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

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The greening within the framework of the CAP 2014-2020

Regulation (EU) 1307/2013 – Direct payments (DP)

- 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

Literature highlights / 1

- 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)

Literature highlights / 2

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

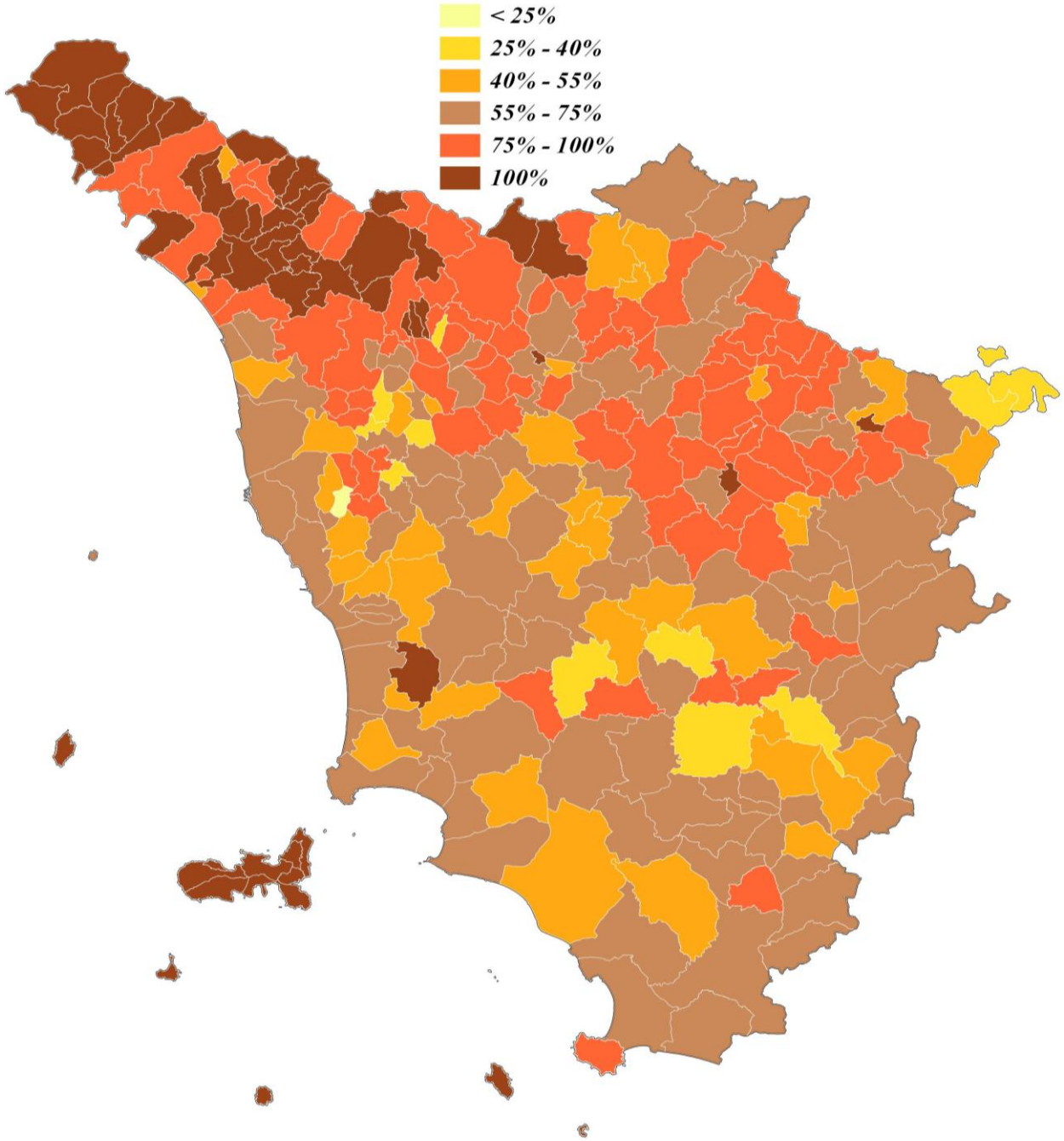
- Ex-ante impact assessment of different levels of direct payments (greening and basic payment) to farmers
- Upscaling of farm-level results to identify the cost-effectiveness of the greening component
- Testing the model on arable farms at the NUTS 3 level (province of Grosseto, Italy)

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

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

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

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

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

Farmers would opt for *cc* only

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

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

(i) Management Intensity Index (MII)*: management intensity in non-grassland areas; proxy: nitrogen inputs; N_{inputs} < 20 kg/ha => MII → 0; N_{inputs} > 190 kg/ha => MII → 1

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

*Nitrate Directive is considered

Cost-effectiveness analysis

$$CE_i = \frac{E_i}{C_i}$$

$$E_i = 100\left(\sqrt{DCI_i * MII_i}\left(\frac{\sum_{s \notin G} x_s}{\sum_{s} x_s} \right) + LII_i \frac{\sum_{s \in G} x_s}{\sum_{s} x_s} \right) = HNVdrivers$$

C_i = payment level: -50%DP, current payment, +50%DP

Results/1
Impact of different greening designs on farm involvenent in the measure

Province of Grosseto: Share of farms and UAA involved in the greening

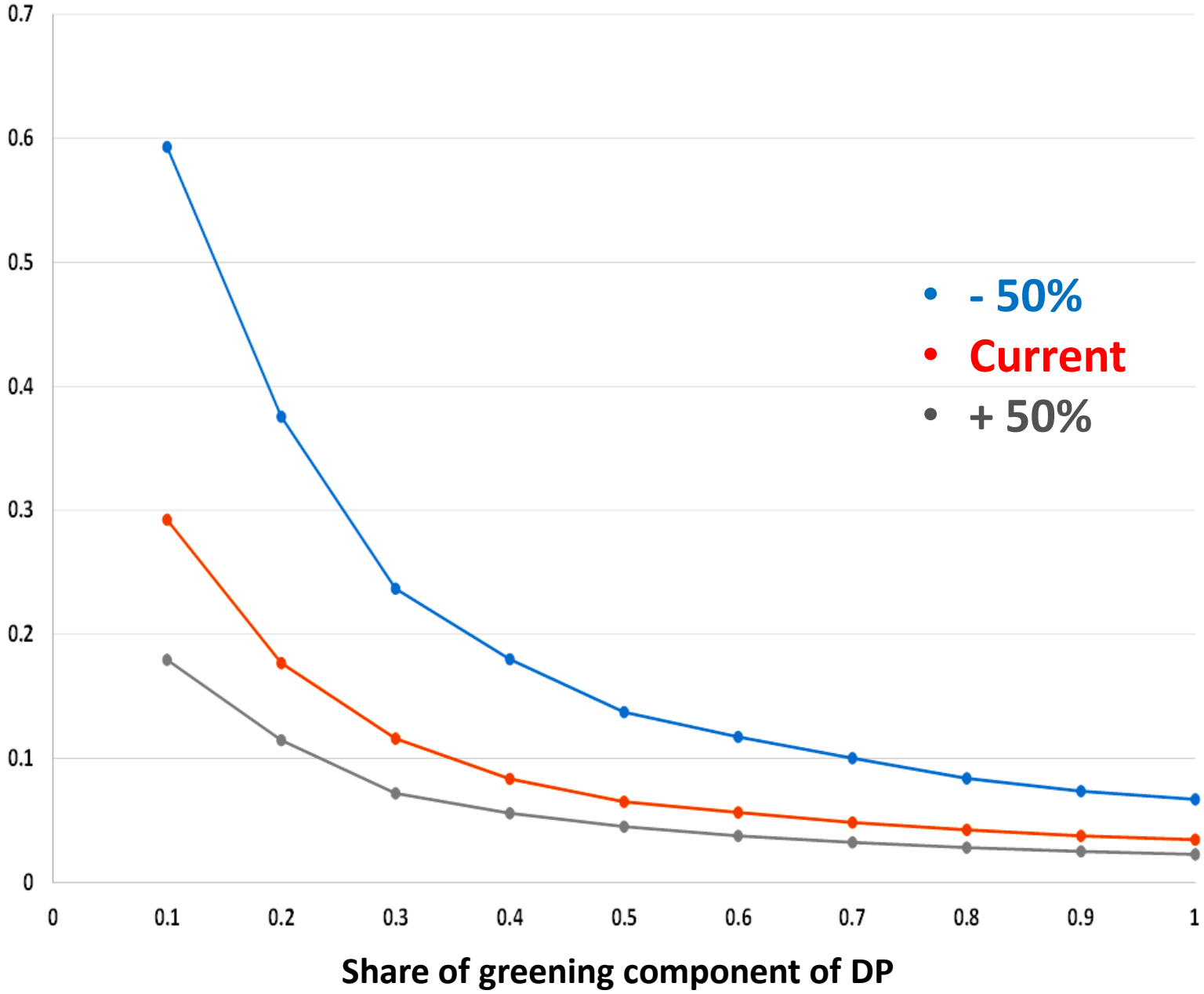
Share of Greening	Direct Payment Level							
	No payment		-50% DP		Current		+50% DP	
	Farms	UAA	Farms	UAA	Farms	UAA	Farms	UAA
0	-	-	-	-	-	-	-	-
0.1	-	-	0.1892	0.2311	0.6446	0.6141	0.6942	0.6714
0.2	-	-	0.6446	0.6141	0.6942	0.6714	0.7028	0.6944
0.3	-	-	0.6942	0.6714	**0.7028**	0.6944	0.7061	0.7230
0.4	-	-	0.6942	0.6714	0.7061	0.7230	**0.7130**	0.7624
0.5	-	-	0.6942	0.6714	**0.7130**	0.7624	0.7130	0.7624
0.6	-	-	0.7028	0.6944	0.7130	0.7624	0.7130	0.7624
0.7	-	-	0.7028	0.6944	0.7130	0.7624	0.7130	0.7624
0.8	-	-	0.7061	0.7230	0.7130	0.7624	0.7130	0.7624
0.9	-	-	0.7061	0.7230	0.7130	0.7624	0.7130	0.7624
1	-	-	**0.7130**	0.7624	0.7130	0.7624	0.7130	0.7624

Results/2
Greening's environmental effect at the NUTS 3 level

HNV drivers: Upscaling at the NUTS 3 level (province of Grosseto)

Share of Greening	Direct Payment Level			
	No payment	-50% DP	Current	+50% DP
0	0.263	0.288	0.284	0.282
0.1	0.263	0.364	0.370	0.377
0.2	0.263	0.372	0.382	0.384
0.3	0.263	0.377	**0.384**	0.404
0.4	0.263	0.376	0.393	**0.409**
0.5	0.263	0.386	**0.409**	0.409
0.6	0.263	0.386	0.409	0.409
0.7	0.263	0.385	0.409	0.409
0.8	0.263	0.393	0.409	0.409
0.9	0.263	0.404	0.409	0.409
1	0.263	0.409	0.409	0.409

Results/3
Cost-effectiveness of alternative greening designs



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

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Thank you for your attention

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