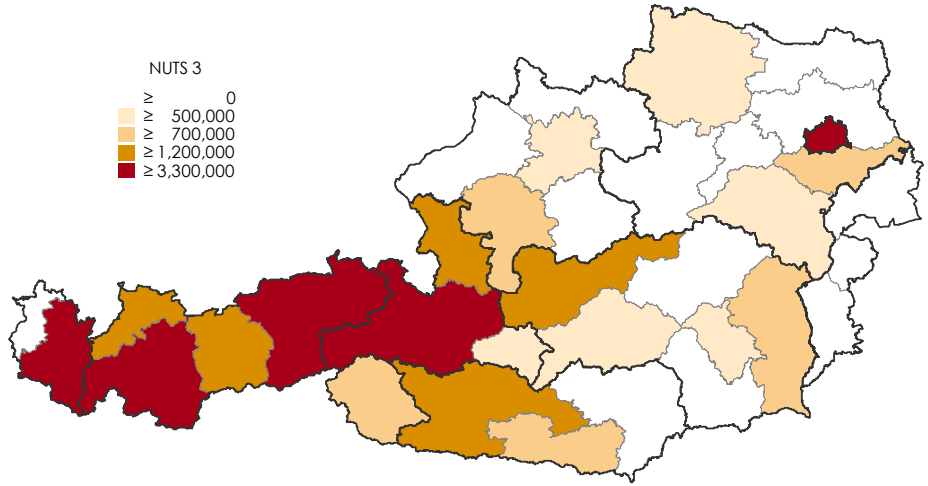


Overnight stays per capita by NUTS 3 region, 2013



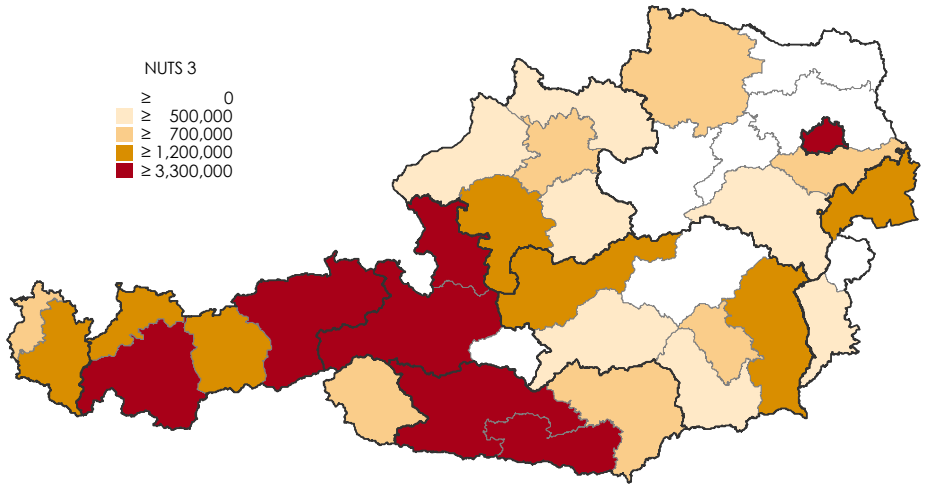
- Winter tourism is more regionally concentrated than summer tourism:

No. of overnight stays by NUTS 3 region:
Winter 2013/14 (Nov-April)



Total of 66,5 mio. overnight stays

No. of overnight stays by NUTS 3 region:
Summer 2013 (May-October)



Total of 64,5 mio. overnight stays

Research agenda

Research questions:

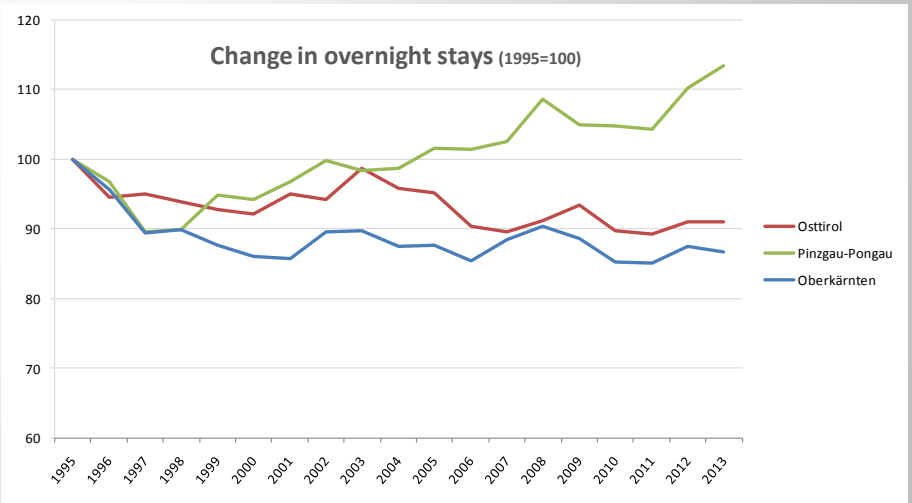
- To what extent can observed differences in growth of overnight stays by regions be explained by
  - region-idiosyncratic effects
  - differences in regional tourism demand with respect to countries of origin of visitors?
- How does the touristic performance of regions develop over time
  - if differences in the mix of origin countries are controlled for?

Illustration

- Three regions of the same type (intensive alpine tourism) with almost identical visitor structures grow at different rates

Share of overnight stays by origin of visitors in %

	Ober-kärnten	Osttirol	Pinzgau-Pongau
AUT	25	22	23
GER	59	60	56
ITA	2	4	1
MOEL	2	1	2
BENELUX	9	9	10
SCAN	1	2	3
SUI+LIE	1	1	1
UK_IRL	0	1	3
Rest_EU15	0	1	1
ROW	0	1	1

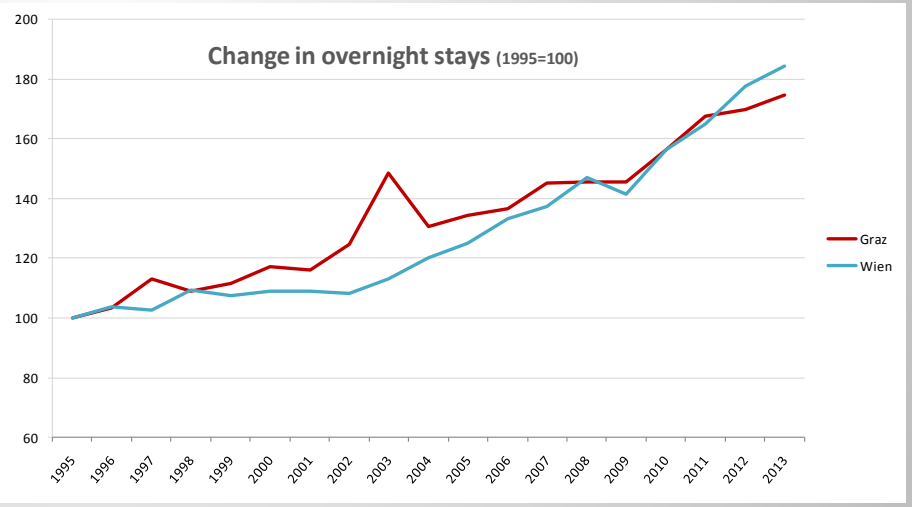


Illustration

- Two regions of the same type (extensive city tourism) with different visitor structures grow at similar rates

Share of overnight stays by origin of visitors in %

	Graz	Wien
AUT	63	13
GER	13	24
ITA	4	8
MOEL	5	6
BENELUX	1	4
SCAN	1	3
SUI+LIE	2	4
UK_IRL	1	4
Rest_EU15	2	8
ROW	8	24



A Dynamic Shift-Share Regression

- Application of dynamic regression shift-share analysis [Berzeg (1978), Stockman (1988), Patterson (1991), Costello (1993), Marimon - Zilibotti (1998), Möller (2000) and others]
- Equation to be estimated:

$$e(o,r,t) = \beta_{h(o)} h(o) + \beta_{m(o,r)} m(o,r) + \beta_{b(t)} b(t) + \beta_{f(o,t)} f(o,t) + \beta_{g(r,t)} g(r,t) + u(o,r,t)$$

e	growth in the number of overnight stays
$h(o)$	time invariant tourism trend in origin o shared by all regions r (*e.g. higher growth of Chinese vs. German visitors*)
$m(o,r)$	time invariant specific to origin o and region r
	(*e.g. traditional demand patterns - Dutch guests concentrated in Saaalbach - Hinterglemm*)
$b(t)$	pure time effect shared by all regions (*e.g. business cycle effects*)
$f(o,t)$	fixed time - origin effect shared by all regions (*e.g. devaluation of Russian Rubel*)
$g(r,t)$	region specific time effect for all origins (*e.g. natural disaster in one region*)
$u(o,r,t)$	idiosyncratic disturbance, orthogonal to all other effects (i.i.d. error)

Restrictions

- Model suffers from perfect multicollinearity
  - Instead of taking individual regions/origins as reference groups
  - restrictions on the coefficients of the independent variables are imposed such that all different effects are orthogonal to each other and thus independent
  - Reference groups = averages over regions, points in time, origins
- Estimation by weighted OLS in order to deal with the problem of "shipbuilding-in-the-midlands"

Restrictions

$$\sum_{r=1}^{R} \beta_{m(o,r)} = 0$$

Coefficients $ß_{m(i,r)}$ measure the deviation in regional growth of overnight stays of origin *o* from the national (i.e. average) growth path with respect to visitors of the same origin.

$$\sum_{o=1}^{O} \beta_{f(o,t)} = 0$$

Temporary origin-specific deviations from the trend with respect to visitors from origin *o* at time *t* average out over visitors from all origins.

$$\sum_{t=1}^{T} \beta_{f(o,t)} = 0$$

For each origin *o*, these deviations are also assumed to average to zero over time.

$$\sum_{t=1}^{T} \beta_{g(r,t)} = 0$$

Deviations of the regional from the national business cycle average to zero over time.

$$\sum_{r=1}^{R} \beta_{g(r,t)} = 0$$

For each point in time *t*, cyclical deviations cancel out over all regions as well.

$$\sum_{t=1}^{T} \beta_{b(t)} = 0$$

National cyclical movements are defined as temporal deviations from the national growth trend.

Virtual Overnight Stays

Estimated parameters are used to calculate some indicators:

- "Virtual" growth rate e_{virt} equal across all regions:

$$e_{virt}(o,t) = \beta_{h(o)} + \beta_{b_{(t)}} + \beta_{f_{(o,t)}}$$

- "Virtual" level of overnight stays for each region and each regional origin

$$E_{virt}(o,r,t) = e_{virt}(o,t) \cdot E_{virt}(o,r,t-1)$$

- Indicators $W_{(i,n,t)}$ and $W_{(n,t)}$

$$W(o,r,t) = E_{act}(o,r,t) \div E_{virt}(o,r,t)$$

$$W(r,t) = \sum_{o=1}^{O} E_{act}(o,r,t) \div \sum_{o=1}^{O} E_{virt}(o,r,t)$$

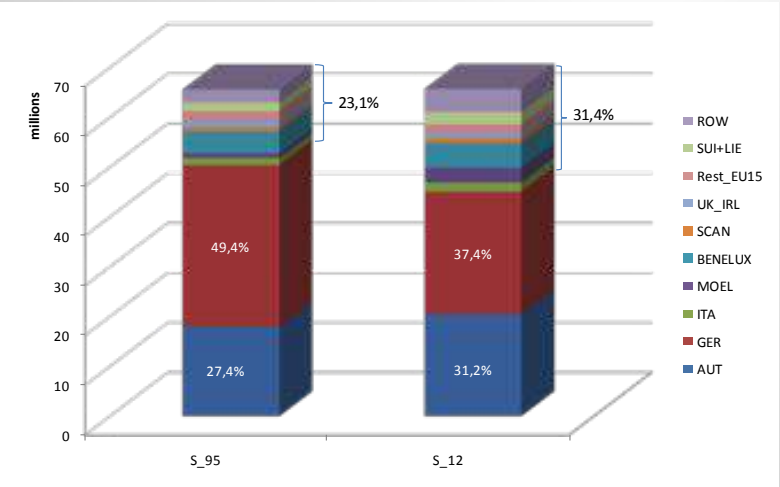
Indicators allow assessing the positive or negative influence of the region-specific factors:

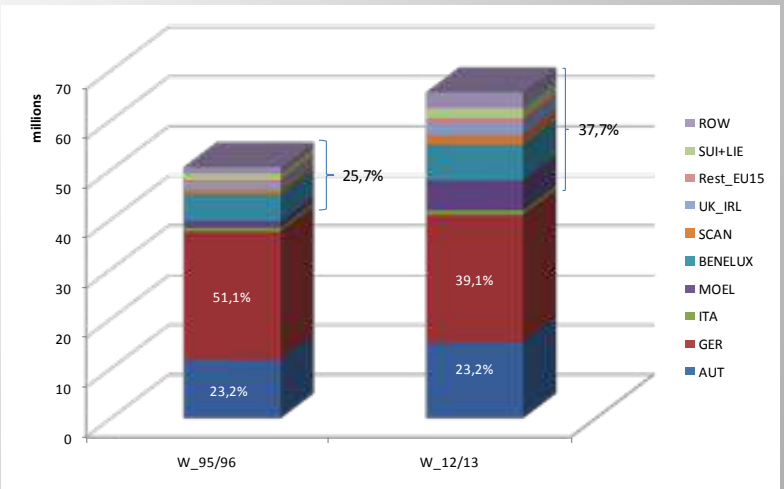
- $W_{(o,r,t)} > 1$: regional visitor group of origin o developed better than predicted on the basis of national effects: the actual time series lies above the hypothetical one.

- $W_{(r,t)} > 1$: region-specific factors exerted a positive influence.

- Data on overnight stays by NUTS-3 regions and countries of origin of visitors on an annual (1995-2013) and bi-seasonal basis (winter 1996/97 – winter 2013/14 and summer 1995 – summer 2013)
- 10 country groups distinguished (Austria + 9 foreign country groups)

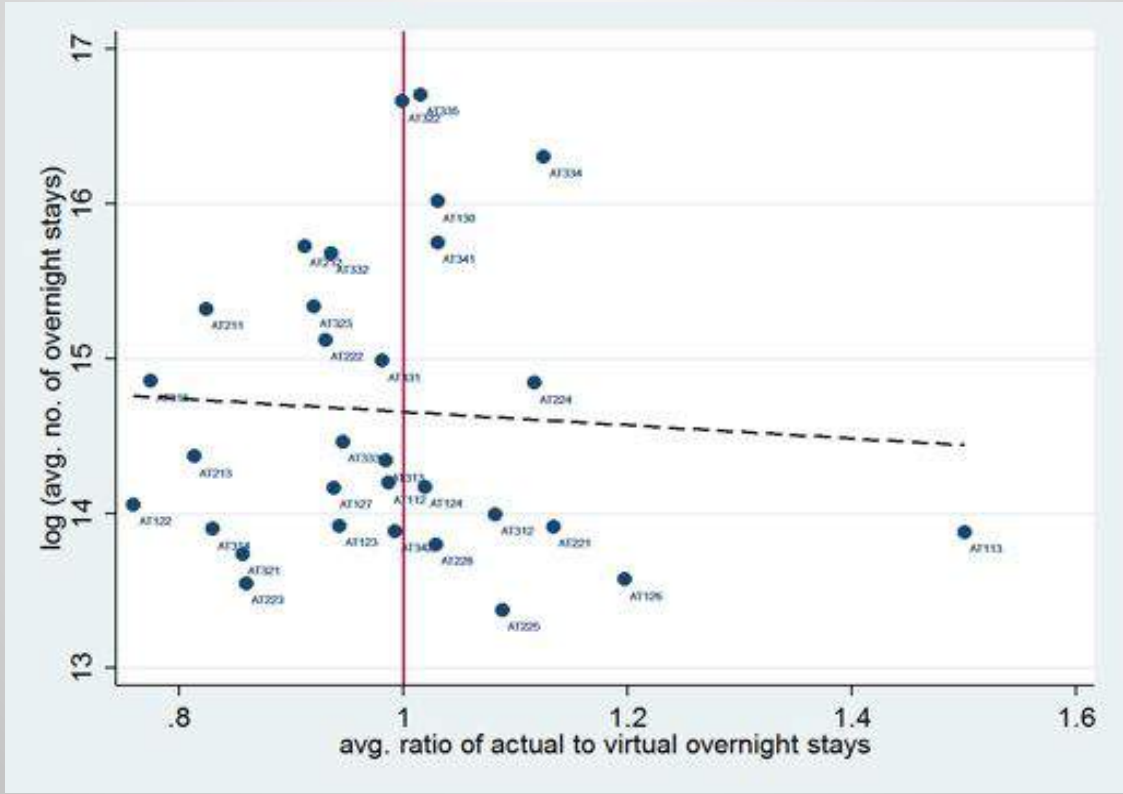
Change in overnight stays 1995-2012 by season and origin of visitors





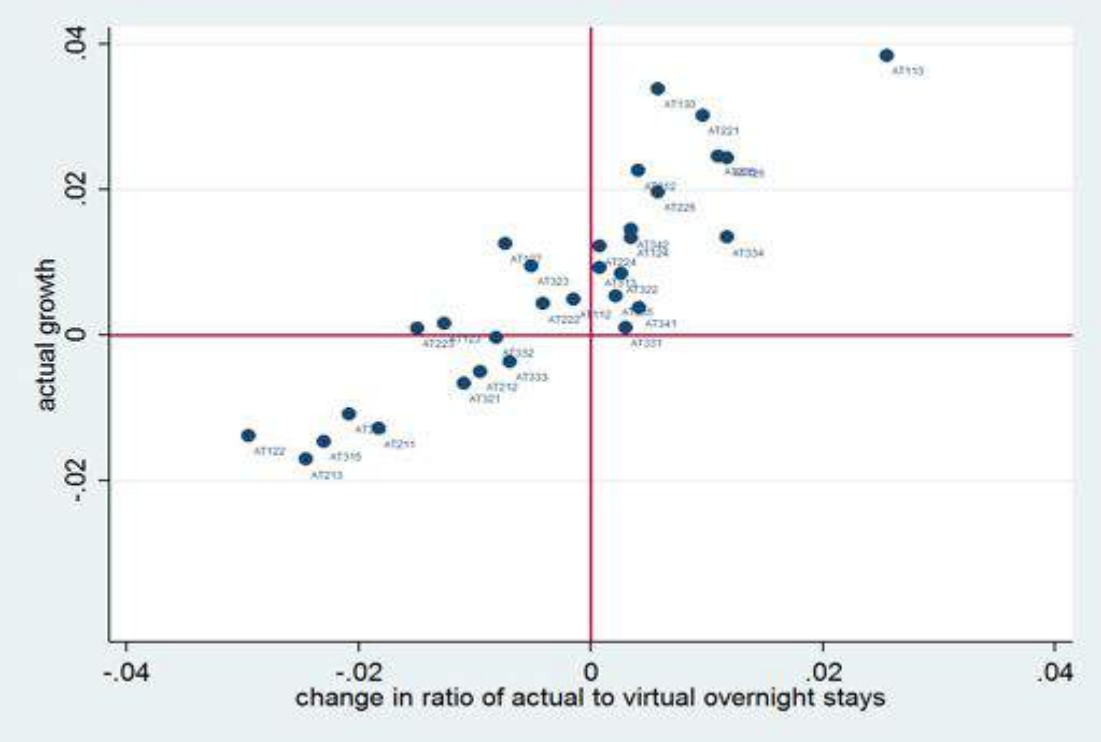
Results for NUTS 3 Regions

- No significant correlation between the level of overnight stays and changes in the competitive performance

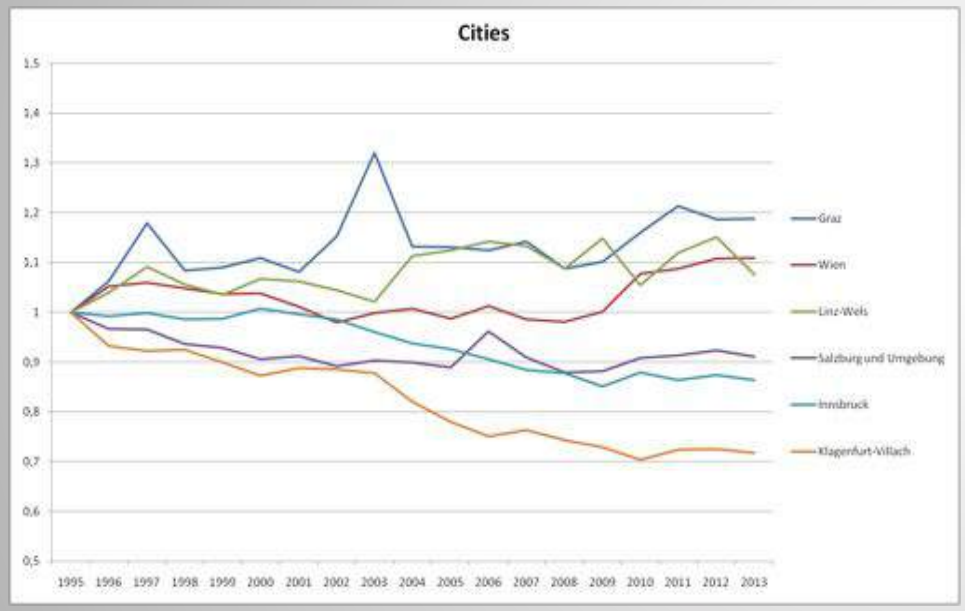


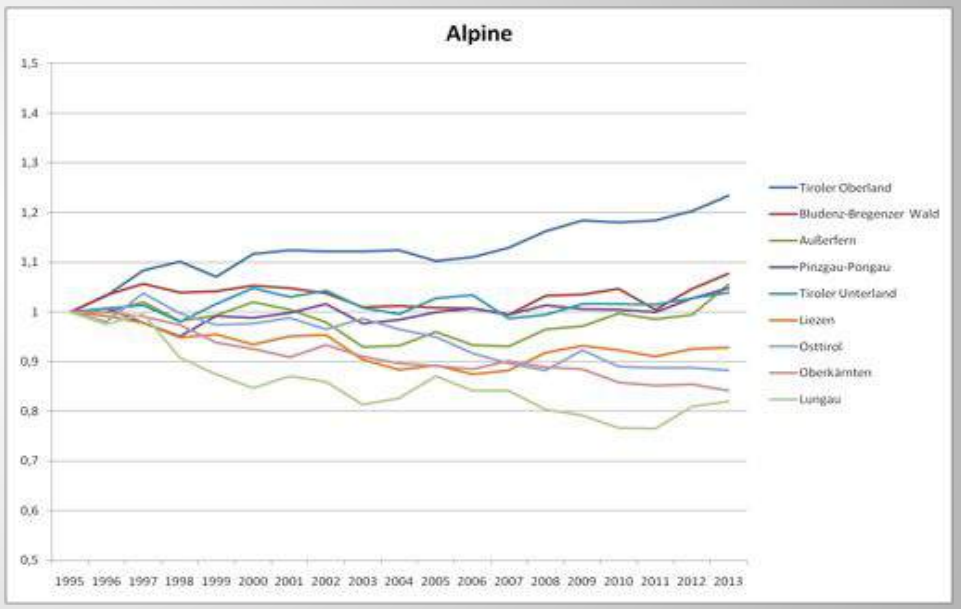
Results for NUTS 3 Regions

- High degree of correlation between changes in the competitive performance and tourist development – this implies that idiosyncratic effects outweigh origin-specific effects

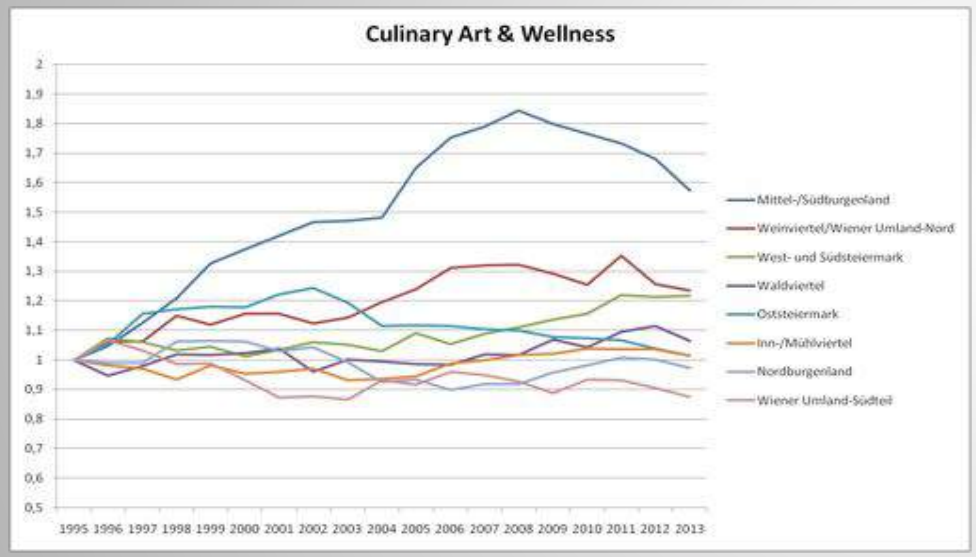


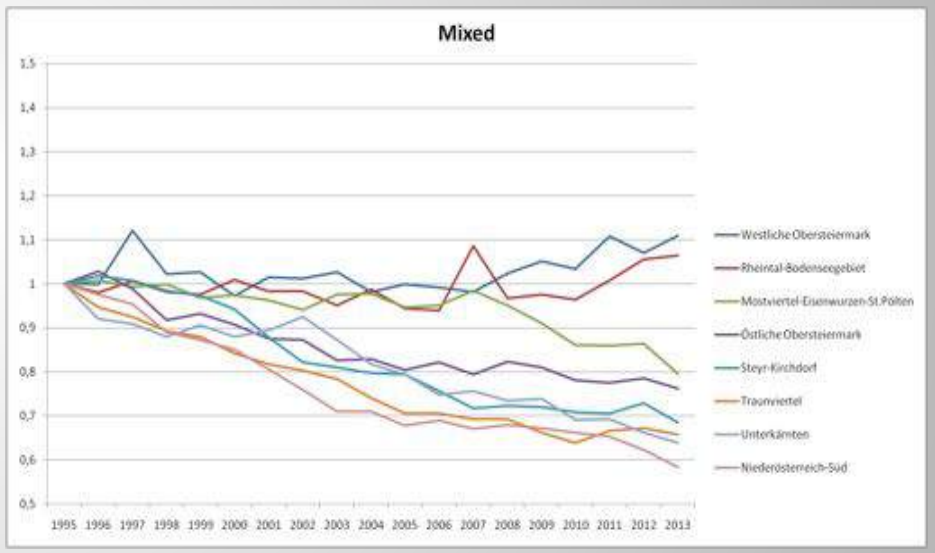
Results for NUTS 3 Regions by Type





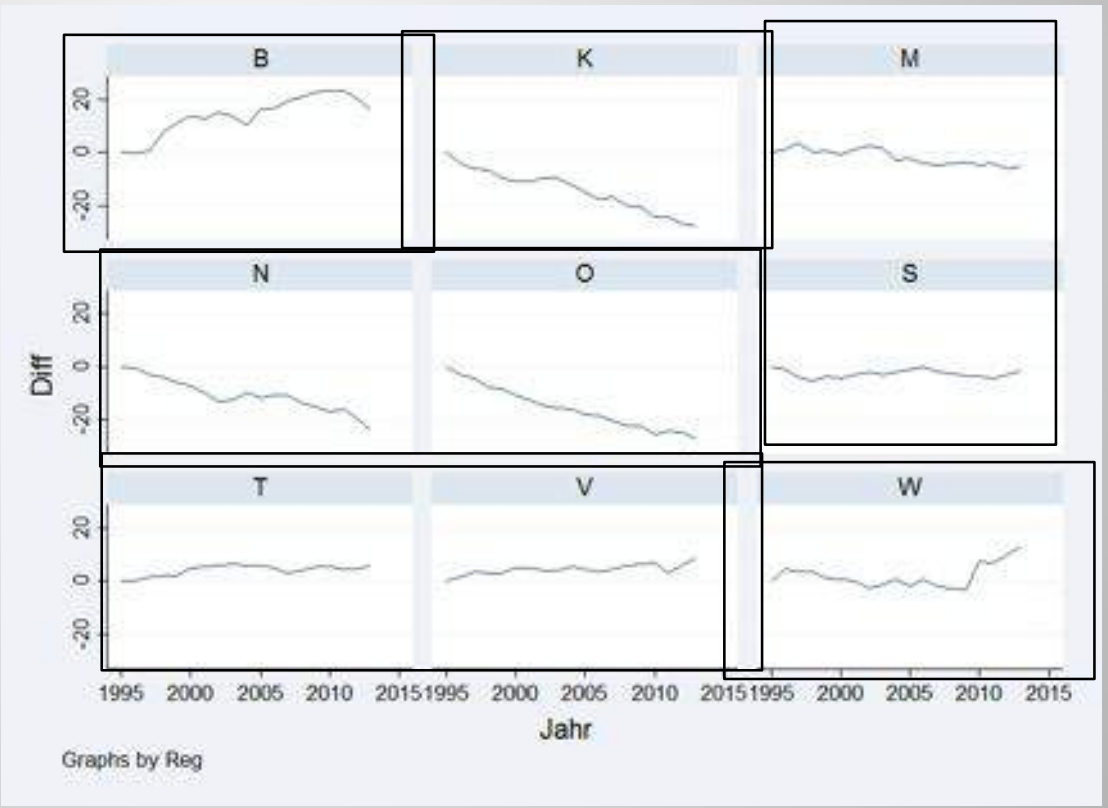
Results for NUTS 3 Regions by Type





Results for Provinces (Actual minus Virtual Developments)

- **$W_r > 0$:**
  Burgenland (B)
- **$W_r > 0$ after 2010:**
  Vienna (W)
- **W_r slightly above 0:**
  Tyrol (T)
  Vorarlberg (V)
- **W_r slightly below 0:**
  Salzburg (S)
  Styria (M)
- **$W_r < 0$:**
  Carinthia (K)
  Upper Austria (O)
  Lower Austria (N)



What to do now….

- Competitive position / development of different regions as indicated by our indicator needs to be explained
- Regressions analysis with W as depend variable to shed light on potential determinants of regional competitiveness

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Thank you for your attention – comments are always welcome!