SPATIAL ANALYSIS OF RURAL DEVELOPMENT MEASURES
Causal Relationships of RDP Participation (pb #5)

What we did to answer this question
- We determined explanatory variables for participation; we developed and applied spatial econometric models for selected measures of axes 1, 2 and 3 for impact indicators. We did so for six selected case studies and their RDPs at municipality level (NUTS5/LAU2).

What determinants truly influence participation findings from municipality level that indicate single farm decision making)?
- Agricultural structure, but also bio-physical and socio-economic factors influence participation (Brandenburg)
- Also other forces are in place, which determine RDP implementation, such as personal attitudes, initiatives, local community (Brandenburg)
- The scheme design: Due to the nature of 'voluntary' RDP option uptake and the 'competitive' process of the scheme in Scotland, it is predicted that a large number of 'other' factors are responsible for the uptake of these rural measures, e.g. influence of stakeholders, and policy design (Scotland)
- The regional priorities set by the programme design affect the results probably as a mixed effect of environmental characterization and of priority in awarding of the funding (Emilia Romagna)

For which measures did we find neighbourhood effects in participation or expenditures (findings from municipality level that indicate single farm decision making)?
- Spatial econometric analysis indicates marginal neighbourhood effects for measure 121, farm modernization (Brandenburg)
- Spatial econometric analysis indicates only limited neighbourhood effects for 322: village renewal (Brandenburg)
- For the participation of farmers there is significant spatial dependence of outcomes, which is a likely consequence of some farmers serving as examples to neighbours and acquaintances (Noord-Holland)
- The predicted participation for the municipality in agro environmental measure like organic farming or the territorially-based measures show a significant positive crosseffect in the uptake of the measure (Midi Pyrénées)

Causal relationships between EU RD measures and their results in a spatial dimension: Do spatial aspects like neighbourhood effects determine participation rates and measure outcomes?

- We noticed a persistent effect of some measure of the previous programming on the actual programming. Except for mechanisation, the effects are more brakes than levers. (Midi-Pyrénées)

Which relationships between participation or expenditures and impacts of RDP measure could be explained by spatial econometric models?
(We analyzed at municipality level to indicate single farm decision making.)
- The model for payments 121, farm modernization belongs to the weaker of the models (Scotland)
- Socio-economic indicators appear to be less often significant and less stable across models (Emilia Romagna)
- The results of the econometric models confirm that EARDF expenditure contributes towards the stated objective of measure 121 (farm modernization) in terms of higher productivity of agricultural land (CMEF impact indicator) (Slovenia)
- A positive relationship between market orienta-

tion of farms and land productivity can be revealed to from modeling (Slovenia)

- Somewhat surprising is a negative relationship between land productivity and investments in farm mechanization. Result suggests that investments into farm machinery do not bring tangible improvements in economic performance of farm production. The result can be interpreted in various ways. One possibility is that compared with other forms of investments (e.g. building, equipment) investments on farm machinery are less efficient due to a lower public co-financing rates. One could also speculate about possible displacement effects of farm machinery investments, which can be true particularly for small farms. Economic performance of new machinery deteriorates due to relatively high unit costs (Slovenia)

Spatial econometrics point to the relevance of the spatial dimension, but are not easily interpreted

Agri-environmental measures (AEM) participation and payments (findings from municipality level that indicate single farm decision making)

- It was possible (in spite of the data limitations) to estimate models for measure 214, with a relevant ability to explain participation (Emilia Romagna)
  - Within these models the spatial component was highly significant and important

- When analysing AEM with spatial econometrics, model performance is improved when submeasures are considered
  - In comparison to the full measure models, the AIC (Akaike Information Criterion) for the measure 214 options group breakdown model shows model improvements (Scotland)
- The explanatory variables are sharply differentiated by sub-measures of 214 (Emilia Romagna)
- The model with the best fit was for Bird conservation payments (Scotland)
- The results are strongly influenced by the preponderance of meadow bird protection as a sub-measure (Noord-Holland)

Spatial econometrics point to the relevance of the spatial dimension, but are not easily interpreted

- All dependent variables (although only negligibly so for bird conservation option group) showed significant spatial autocorrelation (Scotland)
- A strong explanation of the variance in the dependents was not found (Scotland)
- There was varying importance of particular variables with the corresponding dependent variables and between spatial and non-spatial models (Scotland)

Case studies were carried out in six areas across Europe: Scotland, Midi-Pyrenees, Noord-Holland, Brandenburg, Emilia Romagna and Slovenia.

These areas vary substantially in the social and economic makeup of their countryside. Moreover, the Rural Development Programmes that are active in these areas set different priorities. Therefore, all outcomes discussed in this policy brief carry a note indicating which case study provided each conclusion.