The Ordered Switching Regimes Model: With Applications in Health and Education

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Switching regimes models (SRM hereafter) arise when a random variable Y is explained in different fashions across alternate regimes, where individuals choose their regime membership. The simplest of these model types has just two regimes, and is due originally to Roy (1951). While Roy's model concerned a binary switch, situations can arise in which multiple regimes are possible, as occurs in our present case. With three or more regimes, we examine the Ordered SRM (OSRM hereafter) in which regime-membershipis determined by an ordered response on an underlying utility variable, the latter can be associated with Y. The OSRM is discussed in terms of the multivariate normal distribution in Vella (1998), with antecedents in Heckman (1976), Terza (1983) and Garen (1984). We extend the OSRM to abitrary settings by using a copula approach to model specification. The OSRM is illustrated by applications in health economics (single-spell durationand vigour with which sporting activities are undertaken), and higher education (course achievement depending on extent of participation in a peer-assisted learning programme).