

SHIFTING PREFERENCES AND TIME-VARYING  
PARAMETERS IN DEMAND ANALYSIS: A MONTE  
CARLO EXPERIMENT

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Ph.D. DISSERTATION PROPOSAL

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## Abstract

Using Monte Carlo experiments, I address two issues in demand analysis. The first relates to the performance of local flexible functional forms in recovering the time-varying elasticities of a true model, and in correctly identifying goods as complements, substitutes, normal or inferior. The problem is illustrated with the nonlinear almost ideal demand system (NLAI) and the Rotterdam model (RM). For the AIDS, I also consider two versions of its linear approximation: one with simple formulas (LAISF) and the other with corrected formulas (LAICF). The second issue concerns the ability of the flexible functional structures to satisfy theoretical regularity in terms of the Slutsky matrix being negative semi-definite at each time period of time.

I tackle these issues in the framework of structural time series models, computing the relevant time-varying elasticities by means of Kalman filtered and smoothed coefficients. The estimated time-varying coefficients are obtained under the pure random walk and the local trend hypotheses. I find that both the NLAI and the RM qualitatively perform well in approximating the signs of the time-varying income and substitution elasticities. Quantitatively, the RM tends to produce values of the time-varying elasticity of substitution close to the true ones within separable utility branches while the NLAI tends to produce overestimating values. On the other hand, the RM produces time-varying income elasticities with values close to the true ones while the NLAI tends to produce constant values over time. The LAISF model qualitatively performs similarly to the NLAI, but the LAICF does not. Finally, the NLAI achieves higher levels of the regularity index under the local trend specification while the RM achieves higher regularity levels under the random walk specification. In contrast, the LAISF and the LAICF models achieve lower levels of regularity under both specifications of the time-varying coefficients. Globally, the LAICF which widely adopted in applied work performs poorly compared to the RM and the NLAI. These findings are robust to different values of the time-varying parameters in the utility function. Two implications emerge from this research. First, the LAICF model should be considered as a model on its own rather than as an approximation of the NLAI. Second, the choice between an AIDS-type model and the RM should be motivated by their performance with respect to the properties a hypothesized true model for the data at hand, especially when working with real data.