Mobility Decomposition Over Several Periods:
Theory and Evidence on Consumption Mobility from Peru

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Decomposing economic mobility into structural and exchange components has long been a matter of concern among social scientists. While there seems to be consensus that exchange mobility is the component that captures the effect of rerankings, the precise definition of structural mobility is less clear in the literature, beyond a notion that structural mobility captures everything else, chiefly changes in the marginal distributions. Recently van Kerm has proposed understanding structural mobility in terms of a growth component and a dispersion component (van Kerm, 2004). His decomposition of mobility into structural and exchange components, and that of Ruiz-Castillo (2004), are the most significant recent contributions. Both work using counterfactual distributions that isolate the respective components. But these techniques have been devised for two-period analyses.

An alternative decomposition has been proposed by Tsui (2009), which is the first (to my knowledge) that is applicable to several periods. However, the structural component of Tsui decomposition has a very stringent benchmark situation of lack of structural mobility: its structural component is equal to zero if and only if income inequality in each and every period is zero (i.e. all cross-sectional distributions are compressed around their means). This is at odds with the less stringent benchmarks of perfect (structural) immobility discussed in the literature; e.g. income problems that keep the level of time-specific income inequality constant (e.g. Chakravarty et al. (1985)).

Considering this recent interest in mobility decomposition, my first methodological contribution is a decomposition of mobility over several periods, but using the mobility concepts and approaches proposed by Shorrocks (1978) and Maasoumi and Zandvakili (1986). They both measure income mobility (or that of some of their wellbeing metric) as the degree of equalization of the whole income stream relative to a weighted sum of time-specific income inequalities. I apply the counterfactual approach of Ruiz-Castillo and Van Kerm to a general family of mobility indices which contain the indices of Shorrocks and Maasoumi and Zandvakili as special cases. This proposal has the advantage of being applicable to multiple periods and of having a benchmark of perfect structural immobility that is more in tune with the concepts discussed in the early literature.

A second methodological contribution stems from the observation that all current decomposition approaches isolate a structural component that is insensitive to rerankings (as it should be), but their exchange component is sensitive to both rerankings (as desired) and to structural changes. So, instead of proposing a decomposition of an index into these two components, I propose measuring the exchange and structural components of mobility over several periods using indices of exchange mobility that are only sensitive to rerankings while being insensitive to any other distributional change; and using indices of structural mobility that are insensitive to rerankings while being sensitive to other distributional changes. For this pure exchange component, either intragroup rank concordance indices or copula-based indices are good candidates. I propose

using rank concordance indices from the family characterized by Seth and Yalonetzky (2011). For the structural indices I propose using the rank-insensitive indices proposed in the first part of this paper. I discuss the pros and cons of using these pairs of indices separately, as in a dashboard approach, or together, as part of a composite index.

Finally, I apply these two methodological contributions to the analysis of consumption mobility and inequality using three rounds of the Young Lives panel dataset (2002, 2006, 2009) that tracks two cohorts of children and their families in Andhra Pradesh, Ethiopia, Peru and Vietnam.

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