TP 6, Anne Margarian

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Consequences of the complexity of structural change in Agriculture

Remaining puzzles after two years of analyses

Structure of the presentation

1. **Summary of results from the past two years**
   a. **The interdependent influence of farm-level-characteristics on farm-exits**
   b. **The ambiguous influence of policies on farms from different size-classes**
   c. **Neighbourhood-effects in the determination of farm-exits**
2. **Conclusions with respect to sector-models**
   a. **Modeling structural change on the farm-level**
   b. **Modeling the aggregate sector's development**
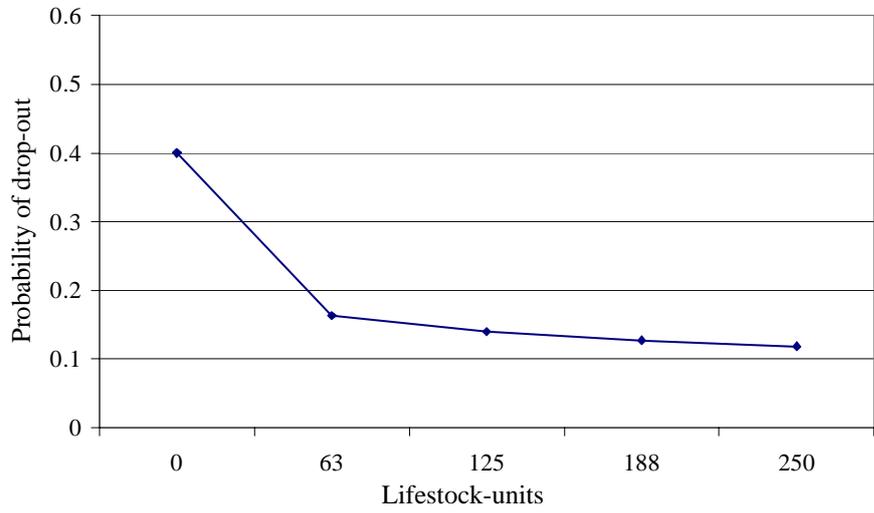
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1a   Analysis of single farm data

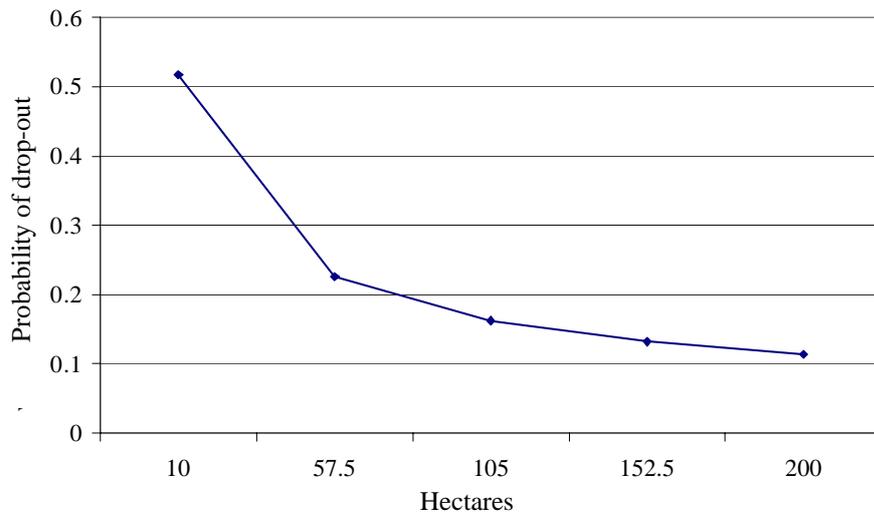**Farm-characteristics' relation to farm-exits**
- **descriptive**
- **logistic regression**

Non-linear influence of farmer's age

Age 2003	Abandonment 03 or 07		Sum
	No	Yes	*Percent*
younger 49	149,173	65,741	**214,914**
	69	*31*	*100*
49 and older	140,285	56,735	**197,020**
	71	*29*	*100*
thereof:			
49-59	78,019	18,752	96,771
	81	*19*	*100*
59-64	30,025	14,104	44,129
	68	*32*	*100*
64-69	23,413	15,062	38,475
	61	*39*	*100*
69 and older	8,828	8,817	17,645
	50	*50*	*100*
Sum	289,458	122,476	**411,934**
Percent	*70*	*30*	*100*

Graph of non-linear influence of livestock

Probability of drop-out vs Lifestock-units

Lifestock-units	Probability of drop-out
0	0.40
63	0.16
125	0.14
188	0.13
250	0.12

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Graph of non-linear influence of land

Probability of drop-out vs Hectares

Hectares	Probability of drop-out
10	0.52
57.5	0.22
105	0.16
152.5	0.13
200	0.11

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Different picture considering livestock

Grazing-Lifestock Farms in Lower-Saxony
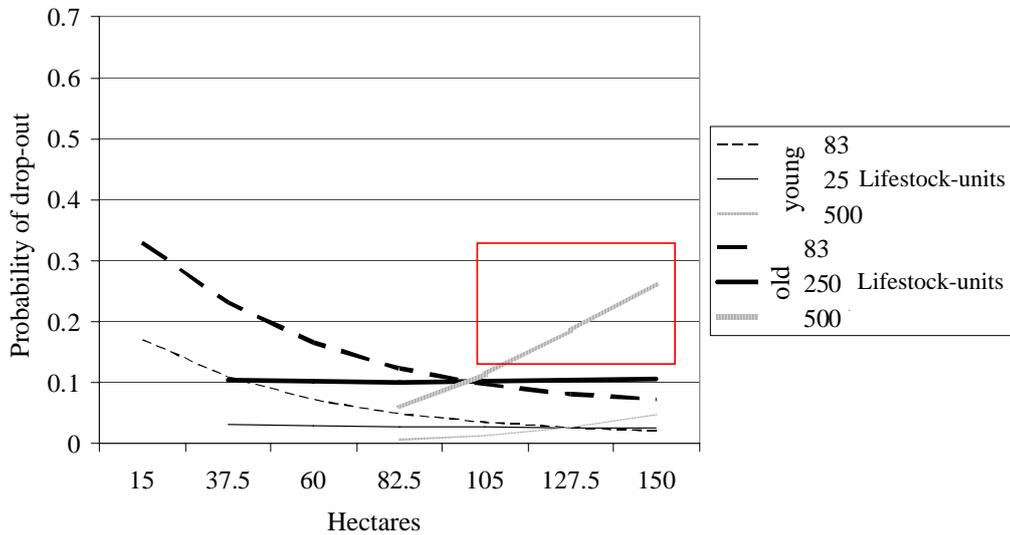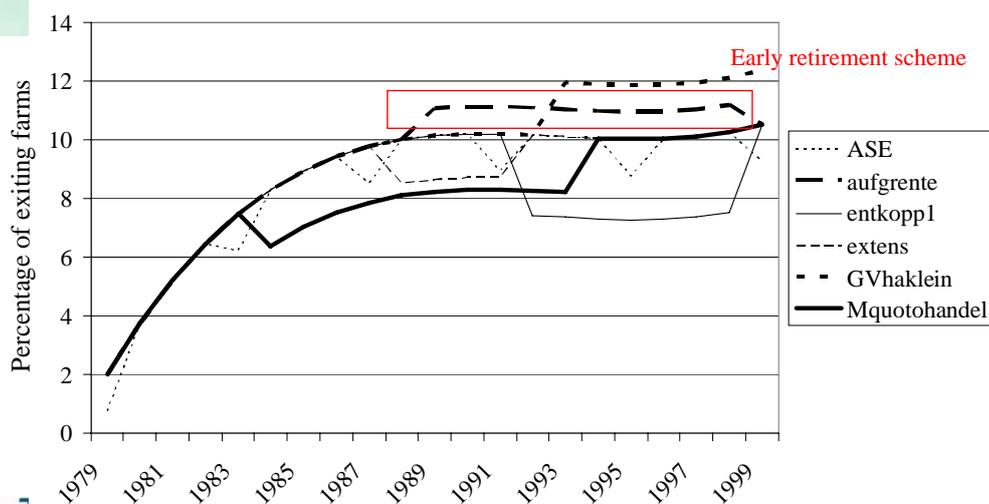

Pig- & Poultry-Farms in Lower-Saxony

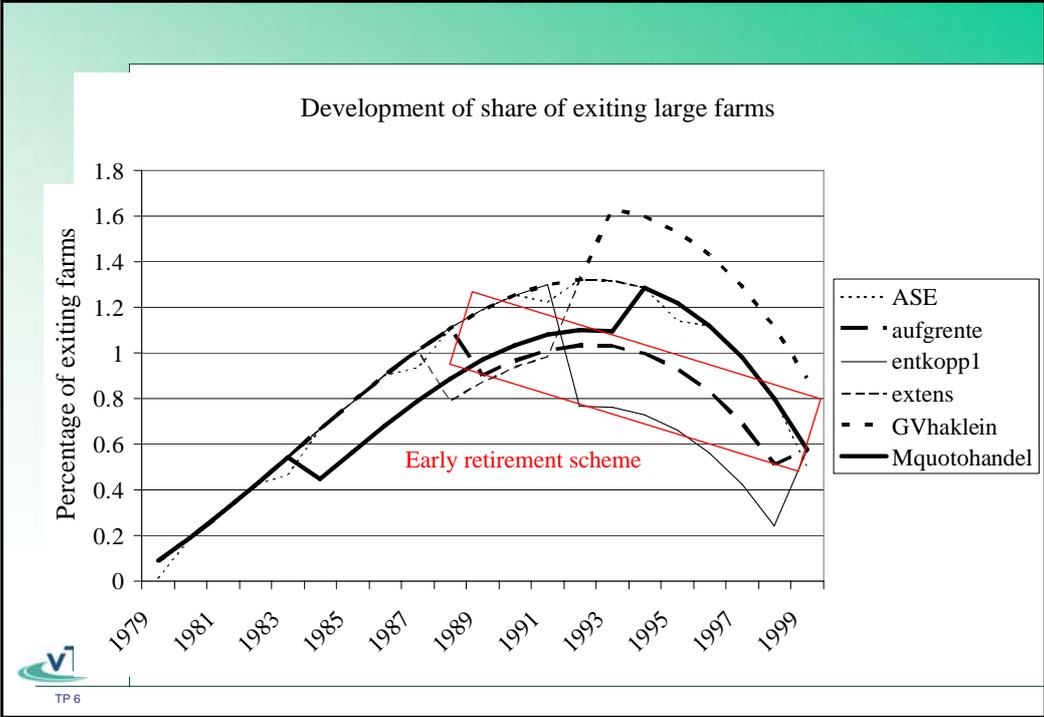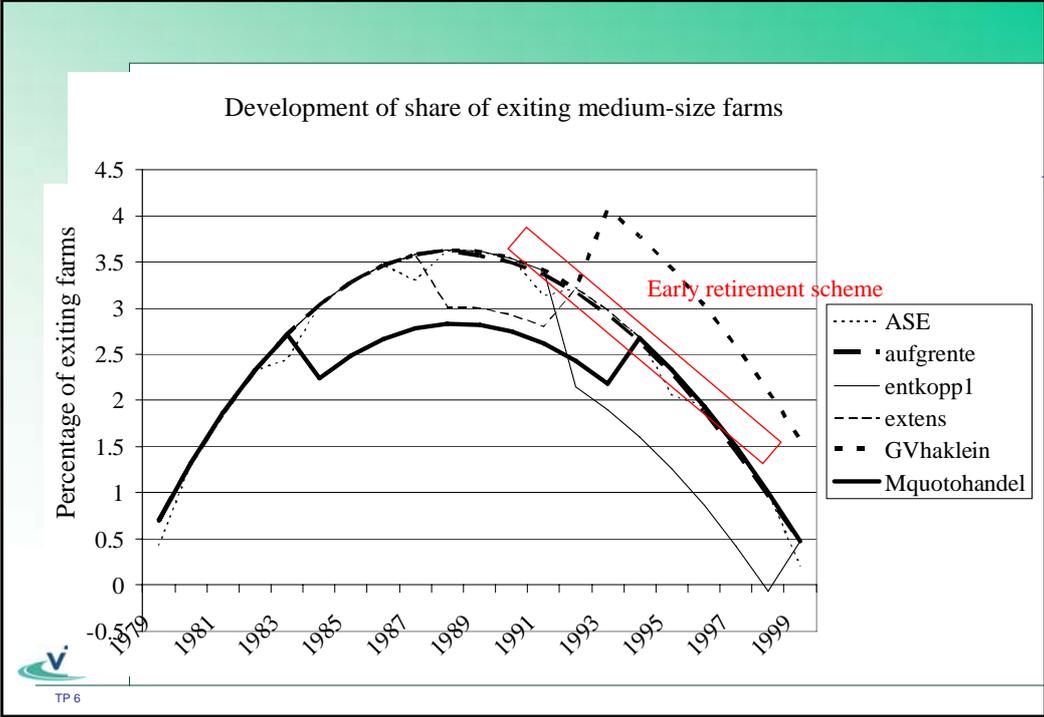## Different picture considering livestock
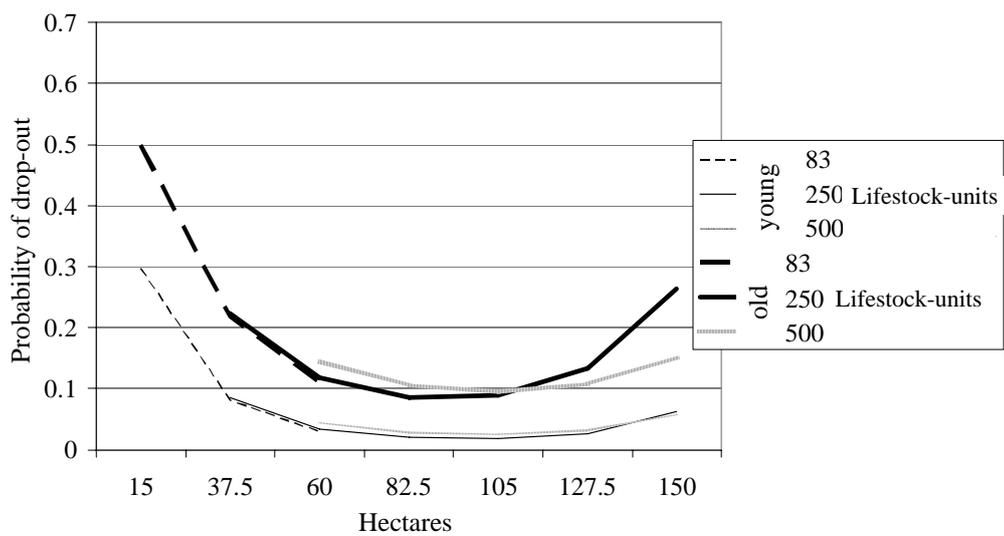
1b Panel analysis of farm-transitions between size-classes

- **economic fluctuations**
- **development between 1979 and 1999**
  - **Prices for commodities**
  - **Prices for production factor**
  - **Farmers' demand for long-term credits**
  - **joblessness**

- **political measures**
- **Dummies show duration of validity**
  - **Non-tradeable milk-quota 1984-1994**
  - **Tradeable milk-quota from 1994 on**
  - **Premium for extensification and set aside 1988-1992**
  - **Early-retirement-measure 1989-1998**
  - **cut of price-support with income-compensation (Mc-Sharry) 1992**
  - **followed 1999 by Agenda 2000**

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Development of share of exiting small farms

Early retirement scheme

Legend:
- ASE
- aufgrente
- entkopp1
- extens
- GVhaklein
- Mquotohandel

y-axis: Percentage of exiting farms (0–14)
x-axis: 1979–1999

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Development of share of exiting medium-size farms

Development of share of exiting large farms

1c Analyses of transition probabilities
and mobility-indices   with Silke Huettel

Table A.5:   Description of variance analysis (MANOVA)

Source	Degrees of freedom	Upward mobility		Downward mobility		Exit mobility	
		Typ3 III sum of squares	Pr > F	Typ3 III sum of squares	Pr > F	Typ3 III sum of squares	Pr > F
economic cluster	4	0.11	0.024	0.12	0.074	0.07	0.342
production-type-cluster	5	0.04	0.548	0.07	0.396	0.10	0.241
structural cluster	4	0.70	<.0001	0.06	0.339	0.60	<.0001
year	1	0.00	0.640	0.10	0.008	0.07	0.029
year*economic cluster	4	0.08	0.084	0.08	0.225	0.02	0.792
year*production-type-cluster	5	0.04	0.553	0.04	0.649	0.05	0.610
year*structural cluster	4	0.11	0.019	0.16	0.019	0.01	0.982
R-square		0.18		0.08		0.20	
Pr>F		<.0001		0.002		<.0001	

Note: 642 observations (321 districts for two time-periods)
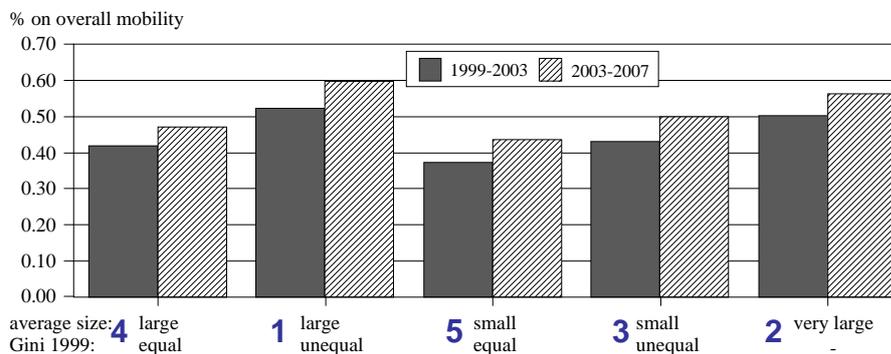Source: Own calculation based on FDZ 1999 - 2007,
        Arbeitskreis Volkswirtschaftliche Gesamtrechnung; SAS Proc GLM.

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Relation between regional farm-structure and exit-mobility

% on overall mobility

| average size: | 4 large equal | 1 large unequal | 5 small equal | 3 small unequal | 2 very large - |
| Gini 1999: | | | | | |

Source: Own calculations based on FDZ 1999-2007.

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7

2a   Modeling structural change

- **Our approach: Modeling via exogenously estimated, constant coefficients**
- **Problem:**
  - **complex relations between factors of influence**
  - **great number of coefficients to be estimated**
    - **for example: impact of price-change differentiated by production-type by size-class by type of region**
  - **In how far do regional differentiated developments have to be modeled?**

Alternative approach

- **Modeling the rational behind the development by taking into account**
  - **rents of the status quo and**
  - **strategic interaction of farms on land market**
  - **... because these cause the observed**
    - **heterogenous reactions**
    - **non-linear influences and**
    - **neighbourhood-effects**

2b   Modeling sector-development on an aggregate level

Due to status-quo-rents and strategic interaction of farms on the aggregate level adverse reactions of production on economic changes are possible

- - - Loss of 75 farms in the district

-- Loss of 229 farms

— Loss of 383 Farms
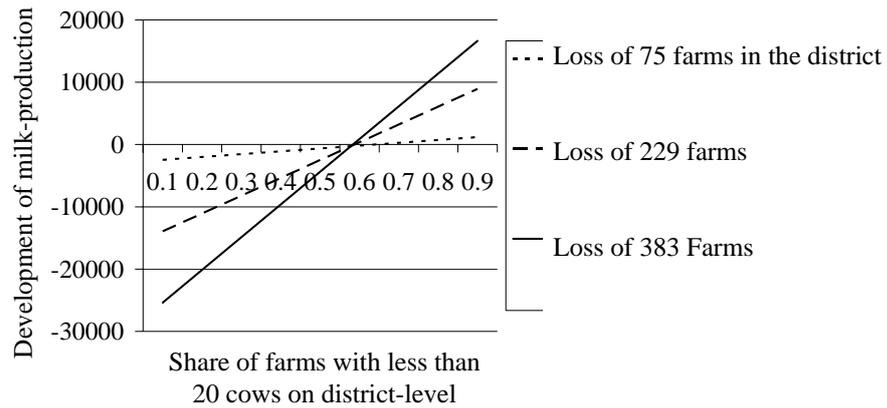
Another question:

- **How do regional differences in adaption towards exogenous changes affect outcomes on the national level?**

Resumè

In order to project sectoral developments reliably

- **the mechanisms of farm-adaption will have to be understood comprehensively**
- **models of structural change have to be build on these mechanisms**
- **regional peculiarities and neighbourhood-effects have to be taken into account**
- **in order to avoid aggregation errors the right spatial level has to be chosen**
- **a bottom-up approach of modeling has to be applied**

Outlook?

One of the biggest capitals of this research-group is the plurality of models and approaches integrated.

At the same time this should be seen as a challenge.

- **What assumptions and paradigms hide behind the different approaches?**
- **Are the different approaches compatible in their assumptions? If not ...**
  - **... what are the underlying theoretic reasons for incompatibility?**
  - **... what are the consequences in modeling?**
- **Might differences be due to pragmatism and if so ...**
  - **... under which circumstances does pragmatism lead to satisfactory scientific results?**

**Thank you very much
for the opportunity
to take part in this
inspiring research-group**

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Back-up: A possible rational

	Mengenführer	Mengenfolger	Stabilisierer
Mengenführer	-0.05	1	(1-b)*0.46 + b*1.16
Mengenfolger	-0.25	0.5	0.6
Stabilisierer	(1-b)*0.21 + b*(-0.39)	0.3	0.4

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