

# Persistent transitions and chronic poverty: Accounting for the effects of classification error

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"Progress towards alleviating extreme poverty, the first of the Sustainable Development Goals, has stagnated in recent years (World Bank, 2022). Well targeted policies necessary to reignite progress towards this goal should distinguish between chronic and transitory poverty (Jalan and Ravallion, 1998). Reliable estimates of poverty dynamics – the movement into and out of poverty – are used to identify the extent to which poverty is chronic or transitory (Green and Hulme, 2005).

There are long-standing concerns that measurement error in the underlying welfare aggregate overestimates poverty transitions and makes chronic poverty appear transitory (Rendtel et al., 1998). Measurement errors are ubiquitous in the survey data used to construct these welfare aggregates. Serially uncorrelated measurement error in the consumption aggregate can overestimate consumption in one wave and underestimate it in the next. If true consumption is in the neighborhood of the poverty line, measurement error can cause a transient misclassification of poverty status and an upward bias on estimated poverty transitions. Even when there are no changes in consumption and poverty over time, measurement and classification error will create the appearance of change. Although these errors do occur in rich countries, they are particularly pervasive in low-income countries (Ashenfelter et al., 1986) where poverty assessments are most critical.

Correcting for the confounding effects of measurement and classification error is challenging (Duclos et al., 2010). Many studies have turned to auxiliary data sources -- reinterviews, administrative data, or national accounts -- to correct measurement errors in survey data (Poterba and Summers, 1986; Chua and Fuller, 1987). However, these data sources have their own errors (Abowd and Stinson, 2013), and integrating data from different sources introduces additional issues, like matching errors, inconsistent interview methods, and variation in timing of interviews. These correction methods are not always feasible in low-income countries, where reinterviews can be prohibitively expensive and administrative data are scarce. These challenges necessitates the development of structural econometric approaches to dealing with measurement and classification errors (Poterba and Summers, 1986; Dinkelman, 2004; Burger, 2016). There are a few attempts to model mobility under measurement error in the literature but these typically rely on the Markov assumption on a continuous outcome, as in (Ward, 2023) or do not allow convenient extensions to the functional form to allow for duration-dependence or heterogeneity, as in Biemer and Bushery (2000). This potentially exaggerates the estimated effect and extent of classification errors by attributing the full violation of the Markov property to classification error.

This study develops novel structural approaches to the estimation of wellbeing and poverty dynamics in data-challenged environments, and applies it to 3 and 4 waves of household panel data in Nigeria. We present a novel structural classification error estimator that directly models poverty transitions in the presence of classification error. This estimator is extended to provide additional support for the identifying assumptions. The first extension is to allow for higher-order dependence by modeling poverty transitions as an AR(2) process. The second extension is into a multiple equation nonlinear systems estimator, in which the probability of misclassifying poverty status is allowed to depend on other inconsistent survey responses. In both cases, support is found for the hypothesis that there is significant misclassification of poverty and that this error underrepresents the extent of chronic poverty. Our results suggest that transitions out of poverty by a factor of 3, and that neglecting classification error makes approximately 40\% of chronic poverty appear transitory.

To check the robustness of our results, we first allow for duration-dependence by allowing the poverty transitions process to be AR(2). Second, we use a continuous approach to estimate consumption mobility and simulate implied poverty transitions. In both cases, support is found for the hypothesis that there is significant misclassification of poverty and that this error underrepresents the extent of chronic poverty. Lastly, we present further evidence that classification error drives a violation in the Markov property by showing that households with inconsistent responses to other survey questions have lower observed poverty transitions and higher estimated misclassification rates.

## Sources

Abowd, J. M. and Stinson, M. H. (2013), ‘Estimating measurement error in annual job earnings: A comparison of survey and administrative data’, *Review of Economics and Statistics* 95(5), 1451–1467.

Ashenfelter, O., Deaton, A. and Solon, G. (1986), *Collecting panel data in developing countries: Does it make sense?*, Technical Report 23, The World Bank, Washington.

Biemer, P. and Bushery, J. (2000), ‘On the validity of markov latent class analysis for estimating classification error in labor force data’, *Survey Methodology* 26(2), 139–152.

Burger, C. (2016), *A Structural Approach to Modeling South African Labour Market Decisions*, PhD thesis, Stellenbosch University.

Chua, T. and Fuller, W. (1987), ‘A model for multinomial response error applied to labor flows’, *Journal of American Statistical Association* 82(397), 46–51.

Dinkelman, T. (2004), ‘How household context affects search outcomes of the unemployed in kwazulu-natal, south africa: A panel data analysis’, *South African Journal of Economics* 72(3), 484–521.

Duclos, J.-Y., Araar, A. and Giles, J. (2010), ‘Chronic and transient poverty: Measurement

and estimation, with evidence from china', *Journal of development Economics* 91(2), 266–277.

Green, M. and Hulme, D. (2005), 'From correlates and characteristics to causes: thinking about poverty from a chronic poverty perspective', *World Development* 33(6), 867–879.

Jalan, J. and Ravallion, M. (1998), *Determinants of transient and chronic poverty: evidence from rural China*, number 1936, World Bank Group.

Poterba, J. and Summers, L. (1986), 'Reporting errors and labor market dynamics', *Econometrica* 54(6), 1319–1338.

Rendtel, U., Langeheine, R. and Berntsen, R. (1998), 'The estimation of poverty dynamics using different measurements of household income', *Review of Income and Wealth* 44(1), 81–98.

Ward, Z. (2023), 'Intergenerational mobility in american history: Accounting for race and measurement error', *American Economic Review* 113(12), 3213–3248

World Bank (2022), *Poverty and shared prosperity 2022: Correcting course*, The World Bank."