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Economic versus non-economic motives of transhumant farmers in Greece

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Abstract. Transhumance in Greece constitutes a paradigm of a multifunctional system, affecting the environment and the viability of mountainous areas, while its continuation is linked to the cultural identity of these areas, including the maintenance of the transhumant farmer profession itself. This study proposes a conceptual framework to approach the multifunctional character of transhumance. Through a questionnaire survey, a latent construct measuring the degree to which transhumant farmers are motivated by their multiple roles in their decision-making process was proposed. In order to examine the validity of this latent construct, a confirmatory factor analysis was employed, revealing that farmers incorporate economic and non-economic features within the same framework, thus understanding that they play distinct roles, all of which comprise the multifunctional character of their profession. Not surprisingly, economic features are negatively correlated with non-economic ones, providing an explanation as to why transhumance has demonstrated resilience under harsh economic conditions. The results can be used in the implementation of Reg. EC/1305/2013, as they highlight that funds for transhumance should not be of purely economic nature, but should also be allocated to sectors affected by the multifunctional character of the system.

Keywords. Extensive livestock farming – Environment – Rural development – Confirmatory factor analysis.

La multifonctionnalité de la transhumance : Les éleveurs aperçoivent leur rôles diverses ?

Résumé. *La transhumance en Grèce constitue le paradigme d'un système multifonctionnel, qui affecte l'environnement et la viabilité des zones montagneuses et dont la continuation est indispensable pour sauvegarder l'identité culturelle de ces domaines. Cette étude propose un cadre conceptuel pour examiner le caractère multifonctionnel de la transhumance. Grâce à une enquête, une construction latente mesurant le degré de motivation des éleveurs dans leurs multiples rôles a ce qui concerne la prise de décision a été proposée. Afin d'examiner la validité de cette construction latente, une "Confirmatory Factor Analysis" a été menée, révélant que les éleveurs intègrent des fonctions économiques et non-économiques dans le même cadre, en apercevant ainsi qu'ils jouent des rôles distincts, et qu'ils comprennent le caractère multifonctionnel de leur profession. Les caractéristiques économiques sont corrélés négativement avec les caractéristiques non-économiques, en expliquant la résilience que la transhumance connait sous des conditions économiques difficiles. Les résultats peuvent être utilisés dans la mise en œuvre de Reg. EC/1305/2013, car ils mettent en évidence que les fonds pour la transhumance ne doivent pas seulement être de nature purement économique, mais devraient également être attribuésaux secteurs touchés par le caractère multifonctionnel du système.*

Mots-clés. *Elevage d' animaux extensif – Environnement – Développement rurale – Confirmatory factor analysis.*

I – Introduction

In Greece, sheep and goat transhumant farms play numerous roles, as almost all types of family farms in the EU (de Vries, 2000).When it comes to the economic performance of transhumance, the low requirements of the system in fixed capital, purchased feedstuff and hired labor (Ragkos

et al., 2014) demonstrate that it is cost-efficient. However, its resilience through time, even under difficult conditions, implies that there are also non-economic factors affecting the decision to remain in the system. Such factors can be integrated and examined within the framework of multifunctional farming, as proposed by the OECD (2001). This approach implies that agricultural and livestock production systems produce non-traded outputs categorized as those affecting the environment and rural amenities (Lankonski and Ollikainen, 2003). Indeed, the performance of seasonal movements has generated a particular way of life and a broad range of customs followed by transhumant farmers, which shape the "agricultural cultural heritage" of the system (Sivignon, 1975). Transhumance has been –and still is– the main economic activity for many Greek mountainous areas (Ispikoudis *et al*., 2002), being the basis for a development process "from the inside" which takes advantage of existing know-how, infrastructure and natural resources. The system also plays a two-fold environmental role through the protection of genetic diversity, by rearing sheep and goats of rare autochthonous breeds, and through the development of mountainous rangelands.

The new Common Agricultural Policy of the EU (Reg. EC/1305/2013 and Reg. Ec/1307/2013), provides income support and financial opportunities to extensive livestock farmers. In order to achieve the best allocation of funds it is important to discern the motivation behind these farmers' decisions to remain in the transhumant system. In other words, it is accepted that transhumance is multifunctional, but are farmers aware of their multiple roles and do these roles affect their decisions? In order to answer this question, this study proposes a latent construct which comprises economic and non-economic implications of transhumance, measuring how farmers are motivated by their multifunctional role in their decision-making process.

II – Materials and methods

The empirical analysis is based on a questionnaire survey of 551 transhumant livestock farmers. Participants were interviewed concerning the degree to which they acknowledge the multiple roles that they are supposed to play. Using a 5-point Likert scale (Totally agree, Agree, Neither agree nor disagree, Disagree, Totally disagree), respondents were presented with four latent constructs, each one including 6 to 7 item describing dimensions of the multifunctionality of transhumance (Table 1). The survey was conducted from 2012-2014 The initial processing of the data excluded 23 cases, yielding a valid dataset of 527 responses.

A Confirmatory Factor Analysis (CFA) (Brown, 2006) was employed in order to examine the validity and reliability of the latent construct, that is to demonstrate that the four latent variables describe the same notion –the multifunctionality of transhumance– in a consistent manner and that they can all be included within a common framework of examination of the system. Numerous specifications of the latent construct were tested and some items were removed in order to improve the goodness-of-fit measures. The most commonly used goodness-of-fit measures are the root mean square of approximation (RMSEA), the standardized root mean square residual(SRMR),the comparative fit index (CFI), the goodness-of-fit index (GFI) and the adjusted goodness-of-fit index (AGFI) (Hu and Bentler, 1999, Ardoin *et al*., 2012). The final specification of the latent construct is illustrated in Fig. 1.

Table 1. Latent variables and items describing the multifunctionality of the transhumant sector

Latent variables	Items	Statements	Average (min = 1, max = 5)
Economic performance (EP) *Economic aspects of the system*	Ec1	"Intensive sheep and goat farming is less profitable"	3.42
	Ec2	"My job is very tiring and I am thinking about quitting"	3.36
	Ec3	"Transhumance is profitable"	3.08
	Ec4	"I am planning to continue transhumance"	4.05
	Ec5	"I am happy with transhumance"	3.66
	Ec6	"Being a livestock farmer is nice because I am the owner of my business"	4.18
Rural develop-ment (RD) *Contribution to to rural development and culture*	RD1	"Transhumance safeguards culture and tradition"	3.92
	RD2	"The village would be lost without transhumant flocks"	3.47
	RD3	"I don't want to live in a city because life is worse there"	3.62
	RD4	"Transhumance contributes to the development of mountainous areas"	3.91
	RD5	"I like traditional festivals"	4.00
	RD6	"I know the traditional habits and customs my grandparents taught me"	3.81
Environmental protection (ENV) *Transhumance and the environment*	En1	"I am obliged to protect the environment"	3.71
	En2	"I like livestock farming because I get in touch with nature"	4.15
	En3	"Transhumant flocks contribute to the protection of rangelands"	4.16
	En4	"I know the repercussions of excessive pesticide and antibiotic use"	4.15
	En5	"Overgrazing in mountainous rangelands during summer degrades them"	3.47
	En6	"Transhumance is more environmental-friendly "	3.34
The profession (PR) *Merits and traditional aspects of transhumance*	Pr1	"My profession is socially acceptable"	3.07
	Pr2	"I like the way of living of a transhumant farmer"	3.95
	Pr3	"I like to produce my own food for my family"	3.52
	Pr4	"My profession made it difficult for me to find a wife (husband)"	3.96
	Pr5	"I like the (livestock) farming profession"	3.24
	Pr6	"I want my children to become (livestock) farmers"	2.71

III – Results and discussion

The results of the CFA are reported in Table 2. According to values reported by Hu and Bentler (1999) all goodness-of-fit measures were satisfactory and modification indices were all reasonable, indicating the robustness of the latent construct. Latent variables referring to non-economic functions (RD, ENV, PR) explained more of the variance (49.2%, 40.8% and 36.9% respectively) than EP (21.0%). Positive correlations were estimated among RD, ENV and PR (Table 2) but, not surprisingly, EP was negatively correlated with all of them. Indeed, this implies that there are two types of motivations for transhumant farmers –economic benefits for themselves and the provision of benefits for society– which are considered as "rival": a high interest for EP would entail less care for non-traded outputs, while preferences in favor of the provision of other goods and services could favor their production despite any potential economic drawbacks. This explains the resilience of the system, as it has kept on operating through harsh economic conditions, including the low opportunity costs of labor and historic and social isolation of areas where transhumance is practiced.

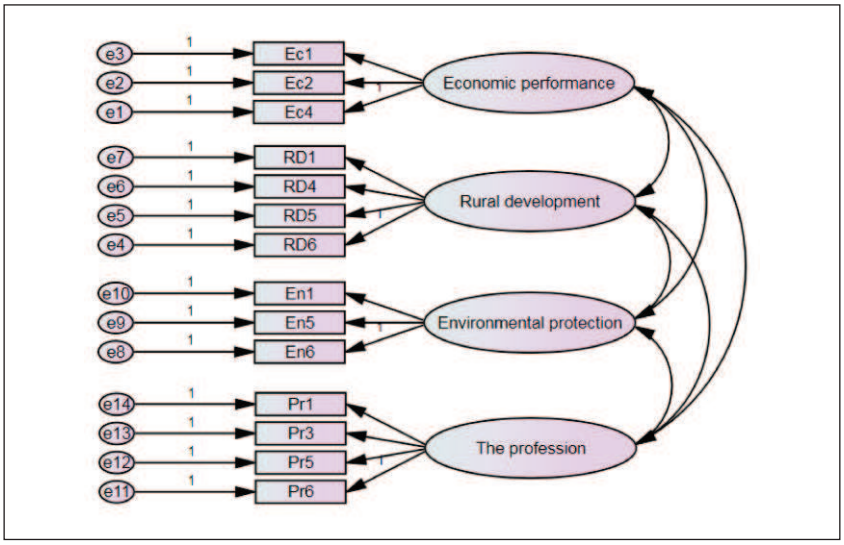

Fig. 1. Theoretical latent construct – Tree diagram describing the multifunctionality of tranhumance.

Table 2. Results of the CFA – Factor loadings, variance accounted for and goodness-of-fit

Factor	Items	Unstandardized coefficients (factor loadings)	Standard error	Estimate/ st. err.	Variance explained (%)	Variance explained by factor (%)	Correlations between latent variables
Economic performance (EP)	Ec1	1.53	0.39	3.87	19.6	21.0	RD -0.078
	Ec2	1.81	0.48	3.73	26.7		ENV -0.138
	Ec4	1.00			16.8		PR -0.088
Rural development (RD)	RD1	0.96	0.07	13.06	53.1	49.2	ENV 0.704
	RD4	0.98	0.07	13.40	58.5		PR 0.625
	RD5	0.78	0.07	12.00	37.1		
	RD6	1.00			48.2		
Environmental protection (ENV)	En1	1.32	0.11	11.89	67.7	40.8	PR 0.753
	En5	0.64	0.08	7.73	15.7		
	En6	1.00			38.9		
The profession (PR)	Pr1	1.62	0.20	7.84	37.1	36.9	
	Pr3	1.67	0.22	7.58	42.4		
	Pr5	1.80	0.22	8.26	50.9		
	Pr6	1.00			17.2		
Chi-square = 222.71		Chi-square/df (Cmin/df) = 3.137			RMSEA = 0.064		
df = 71		GFI = 0.942			SRMR = 0.051		
p = 0.000		AGFI = 0.914			CFI = 0.914		

IV – Conclusions

The latent construct described in this paper can be of use in the implementation of Reg. EC/1305/2013 and in the design of targeted measures supporting transhumance, as it encompasses all the factors which motivate transhumant farmers in their decision-making process. It is highlighted that funds for transhumance should not only be granted through purely economic incentives at the farm level (income support, financing of farm investments), but should also be allocated to actions supporting the multifunctional character of the system, for instance measures for rangeland management, the protection of the livelihood of mountainous villages, the promotion of the cultural heritage of transhumance and the development of the overall image of transhumant farmers, which would enable them to increase their self-esteem. However, the low variance explained by factor EP implies that this factor should be tested in the future and that there are potentially many more factors formulating the opinions of transhumant farmers concerning the economic performance of their activity.

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