PhD Project: Weather effects on price expectations in agricultural commodity markets

Background

Weather variables play a particularly important role in agricultural production, and thus affect the expectations on agricultural commodity markets. However, as of today there is little attempt to explicitly model this mechanism. In agricultural economics model weather is often a stochastic component in the error terms of the supply equations, focusing on yields more often than prices. On the other hand, macroeconometrics makes use of structural models with a range of endogenous variables that are useful to investigate the price drivers of the markets and market expectations, but to this field weather is quite an irrelevant variable. The body of climate-change literature, meanwhile, provides valuable insights into weather modeling, yet does not look into the market aspect. The research gap among these fields is therefore to be bridged.

Research objective and methodology

Putting focus on futures markets of main agricultural commodities (e.g. corn and soybean), this dissertation aims to shed light on the mechanism through which weather events affect price expectations on the markets.

Starting with an extensive literature review on current weather modelling and agricultural market expectation modelling approaches, the dissertation will explore two different directions for combining these two domains. The first direction would be directly incorporating weather as explicit variable(s) in the models of market expectations, alongside other variables. Either extreme events (e.g. droughts, floods, hail, etc.) or regular weather patterns (e.g. temperature and precipitations) can be used as weather proxies. The other direction is to study the weather-state-dependent reaction of market expectations to other events/variables (i.e. indirect effect). Dynamic Simultaneous Equation Models (DSEM) will be the main methodology approach of the thesis.