CAP post-2013: alternative greening designs in Tuscany (Italy)

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The greening within the framework of the CAP 2014-2020


- DP disentanglement: basic payment (BP) = 58%, greening = 30% national ceiling
- Entitlement allocation: from historical to regional
- Partial convergence to a flat rate by the end of 2019
- Joint implementation of 3 agricultural practices beneficial for the climate and the environment on eligible arable land:
  (i) crop diversification
  (ii) permanent grassland maintenance*
  (iii) ecological focus areas (EFAs)

*In Italy, this prescription is applied at the national level

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• Potential greening inability to cover farm costs ascribed to policy implementation
• Trade-offs between provision of ecosystem services and overall public and private policy costs
  (Hart and Little, 2012; Hauck et al., 2014; Matthews, 2014)

• The renovated direct DP system is expected not to remunerate farmers for the associated
  - loss of added value
  - higher direct and indirect costs for bureaucratic requirements
  - risk of sanctions
thus, farmers could opt out the CAP (Shulz et al., 2014)
Compliance with greening requirements

• The great majority of EU’s arable land is already conforming with crop diversification (Westhoek et al., 2012)

• Tuscany
  - 90% farms are exempted from crop diversification
  - 36.1% UAA is not meeting greening prescriptions: mainly southern municipalities (province of Grosseto), where farms are wider (Landi et al., 2014)

Effects on land demand

• Permanent grassland & EFA: farmland left fallow would cause a decrease in arable land (Was et al., 2014)

• Greening could increase the demand for land (Puddu et al., 2014)
Objectives of the study

• Ex-ante impact assessment of different levels of direct payments (greening and basic payment) to farmers

• Upscaling of farm-level results to identify the cost-effectiveness of the greening component

• Testing the model on arable farms at the NUTS 3 level (province of Grosseto, Italy)
Methodological framework

Ex-ante analysis of CAP’s greening measure

1. Identification of representative farm types: *Non-hierarchical cluster analysis*
2. Definition of policy parameters: share of basic & greening components (Frascarelli, 2014)
3. Simulation of farmers’ choice about greening: *Discontinue integer non linear model*
4. Impact assessment at the farm level. (Frascarelli, 2014)
5. Upscaling at the territorial level & measure of the contribution to environmental improvement: *Drivers of HNV farmland* (Paracchini et al., 2008; Paracchini and Britz, 2010)
6. Cost-effectiveness analysis
Case study
Data

- Farms’ costs: FADN
- Italian Agricultural Census 2010

1. Cluster analysis on a subsample: Province of Grosseto (NUTS 3)
   - 7856 farms: arable farming systems only
   - 32 representative clusters

2. Association of representative farms to “altitude” (plain, hill, mountain)

3. Cluster classification criteria
   (i) farmland surface area
   (ii) amount of household and/or off-farm labour employed
   (iii) amount of single farm payments
Theoretical model

$$\pi_i = \left( \pi_i^0 ; \pi_i^{cc} ; \pi_i^{cc+g} \right)$$

$\pi_i^0 = \sum_{j=1}^{J} p_i \cdot f_i(...) - k_j(...)$

$$\pi_i^{cc} = \left[ \pi_i^0 - C_i(e_{cc}) \right] + (1-\alpha)DP_i \cdot l_i > 0$$

$$\pi_i^{cc+g} = \left[ \pi_i^0 - C_i(e_{cc},e_g) \right] + DP_i \cdot l_i > 0$$

0 = out the CAP
cc = cross-compliance $\rightarrow$ BP only
g = compliance with greening prescriptions $\rightarrow$ BP + greening payment

Farmers would opt for cc only
Farmers would comply with g
Environmental impact assessment

HNV drivers (Paracchini et al., 2008; Paracchini and Britz, 2010)

(i) Diversity Crop Index (DCI): crop diversity in non-grassland areas; proxy: Shannon Index

(ii) Management Intensity Index (MII)*: management intensity in non-grassland areas; proxy: nitrogen inputs; $N_{\text{inputs}} < 20 \text{ kg/ha} \Rightarrow \text{MII} \to 0$; $N_{\text{inputs}} > 190 \text{ kg/ha} \Rightarrow \text{MII} \to 1$

(iii) Livestock Intensity Index (LII)*: livestock pressure over grassland areas and EFAs (biodiversity); livestock size is assumed fixed $\Rightarrow$ LII measures the changes in grassland due to greening

*Nitrate Directive is considered
Cost-effectiveness analysis

\[ CE_i = \frac{E_i}{C_i} \]

\[ E_i = 100 \left( \sqrt{DCI_i \times MII_i} \left( \sum_{s \in G} x_s \right) + LII_i \left( \frac{\sum_{s \in G} x_s}{\sum_{s} x_s} \right) \right) = HNVdrivers \]

\[ C_i = \text{payment level: -50\%DP, current payment, +50\%DP} \]
Impact of different greening designs on farm involvement in the measure

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Greening’s environmental effect at the NUTS 3 level

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Results/3
Cost-effectiveness of alternative greening designs

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Closing remarks

• Area based payments & partial convergence
• Rules complexity
• EFA and diversification costs borne by farmers would be higher in more fertile rather than in less fertile land (Shulz et al., 2014)
• Farm structure affects greening’s acceptance by farmers
• Different times and places under study make it difficult the comparison among research studies
• Paperwork costs still uncertain
Thank you for your attention

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