

iamo

Leibniz Institute of Agricultural Development
in Central and Eastern Europe

***Managing complexity:
What do we know about structural changes in agriculture?***

Alfons Balmann

IERIGZ Conference, Jachranka, 09.12.2013

Leibniz
Leibniz Association

- Should EU direct payments be limited per farm?
 - Do land markets need stronger regulations to control land prices and engagements of external investors?
 - Should herd sizes in livestock production be limited?
 - Should regional concentration of livestock production be controlled?
-
- Significant and long-lasting conflicts!
 - NGO positions dominate public debates rather than farmers!
 - **Why?**

➤ Broadening definition

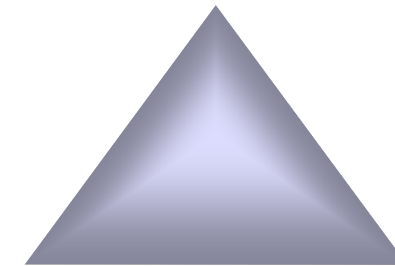
- Changes in the conglomerate of farms, their legal status as well production capacities, technologies and activities including their embedding in
 - agricultural value chains,
 - (rural) society and economy as well as in
 - institutions and politics

Structural change in agriculture

➤ Agricultural structures as complex adaptive systems

- manifold dimensions
- manifold levels:
individuals, firms, institutions, sectors, regions,...
- bounded rationality, subjective perceptions of actors
- dynamics and non-linearities

interactions



time

space

➤ Scientific challenges

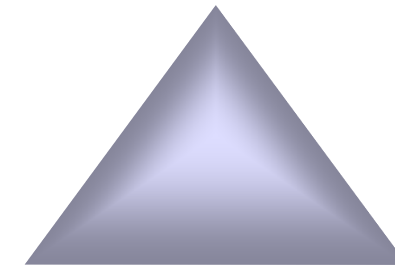
- Evolutionary process with bounded predictability!
- Analysis requires appropriate methodologies!

Structural change in agriculture

➤ Agricultural structures as complex adaptive systems

- manifold dimensions
- manifold levels:
individuals, firms, institutions, sectors, regions,...
- bounded rationality, subjective perceptions of actors
- dynamics and non-linearities

interactions



time

space

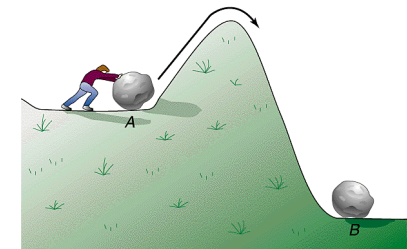
➤ Political challenges

- Perception and communication of reality!
- Understanding of relations between causes and effects!

Structural change in agriculture

Theses on specific problems to cope with structural change

- Limitations to understand structures!
 - knowledge of facts
 - cognitive capacities
 - mental models
- Limitations to understand structural change!
 - non-linearities
 - self-organization
 - path dependence
- Danger of policy failures!



Structural change in agriculture

Theses on specific problems to cope with structural change

– **Limitations to understand structures!**

- knowledge of facts
- cognitive capacities
- mental models



Understanding agricultural structures

“20 % of farms get
80 % of EU direct payments!”

or:

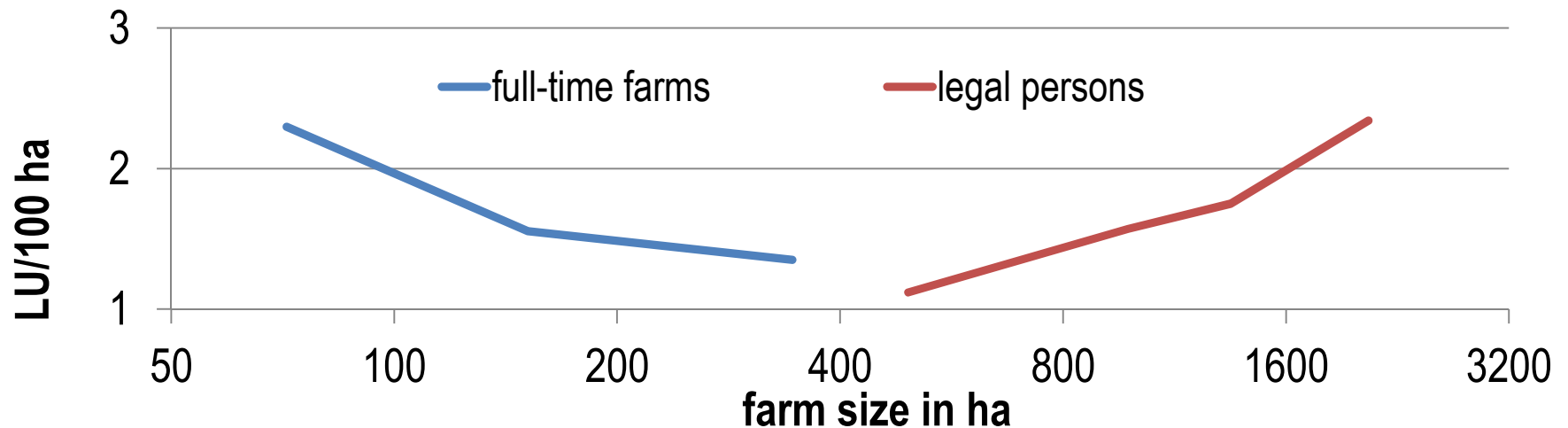
“20 % of farms provide
80 % of societal benefits!”



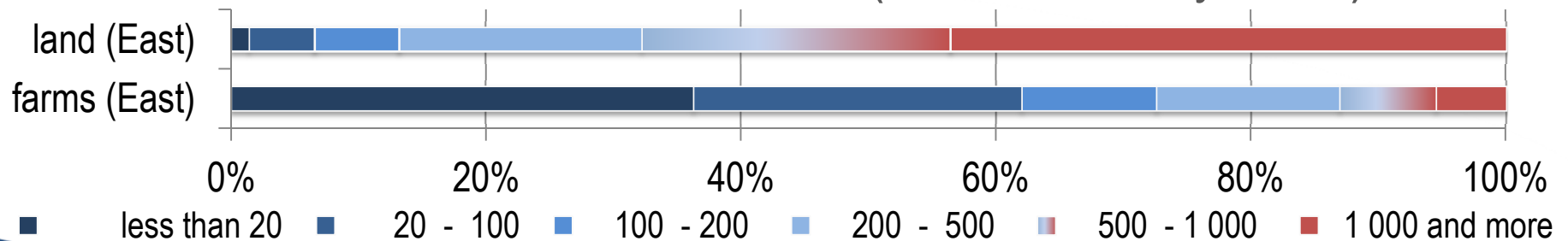
- Direct payments in East Germany (2011/12)
 - Full-time family farms: 20 266 €/labor unit (1,5 LU/100 ha)
 - Legal persons: 16 499 €/ labor unit (1,9 LU/100 ha)

Understanding agricultural structures

Relationship farm size and employment (East Germany 2011/12)

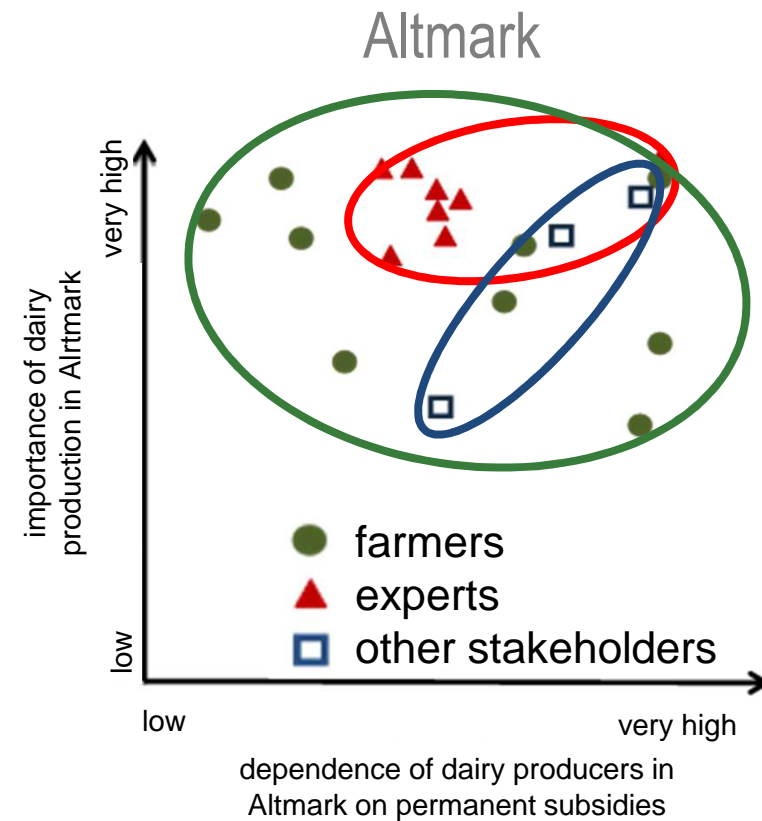
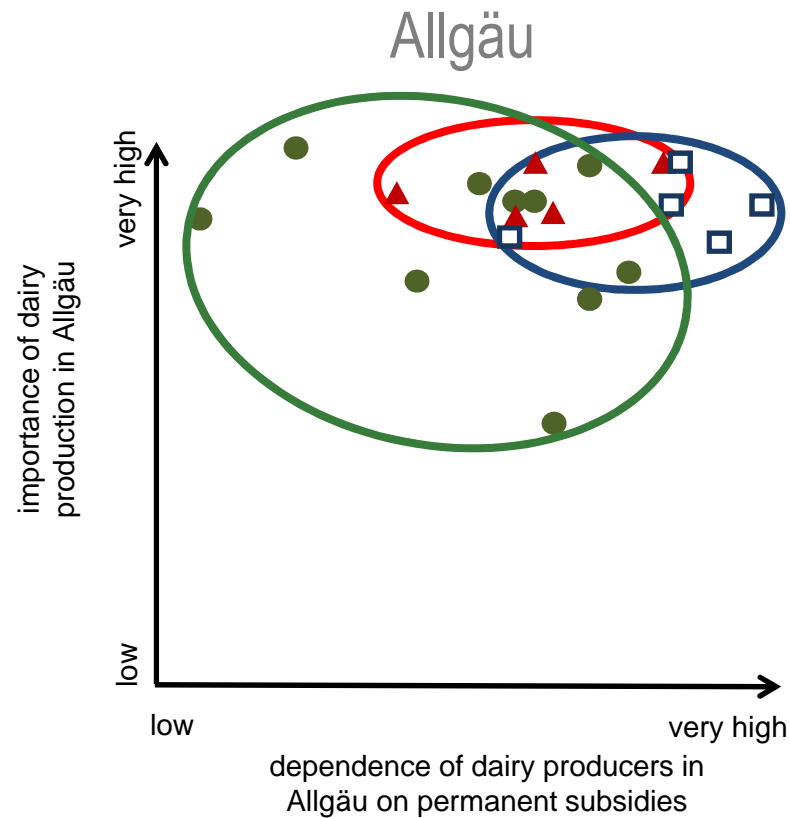


Share of farm size classes (East Germany 2012)



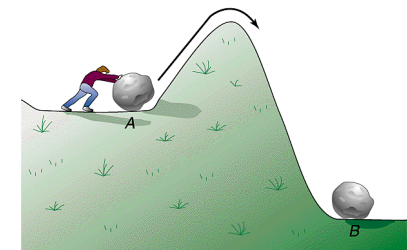
Understanding agricultural structures

Mental models in dairy production



Theses on specific problems to cope with structural change

- Limitations to understand structures!
 - knowledge of facts
 - cognitive grasp
 - mental models
- **Limitations to understand structural change!**
 - non-linearities
 - self-organization
 - path dependence



Understanding structural change

Strange phenomena in agriculture

- regional heterogeneity
- persistence of "suboptimal" structures
- persistent income disparities

➤ Path dependence

- Example: dairy sector

- long tradition of protection and regulation
- survival of outdated technologies
(e.g. tethering in German dairy farms: 65% of farms, 27% of cows)
- persistently low incomes



Understanding structural change

Strange phenomena in agriculture

- regional heterogeneity
- persistence of "suboptimal" structures
- persistent income disparities

➤ Path dependence

• Example: transition in agriculture

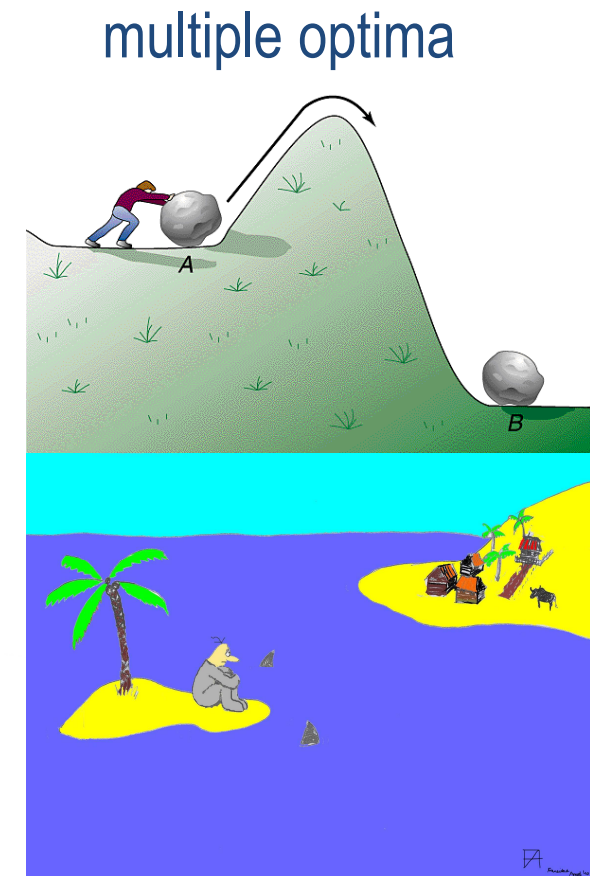
- Persistence of dual structures in Eastern Europe
 - simultaneity of very large and very small farms (partly in symbiosis)



Understanding structural change

Reasons for path dependence

- competing technologies
- sunk costs with long life-cycles
 - labor, buildings, knowledge
- network externalities
 - vertical, horizontal
 - political / institutional (mental models)
- political and institutional frictions
 - production quotas
 - taxation, inheritance laws

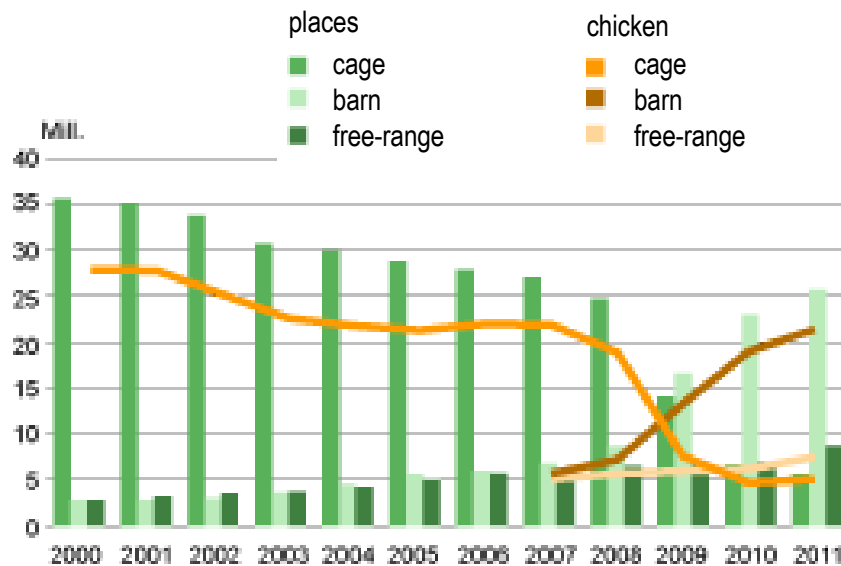


resistance to adjust

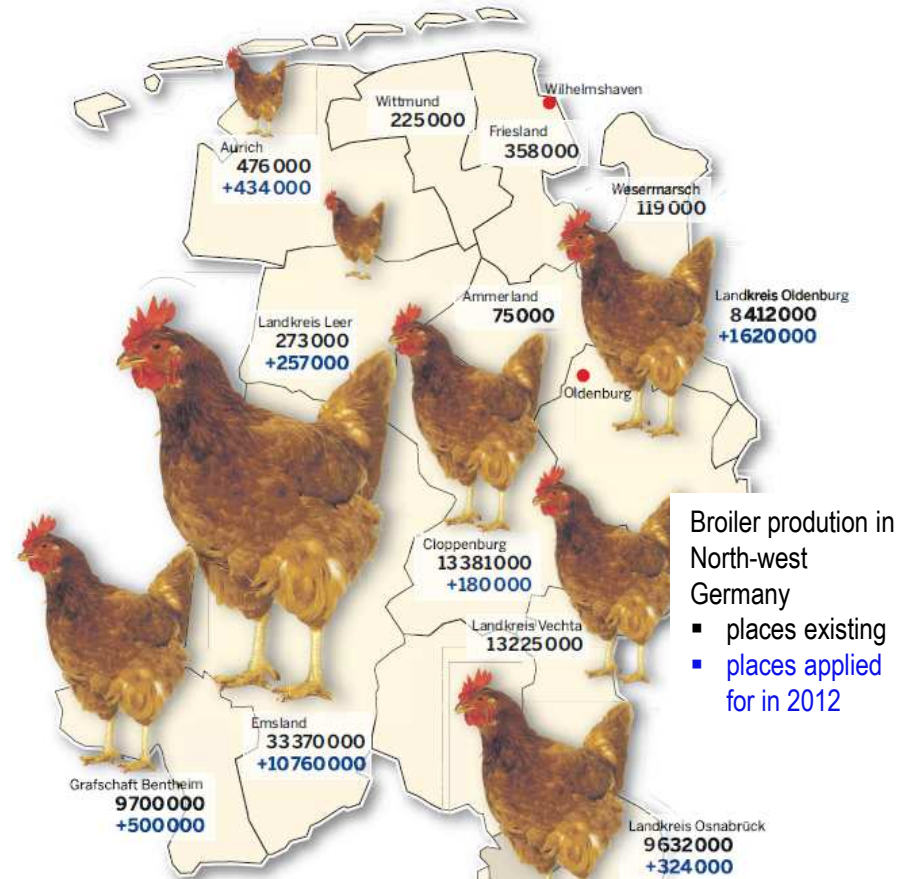
Understanding structural change

On the other hand: enormous dynamics in German chicken sector

Egg production systems in Germany*



- only farms with more than 3000 chicken



Theses on specific problems to cope with structural change

- Limitations to understand structures!
 - knowledge of facts
 - cognitive grasp
 - mental models
- Limitations to understand structural change!
 - non-linearities
 - self-organization
 - path dependence
- **Danger of policy failures!**

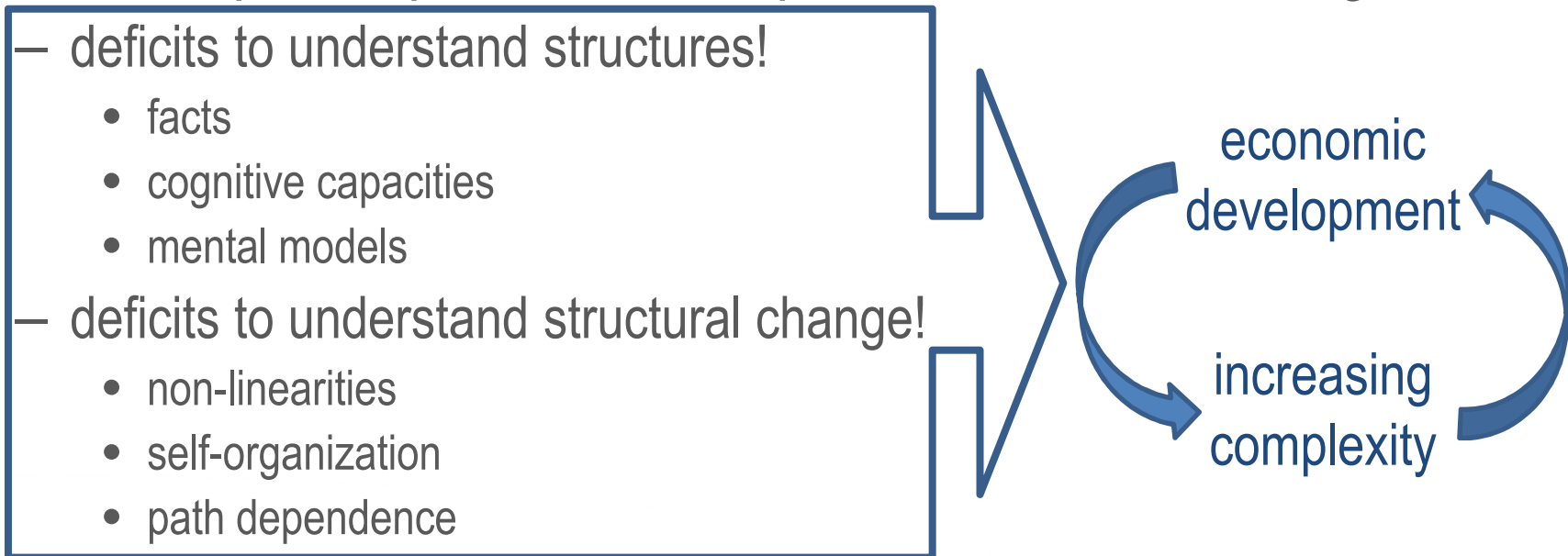


Example: Debate on capping of EU direct payments

- Result of 2013 Reform agreements
 - reduction of direct payments > 150 000 €/farm by 5 %
 - extra payments for first hectares
- Structural impacts: ignorable
 - in regions with large farms dominating: small farms not relevant!
 - in regions with small farms dominating: all benefit!
 - In general: hobby and part-time farms benefit most!
 - Support of today's farms is a taxation of tomorrow's farms!



Theses on specific problems to cope with structural change

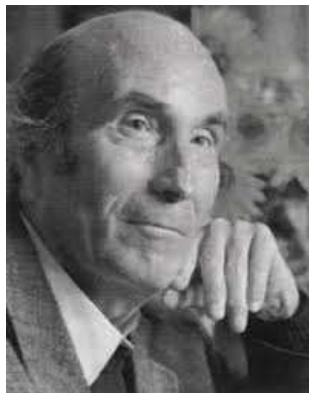


Structural change in agriculture

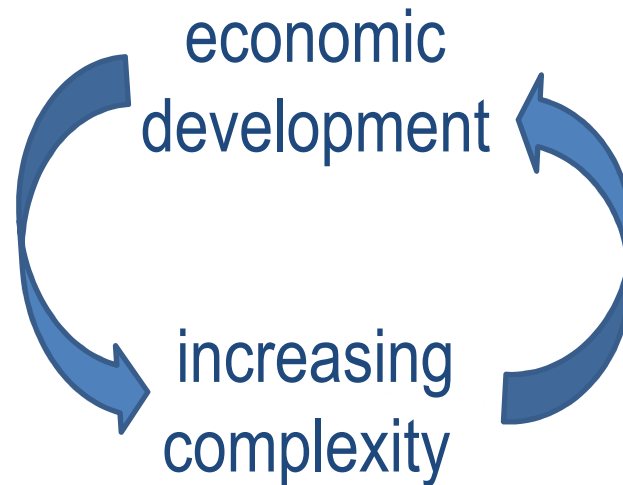


**externalization of
social costs**

creative destruction



**externalization of
environmental complexity**



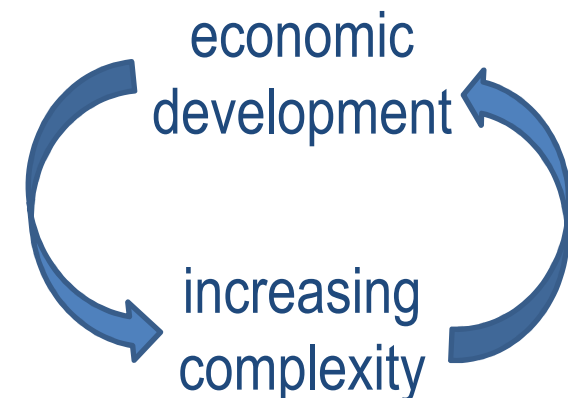
**reducing complexity
through markets**



Structural change in agriculture

How to manage complexity of structural change?

- "Laissez faire" ignores externalities!
 - Causes societal resistance!
- Political control is bounded
 - Fails because of over-complexity
 - Risks > chances
 - Policy can set legal and institutional framework!
- Sectoral self-organization
 - Corporate Social Responsibility may overcome social transaction costs
 - Problem: small farms imply social dilemmas
 - Problem: heterogeneity of sector implies internal conflicts
 - **Coordination via "chain captains"!**
 - **Moderating policies may be supportive!**

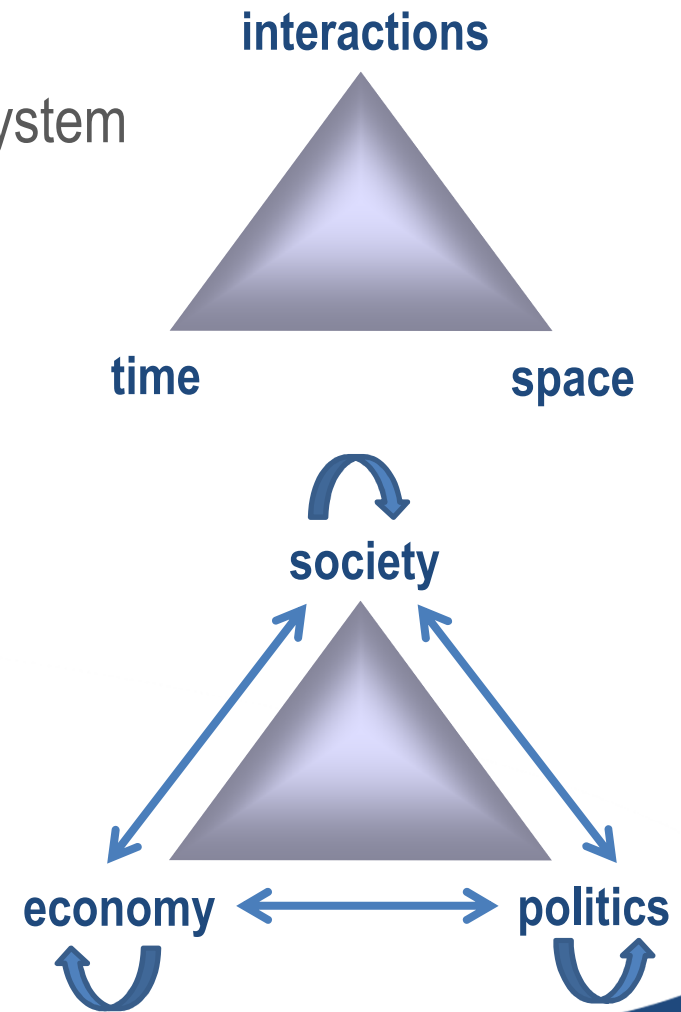


} difficulties for collective actions

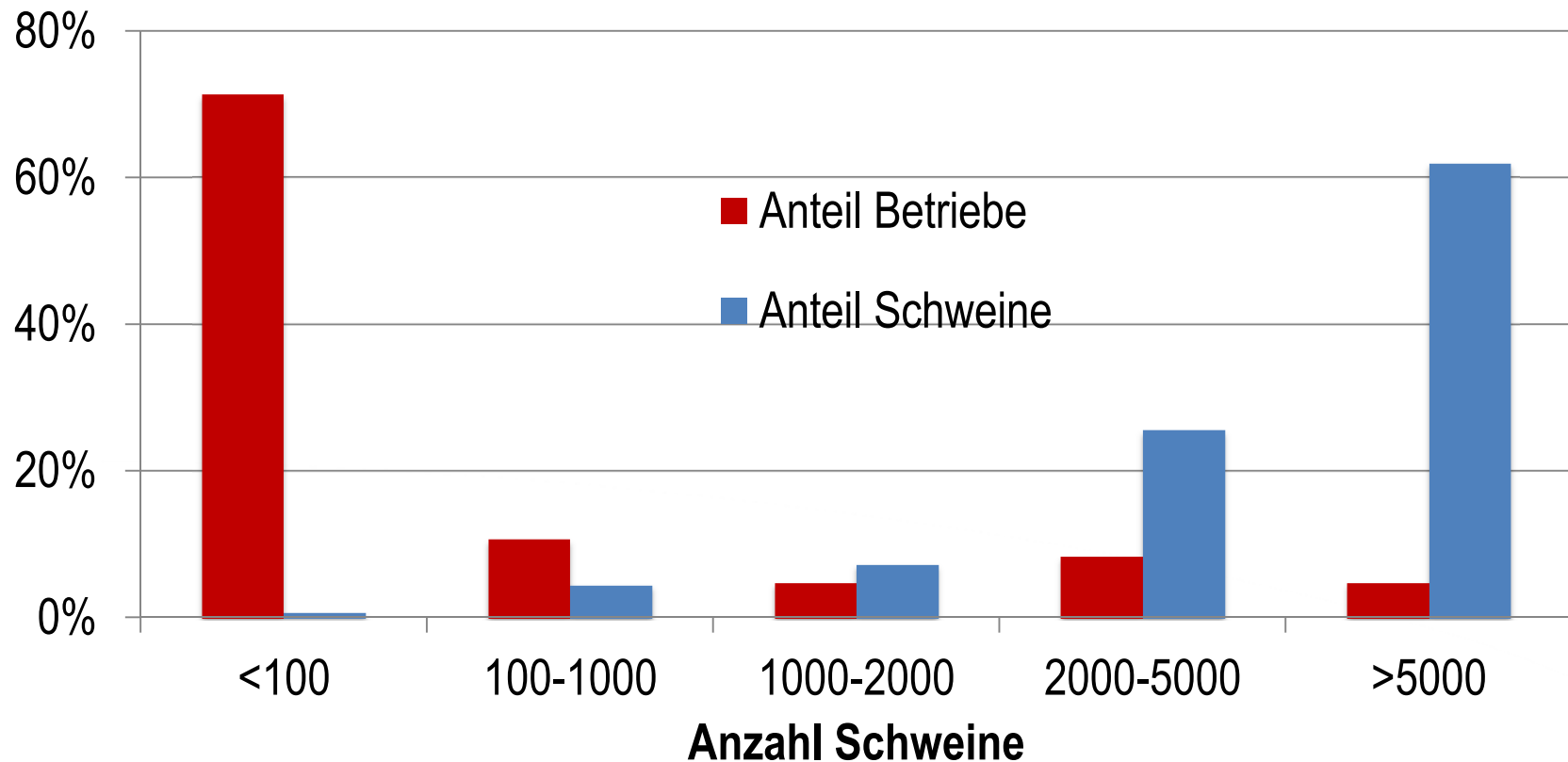
Structural change in agriculture

Research challenges

- structural change as a complex adaptive system requires adequate approaches
 - theory
 - methodology
 - empirics
- understanding areas of conflicts among economy, society and politics
 - interactions between subsystems
 - interactions within subsystems



Struktur der US-Schweinebestände (2012)

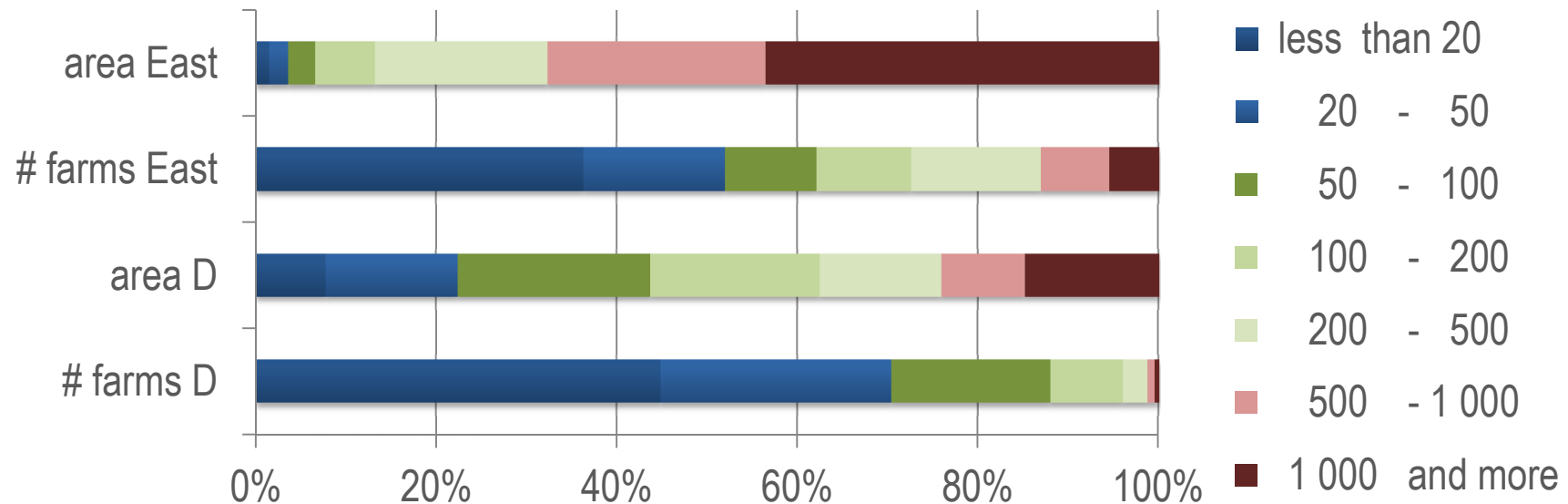


Grasping agricultural structures

“20 % of farms receive
80 % of subsidies!”



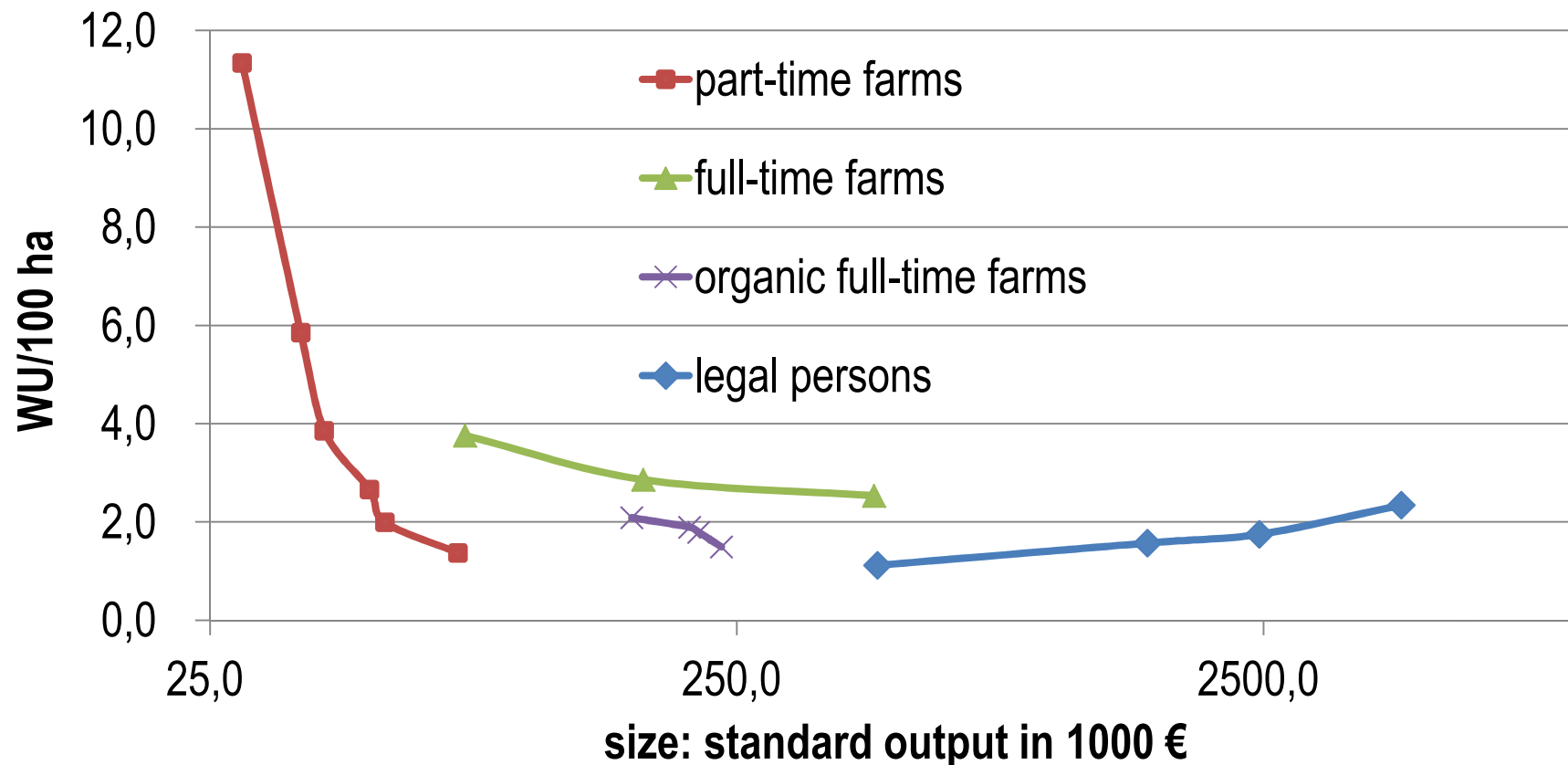
Share of farm size classes (Germany 2012)



- East: 80 % of land managed by just 20 % of farms (> 200 ha)
- D: 77 % of land managed by largest 30 % of farms (> 50 ha)
- **Pareto-rule (80/20) at least partly fulfilled**

Grasping agricultural structures

Relation farm organization and employment (D 2011/2012)



Strukturwandel begreifen

Andererseits: Proteste gegen Milchmarktliberalisierung...

