An application of the analytic hierarchy process method in farmland appraisal

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Abstract

This paper applies a multi-criteria methodology to farmland appraisal known as the analytic hierarchy process (AHP). This methodology is especially useful when there is partial information and/or qualitative variables are used or when quantitative variables are used but the professional does not have access to their quantification. This context presents difficulties when applying conventional farmland appraisal methods. Likewise, the application of the analytic hierarchy process to the field of farmland appraisal is an advance with respect to previous studies on the application of multi-criteria methods in which only quantitative variables have been used.

Additional key words: AHP, multi-criteria analysis, partial information, qualitative variables.

Introduction

Asset appraisal in general, and of farmland in particular, as a process with its own methodology, is based on the assets that are valued or appraised and which are located in a market that is very different from the perfect competitive model. Generally, this model does not perform well if applied to frequent transactions; although when it does perform well, it lacks transparency and is not homogenous, free and concurrent, and therefore the market value or probable prices cannot be easily estimated.

Conversely, information regarding market values is a fundamental element in the appraisal methodology and delimits the use of certain methodologies according to their database requirements. This allows for consideration of an ample array of possibilities which range from classic synthetic methods where the information is reduced to one reference value (Caballer, 1974; Ballestero and Romero, 1992), to modern developments in synthetic methods, Beta one-dimensional (Ballestero, 1973; Ballestero and Caballer, 1982; Alonso and Lozano, 1993; Garcia and Garcia, 2003) and two-dimensional methods (Romero, 1997; García et al., 1999a,b; Palacios et al., 2000; Herrerías Pleguezuelo et al., 2001; 2002) to econometric methods (Caballer, 1976; Segura et al., 1998; Calatrava and Cañero, 2000; Isakson, 2001) whose application requires a large amount of data and is therefore restrictive in the study of certain markets, despite being superior to previous methods.

In order to improve the results obtained by the development of comparative methods, the use of the multi-criteria methodology in the context of quantitative variables has already been proposed in previous works (Caballer and Aznar, 2004). The purpose of this paper was to take a further step in the