Some like to join, others to deliver. An econometric analysis of farmers' relationships with agricultural co-operatives

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Motivation (A)

A) Agro-food co-ops are important in the Italian context

1. About 783 thousands farmers participate in one or more agro-food cooperatives belonging to co-op umbrella organizations

2. 12,000 food co-ops are in the umbrella organizations

3. Italian agro-food co-operatives represent a relevant component of the European co-operative movement, being fourth in terms of turnover and second in term of employees

Source: Italian Ministry of Agriculture, Food and Forestry, 2009

Motivation (B)

B) A "simple" observation working on Italian FADN 2006

Frequency of co-op membership and delivery in the sample

Membership of co-operative	Delivery to co-operative		
	No	Yes	*Total*
No	9,929	635	*10,564*
Yes	3,223	1,596	*4,819*
Total	*13,152*	*2,231*	*15,383*

Source: FADN, 2006

Motivation (B)

1. Membership with production delivery (*strong membership*)
2. Membership without production delivery (*soft membership*)
3. Non-membership with production delivery (*shadow membership*)
4. Non-membership and no delivery (*no membership*)

How to explain this?

Research questions

1. Which farmers become member of a co-op and why?
2. Which farmers deliver to a co-op and why?
3. Why are co-op membership and delivering not always related?
4. Is co-op membership a determinant of co-op delivery?

Theoretical background: New Institutional Economics

How to model famers` decisions on co-op membership or delivery ?

As farmers' choices on specific governance structures that maximize the return on transactions (i.e. expected residual income), conditional on both transacting parties and product features

(Williamson, 1987; Ménard, 2000; Hendrikse, 2007)

Contractual and membership relations with co-ops are part of (local) networking decisions that differ from networking with an IOE

(Staatz, 1987; Hendrikse and Veerman, 2001; Bijman, 2002)

In a co-op owners benefit mainly from using the services, while in an IOE owners benefit from returns on investment

Theoretical background: New Institutional Economics

What are the main determinants for the choice of the type of membership?

Choice of membership is related to the increase of specificity involved in the transaction

Co-op membership starts to be an attractive solution to carry out transactions the more this mutual dependency increases and the more hierarchy (power and centralized coordination) is required to regulate cooperation and competition within the organization of the transactions

(Ménard 2004; 2007; Williamson, 2005; Karantininis, 2007)

Theoretical background: New Institutional Economics

Hypotheses	Type of factor	Factor	Impact on membership	Impact on delivery
H1: Location specificity matters	Local market structure	Co-op concentration in the location area	(+++)	(+)
		Specialization of cooperatives operating in the area	(++)	(+)
	Social and institutional context	Region/area of location	(+/-)	(+/-)
	Geographical isolation	Location in a mountain area	(+/-)	(+/-)
		Location in a rural area	(+/-)	(+/-)
H2: Asset specificity matters	Size	Farm size in economic and physical terms	(+/-)	(+/-)
	Specialization	Type and degree of agricultural specialization	(+)	(+)
	Human capital and organizational specificity	Manager's age	(+)	
		Type of management	(+/-)	(+/-)
		Successor	(+/-)	(+/-)
		Family contribution to labour force	(+/-)	(+/-)
H3: Relational specificity matters	Other networking activities	Membership in agricultural related association	(+)	
		Membership in non-agricultural related association	(+)	

Bivariate probit model

1) Allows for membership endogeneity in delivering equation explicitly → Greene (1998; 2008: 823-824)

2) We can test correlation between decisions

3) We can test the role of a common set of determinants as stated in hypotheses 1, 2 and 3

$$(1)\quad memb^{*} = x_1'\beta_1 + \varepsilon_1, \qquad memb = 1 \quad if\ memb^{*} > 0, 0\ otherwise$$

$$(2)\quad del^{*} = x_2'\beta_2 + \gamma memb + \varepsilon_2, \qquad del = 1 \quad if\ del^{*} > 0, 0\ otherwise$$

$$E(\varepsilon_1) = E(\varepsilon_2) = 0; Var(\varepsilon_1) = Var(\varepsilon_2) = 1; Cov(\varepsilon_1, \varepsilon_2) = \rho$$

Results (1): Location specificity matters

Variables		Membership		Delivery	
		Coeff.		*Coeff.*	
Location specificity (X1)					
Local market structures	*reg_coop_id*	2.781	(0.680) ***	2.276	(0.831) ***
	d_meatfish	-3.849	(0.498) ***	-1.582	(0.566) ***
	d_fruitveg	1.046	(0.499) **	0.773	(0.885)
	d_vegoils	1.128	(0.205) ***	-1.143	(0.320) ***
	d_dairy	-0.371	(0.096) ***	0.508	(0.106) ***
	d_grain	6.250	(1.432) ***	0.846	(1.776)
	d_feed	-3.967	(1.075) ***	1.798	(1.264)
	d_drink	1.618	(0.127) ***	0.418	(0.176) **
Social and institutional context	*agr_empl*	2.305	(0.281) ***	-1.973	(0.342) ***
	south	-0.006	(0.030)	-0.395	(0.042) ***
Geographical isolation	*periurb*	0.080	(0.046)	0.087	(0.059) **
	rur_int	-0.031	(0.046)	0.122	(0.060) **
	rur_rem	0.196	(0.053) ***	-0.057	(0.070)
	hill	0.082	(0.035) **	-0.021	(0.042)
	mont	0.011	(0.048)	0.045	(0.061)
Wald test H1: $X_1 = 0$			556.50 ***		322.28 ***

Results (2): Asset specificity matters

Variables		Membership		Delivery	
		Coeff.		*Coeff.*	
Asset specificity (X_2)					
Size	*uaa*	0.0002	(0.0002)	0.0000	(0.0003)
	fixasset	-0.002	(0.001) **	0.003	(0.001) ***
Specialization	*arabl_spec*	-0.099	(0.040) **	-0.269	(0.053) ***
	hort_spec	-0.591	(0.074) ***	-0.596	(0.121) ***
	perm_spec	-0.436	(0.059) ***	-0.040	(0.073)
	livstock_spec	0.440	(0.070) ***	-0.019	(0.082) ***
	dprocess	0.066	(0.026) **	0.118	(0.033) ***
	organic	-0.065	(0.046)	0.026	(0.057)
Human capital and organizational specificity	*age*	0.002	(0.001) ***	-	-
	manag	0.188	(0.043) ***	0.100	(0.056) *
	succes	0.120	(0.047) **	0.001	(0.053)
	dev_plan	0.454	(0.024) ***	0.159	(0.037) ***
	acc_serv	0.230	(0.040) ***	-0.045	(0.050)
	tot_lab	-0.008	(0.005)	-0.019	(0.007) ***
Wald test H2: $X_2 = 0$			608.37 ***		96.14 ***

Results (3): Relational specificity matters

Variables		Membership		Delivery	
		Coeff.		*Coeff.*	
Relational specificity (X_3)					
Other networking activities	*ass_prod*	0.346	(0.022) ***	-	-
	other_netw	0.213	(0.022) ***	-	-
Wald test H3: $X_3 = 0$			307.57 ***		

Results (4): Correlation between decisions

Variables		Membership		Delivery	
		Coeff.		*Coeff.*	
Membership	*memb*	-	-	2.003	(0.084) ***
Intercept	*int*	-1.648	(0.087) ***	-1.913	(0.095) ***
ρ		-0.631 (0.056) ***			
Wald test $\chi^2(60)$		5987.02 ***			

Discussion and conclusions (1)

a) Strong membership (membership and delivering) is associated with a higher concentration of co-ops, in particular for farmers that supply to drinks and beverages co-ops in regions that have a high share of those co-ops, on-farm processing, combined management and labour on the farm and having a business plan.

b) Soft membership (member but not delivering) occurs when there is a large share of vegetable oil co-ops, in regions where agriculture is the main economic activity and among livestock farmers.

Discussion and conclusions (2)

c) Delivering without membership (shadow membership) happens with large shares of dairy co-ops and for farms with a large quantity of fixed assets.

d) Non-membership is associated with a large share of co-ops in the meat and fish sector, and among arable and horticultural farms.

Discussion and conclusions (3)

1) Co-ops increase farmers` market participation (e.g. D&B and F&V)

2) Co-ops are relevant in rural areas and for local developm. → Local agency

Traditional motivations for policy support of food co-ops in Italy are confirmed

3) Business-related features have to be considered much more in the future

4) Specificity is a valuable dimension for analysing co-op memberships

Limitations and further research

1) Data limitations on the role of other dimensions such as uncertainty and frequency of the transactions between farmers and co-ops.

2) Static analysis (temporarily and occasional delivering?)

3) No information on co-ops organization, type of contracts and requirements, level of commitment, decision-making process

4) No info about farmers' willingness to participate and motivations, time-spending on co-op relationships, available alternatives in the business environment, path-dependency

Thank you for your attention !!