ESPON

EUROPEAN SPATIAL PLANNING
OBSERVATION NETWORK

Exploring possible
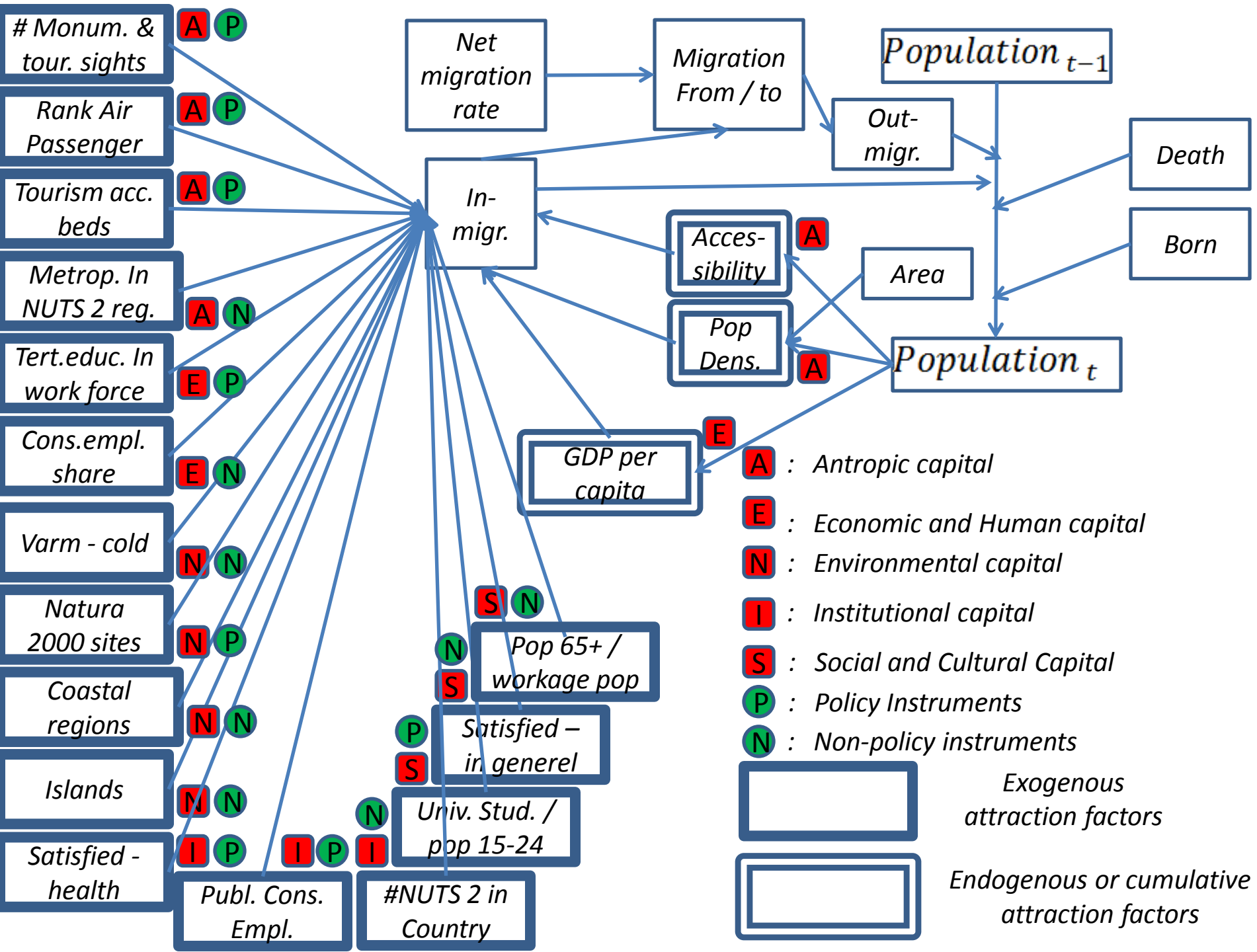futures for territorial
attractiveness -
The ATTREG-future-model

Outline

- Territorial Capital (in-dep.) - Mobility (dep.)
- Why model impacts? (More than the direct effects)
- The ATTREG-future model
- Scenarios include
  - Multiplier experiments with the ATTREG-future-model
  - 3 scenarios (smart, sustainable, inclusive)
  - Convergence regions / Overheating regions
- Results of 1 multiplier experiments for inclusive scenario for Cornwall and Isles of Scilly, UK
- The DEMIFER and the ATTREG-future scenarios

Monum. & tour. sights — A P

Rank Air Passenger — A P

Tourism acc. beds — A P

Metrop. In NUTS 2 reg. — A N

Tert.educ. In work force — E P

Cons.empl. share — E N

Varm - cold — N N

Natura 2000 sites — N P

Coastal regions — N N

Islands — N N

Satisfied - health — I P

Publ. Cons. Empl. — I P

#NUTS 2 in Country — I

Net migration rate

Migration From / to

Population $_{t-1}$

Out-migr.

In-migr.

Death

Born

Acces-sibility — A

Area

Pop Dens. — A

Population $_t$

GDP per capita — E

Pop 65+ / workage pop — S N

Satisfied – in generel — P S

Univ. Stud. / pop 15-24 — N

A : Antropic capital

E : Economic and Human capital

N : Environmental capital

I : Institutional capital

S : Social and Cultural Capital

P : Policy Instruments

N : Non-policy instruments

Exogenous attraction factors

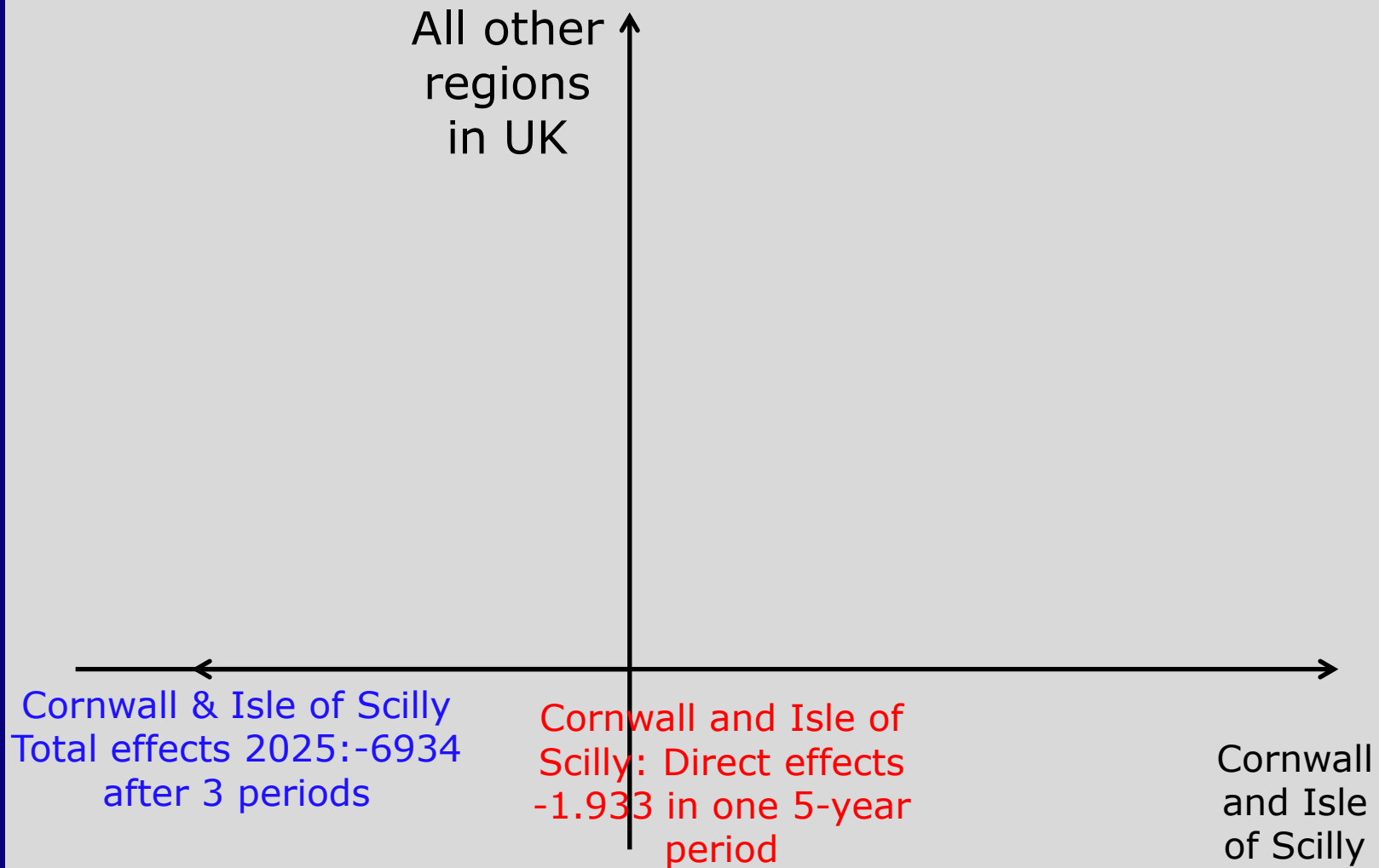Endogenous or cumulative attraction factors

The direct effects

- From territorial capital to
  - Migration by age groups
  - Tourism flows by foreign / domestic tourist
- The quantitative analysis (multi-variate regression)
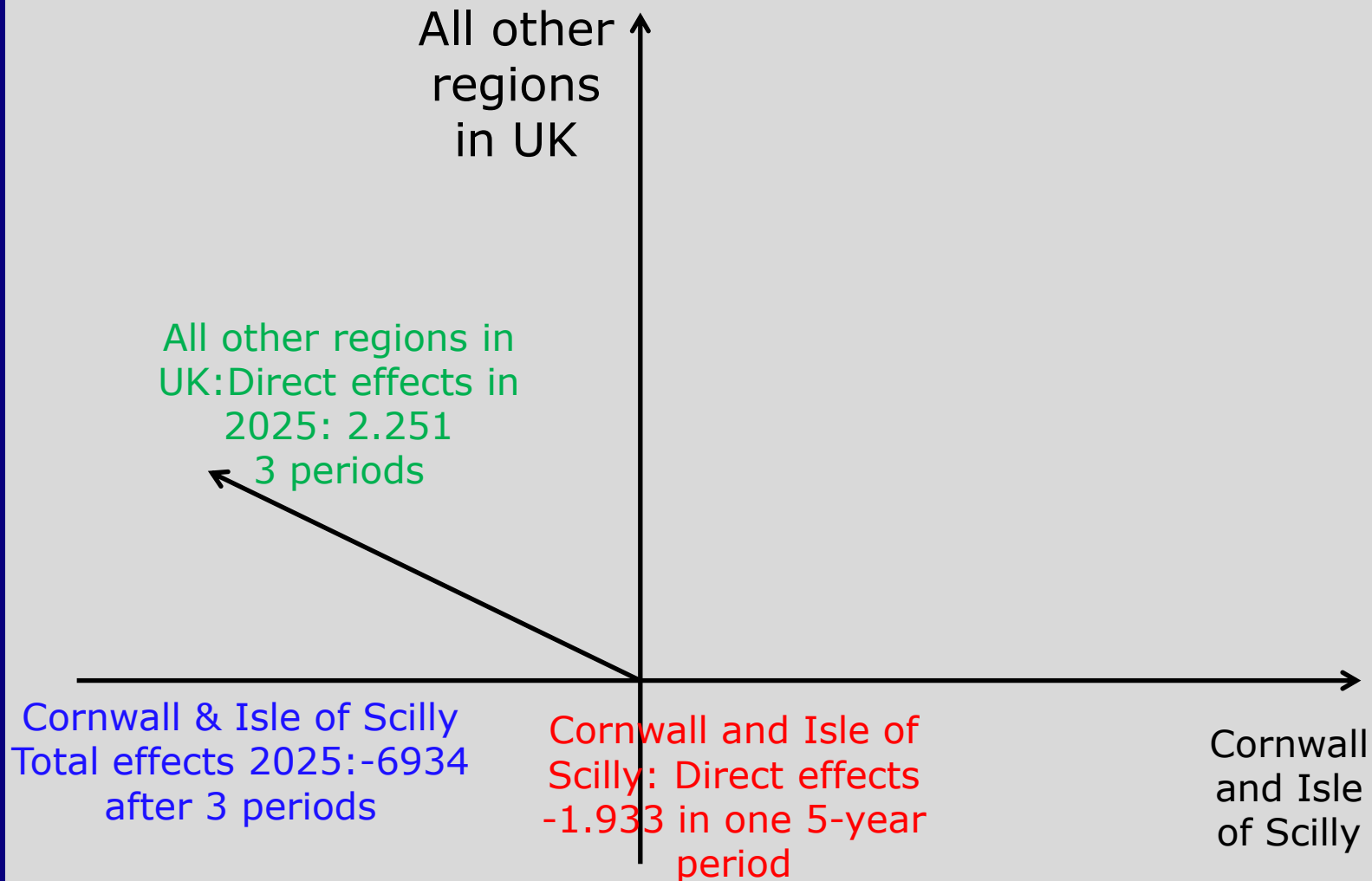- Add to the direct effects the influence of policy process!!

Direct and derived effects of inclusive scenario for Cornwall and Isles of Scilly, UK
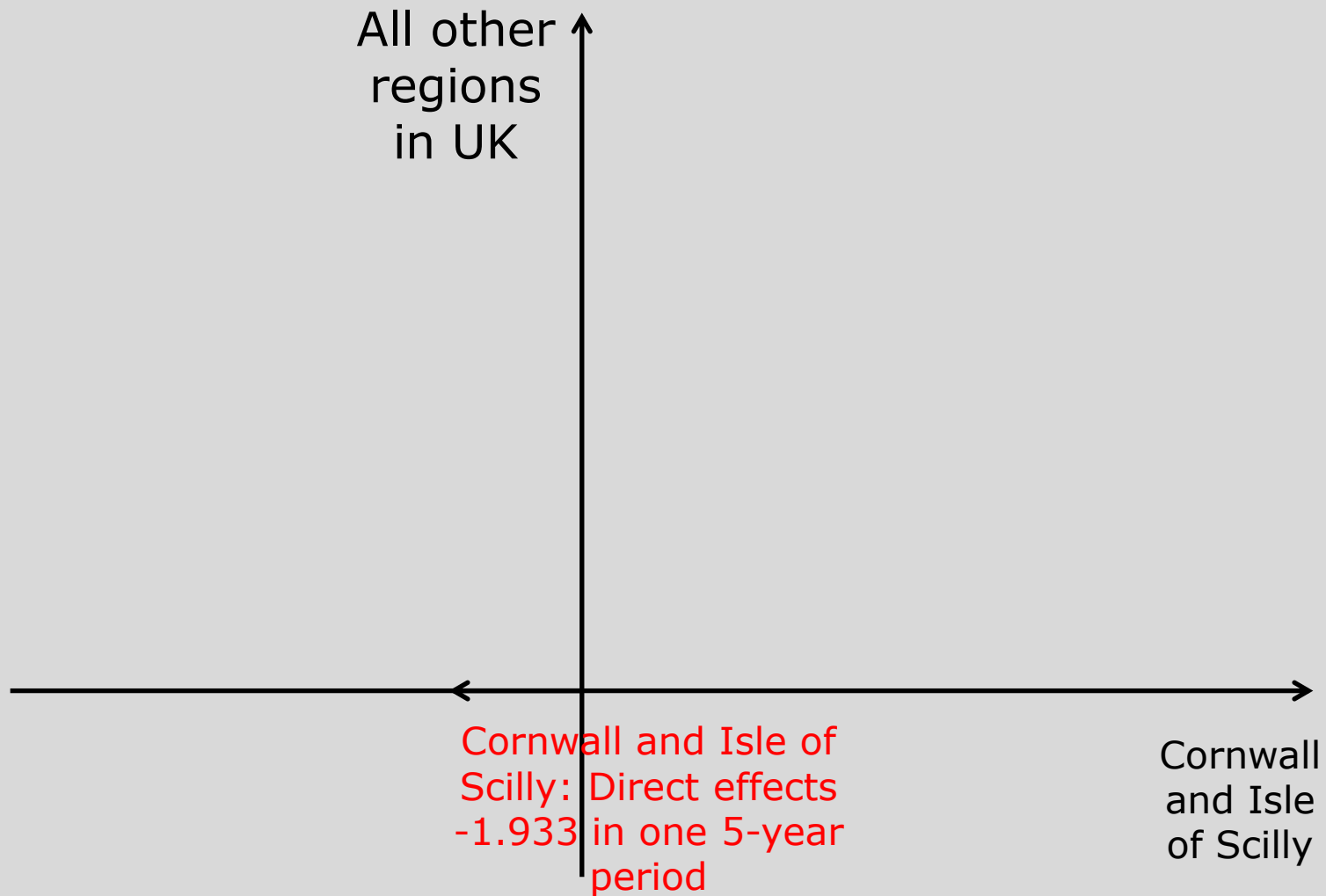
All other
regions
in UK

Cornwall and Isle of
Scilly: Direct effects
-1.933 in one 5-year
period

Cornwall
and Isle
of Scilly

Direct and derived effects of inclusive scenario for Cornwall and Isles of Scilly, UK

All other regions in UK

Cornwall & Isle of Scilly Total effects 2025:-6934 after 3 periods

Cornwall and Isle of Scilly: Direct effects -1.933 in one 5-year period

Cornwall and Isle of Scilly

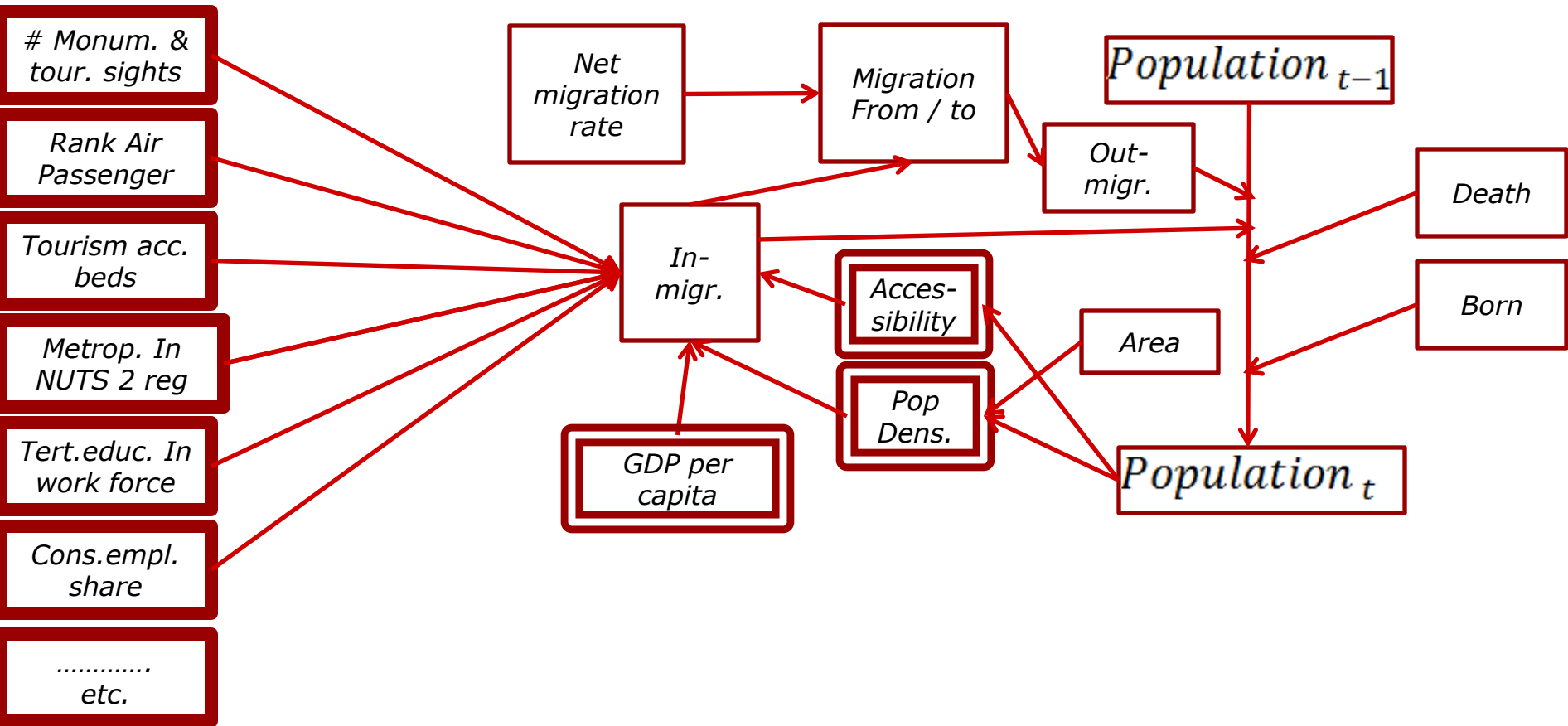Direct and derived effects of inclusive scenario for Cornwall and Isles of Scilly, UK

All other regions in UK

All other regions in UK:Direct effects in 2025: 2.251 3 periods

Cornwall & Isle of Scilly Total effects 2025:-6934 after 3 periods

Cornwall and Isle of Scilly: Direct effects -1.933 in one 5-year period

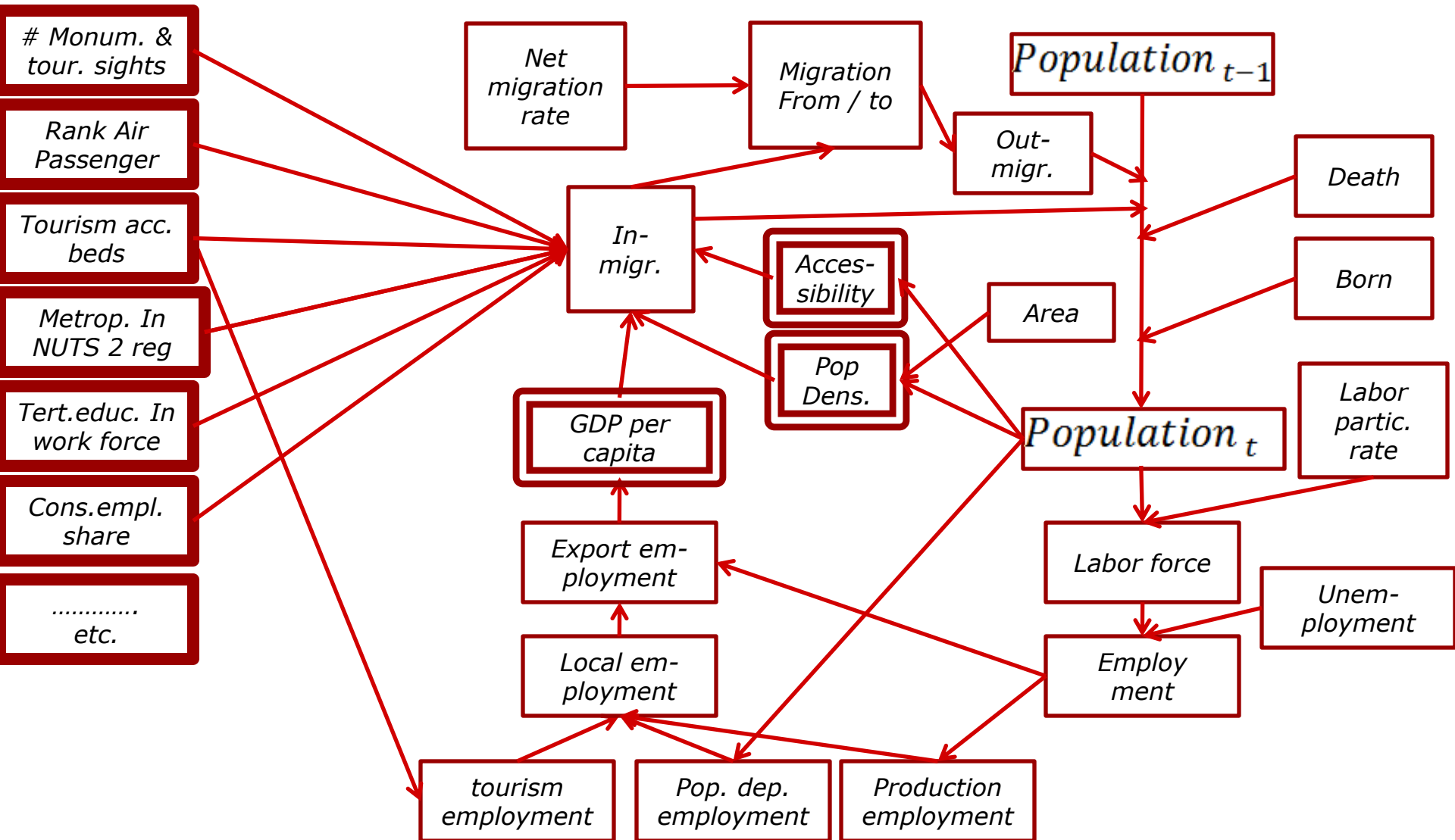Cornwall and Isle of Scilly

What happens in the model?

- Direct effects
- The direct effects accumulate each year to total effects
- Where do in migrants come from?
- What happens on labor market?
- What happens with jobs, balance of trade and GDP pr. capita?

Boxes and labels:
- # Monum. & tour. sights
- Rank Air Passenger
- Tourism acc. beds
- Metrop. In NUTS 2 reg
- Tert.educ. In work force
- Cons.empl. share
- …………. etc.

- Net migration rate
- Migration From / to
- $Population_{t-1}$
- Out-migr.
- Death
- In-migr.
- Acces-sibility
- Area
- Born
- GDP per capita
- Pop Dens.
- $Population_t$

: Exogenous attraction factors

: Endogenous or cumulative attraction factors

Monum. & tour. sights

Rank Air Passenger

Tourism acc. beds

Metrop. In NUTS 2 reg

Tert.educ. In work force

Cons.empl. share

…………. etc.

Net migration rate

Migration From / to

Out-migr.

$Population_{t-1}$

Death

Born

In-migr.

Acces-sibility

Area

Pop Dens.

Labor partic. rate

GDP per capita

$Population_{t}$

Export em-ployment

Labor force

Unem-ployment

Local em-ployment

Employ ment

tourism employment

Pop. dep. employment

Production employment

: Exogenous attraction factors

: Endogenous or cumulative attraction factors

ATTREG-future model
Causal structure

- 2 simultanous blocks:
  - Migration – Population - Attractions
  - Population – Labour force - employment – Income/capita - trade
- Direct effects from attractions
- Derived effects from attractions should add impacts from the 2 simultanous blocks with a number of iterations

The ATTREG-future model and scenarios with the ATTREG-future model

- ATTREG-future model is an extended demographic model
- Changes in exogenous variables
  – Policy instrument
  – Non-policy variables
- 3 scenarios with the ATTREG-future-model : Smart, Sustainable and Inclusive
- 2 types of regions: Convergence Regions & Overheating regions
- Impact experiment:
  – Inclusive scenario
  – 1 experiments region:
    - UKK3 Cornwall and Isles of Scilly

Policy bundles with the ATTREG-future model

	Smart growth	Inclusive growth	Sustainable growth
Monument index		+	
Rank of airport	+	-	
Tourism beds	+		
Accessibility	++	-	
Tertiary educated workforce	+		
NACE G-I employment			+
Natura 2000 areas		+	
Satisfied with health services			+
Public sector employment		+	+
Student ratio	+		+
Life satisfaction		+	+

ESPON
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OBSERVATION NETWORK

	Type of variable	Unit	Net migration rate for 15-24 years per 1000 hd	Net migration rate for 25-49 years per 1000 hd	Net migration rate for 50-64 years per 1000 hd	Residents arrivals pr. capita	Foreign arrivals pr. capita
			Beta = standardized coefficient				
Antropic capital:							
Monuments and other tourist sights valued 2 stars in TCI "green guides series", indexed, NUTS2	Exogenous / Policy	Index=1	-0,035	0,078	-0,170	-0,081	-0,115
CRUDE POPULATION DENSITY 2008	Cumulative/endogenous	Cap /km2	0,221	-0,008	-0,255	-0,086	0,004
Rank of AIRPASS05	Exogenous / Policy	Number 1-277	-0,022	-0,037	0,133	0,195	0,037
number of tourism accommodation beds in NUTS2 region	Exogenous / Policy	Number	0,058	0,143	0,341	0,262	0,308
sum of population accessibility scores (working age population accessibility per hour travel distance, 2001)	Cumulative/endogenous	Index=100	-0,200	-0,113	-0,123	-0,330	-0,184
location of a metropolitan urban area in NUTS2	Exogenous / Non-policy	1 or 0	0,086	-0,051	-0,045	-0,205	-0,117
Economic and Human capital:							
Average GDP per capita 2001-03	Cumulative/endogenous	Euro / cap	0,418	0,132	-0,120	0,298	0,409
average % of working age adults with tertiary education 2001-03	Exogenous / Non Policy	Share between 0 and 1	-0,074	0,167	-0,153	0,018	-0,268
average % of consumption-related employment 2001-03	Exogenous / Non-policy	Share between 0 and 1	0,169	0,262	0,124	0,209	0,624
Environmental capital:							
Difference between WARM and COLD	Exogenous / Non Policy	degree Celcius	-0,193	-0,278	-0,168	0,075	-0,031
The percent share of the Natura 2000 sites within the NUTS	Exogenous / Policy	0-100%	0,035	0,027	0,017	0,035	-0,036
Coastal classification from ESPON (EN2_36)	Exogenous / Non policy	1 or 0	-0,126	-0,082	0,015	-0,128	-0,201
Island classification from ESPON (EN2_35)	Exogenous / Non-policy	1 or 0	-0,094	-0,076	0,058	0,047	0,089
Institutional capital:							
% of respondents who were more satisfied with the "state of health services in country nowadays" relative to the EU median score	Exogenous / Policy	0-100%	0,120	0,121	0,203	0,089	0,203
average % of public sector employment 2001-03	Exogenous / Policy	0-100%	-0,191	-0,267	0,051	0,119	-0,163
number of NUTS2 region within country in which located	Exogenous / Non-policy	1-39	0,221	-0,055	0,138	0,248	-0,042

## Direct effects in 2025 for Cornwall and isle of Scilly – Inclusive scenario

|	15-29 years	30-49 years	50-64 years	Total direct effects
Exogenous Territorial Capital ()				
Monuments and other tourist sights valued 2 stars in TCI green guides series, indexed (number)	0	0	0	**0**
Rank of airport embarcations and disembarcations of all airports within region (number)	-	-	-	
Number of tourism accommodation beds (number)	0	0	0	**0**
Sum of working age population accessibility per hour travel distance, 2001 (number)	0	0	0	**0**
Location of a metropolitan urban area in region (number)	0	0	0	**0**
Average % of working age adults with tertiary education 2001-03 (number)	0	0	0	**0**
Average % of consumption-related employment 2001-03 (number)	22,55	546,98	-331,06	**238.47**
Difference between WARM and COLD (number)	0	0	0	**0**
The percent share of the Natura 2000 sites within the region (number)	0	0	0	**0**
Coastal classification from ESPON (number)	0	0	0	**0**
Island classification from ESPON (number)	0	0	0	**0**
% more satisfied "state of health services in country nowadays"/EU median score (number)	40,32	-1.068,47	-35,28	**-1063,43**
Average % of public sector employment 2001-03 (number)	-2.394,93	-6.974,56	138,68	**-9334,21**
Number of NUTS2 region within country in which located (number)	0	0	0	**0**
Ratio of the number of university students against people aged 15 to 24 years, 2007 (number)	0	0	0	**0**
% satisfied with life as a whole relative to the EU median scorefunction (number)	238,56	3.856,72	744,08	**4839,36**
Dependency ratio of population aged 65 and over and the working age population, 2001 (number)	-622,03	2.019,57	1.885,77	**3283,26**
Total effects	**-2.715,53**	**-1.619,76**	**2.402,20**	**-1933,09**

ATTREG-future model: Direct and derived effects attraction policy scenario for Cornwall and isle of Scilly

	Smart scenario		Sustainable scenario		Inclusive scenario	
	Popula-tion	Employ-ment	Popula-tion	Employ-ment	Population	Employment
Cornwall and isle of Scilly	-5728	-3494	23110	16800	-6934	-6209
Rest of UK	15792	8114	-24140	-16695	2251	3577
Rest of Europe	-13199	-23954	11850	15875	267	56
Total	-3135	-15840	10820	15980	-4416	-2576

Patterns of impacts with positive direct effects

Nation border

Surrounding regions

Surrounding regions

+ + + +

Target region

− −

− − −

−
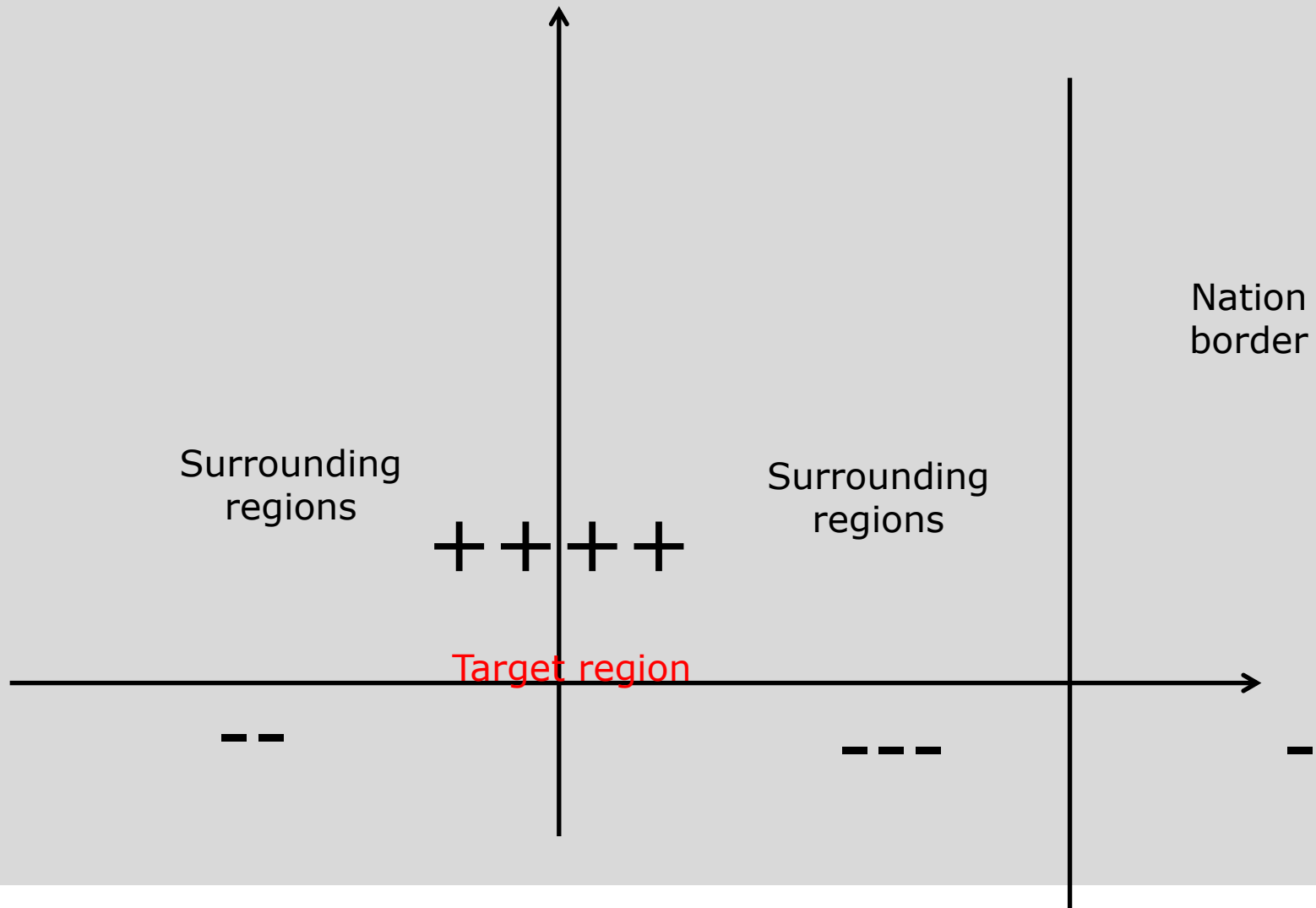
Patterns of impacts with negative direct effects
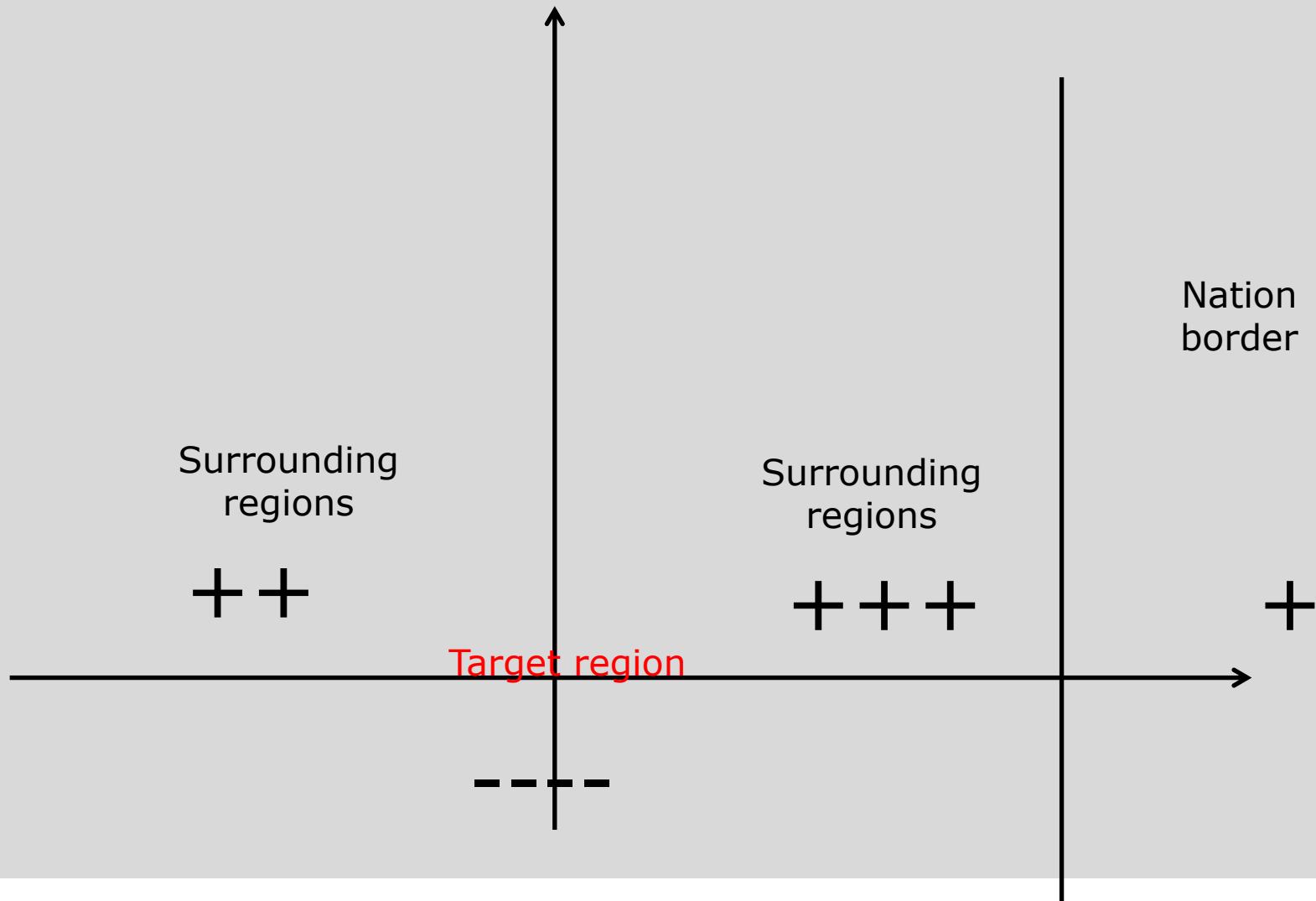
Combining results from a number of regions

- Adding the "landscapes" of single regions (into impact maps for convergence/overheating regions

- If direct effects have different signs for target regions

- If UK-regions are influenced from other UK regions with different "signs"

- Problems with top-down cluster method, if direct effects are different for different target regions

- Analysis based upon bottom-up and detailed information is needed!
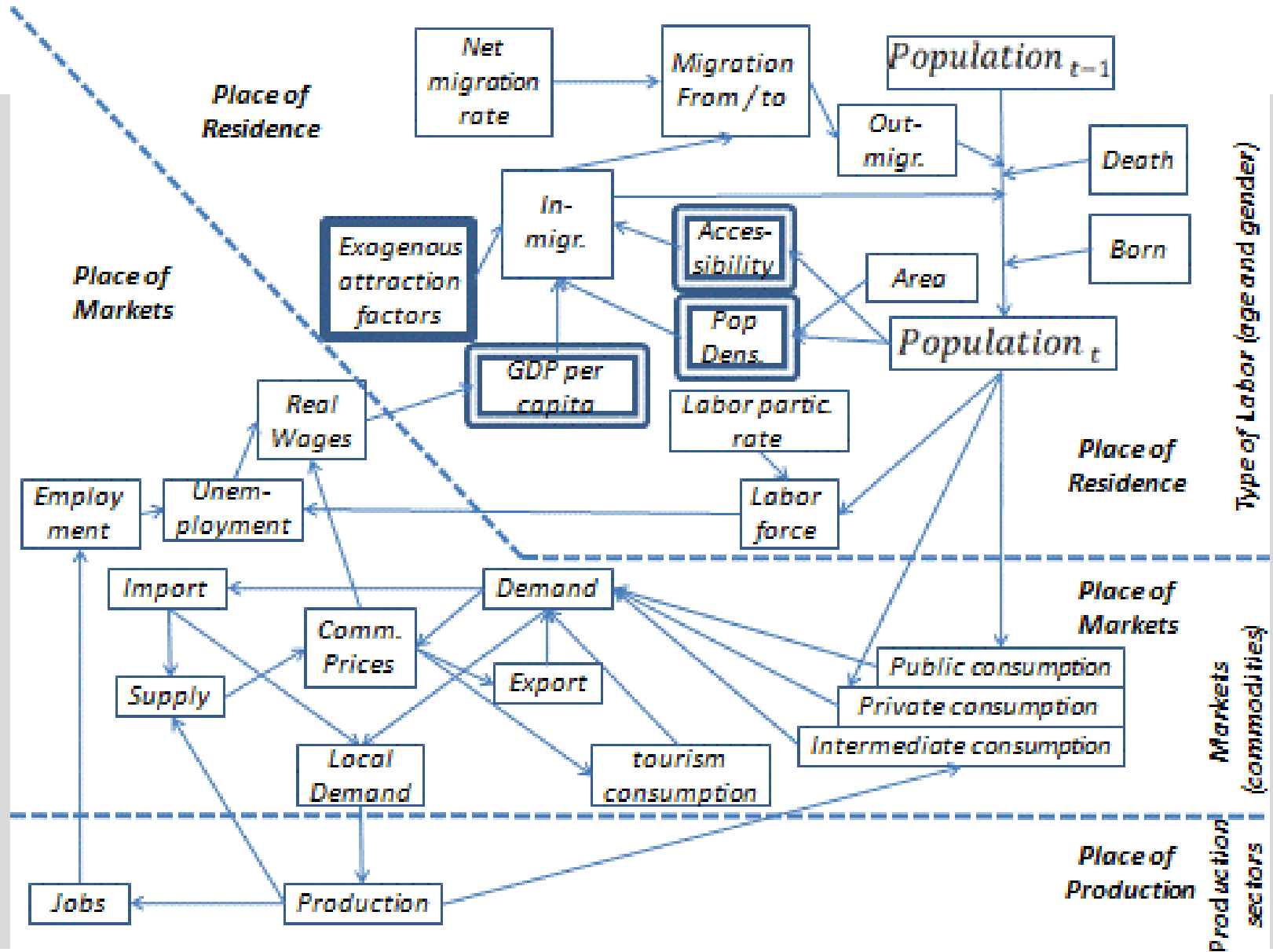
DEMIFER(MULTIPOLES-model) and scenarios

- DEMIFER / MULTIPOLES-model is ESPON-state of the art interregional demographic model (=Pure demographic model)
- Scenarios in DEMIFER (with the MULTIPOLES-model):
  - 3 reference scenarios
    - Unchanged migration pattern ("status quo")
    - No internal and outside EU in-migration ("No migration scenario")
    - No outside EU in-migration (" No extra-Europe migration scenario)
  - 4 Development / policy scenarios
    - GROWING SOCIAL EUROPE (GSE) (High growth / Collectivism)
    - EXPANDING MARKET EUROPE (EME) (High growth / Individualism)
    - LIMITED SOCIAL EUROPE (LSE) (Low growth / Collectivism)
    - CHALLENGED MARKET EUROPE (CME) (Low growth / Individualism)
  - 1 impact study/ multiplier experiment
    - migration from climate changes ("status quo" & LSE)

The four DEMIFER (Multipoles-model) development / policy scenarios

Table 1. The four DEMIFER scenarios based on the dimensions "economy-environment" and "distribution-fairness"

<table>
<tr>
<td rowspan="2">ECONOMY – ENVIRONMENT</td>
<td>Growth enabled by technical and social innovation</td>
<td>GROWING SOCIAL EUROPE
High growth / Collectivism

GSE</td>
<td>EXPANDING MARKET EUROPE
High growth / Individualism
EME</td>
</tr>
<tr>
<td>Growth limited by environmental constraints</td>
<td>LIMITED SOCIAL EUROPE
Low growth / Collectivism

LSE</td>
<td>CHALLENGED MARKET EUROPE
Low growth / Individualism
CME</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collectivism</td>
<td>Individualism</td>
</tr>
<tr>
<td></td>
<td></td>
<td colspan="2">DISTRIBUTION – FAIRNESS</td>
</tr>
</table>

Source: ESPON (2010e)