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A comparison of weighted time-product dummy and time dummy hedonic indexes

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This paper compares two model-based multilateral price indexes: the time-product dummy (TPD) index and the time dummy hedonic (TDH) index, both estimated by expenditure-share weighted least squares regression. The TPD model can be viewed as the saturated version of the underlying TDH model, and we argue that the regression residuals are "distorted towards zero" due to overfitting. We decompose the ratio of the two indexes in terms of average regression residuals of the new and disappearing items (plus a third component that depends on the change in the matched items' normalized expenditure shares). The decomposition explains under which conditions the TPD index suffers from quality-change bias or, more generally, lack-of-matching bias. An example using scanner data on men's t-shirts illustrates our theoretical framework.