FACTORS DETERMINING COLLECTIVE ACTION IN ALBANIAN AGRICULTURE: CASE OF APPLE PRODUCERS IN ALBANIA

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Abstract

Under the small farm size constraints, there is no better alternative to cooperation for Albanian agriculture. The objective if this study is to assess the impact of individuals' and environmental characteristics on the likelihood of farmers' cooperation in the major apple production area in Albania. Three regression models with binary qualitative dependent variable, namely Linear Probability Model, Logit Regression Model and Probit Regression Model have been used to test the hypothesis. Study results reveal the factors having a positive impact on farmers' likelihood to cooperate are social capital, wealth and leadership. The results are of both theoretical and practical importance. Theoretically, study supports that social capital, farm size and leadership are particularly important in post communist transition agriculture. Practically, results benefits government agencies in two ways: better targeting of potential farmers groups, and improving preconditions for collective action through increasing the stock of social capital and designing and implementing leadership programs and long terms policies to increase farm size.

Key words: collective action, producers groups, apple, Albania

Introduction

Albanian agriculture is dominated by very small farms. Average farm size for the country as a whole for 2008 was 1.2 ha, and situated between 0.7 ha 1.5 ha. Farm size has grown very slowly to 1.2 ha from 1.04 ha in 2000. Additionally, land fragmentation represents a major problem as well. The average number of parcels per farm is 3.8 and it is situated between 2.7 and 6.2. Average area per parcel is very small.

Given the tiny farm size and land fragmentation, farmers encounter many difficulties in improving technology at farm level, providing inputs, selling their farm produce and facing unfair competition from input suppliers and traders. Hence, there is no better alternative to cooperation among farmers.

Apple production is an important activity for Albanian agriculture. With a rather high labor to land supply ratio, labor intensive industries are an economically justified alternative. On the demand side, apples expenditures are the second highest in household expenditures for all fruit and vegetables combined, following tomatoes (USAID's AAC 2008).

The Ministry of Agriculture, Food and Consumer Protection (MAFCP) is currently supporting the fruit and vegetable sector through an investment support scheme, providing subsidies for new fruit (apple) plantations. On a strategic viewpoint, fruit production, including apple production, is one of the four priority sectors of the new Programme for Rural Development in Albania [8].

As a consequence, domestic production of apple in Albania has rapidly increased in recent years due to new plantations. Production of apple has increased substantially since the year 2000, being more than quadrupled between 2000 and 2010, as shown in the Table 1.

Domestic production currently covers more than 3/4 (76.7%) of domestic supply MAFCP (Table 1)); this share has increased substantially as compared to 2000 when domestic supply was dominated by imports while domestic production was less than 1/3 of the supply.

Table 1: Dynamics of production and total supply of apple

Category	Unit/Year	2000	2005	2006	2007	2008	2009	2010
Production	Mt	12,000	16,000	27,566	36,000	45,000	47,202	54,604*
Import	Mt	28,163	38,417	33,723	22,516	15,641	12,928	17,702
Export	Mt	0	0	0	147	34	109	1,097
Supply	Mt	40,163	54,417	61,289	58,369	60,607	60,022	71,209
Export/import	%	0.0%	0.0%	0.0%	0.7%	0.2%	0.8%	6.2%
Production/supply	%	29.9%	29.4%	45.0%	61.5%	59.1%	78.6%	76.7%
Import/supply	%	70.1%	70.6%	55.0%	38.6%	41.0%	21.5%	24.9%

Source: FAOSTAT (production), UNSTAT (import – export), *MAFCP Statistical Sector

1.1 Research problem

The collective action in Albanian agriculture remains limited. Additionally, studies on determinants of (initiating) collective action in a post-communist, transition country are almost missing. Therefore, determining the factors conducive to collective action in a strategic and fast growing sector is of both practically useful and theoretically important.

1.2 Previous studies on collective action

Previous research results show that there is still a great deal of debate over the factors that determine ‘‘successful’’ collective action. The following discussion summarizes previous studies on determinants of collective action.

Table 2: Previous studies on collective action

Determinants	Description
Group size	Theoretically, smaller groups have an advantage in cooperation because strategies are more likely observable; the share in the loss from not following the rules are larger; interlinkages among group members are likely to be more important; and negotiation costs are lower [4, 7]. However, the more frequently the transaction takes place, the lower the fixed costs per unit.In a producer group situation, frequency of transactions can be raised through increasing the number of members [2].
Wealth/Group heterogeneity	The theoretical impact of differences in assets or wealth on cooperation is ambiguous. With increasing wealth, the relative importance of potential benefits is decreased and thus the potential for participation could decline [9]. On the other hand, wealthier members may find it in their interest to assume leadership and benefactor roles within a community [9].
Social capital	There is a broad consensus among researchers that social capital has a positive impact on collective action. Several studies [2, 7] support that social capital is a strong predictor of collective action. Bardhan [4] indicates that in a world where we often cannot predict each other’s reactions, norms provide much-needed rules of thumb lend a degree of inflexibility and commitment which form the basis of our binding agreements. As a result, we often do better by following norms than by calculation.
Conflicts	Intra village conflicts may impede collective action [4]. Internalization of cooperative norms is more difficult under such circumstances; the degree of confidence or trust that individuals have in the likelihood that others will play their part in a cooperative agreement may be low; the “degree of community” which lends viability to conditional cooperation in the evolutionary models we have may be missing.
Leadership	Leadership is an important determinant of cooperation. Banaszak [2] summarizing relevant studies on the role of leadership on cooperation – departing from a game theory perspective - states that: … in coordination games leaders emerge in order to economize on choosing one of multiple equilibria. In social dilemma games, furthermore, the institution of leadership increases individual contribution levels by setting an example for other players and changing the payoff structure by introducing sanctions for free-riding. Several studies [2, 6, 7] have found a positive significant impact of leadership on collective action.
Competition	Banaszak [2] posits that competition with other intermediaries might increase the likelihood of deviation from group rules expressed through sales outside, and thus decreases the likelihood of achieving success by producer groups. A volatile environment may raise the attractiveness of a short-run gain of defection in relation to the obedience to the long-run implicit contract. In such conditions

	defection of one group member might also result in a cascade of defection by others, since everyone else sees less value in the initial choice.
Exit options	Migration and mobility possibilities – or exit options - work against cooperation. A higher number of exit options, is expected to reduce cooperative capacity, because it weakens social cohesion and may make it more difficult to make and enforce collective decisions [4].
Education	Education in general is hypothesized to favor cooperative capacity by increasing individuals' capacity to acquire information and transform such information into practical knowledge.
Age	Older people are accepted to cooperate less than younger people because of infity, risk aversion or wealth [9].
Communication	Communication among members is expected to have a positive impact on the likelihood of producer groups achieving success. As discussed by Banaszak [2], communication promotes cooperation. Communication could also increase the observability of others' actions and decrease the attractiveness of cheating. The results indicate that successful cooperation might be attributed to the opportunity to coordinate behavior in the communication phase.
Previous business relations	Previous business relations are expected to have a positive impact on cooperative behavior [2].
Community social heterogeneity	Previous studies support that socially heterogeneous communities tend to cooperate for a number of reasons: (i) heterogeneous communities find it hard to agree on the characteristics of the common good, (ii) individuals might simply dislike working with others outside their group [1], heterogeneous communities might disagree on how to share the private benefits associated with collective action, or value less the benefits accruing to members of the other groups [4], social heterogeneity might undermine the ability to devise mechanisms that sustain cooperation.

2. Objectives and hypothesis

2.1 General objective

Determine the factors predicting apple producers' likelihood of participation in collective action in apple production area in Albania

2.2 Specific objectives

- Assess the impact of farmers' individual characteristics on the likelihood of their participation in collective action.

- Ascertain the impact of the environmental characteristics as perceived by farmers on the likelihood of their participation in collective action.

The determinants of collective action may be classified into individual characteristics, group and environment characteristics.

Table 3: Factors determining collective action

Collective action determinant	Hypothesized relationship to likelihood of cooperating
Individual characteristics	
Social capital	The higher the stock of social capital, the higher likelihood of collective action
Wealth	Engagement in collective action increases as wealth increases
Exit options	Exit options available decreases the likelihood of collective action
Education	The higher education the higher the likelihood of collective action
Age	Collective action decreases with age
Environmental characteristics	
Perceived conflicts	The higher perceived conflicts the lower likelihood of collective action
Perceived competition	The higher the competition the lower the likelihood of collective action
Perceived leadership	Farmers perception on the presence of leadership increase the likelihood of collective action

The predictors hypothesized as having an impact on collective action are summarized in the Table 3.

Note that only individual characteristics and environmental characteristics as perceived by farmers

are investigated in this study. This is because the farmers groups in Albania are rather missing, or at best not allowing for a statistically sound analysis.

3. Methods and procedures

3.1 Variables and measures

Discussion on the empirical model(s) to be used in the study is preceded by an introduction on translating collective action determinants (concepts) into variables and the way the last has been measured.

Table 4: Determinants, variables, measures and symbols

Determinants	Variables	Measures	Symbols
	Dependent variable		
Likelihood to cooperate	*LikelyCoop*	Dummy variable. 1=cooperate, 0=does not cooperate	Y
	Independent variables		
Social capital	*SocCap*	Scale variable. Composite indicator taking into account former participation in formal/informal collective action and the degree of participation	X_1
Wealth	*FarmSize*	Scale variable. Number of apple trees.	X_2
Exit options	*MainJob*	Dummy variable. 1=farming main job, 0=farming non main job	X_3
Education	*Education*	Ordinal variable. 1= non finished elementary, 2=Elementary (4 years), 3=Junior high school, 4=Non-finished high school, 5=High school, 6=non-finished professional school, 7=professional school, 8=non-finished inuversity, 9=university	X_4
Age	*Age*	Scale variable. Number of years	X_5
Perceived conflicts	*Conflict*	Ordinal variable. 1=Less than in other villages, 2=same as in other villages, 3=more than in other villages	Z_1
Perceived competition	*Compet*	Ordinal variable. 1=No competition … 5=Very strong competition	Z_2
Perceived leadership	*Leadership*	Dummy variable. 1=presence of leadership, 0=lack of presence of leadership	Z_3

3.2 Empirical model(s)

Three empirical models with qualitative dependent variables were used to test the impact of identified predictors on the outcome, namely Linear Probability Model, Logit Regression Model and Probit Regression Model.

Linear probability model

This model has the functional form:

$$Y_i = a_iX_i + b_iZ_i + e \qquad (1)$$

where Y_i is the dummy variable for individual *i* to participate in collective action, X_i is a vector of the characteristics of individual *i*, Z_j is a vector of economic and social ("environmental") characteristics as perceived by individuals, *a* and *b* are vectors of parameters to be estimated.

Binary logit model

This model has the form:

$$Y_i = 1/[1+\exp(a_iX_i + b_iZ_i)] + e \qquad (2)$$

The odds ratio will be given by the equation below:

$$P/(1-P) = \exp(a_iX_i + b_iZ_i) \qquad (3)$$

The odds ratio for the case at hand should be interpreted follows: one unit change – say - in the stock of social capital increases by e^{b1} the probability ratio between farmers participates to farmers does not participate in collective action.

Binary probit model

This model has the following functional form:

$$Y_i = \Phi(a_i X_i + b_i Z_i) \qquad (4)$$

In this model, ***Φ*** denotes cumulative normal standard distribution function, or the probability that a variable with standard normal distribution is greater than the number in brackets. This is the predicted probability that an individual with given values of X and Z variables is willing to cooperate.

3.2 Data Sources

Data collection instrument. Data processed come from a survey designed and implemented for this study. The survey instrument was designed to collect information needed to achieve the stated objectives (test the hypothesis posited). Important information to be collected through survey instruments includes: (i) demographics (age, gender, education, employment), (ii) land resources and apple production, (iii) market for apples, (iv) economic environmental problems (market information, input and output markets structure and market infrastructure, irrigation, agricultural machinery), (v) attitude towards collective action, (vi) participation in organizations and processes involving collective action, (vii) costs and benefits from engaging in collective action, (viii) perception of leadership presence, (ix) conflicts and conflict resolution mechanisms.

Sample design. A sample size of 220 interviews was deemed to be representative. The survey was conducted in two major areas of apple production in Albania, namely Korca and Dibra. Six villages on Korca and 6 villages in Diber were randomly selected in apple production area and quotas were allocated to each village proportional to the number of apple growers. Within each village, farmers were selected using randomly.

4. Results and discussions

Results suggest that five factors affect farmers' likelihood to cooperate. They are social capital (measured by *SocCap*), wealth (measured by *FarmSize*), education (measured by *Education*), competition (measured by *Compet*) and leadership (measures by *Leadership*). These factors are found to be statistically significant at 0.01 or 0.05 level of significance as shown by p-value (last column in Table 5). The rest of variables discussed in Table 3 are found to be statistically insignificant.

Table 5: Linear Probability model

Variables	Parameter Estimates	Standard Error	TStatistic	P-Value
SocCap	0,0211013	0,0073634	2,8657	0,0046
FarmSize	0,0000581214	0,0000285705	2,03432	0,0432
Education	-0,026841	0,00965943	-2,77873	0,0060
Compet	0,15989	0,0214808	7,44336	0,0000
Leadership	0,192977	0,0578347	3,3367	0,0010

For simplicity, out of three model tested (refer to Methods and procedures: empirical models), Linear Probability Model outcomes are used to interpret the results (Table 5). It is worth noting however that the three models used generate similar results as far as significance of estimates and their signs are concerned.

Three variables, namely *SocCap, FarmSize, and Leadership* have a positive impact on farmers' likelihood to engage in collective action as shown by the parameter estimate signs in Table 5. This is in conformity with the way these factors have been hypothesized in this study. How can one interpret the above results?

The parameter estimate for social capital (0.021)

means that probability of engaging in collective action increases by 2.1% with one additional unit of social capital, or that probability increases with 21.1% for 10 additional units of SocCap. This is a very important finding.

Measuring social capital

Social capital is a composite indicator taking into account former participation in formal/informal collective action and the degree of participation. Eighteen formal groups and six informal activities involving collective action have been included in the questionnaire. The degrees of participation in in collective action ranges from 1 to 4; 1=not active, 2=somewhat active, 3=very active, 4=organization. Respondents get 1 for participation in each formal organization/informal activity and 1 to 4 for the degree of participation. For instance, is someone is participating very actively in a parents committee and actively in irrigation canal maintenance, his stock of social capital is 5=(1*3+1*2); the 1 in the former calculation stands for participation and 3 and 2 stand for the degree of participation in the respective collective action.

Krishna [5] has used participation in formal/informal activities as a proxy for measuring collective action. Additionally, World Bank [10] uses participation in networks as a proxy of social capital.

Simply put, the probability an apple growers to engage in collective action increases by around 20% if this farmers has been participating, say, very actively in 2 informal activities and in 1 formal organization involving collective action. The SocCap variable interval is between 0 and 27 units.

Wealth, measured by FarmSize, or by the number of apple trees, also have a very important impact on farmers likelihood to cooperate. Parameter estimate for FarmSize (0,000058) means that the probability of apple growers to engage in collective action increases by around 5.8% for every 1000 additional trees farmed; it is important to remind here that unit measure for FarmSize is in trees. Since the FarmSize variable interval is between 20 and 8300 trees, one compute may find that the probability of "wealthiest" farmers to engage in collective action is around 50% (8.3*5.8%) higher than the "poorest" farmer. The finding suggests that when shifting from subsistence to commercial farming, cooperation becomes more interesting.

The impact of perceived leadership on farmers' likelihood to engage in collective action is easily interpretable: the perception that there exists a leader in the closest community increases by 19.3% the probability of participating in collective action. This does not come as a surprise. The leadership is a scarce resource in Albanian farmers' community. The evidence from the field supports that relationship between success and failure in cooperative projects is closely related to the quality of the leader.

Two statistically significant variables (*Compet and Education)* have the reverse impact when compared with the way they have been hypothesized however. The positive relationship between competition and likelihood to cooperate says that farmers' likelihood to cooperate increases when intermediaries (traders) compete "cooperative project" by buying the produce at fair prices; this should not be the case. Additionally, the negative relationship between education and likelihood to cooperate says that as education level increases, the likelihood to cooperate decreases. This is different from what have been hypothesized.

5. Conclusions

The objectives of the study were to assess the impact of farmers' individual and environmental characteristics on their likelihood to cooperate. Results show that social capital (SocCap), wealth (FarmSize)

and leadership (Leadership) are significant factors positively affecting cooperation. Research findings are in line with the way they have been hypothesized and in conformity with previous studies.

The results are of both theoretical and practical importance. Theoretically, study supports that social capital, wealth and leadership are particularly important in post communist transition country agriculture. Practically, results benefits government agencies in two ways: better targeting of potential farmers groups, and improving preconditions for collective action through increasing the stock of social capital by supporting farmers to assist in "first collective action experience", designing and implementing leadership programs and long terms policies to increase farm size.

The study results suggest two major groups of factors still remain to be further researched; (i) the reverse signs for the two statistically significant factors, namely education and competition, need more in depth understanding, and (ii) the statistically non-significance of the three factors hypothesized as important determinants, namely *exit options, age* and *conflicts* should be reconsidered in future studies by the authors or by other researchers.

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