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Innovation and Member Commitment in Agricultural Cooperatives

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“Member commitment is critical because it is a measure of how well a co-op is able to differentiate itself from an IOF.”

“A simple definition of member commitment is the preference of co-op members to patronize a co-op even when the co-ops price or service is not as good as that provided by an investor-oriented firm (IOF).”

(Fulton, 1999)

- Member commitment falls down in large agricultural cooperatives (Fulton, 1999 ; Nilsson *et al.*, 2009)
 - Decrease operations
 - Increase decision making inefficiencies
 - Increase transaction costs (Österberg & Nilsson, 2009)
 - Reduce the differences between Coop and IOF

- Two commitment dimensions are currently distinguished
 - Economic involvement
 - Governance participation

- We focus here on the determinants of economic involvement

➤ Our question:

What influences economic involvement?

➤ Our case study:

A large French multipurpose cooperative located in Western France
The cooperative differentiates from other coops by putting farms' innovation as one of its strategic objectives.

➤ Our contribution:

We explore how the relationships between the members and their cooperative (economic participation, distance, cooperative outlets, membership duration) affect the members' economic involvement
We identify the role played by innovation

1. Literature review of member commitment determinants
2. Data
3. Empirical model
4. Results and discussion
5. Conclusion

Literature review

1. How do economic involvement and governance participation interact ?
 - Fulton (1999), Österberg *et al.* (2009) and Barraud-Didier *et al.* (2014)
2. What are the attitudinal determinants of member commitment ?
 - Hansen *et al.* (2002), Morrow *et al.* (2004), Nilsson *et al.* (2009) and Österberg & Nilsson (2009) Hernandez-Espallardo *et al.* (2012), Arcas-Lario *et al.* (2012)
3. What are the cooperatives' features that favor member commitment ?
 - Klein *et al.* (1997), Nilsson *et al.* (2009), Barraud-Didier *et al.* (2012)
4. What are the farms' (or farmers') characteristics ?
5. What are the specifications of the relation between the farm and the coop ?

➤ Farms or farmers' characteristics

- Farm size has a positive impact on economic involvement
 - Bhuyan (2007), Gray & Kraenzle (1998) and Klein *et al.* (1997)
- Older farmers tend to be more economically involved
 - Klein *et al.* (1997); Österberg and Nilsson (2009)
- Farmers with high level of education are supposed more economically involved
 - Trechter *et al.* (2002)
- Distance from the headquarters
 - Pozzobon and Zylbersztajn (2011) shows that the closest farmers tend to participate more to governance cooperative

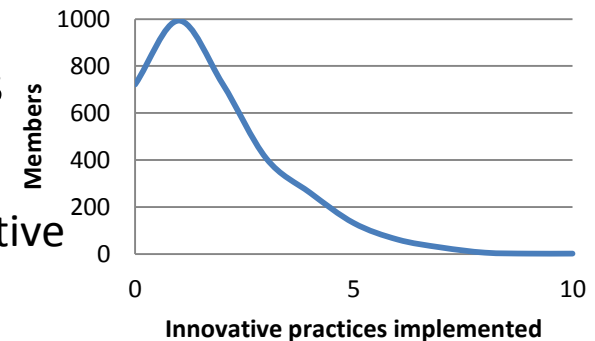
➤ Relationships between cooperatives and their members

- Membership duration (Bhuyan, 2007, Trechter *et al.*, 2002)

- **Hypothesis 1:** Innovation strengthens economic involvement in the cooperative.
- **Hypothesis 2:** The farms which are owned by several associates have a lower economic involvement in their cooperative.
- **Hypothesis 3:** The more the member is distant from the cooperative, the less involved he is.
 - The more the farm is distant from the cooperative headquarters the less committed the members are.
 - The less the outlets/supplies are available in the cooperative, the less involved the members are.

Data

- Based on a sample of 3330 members
 - Approximately 90% of the total business
- The database provides information on various socioeconomic member attributes during the 2013-2014 agricultural campaign
- *Economic involvement = delivered outputs / existing outputs*
 - We distinguish three level of economic involvement
 - Low = 0.5 (608 members)
 - Intermediate $\in]0.5 ; 1[$ (714 members)
 - High = 1 (2008 members)
- *Innovation* relates to the number of new farms practices that members implement on their farm.
 - 16 new agricultural practices offered by the cooperative



- Territorial presence and distance from the headquarters
 - *Territorial presence = possible outputs / existing outputs*
 - Distance : distance between each farm and the cooperative headquarters
 - Average of 86 km and 1h21 to headquarters
- *Business sales* are the sum of *output sales* and *input purchases* that each member generates with the cooperative

Fixed effects:

- Farm's legal status:
 - EI [reference] (1031 members)
 - EARL (1272 members)
 - GAEC (761 members)
 - Various (266 members)

- Farm specialization
 - *Specialization in livestock*
 - *Specialization in crops*
 - *Mixed farming*

- Membership duration
 - Less than or equal to 5 years,
 - Between 6 and 15 years,
 - More than 15 years

Empirical model

- A member's utility

$$U_{ij} = V_{ij} + \varepsilon_{ij}$$

- We observe the outcome $y_{ij} = j$ when the alternative j gives the highest utility among all the alternatives.

$$\Pr(y_{ij} = j) = \Pr(U_{ij} \geq U_{ik}), \text{ for all } k$$

- We choose a multinomial logit model with three alternative choices

$$p_{ij} = \frac{\exp(x_i' \beta_j)}{\sum_{l=1}^m \exp(x_i' \beta_l)}$$

- We then compute marginal effects as

$$ME_{ijk} = \frac{\partial \Pr(y_i = j)}{\partial x_{ik}}$$

Marginal effects

	Low economic involvement		Intermediate economic involvement		High economic involvement	
Innovation	-0.02	***	-0.01		0.02	***
Business Sales	-0.13	***	-0.20	***	0.32	***
Output delivery/input supply	-0.01	**	0.01	**	0.01	**
Territorial presence	0.04		0.59	***	-0.63	***
Distance	0.06	***	-0.07	***	0.01	
Existing outputs	-0.03	***	0.12	***	-0.10	***
Membership years						
<i>Less than 5 years</i>	-0.00		-0.01		0.01	
<i>5-15 years</i>	-0.01		-0.02		0.03	*
<i>More than 15 years</i>	Ref		Ref		Ref	
Farm Specialization						
<i>Mixed farming</i>	Ref		Ref		Ref	
<i>Specialization in crops</i>	-0.31	***	-0.03		0.34	***
<i>Specialization in animal production</i>	-0.08	***	-0.05	*	0.12	***
Legal status						
<i>EI</i>	Ref		Ref		Ref	
<i>EARL</i>	0.02		0.04	**	-0.06	***
<i>GAEC</i>	0.08	***	0.03	*	-0.11	***
<i>Various</i>	0.06	**	0.00		-0.06	**

Conclusion

- The adoption of innovative agricultural practices
 - increases the probability to choose a high level of economic involvement and
 - decrease the probability to choose a low level of economic involvement.

- Other determinants affect member commitment
 - member sales with the cooperative
 - multi-output farm strategy
 - cooperative territorial presence
 - distance to the cooperative headquarters

Further improvements

- Robustness checks
 - Individual farms
 - Mixed farming
 - Farms cannot deliver all their outputs to the cooperative

- Multinomial model with random effects

Future research

- Use panel data to better assess the role of innovation in economic involvement
- Collect more information about farms and farmers
 - Age, Education, Networks, Farm size
- Examine how economic involvement interlock with innovation
 - Collect more information on the key factors that explain why farmers adopt innovation

Thank you for your attention

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	Mean	St dev	Q1	Median	Q3
Economic involvement	0.84	0.20	0.67	1	1
Innovation	1.79	1.58	1	1	3
Business Sales (million €)	0.318	0.35	0.12	0.22	0.38
Distance (100km)	0.87	0.59	0.44	0.73	1.22
Existing outputs	2.47	1.24	1	2	3
Output delivery/input supply	1.7	4.5	0.8	1.2	1.7
Territorial presence	0.95	0.15	1	1	1
Farm specialization					
<i>Mixed farming</i>	0.59	0.49	0	1	1
<i>Specialization in crops</i>	0.33	0.47	0	0	1
<i>Specialization in animal production</i>	0.08	0.27	0	0	0
Legal status					
<i>Individual farmers</i>	0.31	0.46	0	0	1
<i>EARL</i>	0.38	0.49	0	0	1
<i>GAEC</i>	0.23	0.42	0	0	0
<i>Various</i>	0.08	0.27	0	0	0
Membership years					
<i>Less than 5 years</i>	0.18	0.38	0	0	0
<i>5-15 years</i>	0.27	0.44	0	0	1
<i>More than 15 years</i>	0.56	0.50	0	1	1

	Model 1			Model 2		
Economic involvement	Low <i>Ref</i>	Med.	High	Low <i>Ref</i>	Med.	High
Innovation					0.05 (0.04)	0.17*** (0.04)
Business Sales		-0.60** (0.29)	2.07*** (0.23)		-0.65* (0.29)	1.85*** (0.23)
Output delivery/input supply		0.09** (0.04)	0.09*** (0.04)		0.10** (0.04)	0.10** (0.04)
Territorial presence		3.71*** (0.68)	-2.43*** (0.36)		3.75*** (0.69)	-2.47*** (0.36)
Distance		-0.85*** (0.16)	-0.36*** (0.11)		-0.83*** (0.16)	-0.30*** (0.10)
Existing outputs		0.96*** (0.08)	-0.16** (0.07)		0.94*** (0.08)	-0.21*** (0.07)
const		-5.95*** (0.77)	2.90*** (0.45)		-6.02*** (0.77)	2.80*** (0.46)
Number of observation	3330			3330		
Log likelihood	-2283.42			-2272.24		
LR chi2(24) =	1731.36***			1753.72***		

