Jordbruks verket

Swedish Board of Agriculture

The variability in Swedish farm performance

Three perspectives on the competiveness of Swedish farms (Preliminary results)

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Data

- Swedish farms in FADN (2005—2013)
- Sample contains in total 8730 observations
- About 1000 farms each year

- All farms and 4 specializations are considered
- Cattle (374), Milk (2883), pig (888), COP (827)
- In a specialized farm at least 50 % of the revenue is related to a specialization

Measures of profitability and productivity

- 4 measures of profitability (ratios)
  - Cost revenue without subsidies (CR)
  - Cost revenue with subsidies (CRS)
  - Private cost benefit (PCB)
  - Private cost benefit with subsidies (PCBS)

  (e.g. Davidova *et al*, 2003)

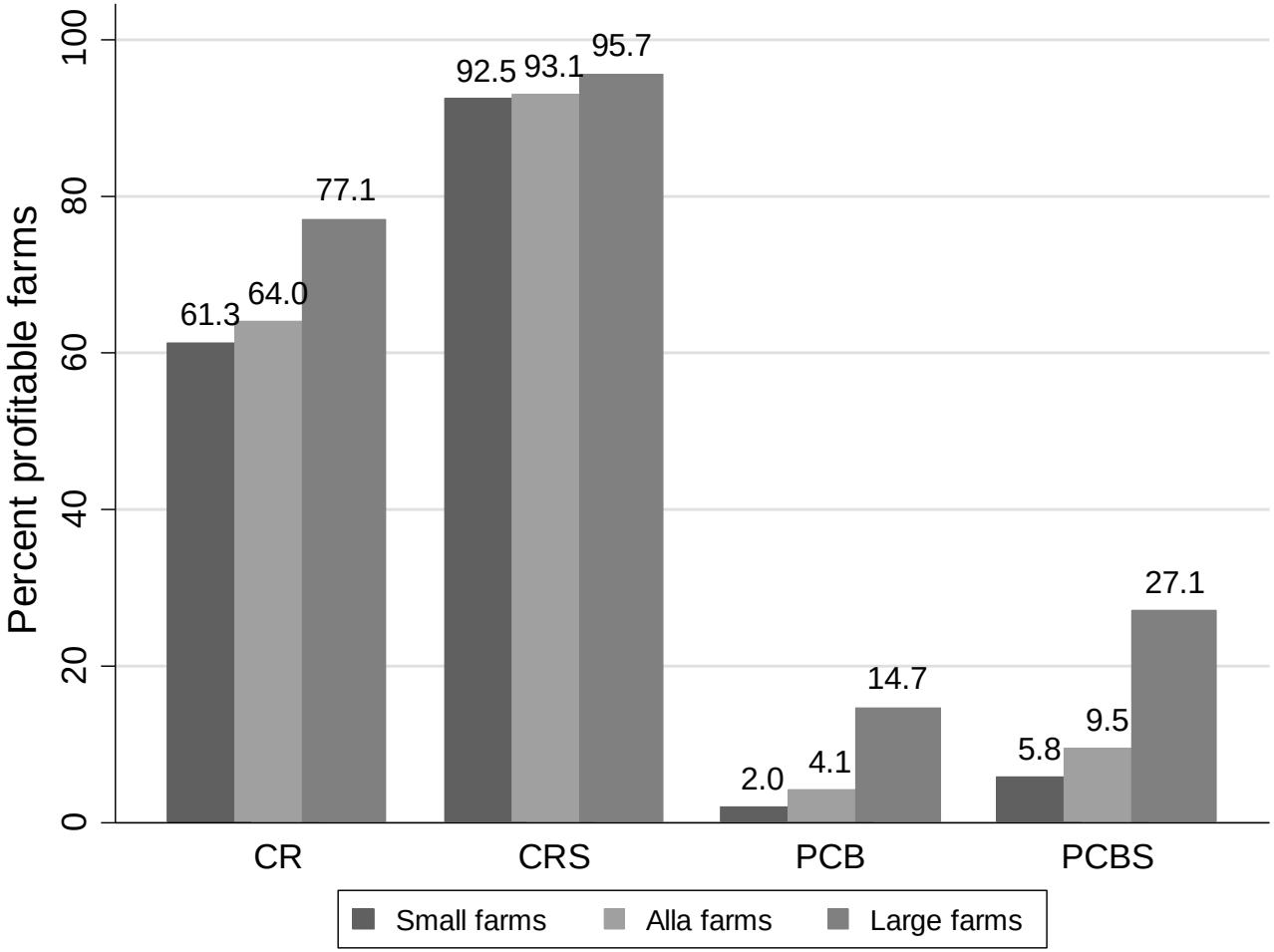
- Productivity is measured by a Törnqvist TFP index

  (e.g. Rasmussen, 2011)

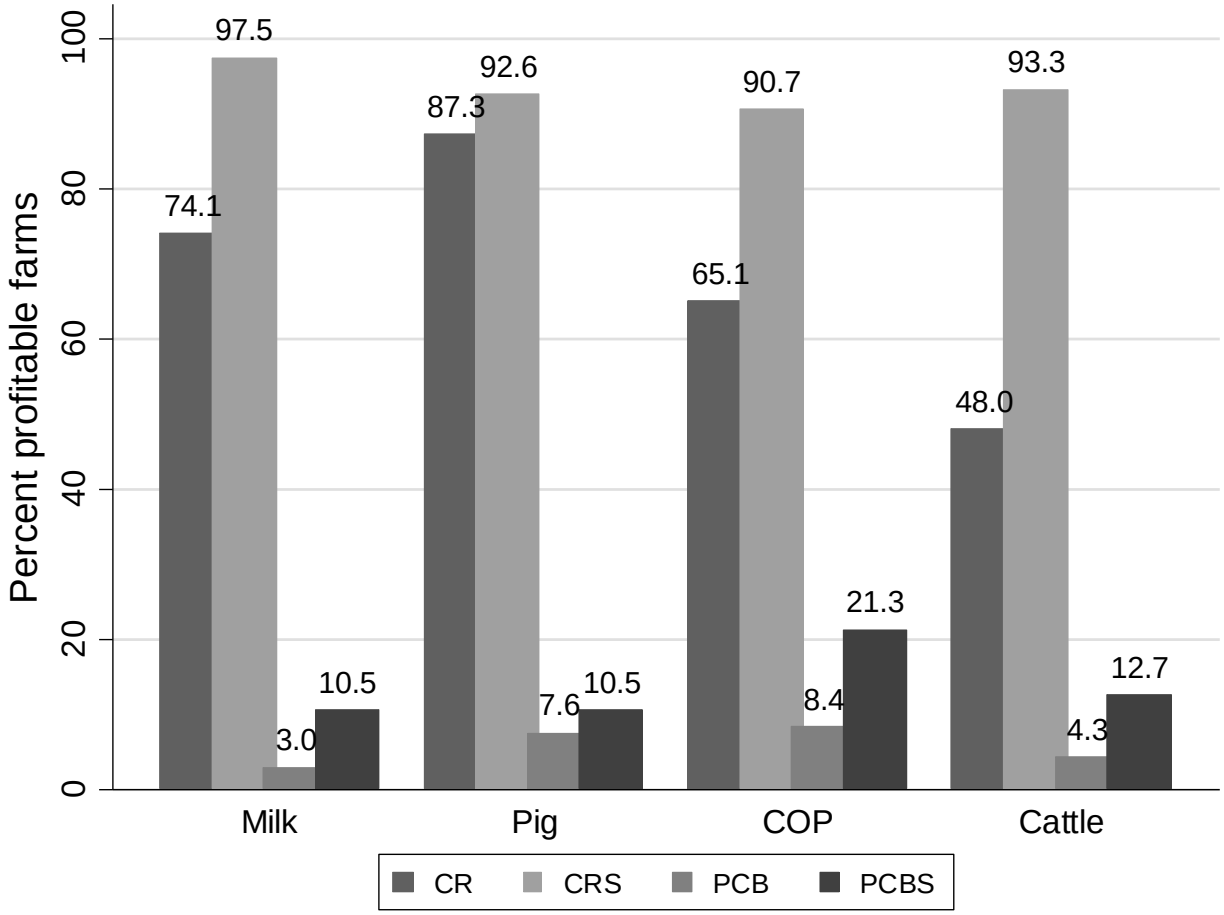
- Profit and TFP change are calculated following Kumbhakar *et al* (2000)

  See also Kumbhakar and Lien (2009) and Sipiläinen *et al* (2014)

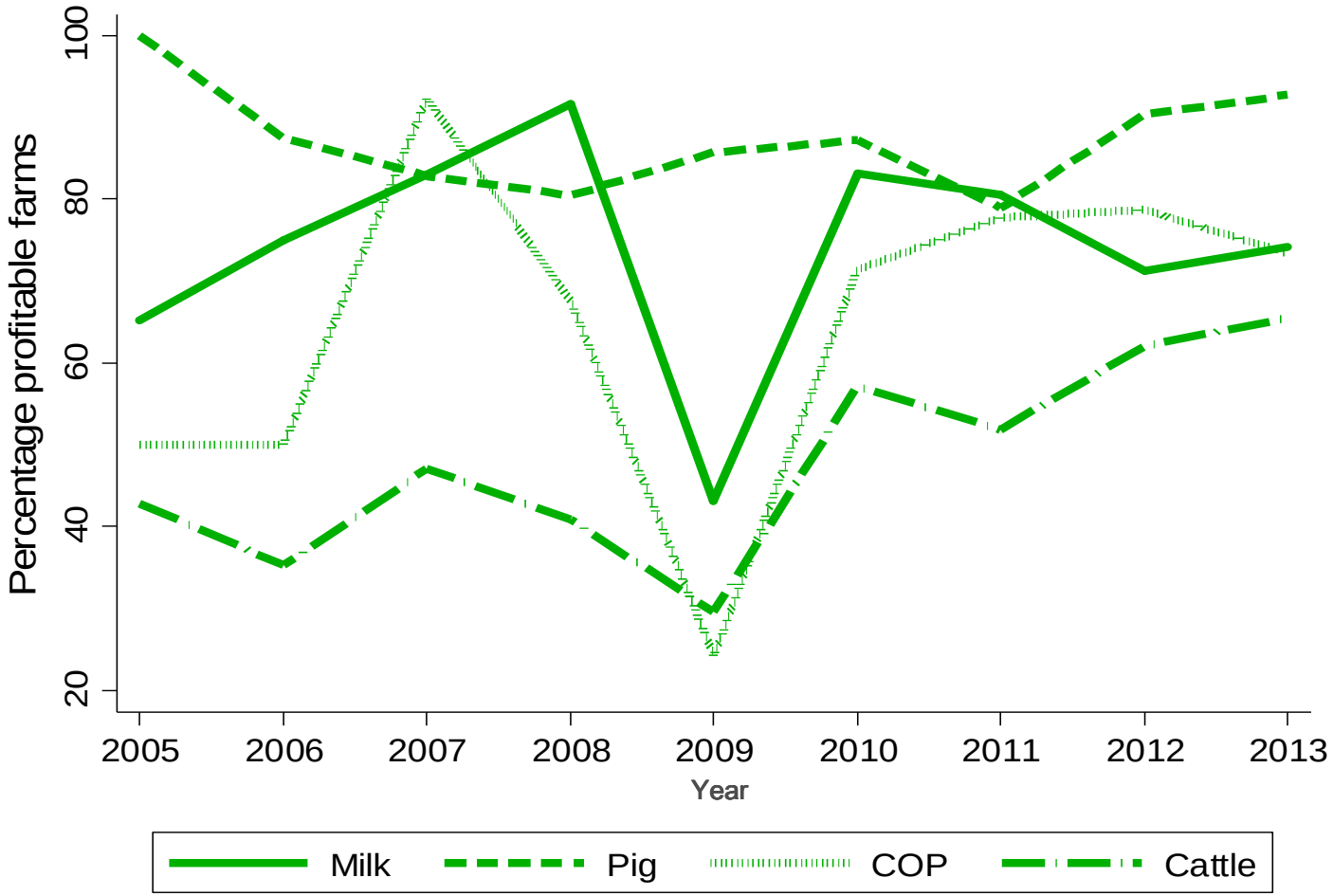
How profitable are Swedish Farms?



How profitable are Swedish Farms?



How profitable are Swedish Farms?



Productivity and profitability in homogenous farm clusters

- 8 homogenous clusters of farms are identified using Cluster analysis (year 2013).
- Structural, managerial, operational, regional characteristics are used to define the clusters
- Including: total labour in Annual Work Units (AWU), total output including subsidies), total assets, total utilised agricultural area, total livestock in Livestock Units . The share of COP and milk output of total output, land per AWU, LU per AWU, depreciation per AWU, total subsides and the percentage of gross output originating from subsides, percentage of paid labour, percentage of rented land, debt to equity, equity to assets, leverage, interest paid to gross output…

Productivity and profitability in homogenous farm clusters

%	PCB	PCBS	CR	CRS	TFP
Smaller	0	3	53	88	34
Milk (plain)	2	4	82	95	55
Pig	5	10	92	100	95
Company	31	66	65	89	83
Larger	2	4	60	87	44
Mountainous	1	9	29	91	51
Forest	0	1	46	90	36
Milk (forest)	2	6	81	97	55

Principal sources of variation in farm performance

- How do profitability varies between specialization, region (nuts3), and farms?
- Applies multilevel analysis (cross-classified error component models)

- $y_{tf(rs)} = \beta_0 + \zeta_{f(rs)} + \zeta_{1r} + \zeta_{2s} + \zeta_{3rs} + \epsilon_{tf(rs)}$

- Observations across time are nested within farms and farms are cross-nested within both specializations and regions.

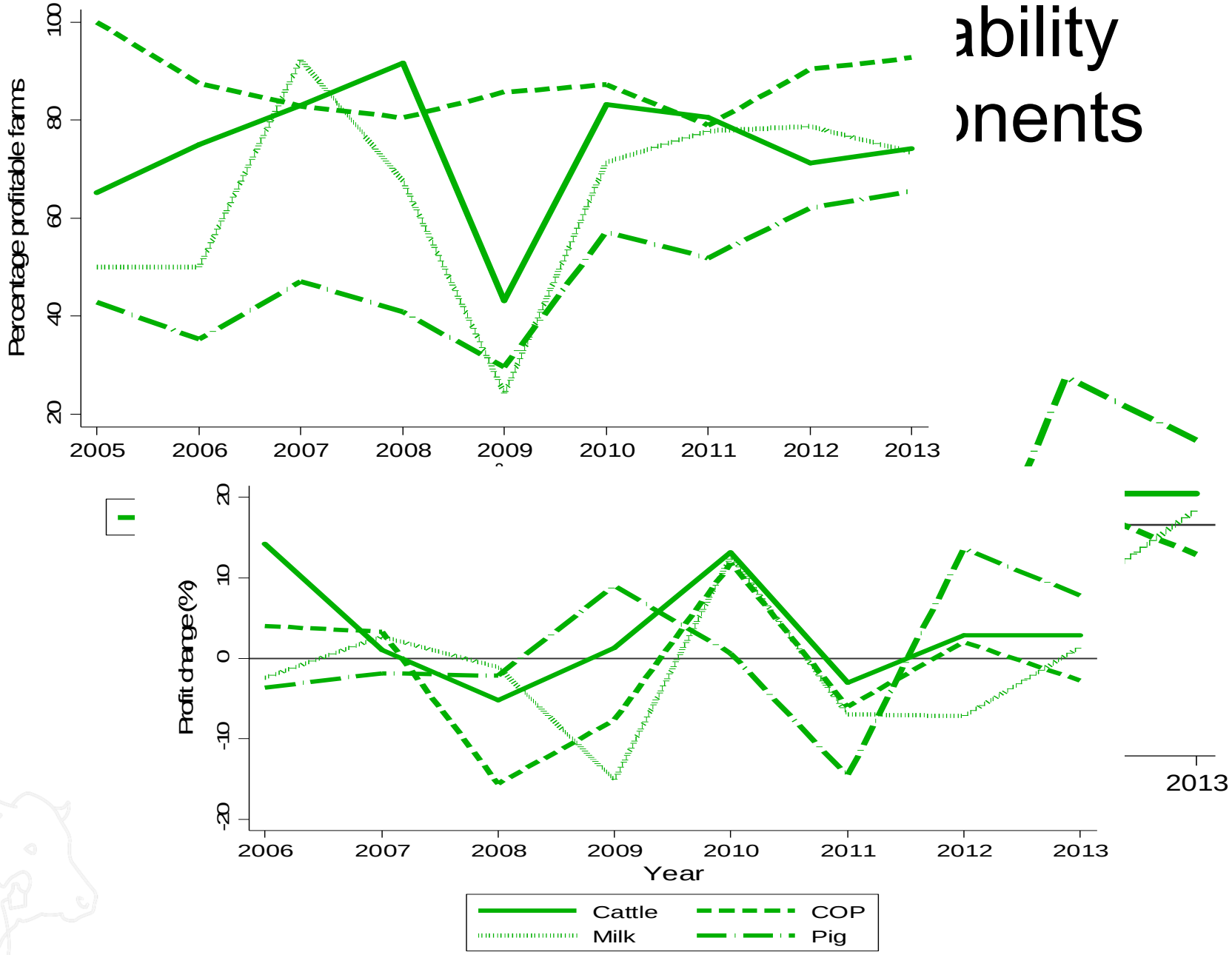
Principal sources of variation in farm performance

VPC (%)	PCB	PCBS	CR	CRS
Specialization	21*	21*	8*	3*
Region (NUTS3)	4*	8*	7*	1
Interaction(specialization & region)	15*	16*	5*	-
Farm	50*	47*	31*	39*
Residual	10*	8*	48*	57*

Productivity and profitability growth and their components

- Components of profit change (with respect to total costs)
  - Output growth
  - Output price change
  - Input price change
  - TFP change
- Components of TFP change
  - Scale
  - Technical change (TC)
  - Technical efficiency change (TEC)
  - Allocative change

ability
onents



Productivity and profitability change and their components

	All	<Median$_t$	>Median$_t$
Cattle	Profit(+2) Output prices(+2) Input prices(-3) TFP(+4)	Profit(-6) Output prices(+1) Input prices(-5) TFP(-1)	Profit(+12) Output prices(+4) Input prices(-1) TFP(+9)
COP	Profit(-2) Output(+1) Output prices(+1) Input prices(-2) TFP(-2)	Profit(-13) Output(+3) Input prices(-7) TFP(-9)	Profit(+10) Output prices(+2) Input prices(+2) TFP(+6)
Milk	Profit(-2) Output prices(+2) Input prices(-4) TFP(-1)	Profit(-10) Output(+1) Output prices(+2) Input prices(-7) TFP(-7)	Profit(+7) Output prices(+3) TFP(+4)
Pig	Profit(+1) Output(+3) Output prices(+1) Input prices(-4) TFP(+2)	Profit(-8) Output(-1) Input prices(-6) TFP(-2)	Profit(+11) Output(+6) Output prices(+2) Input prices(-2) TFP(+5)

Productivity and profitability change and their components

	All	<Median$_t$	>Median$_t$
Cattle	TFP(+4) Allocative (+2) TC(+1)	TFP(-1) Allocative (-2) TC(+1)	TFP(+9) Allocative (+5) TC(+1) TEC(+1) Scale(+1)
COP	TFP(-2) Allocative (-1) TC(-1)	TFP(-9) Allocative (-4) TC(-1) TEC(-5)	TFP(+6) Allocative (+1) TC(+1) TEC(+5) Skalfördelar(+1)
Milk	TFP(-1) TC(-1)	TFP(-7) Allocative (-2) TC(-1) TEC(-4)	TFP(+4) Allocative (+2) TC(-1) TEC(+4)
Pig	TFP(+2) Allocative (+1) TC(+1)	TFP(-2) Allocative (-3) TC(+1)	TFP(+5) Allocative (+4) TC(+1)

Conclusions

- Generally poor profitability without subsidies
- Profitability varies between and within farms
- But there is also variation between regions and specializations

- The results indicate that farm generally have a “low” compensation for own factors of production

- Profit change has mostly been related to productivity, input and output price change
- TFP change has mostly been related to allocative change and technical efficiency change.

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