EXPAMOD - a tool for linking farm level and market level models

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Farm management models help quantifying changes in land use patterns and agronomic practices for a given set of prices and policies, which indirectly have an effect on indicators of multifunctionality like the visual character of agricultural landscapes, biological diversity, and pollution levels. However, prices are unlikely to remain exogenous in any economic analysis, so that farm level optimization results may no longer be valid. Market level models, on the contrary, are able to capture the supply and price impacts derived by policy shocks at the farm and regional level, but are generally not sufficiently detailed for the calculation of environmental impacts, since they lack differentiated agronomic practices. By linking farm level and market level models we seek to mitigate this weakness and endogenise the price-quantity response in farm management models. The main steps in our approach are as follows. A collection of farm models, FSSIM, is run for several representative farm types with different exogenous price sets for a baseline and a policy scenario. Next, the proposed econometric model (EXPAMOD) estimates the differences in supply responses, and statistically propagates these responses to out of sample farm-region combinations. Changes in relative farm level profits are then used to assign new weights to the farm types covered by the analysis. The supply changes at the micro level and the revised weights for the farm types are then used to adjust supply in the market model CAPRI, so that revised prices are obtained. These prices are then fed back in a last step to FSSIM . The main modeling benefit of our approach is that it combines the strong points of farm management and market level models. From a policy analysis perspective the resulting farm type and acreage responses provide a much improved base for various environmental and landscape modeling exercises.

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