

# Direct Payments in Germany - Income and Distributional Effects of the 2013 CAP Reform

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European Evaluation Helpdesk  
Good Practice Workshop  
How to assess direct payment  
interventions in the new CAP

08./09.11.2022, Athens



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# Motivation: Redistribution of DP was an important objective of 2013 CAP Reform

## EU Regulation 1307/2013:

- „The **distribution** of direct income support among farmers is characterised by the allocation of **disproportionate amounts of payments to a rather small number of large beneficiaries**.  
“**objective of a more balanced distribution of payments** between small and large beneficiaries“
- “Larger beneficiaries, due to their ability to exploit economies of size, do not require the same level of unitary support in order for the **objective of income support** to be efficiently achieved.”  
“in order to achieve the **objective of income support effectively**, Member States should be allowed to redistribute direct support between farmers by granting them an extra payment for the first hectares.”

# Objectives and context of the case study

**To what extent has the 2013 CAP reform contributed to the postulated distributional aims in Germany?**

**What role do the different direct payments schemes play in this?**

**Reference:** [Pre-reform CAP](#)

- 2013 DP scheme (Regional model, fully decoupled)
- Modulation (size-dependent curtailment of direct payments)

**Scenario:** National Implementation of [2013 CAP reform](#)

- Redistribution from first to second pillar (4.5%)
- [Basic payment](#)
- [Greening payment](#)
- [Support for young farmers](#)
- [Redistributive payment](#) (higher rates for 'first hectares')

# Data and Method

## Data

- German [FADN](#)
- 3-year averages to reduce the impact of income variability
- Sample selection → full-time family farms (N = 7731)

## Methodological approach

Ex-ante analysis: Simple static simulation of new DP schemes

### 1. To measure contribution of an income source to aggregate inequality

- [Decomposition](#) of the [Gini coefficient](#) by income / direct payment component
- Widely used, e.g. Severini and Tantari 2013 (IT), Ciliberti and Frascarelli 2018 (IT), Antonella et al. 2019 (IT), Keeney 2000 (IR), El Benni 2012 (CH)
- Other approaches see e.g. Allanson 2006ff (Sc), Piet and Desjieux 2021 (FR)

### 2. To account for farm and market adjustments (additional study):

- [Agri-economics models](#): Farm Model (FARMIS) + EU Market Model (ESIM)

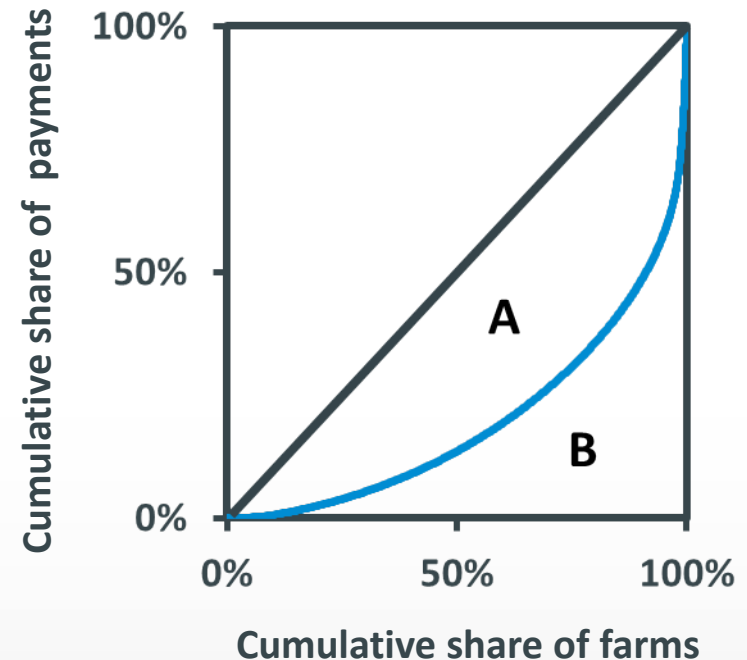
# Distributional analysis using the Gini coefficient (G)

## The Gini coefficient

- distributional measure
- calculated as

$$\frac{\text{Area A}}{\text{Area A} + \text{Area B}}$$

- values range from 0 to 1  
G = 0 indicates equal distribution  
G = 1 indicates maximal concentration



# Gini coefficient (G), its decomposition and the Gini income elasticity

$$G = \sum_{k=1}^K S_k \times G_k \times R_k$$

**Component  $k$ 's share in total income**    **Gini coefficient of income component  $k$**     **Gini correlation between total income and component  $k$**

**Gini income elasticity**  $\varepsilon_k$  measures the impact of a marginal proportional change in an income component on the Gini index of income inequality  
*e.g., if  $\varepsilon_k > 0$ , then a proportional increase of component  $k$  increase income inequality*

# Case study: Specification and assumptions

## Assumptions:

- (Marginal) change in income component has **no market effects** (constant input and output prices, no production impacts)
- **Short term impacts**
- Redistributed second pillar payments are income neutral (premium reflects costs)

# Selected results

	Share % ( $S_k$ )	Gini coefficient ( $G_k$ )	Elasticity $\epsilon_k$
<b>Current system</b>			
Farm income		0.463	
First pillar payments	47.7	0.438	-0.263
<b>CAP reform</b>			
Farm income		0.473	
First pillar payments	44.9	0.423	-0.288
Basic payment	27.5	0.449	-0.169
Greening payment	13.5	0.449	-0.082
First hectares payment	3.7	0.166	-0.034
Support to young farmers	0.3	0.963	-0.002

small reduction in inequality of DP

but no reduction in inequality of distribution of incomes

First hectares support is almost equally distributed, however

Low "leverage" due to limited financial magnitude



# Outlook: ‘Fair(er)’ distribution of DP remains an important objective of the current CAP

## EU Regulation 2021/2115:

- “to ensure a fairer distribution and more effective and efficient targeting of income support”
  - “to promote a more balanced distribution of support”
  - “to provide for a targeted distribution of direct payments and to reinforce income support for those who need it most.”
- Impact Indicator I.26 A fairer CAP: Distribution of CAP support

# Challenges – and potential solutions

How to define “fairness” in the distribution of support?

- Absolute vs Relative Measures?

Choosing the reference:

- ‘Pre-reform’
- or ‘No DP’ or ‘ideal DP’ ?

How to deal with negative income values?

depends on the focus of the evaluation

- is it getting better?
- is it effective and efficient?

Accounting for market effects

- Necessary?

- Price and production effects
- Land price transmission

- common approach is simply disregarding farms with negative incomes...

- “While their inclusion generally does not affect the direction of distributional effects, it may have considerable impact on their magnitude”  
Deppermann et al., 2014
- model at EU level
- account for at MS/regional level

# Thank you for your attention!

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# Gini coefficient (G), its decomposition and the Gini income elasticity

$$G = \sum_{k=1}^K S_k \times G_k \times R_k$$

Component  $k$ 's share in total income      Gini coefficient of income component  $k$       Gini correlation between total income and component  $k$

Concentration coefficient  $C_k$

measures how income from each source is transferred across a population ranked with respect to the level of total income received

$C_k < G$ : component  $k$  reduces overall income inequality

**Gini income elasticity**  $\varepsilon_k$  measures the impact of a marginal proportional change in an income component on the Gini index of income inequality  
*e.g., if  $\varepsilon_k > 0$ , then a proportional increase of component  $k$  increase income inequality*

# Gini coefficient (G), its decomposition and the Gini elasticity

$$G = \frac{2 \sum_{k=1}^K [cov(Y_k, r(Y))]}{N\mu(Y)}$$

$$G = \underbrace{\sum_{k=1}^K \frac{\mu(Y_k)}{\mu(Y)}}_{S_k} \times \underbrace{\frac{2cov(Y_k, r(Y_k))}{N\mu(Y_k)}}_{G_k} \times \underbrace{\frac{cov(Y_k, r(Y))}{cov(Y_k, r(Y_k))}}_{R_k}$$

**Component  $k$ 's  
share in total  
income**

**Gini coefficient  
of income  
component  $k$**

**Gini correlation  
between total income  
and component  $k$**

**Gini elasticity**  $\longrightarrow \epsilon_k = \frac{\partial G}{\partial \mu(Y_k)} \times \frac{\mu(Y_k)}{G} = \frac{R_k \times G_k \times S_k}{G} - S_k$

Source: Following Lerman and Yitzhaki 1985, p. 152 and Podder 1993, p. 54

# Selected literature (1)

Hansen H and Offermann F (2016): Direct Payments in Germany - Income and Distributional Effects of the 2013 CAP Reform. German Journal of Agricultural Economics 65 (2016), Number 2, 77-93.

Deppermann A, Grethe H, Offermann F (2014) Distributional effects of CAP liberalisation on western German farm incomes: an ex-ante analysis European Review of Agricultural Economics, Volume 41, Issue 4, September 2014, Pages 605–626

Allanson P (2006). The redistributive effects of agricultural policy on Scottish farm incomes. Journal of Agricultural Economics 57: 117–128.

Allanson P (2007). Classical horizontal inequities in the provision of agricultural income support. Review of Agricultural Economics 29: 656–671.

Allanson P (2008). On the characterisation and measurement of the redistributive effect of agricultural policy. Journal of Agricultural Economics 59: 169–187.

Ciliberti S and Frascarelli A (2018) : The CAP 2013 reform of direct payments: Redistributive effects and impacts on farm income concentration in Italy, Agricultural and Food Economics, Vol. 6, Iss. 1, pp. 1-18

El Benni N, Finger R, Mann S, Lehmann B (2012): The distributional effects of agricultural policy reforms in Switzerland. Agric. Econ. – Czech, 58: 497-509.

# Selected literature (2)

- Keeney M (2000). The distributional impact of direct payments on Irish farm incomes. *Journal of Agricultural Economics* 51: 252–265.
- Lerman R I and Yitzhaki S (1985): Income inequality effects by income source: a new approach and applications to the United States. In: *The Review of Economics and Statistics* 67 (1): 151-156
- Piet L and Desjeux Y (2021): New perspectives on the distribution of farm incomes and the redistributive impact of CAP payments. *European Review of Agricultural Economics* Vol 48 (2), 385–414
- Podder N (1993): The disaggregation of the Gini coefficient by factor components and its applications to Australia. In *Review of Income and Wealth* 39 (1): 51-61.
- Severini S and Tantari A (2013): The effects of EU farm payments policy and its recent reform on farm income inequality. In: *Journal of Policy Modelling* 35 (2): 221-227.
- Tantari A, Pierangeli F, Concetta C (2019) Assessing the Impact of Direct Payments Convergence on Farm Income Inequality: The Case of Italian Farms, *Journal of International Food & Agribusiness Marketing*, 31:4, 417-428