TECHNISCHE UNIVERSITÄT DRESDEN

DRESDEN concept

Using Sentinel-2 data to predict the return of grain futures and building a trading strategy

NoR Sponsorship 2928c6

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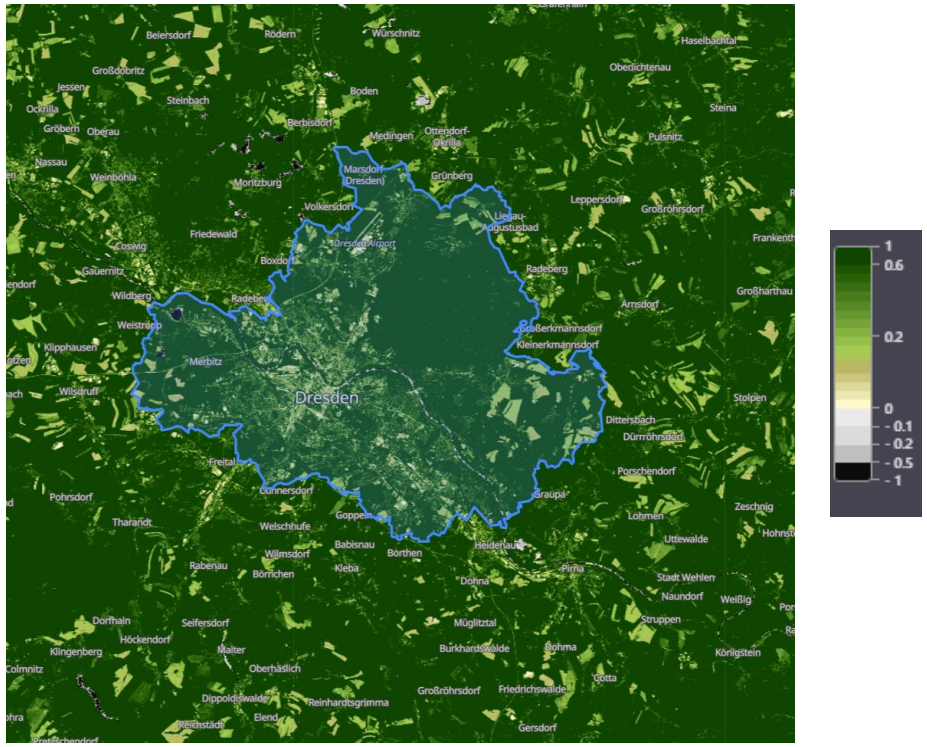
Objective

- My project builds on research that identifies an effect of key reports on the return of grain futures (Piette 2019)
- I wanted to investigate whether the faster revisit time and faster distribution of Sentinel-2 data offered a competitive advantage over, for example, Terra and Aqua imagery
- I was also able to start two more research-projects, with the provided data which are outlined at the end of this slide deck

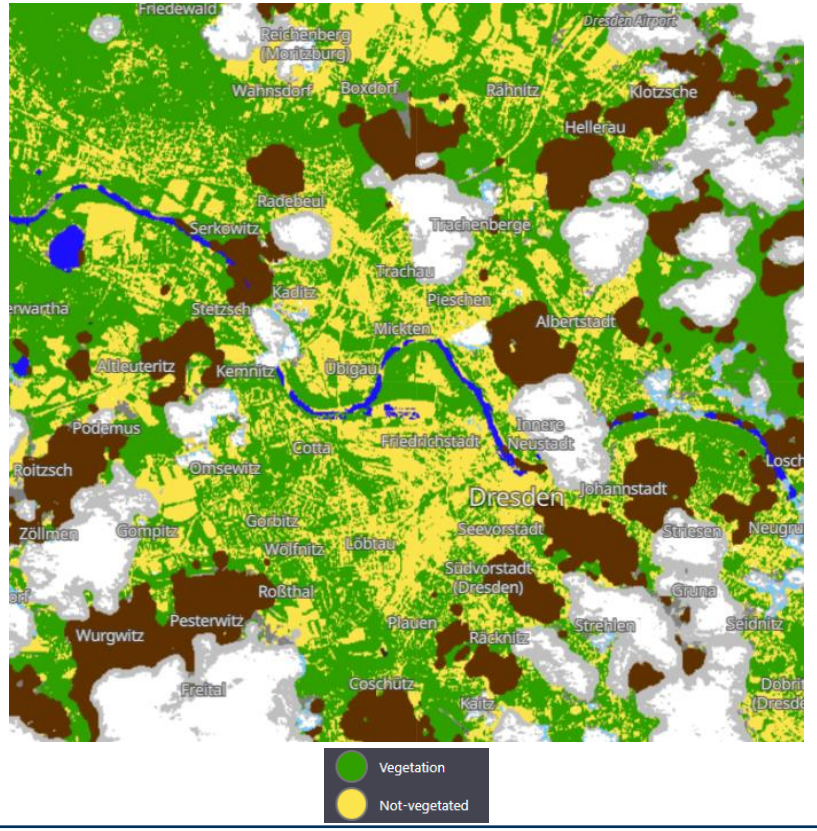
Method

Using Sentinels statistical API and the resources provided by the NoR, I used three different metrices to predict the grain yields of US Corn and Winter Wheat

(1) NDVI

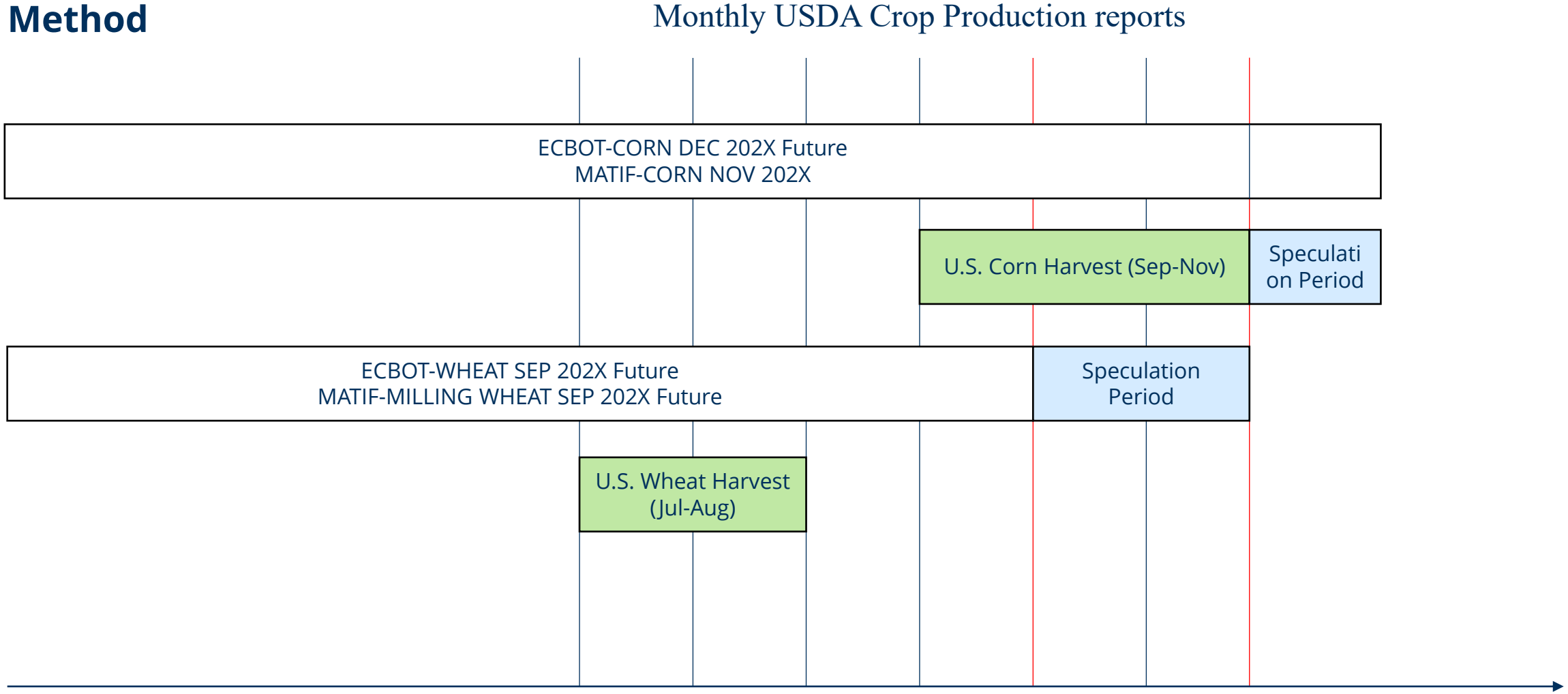


Number of (2) vegetated and (3) baren soil pixels



Method Comparing

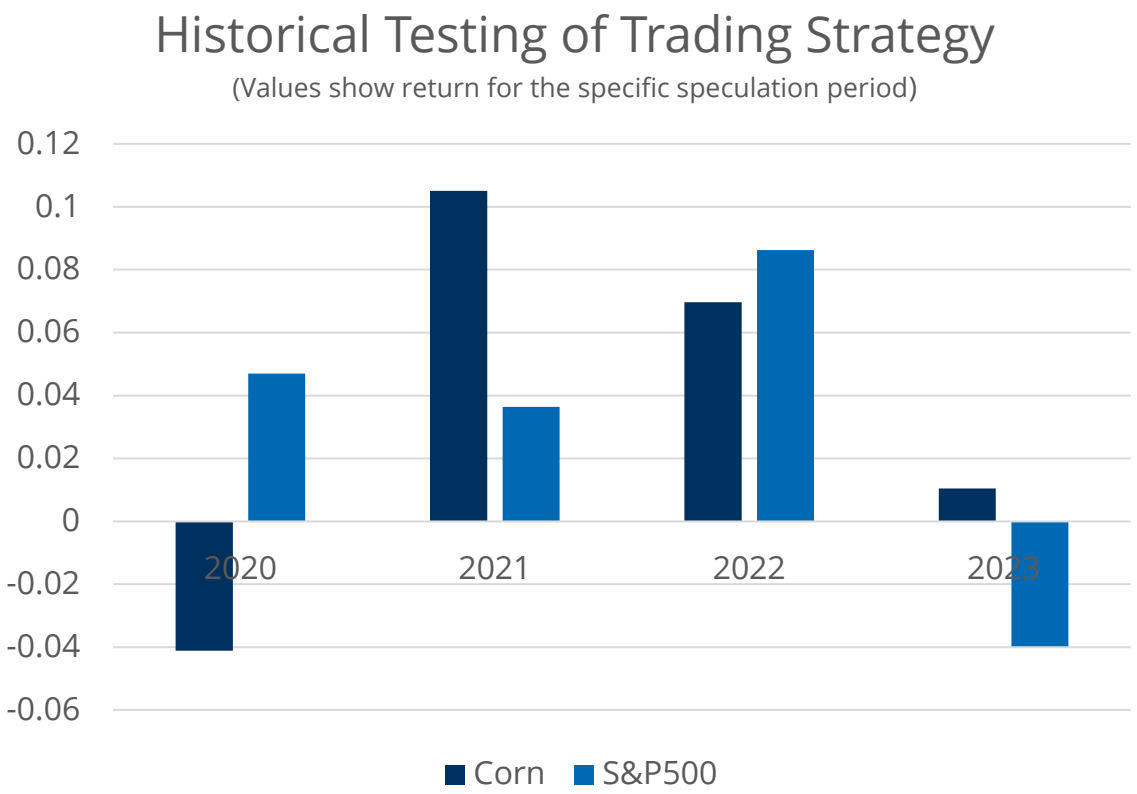
Method

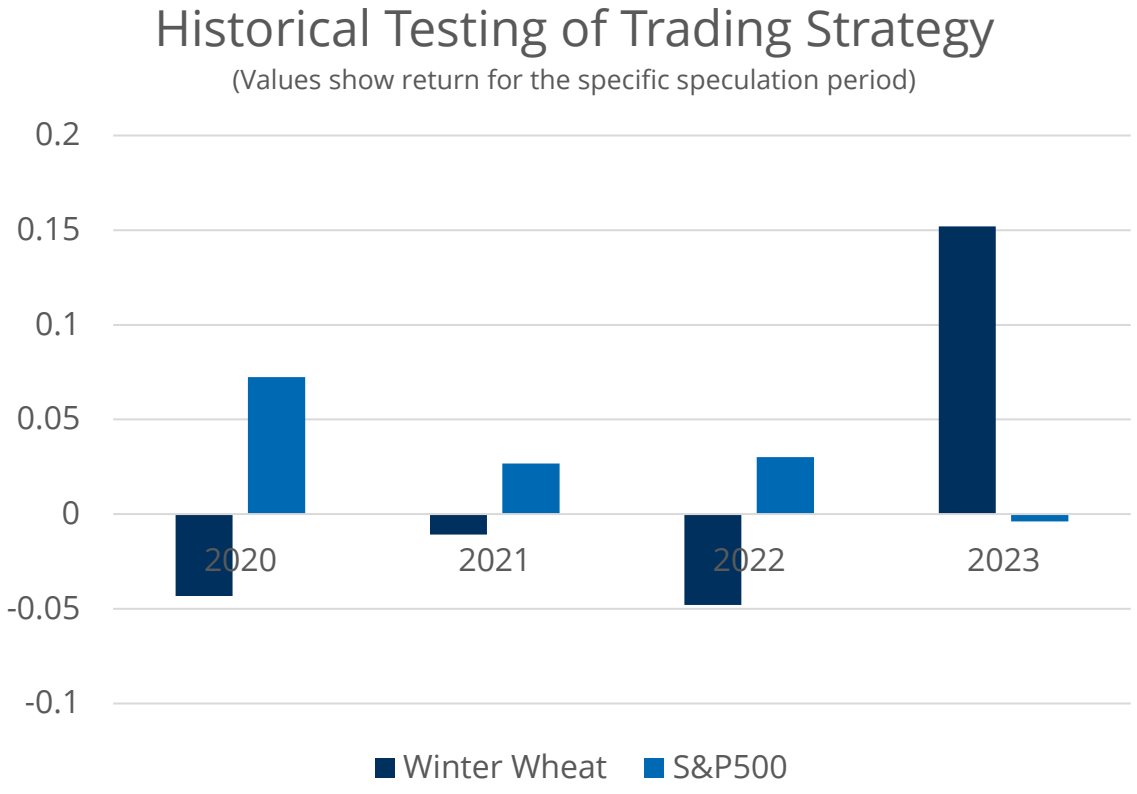


Source: USDA Crop Calendar

After the last USDA Crop production report for given year and commodity, a future is bought or sold, depending on newest, Sentinel-2 U.S. satellite pictures (red lines)

Results





While I could achieve positive returns on average for corn, I could not consistently beat the market in the same period

→ Effect was similar for Europe

Additional Projects utilizing the NoR Ressources

Local Climate Change Effects and Impact on Elections

- Using extracted satellite data for Europe, we are currently investigating the impact of visible climate change effects on voting outcomes in Germany
- We propose, that citizens that experience climate change through a changing vegetation are more likely to vote for parties that are fighting against climate change

→ Work in Progress

Local Climate Change Impact on Companies SDG achievements

- Using extracted satellite data for Europe, we are currently investigating the impact of visible climate change effects on the environmental behavior of firms
- We propose, that firms that experience climate change through a changing vegetation are more likely to transition to climate friendly companies

→ Work in Progress

Benefits

1. I show that positive returns are really only possible for Corn. NDVI Sentinel images, which are freely available with a subsidy, provide the best freely available images. However, it appears that speculators in wheat markets have access to better images. Thus, we reveal an information asymmetry that hinders market efficiency (which would also benefits farmers).
2. I am currently working with other co-authors on projects that help us to better understand the political and economical effects of climate change.

References

USDA Crop Calendar https://ipad.fas.usda.gov/ogamaps/cropcalendar.aspx

Satellite images were extracted using the Sentinel Hub EO Browser

Piette, P. (2019). Can Satellite Data Forecast Valuable Information from USDA Reports ? Evidences on Corn Yield Estimates (No. 2213-2021-767), from https://ageconsearch.umn.edu/record/309635/.

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