

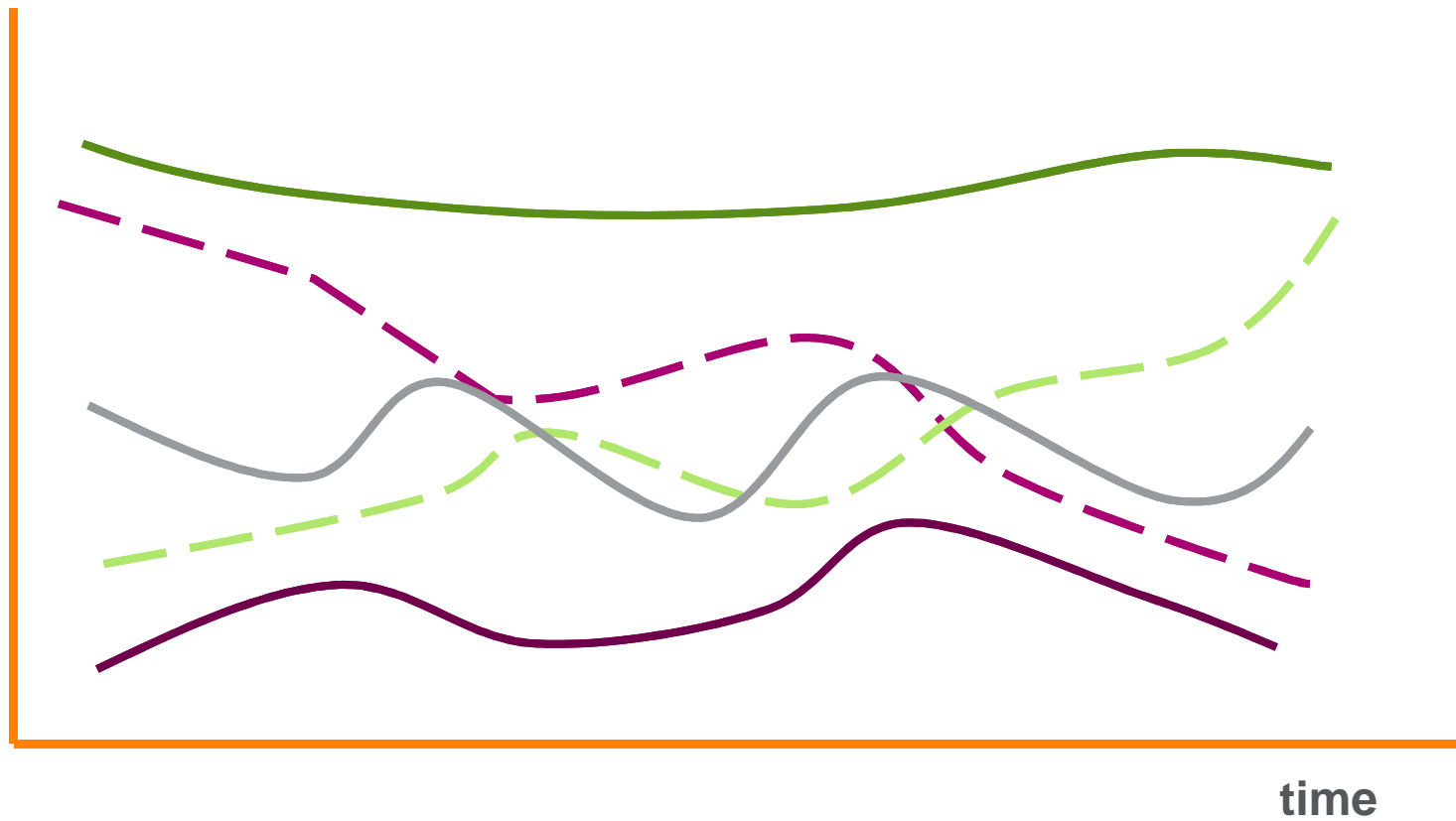
# Strategic choices for Financial Success on Finnish Dairy Farms

Pacioli 2015

Heikki Mäkinen & Jukka Tauriainen

# Development of success over time

Level of success



## Success indicator

- How to measure success in farming?
  - Multitude of viewpoints:
    - Farm size, growth, product quality, productivity, efficiency, well being, continuation, sustainability,...
- Farming as business:
  - making profit, being profitable
  - profitability indicators should be used

## Factors affecting success & profitability

- The farmer
- Management, decision making
- Farm properties
- Operating environment
- **Strategic choices**

## Strategic choices

- Farmer's decisions that have an effect on the whole business and are important for success
- Some decisions can be seen as strategic only afterwards
- There is no all-inclusive theory of strategy

## ”Strategy schools”

- Lots of debate in business literature in the 1990’s
  - The Planning School (Ansoff)
  - The Learning school (Mintzberg)
  
- Following the Learning School:
  - An **emergent strategy** is a pattern of action that develops over time in an organization in the absence of a specific mission and goals, or despite a mission and goals.
  - Emergent strategy is sometimes called **realized strategy**. It may differ from an **intended strategy**.

## Research question

- ***What do the emergent strategies look like on dairy farms with different success patterns?***
  - In a ten years period
  - Deduced from accounting information

# Operationalization 1

Success is measured as the level and development of profitability

$$\text{Profitability ratio} = \frac{\text{Family Farm Income}}{\text{wage claim} + \text{interest claim}}$$

Profitability Ratio	2014e. 22 % ready	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
Cereal Farms	0,08	0,17	0,39	0,37	0,37	-0,06	0,22	0,81	0,42	0,30	0,37
Dairy Farms	0,59	0,52	0,60	0,57	0,58	0,51	0,63	0,58	0,48	0,47	0,52
Cattle Farms	0,48	0,49	0,40	0,41	0,47	0,42	0,34	0,47	0,38	0,50	0,47
Pig farms	0,27	0,22	0,56	0,41	0,53	0,53	0,32	0,71	0,63	0,62	0,44
All Farms	0,38	0,40	0,47	0,48	0,48	0,33	0,45	0,62	0,48	0,46	0,47



## Operationalization 2

Emergent strategy is analyzed with 24 variables that might give an overview of farmer's strategic management decisions:

### 1. Size and growth

- Turnover in the beginning
- Change of turnover (%)
- Arable area in the beginning (ha)
- Change of arable area (%)

## Operationalization 3

### 2. "Productivity"

- Change of gross margin-%
- Labour productivity, (l of milk per hour)
- Change of labour productivity (%)
- Milk yield per cow
- Change of milk yield (%)
- Silage area per cow (ha)
- Change of silage area (%)

### 3. "Structure of farm"

- Equity ratio (%)
- Change of equity ratio
- Average level of investments (investments/value added, %)
- Average milk share of total output (%)
- Change of milk share
- Average share of family work (% of total hours)
- Change of family work
- Average share of rented arable area (% of total area)
- Average level of contract work (% of running costs)
- Change of contract work

## Data and analysis methods 1

- Finnish FADN farms with milk production
- Years 2004 – 2013
  - 200 farms in the panel

### Analysis

Step 1: **Calculating** the 24 "strategy variables"

Step 2: **Ranking** farms by profitability

- Profitability ratio as an average of 2004 – 2005 and 2012 - 2013 to decrease random variation
- Three classes at the beginning (low, medium, high)
- Three classes at the end of the period

## Data and analysis methods 2

Step 3: **Cross tabulation** of classes to determine the pattern of success for each farm

→ **success class** as a combination of situation at the beginning and situation at the end

Step 4: **Discriminant analysis** to find variables that can explain the success class membership

→ Canonical discriminant functions interpreted as **dimensions** of emergent strategies

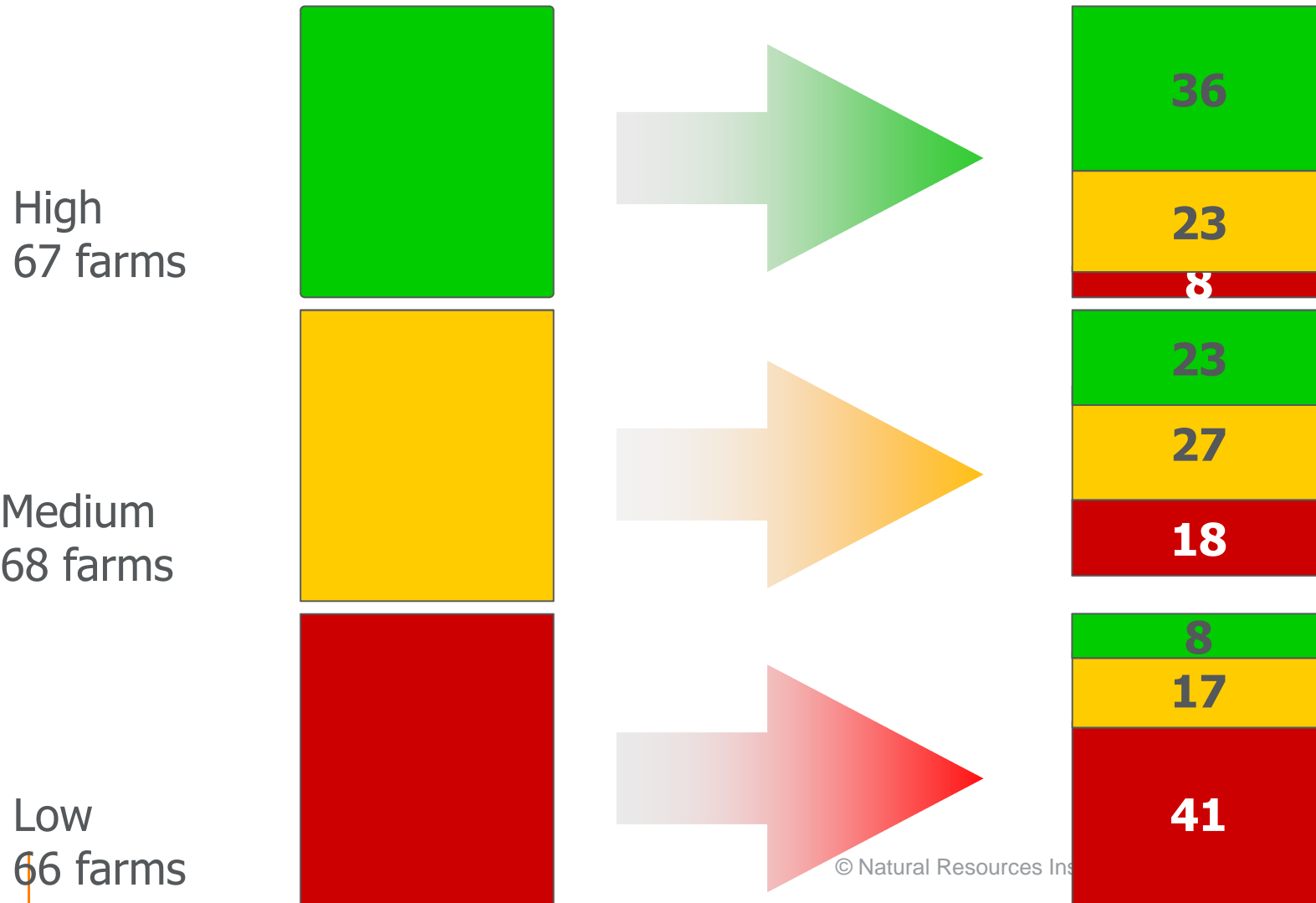
→ *What do farm strategies look like in different success classes?*

## Results: cross-tabulation of profitability classes

Profitability at the beginning	Profitability at the end			Total
	Low	Medium	High	
<b>Low</b>	41	17	8	66
	20.40	8.46	3.98	32.84
	62.12	25.76	12.12	
	61.19	25.37	11.94	
<b>Medium</b>	18	27	23	68
	8.96	13.43	11.44	33.83
	26.47	39.71	33.82	
	26.87	40.30	34.33	
<b>High</b>	8	23	36	67
	3.98	11.44	17.91	33.33
	11.94	34.33	53.73	
	11.94	34.33	53.73	
<b>Total</b>	67	67	67	201
	33.33	33.33	33.33	100.00

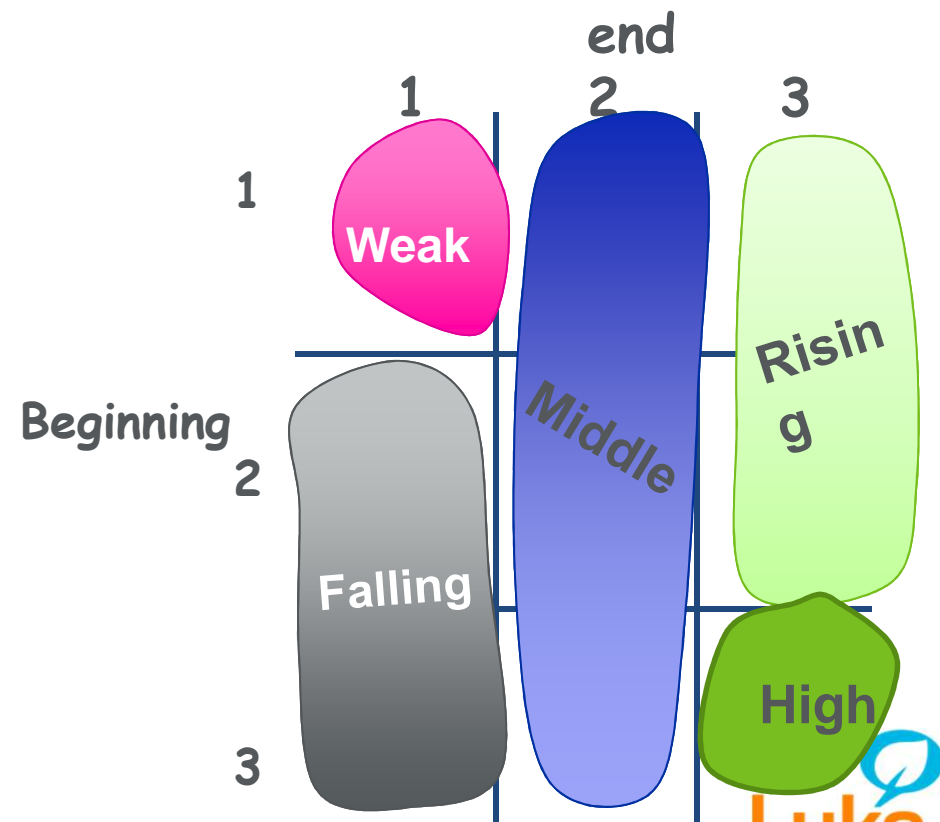
Statistic	DF	Value	Prob
<b>Chi-Square</b>	4	45.8308	<.0001
<b>Likelihood Ratio Chi- Square</b>	4	47.2176	<.0001
<b>Mantel- Haenszel Chi- Square</b>	1	41.7589	<.0001

## Results: cross-tabulation of profitability classes



## Results: discriminant analysis

- Previous cross-tabulation gives  $3 \times 3 = 9$  possible success classes with smallest  $n = 8$ 
  - have to **decrease number of classes** before discriminant analysis
  - some classes combined to have just five **farm groups**:
    - "High"*
    - "Rising"*
    - "Middle"*
    - "Falling"*
    - "Weak"*



## Results: Discriminant analysis

Five groups and 24 potential explanatory variables yield three statistically significant canonical **discriminant functions**:

	Canonical correlation	Eigenvalue	Proportion	Cumulative	F value	DF	p
Can 1	0.66	0.90	0.62	0.62	6.19	40	<.0001
Can 2	0.48	0.36	0.25	0.87	3.71	27	<.0001
Can 3	0.29	0.13	0.09	0.96	2.27	16	0.03
Can 4	0.20	0.06	0.04	1.00	1.65	7	0.12



## Results: Standardized canonical coefficients

... and ten significant **discriminating variables**

	Can1	Can2	Can3
<b>Turnover</b>	0.37		
<b>Change of turnover</b>	0.46	0.70	
<b>Change of gross margin %</b>	0.42	-0.74	
<b>Labor productivity</b>	0.42		0.35
<b>Change of labour prod.</b>		-0.53	
<b>Average milk yield</b>		0.36	-0.71
<b>Equity ratio</b>		0.50	0.40
<b>Level of investments</b>	-1.07		
<b>Change of milk share of output</b>		0.40	
<b>Share of family work</b>			-0.63

## Results: Farm group averages on canonical variables

	Can1	Can2	Can3
<b>Weak</b>	<b>-1.41</b>	<b>-0.58</b>	0.29
<b>Middle</b>	0.21	-0.11	<b>-0.42</b>
<b>High</b>	<b>1.04</b>	0.38	<b>0.53</b>
<b>Rising</b>	<b>0.99</b>	<b>-0.51</b>	0.00
<b>Falling</b>	<b>-0.94</b>	<b>1.27</b>	-0.10

## Results: Interpreting the canonical variables

### Can1

- discriminates High and Rising farms from Low and Falling farms
- gets high values on farms with:
  - high initial turnover
  - Increasing turnover
  - Increasing gross margin %
  - High initial labour productivity
  - Low level of investments

→ Represents ”**economies of size**”

### Can2

- discriminates Falling farms from Weak and Rising farms
- Gets high values on farms with:
  - Increasing turnover
  - Decreasing gross margin %
  - Decreasing labour productivity
  - High initial milk yield
  - High initial equity ratio
  - Increasing milk share of output

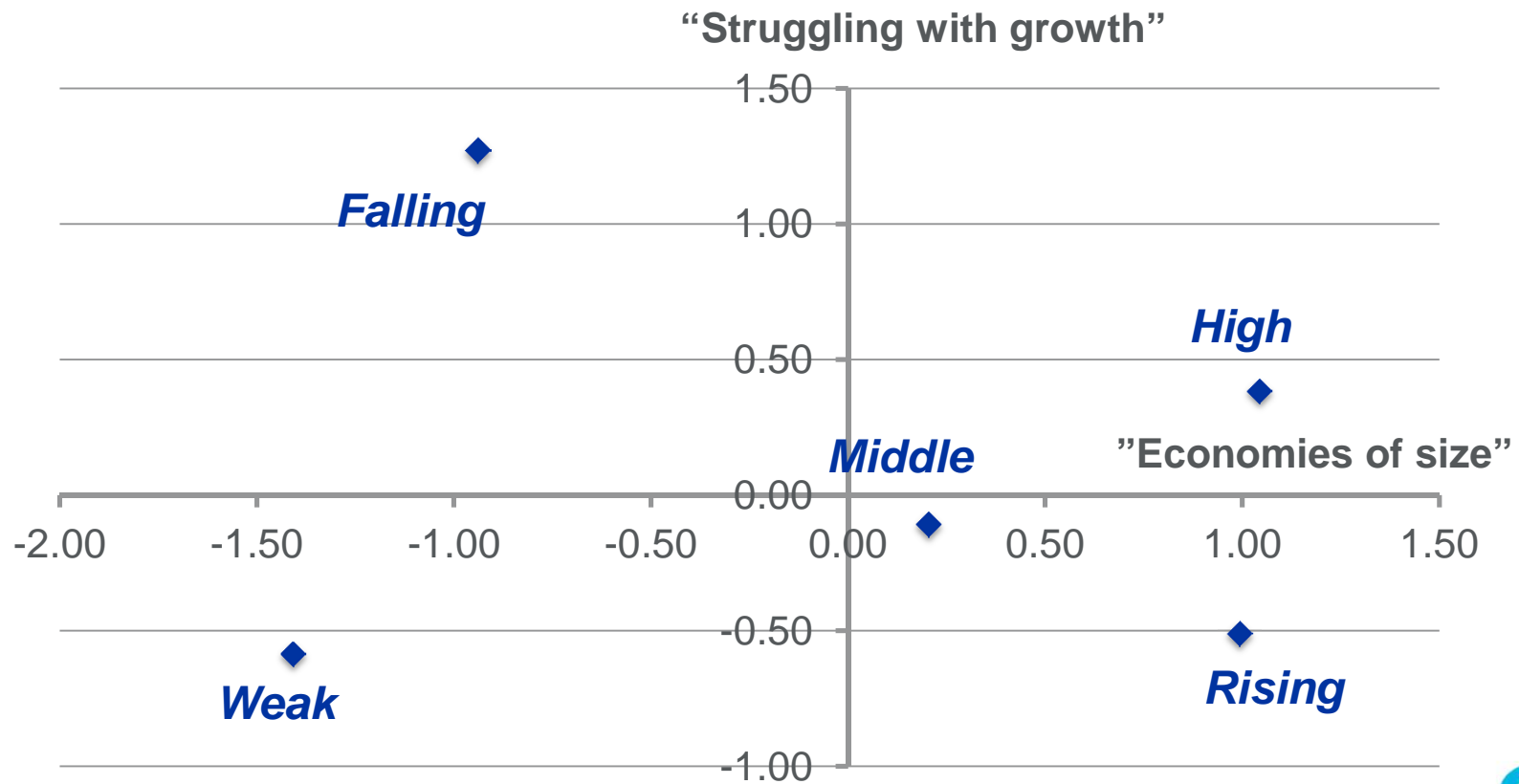
→ Represents ”**struggling with growth**”

## Results: Interpreting the canonical variables

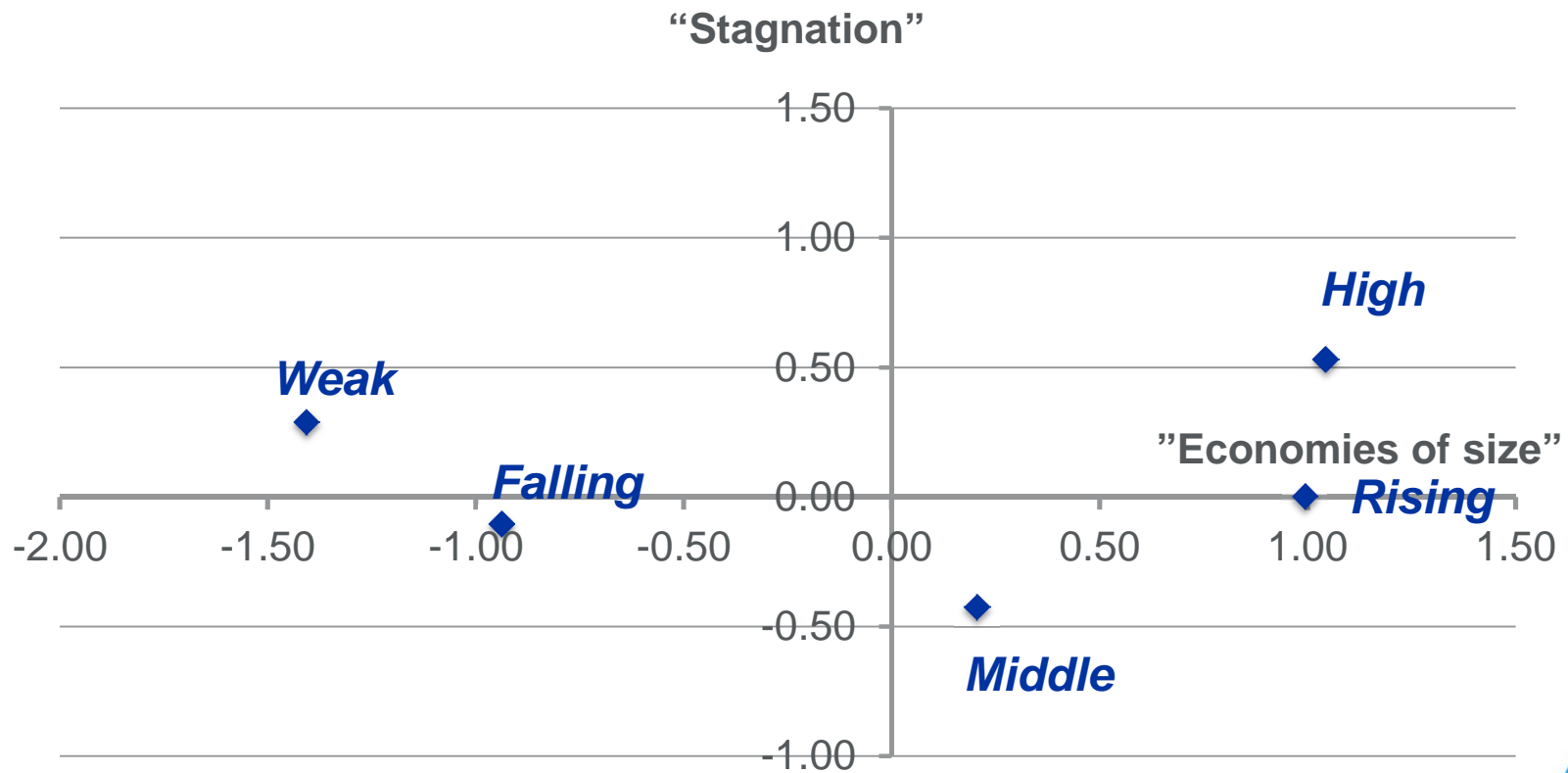
### Can3

- Discriminates High farms from Middle farms (a little)
  - Gets high values on farms with:
    - High labour productivity
    - Low initial milk yield
    - High initial equity ratio
    - Low share of family work
- No dynamic elements, represents **”stagnation”**

## Results: Farm group averages on canonical variables 1 and 2



## Results: Farm group averages on canonical variables 1 and 3



## Conclusions: emergent strategies in different success groups

- Highly performing farms:
  - Utilize economies of size
  - Concentrate on productivity
  - Do not grow, do not have growth-associated problems
    - Growth period is over, what next?
    - Are in a risk of stagnation?
- Rising farms:
  - Utilize economies of size
  - No growth, no stagnation
    - Growth period is over, time to enjoy the fruits?
- Middle group
  - No dominating traits on strategy

## ... Conclusions: emergent strategies in different success groups

- Weakly performing farms
  - No economies of size
  - No growth
  - Some stagnation
    - Preparing for exit?
- Falling farms
  - No economies of size
  - Are struggling strongly with growth
  - No signs of stagnation
    - Future high performers, if growth-associated problems are tamed?
    - Still too small to prosper?



## Conclusions: some remarks

- Dispersion within groups is high, groups are overlapping
  - Necessary to analyze the discriminating variables class by class to avoid wrong conclusions
- Middle group is problematic, serves as a dump class in the analysis (might be modified in the future)
- Model performs well in re-classifying the farms:
  - 60 – 85 % re-classified correctly
  - Most mistakes on Middle group farms
  - Future analysis with only "dynamic" variables in the analysis
    - What changes happen in farming and can they explain success over time

Thank you!

