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AECP members in bold

Spiegel, A., Britz, W., **Finger, R.**

Risk, risk aversion and agricultural technology adoption – a combination of real options and stochastic dominance.

Abstract

What changes in the distribution of crop yields occur as a result of technological innovation? Viewing observed yields as random variables, estimation of the yield distribution conditional on time provides one approach for characterizing distributional transformation. Yields are also affected by weather and other covariates, spatial correlation, and a paucity of data in any one location. Common parametric and nonparametric methods rarely consider these aspects in a unified manner. Comprehensive solutions for describing the distribution of yields can be considered ideal. We implement a Bayesian spatial quantile regression model for the conditional distribution of yields that is distribution-free, includes weather (covariate) effects, smooths across space, and models the complete quantile process. Results provide insight into the temporal and spatial evolution of crop yields with implications for the measurement of technological change.

Böcker, T., Britz, W., **Möhring, N., Finger, R.**

An Economic and Environmental Assessment of a Glyphosate Ban for the Example of Maize Production

Abstract

The effects of a glyphosate ban on cultivation of silage maize are simulated using a spatially explicit bio-economic model that accounts for different pre- and post-sowing weed control strategies and production risks. We analyse the effects of a glyphosate ban on farmers' choices of field-level weed control strategies. These strategies are evaluated in two environmental dimensions. More specifically, we consider a pesticide load indicator to assess environmental toxicity, fate and human health effects as well as the energy demand of the agricultural system. We find that a glyphosate ban leads to a significant reduction of the pesticide load of silage maize production. However, a glyphosate ban also leads to somewhat higher energy consumption.

Severini, S., Biagini, L., El Benni, N., **Finger, R.**

Assessing the distribution and extent of indemnifications provided by the EU Income Stabilization Tool by means of a LASSO-Tweedie approach

Abstract

The income stabilization tool (IST) improves risk management opportunities for European farmers. Few analyses exist that identify farm characteristics determining severe income reductions and associated IST indemnifications. We extend the existing literature on this issue by applying a LASSO-Tweedie approach on a panel of Italian farms. The Tweedie is an innovative method to handle zero-inflated problems (i.e. many farms don't receive indemnities) while LASSO is a powerful variable selection procedure suitable when many regressors can potentially be considered. As far as our knowledge, this methodology has not been used yet in agricultural economics analyses.

In the considered case, a two-stage approach could lead to biased results because binomial models have a limited predictive capacity. The LASSO-Tweedie overcomes this problem and allows to strongly reduce the deviance, to begin with a wide set of potential explanatory variables and to reduce these to only those that are highly relevant.

Empirical findings are in general coherent with what has been found by previous analyses (e.g. farm size and diversification) but additionally suggest that the variability of some farm characteristics (e.g. farm size) observed in previous years influences the probability to receive IST indemnities.

Hirsch, S., Lanter, D., Finger, R.

Profitability of Firms in EU Food Retailing

Abstract

This article investigates the drivers and the persistence of firm profits in EU food retailing thereby generating insights for the derivation of managerial strategies as well as antitrust policies in this highly dynamic sector. Using a dynamic panel model, a sample of 13,256 food retailers from five EU countries – France, Poland, Spain, Sweden, and the UK – is analyzed over the period 2006 to 2014. Our findings indicate that profits in food retailing are more persistent than in other retail sectors presumably caused by high bargaining power towards processors and entry barriers that lead to less pronounced competition. The results also show that profits are influenced by firm- and industry-specific characteristics. While industry concentration and firm size positively influence profitability, firm age and financial risk tend to have a negative impact.

Dalhaus, T., Finger, R.

Bayesian quantile regression for weather index insurance design: Insuring idiosyncratic risk under data scarcity

Abstract

Crop insurances play a key role in managing farmers' financial exposure to climate risks. Recent developments have shown that weather index insurances (WII) help to overcome problems of asymmetric information in classical indemnity based crop insurances. However, basis risk, i.e. the discrepancy between WII payout and on-farm losses, constitutes the largest adoption hurdle to overcome. Currently, rich farm-level yield records are indispensable to design functioning WII contracts. Thus, farmers remain mostly unprotected in case of farm-level yield data scarcity. We here develop a Bayesian quantile regression (BQR) framework to reduce this type of basis. To this end, we use county-level yield data as informative prior for estimating the impact of farm-level rainfall on farm-level yields. We are thus able to combine the rich sources of county-level yield data with scarce data on the farm-level. We use an empirical example of insuring drought risk in Eastern German winter wheat production. Our results show that, although our approach helps to effectively reduce farmers' financial exposure to drought risk, basis risk remains unaffected in our case study context. Further research might expand the here proposed BQR to other perils with higher spatial dependence and regions with longer records of county yields.

Schaub, S., Buchmann, N., Lüscher, A., **Finger, R.**

Economic benefits from higher species diversity in intensively managed grasslands

Abstract

Grasslands cover a major share of the world's agricultural area and are important in global food security. Species diversity in grasslands is known to increase and stabilize biomass yields. In this paper, we valuate these effects of species diversity from an agro-economic perspective. We extend earlier research by accounting for species diversity effects on nutrient content and nutrient yield and we use a rich dataset from 16 intensively managed grassland sites across Europe. Combining this information, we focus on milk production potential and potential revenues from milk production. The results show a higher potential milk production, thus, higher revenues with higher species diversity. We also report reduced production risk in more diverse grasslands because of lower variance of nutrient yield. Further, we find considerable gains in certainty equivalent as the expected value and total insurance value increase with species diversity. These findings are supported using tests based on stochastic dominance analysis. Furthermore, we also find a positive diversity effect when the best performing monocultures are compared with all and best performing mixtures. Overall, we find that farmers economically benefit from higher species diversity and our results facilitate decision making to sustainably intensify grassland based production.

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Vroege, W., Dalhaus, T., Finger, R.

Index-based Insurances for Grasslands – A Review

Abstract

Index insurance schemes have been proposed as an alternative to overcome problems of asymmetric information and transaction costs when insuring agriculture with traditional indemnity-based insurances, and to allow to insure usually uninsurable land use forms such as pastures. It has been advocated that insurances based on variables highly correlating with, but independent of, the production at the farm have a particularly high potential to insure grasslands. We aim to shed light on the supply, diversity and uptake of index-based insurances for grassland production in developed countries. More specifically, this review provides a classification of grassland index insurance products, thereby incorporating the increasing possibilities of satellite imagery. It discusses ten grassland index insurance products that are on the market, summarizes their characteristics and discusses their strengths and weaknesses. A complete and verified overview was achieved by including systematizing expert interviews. Lastly, it targets to critically asses the different types of index insurances and provides an outlook on future developments.